Osmond and Gardner Modelling

Austria IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	336.71	6.60	51	P, C	93.52	1791.50	0.0000
AGE-PERIOD	79.77	1.77	45	Cohort	72.63	424.03	0.0000
AGE-COHORT	76.99	2.14	36	Period	71.64	408.40	0.0000
PERIOD-COHORT	27.33	0.68	40	Age	20.12	145.17	0.0000
FULL AGE-PERIOD-COHORT	21.83	0.68	32			115.84	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	2.018053	104.244579
35	2.376628	238.027702
40	2.728650	535.364769
45	3.008983	1020.899864
50	3.269068	1858.097358
55	3.514945	3272.992175
60	3.750072	5624.348513
65	3.950536	8923.524851
70	4.141987	13867.150200
75	4.320453	20914.787579

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.035466	1.085090
1966	0.014954	1.035032
1971	0.005210	1.012069
1976	0.020128	1.047437
1981	-0.019608	0.955855
1986	-0.072429	0.846391

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.016459	0.962811
1891	0.001483	1.003421
1896	0.011278	1.026308
1901	0.009772	1.022755
1906	-0.002153	0.995055
1911	-0.020688	0.953481
1916	0.006556	1.015211
1921	0.022982	1.054343
1926	-0.003306	0.992416
1931	0.034256	1.082071
1936	-0.063294	0.864382
1941	-0.040936	0.910047
1946	-0.072214	0.846811
1951	-0.066411	0.858201
1956	-0.248736	0.563980

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	172.0	101.0	108.0	108.0	100.0	69.0
	EXP	134.0	103.4	130.1	124.8	105.0	69.0
	CHI	10.8	0.1	3.8	2.2	0.2	0.0
35 -	OBS	297.0	303.0	230.0	293.0	247.0	216.0
	EXP	293.0	295.4	232.1	301.5	253.1	211.2
	CHI	0.1	0.2	0.0	0.2	0.1	0.1
40 -	OBS	529.0	616.0	614.0	495.0	664.0	518.0
	EXP	539.2	627.6	647.5	527.3	603.0	496.8
	CHI	0.2	0.2	1.7	2.0	6.2	0.9
45 -	OBS	789.0	948.0	1153.0	1300.0	932.0	959.0
	EXP	857.6	967.8	1147.4	1234.7	885.2	995.1
	CHI	5.5	0.4	0.0	3.5	2.5	1.3
50 -	OBS	2026.0	1477.0	1712.0	2072.0	1949.0	1360.0
	EXP	2095.1	1442.2	1669.0	2065.2	1954.3	1372.3
	CHI	2.3	0.8	1.1	0.0	0.0	0.1
55 -	OBS	3868.0	3293.0	2321.0	2901.0	3206.0	2784.0
	EXP	3879.1	3319.7	2347.4	2861.6	3103.6	2864.9
	CHI	0.0	0.2	0.3	0.5	3.4	2.3
60 -	OBS	6201.0	5934.0	4982.0	3586.0	4161.0	4201.0
	EXP	6127.8	5694.6	5069.2	3782.6	4092.6	4311.5
	CHI	0.9	10.1	1.5	10.2	1.1	2.8
65 -	OBS	7047.0	7693.0	7506.0	7187.0	4768.0	4942.0
	EXP	7004.5	7747.2	7454.8	7162.0	4711.0	5065.9
	CHI	0.3	0.4	0.4	0.1	0.7	3.0
70 -	OBS	7243.0	7704.0	8897.0	9354.0	8095.0	5411.0
	EXP	7251.3	7887.6	8969.1	9298.1	8080.5	5223.4
	CHI	0.0	4.3	0.6	0.3	0.0	6.7
75 -	OBS	7003.0	6922.0	7817.0	9411.0	8381.0	7932.0
	EXP	7003.0	6913.7	7679.4	9359.0	8728.7	7791.8
	CHI	0.0	0.0	2.5	0.3	13.9	2.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	35834.19	895.85	40	P, C	94.94	0.0000
AGE-PERIOD	3487.54	87.19	40	Cohort	48.01	0.0000
AGE-COHORT	10833.90	270.85	40	Period	83.26	0.0000
PERIOD-COHORT	2314.00	57.85	40	Age	21.64	0.0000
FULL AGE-PERIOD-COHORT	1813.18	45.33	40			0.0000

AGE	EFFECT
30	104.244579
35	238.027702
40	535.364769
45	1020.899864
50	1858.097358
55	3272.992175
60	5624.348513
65	8923.524851
70	13867.150200
75	20914.787579

PERIOD	EFFECT	LOWER	UPPER
% Period Change	88.5480	85.5480	91.5480
1961	1.085090		
1966	1.035032		
1971	1.012069		
1976	1.047437		
1981	0.955855		
1986	0.846391		
1991	0.749463	0.724071	0.774855
1996	0.663635	0.619429	0.709364
2001	0.587636	0.529909	0.649409
2006	0.520340	0.453327	0.594521

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.962811	1.000000	
1891	1.003421	2.000000	
1896	1.026308	4.000000	
1901	1.022755	8.000000	
1906	0.995055	16.000000	
1911	0.953481	32.000000	
1916	1.015211	64.000000	
1921	1.054343	128.000000	
1926	0.992416	256.000000	
1931	1.082071	512.000000	
1936	0.864382	1024.000000	
1941	0.910047	2048.000000	
1946	0.846811	4096.000000	
1951	0.858201	8192.000000	
1956	0.825609	EXTRAPOLATION	0.563980
1961	0.803027	EXTRAPOLATION	
1966	0.781063	EXTRAPOLATION	
1971	0.759699	EXTRAPOLATION	
1976	0.738920	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	157.1	91.1	79.7	80.0	81.5	49.8	50.4	49.8	35.7	32.8
	EXP	122.4	93.3	96.0	92.5	85.5	72.8	62.7*	54.0*	46.5*	40.1*
	Elow							60.6	50.4	42.0	34.9
	Eup							64.9	57.8	51.4	45.8
35	OBS	259.8	273.4	206.3	220.5	188.0	176.8	138.7	123.1	80.8	62.0
	EXP	256.3	266.6	208.2	226.9	192.7	172.9	147.3*	126.8*	109.3*	94.1*
	Elow							142.3	118.4	98.5	82.0
	Eup							152.3	135.6	120.7	107.5
40	OBS	600.9	539.7	556.0	455.0	512.8	400.1	395.7	311.2	205.2	155.7
	EXP	612.5	549.9	586.3	484.7	465.7	383.7	344.3*	293.3*	252.6*	217.6*
	Elow							332.7	273.8	227.8	189.6
	Eup							356.0	313.5	279.2	248.6
45	OBS	1034.7	1091.3	1030.4	1218.3	888.1	757.9	703.8	723.2	445.2	360.0
	EXP	1124.6	1114.1	1025.4	1157.1	843.5	786.4	647.9*	581.4*	495.3*	426.6*
	Elow							626.0	542.7	446.6	371.6
	Eup							669.9	621.5	547.4	487.4
50	OBS	1859.0	1999.5	2033.8	1937.8	1916.6	1347.2	1336.2	1172.7	900.8	643.7
	EXP	1922.4	1952.4	1982.7	1931.5	1921.8	1359.4	1267.3*	1044.2*	937.1*	798.2*
	Elow							1224.4	974.6	845.0	695.4
	Eup							1310.2	1116.2	1035.6	912.0
55	OBS	3523.8	3204.0	3325.0	3664.3	3207.2	2912.9	2184.1	2078.0	1295.7	1191.4
	EXP	3533.9	3230.1	3362.9	3614.6	3104.8	2997.6	2120.3*	1976.7*	1628.7*	1461.6*
	Elow							2048.5	1845.0	1468.7	1273.3
	Eup							2192.2	2112.9	1799.9	1669.9
60	OBS	6316.4	6036.1	5334.1	5669.9	5762.9	4603.2	4448.2	3298.1	2290.8	1857.6
	EXP	6241.8	5792.6	5427.4	5980.8	5668.2	4724.3	4561.2*	3226.3*	3007.8*	2478.3*
	Elow							4406.7	3011.4	2712.3	2159.1
	Eup							4715.7	3448.6	3323.9	2831.6
65	OBS	9997.8	9380.2	9048.3	8943.1	8764.1	7768.4	6622.1	6352.2	3817.7	3095.3
	EXP	9937.6	9446.3	8986.6	8912.0	8659.3	7963.2	6637.1*	6408.0*	4532.6*	4225.6*
	Elow							6412.3	5981.1	4087.4	3681.4
	Eup							6862.0	6849.5	5009.1	4828.0
70	OBS	15081.2	14387.7	14238.5	14540.0	12661.1	12343.5	11206.5	9485.3	7235.2	5122.5
	EXP	15098.6	14730.5	14353.9	14453.1	12638.4	11915.6	10957.7*	9132.9*	8817.6*	6237.1*
	Elow							10586.4	8524.6	7951.4	5433.8
	Eup							11328.9	9762.3	9744.5	7126.2
75	OBS	21850.4	21747.7	22113.3	22529.8	19100.2	17182.3	18163.3	16355.1	11917.4	10288.7
	EXP	21850.4	21721.5	21724.1	22405.4	19892.7	16878.6	15913.3*	14634.0*	12197.1*	11776.0*
	Elow							15374.1	13659.2	10998.9	10259.4
	Eup							16452.4	15642.4	13479.2	13454.8
30-79	OBS	3800.7	3664.5	3583.6	3675.8	3352.9	2947.0	2730.1	2403.5	1667.5	1337.1
	EXP	3807.8	3665.4	3582.9	3684.7	3343.1	2952.6	2619.3*	2272.5*	1939.5*	1661.1*
	Elow							2530.6	2121.2	1749.0	1447.2
	Eup							2708.1	2429.1	2143.4	1897.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	172.0	101.0	108.0	108.0	100.0	69.0	86.0	90.0	56.0	44.0
	EXP	134.0	103.4	130.1	124.8	105.0	101.0	107.1*	97.6*	72.9*	53.8*
	CHI	10.759	0.054	3.764	2.250	0.236	10.143	4.144	0.586	3.924	1.782
35 -	OBS	297.0	303.0	230.0	293.0	247.0	216.0	199.0	211.0	146.0	99.0
	EXP	293.0	295.4	232.1	301.5	253.1	211.2	211.4*	217.5*	197.4*	150.3*
	CHI	0.055	0.195	0.019	0.242	0.149	0.109	0.722	0.192	13.393	17.489
40 -	OBS	529.0	616.0	614.0	495.0	664.0	518.0	492.0	446.0	349.0	283.0
	EXP	539.2	627.6	647.5	527.3	603.0	496.8	428.2*	420.3*	429.6*	395.5*
	CHI	0.194	0.215	1.731	1.984	6.163	0.904	9.516	1.566	15.115	31.981
45 -	OBS	789.0	948.0	1153.0	1300.0	932.0	959.0	906.0	889.0	629.0	610.0
	EXP	857.6	967.8	1147.4	1234.7	885.2	995.1	834.0*	714.7*	699.7*	722.8*
	CHI	5.483	0.405	0.028	3.458	2.479	1.307	6.210	42.488	7.151	17.593
50 -	OBS	2026.0	1477.0	1712.0	2072.0	1949.0	1360.0	1650.0	1465.0	1081.0	896.0
	EXP	2095.1	1442.2	1669.0	2065.2	1954.3	1372.3	1565.0*	1304.5*	1124.5*	1111.1*
	CHI	2.280	0.838	1.108	0.022	0.014	0.111	4.618	19.755	1.679	41.625
55 -	OBS	3868.0	3293.0	2321.0	2901.0	3206.0	2784.0	2109.0	2454.0	1555.0	1385.0
	EXP	3879.1	3319.7	2347.4	2861.6	3103.6	2864.9	2047.4*	2334.3*	1954.7*	1699.0*
	CHI	0.032	0.215	0.298	0.541	3.380	2.284	1.852	6.134	81.717	58.044
60 -	OBS	6201.0	5934.0	4982.0	3586.0	4161.0	4201.0	3933.0	2970.0	2558.0	2112.0
	EXP	6127.8	5694.6	5069.2	3782.6	4092.6	4311.5	4032.9*	2905.3*	3358.6*	2817.7*
	CHI	0.876	10.060	1.501	10.219	1.142	2.832	2.475	1.439	190.862	176.732
65 -	OBS	7047.0	7693.0	7506.0	7187.0	4768.0	4942.0	5364.0	5013.0	3149.0	3206.0
	EXP	7004.5	7747.2	7454.8	7162.0	4711.0	5065.9	5376.2*	5057.0*	3738.7*	4376.8*
	CHI	0.258	0.379	0.352	0.087	0.690	3.032	0.028	0.383	93.011	313.172
70 -	OBS	7243.0	7704.0	8897.0	9354.0	8095.0	5411.0	5975.0	6451.0	4932.0	3751.0
	EXP	7251.3	7887.6	8969.1	9298.1	8080.5	5223.4	5842.3*	6211.4*	6010.7*	4567.1*
	CHI	0.010	4.272	0.579	0.336	0.026	6.738	3.012	9.245	193.585	145.844
75 -	OBS	7003.0	6922.0	7817.0	9411.0	8381.0	7932.0	5865.0	6741.0	6412.0	5725.0
	EXP	7003.0	6913.7	7679.4	9359.0	8728.7	7791.8	5138.5*	6031.6*	6562.5*	6552.5*
	CHI	0.000	0.010	2.465	0.289	13.853	2.523	102.726	83.425	3.451	104.514
30-79	OBS	35175.0	34991.0	35340.0	36707.0	32503.0	28392.0	26579.0	26730.0	20867.0	18111.0
	EXP	35184.6	34999.3	35346.0	36716.8	32517.0	28433.9	25582.9*	25294.3*	24149.3*	22446.5*
	O/E	1.000	1.000	1.000	1.000	1.000	0.999	1.039	1.057	0.864	0.807

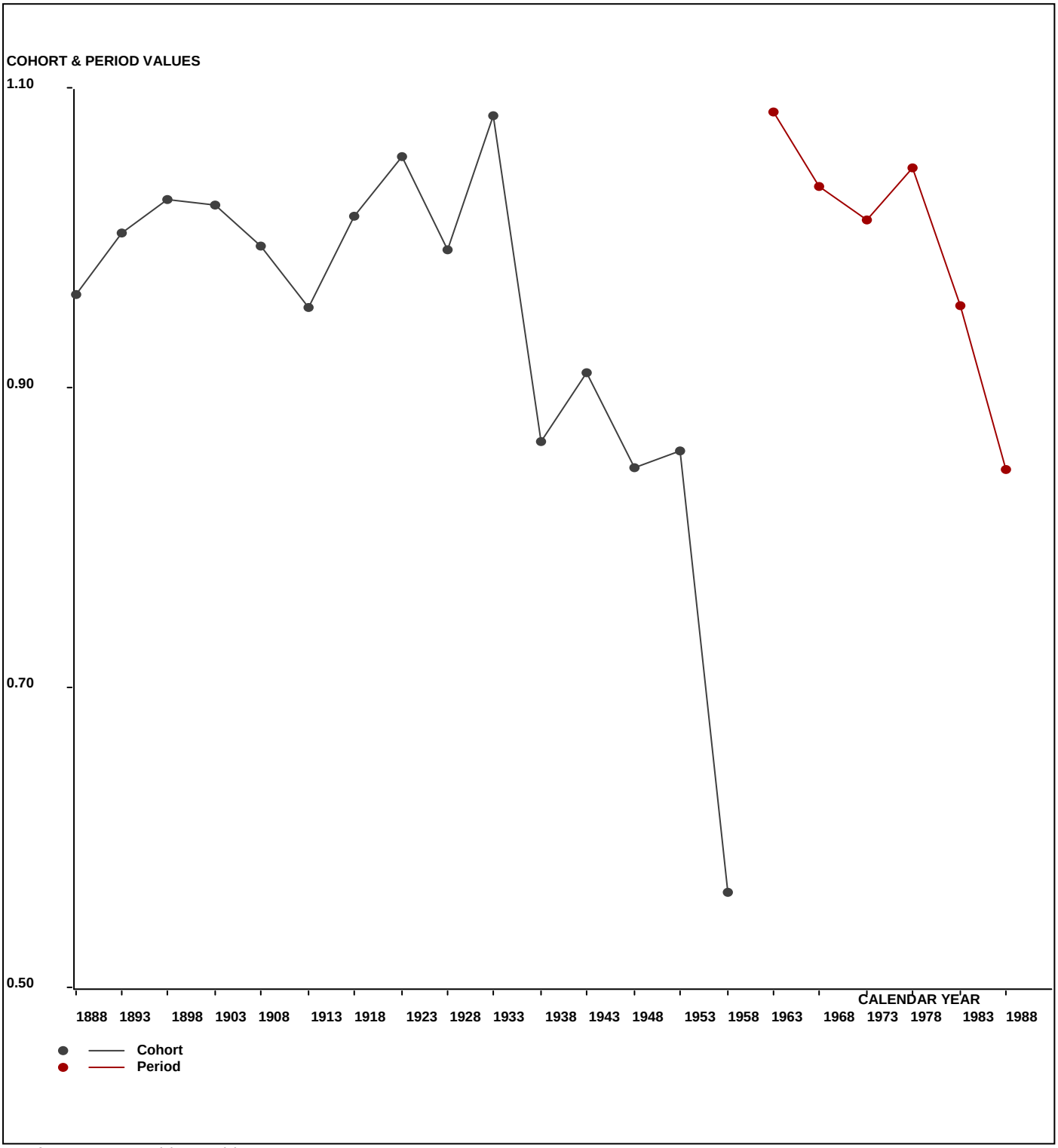
CHI SQUARE (LOG)= 1813.1814 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

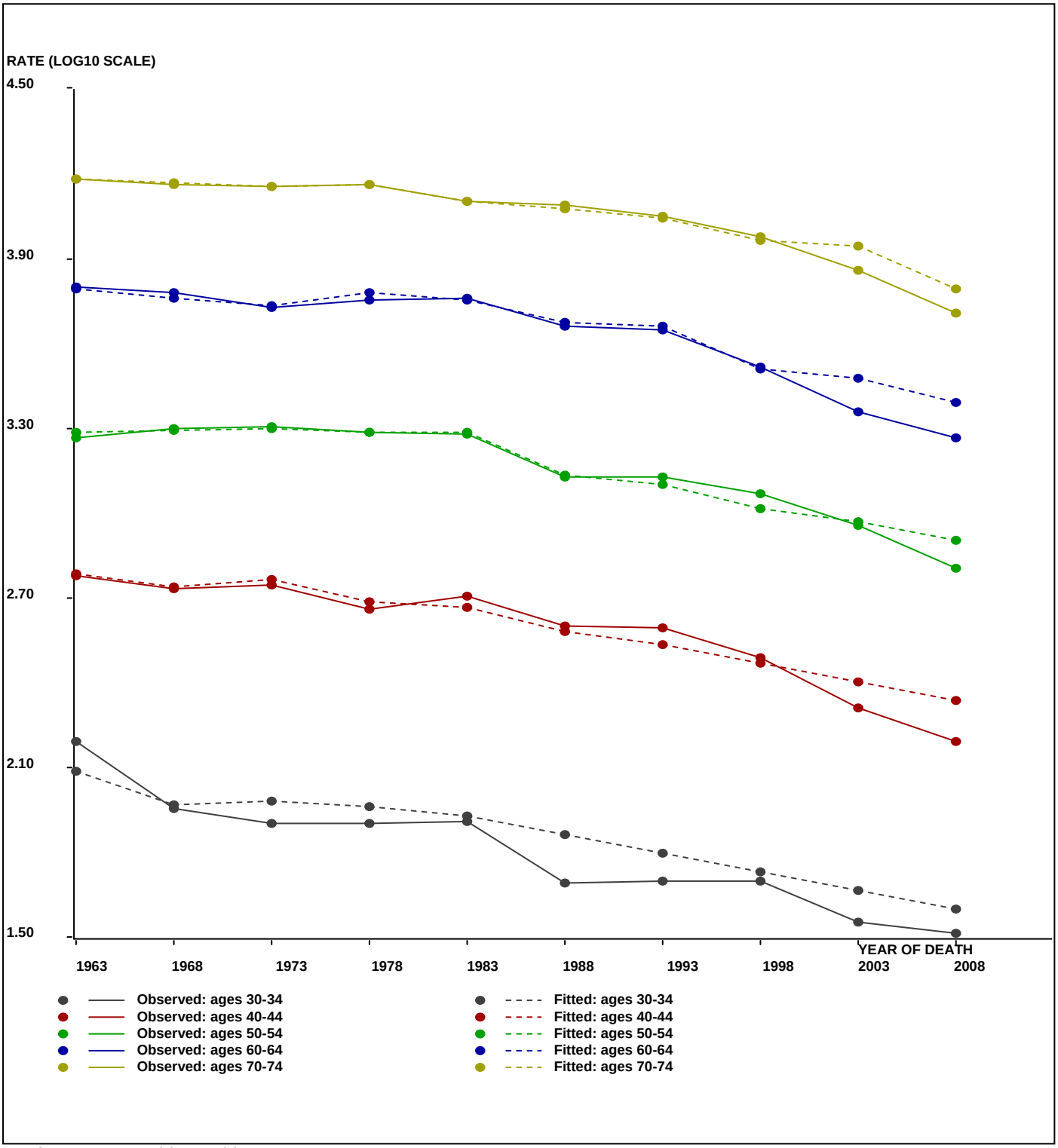


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	50.4	138.7	395.7	703.8	1336.2	2184.1	4448.2	6622.1	11206.5	18163.3
	PRE	62.7	147.3	344.3	647.9	1267.3	2120.3	4561.2	6637.1	10957.7	15913.3
	RES	-12.343	-8.607	51.335	55.910	68.845	63.763	-113.000	-15.020	248.821	2250.005
1996-	OBS	49.8	123.1	311.2	723.2	1172.7	2078.0	3298.1	6352.2	9485.3	16355.1
	PRE	54.0	126.8	293.3	581.4	1044.2	1976.7	3226.3	6408.0	9132.9	14634.0
	RES	-4.187	-3.768	17.904	141.762	128.502	101.326	71.799	-55.796	352.346	1721.055
2001-	OBS	35.7	80.8	205.2	445.2	900.8	1295.7	2290.8	3817.7	7235.2	11917.4
	PRE	46.5	109.3	252.6	495.3	937.1	1628.7	3007.8	4532.6	8817.6	12197.1
	RES	-10.796	-28.455	-47.388	-50.072	-36.209	-333.013	-717.004	-714.920	-1582.431	-279.709
2006-	OBS	32.8	62.0	155.7	360.0	643.7	1191.4	1857.6	3095.3	5122.5	10288.7
	PRE	40.1	94.1	217.6	426.6	798.2	1461.6	2478.3	4225.6	6237.1	11776.0
	RES	-7.295	-32.101	-61.875	-66.553	-154.504	-270.146	-620.666	-1130.322	-1114.558	-1487.229

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	86.0	199.0	492.0	906.0	1650.0	2109.0	3933.0	5364.0	5975.0	5865.0
	PRE	107.1	211.4	428.2	834.0	1565.0	2047.4	4032.9	5376.2	5842.3	5138.5
	CHI	4.144	0.722	9.516	6.210	4.618	1.852	2.475	0.028	3.012	102.726
1996-	OBS	90.0	211.0	446.0	889.0	1465.0	2454.0	2970.0	5013.0	6451.0	6741.0
	PRE	97.6	217.5	420.3	714.7	1304.5	2334.3	2905.3	5057.0	6211.4	6031.6
	CHI	0.586	0.192	1.566	42.488	19.755	6.134	1.439	0.383	9.245	83.425
2001-	OBS	56.0	146.0	349.0	629.0	1081.0	1555.0	2558.0	3149.0	4932.0	6412.0
	PRE	72.9	197.4	429.6	699.7	1124.5	1954.7	3358.6	3738.7	6010.7	6562.5
	CHI	3.924	13.393	15.115	7.151	1.679	81.717	190.862	93.011	193.585	3.451
2006-	OBS	44.0	99.0	283.0	610.0	896.0	1385.0	2112.0	3206.0	3751.0	5725.0
	PRE	53.8	150.3	395.5	722.8	1111.1	1699.0	2817.7	4376.8	4567.1	6552.5
	CHI	1.782	17.489	31.981	17.593	41.625	58.044	176.732	313.172	145.844	104.514

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	528.18	10.36	51	P, C	96.06	2824.46	0.0000
AGE-PERIOD	46.35	1.03	45	Cohort	55.16	246.42	0.0000
AGE-COHORT	69.86	1.94	36	Period	70.25	371.04	0.0000
PERIOD-COHORT	25.26	0.63	40	Age	17.73	134.15	0.0000
FULL AGE-PERIOD-COHORT	20.78	0.65	32			110.32	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.604228	40.200164
35	1.909690	81.225133
40	2.247808	176.932704
45	2.510458	323.934799
50	2.776187	597.291810
55	3.045182	1109.639022
60	3.351490	2246.415384
65	3.655253	4521.195729
70	3.931137	8533.697025
75	4.188823	15446.255720

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.029360	1.069940
1966	0.037428	1.090004
1971	0.024571	1.058207
1976	-0.000429	0.999012
1981	-0.019952	0.955098
1986	-0.114078	0.768992

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.038822	1.093508
1891	0.030008	1.071540
1896	0.021375	1.050450
1901	0.023257	1.055011
1906	0.011132	1.025963
1911	-0.029017	0.935369
1916	-0.042267	0.907262
1921	-0.058379	0.874220
1926	-0.095429	0.802733
1931	-0.023539	0.947243
1936	-0.058986	0.872999
1941	-0.025574	0.942813
1946	-0.045370	0.900803
1951	0.045298	1.109937
1956	0.030648	1.073118

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	43.0	48.0	51.0	48.0	52.0	46.0
	EXP	44.6	42.4	54.4	48.8	52.3	46.0
	CHI	0.1	0.7	0.2	0.0	0.0	0.0
35 -	OBS	68.0	74.0	98.0	107.0	98.0	85.0
	EXP	79.7	92.9	83.6	101.7	91.8	84.7
	CHI	1.7	3.9	2.5	0.3	0.4	0.0
40 -	OBS	114.0	148.0	211.0	188.0	228.0	153.0
	EXP	145.7	176.7	195.9	167.9	206.3	158.7
	CHI	6.9	4.7	1.2	2.4	2.3	0.2
45 -	OBS	226.0	265.0	312.0	376.0	268.0	271.0
	EXP	239.8	268.1	307.9	327.1	283.4	297.2
	CHI	0.8	0.0	0.1	7.3	0.8	2.3
50 -	OBS	604.0	408.0	510.0	549.0	565.0	376.0
	EXP	651.5	436.3	465.1	512.2	549.5	404.8
	CHI	3.5	1.8	4.3	2.7	0.4	2.0
55 -	OBS	1315.0	1092.0	759.0	852.0	900.0	704.0
	EXP	1337.0	1162.8	743.7	767.2	850.4	772.5
	CHI	0.4	4.3	0.3	9.4	2.9	6.1
60 -	OBS	2517.0	2525.0	2068.0	1259.0	1364.0	1208.0
	EXP	2489.4	2469.7	2076.8	1287.7	1354.3	1265.5
	CHI	0.3	1.2	0.0	0.6	0.1	2.6
65 -	OBS	3669.0	4324.0	4138.0	3351.0	2074.0	1815.0
	EXP	3581.7	4264.0	4071.9	3395.2	2131.4	1933.6
	CHI	2.1	0.8	1.1	0.6	1.5	7.3
70 -	OBS	4704.0	5257.0	5914.0	5542.0	4857.0	2718.0
	EXP	4698.8	5232.0	5953.1	5626.9	4874.3	2609.9
	CHI	0.0	0.1	0.3	1.3	0.1	4.5
75 -	OBS	5792.0	5737.0	5955.0	6751.0	6625.0	5310.0
	EXP	5792.0	5742.2	6069.5	6800.3	6641.4	5129.0
	CHI	0.0	0.0	2.2	0.4	0.0	6.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	39895.50	997.39	40	P, C	94.97	0.0000
AGE-PERIOD	867.11	21.68	40	Cohort	-131.45	0.0000
AGE-COHORT	14096.31	352.41	40	Period	85.76	0.0000
PERIOD-COHORT	2028.17	50.70	40	Age	1.05	0.0000
FULL AGE-PERIOD-COHORT	2006.94	50.17	40			0.0000

AGE	EFFECT
30	40.200164
35	81.225133
40	176.932704
45	323.934799
50	597.291810
55	1109.639022
60	2246.415384
65	4521.195729
70	8533.697025
75	15446.255720

PERIOD	EFFECT	LOWER	UPPER
% Period Change	80.5144	77.5144	83.5144
1961	1.069940		
1966	1.090004		
1971	1.058207		
1976	0.999012		
1981	0.955098		
1986	0.768992		
1991	0.619149	0.596079	0.642219
1996	0.498504	0.462047	0.536345
2001	0.401368	0.358153	0.447926
2006	0.323159	0.277621	0.374083

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.093508	1.000000	
1891	1.071540	2.000000	
1896	1.050450	4.000000	
1901	1.055011	8.000000	
1906	1.025963	16.000000	
1911	0.935369	32.000000	
1916	0.907262	64.000000	
1921	0.874220	128.000000	
1926	0.802733	256.000000	
1931	0.947243	512.000000	
1936	0.872999	1024.000000	
1941	0.942813	2048.000000	
1946	0.900803	4096.000000	
1951	1.109937	8192.000000	
1956	1.113145	EXTRAPOLATION	1.073118
1961	1.172360	EXTRAPOLATION	
1966	1.234725	EXTRAPOLATION	
1971	1.300408	EXTRAPOLATION	
1976	1.369585	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	39.3	43.3	37.6	35.6	42.4	33.2	29.3	23.8	14.0	9.7
	EXP	40.7	38.3	40.1	36.2	42.6	34.4	29.2*	24.7*	21.0*	17.8*
	Elow							28.1	22.9	18.7	15.3
	Eup							30.3	26.6	23.4	20.6
35	OBS	59.5	66.8	87.9	80.5	74.6	69.6	53.0	47.8	26.6	21.3
	EXP	69.8	83.9	75.0	76.5	69.9	69.3	56.0*	47.5*	40.3*	34.1*
	Elow							53.9	44.0	35.9	29.3
	Eup							58.1	51.1	44.9	39.5
40	OBS	129.5	129.7	191.1	172.8	176.1	118.2	104.5	96.3	58.8	42.4
	EXP	165.5	154.8	177.4	154.3	159.3	122.6	121.6*	98.2*	83.3*	70.6*
	Elow							117.1	91.0	74.3	60.6
	Eup							126.1	105.6	92.9	81.7
45	OBS	296.4	305.1	278.8	352.4	255.4	214.2	178.7	172.5	106.9	82.6
	EXP	314.4	308.7	275.2	306.5	270.1	234.9	180.7*	179.2*	144.7*	122.7*
	Elow							173.9	166.1	129.1	105.4
	Eup							187.4	192.8	161.5	142.1
50	OBS	554.2	552.3	605.9	513.5	555.6	372.5	317.4	270.6	181.7	137.9
	EXP	597.8	590.7	552.6	479.0	540.4	401.0	348.7*	268.2*	266.1*	214.9*
	Elow							335.7	248.6	237.4	184.6
	Eup							361.7	288.6	297.0	248.7
55	OBS	1198.0	1062.5	1087.3	1076.2	900.3	736.6	570.6	439.5	298.3	202.2
	EXP	1218.1	1131.3	1065.3	969.1	850.7	808.3	599.8*	521.5*	401.2*	398.0*
	Elow							577.4	483.4	358.0	341.9
	Eup							622.1	561.1	447.7	460.7
60	OBS	2563.8	2568.4	2214.1	1990.6	1889.1	1323.7	1124.2	852.8	548.1	350.1
	EXP	2535.8	2512.2	2223.5	2036.1	1875.7	1386.7	1317.5*	977.6*	850.1*	653.9*
	Elow							1268.4	906.1	758.6	561.8
	Eup							1366.6	1051.8	948.7	757.0
65	OBS	5205.3	5272.3	4988.3	4169.8	3812.2	2853.0	1975.3	1836.1	1018.4	746.3
	EXP	5081.5	5199.2	4908.6	4224.8	3917.7	3039.5	2247.1*	2134.9*	1584.2*	1377.5*
	Elow							2163.4	1978.8	1413.6	1183.4
	Eup							2330.8	2297.0	1768.0	1594.6
70	OBS	9794.6	9817.8	9464.6	8614.6	7596.6	6200.3	4206.9	3359.8	2370.7	1451.7
	EXP	9783.7	9771.0	9527.2	8746.6	7623.7	5953.8	4619.1*	3414.9*	3244.5*	2407.5*
	Elow							4446.9	3165.2	2895.1	2068.2
	Eup							4791.2	3674.1	3620.8	2786.9
75	OBS	18071.9	18024.6	16845.9	16161.8	15098.3	11502.5	9309.3	7649.8	4395.6	3218.7
	EXP	18071.9	18041.0	17170.0	16279.9	15135.7	11110.4	8676.6*	6731.5*	4976.7*	4728.3*
	Elow							8353.3	6239.2	4440.8	4062.0
	Eup							8999.9	7242.5	5553.9	5473.3
30-79	OBS	2071.1	2063.4	1964.4	1806.2	1651.1	1267.4	963.0	798.2	495.0	341.8
	EXP	2075.0	2068.6	1961.9	1801.1	1652.2	1273.8	1009.8*	810.7*	664.9*	564.9*
	Elow							972.1	751.4	593.3	485.3
	Eup							1047.4	872.3	742.0	653.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	43.0	48.0	51.0	48.0	52.0	46.0	50.0	43.0	22.0	13.0
	EXP	44.6	42.4	54.4	48.8	52.3	47.7	49.8*	44.7*	32.9*	23.9*
	CHI	0.058	0.740	0.208	0.013	0.002	0.062	0.001	0.063	3.598	4.956
35 -	OBS	68.0	74.0	98.0	107.0	98.0	85.0	76.0	82.0	48.0	34.0
	EXP	79.7	92.9	83.6	101.7	91.8	84.7	80.3*	81.4*	72.7*	54.5*
	CHI	1.729	3.858	2.464	0.279	0.417	0.001	0.234	0.005	8.415	7.718
40 -	OBS	114.0	148.0	211.0	188.0	228.0	153.0	130.0	138.0	100.0	77.0
	EXP	145.7	176.7	195.9	167.9	206.3	158.7	151.2*	140.7*	141.6*	128.3*
	CHI	6.898	4.659	1.170	2.411	2.281	0.204	2.970	0.052	12.206	20.521
45 -	OBS	226.0	265.0	312.0	376.0	268.0	271.0	230.0	212.0	151.0	140.0
	EXP	239.8	268.1	307.9	327.1	283.4	297.2	232.6*	220.3*	204.5*	207.9*
	CHI	0.792	0.037	0.055	7.313	0.841	2.308	0.028	0.315	13.981	22.196
50 -	OBS	604.0	408.0	510.0	549.0	565.0	376.0	392.0	338.0	218.0	192.0
	EXP	651.5	436.3	465.1	512.2	549.5	404.8	430.6*	335.1*	319.3*	299.1*
	CHI	3.459	1.838	4.329	2.651	0.437	2.049	3.454	0.026	32.139	38.326
55 -	OBS	1315.0	1092.0	759.0	852.0	900.0	704.0	551.0	519.0	358.0	235.0
	EXP	1337.0	1162.8	743.7	767.2	850.4	772.5	579.2*	615.9*	481.5*	462.7*
	CHI	0.363	4.305	0.317	9.362	2.891	6.075	1.369	15.242	31.672	112.036
60 -	OBS	2517.0	2525.0	2068.0	1259.0	1364.0	1208.0	994.0	768.0	612.0	398.0
	EXP	2489.4	2469.7	2076.8	1287.7	1354.3	1265.5	1164.9*	880.4*	949.2*	743.5*
	CHI	0.306	1.238	0.037	0.641	0.070	2.616	25.071	14.342	119.816	160.552
65 -	OBS	3669.0	4324.0	4138.0	3351.0	2074.0	1815.0	1600.0	1449.0	840.0	773.0
	EXP	3581.7	4264.0	4071.9	3395.2	2131.4	1933.6	1820.2*	1684.8*	1306.7*	1426.8*
	CHI	2.129	0.843	1.073	0.575	1.545	7.274	26.632	33.012	166.692	299.584
70 -	OBS	4704.0	5257.0	5914.0	5542.0	4857.0	2718.0	2243.0	2285.0	1616.0	1063.0
	EXP	4698.8	5232.0	5953.1	5626.9	4874.3	2609.9	2462.8*	2322.5*	2211.6*	1762.9*
	CHI	0.006	0.120	0.257	1.282	0.062	4.475	19.608	0.605	160.419	277.883
75 -	OBS	5792.0	5737.0	5955.0	6751.0	6625.0	5310.0	3006.0	3153.0	2365.0	1791.0
	EXP	5792.0	5742.2	6069.5	6800.3	6641.4	5129.0	2801.7*	2774.5*	2677.6*	2631.0*
	CHI	0.000	0.005	2.162	0.358	0.041	6.391	14.895	51.637	36.502	268.166
30-79	OBS	19052.0	19878.0	20016.0	19023.0	17031.0	12686.0	9272.0	8987.0	6330.0	4716.0
	EXP	19060.2	19887.1	20021.9	19035.0	17035.2	12703.6	9773.1*	9100.2*	8397.7*	7740.5*
	O/E	1.000	1.000	1.000	0.999	1.000	0.999	0.949	0.988	0.754	0.609

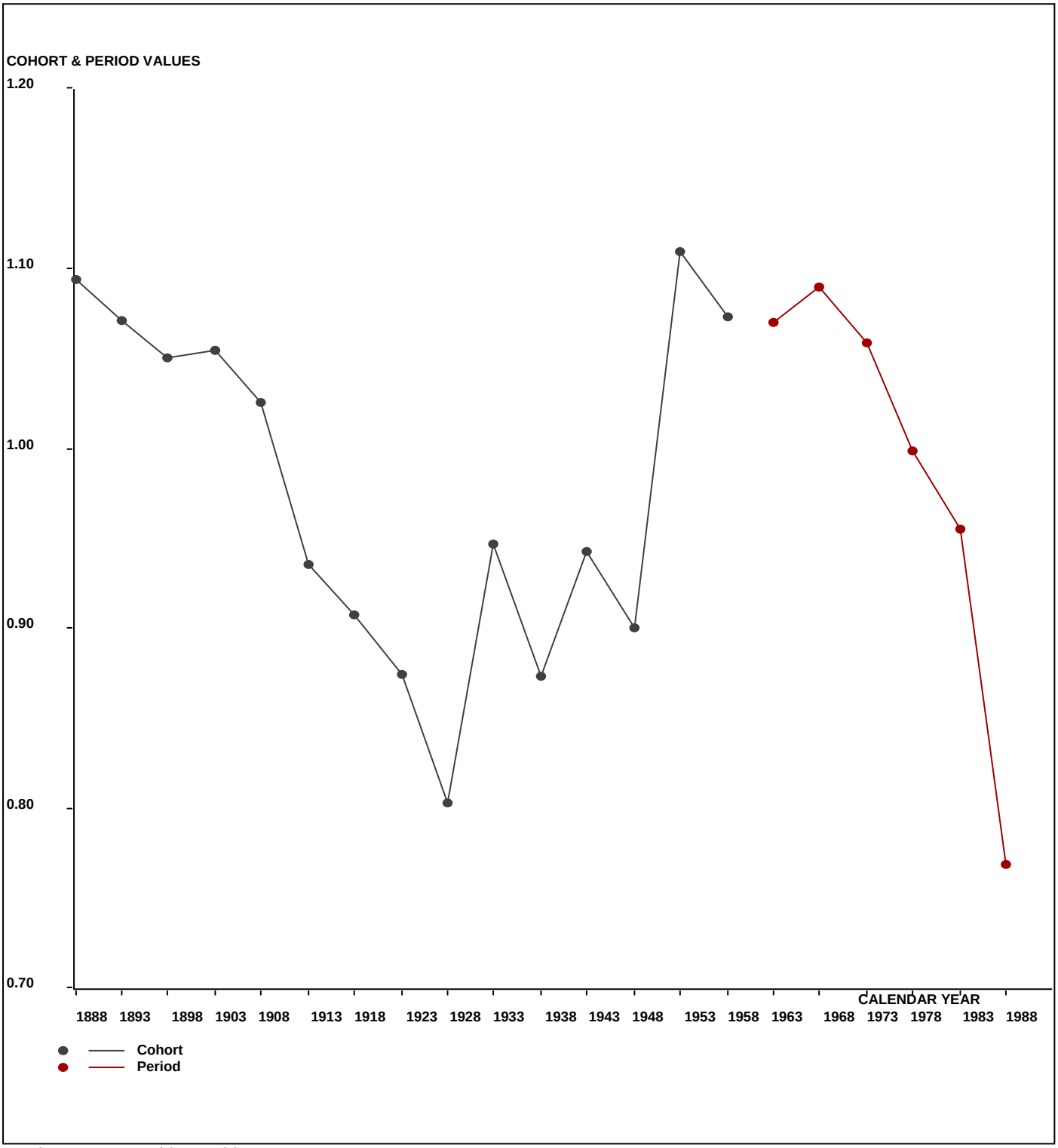
CHI SQUARE (LOG)= 2006.9377 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

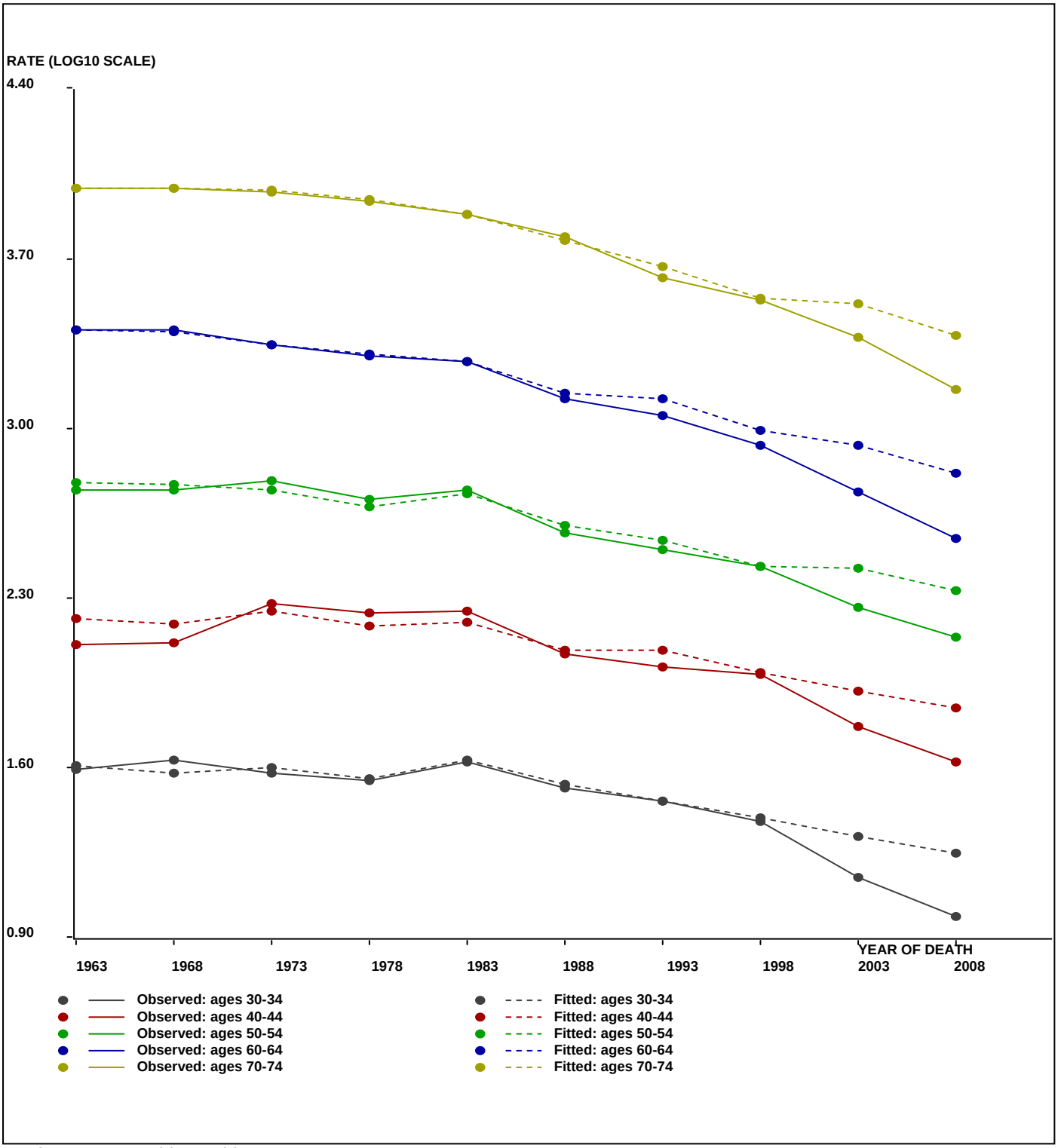


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	29.3	53.0	104.5	178.7	317.4	570.6	1124.2	1975.3	4206.9	9309.3
	PRE	29.2	56.0	121.6	180.7	348.7	599.8	1317.5	2247.1	4619.1	8676.6
	RES	0.120	-3.019	-17.042	-1.993	-31.227	-29.163	-193.283	-271.813	-412.157	632.640
1996-	OBS	23.8	47.8	96.3	172.5	270.6	439.5	852.8	1836.1	3359.8	7649.8
	PRE	24.7	47.5	98.2	179.2	268.2	521.5	977.6	2134.9	3414.9	6731.5
	RES	-0.928	0.362	-1.881	-6.775	2.346	-82.045	-124.780	-298.840	-55.130	918.334
2001-	OBS	14.0	26.6	58.8	106.9	181.7	298.3	548.1	1018.4	2370.7	4395.6
	PRE	21.0	40.3	83.3	144.7	266.1	401.2	850.1	1584.2	3244.5	4976.7
	RES	-6.941	-13.691	-24.446	-37.845	-84.420	-102.896	-302.014	-565.819	-873.799	-581.058
2006-	OBS	9.7	21.3	42.4	82.6	137.9	202.2	350.1	746.3	1451.7	3218.7
	PRE	17.8	34.1	70.6	122.7	214.9	398.0	653.9	1377.5	2407.5	4728.3
	RES	-8.106	-12.844	-28.233	-40.096	-76.917	-195.856	-303.881	-631.210	-955.833	-1509.544

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	50.0	76.0	130.0	230.0	392.0	551.0	994.0	1600.0	2243.0	3006.0
	PRE	49.8	80.3	151.2	232.6	430.6	579.2	1164.9	1820.2	2462.8	2801.7
	CHI	0.001	0.234	2.970	0.028	3.454	1.369	25.071	26.632	19.608	14.895
1996-	OBS	43.0	82.0	138.0	212.0	338.0	519.0	768.0	1449.0	2285.0	3153.0
	PRE	44.7	81.4	140.7	220.3	335.1	615.9	880.4	1684.8	2322.5	2774.5
	CHI	0.063	0.005	0.052	0.315	0.026	15.242	14.342	33.012	0.605	51.637
2001-	OBS	22.0	48.0	100.0	151.0	218.0	358.0	612.0	840.0	1616.0	2365.0
	PRE	32.9	72.7	141.6	204.5	319.3	481.5	949.2	1306.7	2211.6	2677.6
	CHI	3.598	8.415	12.206	13.981	32.139	31.672	119.816	166.692	160.419	36.502
2006-	OBS	13.0	34.0	77.0	140.0	192.0	235.0	398.0	773.0	1063.0	1791.0
	PRE	23.9	54.5	128.3	207.9	299.1	462.7	743.5	1426.8	1762.9	2631.0
	CHI	4.956	7.718	20.521	22.196	38.326	112.036	160.552	299.584	277.883	268.166

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	228.52	4.48	51	P, C	97.07	1215.12	0.0000
AGE-PERIOD	175.30	3.90	45	Cohort	96.18	933.06	0.0000
AGE-COHORT	8.30	0.23	36	Period	19.32	44.10	0.1664
PERIOD-COHORT	13.48	0.34	40	Age	50.33	71.62	0.0016
FULL AGE-PERIOD-COHORT	6.70	0.21	32			35.61	0.3021

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.127703	13.418481
35	1.637170	43.368100
40	2.111303	129.211946
45	2.536689	344.103285
50	2.884053	765.690198
55	3.163361	1456.670915
60	3.384698	2424.924413
65	3.546227	3517.439827
70	3.646385	4429.812421
75	3.688014	4875.446235

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.001948	1.004495
1966	-0.001015	0.997666
1971	0.000337	1.000777
1976	0.005739	1.013303
1981	0.003912	1.009049
1986	-0.012317	0.972038

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.133204	0.735861
1891	-0.020269	0.954402
1896	0.048417	1.117936
1901	0.080188	1.202784
1906	0.035672	1.085605
1911	-0.047607	0.896176
1916	-0.081017	0.829818
1921	-0.060531	0.869899
1926	-0.041916	0.907997
1931	-0.006100	0.986052
1936	-0.054712	0.881633
1941	0.031850	1.076092
1946	0.070070	1.175088
1951	0.066510	1.165494
1956	-0.053228	0.884652

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	19.0	18.0	20.0	14.0	13.0	16.0
	EXP	14.6	13.1	19.6	21.6	19.4	16.0
	CHI	1.4	1.8	0.0	2.6	2.1	0.0
35 -	OBS	44.0	51.0	51.0	56.0	56.0	65.0
	EXP	45.2	47.3	42.7	62.8	67.6	60.0
	CHI	0.0	0.3	1.6	0.7	2.0	0.4
40 -	OBS	94.0	125.0	140.0	128.0	177.0	207.0
	EXP	99.4	133.6	140.8	125.6	181.7	191.1
	CHI	0.3	0.6	0.0	0.0	0.1	1.3
45 -	OBS	200.0	249.0	346.0	384.0	325.0	466.0
	EXP	218.7	259.4	349.9	366.9	321.2	455.5
	CHI	1.6	0.4	0.0	0.8	0.0	0.2
50 -	OBS	745.0	440.0	570.0	773.0	800.0	641.0
	EXP	751.2	468.3	561.1	753.3	774.7	662.4
	CHI	0.1	1.7	0.1	0.5	0.8	0.7
55 -	OBS	1771.0	1331.0	842.0	1019.0	1365.0	1282.0
	EXP	1743.6	1338.5	844.4	1016.6	1334.1	1334.4
	CHI	0.4	0.0	0.0	0.0	0.7	2.1
60 -	OBS	2911.0	2574.0	2001.0	1320.0	1547.0	1915.0
	EXP	2876.2	2582.0	2031.3	1289.6	1536.9	1953.2
	CHI	0.4	0.0	0.5	0.7	0.1	0.7
65 -	OBS	2729.0	3496.0	3221.0	2564.0	1580.0	1886.0
	EXP	2784.1	3461.6	3170.1	2566.9	1602.3	1892.1
	CHI	1.1	0.3	0.8	0.0	0.3	0.0
70 -	OBS	2057.0	2680.0	3279.0	3094.0	2563.0	1605.0
	EXP	2039.6	2645.5	3331.9	3134.9	2561.2	1566.4
	CHI	0.1	0.4	0.8	0.5	0.0	1.0
75 -	OBS	1155.0	1460.0	1948.0	2465.0	2313.0	2005.0
	EXP	1155.0	1477.6	1928.2	2482.1	2343.5	1960.6
	CHI	0.0	0.2	0.2	0.1	0.4	1.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	5413.60	135.34	40	P, C	48.60	0.0000
AGE-PERIOD	695.10	17.38	40	Cohort	-300.32	0.0000
AGE-COHORT	5030.71	125.77	40	Period	44.69	0.0000
PERIOD-COHORT	2112.18	52.80	40	Age	-31.74	0.0000
FULL AGE-PERIOD-COHORT	2782.62	69.57	40			0.0000

AGE	EFFECT
30	13.418481
35	43.368100
40	129.211946
45	344.103285
50	765.690198
55	1456.670915
60	2424.924413
65	3517.439827
70	4429.812421
75	4875.446235

PERIOD	EFFECT	LOWER	UPPER
% Period Change	96.3321	93.3321	99.3321
1961	1.004495		
1966	0.997666		
1971	1.000777		
1976	1.013303		
1981	1.009049		
1986	0.972038		
1991	0.936385	0.907224	0.965546
1996	0.902039	0.846731	0.959097
2001	0.868953	0.790272	0.952691
2006	0.837081	0.737577	0.946328

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.735861	1.000000	
1891	0.954402	2.000000	
1896	1.117936	4.000000	
1901	1.202784	8.000000	
1906	1.085605	16.000000	
1911	0.896176	32.000000	
1916	0.829818	64.000000	
1921	0.869899	128.000000	
1926	0.907997	256.000000	
1931	0.986052	512.000000	
1936	0.881633	1024.000000	
1941	1.076092	2048.000000	
1946	1.175088	4096.000000	
1951	1.165494	8192.000000	
1956	1.240173	EXTRAPOLATION	0.884652
1961	1.304339	EXTRAPOLATION	
1966	1.371825	EXTRAPOLATION	
1971	1.442803	EXTRAPOLATION	
1976	1.517453	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	17.4	16.2	14.8	10.4	10.6	11.5	9.4	10.5	9.6	4.5
	EXP	13.3	11.8	14.5	16.0	15.8	16.2	16.4*	16.6*	16.8*	17.0*
	Elow							15.9	15.6	15.3	15.0
	Eup							16.9	17.7	18.4	19.3
35	OBS	38.5	46.0	45.8	42.1	42.6	53.2	36.2	28.6	23.8	22.5
	EXP	39.6	42.7	38.3	47.3	51.4	49.1	50.4*	51.0*	51.7*	52.4*
	Elow							48.8	47.9	47.0	46.2
	Eup							51.9	54.3	56.7	59.2
40	OBS	106.8	109.5	126.8	117.7	136.7	159.9	160.8	109.6	71.7	57.2
	EXP	112.9	117.1	127.5	115.4	140.3	147.6	141.0*	144.5*	146.5*	148.4*
	Elow							136.6	135.7	133.2	130.7
	Eup							145.4	153.7	160.6	167.7
45	OBS	262.3	286.6	309.2	359.9	309.7	368.3	344.9	331.1	261.2	197.1
	EXP	286.8	298.6	312.7	343.8	306.1	359.9	378.6*	361.8*	370.8*	375.7*
	Elow							366.8	339.6	337.2	331.0
	Eup							390.4	384.6	406.6	424.7
50	OBS	683.6	595.7	677.1	722.9	786.7	635.0	696.4	649.2	636.7	485.7
	EXP	689.3	633.9	666.6	704.5	761.8	656.2	771.5*	811.6*	775.5*	794.9*
	Elow							747.5	761.8	705.2	700.4
	Eup							795.6	863.0	850.2	898.6
55	OBS	1613.4	1295.0	1206.2	1287.1	1365.5	1341.4	1078.1	1122.8	1044.0	1034.0
	EXP	1588.5	1302.4	1209.7	1284.0	1334.6	1396.2	1202.6*	1414.0*	1487.4*	1421.1*
	Elow							1165.1	1327.3	1352.7	1252.2
	Eup							1240.0	1503.4	1630.7	1606.6
60	OBS	2965.2	2618.3	2142.4	2087.1	2142.6	2098.3	2052.7	1591.3	1580.6	1487.3
	EXP	2929.8	2626.4	2174.8	2039.0	2128.5	2140.3	2239.0*	1928.5*	2267.5*	2385.3*
	Elow							2169.3	1810.2	2062.2	2101.7
	Eup							2308.7	2050.4	2486.0	2696.6
65	OBS	3871.7	4262.7	3882.8	3190.5	2904.2	2964.6	2858.0	2705.4	1964.0	2089.3
	EXP	3949.9	4220.8	3821.5	3194.2	2945.2	2974.3	2990.6*	3128.6*	2694.7*	3168.4*
	Elow							2897.5	2936.8	2450.7	2791.8
	Eup							3083.8	3326.5	2954.4	3581.9
70	OBS	4283.0	5005.1	5247.6	4809.4	4008.7	3661.3	3636.7	3276.0	3073.3	2402.2
	EXP	4246.8	4940.7	5332.2	4873.0	4005.8	3573.2	3608.3*	3628.2*	3795.6*	3269.2*
	Elow							3496.0	3405.8	3451.9	2880.6
	Eup							3720.7	3857.7	4161.4	3695.9
75	OBS	3603.8	4587.1	5510.6	5901.2	5271.3	4343.2	4310.9	3833.4	3561.1	3211.5
	EXP	3603.8	4642.3	5454.7	5942.1	5340.7	4247.1	3788.4*	3825.7*	3846.8*	4024.2*
	Elow							3670.4	3591.1	3498.4	3545.9
	Eup							3906.3	4067.7	4217.5	4549.4
30-79	OBS	1232.9	1263.3	1244.7	1198.6	1129.0	1066.6	1026.0	925.7	825.2	745.4
	EXP	1234.9	1266.6	1244.4	1195.8	1128.3	1068.9	1059.6*	1070.5*	1084.5*	1103.7*
	Elow							1026.6	1004.8	986.3	972.5
	Eup							1092.6	1138.2	1189.1	1247.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	19.0	18.0	20.0	14.0	13.0	16.0	16.0	19.0	15.0	6.0
	EXP	14.6	13.1	19.6	21.6	19.4	22.4	28.0*	30.0*	26.4*	22.9*
	CHI	1.359	1.849	0.009	2.649	2.096	1.843	5.121	4.021	4.895	12.449
35 -	OBS	44.0	51.0	51.0	56.0	56.0	65.0	52.0	49.0	43.0	36.0
	EXP	45.2	47.3	42.7	62.8	67.6	60.0	72.3*	87.5*	93.4*	83.6*
	CHI	0.033	0.293	1.633	0.746	1.979	0.414	5.685	16.922	27.212	27.140
40 -	OBS	94.0	125.0	140.0	128.0	177.0	207.0	200.0	157.0	122.0	104.0
	EXP	99.4	133.6	140.8	125.6	181.7	191.1	175.3*	207.1*	249.0*	269.7*
	CHI	0.294	0.552	0.005	0.046	0.120	1.325	3.467	12.136	64.795	101.786
45 -	OBS	200.0	249.0	346.0	384.0	325.0	466.0	444.0	407.0	369.0	334.0
	EXP	218.7	259.4	349.9	366.9	321.2	455.5	487.4*	444.7*	523.9*	636.6*
	CHI	1.602	0.419	0.043	0.800	0.044	0.244	3.863	3.196	45.793	143.811
50 -	OBS	745.0	440.0	570.0	773.0	800.0	641.0	860.0	811.0	764.0	676.0
	EXP	751.2	468.3	561.1	753.3	774.7	662.4	952.8*	1013.9*	930.5*	1106.4*
	CHI	0.051	1.705	0.141	0.517	0.825	0.693	9.031	40.607	29.805	167.421
55 -	OBS	1771.0	1331.0	842.0	1019.0	1365.0	1282.0	1041.0	1326.0	1253.0	1202.0
	EXP	1743.6	1338.5	844.4	1016.6	1334.1	1334.4	1161.2*	1669.8*	1785.1*	1652.0*
	CHI	0.430	0.043	0.007	0.006	0.716	2.057	12.445	70.784	158.603	122.597
60 -	OBS	2911.0	2574.0	2001.0	1320.0	1547.0	1915.0	1815.0	1433.0	1765.0	1691.0
	EXP	2876.2	2582.0	2031.3	1289.6	1536.9	1953.2	1979.7*	1736.6*	2532.0*	2711.9*
	CHI	0.420	0.025	0.452	0.717	0.067	0.749	13.697	53.079	232.345	384.346
65 -	OBS	2729.0	3496.0	3221.0	2564.0	1580.0	1886.0	2315.0	2135.0	1620.0	2164.0
	EXP	2784.1	3461.6	3170.1	2566.9	1602.3	1892.1	2422.5*	2469.0*	2222.7*	3281.8*
	CHI	1.092	0.341	0.816	0.003	0.311	0.020	4.767	45.190	163.426	380.716
70 -	OBS	2057.0	2680.0	3279.0	3094.0	2563.0	1605.0	1939.0	2228.0	2095.0	1759.0
	EXP	2039.6	2645.5	3331.9	3134.9	2561.2	1566.4	1923.9*	2467.6*	2587.3*	2393.9*
	CHI	0.148	0.449	0.839	0.534	0.001	0.954	0.119	23.262	93.689	168.384
75 -	OBS	1155.0	1460.0	1948.0	2465.0	2313.0	2005.0	1392.0	1580.0	1916.0	1787.0
	EXP	1155.0	1477.6	1928.2	2482.1	2343.5	1960.6	1223.3*	1576.8*	2069.7*	2239.2*
	CHI	0.000	0.209	0.203	0.118	0.396	1.005	23.271	0.006	11.415	91.325
30-79	OBS	11725.0	12424.0	12418.0	11817.0	10739.0	10088.0	10074.0	10145.0	9962.0	9759.0
	EXP	11727.7	12426.9	12420.0	11820.3	10742.5	10098.1	10426.2*	11703.0*	13020.1*	14398.0*
	O/E	1.000	1.000	1.000	1.000	1.000	0.999	0.966	0.867	0.765	0.678

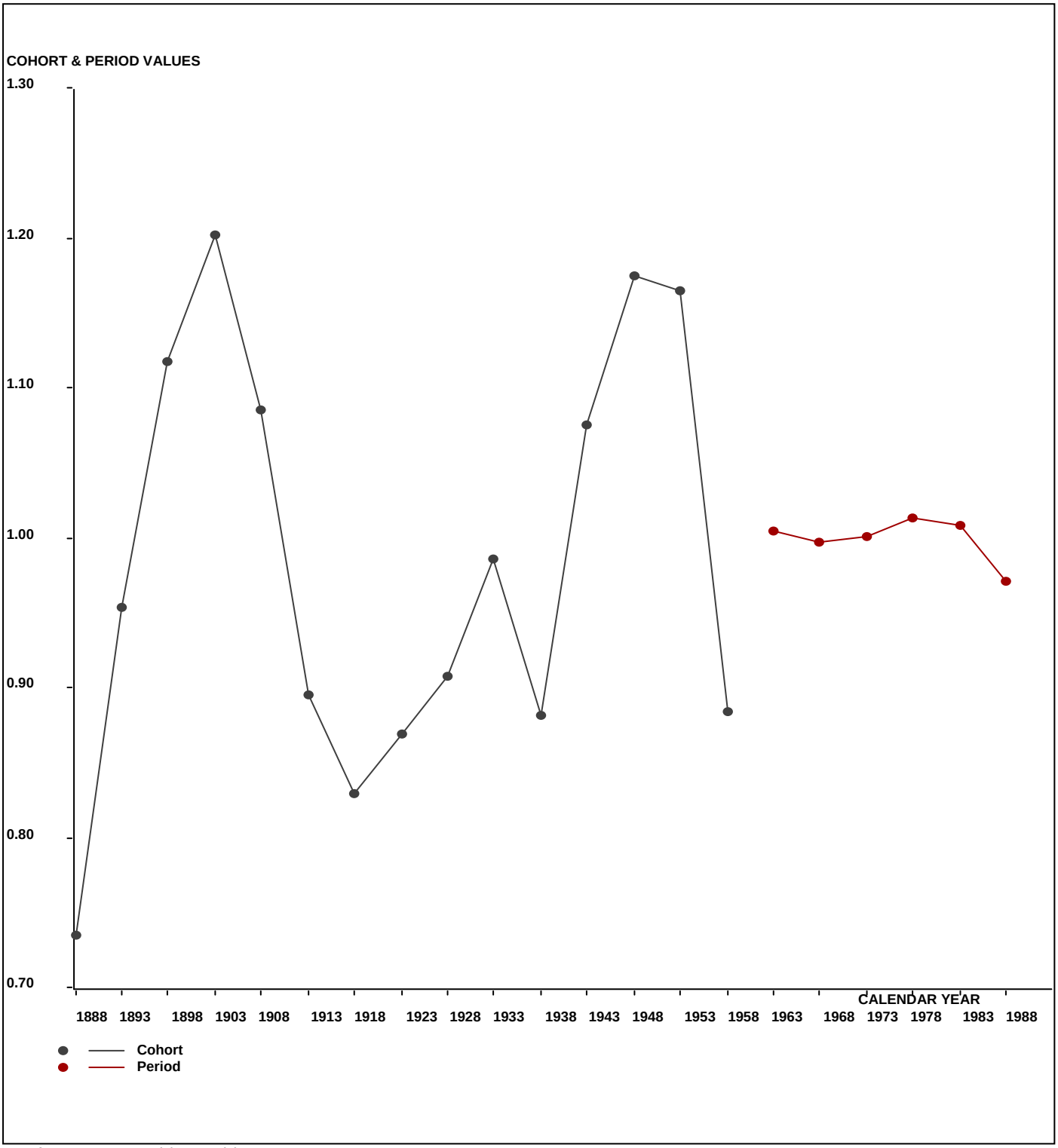
CHI SQUARE (LOG)= 2782.6220 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

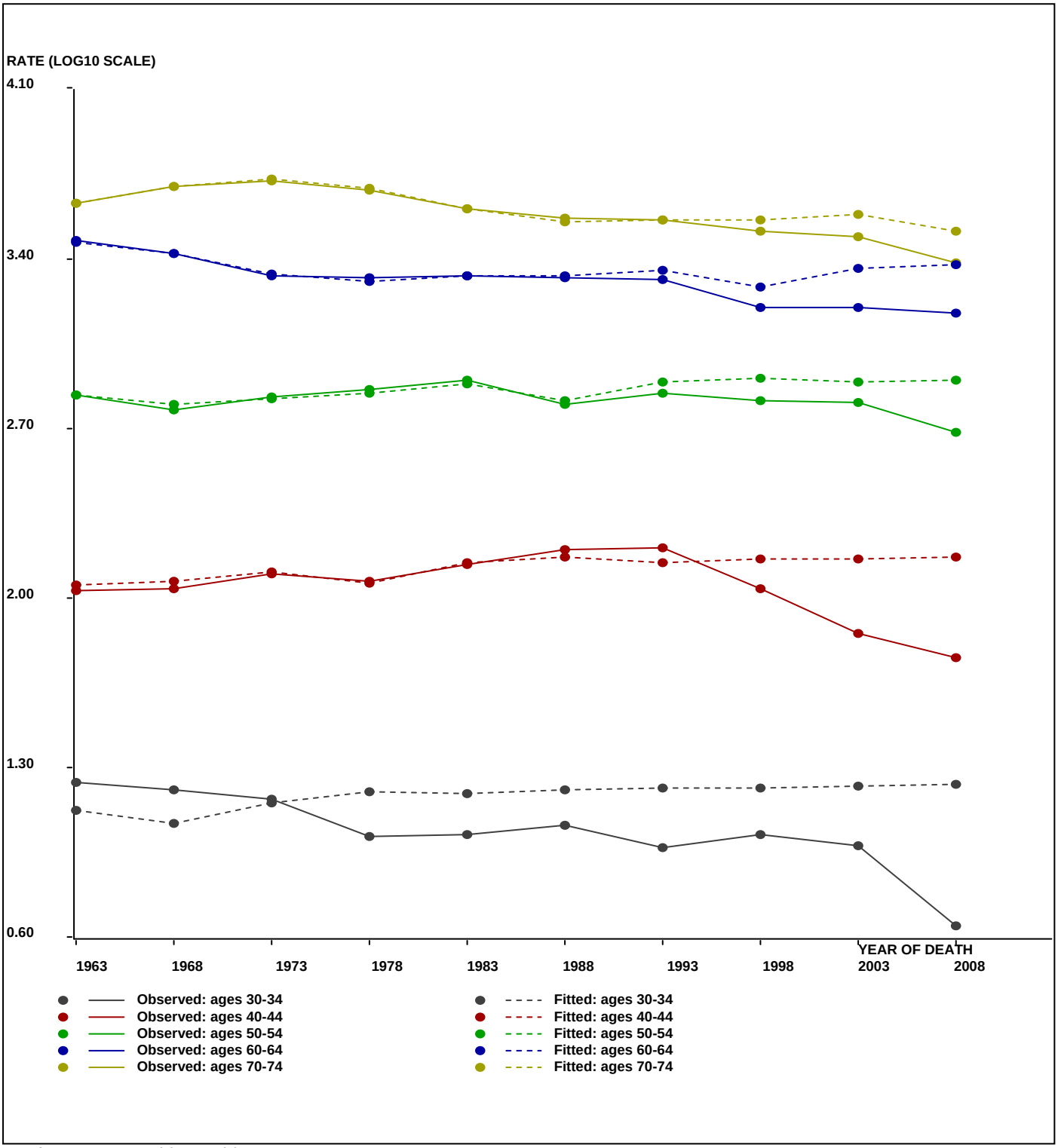


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	9.4	36.2	160.8	344.9	696.4	1078.1	2052.7	2858.0	3636.7	4310.9
	PRE	16.4	50.4	141.0	378.6	771.5	1202.6	2239.0	2990.6	3608.3	3788.4
	RES	-7.013	-14.126	19.829	-33.706	-75.118	-124.492	-186.241	-132.672	28.376	522.514
1996-	OBS	10.5	28.6	109.6	331.1	649.2	1122.8	1591.3	2705.4	3276.0	3833.4
	PRE	16.6	51.0	144.5	361.8	811.6	1414.0	1928.5	3128.6	3628.2	3825.7
	RES	-6.081	-22.443	-34.988	-30.671	-162.423	-291.119	-337.150	-423.262	-352.275	7.737
2001-	OBS	9.6	23.8	71.7	261.2	636.7	1044.0	1580.6	1964.0	3073.3	3561.1
	PRE	16.8	51.7	146.5	370.8	775.5	1487.4	2267.5	2694.7	3795.6	3846.8
	RES	-7.250	-27.901	-74.703	-109.634	-138.784	-443.357	-686.876	-730.686	-722.270	-285.678
2006-	OBS	4.5	22.5	57.2	197.1	485.7	1034.0	1487.3	2089.3	2402.2	3211.5
	PRE	17.0	52.4	148.4	375.7	794.9	1421.1	2385.3	3168.4	3269.2	4024.2
	RES	-12.574	-29.835	-91.157	-178.575	-309.211	-387.140	-897.959	-1079.169	-867.037	-812.696

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	16.0	52.0	200.0	444.0	860.0	1041.0	1815.0	2315.0	1939.0	1392.0
	PRE	28.0	72.3	175.3	487.4	952.8	1161.2	1979.7	2422.5	1923.9	1223.3
	CHI	5.121	5.685	3.467	3.863	9.031	12.445	13.697	4.767	0.119	23.271
1996-	OBS	19.0	49.0	157.0	407.0	811.0	1326.0	1433.0	2135.0	2228.0	1580.0
	PRE	30.0	87.5	207.1	444.7	1013.9	1669.8	1736.6	2469.0	2467.6	1576.8
	CHI	4.021	16.922	12.136	3.196	40.607	70.784	53.079	45.190	23.262	0.006
2001-	OBS	15.0	43.0	122.0	369.0	764.0	1253.0	1765.0	1620.0	2095.0	1916.0
	PRE	26.4	93.4	249.0	523.9	930.5	1785.1	2532.0	2222.7	2587.3	2069.7
	CHI	4.895	27.212	64.795	45.793	29.805	158.603	232.345	163.426	93.689	11.415
2006-	OBS	6.0	36.0	104.0	334.0	676.0	1202.0	1691.0	2164.0	1759.0	1787.0
	PRE	22.9	83.6	269.7	636.6	1106.4	1652.0	2711.9	3281.8	2393.9	2239.2
	CHI	12.449	27.140	101.786	143.811	167.421	122.597	384.346	380.716	168.384	91.325

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	389.43	7.64	51	P, C	98.02	2090.50	0.0000
AGE-PERIOD	42.82	0.95	45	Cohort	82.04	227.41	0.0000
AGE-COHORT	214.16	5.95	36	Period	96.41	1143.68	0.0000
PERIOD-COHORT	17.43	0.44	40	Age	55.88	92.65	0.0000
FULL AGE-PERIOD-COHORT	7.69	0.24	32			40.91	0.1344

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.083370	12.116288
35	1.396665	24.926689
40	1.607640	40.517252
45	1.895383	78.592835
50	2.238463	173.166338
55	2.550127	354.916868
60	2.847141	703.300305
65	3.121963	1324.227859
70	3.373022	2360.599893
75	3.608049	4055.547114

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.053148	0.884814
1966	0.174609	1.494890
1971	-0.039399	0.913275
1976	-0.087085	0.818304
1981	-0.039544	0.912969
1986	-0.082891	0.826246

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.047467	0.896465
1891	-0.050465	0.890298
1896	0.017791	1.041815
1901	0.052819	1.129326
1906	0.033989	1.081406
1911	-0.034628	0.923362
1916	-0.032753	0.927357
1921	-0.042444	0.906893
1926	-0.058442	0.874093
1931	-0.014352	0.967492
1936	-0.035044	0.922477
1941	-0.042471	0.906836
1946	-0.026349	0.941133
1951	-0.039920	0.912179
1956	0.158590	1.440756

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	10.0	15.0	15.0	17.0	10.0	20.0
	EXP	11.4	18.5	13.6	12.6	12.4	20.0
	CHI	0.2	0.7	0.1	1.5	0.5	0.0
35 -	OBS	18.0	33.0	21.0	30.0	32.0	25.0
	EXP	22.0	39.9	23.4	24.6	28.1	22.9
	CHI	0.7	1.2	0.2	1.2	0.5	0.2
40 -	OBS	25.0	57.0	40.0	46.0	44.0	30.0
	EXP	28.6	60.4	39.5	33.3	43.4	40.8
	CHI	0.5	0.2	0.0	4.9	0.0	2.9
45 -	OBS	40.0	81.0	87.0	69.0	75.0	66.0
	EXP	49.2	92.6	70.2	66.4	69.5	74.5
	CHI	1.7	1.4	4.0	0.1	0.4	1.0
50 -	OBS	143.0	186.0	129.0	144.0	152.0	117.0
	EXP	154.2	177.3	120.7	132.4	155.5	133.2
	CHI	0.8	0.4	0.6	1.0	0.1	2.0
55 -	OBS	384.0	480.0	207.0	211.0	287.0	279.0
	EXP	372.8	503.5	209.8	208.5	283.1	271.2
	CHI	0.3	1.1	0.0	0.0	0.1	0.2
60 -	OBS	711.0	1115.0	556.0	322.0	442.0	435.0
	EXP	689.9	1117.7	553.9	337.5	420.4	463.6
	CHI	0.6	0.0	0.0	0.7	1.1	1.8
65 -	OBS	862.0	1869.0	1078.0	813.0	589.0	612.0
	EXP	860.4	1833.5	1084.9	804.1	609.9	631.2
	CHI	0.0	0.7	0.0	0.1	0.7	0.6
70 -	OBS	886.0	1966.0	1501.0	1344.0	1264.0	830.0
	EXP	893.1	1968.6	1521.3	1343.9	1272.3	792.9
	CHI	0.1	0.0	0.3	0.0	0.1	1.7
75 -	OBS	1031.0	1725.0	1365.0	1528.0	1755.0	1459.0
	EXP	1031.0	1718.0	1364.0	1565.5	1756.9	1428.3
	CHI	0.0	0.0	0.0	0.9	0.0	0.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	3057.87	76.45	40	P, C	82.07	0.0000
AGE-PERIOD	1714.86	42.87	40	Cohort	68.02	0.0000
AGE-COHORT	366.25	9.16	40	Period	-49.74	0.0000
PERIOD-COHORT	564.19	14.10	40	Age	2.80	0.0000
FULL AGE-PERIOD-COHORT	548.41	13.71	40			0.0000

AGE	EFFECT
30	12.116288
35	24.926689
40	40.517252
45	78.592835
50	173.166338
55	354.916868
60	703.300305
65	1324.227859
70	2360.599893
75	4055.547114

PERIOD	EFFECT	LOWER	UPPER
% Period Change	90.5010	87.5010	93.5010
1961	0.884814		
1966	1.494890		
1971	0.913275		
1976	0.818304		
1981	0.912969		
1986	0.826246		
1991	0.747760	0.722973	0.772548
1996	0.676730	0.632608	0.722340
2001	0.612448	0.553539	0.675395
2006	0.554271	0.484352	0.631501

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.896465	1.000000	
1891	0.890298	2.000000	
1896	1.041815	4.000000	
1901	1.129326	8.000000	
1906	1.081406	16.000000	
1911	0.923362	32.000000	
1916	0.927357	64.000000	
1921	0.906893	128.000000	
1926	0.874093	256.000000	
1931	0.967492	512.000000	
1936	0.922477	1024.000000	
1941	0.906836	2048.000000	
1946	0.941133	4096.000000	
1951	0.912179	8192.000000	
1956	0.914787	EXTRAPOLATION	1.440756
1961	0.911844	EXTRAPOLATION	
1966	0.908912	EXTRAPOLATION	
1971	0.905988	EXTRAPOLATION	
1976	0.903074	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	9.1	13.5	11.1	12.6	8.1	14.4	5.9	2.8	1.3	1.5
	EXP	10.4	16.7	10.0	9.3	10.1	9.2	8.3*	7.5*	6.7*	6.1*
	Elow							8.0	7.0	6.1	5.3
	Eup							8.5	8.0	7.4	6.9
35	OBS	15.7	29.8	18.8	22.6	24.4	20.5	12.5	11.1	7.7	8.8
	EXP	19.3	36.1	21.0	18.5	21.4	18.8	17.1*	15.4*	13.9*	12.5*
	Elow							16.5	14.4	12.5	10.9
	Eup							17.6	16.4	15.3	14.3
40	OBS	28.4	49.9	36.2	42.3	34.0	23.2	20.1	20.2	14.7	14.3
	EXP	32.5	52.9	35.8	30.6	33.5	31.5	27.6*	25.1*	22.6*	20.4*
	Elow							26.7	23.4	20.5	17.8
	Eup							28.6	26.8	25.0	23.3
45	OBS	52.5	93.2	77.8	64.7	71.5	52.2	40.4	48.0	40.3	41.3
	EXP	64.5	106.5	62.7	62.2	66.2	58.9	55.3*	48.5*	44.0*	39.7*
	Elow							53.5	45.4	39.8	34.7
	Eup							57.1	51.8	48.6	45.3
50	OBS	131.2	251.8	153.2	134.7	149.5	115.9	102.0	88.9	115.0	88.4
	EXP	141.5	240.1	143.4	123.9	153.0	132.0	117.4*	110.3*	96.7*	87.8*
	Elow							113.5	103.1	87.4	76.7
	Eup							121.3	117.7	106.7	100.0
55	OBS	349.8	467.0	296.5	266.5	287.1	291.9	199.9	221.0	203.3	234.8
	EXP	339.6	489.9	300.6	263.4	283.2	283.7	244.8*	217.8*	204.6*	179.4*
	Elow							236.7	203.6	184.9	156.8
	Eup							252.9	232.5	225.6	204.4
60	OBS	724.2	1134.2	595.3	509.1	612.2	476.6	480.7	390.9	435.2	452.1
	EXP	702.8	1136.9	593.1	533.7	582.3	507.9	508.8*	439.0*	390.6*	366.9*
	Elow							491.9	410.4	353.0	320.6
	Eup							525.7	468.6	430.8	418.0
65	OBS	1223.0	2278.9	1299.5	1011.7	1082.6	962.0	995.0	906.0	853.5	795.5
	EXP	1220.7	2235.6	1307.8	1000.6	1121.2	992.3	865.5*	867.0*	748.1*	665.6*
	Elow							836.8	810.5	676.2	581.6
	Eup							894.2	925.4	825.0	758.3
70	OBS	1844.8	3671.6	2402.2	2089.1	1977.0	1893.4	1659.9	1495.4	1811.7	1267.3
	EXP	1859.6	3676.4	2434.7	2088.9	1990.0	1808.8	1600.8*	1396.4*	1398.7*	1207.0*
	Elow							1547.7	1305.3	1264.2	1054.7
	Eup							1653.9	1490.5	1542.5	1375.2
75	OBS	3216.9	5419.6	3861.4	3658.0	3999.6	3160.5	3140.3	2705.2	3066.7	2668.8
	EXP	3216.9	5397.5	3858.7	3747.9	4004.0	3094.1	2812.3*	2489.0*	2171.1*	2174.8*
	Elow							2719.1	2326.7	1962.3	1900.5
	Eup							2905.5	2656.7	2394.2	2477.8
30-79	OBS	440.7	772.9	490.2	431.1	455.6	392.1	365.6	327.2	356.9	310.4
	EXP	442.2	773.8	489.7	431.4	455.7	392.3	354.2*	319.7*	290.9*	267.4*
	Elow							342.5	298.9	262.9	233.7
	Eup							366.0	341.3	320.8	304.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	10.0	15.0	15.0	17.0	10.0	20.0	10.0	5.0	2.0	2.0
	EXP	11.4	18.5	13.6	12.6	12.4	12.7	14.1*	13.5*	10.5*	8.1*
	CHI	0.162	0.669	0.144	1.545	0.460	4.198	1.191	5.314	6.913	4.631
35 -	OBS	18.0	33.0	21.0	30.0	32.0	25.0	18.0	19.0	14.0	14.0
	EXP	22.0	39.9	23.4	24.6	28.1	22.9	24.5*	26.4*	25.1*	20.0*
	CHI	0.739	1.209	0.248	1.194	0.530	0.183	1.710	2.059	4.891	1.795
40 -	OBS	25.0	57.0	40.0	46.0	44.0	30.0	25.0	29.0	25.0	26.0
	EXP	28.6	60.4	39.5	33.3	43.4	40.8	34.4*	35.9*	38.5*	37.1*
	CHI	0.459	0.194	0.005	4.866	0.007	2.855	2.552	1.341	4.720	3.321
45 -	OBS	40.0	81.0	87.0	69.0	75.0	66.0	52.0	59.0	57.0	70.0
	EXP	49.2	92.6	70.2	66.4	69.5	74.5	71.2*	59.6*	62.2*	67.3*
	CHI	1.712	1.443	4.019	0.102	0.442	0.973	5.176	0.007	0.436	0.108
50 -	OBS	143.0	186.0	129.0	144.0	152.0	117.0	126.0	111.0	138.0	123.0
	EXP	154.2	177.3	120.7	132.4	155.5	133.2	145.0*	137.8*	116.1*	122.2*
	CHI	0.812	0.424	0.567	1.010	0.081	1.980	2.491	5.204	4.136	0.005
55 -	OBS	384.0	480.0	207.0	211.0	287.0	279.0	193.0	261.0	244.0	273.0
	EXP	372.8	503.5	209.8	208.5	283.1	271.2	236.4*	257.2*	245.5*	208.6*
	CHI	0.339	1.097	0.038	0.029	0.053	0.227	7.969	0.056	0.009	19.883
60 -	OBS	711.0	1115.0	556.0	322.0	442.0	435.0	425.0	352.0	486.0	514.0
	EXP	689.9	1117.7	553.9	337.5	420.4	463.6	449.9*	395.4*	436.2*	417.1*
	CHI	0.644	0.007	0.008	0.716	1.105	1.759	1.375	4.757	5.692	22.502
65 -	OBS	862.0	1869.0	1078.0	813.0	589.0	612.0	806.0	715.0	704.0	824.0
	EXP	860.4	1833.5	1084.9	804.1	609.9	631.2	701.1*	684.2*	617.1*	689.4*
	CHI	0.003	0.689	0.044	0.099	0.719	0.587	15.698	1.384	12.237	26.274
70 -	OBS	886.0	1966.0	1501.0	1344.0	1264.0	830.0	885.0	1017.0	1235.0	928.0
	EXP	893.1	1968.6	1521.3	1343.9	1272.3	792.9	853.5*	949.7*	953.5*	883.8*
	CHI	0.056	0.003	0.272	0.000	0.054	1.736	1.162	4.773	83.119	2.208
75 -	OBS	1031.0	1725.0	1365.0	1528.0	1755.0	1459.0	1014.0	1115.0	1650.0	1485.0
	EXP	1031.0	1718.0	1364.0	1565.5	1756.9	1428.3	908.1*	1025.9*	1168.1*	1210.1*
	CHI	0.000	0.029	0.001	0.900	0.002	0.658	12.350	7.744	198.781	62.433
30-79	OBS	4110.0	7527.0	4999.0	4524.0	4650.0	3873.0	3554.0	3683.0	4555.0	4259.0
	EXP	4112.6	7530.0	5001.5	4528.8	4651.7	3871.4	3438.1*	3585.5*	3672.8*	3663.8*
	O/E	0.999	1.000	0.999	0.999	1.000	1.000	1.034	1.027	1.240	1.162

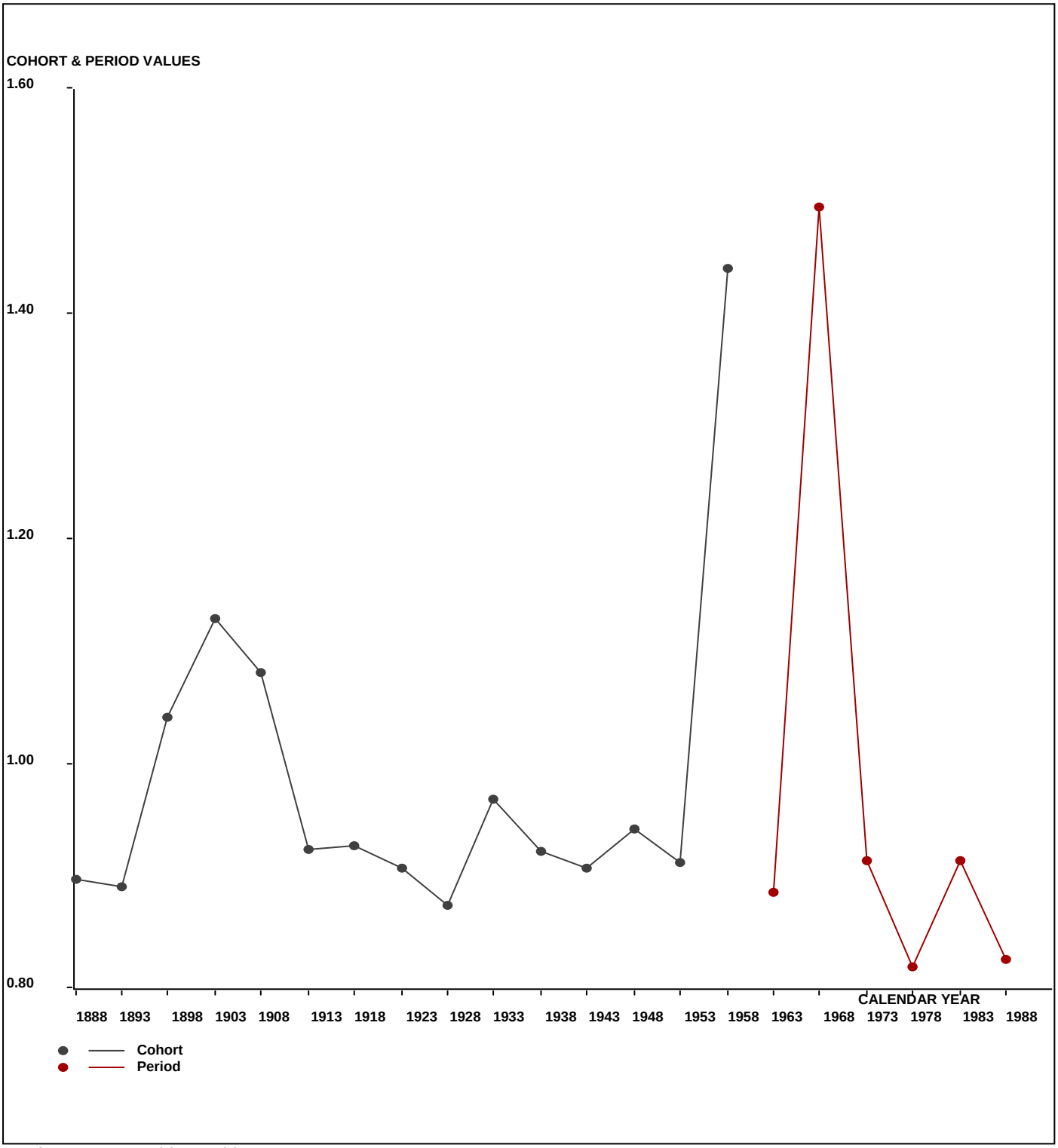
CHI SQUARE (LOG)= 548.4077 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

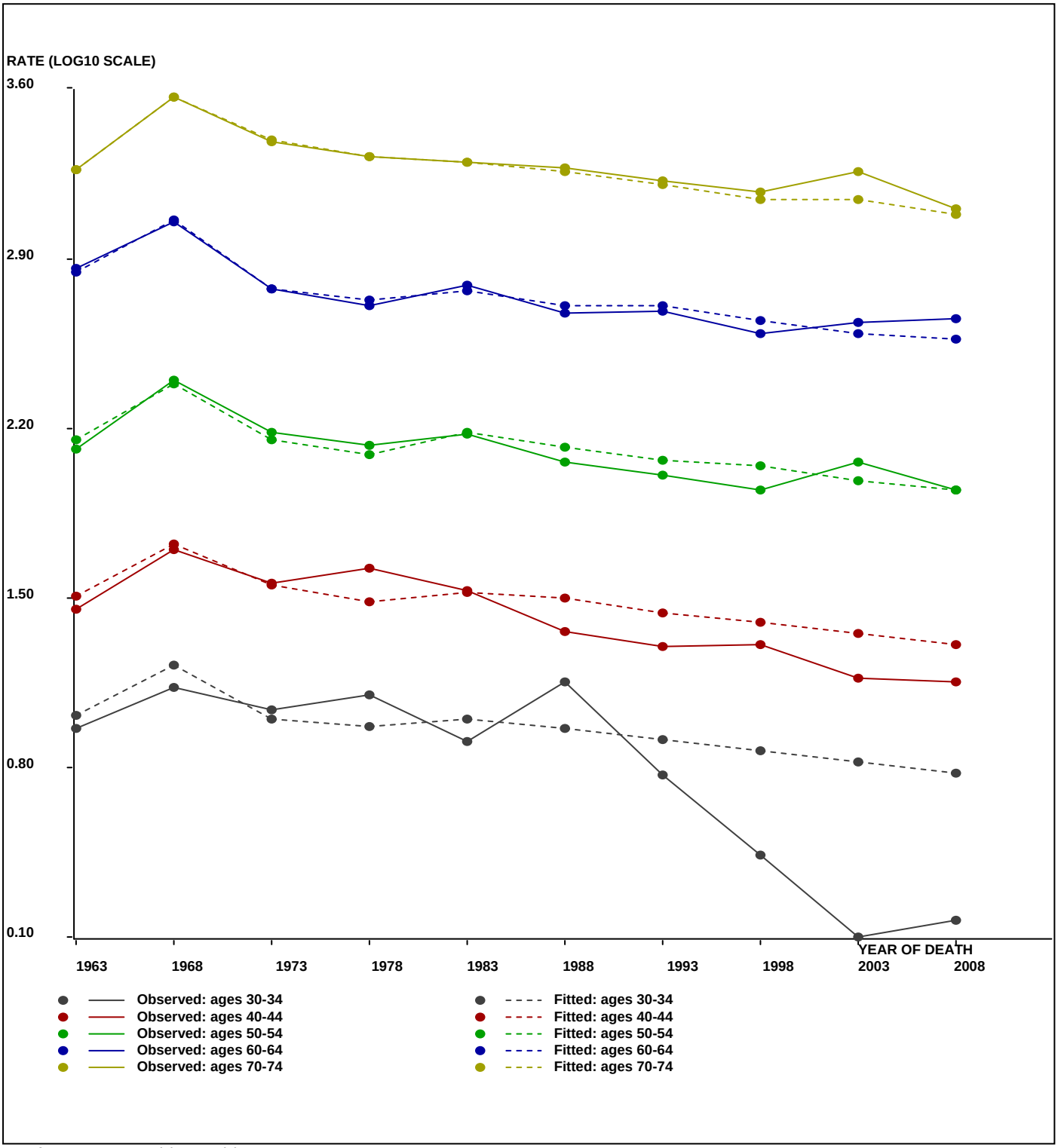


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	5.9	12.5	20.1	40.4	102.0	199.9	480.7	995.0	1659.9	3140.3
	PRE	8.3	17.1	27.6	55.3	117.4	244.8	508.8	865.5	1600.8	2812.3
	RES	-2.401	-4.507	-7.531	-14.913	-15.390	-44.948	-28.133	129.513	59.063	327.969
1996-	OBS	2.8	11.1	20.2	48.0	88.9	221.0	390.9	906.0	1495.4	2705.2
	PRE	7.5	15.4	25.1	48.5	110.3	217.8	439.0	867.0	1396.4	2489.0
	RES	-4.683	-4.298	-4.846	-0.519	-21.435	3.205	-48.160	38.993	98.998	216.249
2001-	OBS	1.3	7.7	14.7	40.3	115.0	203.3	435.2	853.5	1811.7	3066.7
	PRE	6.7	13.9	22.6	44.0	96.7	204.6	390.6	748.1	1398.7	2171.1
	RES	-5.446	-6.128	-7.925	-3.686	18.260	-1.263	44.621	105.351	412.983	895.610
2006-	OBS	1.5	8.8	14.3	41.3	88.4	234.8	452.1	795.5	1267.3	2668.8
	PRE	6.1	12.5	20.4	39.7	87.8	179.4	366.9	665.6	1207.0	2174.8
	RES	-4.575	-3.751	-6.107	1.593	0.567	55.401	85.211	129.939	60.330	493.980

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	10.0	18.0	25.0	52.0	126.0	193.0	425.0	806.0	885.0	1014.0
	PRE	14.1	24.5	34.4	71.2	145.0	236.4	449.9	701.1	853.5	908.1
	CHI	1.191	1.710	2.552	5.176	2.491	7.969	1.375	15.698	1.162	12.350
1996-	OBS	5.0	19.0	29.0	59.0	111.0	261.0	352.0	715.0	1017.0	1115.0
	PRE	13.5	26.4	35.9	59.6	137.8	257.2	395.4	684.2	949.7	1025.9
	CHI	5.314	2.059	1.341	0.007	5.204	0.056	4.757	1.384	4.773	7.744
2001-	OBS	2.0	14.0	25.0	57.0	138.0	244.0	486.0	704.0	1235.0	1650.0
	PRE	10.5	25.1	38.5	62.2	116.1	245.5	436.2	617.1	953.5	1168.1
	CHI	6.913	4.891	4.720	0.436	4.136	0.009	5.692	12.237	83.119	198.781
2006-	OBS	2.0	14.0	26.0	70.0	123.0	273.0	514.0	824.0	928.0	1485.0
	PRE	8.1	20.0	37.1	67.3	122.2	208.6	417.1	689.4	883.8	1210.1
	CHI	4.631	1.795	3.321	0.108	0.005	19.883	22.502	26.274	2.208	62.433

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	782.84	15.35	51	P, C	97.55	4172.79	0.0000
AGE-PERIOD	37.32	0.83	45	Cohort	48.54	198.21	0.0000
AGE-COHORT	56.37	1.57	36	Period	65.93	299.04	0.0000
PERIOD-COHORT	20.95	0.52	40	Age	8.35	111.24	0.0000
FULL AGE-PERIOD-COHORT	19.20	0.60	32			101.95	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.379517	23.961661
35	1.672196	47.010649
40	1.964894	92.234667
45	2.298480	198.829280
50	2.579998	380.187687
55	2.909236	811.401558
60	3.233076	1710.314068
65	3.538941	3458.926495
70	3.843894	6980.612092
75	4.107292	12802.427305

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.068982	1.172147
1966	0.039376	1.094903
1971	0.012721	1.029724
1976	0.013561	1.031719
1981	-0.073774	0.843773
1986	-0.104944	0.785337

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.019386	1.045649
1891	0.019552	1.046050
1896	0.029694	1.070765
1901	0.010341	1.024097
1906	-0.013223	0.970011
1911	-0.029248	0.934871
1916	-0.008699	0.980169
1921	-0.017356	0.960825
1926	-0.040742	0.910455
1931	-0.029418	0.934506
1936	-0.062329	0.866305
1941	-0.021631	0.951412
1946	-0.016562	0.962583
1951	-0.014139	0.967968
1956	-0.371624	0.424987

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	39.0	24.0	23.0	22.0	25.0	11.0
	EXP	28.1	24.0	30.5	31.0	23.8	11.0
	CHI	4.2	0.0	1.8	2.6	0.1	0.0
35 -	OBS	78.0	44.0	49.0	46.0	54.0	42.0
	EXP	68.2	51.7	44.4	59.7	49.3	43.3
	CHI	1.4	1.1	0.5	3.1	0.5	0.0
40 -	OBS	133.0	110.0	89.0	88.0	105.0	92.0
	EXP	127.9	124.3	95.4	86.8	94.8	89.4
	CHI	0.2	1.7	0.4	0.0	1.1	0.1
45 -	OBS	249.0	246.0	239.0	181.0	165.0	196.0
	EXP	231.0	255.0	249.9	204.0	151.0	188.4
	CHI	1.4	0.3	0.5	2.6	1.3	0.3
50 -	OBS	607.0	425.0	416.0	462.0	331.0	243.0
	EXP	583.8	404.7	451.5	470.2	313.1	264.7
	CHI	0.9	1.0	2.8	0.1	1.0	1.8
55 -	OBS	1341.0	1080.0	699.0	897.0	863.0	611.0
	EXP	1241.7	1128.2	789.5	941.0	797.2	607.3
	CHI	7.9	2.1	10.4	2.1	5.4	0.0
60 -	OBS	2554.0	2322.0	2208.0	1491.0	1629.0	1455.0
	EXP	2555.6	2321.5	2137.0	1591.8	1557.5	1502.4
	CHI	0.0	0.0	2.4	6.4	3.3	1.5
65 -	OBS	4469.0	4377.0	4118.0	3959.0	2527.0	2770.0
	EXP	4501.3	4413.3	4075.0	4024.2	2446.2	2762.5
	CHI	0.2	0.3	0.5	1.1	2.7	0.0
70 -	OBS	6663.0	7197.0	7170.0	7371.0	5917.0	4163.0
	EXP	6804.6	7246.0	7228.9	7216.0	5887.1	4102.5
	CHI	2.9	0.3	0.5	3.3	0.2	0.9
75 -	OBS	8698.0	9012.0	9694.0	10529.0	8315.0	8278.0
	EXP	8698.0	8873.0	9613.4	10433.0	8624.1	8292.0
	CHI	0.0	2.2	0.7	0.9	11.1	0.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	24303.61	607.59	40	P, C	86.94	0.0000
AGE-PERIOD	2986.32	74.66	40	Cohort	-6.27	0.0000
AGE-COHORT	2825.35	70.63	40	Period	-12.32	0.0000
PERIOD-COHORT	3400.69	85.02	40	Age	6.68	0.0000
FULL AGE-PERIOD-COHORT	3173.53	79.34	40			0.0000

AGE	EFFECT
30	23.961661
35	47.010649
40	92.234667
45	198.829280
50	380.187687
55	811.401558
60	1710.314068
65	3458.926495
70	6980.612092
75	12802.427305

PERIOD	EFFECT	LOWER	UPPER
% Period Change	93.0744	90.0744	96.0744
1961	1.172147		
1966	1.094903		
1971	1.029724		
1976	1.031719		
1981	0.843773		
1986	0.785337		
1991	0.730948	0.707388	0.754509
1996	0.680326	0.637176	0.724890
2001	0.633210	0.573933	0.696434
2006	0.589356	0.516967	0.669095

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.045649	1.000000	
1891	1.046050	2.000000	
1896	1.070765	4.000000	
1901	1.024097	8.000000	
1906	0.970011	16.000000	
1911	0.934871	32.000000	
1916	0.980169	64.000000	
1921	0.960825	128.000000	
1926	0.910455	256.000000	
1931	0.934506	512.000000	
1936	0.866305	1024.000000	
1941	0.951412	2048.000000	
1946	0.962583	4096.000000	
1951	0.967968	8192.000000	
1956	0.978226	EXTRAPOLATION	0.424987
1961	0.989591	EXTRAPOLATION	
1966	1.001089	EXTRAPOLATION	
1971	1.012720	EXTRAPOLATION	
1976	1.024487	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	36.4	22.8	17.7	16.9	20.6	8.0	15.9	12.7	10.2	8.9
	EXP	26.2	22.7	23.5	23.8	19.6	18.4	17.3*	16.3*	15.4*	14.5*
	Elow							16.8	15.3	13.9	12.7
	Eup							17.9	17.4	16.9	16.4
35	OBS	57.4	41.0	46.3	35.6	41.9	34.7	24.9	33.3	17.1	15.6
	EXP	50.2	48.1	41.9	46.1	38.2	35.7	33.6*	31.6*	29.8*	28.1*
	Elow							32.5	29.6	27.0	24.6
	Eup							34.7	33.7	32.8	31.9
40	OBS	108.0	81.3	82.8	83.6	82.0	71.7	92.7	72.8	39.2	25.4
	EXP	103.9	91.9	88.8	82.4	74.0	69.7	65.3*	61.4*	57.8*	54.4*
	Elow							63.2	57.5	52.4	47.7
	Eup							67.4	65.4	63.6	61.8
45	OBS	246.2	201.8	178.3	170.1	158.8	154.6	140.7	137.6	98.3	68.3
	EXP	228.4	209.2	186.4	191.7	145.3	148.6	139.9*	130.9*	123.2*	116.0*
	Elow							135.4	122.6	111.6	101.7
	Eup							144.4	139.5	135.5	131.7
50	OBS	433.2	428.5	346.6	350.9	316.9	237.5	267.4	260.5	216.3	127.3
	EXP	416.6	408.0	376.2	357.1	299.8	258.7	264.4*	249.0*	233.0*	219.2*
	Elow							255.9	233.2	211.2	192.3
	Eup							272.9	265.3	256.3	248.8
55	OBS	996.3	795.0	725.1	766.7	674.7	599.1	543.1	503.1	307.9	260.6
	EXP	922.6	830.5	819.0	804.3	623.3	595.5	513.8*	525.2*	494.6*	462.9*
	Elow							497.2	491.9	448.3	406.0
	Eup							530.4	559.6	543.9	525.5
60	OBS	2051.8	1816.9	1701.1	1620.1	1450.2	1184.3	1159.5	932.8	647.6	470.2
	EXP	2053.0	1816.5	1646.4	1729.6	1386.6	1222.9	1168.3*	1008.0*	1030.4*	970.3*
	Elow							1130.6	944.1	933.9	851.1
	Eup							1205.9	1074.0	1133.2	1101.5
65	OBS	4310.2	3846.6	3491.4	3282.2	2955.2	2617.1	2368.3	2034.4	1281.8	925.1
	EXP	4341.3	3878.4	3454.9	3336.2	2860.7	2610.0	2301.9*	2199.1*	1897.4*	1939.5*
	Elow							2227.7	2059.6	1719.8	1701.3
	Eup							2376.1	2343.1	2086.9	2201.9
70	OBS	8381.0	8128.6	7301.3	7136.1	5534.4	5452.7	4782.0	3999.3	2971.3	2044.6
	EXP	8559.1	8184.0	7361.3	6986.0	5506.4	5373.4	4902.6*	4323.8*	4130.7*	3564.0*
	Elow							4744.6	4049.6	3744.0	3126.3
	Eup							5060.6	4607.1	4543.1	4046.2
75	OBS	15691.4	14892.7	14234.2	13651.2	10102.8	9383.6	10016.3	8335.1	6491.3	5068.1
	EXP	15691.4	14662.9	14115.9	13526.8	10478.4	9399.4	9172.3*	8368.6*	7380.7*	7051.0*
	Elow							8876.7	7837.8	6689.8	6185.0
	Eup							9468.0	8916.8	8117.7	8005.0
30-79	OBS	1748.6	1615.3	1489.0	1438.9	1168.5	1066.5	1030.9	874.7	632.3	465.5
	EXP	1745.5	1616.7	1496.3	1449.8	1156.9	1068.4	996.9*	911.3*	837.8*	785.6*
	Elow							964.7	853.5	759.3	689.1
	Eup							1029.0	971.0	921.4	891.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	39.0	24.0	23.0	22.0	25.0	11.0	26.0	22.0	16.0	12.0
	EXP	28.1	24.0	30.5	31.0	23.8	25.3	28.4*	28.3*	24.0*	19.4*
	CHI	4.187	0.000	1.840	2.617	0.064	8.098	0.203	1.418	2.691	2.852
35 -	OBS	78.0	44.0	49.0	46.0	54.0	42.0	35.0	55.0	30.0	25.0
	EXP	68.2	51.7	44.4	59.7	49.3	43.3	47.3*	52.3*	52.2*	44.8*
	CHI	1.410	1.135	0.480	3.129	0.456	0.038	3.207	0.138	9.444	8.782
40 -	OBS	133.0	110.0	89.0	88.0	105.0	92.0	114.0	103.0	65.0	45.0
	EXP	127.9	124.3	95.4	86.8	94.8	89.4	80.2*	86.8*	95.9*	96.4*
	CHI	0.199	1.652	0.429	0.017	1.086	0.073	14.196	3.005	9.956	27.389
45 -	OBS	249.0	246.0	239.0	181.0	165.0	196.0	181.0	169.0	139.0	114.0
	EXP	231.0	255.0	249.9	204.0	151.0	188.4	179.9*	160.8*	174.2*	193.5*
	CHI	1.404	0.314	0.476	2.584	1.294	0.308	0.006	0.416	7.127	32.662
50 -	OBS	607.0	425.0	416.0	462.0	331.0	243.0	337.0	331.0	264.0	180.0
	EXP	583.8	404.7	451.5	470.2	313.1	264.7	333.2*	316.3*	284.5*	309.9*
	CHI	0.925	1.017	2.789	0.143	1.026	1.771	0.044	0.681	1.472	54.422
55 -	OBS	1341.0	1080.0	699.0	897.0	863.0	611.0	549.0	622.0	385.0	315.0
	EXP	1241.7	1128.2	789.5	941.0	797.2	607.3	519.3*	649.3*	618.4*	559.5*
	CHI	7.934	2.061	10.374	2.056	5.424	0.022	1.693	1.150	88.072	106.870
60 -	OBS	2554.0	2322.0	2208.0	1491.0	1629.0	1455.0	1151.0	916.0	782.0	575.0
	EXP	2555.6	2321.5	2137.0	1591.8	1557.5	1502.4	1159.7*	989.9*	1244.2*	1186.4*
	CHI	0.001	0.000	2.356	6.379	3.282	1.494	0.065	5.518	171.717	315.094
65 -	OBS	4469.0	4377.0	4118.0	3959.0	2527.0	2770.0	2760.0	1922.0	1211.0	1079.0
	EXP	4501.3	4413.3	4075.0	4024.2	2446.2	2762.5	2682.6*	2077.6*	1792.6*	2262.1*
	CHI	0.231	0.298	0.453	1.055	2.671	0.020	2.231	11.651	188.690	618.741
70 -	OBS	6663.0	7197.0	7170.0	7371.0	5917.0	4163.0	4642.0	4264.0	2618.0	1820.0
	EXP	6804.6	7246.0	7228.9	7216.0	5887.1	4102.5	4759.1*	4610.0*	3639.6*	3172.5*
	CHI	2.946	0.331	0.480	3.331	0.151	0.893	2.880	25.965	286.744	576.613
75 -	OBS	8698.0	9012.0	9694.0	10529.0	8315.0	8278.0	6394.0	7026.0	6052.0	4000.0
	EXP	8698.0	8873.0	9613.4	10433.0	8624.1	8292.0	5855.3*	7054.3*	6881.2*	5565.0*
	CHI	0.000	2.178	0.676	0.883	11.081	0.023	49.567	0.114	99.921	440.125
30-79	OBS	24831.0	24837.0	24705.0	25046.0	19931.0	17861.0	16189.0	15430.0	11562.0	8165.0
	EXP	24840.2	24841.6	24715.5	25057.5	19944.2	17877.7	15645.1*	16025.7*	14806.8*	13409.6*
	O/E	1.000	1.000	1.000	1.000	0.999	0.999	1.035	0.963	0.781	0.609

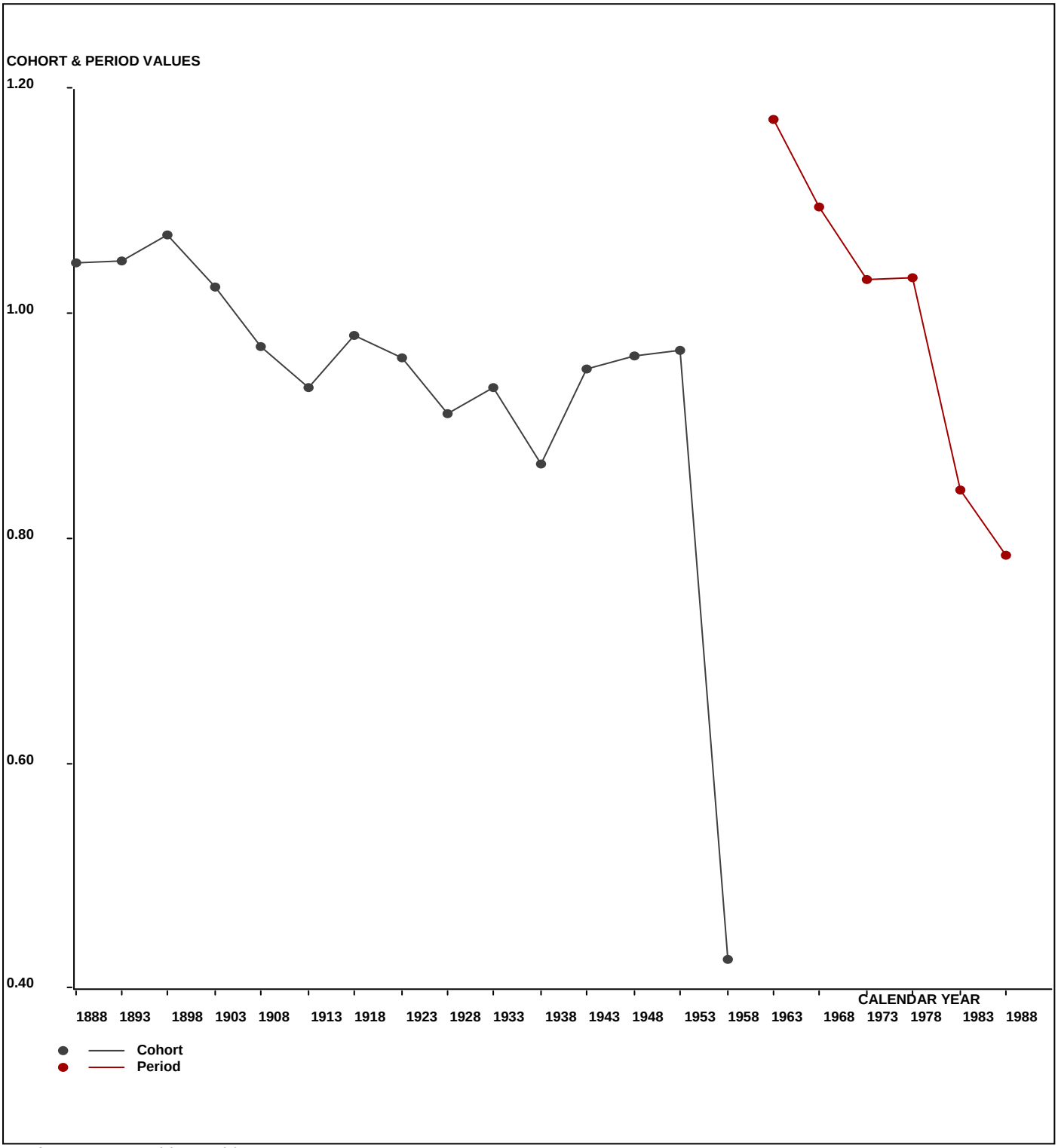
CHI SQUARE (LOG)= 3173.5294 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

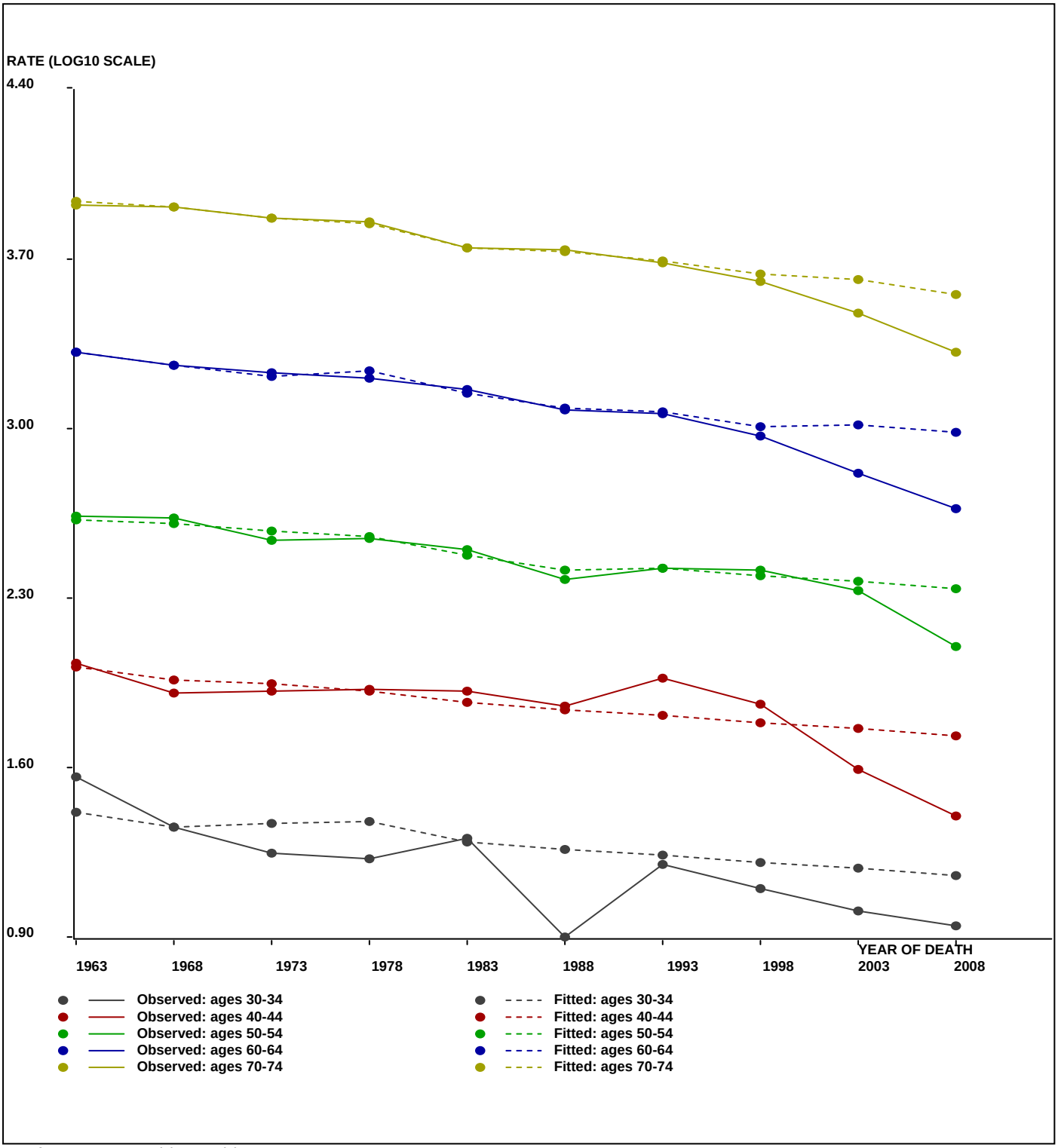


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	15.9	24.9	92.7	140.7	267.4	543.1	1159.5	2368.3	4782.0	10016.3
	PRE	17.3	33.6	65.3	139.9	264.4	513.8	1168.3	2301.9	4902.6	9172.3
	RES	-1.464	-8.751	27.447	0.828	3.030	29.338	-8.746	66.384	-120.602	843.920
1996-	OBS	12.7	33.3	72.8	137.6	260.5	503.1	932.8	2034.4	3999.3	8335.1
	PRE	16.3	31.6	61.4	130.9	249.0	525.2	1008.0	2199.1	4323.8	8368.6
	RES	-3.651	1.627	11.418	6.661	11.553	-22.102	-75.257	-164.682	-324.502	-33.569
2001-	OBS	10.2	17.1	39.2	98.3	216.3	307.9	647.6	1281.8	2971.3	6491.3
	PRE	15.4	29.8	57.8	123.2	233.0	494.6	1030.4	1897.4	4130.7	7380.7
	RES	-5.141	-12.675	-18.622	-24.908	-16.764	-186.645	-382.780	-615.593	-1159.431	-889.393
2006-	OBS	8.9	15.6	25.4	68.3	127.3	260.6	470.2	925.1	2044.6	5068.1
	PRE	14.5	28.1	54.4	116.0	219.2	462.9	970.3	1939.5	3564.0	7051.0
	RES	-5.540	-12.417	-29.010	-47.643	-91.859	-202.297	-500.026	-1014.356	-1519.435	-1982.928

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	26.0	35.0	114.0	181.0	337.0	549.0	1151.0	2760.0	4642.0	6394.0
	PRE	28.4	47.3	80.2	179.9	333.2	519.3	1159.7	2682.6	4759.1	5855.3
	CHI	0.203	3.207	14.196	0.006	0.044	1.693	0.065	2.231	2.880	49.567
1996-	OBS	22.0	55.0	103.0	169.0	331.0	622.0	916.0	1922.0	4264.0	7026.0
	PRE	28.3	52.3	86.8	160.8	316.3	649.3	989.9	2077.6	4610.0	7054.3
	CHI	1.418	0.138	3.005	0.416	0.681	1.150	5.518	11.651	25.965	0.114
2001-	OBS	16.0	30.0	65.0	139.0	264.0	385.0	782.0	1211.0	2618.0	6052.0
	PRE	24.0	52.2	95.9	174.2	284.5	618.4	1244.2	1792.6	3639.6	6881.2
	CHI	2.691	9.444	9.956	7.127	1.472	88.072	171.717	188.690	286.744	99.921
2006-	OBS	12.0	25.0	45.0	114.0	180.0	315.0	575.0	1079.0	1820.0	4000.0
	PRE	19.4	44.8	96.4	193.5	309.9	559.5	1186.4	2262.1	3172.5	5565.0
	CHI	2.852	8.782	27.389	32.662	54.422	106.870	315.094	618.741	576.613	440.125

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1001.70	19.64	51	P, C	98.11	5375.05	0.0000
AGE-PERIOD	74.25	1.65	45	Cohort	74.53	397.36	0.0000
AGE-COHORT	40.00	1.11	36	Period	52.73	212.54	0.0000
PERIOD-COHORT	34.41	0.86	40	Age	45.05	183.51	0.0000
FULL AGE-PERIOD-COHORT	18.91	0.59	32			100.52	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.658265	45.526609
35	1.865655	73.393115
40	2.119819	131.770612
45	2.381946	240.960679
50	2.620930	417.763334
55	2.848032	704.744648
60	3.136606	1369.638086
65	3.456685	2862.100065
70	3.790321	6170.509025
75	4.097174	12507.588304

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.049305	1.120226
1966	0.036709	1.088201
1971	0.013366	1.031255
1976	-0.011367	0.974167
1981	-0.026597	0.940596
1986	-0.104852	0.785504

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.040558	1.097888
1891	0.051647	1.126281
1896	0.049318	1.120258
1901	0.028549	1.067944
1906	0.000191	1.000440
1911	-0.046526	0.898410
1916	-0.081975	0.827990
1921	-0.127191	0.746120
1926	-0.197140	0.635126
1931	-0.189727	0.646060
1936	-0.200044	0.630894
1941	-0.083054	0.825936
1946	-0.063322	0.864327
1951	0.004161	1.009628
1956	0.015713	1.036843

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	25.0	20.0	56.0	61.0	53.0	51.0
	EXP	35.3	32.9	50.4	49.9	52.5	51.0
	CHI	3.0	5.1	0.6	2.4	0.0	0.0
35 -	OBS	57.0	41.0	51.0	95.0	81.0	70.0
	EXP	71.0	55.4	50.5	76.4	77.0	70.5
	CHI	2.8	3.7	0.0	4.6	0.2	0.0
40 -	OBS	121.0	114.0	114.0	96.0	137.0	97.0
	EXP	135.7	123.2	94.4	85.2	131.1	114.8
	CHI	1.6	0.7	4.1	1.4	0.3	2.8
45 -	OBS	202.0	243.0	235.0	178.0	157.0	162.0
	EXP	226.0	238.5	211.6	161.4	148.6	198.2
	CHI	2.5	0.1	2.6	1.7	0.5	6.6
50 -	OBS	541.0	350.0	416.0	381.0	270.0	201.0
	EXP	589.1	373.4	385.8	340.3	265.1	211.8
	CHI	3.9	1.5	2.4	4.9	0.1	0.6
55 -	OBS	1038.0	897.0	618.0	642.0	541.0	341.0
	EXP	1063.1	935.9	580.1	599.3	538.5	364.7
	CHI	0.6	1.6	2.5	3.0	0.0	1.5
60 -	OBS	2051.0	1884.0	1667.0	1045.0	1090.0	789.0
	EXP	2039.7	1905.7	1647.1	1016.7	1079.7	839.5
	CHI	0.1	0.2	0.2	0.8	0.1	3.0
65 -	OBS	3766.0	3815.0	3561.0	2990.0	1862.0	1697.0
	EXP	3724.1	3784.8	3482.8	3021.4	1906.0	1775.4
	CHI	0.5	0.2	1.8	0.3	1.0	3.5
70 -	OBS	6264.0	6812.0	6647.0	6079.0	5482.0	3085.0
	EXP	6189.4	6660.1	6673.5	6211.7	5574.8	3064.0
	CHI	0.9	3.5	0.1	2.8	1.5	0.1
75 -	OBS	8527.0	9201.0	9643.0	10021.0	9785.0	7972.0
	EXP	8527.0	9276.4	9840.7	10036.3	9687.0	7786.7
	CHI	0.0	0.6	4.0	0.0	1.0	4.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	42798.43	1069.96	40	P, C	96.73	0.0000
AGE-PERIOD	1315.72	32.89	40	Cohort	-6.22	0.0000
AGE-COHORT	7573.23	189.33	40	Period	81.55	0.0000
PERIOD-COHORT	1627.83	40.70	40	Age	14.15	0.0000
FULL AGE-PERIOD-COHORT	1397.50	34.94	40			0.0000

AGE	EFFECT
30	45.526609
35	73.393115
40	131.770612
45	240.960679
50	417.763334
55	704.744648
60	1369.638086
65	2862.100065
70	6170.509025
75	12507.588304

PERIOD	EFFECT	LOWER	UPPER
% Period Change	83.5112	80.5112	86.5112
1961	1.120226		
1966	1.088201		
1971	1.031255		
1976	0.974167		
1981	0.940596		
1986	0.785504		
1991	0.655984	0.632419	0.679549
1996	0.547820	0.509168	0.587886
2001	0.457491	0.409938	0.508588
2006	0.382057	0.330046	0.439986

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.097888	1.000000	
1891	1.126281	2.000000	
1896	1.120258	4.000000	
1901	1.067944	8.000000	
1906	1.000440	16.000000	
1911	0.898410	32.000000	
1916	0.827990	64.000000	
1921	0.746120	128.000000	
1926	0.635126	256.000000	
1931	0.646060	512.000000	
1936	0.630894	1024.000000	
1941	0.825936	2048.000000	
1946	0.864327	4096.000000	
1951	1.009628	8192.000000	
1956	1.067092	EXTRAPOLATION	1.036843
1961	1.163662	EXTRAPOLATION	
1966	1.268972	EXTRAPOLATION	
1971	1.383813	EXTRAPOLATION	
1976	1.509046	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	23.3	19.0	43.1	46.8	43.6	37.1	25.6	20.7	10.9	9.7
	EXP	32.9	31.3	38.8	38.3	43.2	38.2	34.8*	31.6*	28.8*	26.2*
	Elow							33.5	29.4	25.8	22.7
	Eup							36.0	34.0	32.0	30.2
35	OBS	41.9	38.2	48.2	73.5	62.8	57.8	48.3	46.0	31.4	19.4
	EXP	52.2	51.6	47.8	59.1	59.7	58.2	51.4*	46.8*	42.6*	38.8*
	Elow							49.5	43.5	38.2	33.5
	Eup							53.2	50.2	47.4	44.7
40	OBS	98.2	84.3	106.1	91.2	106.9	75.6	78.9	83.4	56.0	41.8
	EXP	110.1	91.1	87.8	81.0	102.4	89.5	87.3*	77.0*	70.2*	63.9*
	Elow							84.1	71.6	62.9	55.2
	Eup							90.4	82.7	78.0	73.6
45	OBS	199.8	199.4	175.3	167.3	151.1	127.8	138.4	150.6	95.4	69.5
	EXP	223.5	195.6	157.8	151.7	143.0	156.3	136.6*	133.3*	117.6*	107.1*
	Elow							131.7	123.9	105.4	92.5
	Eup							141.5	143.0	130.8	123.4
50	OBS	386.1	352.9	346.6	289.4	258.5	196.4	172.2	175.5	131.1	109.6
	EXP	420.4	376.4	321.4	258.5	253.9	207.0	226.3*	197.8*	193.0*	170.3*
	Elow							218.2	183.9	172.9	147.1
	Eup							234.5	212.3	214.5	196.1
55	OBS	771.2	660.3	641.1	548.8	423.0	334.4	252.3	261.3	179.2	149.7
	EXP	789.8	689.0	601.8	512.2	421.0	357.6	291.7*	318.9*	278.7*	271.8*
	Elow							281.2	296.4	249.7	234.8
	Eup							302.1	342.2	309.8	313.1
60	OBS	1647.7	1474.2	1284.3	1135.5	970.4	642.2	557.1	466.4	293.2	214.3
	EXP	1638.6	1491.1	1269.0	1104.8	961.2	683.3	580.5*	473.4*	517.5*	452.3*
	Elow							559.6	440.0	463.7	390.7
	Eup							601.3	508.0	575.3	520.9
65	OBS	3632.2	3352.7	3019.1	2478.9	2177.5	1603.3	1180.7	936.8	543.0	431.3
	EXP	3591.8	3326.2	2952.9	2504.9	2229.0	1677.4	1192.4*	1013.0*	826.1*	903.1*
	Elow							1149.6	941.5	740.2	780.2
	Eup							1235.3	1087.1	918.3	1040.1
70	OBS	7879.1	7693.8	6768.8	5885.3	5127.5	4040.7	2723.7	2157.2	1469.7	915.6
	EXP	7785.3	7522.3	6795.7	6013.7	5214.3	4013.2	3020.1*	2146.9*	1823.8*	1487.3*
	Elow							2911.6	1995.5	1634.2	1284.8
	Eup							3128.6	2304.0	2027.5	1712.8
75	OBS	15382.9	15205.0	14159.4	12992.6	11888.9	9036.7	7083.8	5215.0	3312.2	2451.7
	EXP	15382.9	15329.6	14449.7	13012.3	11769.8	8826.7	6793.5*	5112.3*	3634.3*	3087.3*
	Elow							6549.4	4751.6	3256.5	2667.0
	Eup							7037.5	5486.2	4040.2	3555.4
30-79	OBS	1582.6	1510.7	1381.9	1221.9	1084.0	823.4	629.2	506.9	327.6	238.1
	EXP	1587.2	1515.3	1375.1	1214.6	1084.5	832.9	651.3*	516.4*	426.7*	381.6*
	Elow							627.9	480.0	382.4	329.6
	Eup							674.7	554.2	474.4	439.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	25.0	20.0	56.0	61.0	53.0	51.0	42.0	36.0	17.0	13.0
	EXP	35.3	32.9	50.4	49.9	52.5	52.5	56.9*	55.0*	45.1*	35.3*
	CHI	3.021	5.081	0.631	2.445	0.005	0.042	3.920	6.540	17.508	14.072
35 -	OBS	57.0	41.0	51.0	95.0	81.0	70.0	68.0	76.0	55.0	31.0
	EXP	71.0	55.4	50.5	76.4	77.0	70.5	72.3*	77.3*	74.6*	62.0*
	CHI	2.753	3.749	0.004	4.555	0.210	0.003	0.258	0.023	5.168	15.513
40 -	OBS	121.0	114.0	114.0	96.0	137.0	97.0	97.0	118.0	93.0	74.0
	EXP	135.7	123.2	94.4	85.2	131.1	114.8	107.3*	109.0*	116.4*	113.1*
	CHI	1.584	0.680	4.086	1.357	0.263	2.750	0.992	0.746	4.703	13.542
45 -	OBS	202.0	243.0	235.0	178.0	157.0	162.0	178.0	185.0	135.0	116.0
	EXP	226.0	238.5	211.6	161.4	148.6	198.2	175.7*	163.7*	166.4*	178.8*
	CHI	2.548	0.086	2.590	1.718	0.477	6.622	0.030	2.774	5.932	22.033
50 -	OBS	541.0	350.0	416.0	381.0	270.0	201.0	217.0	223.0	160.0	155.0
	EXP	589.1	373.4	385.8	340.3	265.1	211.8	285.2*	251.3*	235.6*	240.8*
	CHI	3.932	1.463	2.361	4.864	0.090	0.554	16.322	3.191	24.236	30.555
55 -	OBS	1038.0	897.0	618.0	642.0	541.0	341.0	255.0	323.0	224.0	181.0
	EXP	1063.1	935.9	580.1	599.3	538.5	364.7	294.8*	394.2*	348.4*	328.6*
	CHI	0.592	1.620	2.473	3.048	0.012	1.546	5.376	12.872	44.438	66.302
60 -	OBS	2051.0	1884.0	1667.0	1045.0	1090.0	789.0	553.0	458.0	354.0	262.0
	EXP	2039.7	1905.7	1647.1	1016.7	1079.7	839.5	576.2*	464.9*	624.9*	553.0*
	CHI	0.063	0.246	0.241	0.786	0.098	3.034	0.933	0.101	117.469	153.163
65 -	OBS	3766.0	3815.0	3561.0	2990.0	1862.0	1697.0	1376.0	885.0	513.0	503.0
	EXP	3724.1	3784.8	3482.8	3021.4	1906.0	1775.4	1389.7*	957.0*	780.4*	1053.4*
	CHI	0.471	0.240	1.755	0.327	1.017	3.463	0.135	5.417	91.651	287.549
70 -	OBS	6264.0	6812.0	6647.0	6079.0	5482.0	3085.0	2644.0	2300.0	1295.0	815.0
	EXP	6189.4	6660.1	6673.5	6211.7	5574.8	3064.0	2931.7*	2289.0*	1607.0*	1323.9*
	CHI	0.900	3.463	0.105	2.834	1.546	0.144	28.234	0.053	60.561	195.642
75 -	OBS	8527.0	9201.0	9643.0	10021.0	9785.0	7972.0	4522.0	4396.0	3088.0	1935.0
	EXP	8527.0	9276.4	9840.7	10036.3	9687.0	7786.7	4336.7*	4309.4*	3388.3*	2436.6*
	CHI	0.000	0.612	3.972	0.023	0.992	4.410	7.918	1.739	26.616	103.269
30-79	OBS	22592.0	23377.0	23008.0	21588.0	19458.0	14465.0	9952.0	9000.0	5934.0	4085.0
	EXP	22600.3	23386.3	23016.9	21598.6	19460.4	14478.1	10226.6*	9070.8*	7387.2*	6325.5*
	O/E	1.000	1.000	1.000	1.000	1.000	0.999	0.973	0.992	0.803	0.646

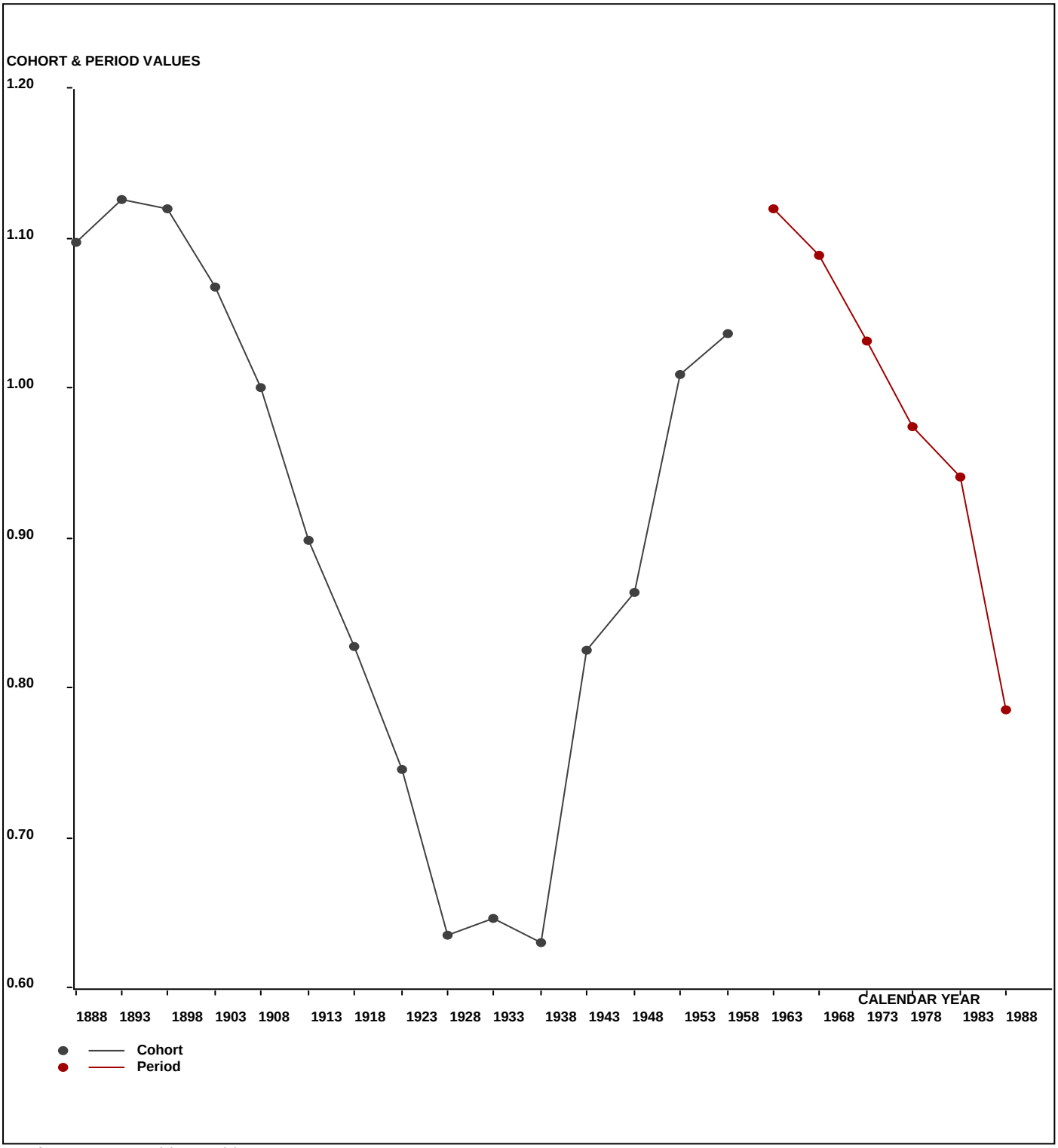
CHI SQUARE (LOG)= 1397.4955 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

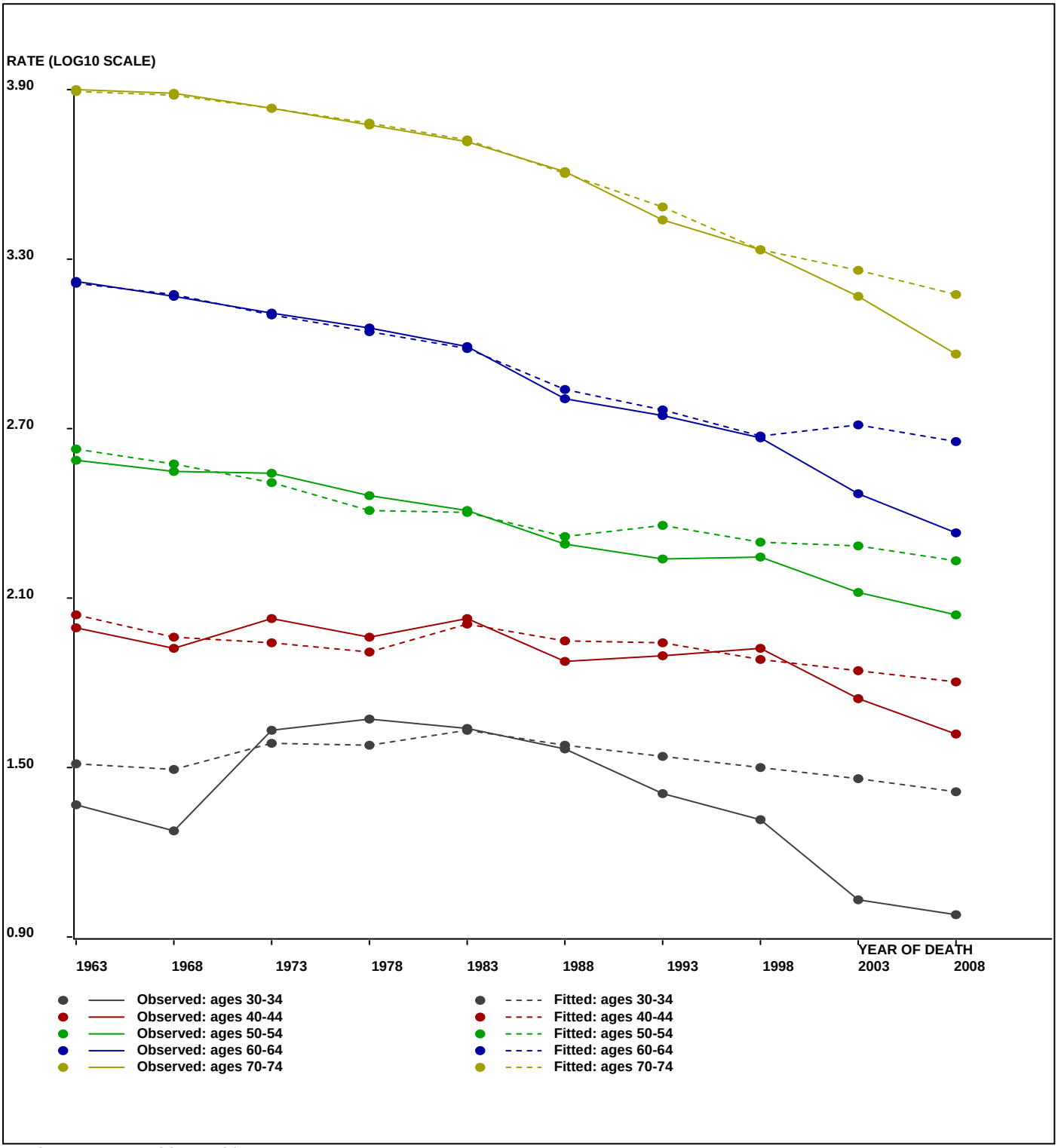


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	25.6	48.3	78.9	138.4	172.2	252.3	557.1	1180.7	2723.7	7083.8
	PRE	34.8	51.4	87.3	136.6	226.3	291.7	580.5	1192.4	3020.1	6793.5
	RES	-9.119	-3.070	-8.390	1.771	-54.145	-39.386	-23.362	-11.734	-296.381	290.281
1996-	OBS	20.7	46.0	83.4	150.6	175.5	261.3	466.4	936.8	2157.2	5215.0
	PRE	31.6	46.8	77.0	133.3	197.8	318.9	473.4	1013.0	2146.9	5112.3
	RES	-10.918	-0.805	6.373	17.349	-22.288	-57.618	-6.994	-76.214	10.304	102.696
2001-	OBS	10.9	31.4	56.0	95.4	131.1	179.2	293.2	543.0	1469.7	3312.2
	PRE	28.8	42.6	70.2	117.6	193.0	278.7	517.5	826.1	1823.8	3634.3
	RES	-17.958	-11.212	-14.101	-22.210	-61.895	-99.520	-224.376	-283.087	-354.054	-322.102
2006-	OBS	9.7	19.4	41.8	69.5	109.6	149.7	214.3	431.3	915.6	2451.7
	PRE	26.2	38.8	63.9	107.1	170.3	271.8	452.3	903.1	1487.3	3087.3
	RES	-16.577	-19.407	-22.102	-37.610	-60.674	-122.109	-238.018	-471.875	-571.745	-635.573

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	42.0	68.0	97.0	178.0	217.0	255.0	553.0	1376.0	2644.0	4522.0
	PRE	56.9	72.3	107.3	175.7	285.2	294.8	576.2	1389.7	2931.7	4336.7
	CHI	3.920	0.258	0.992	0.030	16.322	5.376	0.933	0.135	28.234	7.918
1996-	OBS	36.0	76.0	118.0	185.0	223.0	323.0	458.0	885.0	2300.0	4396.0
	PRE	55.0	77.3	109.0	163.7	251.3	394.2	464.9	957.0	2289.0	4309.4
	CHI	6.540	0.023	0.746	2.774	3.191	12.872	0.101	5.417	0.053	1.739
2001-	OBS	17.0	55.0	93.0	135.0	160.0	224.0	354.0	513.0	1295.0	3088.0
	PRE	45.1	74.6	116.4	166.4	235.6	348.4	624.9	780.4	1607.0	3388.3
	CHI	17.508	5.168	4.703	5.932	24.236	44.438	117.469	91.651	60.561	26.616
2006-	OBS	13.0	31.0	74.0	116.0	155.0	181.0	262.0	503.0	815.0	1935.0
	PRE	35.3	62.0	113.1	178.8	240.8	328.6	553.0	1053.4	1323.9	2436.6
	CHI	14.072	15.513	13.542	22.033	30.555	66.302	153.163	287.549	195.642	103.269

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	58.66	1.15	51	P, C	87.86	312.51	0.0000
AGE-PERIOD	13.71	0.30	45	Cohort	48.03	72.99	0.0052
AGE-COHORT	7.93	0.22	36	Period	10.14	42.27	0.2184
PERIOD-COHORT	8.50	0.21	40	Age	16.21	45.34	0.2590
FULL AGE-PERIOD-COHORT	7.12	0.22	32			37.95	0.2165

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.706327	5.085423
35	1.129723	13.481042
40	1.480457	30.231333
45	1.773112	59.307807
50	2.082132	120.818193
55	2.277379	189.399440
60	2.470052	295.155963
65	2.629526	426.113755
70	2.762964	579.380024
75	2.846749	702.665950

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.061892	0.867178
1966	-0.046725	0.897997
1971	-0.025127	0.943785
1976	-0.007581	0.982696
1981	0.040125	1.096793
1986	0.062862	1.155745

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.048609	0.894110
1891	-0.046417	0.898635
1896	-0.031347	0.930364
1901	0.008112	1.018854
1906	0.009598	1.022346
1911	-0.028405	0.936688
1916	0.012129	1.028321
1921	0.023312	1.055145
1926	0.000357	1.000823
1931	0.016913	1.039712
1936	0.023759	1.056230
1941	0.114279	1.301006
1946	0.158092	1.439102
1951	0.238656	1.732432
1956	0.206311	1.608091

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	6.0	7.0	10.0	5.0	9.0	13.0
	EXP	4.9	5.1	8.1	9.4	11.7	13.0
	CHI	0.2	0.7	0.4	2.0	0.6	0.0
35 -	OBS	17.0	16.0	13.0	17.0	27.0	35.0
	EXP	15.9	13.5	14.2	22.3	27.5	32.7
	CHI	0.1	0.5	0.1	1.3	0.0	0.2
40 -	OBS	38.0	40.0	32.0	34.0	41.0	68.0
	EXP	34.1	36.7	31.9	33.0	55.3	64.5
	CHI	0.5	0.3	0.0	0.0	3.7	0.2
45 -	OBS	63.0	66.0	71.0	49.0	66.0	127.0
	EXP	53.5	68.5	75.1	64.5	71.4	113.1
	CHI	1.7	0.1	0.2	3.7	0.4	1.7
50 -	OBS	150.0	116.0	140.0	124.0	155.0	154.0
	EXP	137.5	110.7	144.4	156.4	143.9	150.9
	CHI	1.1	0.3	0.1	6.7	0.9	0.1
55 -	OBS	217.0	220.0	182.0	226.0	272.0	230.0
	EXP	226.0	216.4	177.2	229.7	265.9	232.1
	CHI	0.4	0.1	0.1	0.1	0.1	0.0
60 -	OBS	300.0	328.0	349.0	278.0	389.0	441.0
	EXP	324.6	346.3	338.7	274.5	383.7	419.4
	CHI	1.9	1.0	0.3	0.0	0.1	1.1
65 -	OBS	354.0	441.0	492.0	472.0	409.0	551.0
	EXP	356.5	443.6	484.9	473.1	411.0	550.0
	CHI	0.0	0.0	0.1	0.0	0.0	0.0
70 -	OBS	364.0	439.0	540.0	618.0	633.0	503.0
	EXP	358.9	428.6	547.1	601.2	636.4	525.7
	CHI	0.1	0.3	0.1	0.5	0.0	1.0
75 -	OBS	302.0	338.0	412.0	575.0	651.0	648.0
	EXP	302.0	343.1	420.2	542.6	648.5	671.1
	CHI	0.0	0.1	0.2	1.9	0.0	0.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	4107.83	102.70	40	P, C	91.21	0.0000
AGE-PERIOD	853.51	21.34	40	Cohort	57.67	0.0000
AGE-COHORT	408.80	10.22	40	Period	11.63	0.0000
PERIOD-COHORT	442.21	11.06	40	Age	18.31	0.0000
FULL AGE-PERIOD-COHORT	361.26	9.03	40			0.0000

AGE	EFFECT
30	5.085423
35	13.481042
40	30.231333
45	59.307807
50	120.818193
55	189.399440
60	295.155963
65	426.113755
70	579.380024
75	702.665950

PERIOD	EFFECT	LOWER	UPPER
% Period Change	105.3749	102.3749	108.3749
1961	0.867178		
1966	0.897997		
1971	0.943785		
1976	0.982696		
1981	1.096793		
1986	1.155745		
1991	1.217866	1.183193	1.252538
1996	1.283325	1.211293	1.357437
2001	1.352303	1.240061	1.471122
2006	1.424988	1.269511	1.594327

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.894110	1.000000	
1891	0.898635	2.000000	
1896	0.930364	4.000000	
1901	1.018854	8.000000	
1906	1.022346	16.000000	
1911	0.936688	32.000000	
1916	1.028321	64.000000	
1921	1.055145	128.000000	
1926	1.000823	256.000000	
1931	1.039712	512.000000	
1936	1.056230	1024.000000	
1941	1.301006	2048.000000	
1946	1.439102	4096.000000	
1951	1.732432	8192.000000	
1956	1.885699	EXTRAPOLATION	1.608091
1961	2.116223	EXTRAPOLATION	
1966	2.374929	EXTRAPOLATION	
1971	2.665261	EXTRAPOLATION	
1976	2.991087	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	5.6	6.6	7.7	3.8	7.4	9.5	7.3	6.9	1.3	3.0
	EXP	4.6	4.8	6.2	7.2	9.7	11.1	13.1*	15.5*	18.3*	21.7*
	Elow							12.7	14.6	16.8	19.3
	Eup							13.5	16.4	19.9	24.3
35	OBS	12.5	14.9	12.3	13.1	20.9	28.9	22.7	15.1	15.4	13.8
	EXP	11.7	12.6	13.4	17.2	21.3	27.0	31.0*	36.6*	43.3*	51.2*
	Elow							30.1	34.6	39.7	45.6
	Eup							31.8	38.7	47.1	57.3
40	OBS	30.9	29.6	29.8	32.3	32.0	53.0	78.1	70.7	56.7	44.0
	EXP	27.7	27.2	29.7	31.4	43.1	50.3	63.8*	73.2*	86.5*	102.3*
	Elow							62.0	69.1	79.3	91.1
	Eup							65.6	77.4	94.1	114.5
45	OBS	62.3	54.1	53.0	46.1	63.5	100.2	132.2	150.6	130.1	134.2
	EXP	52.9	56.2	56.0	60.6	68.7	89.2	103.9*	131.9*	151.2*	178.8*
	Elow							101.0	124.5	138.7	159.3
	Eup							106.9	139.5	164.5	200.1
50	OBS	107.1	116.9	116.6	94.2	148.4	150.5	177.8	250.3	292.4	292.1
	EXP	98.1	111.6	120.3	118.8	137.8	147.5	191.4*	223.1*	283.0*	324.7*
	Elow							186.0	210.6	259.6	289.2
	Eup							196.9	236.0	307.9	363.2
55	OBS	161.2	162.0	188.8	193.2	212.7	225.5	237.4	349.4	433.5	479.0
	EXP	167.9	159.3	183.8	196.4	207.9	227.6	243.6*	316.2*	368.6*	467.6*
	Elow							236.7	298.5	338.0	416.6
	Eup							250.6	334.5	401.0	523.1
60	OBS	241.0	256.6	268.9	302.1	346.3	359.0	384.8	391.0	495.2	636.3
	EXP	260.8	271.0	260.9	298.3	341.6	341.4	373.7*	400.1*	519.3*	605.3*
	Elow							363.1	377.6	476.2	539.2
	Eup							384.4	423.2	564.9	677.2
65	OBS	341.4	387.6	417.1	391.3	478.3	520.6	508.8	597.0	515.5	769.1
	EXP	343.8	389.9	411.1	392.2	480.6	519.6	519.4*	568.6*	608.6*	790.0*
	Elow							504.6	536.6	558.1	703.8
	Eup							534.2	601.4	662.1	883.9
70	OBS	457.9	495.8	549.9	598.3	592.1	658.8	717.0	771.0	770.6	717.9
	EXP	451.5	484.1	557.1	582.1	595.2	688.6	744.5*	744.1*	814.6*	872.0*
	Elow							723.3	702.4	747.0	776.9
	Eup							765.7	787.1	886.2	975.7
75	OBS	544.8	558.6	605.0	745.5	791.0	734.5	894.5	863.6	933.2	981.9
	EXP	544.8	567.0	617.0	703.5	787.9	760.7	880.0*	951.5*	951.0*	1041.1*
	Elow							854.9	898.1	872.1	927.5
	Eup							905.0	1006.4	1034.6	1164.8
30-79	OBS	136.9	144.8	155.3	160.9	185.2	201.3	222.7	253.4	268.9	302.9
	EXP	136.3	144.4	155.2	164.3	185.5	200.2	222.3*	248.5*	284.8*	335.3*
	Elow							215.9	234.6	261.2	298.7
	Eup							228.6	262.9	309.8	375.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	6.0	7.0	10.0	5.0	9.0	13.0	12.0	12.0	2.0	4.0
	EXP	4.9	5.1	8.1	9.4	11.7	15.2	21.5*	26.9*	28.7*	29.1*
	CHI	0.239	0.723	0.440	2.039	0.638	0.330	4.180	8.265	24.820	21.685
35 -	OBS	17.0	16.0	13.0	17.0	27.0	35.0	32.0	25.0	27.0	22.0
	EXP	15.9	13.5	14.2	22.3	27.5	32.7	43.6*	60.5*	75.8*	81.8*
	CHI	0.076	0.456	0.105	1.253	0.007	0.163	3.078	20.842	31.458	43.748
40 -	OBS	38.0	40.0	32.0	34.0	41.0	68.0	96.0	100.0	94.0	78.0
	EXP	34.1	36.7	31.9	33.0	55.3	64.5	78.4*	103.5*	143.6*	181.2*
	CHI	0.453	0.289	0.000	0.029	3.679	0.190	3.934	0.119	17.105	58.774
45 -	OBS	63.0	66.0	71.0	49.0	66.0	127.0	170.0	185.0	184.0	224.0
	EXP	53.5	68.5	75.1	64.5	71.4	113.1	133.7*	162.0*	214.0*	298.4*
	CHI	1.695	0.091	0.224	3.712	0.407	1.713	9.859	3.280	4.195	18.565
50 -	OBS	150.0	116.0	140.0	124.0	155.0	154.0	224.0	318.0	357.0	413.0
	EXP	137.5	110.7	144.4	156.4	143.9	150.9	241.2*	283.5*	345.5*	458.9*
	CHI	1.134	0.257	0.135	6.729	0.859	0.063	1.231	4.201	0.381	4.600
55 -	OBS	217.0	220.0	182.0	226.0	272.0	230.0	240.0	432.0	542.0	579.0
	EXP	226.0	216.4	177.2	229.7	265.9	232.1	246.3*	391.0*	460.9*	565.2*
	CHI	0.359	0.060	0.130	0.061	0.140	0.019	0.159	4.307	14.285	0.337
60 -	OBS	300.0	328.0	349.0	278.0	389.0	441.0	382.0	384.0	598.0	778.0
	EXP	324.6	346.3	338.7	274.5	383.7	419.4	371.0*	392.9*	627.1*	740.1*
	CHI	1.866	0.968	0.315	0.045	0.074	1.109	0.327	0.201	1.347	1.939
65 -	OBS	354.0	441.0	492.0	472.0	409.0	551.0	593.0	564.0	487.0	897.0
	EXP	356.5	443.6	484.9	473.1	411.0	550.0	605.3*	537.1*	575.0*	921.4*
	CHI	0.017	0.016	0.103	0.003	0.009	0.002	0.249	1.342	13.472	0.644
70 -	OBS	364.0	439.0	540.0	618.0	633.0	503.0	696.0	822.0	679.0	639.0
	EXP	358.9	428.6	547.1	601.2	636.4	525.7	722.7*	793.4*	717.8*	776.2*
	CHI	0.071	0.254	0.092	0.468	0.018	0.981	0.988	1.032	2.093	24.264
75 -	OBS	302.0	338.0	412.0	575.0	651.0	648.0	571.0	728.0	870.0	775.0
	EXP	302.0	343.1	420.2	542.6	648.5	671.1	561.8*	802.0*	886.6*	821.7*
	CHI	0.000	0.077	0.160	1.932	0.010	0.793	0.152	6.835	0.312	2.649
30-79	OBS	1811.0	2011.0	2241.0	2398.0	2652.0	2770.0	3016.0	3570.0	3840.0	4409.0
	EXP	1813.9	2012.5	2241.8	2406.8	2655.1	2774.7	3025.4*	3552.8*	4074.9*	4874.1*
	O/E	0.998	0.999	1.000	0.996	0.999	0.998	0.997	1.005	0.942	0.905

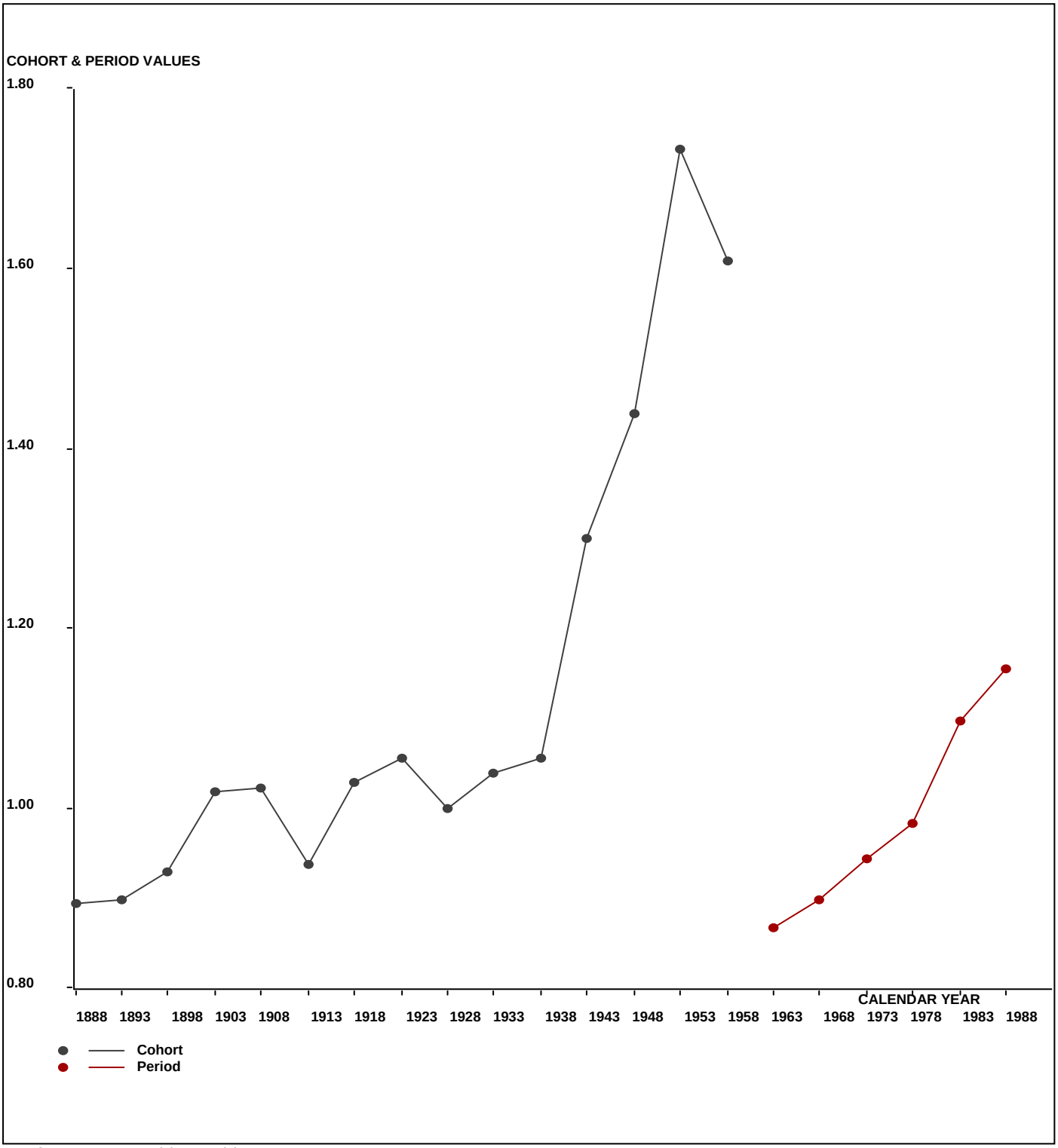
CHI SQUARE (LOG)= 361.2561 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

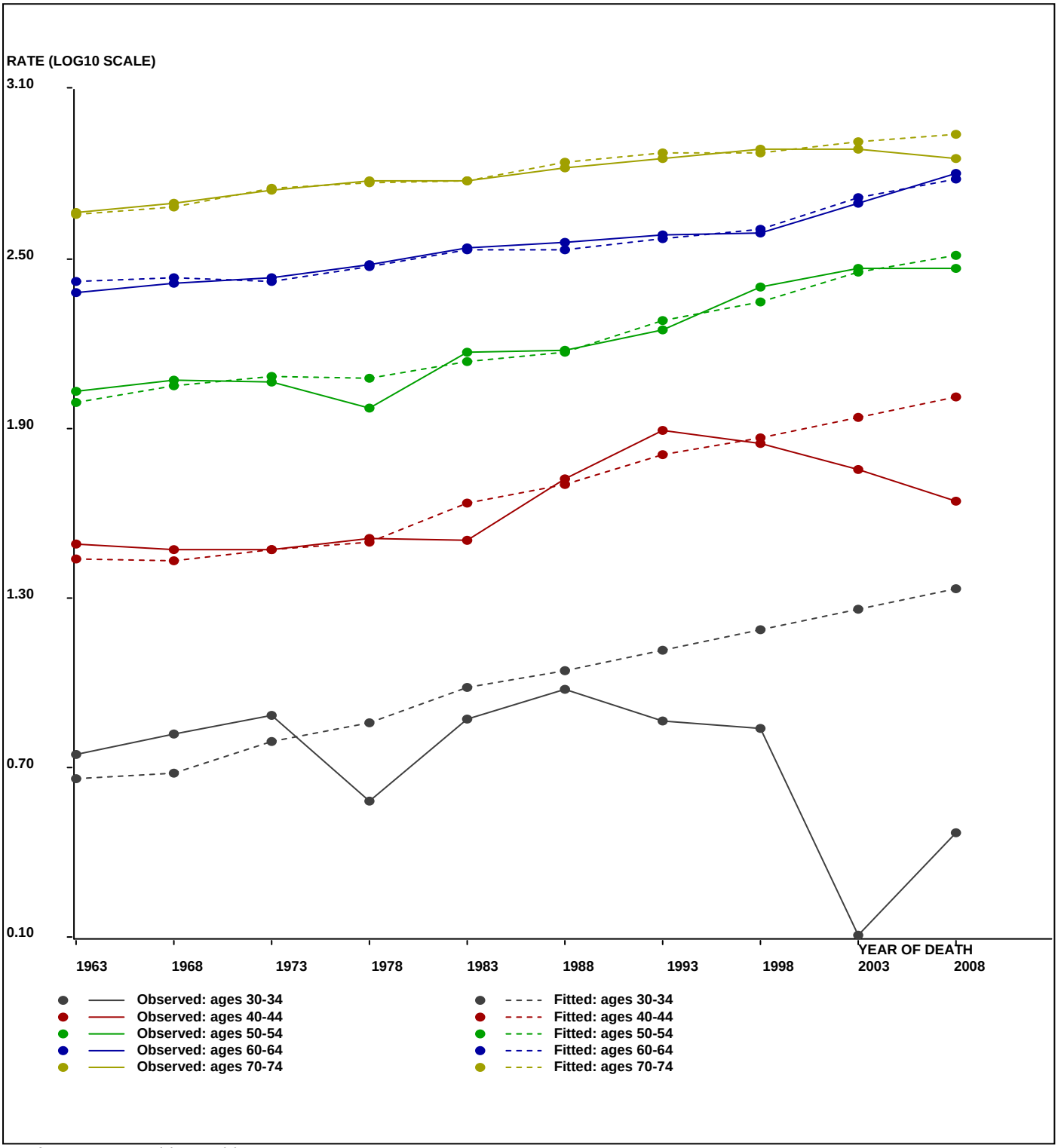


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	7.3	22.7	78.1	132.2	177.8	237.4	384.8	508.8	717.0	894.5
	PRE	13.1	31.0	63.8	103.9	191.4	243.6	373.7	519.4	744.5	880.0
	RES	-5.783	-8.228	14.285	28.227	-13.676	-6.196	11.095	-10.539	-27.530	14.488
1996-	OBS	6.9	15.1	70.7	150.6	250.3	349.4	391.0	597.0	771.0	863.6
	PRE	15.5	36.6	73.2	131.9	223.1	316.2	400.1	568.6	744.1	951.5
	RES	-8.589	-21.486	-2.478	18.766	27.163	33.192	-9.058	28.424	26.833	-87.838
2001-	OBS	1.3	15.4	56.7	130.1	292.4	433.5	495.2	515.5	770.6	933.2
	PRE	18.3	43.3	86.5	151.2	283.0	368.6	519.3	608.6	814.6	951.0
	RES	-17.051	-27.883	-29.864	-21.178	9.396	64.893	-24.069	-93.160	-43.989	-17.845
2006-	OBS	3.0	13.8	44.0	134.2	292.1	479.0	636.3	769.1	717.9	981.9
	PRE	21.7	51.2	102.3	178.8	324.7	467.6	605.3	790.0	872.0	1041.1
	RES	-18.700	-37.436	-58.269	-44.607	-32.502	11.419	30.981	-20.891	-154.176	-59.109

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	12.0	32.0	96.0	170.0	224.0	240.0	382.0	593.0	696.0	571.0
	PRE	21.5	43.6	78.4	133.7	241.2	246.3	371.0	605.3	722.7	561.8
	CHI	4.180	3.078	3.934	9.859	1.231	0.159	0.327	0.249	0.988	0.152
1996-	OBS	12.0	25.0	100.0	185.0	318.0	432.0	384.0	564.0	822.0	728.0
	PRE	26.9	60.5	103.5	162.0	283.5	391.0	392.9	537.1	793.4	802.0
	CHI	8.265	20.842	0.119	3.280	4.201	4.307	0.201	1.342	1.032	6.835
2001-	OBS	2.0	27.0	94.0	184.0	357.0	542.0	598.0	487.0	679.0	870.0
	PRE	28.7	75.8	143.6	214.0	345.5	460.9	627.1	575.0	717.8	886.6
	CHI	24.820	31.458	17.105	4.195	0.381	14.285	1.347	13.472	2.093	0.312
2006-	OBS	4.0	22.0	78.0	224.0	413.0	579.0	778.0	897.0	639.0	775.0
	PRE	29.1	81.8	181.2	298.4	458.9	565.2	740.1	921.4	776.2	821.7
	CHI	21.685	43.748	58.774	18.565	4.600	0.337	1.939	0.644	24.264	2.649

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	135.66	2.66	51	P, C	93.04	726.57	0.0000
AGE-PERIOD	27.27	0.61	45	Cohort	65.39	145.89	0.0000
AGE-COHORT	74.05	2.06	36	Period	87.26	396.26	0.0000
PERIOD-COHORT	12.16	0.30	40	Age	22.40	65.06	0.0074
FULL AGE-PERIOD-COHORT	9.44	0.29	32			50.26	0.0210

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.933516	8.580560
35	1.152721	14.214142
40	1.298983	19.905964
45	1.507566	32.178516
50	1.802875	63.514831
55	2.018240	104.289426
60	2.281670	191.280034
65	2.553349	357.560145
70	2.823191	665.566278
75	3.072494	1181.662776

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.107456	0.780807
1966	0.133623	1.360263
1971	0.007044	1.016352
1976	-0.044160	0.903316
1981	-0.003356	0.992302
1986	-0.066109	0.858798

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.192662	1.558339
1891	0.059495	1.146818
1896	0.029140	1.069401
1901	-0.030801	0.931534
1906	-0.029377	0.934593
1911	-0.051682	0.887805
1916	-0.026563	0.940669
1921	-0.027351	0.938965
1926	-0.073022	0.845236
1931	0.010156	1.023662
1936	0.009090	1.021151
1941	0.081733	1.207072
1946	0.069858	1.174512
1951	0.049507	1.120746
1956	-0.005850	0.986620

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	4.0	10.0	12.0	16.0	13.0	10.0
	EXP	7.4	12.6	13.7	11.9	11.6	10.0
	CHI	1.5	0.5	0.2	1.4	0.2	0.0
35 -	OBS	10.0	17.0	17.0	28.0	18.0	15.0
	EXP	12.8	21.3	15.6	20.0	21.4	16.6
	CHI	0.6	0.9	0.1	3.2	0.5	0.1
40 -	OBS	12.0	33.0	31.0	20.0	23.0	24.0
	EXP	18.0	30.9	22.3	19.3	30.5	25.8
	CHI	2.0	0.1	3.4	0.0	1.9	0.1
45 -	OBS	22.0	56.0	32.0	34.0	33.0	41.0
	EXP	23.9	50.1	37.1	31.7	33.9	42.3
	CHI	0.2	0.7	0.7	0.2	0.0	0.0
50 -	OBS	57.0	68.0	73.0	83.0	60.0	58.0
	EXP	61.7	80.6	72.8	63.8	67.4	57.0
	CHI	0.4	2.0	0.0	5.7	0.8	0.0
55 -	OBS	103.0	169.0	102.0	115.0	93.0	94.0
	EXP	102.4	171.1	96.1	103.5	111.9	93.5
	CHI	0.0	0.0	0.4	1.3	3.2	0.0
60 -	OBS	181.0	300.0	219.0	170.0	185.0	171.0
	EXP	173.2	310.8	224.0	149.6	200.2	170.6
	CHI	0.4	0.4	0.1	2.8	1.2	0.0
65 -	OBS	330.0	511.0	400.0	345.0	269.0	306.0
	EXP	309.6	515.6	400.6	345.9	285.4	305.2
	CHI	1.3	0.0	0.0	0.0	0.9	0.0
70 -	OBS	460.0	870.0	646.0	538.0	639.0	412.0
	EXP	473.8	857.2	618.8	580.4	626.9	410.5
	CHI	0.4	0.2	1.2	3.1	0.2	0.0
75 -	OBS	797.0	1129.0	840.0	735.0	952.0	795.0
	EXP	797.0	1115.5	874.7	766.9	901.9	794.8
	CHI	0.0	0.2	1.4	1.3	2.8	0.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	631.80	15.79	40	P, C	-124.36	0.0000
AGE-PERIOD	1968.02	49.20	40	Cohort	27.97	0.0000
AGE-COHORT	324.24	8.11	40	Period	-337.19	0.0000
PERIOD-COHORT	1773.61	44.34	40	Age	20.08	0.0000
FULL AGE-PERIOD-COHORT	1417.52	35.44	40			0.0000

AGE	EFFECT
30	8.580560
35	14.214142
40	19.905964
45	32.178516
50	63.514831
55	104.289426
60	191.280034
65	357.560145
70	665.566278
75	1181.662776

PERIOD	EFFECT	LOWER	UPPER
% Period Change	86.5460	83.5460	89.5460
1961	0.780807		
1966	1.360263		
1971	1.016352		
1976	0.903316		
1981	0.992302		
1986	0.858798		
1991	0.743255	0.717491	0.769019
1996	0.643258	0.599436	0.688626
2001	0.556714	0.500805	0.616637
2006	0.481814	0.418402	0.552174

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.558339	1.000000	
1891	1.146818	2.000000	
1896	1.069401	4.000000	
1901	0.931534	8.000000	
1906	0.934593	16.000000	
1911	0.887805	32.000000	
1916	0.940669	64.000000	
1921	0.938965	128.000000	
1926	0.845236	256.000000	
1931	1.023662	512.000000	
1936	1.021151	1024.000000	
1941	1.207072	2048.000000	
1946	1.174512	4096.000000	
1951	1.120746	8192.000000	
1956	1.178405	EXTRAPOLATION	0.986620
1961	1.205238	EXTRAPOLATION	
1966	1.232683	EXTRAPOLATION	
1971	1.260752	EXTRAPOLATION	
1976	1.289460	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	3.7	9.5	9.2	12.3	10.7	7.3	4.3	1.7	2.6	0.7
	EXP	6.9	11.9	10.5	9.1	9.5	8.7	7.7*	6.8*	6.0*	5.3*
	Elow							7.4	6.3	5.4	4.6
	Eup							8.0	7.3	6.7	6.1
35	OBS	7.4	15.8	16.1	21.7	14.0	12.4	8.5	4.2	2.9	3.1
	EXP	9.4	19.8	14.8	15.5	16.6	13.7	12.4*	11.0*	9.8*	8.6*
	Elow							12.0	10.3	8.8	7.5
	Eup							12.9	11.8	10.8	9.9
40	OBS	9.7	24.4	28.8	19.0	18.0	18.7	13.0	8.5	8.4	10.2
	EXP	14.6	22.9	20.7	18.4	23.8	20.1	16.6*	15.1*	13.4*	11.8*
	Elow							16.0	14.1	12.0	10.3
	Eup							17.2	16.2	14.8	13.5
45	OBS	21.8	45.9	23.9	32.0	31.8	32.3	24.9	18.7	21.9	25.8
	EXP	23.6	41.1	27.6	29.8	32.6	33.4	28.1*	23.2*	21.1*	18.7*
	Elow							27.1	21.6	19.0	16.2
	Eup							29.1	24.8	23.4	21.4
50	OBS	40.7	68.6	60.8	63.0	57.5	56.7	57.1	44.1	61.4	44.6
	EXP	44.0	81.3	60.6	48.5	64.5	55.7	57.0*	48.0*	39.6*	36.1*
	Elow							55.0	44.7	35.6	31.3
	Eup							59.0	51.4	43.9	41.3
55	OBS	76.5	124.4	105.8	98.3	72.7	92.2	68.3	80.1	109.6	115.8
	EXP	76.1	125.9	99.7	88.5	87.5	91.7	79.2*	81.0*	68.2*	56.3*
	Elow							76.4	75.5	61.3	48.9
	Eup							81.9	86.7	75.5	64.5
60	OBS	145.4	234.7	168.7	184.7	164.7	139.2	128.9	121.2	173.1	202.0
	EXP	139.1	243.2	172.6	162.5	178.2	138.8	145.5*	125.6*	128.5*	108.2*
	Elow							140.5	117.1	115.6	94.0
	Eup							150.6	134.5	142.4	124.1
65	OBS	318.3	449.1	339.1	286.0	314.6	289.1	237.7	233.9	266.7	354.1
	EXP	298.6	453.1	339.6	286.8	333.8	288.3	224.6*	235.4*	203.3*	208.0*
	Elow							216.8	219.4	182.9	180.6
	Eup							232.4	252.1	225.1	238.3
70	OBS	578.6	982.6	657.8	520.9	597.7	539.6	522.3	469.9	592.4	458.4
	EXP	596.0	968.2	630.1	561.9	586.3	537.7	464.5*	361.9*	379.3*	327.5*
	Elow							448.4	337.2	341.2	284.4
	Eup							480.6	387.4	420.1	375.3
75	OBS	1437.8	1865.7	1233.4	953.0	1156.7	901.2	1035.5	822.1	1090.8	1017.4
	EXP	1437.8	1843.4	1284.3	994.3	1095.9	901.0	826.2*	713.7*	556.0*	582.8*
	Elow							797.5	665.1	500.2	506.1
	Eup							854.8	764.1	615.9	667.9
30-79	OBS	139.2	209.9	149.9	130.2	137.2	122.2	116.3	102.1	131.4	129.5
	EXP	140.0	211.2	149.4	127.5	140.6	122.4	109.1*	96.3*	86.3*	80.4*
	Elow							105.3	89.8	77.6	69.8
	Eup							112.9	103.1	95.5	92.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	4.0	10.0	12.0	16.0	13.0	10.0	7.0	3.0	4.0	1.0
	EXP	7.4	12.6	13.7	11.9	11.6	11.9	12.6*	11.8*	9.4*	7.2*
	CHI	1.530	0.522	0.204	1.443	0.172	0.316	2.485	6.577	3.122	5.305
35 -	OBS	10.0	17.0	17.0	28.0	18.0	15.0	12.0	7.0	5.0	5.0
	EXP	12.8	21.3	15.6	20.0	21.4	16.6	17.5*	18.2*	17.1*	13.8*
	CHI	0.594	0.852	0.123	3.163	0.532	0.149	1.742	6.904	8.551	5.612
40 -	OBS	12.0	33.0	31.0	20.0	23.0	24.0	16.0	12.0	14.0	18.0
	EXP	18.0	30.9	22.3	19.3	30.5	25.8	20.4*	21.3*	22.2*	20.9*
	CHI	1.987	0.136	3.431	0.023	1.863	0.120	0.945	4.094	3.006	0.412
45 -	OBS	22.0	56.0	32.0	34.0	33.0	41.0	32.0	23.0	31.0	43.0
	EXP	23.9	50.1	37.1	31.7	33.9	42.3	36.1*	28.5*	29.9*	31.2*
	CHI	0.151	0.696	0.691	0.173	0.023	0.040	0.472	1.059	0.043	4.480
50 -	OBS	57.0	68.0	73.0	83.0	60.0	58.0	72.0	56.0	75.0	63.0
	EXP	61.7	80.6	72.8	63.8	67.4	57.0	71.8*	61.0*	48.4*	51.0*
	CHI	0.357	1.974	0.001	5.745	0.808	0.018	0.001	0.405	14.652	2.834
55 -	OBS	103.0	169.0	102.0	115.0	93.0	94.0	69.0	99.0	137.0	140.0
	EXP	102.4	171.1	96.1	103.5	111.9	93.5	80.0*	100.1*	85.3*	68.1*
	CHI	0.003	0.025	0.360	1.282	3.184	0.003	1.514	0.012	31.395	75.997
60 -	OBS	181.0	300.0	219.0	170.0	185.0	171.0	128.0	119.0	209.0	247.0
	EXP	173.2	310.8	224.0	149.6	200.2	170.6	144.5*	123.4*	155.2*	132.4*
	CHI	0.353	0.374	0.113	2.786	1.153	0.001	1.876	0.156	18.635	99.295
65 -	OBS	330.0	511.0	400.0	345.0	269.0	306.0	277.0	221.0	252.0	413.0
	EXP	309.6	515.6	400.6	345.9	285.4	305.2	261.8*	222.4*	192.0*	242.5*
	CHI	1.349	0.040	0.001	0.002	0.942	0.002	0.885	0.009	18.721	119.807
70 -	OBS	460.0	870.0	646.0	538.0	639.0	412.0	507.0	501.0	522.0	408.0
	EXP	473.8	857.2	618.8	580.4	626.9	410.5	450.9*	385.8*	334.2*	291.5*
	CHI	0.403	0.191	1.196	3.095	0.234	0.005	6.981	34.386	105.530	46.570
75 -	OBS	797.0	1129.0	840.0	735.0	952.0	795.0	661.0	693.0	1017.0	803.0
	EXP	797.0	1115.5	874.7	766.9	901.9	794.8	527.4*	601.6*	518.4*	460.0*
	CHI	0.000	0.164	1.375	1.328	2.778	0.000	33.847	13.877	479.541	255.789
30-79	OBS	1976.0	3163.0	2372.0	2084.0	2285.0	1926.0	1781.0	1734.0	2266.0	2141.0
	EXP	1979.7	3165.6	2375.6	2093.0	2291.1	1928.1	1623.0*	1574.2*	1412.0*	1318.5*
	O/E	0.998	0.999	0.998	0.996	0.997	0.999	1.097	1.101	1.605	1.624

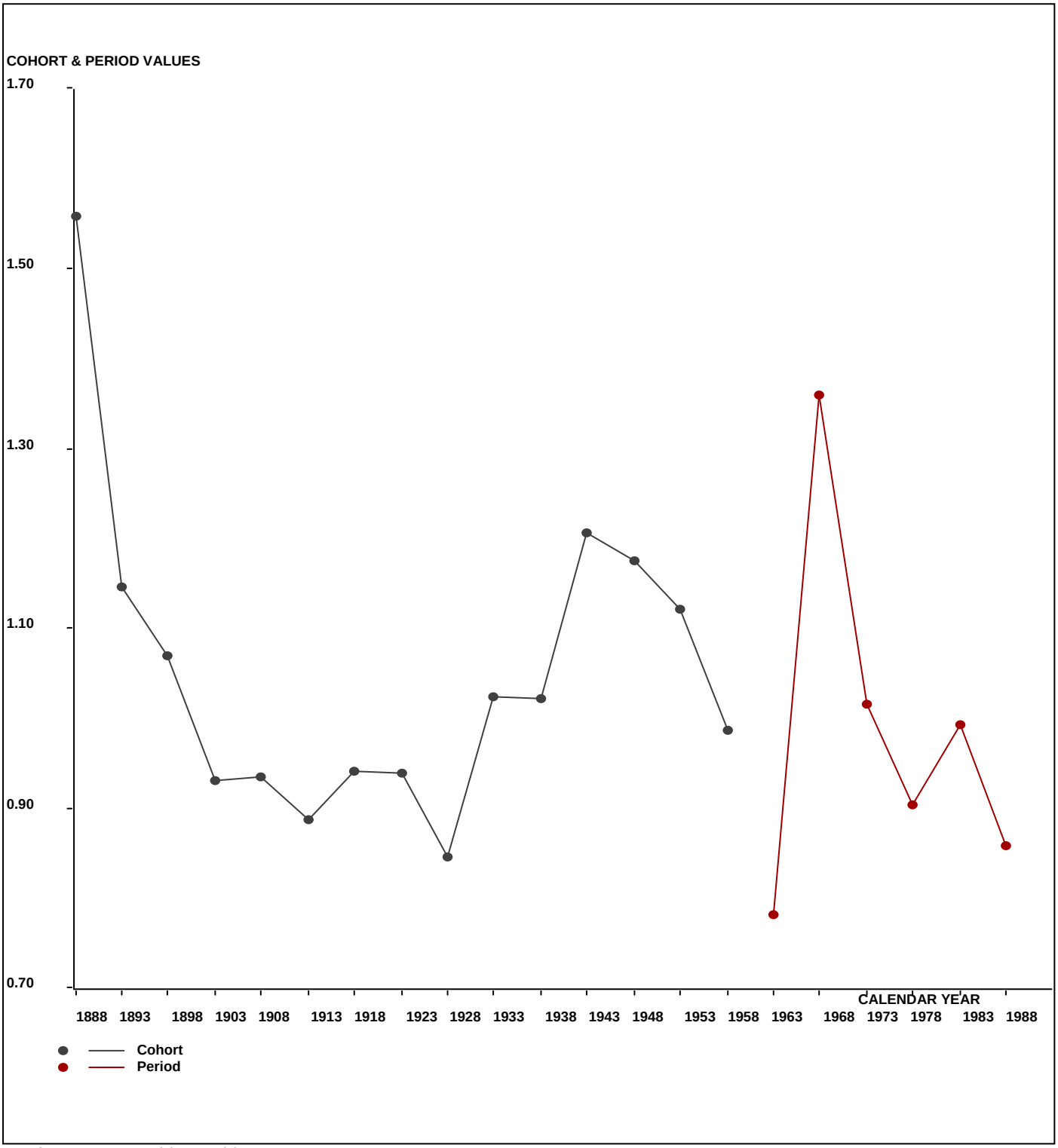
CHI SQUARE (LOG)= 1417.5243 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

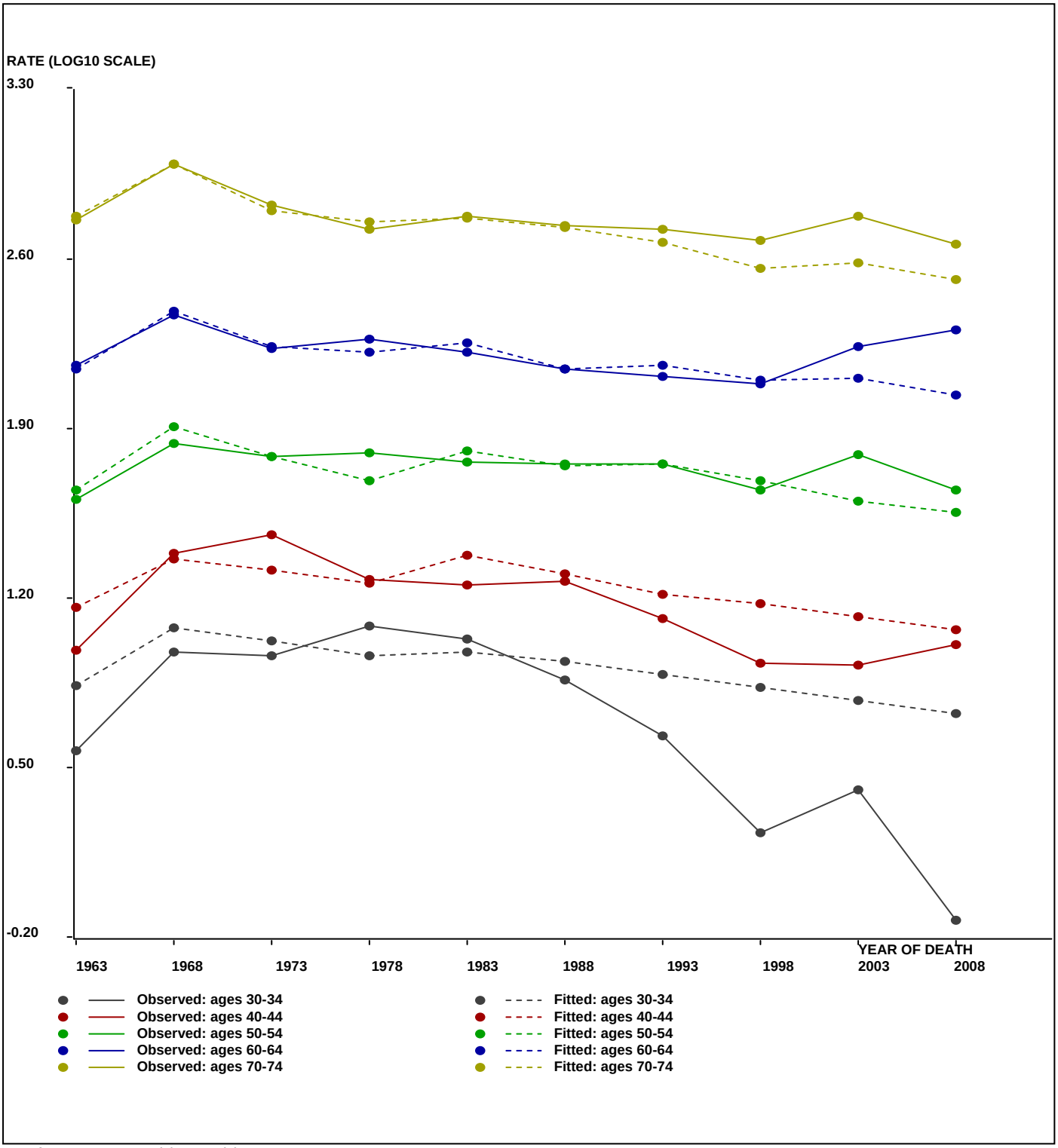


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Austria COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	4.3	8.5	13.0	24.9	57.1	68.3	128.9	237.7	522.3	1035.5
	PRE	7.7	12.4	16.6	28.1	57.0	79.2	145.5	224.6	464.5	826.2
	RES	-3.414	-3.925	-3.570	-3.211	0.152	-10.890	-16.585	13.058	57.796	209.295
1996-	OBS	1.7	4.2	8.5	18.7	44.1	80.1	121.2	233.9	469.9	822.1
	PRE	6.8	11.0	15.1	23.2	48.0	81.0	125.6	235.4	361.9	713.7
	RES	-5.076	-6.785	-6.607	-4.472	-3.909	-0.902	-4.469	-1.522	108.031	108.396
2001-	OBS	2.6	2.9	8.4	21.9	61.4	109.6	173.1	266.7	592.4	1090.8
	PRE	6.0	9.8	13.4	21.1	39.6	68.2	128.5	203.3	379.3	556.0
	RES	-3.466	-6.900	-4.919	0.802	21.809	41.379	44.537	63.466	213.140	534.788
2006-	OBS	0.7	3.1	10.2	25.8	44.6	115.8	202.0	354.1	458.4	1017.4
	PRE	5.3	8.6	11.8	18.7	36.1	56.3	108.2	208.0	327.5	582.8
	RES	-4.587	-5.506	-1.659	7.083	8.503	59.502	93.755	146.155	130.889	434.608

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	7.0	12.0	16.0	32.0	72.0	69.0	128.0	277.0	507.0	661.0
	PRE	12.6	17.5	20.4	36.1	71.8	80.0	144.5	261.8	450.9	527.4
	CHI	2.485	1.742	0.945	0.472	0.001	1.514	1.876	0.885	6.981	33.847
1996-	OBS	3.0	7.0	12.0	23.0	56.0	99.0	119.0	221.0	501.0	693.0
	PRE	11.8	18.2	21.3	28.5	61.0	100.1	123.4	222.4	385.8	601.6
	CHI	6.577	6.904	4.094	1.059	0.405	0.012	0.156	0.009	34.386	13.877
2001-	OBS	4.0	5.0	14.0	31.0	75.0	137.0	209.0	252.0	522.0	1017.0
	PRE	9.4	17.1	22.2	29.9	48.4	85.3	155.2	192.0	334.2	518.4
	CHI	3.122	8.551	3.006	0.043	14.652	31.395	18.635	18.721	105.530	479.541
2006-	OBS	1.0	5.0	18.0	43.0	63.0	140.0	247.0	413.0	408.0	803.0
	PRE	7.2	13.8	20.9	31.2	51.0	68.1	132.4	242.5	291.5	460.0
	CHI	5.305	5.612	0.412	4.480	2.834	75.997	99.295	119.807	46.570	255.789

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	6934.40	135.97	51	P, C	99.46	37249.81	0.0000
AGE-PERIOD	288.94	6.42	45	Cohort	87.02	1534.07	0.0000
AGE-COHORT	257.07	7.14	36	Period	85.41	1363.76	0.0000
PERIOD-COHORT	114.74	2.87	40	Age	67.32	608.95	0.0000
FULL AGE-PERIOD-COHORT	37.50	1.17	32			198.90	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	2.136906	137.058425
35	2.585366	384.916330
40	2.957197	906.143950
45	3.245362	1759.387456
50	3.496022	3133.446950
55	3.698724	4997.165149
60	3.892556	7808.292677
65	4.069004	11722.056859
70	4.240221	17386.871684
75	4.410601	25739.551913

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.098731	1.255252
1966	0.079108	1.199799
1971	0.039189	1.094434
1976	-0.006768	0.984538
1981	-0.079784	0.832177
1986	-0.162263	0.688235

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.003899	1.009019
1891	0.005757	1.013344
1896	0.011194	1.026110
1901	0.015216	1.035657
1906	0.019642	1.046266
1911	0.014900	1.034903
1916	0.015290	1.035834
1921	-0.007142	0.983690
1926	-0.038587	0.914983
1931	-0.061989	0.866984
1936	-0.106656	0.782247
1941	-0.144193	0.717475
1946	-0.175443	0.667663
1951	-0.228860	0.590392
1956	-0.258773	0.551095

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	446.0	361.0	371.0	452.0	429.0	314.0
	EXP	475.2	408.4	399.9	424.4	362.5	314.0
	CHI	1.8	5.5	2.1	1.8	12.2	0.0
35 -	OBS	1336.0	1272.0	1080.0	1138.0	1055.0	779.0
	EXP	1410.8	1296.3	1085.5	1023.1	1002.9	854.7
	CHI	4.0	0.5	0.0	12.9	2.7	6.7
40 -	OBS	3147.0	3162.0	2853.0	2408.0	2092.0	1880.0
	EXP	3286.0	3157.7	2813.0	2312.0	2018.0	1963.6
	CHI	5.9	0.0	0.6	4.0	2.7	3.6
45 -	OBS	5820.0	5920.0	5632.0	5039.0	3796.0	3037.0
	EXP	5997.8	5968.1	5541.7	4827.4	3712.4	3210.5
	CHI	5.3	0.4	1.5	9.3	1.9	9.4
50 -	OBS	9313.0	9883.0	9370.0	8878.0	7172.0	5252.0
	EXP	9491.0	9820.0	9469.6	8641.1	7068.2	5386.1
	CHI	3.3	0.4	1.0	6.5	1.5	3.3
55 -	OBS	12519.0	13749.0	13606.0	13312.0	10977.0	8771.0
	EXP	12553.1	13687.6	13553.1	12904.7	11164.2	9085.2
	CHI	0.1	0.3	0.2	12.9	3.1	10.9
60 -	OBS	15867.0	17213.0	18056.0	17453.0	15864.0	13618.0
	EXP	15533.9	17178.1	18182.2	17612.8	15873.8	13695.2
	CHI	7.1	0.1	0.9	1.4	0.0	0.4
65 -	OBS	18518.0	19846.0	21181.0	21513.0	19786.0	17888.0
	EXP	18441.8	19608.8	20972.3	21786.0	19919.0	18009.3
	CHI	0.3	2.9	2.1	3.4	0.9	0.8
70 -	OBS	21731.0	21167.0	21778.0	22862.0	22560.0	21099.0
	EXP	21522.5	21243.8	21914.5	23111.3	22659.6	20751.4
	CHI	2.0	0.3	0.9	2.7	0.4	5.8
75 -	OBS	22351.0	21789.0	20777.0	21122.0	21609.0	21831.0
	EXP	22351.0	21999.5	20776.8	21565.8	21571.8	21228.2
	CHI	0.0	2.0	0.0	9.1	0.1	17.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	333222.66	8330.57	40	P, C	99.40	0.0000
AGE-PERIOD	4774.89	119.37	40	Cohort	58.16	0.0000
AGE-COHORT	8149.41	203.74	40	Period	75.48	0.0000
PERIOD-COHORT	1898.48	47.46	40	Age	-5.24	0.0000
FULL AGE-PERIOD-COHORT	1997.87	49.95	40			0.0000

AGE	EFFECT
30	137.058425
35	384.916330
40	906.143950
45	1759.387456
50	3133.446950
55	4997.165149
60	7808.292677
65	11722.056859
70	17386.871684
75	25739.551913

PERIOD	EFFECT	LOWER	UPPER
% Period Change	82.7029	79.7029	85.7029
1961	1.255252		
1966	1.199799		
1971	1.094434		
1976	0.984538		
1981	0.832177		
1986	0.688235		
1991	0.569191	0.548544	0.589838
1996	0.470737	0.437205	0.505508
2001	0.389314	0.348466	0.433235
2006	0.321974	0.277737	0.371296

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.009019	1.000000	
1891	1.013344	2.000000	
1896	1.026110	4.000000	
1901	1.035657	8.000000	
1906	1.046266	16.000000	
1911	1.034903	32.000000	
1916	1.035834	64.000000	
1921	0.983690	128.000000	
1926	0.914983	256.000000	
1931	0.866984	512.000000	
1936	0.782247	1024.000000	
1941	0.717475	2048.000000	
1946	0.667663	4096.000000	
1951	0.590392	8192.000000	
1956	0.548116	EXTRAPOLATION	0.551095
1961	0.502374	EXTRAPOLATION	
1966	0.460449	EXTRAPOLATION	
1971	0.422023	EXTRAPOLATION	
1976	0.386804	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	140.0	113.7	99.9	95.9	79.7	52.0	36.7	27.6	29.8	18.6
	EXP	149.2	128.6	107.6	90.1	67.3	51.7	39.2*	29.7*	22.5*	17.1*
	Elow							37.8	27.6	20.2	14.7
	Eup							40.6	31.9	25.1	19.7
35	OBS	418.6	392.9	327.9	302.4	225.0	142.5	120.9	93.0	76.8	71.8
	EXP	442.1	400.4	329.5	271.9	213.9	156.4	120.1*	91.0*	69.0*	52.3*
	Elow							115.7	84.5	61.8	45.1
	Eup							124.4	97.8	76.8	60.3
40	OBS	1071.6	996.1	872.0	726.8	560.9	398.6	294.2	245.6	198.7	176.8
	EXP	1118.9	994.8	859.8	697.9	541.0	416.4	304.5*	233.8*	177.2*	134.3*
	Elow							293.5	217.1	158.6	115.9
	Eup							315.6	251.1	197.2	154.9
45	OBS	2219.8	2059.8	1790.5	1567.6	1171.1	821.8	627.5	511.9	441.1	369.8
	EXP	2287.6	2076.5	1761.8	1501.8	1145.3	868.8	668.6*	489.0*	375.4*	284.6*
	Elow							644.4	454.1	336.0	245.5
	Eup							692.9	525.1	417.8	328.2
50	OBS	3994.2	3919.2	3337.9	2900.1	2293.9	1644.9	1231.2	956.0	809.1	739.9
	EXP	4070.5	3894.2	3373.4	2822.7	2260.7	1687.0	1279.6*	984.8*	720.2*	553.0*
	Elow							1233.2	914.7	644.6	477.0
	Eup							1326.1	1057.6	801.5	637.7
55	OBS	6545.1	6232.7	5687.2	4992.4	3741.2	2878.6	2184.7	1759.3	1370.4	1175.7
	EXP	6562.9	6204.9	5665.0	4839.7	3805.0	2981.8	2225.0*	1687.8*	1298.9*	949.9*
	Elow							2144.3	1567.5	1162.6	819.4
	Eup							2305.7	1812.4	1445.5	1095.4
60	OBS	10368.5	9821.8	8782.5	7890.8	6387.9	4889.4	3796.0	2918.9	2273.7	1862.1
	EXP	10150.9	9801.8	8843.9	7963.0	6391.9	4917.1	3853.2*	2875.3*	2181.0*	1678.5*
	Elow							3713.5	2670.5	1952.2	1447.9
	Eup							3993.0	3087.7	2427.1	1935.7
65	OBS	15160.7	14741.8	13556.1	11793.9	10036.9	7882.5	6149.2	4971.5	3606.3	2888.6
	EXP	15098.3	14565.6	13422.6	11943.6	10104.4	7935.9	6104.8*	4784.0*	3569.8*	2707.9*
	Elow							5883.4	4443.2	3195.3	2335.8
	Eup							6326.3	5137.4	3972.6	3122.7
70	OBS	22330.4	21328.1	19584.5	17716.8	14908.1	12602.7	9826.8	8075.3	6022.8	4360.5
	EXP	22116.1	21405.4	19707.3	17910.0	14974.0	12395.1	9735.0*	7488.8*	5868.6*	4379.1*
	Elow							9381.9	6955.4	5252.8	3777.5
	Eup							10088.2	8042.0	6530.7	5049.9
75	OBS	32601.0	30994.9	28906.1	25705.1	22449.6	18853.7	16154.1	13351.3	9991.4	7418.3
	EXP	32601.0	31294.4	28905.7	26245.2	22410.9	18333.2	15175.7*	11918.9*	9168.8*	7185.1*
	Elow							14625.2	11069.9	8206.8	6197.9
	Eup							15726.2	12799.3	10203.2	8285.7
30-79	OBS	6161.1	5887.6	5342.2	4732.6	3899.5	3094.3	2448.1	1978.2	1508.3	1190.5
	EXP	6155.5	5886.7	5342.9	4737.1	3900.9	3097.0	2426.8*	1868.0*	1426.8*	1085.8*
	Elow							2338.8	1735.0	1277.1	936.6
	Eup							2514.9	2006.0	1587.7	1252.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	446.0	361.0	371.0	452.0	429.0	314.0	242.0	168.0	165.0	104.6
	EXP	475.2	408.4	399.9	424.4	362.5	312.3	258.6*	180.9*	124.5*	95.8*
	CHI	1.799	5.511	2.085	1.790	12.201	0.009	1.067	0.920	13.163	0.805
35 -	OBS	1336.0	1272.0	1080.0	1138.0	1055.0	779.0	744.0	623.0	483.0	414.4
	EXP	1410.8	1296.3	1085.5	1023.1	1002.9	854.7	739.1*	609.7*	434.1*	301.8*
	CHI	3.970	0.454	0.027	12.914	2.703	6.708	0.033	0.290	5.515	42.054
40 -	OBS	3147.0	3162.0	2853.0	2408.0	2092.0	1880.0	1626.0	1522.0	1356.0	1141.7
	EXP	3286.0	3157.7	2813.0	2312.0	2018.0	1963.6	1683.2*	1448.7*	1209.4*	867.5*
	CHI	5.878	0.006	0.568	3.983	2.713	3.562	1.945	3.709	17.765	86.691
45 -	OBS	5820.0	5920.0	5632.0	5039.0	3796.0	3037.0	2953.0	2823.0	2746.0	2554.6
	EXP	5997.8	5968.1	5541.7	4827.4	3712.4	3210.5	3146.5*	2696.8*	2337.2*	1966.2*
	CHI	5.269	0.387	1.470	9.273	1.883	9.373	11.900	5.910	71.509	176.105
50 -	OBS	9313.0	9883.0	9370.0	8878.0	7172.0	5252.0	4485.0	4433.0	4432.0	4591.0
	EXP	9491.0	9820.0	9469.6	8641.1	7068.2	5386.1	4661.3*	4566.7*	3945.1*	3431.4*
	CHI	3.337	0.404	1.048	6.493	1.525	3.340	6.667	3.916	60.088	391.880
55 -	OBS	12519.0	13749.0	13606.0	13312.0	10977.0	8771.0	6850.0	6244.0	6229.0	6331.3
	EXP	12553.1	13687.6	13553.1	12904.7	11164.2	9085.2	6976.2*	5990.0*	5904.0*	5115.6*
	CHI	0.092	0.276	0.207	12.857	3.138	10.863	2.282	10.771	17.894	288.932
60 -	OBS	15867.0	17213.0	18056.0	17453.0	15864.0	13618.0	11089.0	8765.0	7805.0	8207.9
	EXP	15533.9	17178.1	18182.2	17612.8	15873.8	13695.2	11256.3*	8634.1*	7487.0*	7398.8*
	CHI	7.143	0.071	0.876	1.449	0.006	0.435	2.487	1.984	13.505	88.470
65 -	OBS	18518.0	19846.0	21181.0	21513.0	19786.0	17888.0	15726.0	13404.0	10088.0	9366.2
	EXP	18441.8	19608.8	20972.3	21786.0	19919.0	18009.3	15612.5*	12898.5*	9986.1*	8780.2*
	CHI	0.315	2.869	2.076	3.421	0.888	0.817	0.826	19.809	1.040	39.104
70 -	OBS	21731.0	21167.0	21778.0	22862.0	22560.0	21099.0	19194.0	17899.0	14345.0	10944.1
	EXP	21522.5	21243.8	21914.5	23111.3	22659.6	20751.4	19014.7*	16599.0*	13977.5*	10990.8*
	CHI	2.020	0.277	0.850	2.688	0.438	5.822	1.690	101.810	9.660	0.199
75 -	OBS	22351.0	21789.0	20777.0	21122.0	21609.0	21831.0	20942.0	20578.0	18042.0	14832.9
	EXP	22351.0	21999.5	20776.8	21565.8	21571.8	21228.2	19673.6*	18370.3*	16556.7*	14366.5*
	CHI	0.000	2.015	0.000	9.133	0.064	17.115	81.774	265.314	133.253	15.140
30-79	OBS	111048.0	114362.0	114704.0	114177.0	105340.0	94469.0	83851.0	76459.0	65691.0	58488.7
	EXP	111063.0	114368.2	114708.6	114208.6	105352.4	94496.5	83021.9*	71994.8*	61961.6*	53314.6*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	1.010	1.062	1.060	1.097

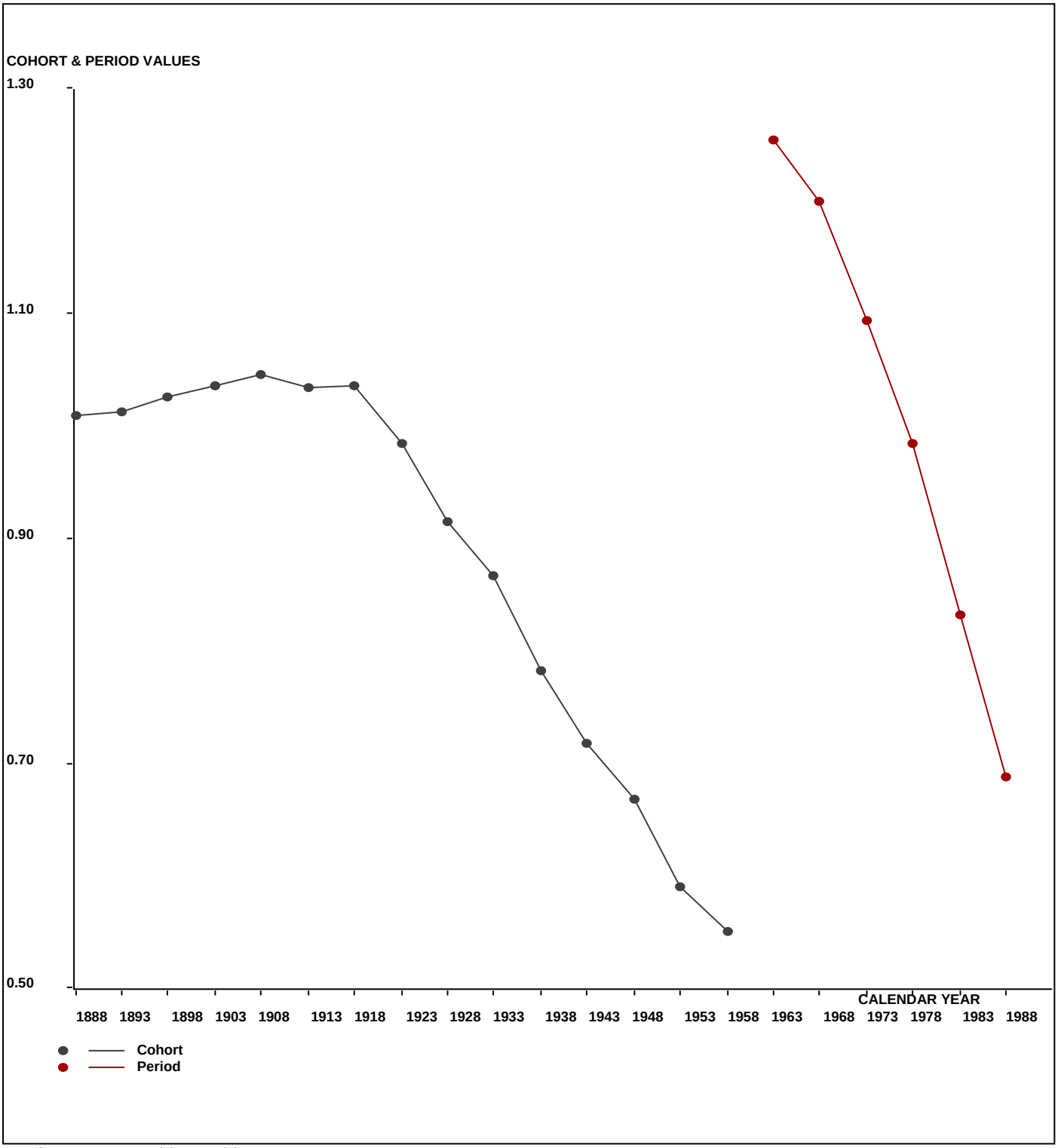
CHI SQUARE (LOG)= 1997.8721 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

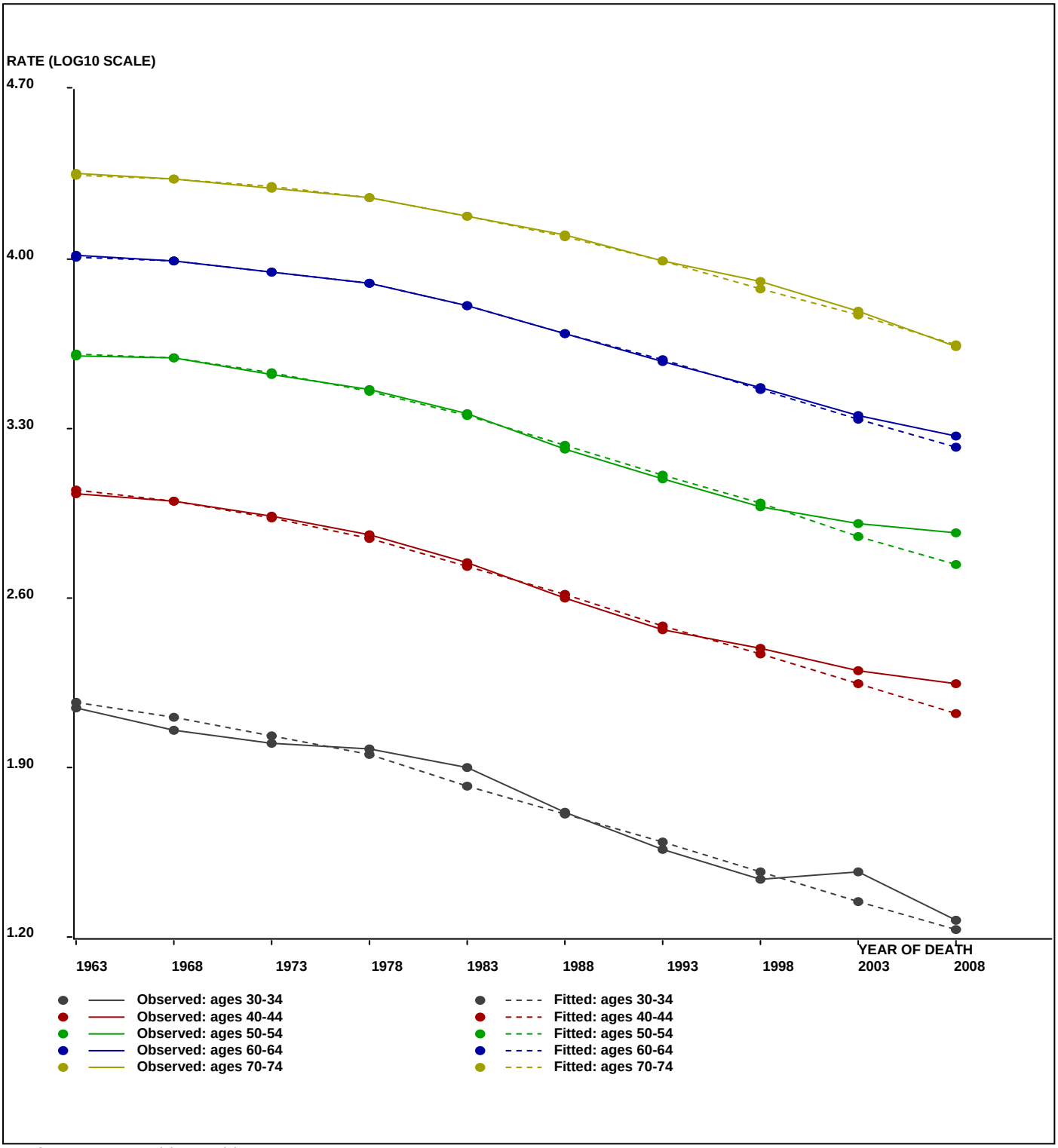


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	36.7	120.9	294.2	627.5	1231.2	2184.7	3796.0	6149.2	9826.8	16154.1
	PRE	39.2	120.1	304.5	668.6	1279.6	2225.0	3853.2	6104.8	9735.0	15175.7
	RES	-2.518	0.804	-10.352	-41.118	-48.395	-40.239	-57.277	44.400	91.791	978.396
1996-	OBS	27.6	93.0	245.6	511.9	956.0	1759.3	2918.9	4971.5	8075.3	13351.3
	PRE	29.7	91.0	233.8	489.0	984.8	1687.8	2875.3	4784.0	7488.8	11918.9
	RES	-2.119	1.986	11.830	22.889	-28.840	71.567	43.587	187.481	586.497	1432.384
2001-	OBS	29.8	76.8	198.7	441.1	809.1	1370.4	2273.7	3606.3	6022.8	9991.4
	PRE	22.5	69.0	177.2	375.4	720.2	1298.9	2181.0	3569.8	5868.6	9168.8
	RES	7.322	7.777	21.479	65.670	88.884	71.508	92.629	36.425	154.281	822.557
2006-	OBS	18.6	71.8	176.8	369.8	739.9	1175.7	1862.1	2888.6	4360.5	7418.3
	PRE	17.1	52.3	134.3	284.6	553.0	949.9	1678.5	2707.9	4379.1	7185.1
	RES	1.564	19.525	42.468	85.170	186.877	225.754	183.548	180.712	-18.626	233.251

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	242.0	744.0	1626.0	2953.0	4485.0	6850.0	11089.0	15726.0	19194.0	20942.0
	PRE	258.6	739.1	1683.2	3146.5	4661.3	6976.2	11256.3	15612.5	19014.7	19673.6
	CHI	1.067	0.033	1.945	11.900	6.667	2.282	2.487	0.826	1.690	81.774
1996-	OBS	168.0	623.0	1522.0	2823.0	4433.0	6244.0	8765.0	13404.0	17899.0	20578.0
	PRE	180.9	609.7	1448.7	2696.8	4566.7	5990.0	8634.1	12898.5	16599.0	18370.3
	CHI	0.920	0.290	3.709	5.910	3.916	10.771	1.984	19.809	101.810	265.314
2001-	OBS	165.0	483.0	1356.0	2746.0	4432.0	6229.0	7805.0	10088.0	14345.0	18042.0
	PRE	124.5	434.1	1209.4	2337.2	3945.1	5904.0	7487.0	9986.1	13977.5	16556.7
	CHI	13.163	5.515	17.765	71.509	60.088	17.894	13.505	1.040	9.660	133.253
2006-	OBS	104.6	414.4	1141.7	2554.6	4591.0	6331.3	8207.9	9366.2	10944.1	14832.9
	PRE	95.8	301.8	867.5	1966.2	3431.4	5115.6	7398.8	8780.2	10990.8	14366.5
	CHI	0.805	42.054	86.691	176.105	391.880	288.932	88.470	39.104	0.199	15.140

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	2097.70	41.13	51	P, C	99.36	11291.59	0.0000
AGE-PERIOD	25.56	0.57	45	Cohort	47.11	135.61	0.0000
AGE-COHORT	86.52	2.40	36	Period	84.38	459.28	0.0000
PERIOD-COHORT	14.07	0.35	40	Age	3.93	74.63	0.0007
FULL AGE-PERIOD-COHORT	13.52	0.42	32			71.70	0.0001

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.540219	34.691196
35	1.803034	63.538088
40	2.044127	110.694669
45	2.291118	195.486955
50	2.556114	359.843375
55	2.803219	635.651417
60	3.070801	1177.066908
65	3.346456	2220.524334
70	3.620619	4174.639274
75	3.885270	7678.388772

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.118115	1.312546
1966	0.090816	1.232584
1971	0.061232	1.151415
1976	-0.020947	0.952912
1981	-0.123742	0.752070
1986	-0.206480	0.621613

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.040161	1.096886
1891	0.027389	1.065096
1896	0.011370	1.026525
1901	0.016934	1.039763
1906	0.007508	1.017437
1911	-0.005505	0.987405
1916	-0.018559	0.958167
1921	-0.051496	0.888185
1926	-0.047242	0.896929
1931	-0.034582	0.923459
1936	-0.057969	0.875046
1941	-0.026496	0.940814
1946	-0.038638	0.914875
1951	0.008103	1.018832
1956	-0.000856	0.998031

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	127.0	139.0	122.0	144.0	143.0	130.0
	EXP	134.0	118.8	139.6	142.5	143.1	130.0
	CHI	0.4	3.4	2.2	0.0	0.0	0.0
35 -	OBS	230.0	235.0	205.0	210.0	222.0	220.0
	EXP	238.7	234.1	210.9	214.3	205.0	219.9
	CHI	0.3	0.0	0.2	0.1	1.4	0.0
40 -	OBS	332.0	380.0	412.0	320.0	320.0	277.0
	EXP	379.0	388.5	385.1	305.8	292.1	296.9
	CHI	5.8	0.2	1.9	0.7	2.7	1.3
45 -	OBS	592.0	630.0	646.0	577.0	425.0	414.0
	EXP	644.6	615.1	635.0	553.0	417.0	422.5
	CHI	4.3	0.4	0.2	1.0	0.2	0.2
50 -	OBS	1034.0	1071.0	1058.0	1016.0	770.0	585.0
	EXP	1087.4	1071.7	1033.0	941.5	781.4	624.9
	CHI	2.6	0.0	0.6	5.9	0.2	2.6
55 -	OBS	1556.0	1691.0	1756.0	1472.0	1257.0	1076.0
	EXP	1623.7	1706.6	1677.7	1434.5	1258.1	1111.8
	CHI	2.8	0.1	3.6	1.0	0.0	1.2
60 -	OBS	2558.0	2628.0	2763.0	2359.0	1885.0	1756.0
	EXP	2458.3	2587.0	2751.2	2377.1	1952.6	1827.8
	CHI	4.0	0.7	0.1	0.1	2.3	2.8
65 -	OBS	3674.0	3825.0	4048.0	3766.0	3170.0	2814.0
	EXP	3654.4	3831.2	4064.5	3811.1	3154.4	2782.1
	CHI	0.1	0.0	0.1	0.5	0.1	0.4
70 -	OBS	5785.0	5300.0	5518.0	5190.0	4625.0	4136.0
	EXP	5679.4	5242.2	5557.6	5222.8	4691.2	4162.7
	CHI	2.0	0.6	0.3	0.2	0.9	0.2
75 -	OBS	7579.0	6979.0	6445.0	6195.0	5729.0	5621.0
	EXP	7579.0	7086.4	6523.3	6251.3	5655.4	5457.1
	CHI	0.0	1.6	0.9	0.5	1.0	4.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	60604.78	1515.12	40	P, C	97.38	0.0000
AGE-PERIOD	1497.89	37.45	40	Cohort	-5.88	0.0000
AGE-COHORT	857.79	21.44	40	Period	-84.89	0.0000
PERIOD-COHORT	1521.33	38.03	40	Age	-4.25	0.0000
FULL AGE-PERIOD-COHORT	1585.97	39.65	40			0.0000

AGE	EFFECT
30	34.691196
35	63.538088
40	110.694669
45	195.486955
50	359.843375
55	635.651417
60	1177.066908
65	2220.524334
70	4174.639274
75	7678.388772

PERIOD	EFFECT	LOWER	UPPER
% Period Change	82.6536	79.6536	85.6536
1961	1.312546		
1966	1.232584		
1971	1.151415		
1976	0.952912		
1981	0.752070		
1986	0.621613		
1991	0.513785	0.495137	0.532433
1996	0.424662	0.394394	0.456048
2001	0.350998	0.314149	0.390622
2006	0.290112	0.250231	0.334581

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.096886	1.000000	
1891	1.065096	2.000000	
1896	1.026525	4.000000	
1901	1.039763	8.000000	
1906	1.017437	16.000000	
1911	0.987405	32.000000	
1916	0.958167	64.000000	
1921	0.888185	128.000000	
1926	0.896929	256.000000	
1931	0.923459	512.000000	
1936	0.875046	1024.000000	
1941	0.940814	2048.000000	
1946	0.914875	4096.000000	
1951	1.018832	8192.000000	
1956	1.019572	EXTRAPOLATION	0.998031
1961	1.047234	EXTRAPOLATION	
1966	1.075647	EXTRAPOLATION	
1971	1.104831	EXTRAPOLATION	
1976	1.134807	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	39.9	43.8	32.8	30.6	26.6	21.5	18.5	10.8	10.1	9.1
	EXP	42.0	37.4	37.6	30.2	26.6	22.0	18.7*	15.8*	13.5*	11.4*
	Elow							18.0	14.7	12.0	9.9
	Eup							19.3	17.0	15.0	13.2
35	OBS	72.1	72.6	62.2	55.8	47.3	40.3	29.6	21.9	17.6	17.7
	EXP	74.8	72.3	64.0	57.0	43.7	40.2	33.3*	28.3*	24.0*	20.4*
	Elow							32.1	26.2	21.5	17.6
	Eup							34.5	30.3	26.7	23.5
40	OBS	113.0	119.7	125.9	96.6	85.8	58.7	60.4	45.8	37.4	28.4
	EXP	129.0	122.4	117.7	92.3	78.3	63.0	57.9*	47.9*	40.7*	34.5*
	Elow							55.8	44.5	36.4	29.8
	Eup							60.0	51.5	45.3	39.8
45	OBS	225.8	219.2	205.4	179.5	131.1	112.0	83.9	79.8	61.2	60.3
	EXP	245.9	214.0	201.9	172.0	128.6	114.3	91.9*	84.6*	70.0*	59.4*
	Elow							88.6	78.6	62.6	51.2
	Eup							95.2	90.8	77.9	68.5
50	OBS	443.5	424.7	376.9	331.9	246.3	183.2	165.8	133.3	113.2	105.8
	EXP	466.4	425.0	368.0	307.6	249.9	195.7	173.9*	139.8*	128.7*	106.4*
	Elow							167.6	129.8	115.2	91.8
	Eup							180.3	150.1	143.2	122.8
55	OBS	813.5	766.6	734.0	552.0	428.4	353.1	294.4	246.8	193.8	156.3
	EXP	848.9	773.6	701.3	538.0	428.8	364.9	285.8*	254.0*	204.1*	187.9*
	Elow							275.4	235.9	182.7	162.1
	Eup							296.2	272.7	227.2	216.7
60	OBS	1671.6	1499.5	1343.9	1066.5	759.0	630.5	558.3	469.9	364.1	283.7
	EXP	1606.4	1476.1	1338.2	1074.7	786.3	656.3	558.5*	437.4*	388.7*	312.4*
	Elow							538.2	406.2	347.9	269.5
	Eup							578.7	469.7	432.6	360.3
65	OBS	3007.9	2841.2	2590.8	2064.6	1608.1	1240.0	1094.1	955.4	717.1	545.7
	EXP	2991.9	2845.8	2601.3	2089.3	1600.1	1226.0	1023.3*	870.8*	682.0*	606.1*
	Elow							986.1	808.7	610.4	522.8
	Eup							1060.4	935.2	759.0	699.0
70	OBS	5944.6	5340.3	4962.2	4022.0	3056.3	2470.5	2203.0	1905.2	1507.7	1135.2
	EXP	5836.1	5282.1	4997.9	4047.4	3100.1	2486.5	1905.0*	1590.1*	1353.1*	1059.8*
	Elow							1835.9	1476.8	1211.1	914.1
	Eup							1974.2	1707.6	1505.9	1222.2
75	OBS	11054.7	9927.6	8966.6	7539.2	5951.8	4854.4	4491.7	3932.5	3029.8	2350.0
	EXP	11054.7	10080.3	9075.5	7607.8	5875.4	4712.9	3780.0*	2896.1*	2417.3*	2057.1*
	Elow							3642.8	2689.7	2163.5	1774.3
	Eup							3917.2	3110.2	2690.2	2372.4
30-79	OBS	1299.5	1190.9	1089.6	889.2	684.2	550.2	491.5	423.2	329.3	258.1
	EXP	1298.5	1191.1	1090.4	889.6	684.5	551.0	445.6*	363.1*	304.1*	255.1*
	Elow							429.4	337.2	272.2	220.1
	Eup							461.7	390.0	338.5	294.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	127.0	139.0	122.0	144.0	143.0	130.0	122.0	66.0	56.0	51.0
	EXP	134.0	118.8	139.6	142.5	143.1	132.8	123.2*	96.5*	74.4*	64.1*
	CHI	0.363	3.432	2.226	0.016	0.000	0.059	0.011	9.638	4.545	2.681
35 -	OBS	230.0	235.0	205.0	210.0	222.0	220.0	182.0	147.0	111.0	101.9
	EXP	238.7	234.1	210.9	214.3	205.0	219.9	204.8*	189.3*	150.9*	117.5*
	CHI	0.318	0.003	0.163	0.088	1.407	0.000	2.546	9.437	10.556	2.070
40 -	OBS	332.0	380.0	412.0	320.0	320.0	277.0	334.0	284.0	255.0	183.6
	EXP	379.0	388.5	385.1	305.8	292.1	296.9	320.3*	297.0*	277.7*	223.1*
	CHI	5.825	0.185	1.882	0.660	2.657	1.331	0.586	0.567	1.851	6.980
45 -	OBS	592.0	630.0	646.0	577.0	425.0	414.0	395.0	440.0	381.0	416.3
	EXP	644.6	615.1	635.0	553.0	417.0	422.5	432.4*	466.5*	435.5*	410.3*
	CHI	4.290	0.361	0.190	1.045	0.153	0.170	3.239	1.502	6.823	0.087
50 -	OBS	1034.0	1071.0	1058.0	1016.0	770.0	585.0	604.0	618.0	620.0	656.7
	EXP	1087.4	1071.7	1033.0	941.5	781.4	624.9	633.6*	648.3*	704.9*	660.5*
	CHI	2.620	0.000	0.604	5.893	0.165	2.553	1.383	1.415	10.222	0.022
55 -	OBS	1556.0	1691.0	1756.0	1472.0	1257.0	1076.0	923.0	876.0	881.0	841.6
	EXP	1623.7	1706.6	1677.7	1434.5	1258.1	1111.8	896.0*	901.3*	927.8*	1011.8*
	CHI	2.819	0.142	3.650	0.979	0.001	1.151	0.812	0.712	2.360	28.631
60 -	OBS	2558.0	2628.0	2763.0	2359.0	1885.0	1756.0	1631.0	1411.0	1250.0	1250.6
	EXP	2458.3	2587.0	2751.2	2377.1	1952.6	1827.8	1631.4*	1313.5*	1334.3*	1377.1*
	CHI	4.047	0.650	0.050	0.138	2.341	2.824	0.000	7.245	5.327	11.617
65 -	OBS	3674.0	3825.0	4048.0	3766.0	3170.0	2814.0	2798.0	2576.0	2006.0	1769.5
	EXP	3654.4	3831.2	4064.5	3811.1	3154.4	2782.1	2616.9*	2347.8*	1907.8*	1965.2*
	CHI	0.105	0.010	0.067	0.533	0.077	0.365	12.529	22.179	5.051	19.484
70 -	OBS	5785.0	5300.0	5518.0	5190.0	4625.0	4136.0	4303.0	4223.0	3591.0	2849.1
	EXP	5679.4	5242.2	5557.6	5222.8	4691.2	4162.7	3721.0*	3524.4*	3222.8*	2659.9*
	CHI	1.962	0.638	0.283	0.207	0.936	0.172	91.040	138.460	42.055	13.461
75 -	OBS	7579.0	6979.0	6445.0	6195.0	5729.0	5621.0	5823.0	6061.0	5471.0	4698.7
	EXP	7579.0	7086.4	6523.3	6251.3	5655.4	5457.1	4900.4*	4463.7*	4365.1*	4113.1*
	CHI	0.000	1.626	0.939	0.508	0.958	4.923	173.714	571.577	280.193	83.364
30-79	OBS	23467.0	22878.0	22973.0	21249.0	18546.0	17029.0	17115.0	16702.0	14622.0	12819.0
	EXP	23478.4	22881.4	22978.0	21253.9	18550.3	17038.6	15480.1*	14248.2*	13401.2*	12602.5*
	O/E	1.000	1.000	1.000	1.000	1.000	0.999	1.106	1.172	1.091	1.017

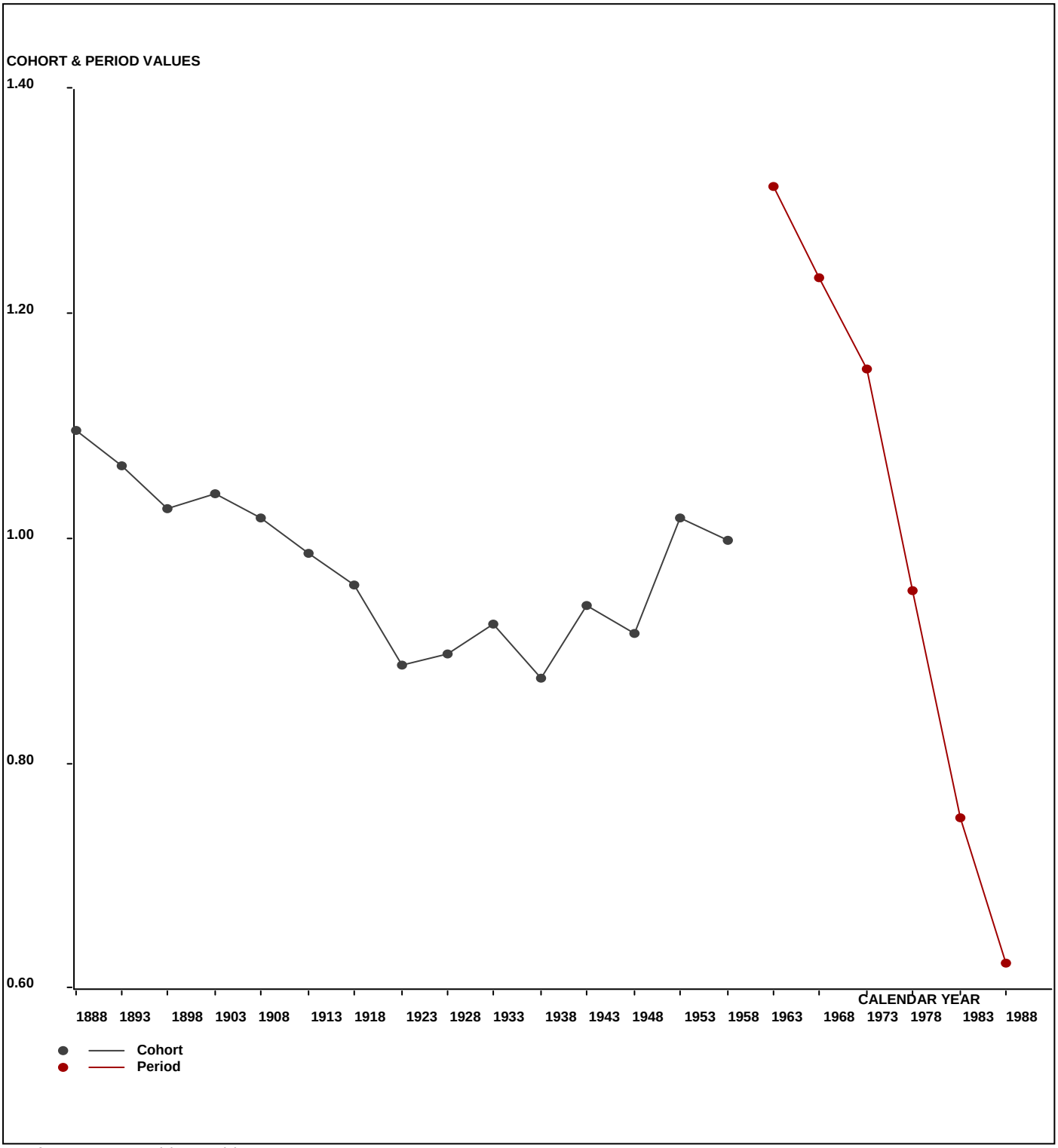
CHI SQUARE (LOG)= 1585.9714 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

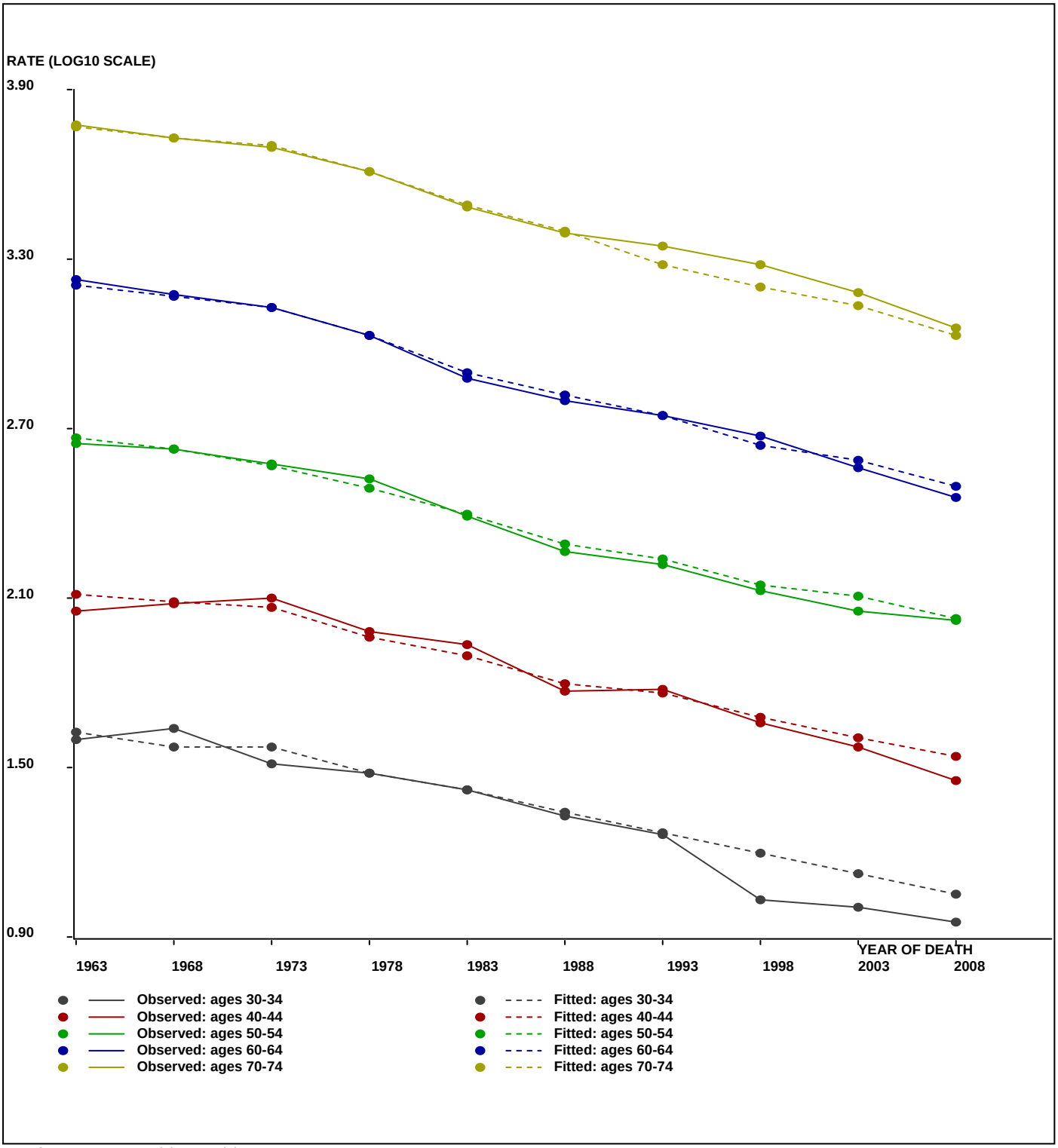


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	18.5	29.6	60.4	83.9	165.8	294.4	558.3	1094.1	2203.0	4491.7
	PRE	18.7	33.3	57.9	91.9	173.9	285.8	558.5	1023.3	1905.0	3780.0
	RES	-0.177	-3.711	2.478	-7.953	-8.127	8.602	-0.152	70.804	297.983	711.699
1996-	OBS	10.8	21.9	45.8	79.8	133.3	246.8	469.9	955.4	1905.2	3932.5
	PRE	15.8	28.3	47.9	84.6	139.8	254.0	437.4	870.8	1590.1	2896.1
	RES	-5.008	-6.310	-2.094	-4.800	-6.531	-7.137	32.485	84.636	315.165	1036.350
2001-	OBS	10.1	17.6	37.4	61.2	113.2	193.8	364.1	717.1	1507.7	3029.8
	PRE	13.5	24.0	40.7	70.0	128.7	204.1	388.7	682.0	1353.1	2417.3
	RES	-3.325	-6.344	-3.322	-8.756	-15.497	-10.294	-24.560	35.093	154.571	612.443
2006-	OBS	9.1	17.7	28.4	60.3	105.8	156.3	283.7	545.7	1135.2	2350.0
	PRE	11.4	20.4	34.5	59.4	106.4	187.9	312.4	606.1	1059.8	2057.1
	RES	-2.336	-2.703	-6.111	0.863	-0.607	-31.605	-28.694	-60.348	75.393	292.858

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	122.0	182.0	334.0	395.0	604.0	923.0	1631.0	2798.0	4303.0	5823.0
	PRE	123.2	204.8	320.3	432.4	633.6	896.0	1631.4	2616.9	3721.0	4900.4
	CHI	0.011	2.546	0.586	3.239	1.383	0.812	0.000	12.529	91.040	173.714
1996-	OBS	66.0	147.0	284.0	440.0	618.0	876.0	1411.0	2576.0	4223.0	6061.0
	PRE	96.5	189.3	297.0	466.5	648.3	901.3	1313.5	2347.8	3524.4	4463.7
	CHI	9.638	9.437	0.567	1.502	1.415	0.712	7.245	22.179	138.460	571.577
2001-	OBS	56.0	111.0	255.0	381.0	620.0	881.0	1250.0	2006.0	3591.0	5471.0
	PRE	74.4	150.9	277.7	435.5	704.9	927.8	1334.3	1907.8	3222.8	4365.1
	CHI	4.545	10.556	1.851	6.823	10.222	2.360	5.327	5.051	42.055	280.193
2006-	OBS	51.0	101.9	183.6	416.3	656.7	841.6	1250.6	1769.5	2849.1	4698.7
	PRE	64.1	117.5	223.1	410.3	660.5	1011.8	1377.1	1965.2	2659.9	4113.1
	CHI	2.681	2.070	6.980	0.087	0.022	28.631	11.617	19.484	13.461	83.364

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1082.36	21.22	51	P, C	99.18	5833.90	0.0000
AGE-PERIOD	159.86	3.55	45	Cohort	94.46	850.82	0.0000
AGE-COHORT	36.06	1.00	36	Period	75.43	191.36	0.0000
PERIOD-COHORT	46.12	1.15	40	Age	80.79	245.16	0.0000
FULL AGE-PERIOD-COHORT	8.86	0.28	32			47.04	0.0420

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.067845	11.690817
35	1.578255	37.866490
40	2.074975	118.843264
45	2.459038	287.765049
50	2.818903	659.026891
55	3.099517	1257.525867
60	3.326927	2122.887704
65	3.510062	3236.400918
70	3.649855	4465.349541
75	3.738756	5479.693928

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.071804	0.847610
1966	-0.034123	0.924437
1971	-0.007083	0.983823
1976	0.011787	1.027513
1981	0.025084	1.059459
1986	0.011895	1.027768

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.333344	0.464148
1891	-0.230769	0.587802
1896	-0.129777	0.741692
1901	-0.057635	0.875719
1906	-0.028462	0.936564
1911	0.000074	1.000171
1916	0.025259	1.059885
1921	0.055772	1.137031
1926	0.076470	1.192531
1931	0.073058	1.183199
1936	0.045105	1.109442
1941	0.034415	1.082468
1946	-0.030575	0.932019
1951	-0.056595	0.877820
1956	-0.188703	0.647586

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	34.0	40.0	33.0	60.0	63.0	47.0
	EXP	37.4	38.1	46.3	52.7	58.5	47.0
	CHI	0.3	0.1	3.8	1.0	0.3	0.0
35 -	OBS	102.0	138.0	156.0	147.0	184.0	182.0
	EXP	122.1	134.1	136.1	158.5	175.3	186.7
	CHI	3.3	0.1	2.9	0.8	0.4	0.1
40 -	OBS	319.0	421.0	504.0	435.0	496.0	520.0
	EXP	336.4	415.9	452.6	448.8	508.4	536.9
	CHI	0.9	0.1	5.8	0.4	0.3	0.5
45 -	OBS	654.0	892.0	1055.0	1139.0	1054.0	1217.0
	EXP	677.8	869.3	1062.0	1124.6	1096.4	1183.1
	CHI	0.8	0.6	0.0	0.2	1.6	1.0
50 -	OBS	1276.0	1613.0	2062.0	2551.0	2519.0	2431.0
	EXP	1302.7	1628.3	2069.5	2472.1	2582.9	2399.3
	CHI	0.5	0.1	0.0	2.5	1.6	0.4
55 -	OBS	1896.0	2520.0	3117.0	3973.0	4690.0	4653.0
	EXP	1909.4	2564.9	3137.1	3917.5	4661.7	4659.4
	CHI	0.1	0.8	0.1	0.8	0.2	0.0
60 -	OBS	2414.0	3269.0	4358.0	5084.0	6354.0	7158.0
	EXP	2411.4	3221.1	4294.6	5113.5	6350.9	7246.9
	CHI	0.0	0.7	0.9	0.2	0.0	1.1
65 -	OBS	2515.0	3552.0	4622.0	6011.0	7259.0	8525.0
	EXP	2485.2	3527.2	4659.4	6066.9	7164.1	8582.8
	CHI	0.4	0.2	0.3	0.5	1.3	0.4
70 -	OBS	2233.0	3060.0	4273.0	5519.0	7108.0	8136.0
	EXP	2165.0	3038.5	4278.0	5545.1	7160.3	8143.4
	CHI	2.1	0.2	0.0	0.1	0.4	0.0
75 -	OBS	1478.0	2023.0	2822.0	4029.0	5262.0	6636.0
	EXP	1478.0	2093.2	2874.0	4051.6	5233.7	6522.3
	CHI	0.0	2.4	0.9	0.1	0.2	2.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	11464.35	286.61	40	P, C	49.51	0.0000
AGE-PERIOD	22723.29	568.08	40	Cohort	74.53	0.0000
AGE-COHORT	23196.64	579.92	40	Period	75.05	0.0000
PERIOD-COHORT	12017.40	300.44	40	Age	51.83	0.0000
FULL AGE-PERIOD-COHORT	5788.37	144.71	40			0.0000

AGE	EFFECT
30	11.690817
35	37.866490
40	118.843264
45	287.765049
50	659.026891
55	1257.525867
60	2122.887704
65	3236.400918
70	4465.349541
75	5479.693928

PERIOD	EFFECT	LOWER	UPPER
% Period Change	97.0088	94.0088	100.0088
1961	0.847610		
1966	0.924437		
1971	0.983823		
1976	1.027513		
1981	1.059459		
1986	1.027768		
1991	0.997025	0.966192	1.027858
1996	0.967202	0.908305	1.027948
2001	0.938271	0.853887	1.028038
2006	0.910205	0.802728	1.028129

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.464148	1.000000	
1891	0.587802	2.000000	
1896	0.741692	4.000000	
1901	0.875719	8.000000	
1906	0.936564	16.000000	
1911	1.000171	32.000000	
1916	1.059885	64.000000	
1921	1.137031	128.000000	
1926	1.192531	256.000000	
1931	1.183199	512.000000	
1936	1.109442	1024.000000	
1941	1.082468	2048.000000	
1946	0.932019	4096.000000	
1951	0.877820	8192.000000	
1956	0.838485	EXTRAPOLATION	0.647586
1961	0.790141	EXTRAPOLATION	
1966	0.744584	EXTRAPOLATION	
1971	0.701654	EXTRAPOLATION	
1976	0.661199	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	10.7	12.6	8.9	12.7	11.7	7.8	8.6	7.4	4.7	2.2
	EXP	11.7	12.0	12.5	11.2	10.9	10.1	9.2*	8.4*	7.7*	7.0*
	Elow							8.9	7.9	7.0	6.2
	Eup							9.5	8.9	8.4	7.9
35	OBS	32.0	42.6	47.4	39.1	39.2	33.3	31.2	24.3	17.5	12.0
	EXP	38.3	41.4	41.3	42.1	37.4	34.2	31.7*	28.9*	26.5*	24.2*
	Elow							30.7	27.2	24.1	21.3
	Eup							32.6	30.8	29.0	27.3
40	OBS	108.6	132.6	154.0	131.3	133.0	110.3	100.0	81.8	64.2	44.5
	EXP	114.5	131.0	138.3	135.5	136.3	113.8	104.0*	96.4*	88.1*	80.5*
	Elow							100.8	90.5	80.2	71.0
	Eup							107.2	102.4	96.5	91.0
45	OBS	249.4	310.4	335.4	354.3	325.2	329.3	276.0	206.5	186.5	148.1
	EXP	258.5	302.5	337.6	349.9	338.2	320.1	267.4*	244.3*	226.4*	207.0*
	Elow							259.1	229.4	206.0	182.5
	Eup							275.7	259.7	248.1	233.8
50	OBS	547.3	639.6	734.6	833.3	805.7	761.4	639.4	517.1	419.7	369.3
	EXP	558.7	645.7	737.2	807.5	826.1	751.5	711.3*	594.1*	542.8*	503.0*
	Elow							689.3	557.9	494.0	443.6
	Eup							733.2	631.4	594.7	568.1
55	OBS	991.3	1142.4	1302.9	1490.0	1598.5	1527.1	1315.3	1082.0	894.5	750.1
	EXP	998.3	1162.7	1311.3	1469.2	1588.8	1529.2	1391.0*	1316.6*	1099.7*	1004.8*
	Elow							1348.0	1236.4	1000.8	886.1
	Eup							1434.0	1399.3	1204.9	1134.9
60	OBS	1577.5	1865.3	2119.8	2298.6	2558.6	2570.0	2386.3	1990.4	1729.2	1405.3
	EXP	1575.8	1838.0	2088.9	2311.9	2557.3	2601.9	2504.3*	2278.0*	2156.1*	1800.9*
	Elow							2426.9	2139.3	1962.2	1588.3
	Eup							2581.8	2421.0	2362.4	2034.2
65	OBS	2059.0	2638.5	2958.1	3295.4	3682.3	3756.6	3574.4	3200.8	2705.0	2367.1
	EXP	2034.6	2620.0	2982.1	3326.0	3634.2	3782.1	3848.0*	3703.7*	3369.0*	3188.7*
	Elow							3729.0	3478.2	3066.0	2812.2
	Eup							3967.0	3936.3	3691.3	3601.8
70	OBS	2294.6	3083.3	3842.6	4276.9	4697.1	4859.7	4825.9	4444.4	4021.8	3487.4
	EXP	2224.8	3061.7	3847.1	4297.1	4731.7	4864.2	5062.1*	5150.4*	4957.3*	4509.2*
	Elow							4905.6	4836.8	4511.4	3976.8
	Eup							5218.7	5473.9	5431.5	5093.4
75	OBS	2155.8	2877.7	3926.1	4903.2	5466.7	5731.0	5746.7	5444.2	5139.7	4664.0
	EXP	2155.8	2977.6	3998.5	4930.7	5437.2	5632.8	5790.6*	6026.2*	6131.3*	5901.4*
	Elow							5611.5	5659.3	5579.9	5204.5
	Eup							5969.6	6404.7	6717.9	6665.9
30-79	OBS	725.5	903.7	1065.3	1197.2	1297.1	1305.0	1226.9	1078.7	945.9	814.9
	EXP	724.8	903.9	1066.3	1197.4	1297.6	1305.1	1288.9*	1243.9*	1167.8*	1070.4*
	Elow							1249.1	1168.1	1062.8	944.0
	Eup							1328.8	1322.0	1279.5	1209.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	34.0	40.0	33.0	60.0	63.0	47.0	57.0	45.0	26.0	12.2
	EXP	37.4	38.1	46.3	52.7	58.5	60.9	60.8*	51.3*	42.6*	39.5*
	CHI	0.301	0.098	3.801	0.998	0.341	3.154	0.234	0.766	6.442	18.864
35 -	OBS	102.0	138.0	156.0	147.0	184.0	182.0	192.0	163.0	110.0	69.1
	EXP	122.1	134.1	136.1	158.5	175.3	186.7	194.8*	193.8*	166.4*	139.5*
	CHI	3.324	0.114	2.897	0.830	0.427	0.118	0.041	4.904	19.129	35.545
40 -	OBS	319.0	421.0	504.0	435.0	496.0	520.0	553.0	507.0	438.0	287.1
	EXP	336.4	415.9	452.6	448.8	508.4	536.9	575.0*	597.2*	601.3*	520.1*
	CHI	0.897	0.063	5.835	0.426	0.301	0.530	0.838	13.622	44.329	104.378
45 -	OBS	654.0	892.0	1055.0	1139.0	1054.0	1217.0	1299.0	1139.0	1161.0	1023.1
	EXP	677.8	869.3	1062.0	1124.6	1096.4	1183.1	1258.4*	1347.5*	1409.4*	1429.9*
	CHI	0.836	0.590	0.046	0.185	1.638	0.973	1.310	32.256	43.765	115.712
50 -	OBS	1276.0	1613.0	2062.0	2551.0	2519.0	2431.0	2329.0	2398.0	2299.0	2291.8
	EXP	1302.7	1628.3	2069.5	2472.1	2582.9	2399.3	2590.9*	2754.8*	2973.3*	3121.0*
	CHI	0.546	0.144	0.027	2.519	1.579	0.420	26.466	46.216	152.909	220.299
55 -	OBS	1896.0	2520.0	3117.0	3973.0	4690.0	4653.0	4124.0	3840.0	4066.0	4039.6
	EXP	1909.4	2564.9	3137.1	3917.5	4661.7	4659.4	4361.3*	4672.7*	4998.4*	5410.9*
	CHI	0.094	0.785	0.129	0.786	0.172	0.009	12.915	148.389	173.939	347.530
60 -	OBS	2414.0	3269.0	4358.0	5084.0	6354.0	7158.0	6971.0	5977.0	5936.0	6194.6
	EXP	2411.4	3221.1	4294.6	5113.5	6350.9	7246.9	7315.8*	6840.5*	7401.5*	7938.2*
	CHI	0.003	0.711	0.937	0.171	0.002	1.091	16.251	109.003	290.154	382.967
65 -	OBS	2515.0	3552.0	4622.0	6011.0	7259.0	8525.0	9141.0	8630.0	7567.0	7675.4
	EXP	2485.2	3527.2	4659.4	6066.9	7164.1	8582.8	9840.9*	9985.8*	9424.2*	10339.3*
	CHI	0.358	0.175	0.300	0.515	1.257	0.389	49.777	184.084	365.989	686.361
70 -	OBS	2233.0	3060.0	4273.0	5519.0	7108.0	8136.0	9426.0	9851.0	9579.0	8752.9
	EXP	2165.0	3038.5	4278.0	5545.1	7160.3	8143.4	9887.5*	11415.9*	11807.0*	11317.3*
	CHI	2.133	0.152	0.006	0.123	0.382	0.007	21.540	214.527	420.428	581.089
75 -	OBS	1478.0	2023.0	2822.0	4029.0	5262.0	6636.0	7450.0	8391.0	9281.0	9325.7
	EXP	1478.0	2093.2	2874.0	4051.6	5233.7	6522.3	7506.8*	9288.0*	11071.7*	11799.7*
	CHI	0.000	2.355	0.942	0.126	0.154	1.981	0.430	86.637	289.613	518.723
30-79	OBS	12921.0	17528.0	23002.0	28948.0	34989.0	39505.0	41542.0	40941.0	40463.0	39671.5
	EXP	12925.4	17530.6	23009.5	28951.3	34992.1	39521.6	43592.2*	47147.6*	49895.6*	52055.4*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.953	0.868	0.811	0.762

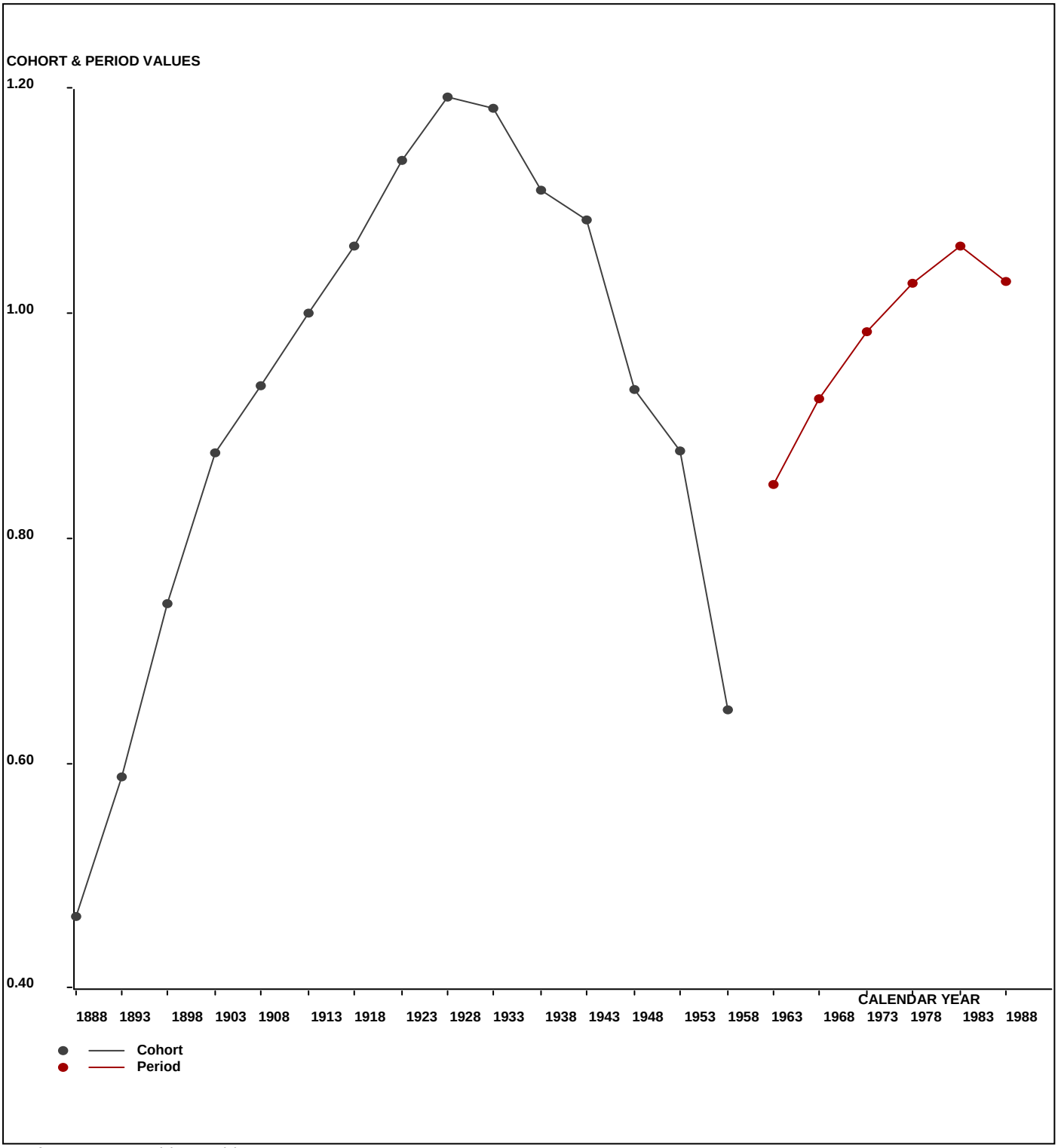
CHI SQUARE (LOG)= 5788.3732 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

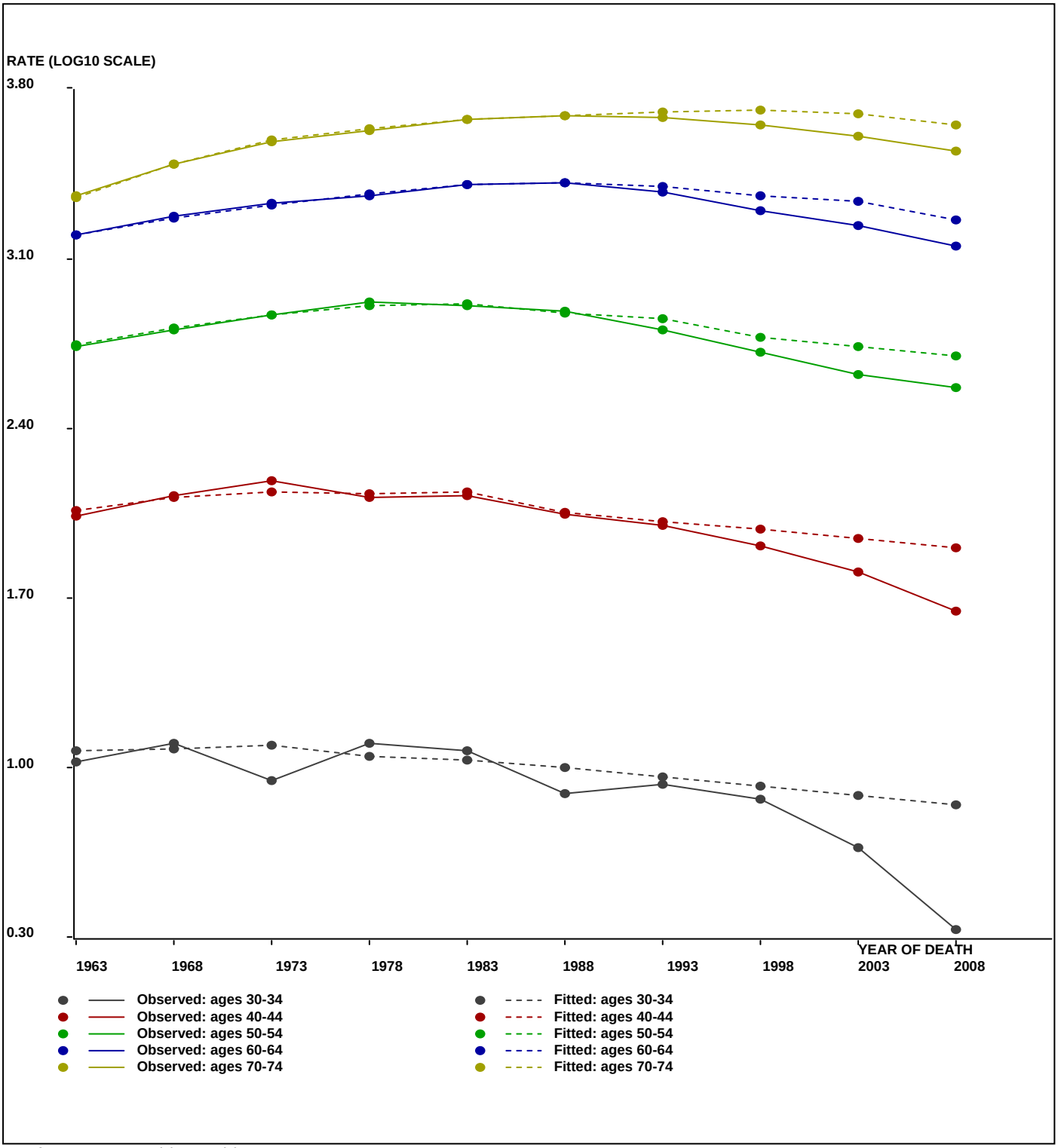


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	8.6	31.2	100.0	276.0	639.4	1315.3	2386.3	3574.4	4825.9	5746.7
	PRE	9.2	31.7	104.0	267.4	711.3	1391.0	2504.3	3848.0	5062.1	5790.6
	RES	-0.572	-0.458	-3.971	8.626	-71.886	-75.695	-118.034	-273.675	-236.273	-43.834
1996-	OBS	7.4	24.3	81.8	206.5	517.1	1082.0	1990.4	3200.8	4444.4	5444.2
	PRE	8.4	28.9	96.4	244.3	594.1	1316.6	2278.0	3703.7	5150.4	6026.2
	RES	-1.029	-4.603	-14.556	-37.801	-76.948	-234.621	-287.557	-502.867	-706.037	-582.017
2001-	OBS	4.7	17.5	64.2	186.5	419.7	894.5	1729.2	2705.0	4021.8	5139.7
	PRE	7.7	26.5	88.1	226.4	542.8	1099.7	2156.1	3369.0	4957.3	6131.3
	RES	-2.994	-8.969	-23.923	-39.895	-123.094	-205.141	-426.900	-663.907	-935.443	-991.645
2006-	OBS	2.2	12.0	44.5	148.1	369.3	750.1	1405.3	2367.1	3487.4	4664.0
	PRE	7.0	24.2	80.5	207.0	503.0	1004.8	1800.9	3188.7	4509.2	5901.4
	RES	-4.862	-12.206	-36.082	-58.874	-133.628	-254.638	-395.559	-821.574	-1021.759	-1237.328

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	57.0	192.0	553.0	1299.0	2329.0	4124.0	6971.0	9141.0	9426.0	7450.0
	PRE	60.8	194.8	575.0	1258.4	2590.9	4361.3	7315.8	9840.9	9887.5	7506.8
	CHI	0.234	0.041	0.838	1.310	26.466	12.915	16.251	49.777	21.540	0.430
1996-	OBS	45.0	163.0	507.0	1139.0	2398.0	3840.0	5977.0	8630.0	9851.0	8391.0
	PRE	51.3	193.8	597.2	1347.5	2754.8	4672.7	6840.5	9985.8	11415.9	9288.0
	CHI	0.766	4.904	13.622	32.256	46.216	148.389	109.003	184.084	214.527	86.637
2001-	OBS	26.0	110.0	438.0	1161.0	2299.0	4066.0	5936.0	7567.0	9579.0	9281.0
	PRE	42.6	166.4	601.3	1409.4	2973.3	4998.4	7401.5	9424.2	11807.0	11071.7
	CHI	6.442	19.129	44.329	43.765	152.909	173.939	290.154	365.989	420.428	289.613
2006-	OBS	12.2	69.1	287.1	1023.1	2291.8	4039.6	6194.6	7675.4	8752.9	9325.7
	PRE	39.5	139.5	520.1	1429.9	3121.0	5410.9	7938.2	10339.3	11317.3	11799.7
	CHI	18.864	35.545	104.378	115.712	220.299	347.530	382.967	686.361	581.089	518.723

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	610.10	11.96	51	P, C	95.02	3293.38	0.0000
AGE-PERIOD	377.94	8.40	45	Cohort	91.97	2027.63	0.0000
AGE-COHORT	125.94	3.50	36	Period	75.89	671.70	0.0000
PERIOD-COHORT	100.45	2.51	40	Age	69.77	536.82	0.0000
FULL AGE-PERIOD-COHORT	30.36	0.95	32			161.59	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.264116	18.370291
35	1.410224	25.717244
40	1.654293	45.112043
45	1.921258	83.417570
50	2.226087	168.301031
55	2.532144	340.520896
60	2.847325	703.598793
65	3.138257	1374.854460
70	3.400813	2516.594122
75	3.654145	4509.676218

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.008029	0.981683
1966	0.065630	1.163134
1971	0.082673	1.209687
1976	0.005179	1.011996
1981	-0.059850	0.871264
1986	-0.063757	0.863462

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.319618	0.479052
1891	-0.205577	0.622907
1896	-0.106755	0.782070
1901	-0.017902	0.959617
1906	0.042591	1.103039
1911	0.074478	1.187076
1916	0.069295	1.172991
1921	0.029704	1.070789
1926	-0.030282	0.932649
1931	-0.090834	0.811271
1936	-0.168922	0.677764
1941	-0.251047	0.560987
1946	-0.409757	0.389263
1951	-0.413869	0.385595
1956	-0.425117	0.375736

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	34.0	27.0	57.0	45.0	34.0	36.0
	EXP	46.6	46.0	46.3	34.1	33.2	36.0
	CHI	3.4	7.8	2.5	3.5	0.0	0.0
35 -	OBS	50.0	76.0	90.0	58.0	38.0	46.0
	EXP	75.1	78.6	69.5	54.9	40.9	46.8
	CHI	8.4	0.1	6.1	0.2	0.2	0.0
40 -	OBS	118.0	131.0	166.0	131.0	79.0	61.0
	EXP	139.3	155.3	144.8	102.5	82.2	71.5
	CHI	3.2	3.8	3.1	7.9	0.1	1.5
45 -	OBS	192.0	273.0	345.0	263.0	148.0	137.0
	EXP	251.8	298.6	296.0	220.1	159.7	149.3
	CHI	14.2	2.2	8.1	8.3	0.9	1.0
50 -	OBS	426.0	567.0	639.0	543.0	356.0	283.0
	EXP	457.3	579.0	612.0	486.3	371.9	314.5
	CHI	2.1	0.3	1.2	6.6	0.7	3.1
55 -	OBS	673.0	1042.0	1170.0	1085.0	757.0	685.0
	EXP	705.3	1037.2	1156.0	983.9	811.9	726.8
	CHI	1.5	0.0	0.2	10.4	3.7	2.4
60 -	OBS	1101.0	1609.0	2021.0	1883.0	1547.0	1561.0
	EXP	1014.3	1582.0	2077.2	1847.3	1630.2	1578.1
	CHI	7.4	0.5	1.5	0.7	4.2	0.2
65 -	OBS	1283.0	2140.0	2855.0	2961.0	2772.0	2876.0
	EXP	1289.3	2065.9	2866.4	3012.7	2769.9	2884.7
	CHI	0.0	2.7	0.0	0.9	0.0	0.0
70 -	OBS	1576.0	2320.0	3205.0	3500.0	3964.0	4279.0
	EXP	1497.6	2271.9	3248.5	3625.0	3938.7	4267.3
	CHI	4.1	1.0	0.6	4.3	0.2	0.0
75 -	OBS	1454.0	2215.0	3024.0	3474.0	4308.0	5458.0
	EXP	1454.0	2296.9	3066.6	3598.6	4171.7	5352.3
	CHI	0.0	2.9	0.6	4.3	4.5	2.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	17636.60	440.91	40	P, C	96.56	0.0000
AGE-PERIOD	12717.60	317.94	40	Cohort	95.23	0.0000
AGE-COHORT	718.66	17.97	40	Period	15.53	0.0000
PERIOD-COHORT	4465.42	111.64	40	Age	86.40	0.0000
FULL AGE-PERIOD-COHORT	607.07	15.18	40			0.0000

AGE	EFFECT
30	18.370291
35	25.717244
40	45.112043
45	83.417570
50	168.301031
55	340.520896
60	703.598793
65	1374.854460
70	2516.594122
75	4509.676218

PERIOD	EFFECT	LOWER	UPPER
% Period Change	99.1045	96.1045	102.1045
1961	0.981683		
1966	1.163134		
1971	1.209687		
1976	1.011996		
1981	0.871264		
1986	0.863462		
1991	0.855730	0.829826	0.881633
1996	0.848066	0.797500	0.900187
2001	0.840472	0.766433	0.919132
2006	0.832945	0.736577	0.938475

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.479052	1.000000	
1891	0.622907	2.000000	
1896	0.782070	4.000000	
1901	0.959617	8.000000	
1906	1.103039	16.000000	
1911	1.187076	32.000000	
1916	1.172991	64.000000	
1921	1.070789	128.000000	
1926	0.932649	256.000000	
1931	0.811271	512.000000	
1936	0.677764	1024.000000	
1941	0.560987	2048.000000	
1946	0.389263	4096.000000	
1951	0.385595	8192.000000	
1956	0.314862	EXTRAPOLATION	0.375736
1961	0.265563	EXTRAPOLATION	
1966	0.223982	EXTRAPOLATION	
1971	0.188912	EXTRAPOLATION	
1976	0.159333	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	10.7	8.5	15.3	9.6	6.3	6.0	4.1	2.3	3.1	2.7
	EXP	14.6	14.5	12.5	7.2	6.2	5.0	4.2*	3.5*	2.9*	2.4*
	Elow							4.0	3.3	2.7	2.2
	Eup							4.3	3.7	3.2	2.7
35	OBS	15.7	23.5	27.3	15.4	8.1	8.4	7.0	5.1	5.2	3.2
	EXP	23.5	24.3	21.1	14.6	8.7	8.6	6.9*	5.8*	4.8*	4.0*
	Elow							6.7	5.4	4.4	3.6
	Eup							7.1	6.1	5.3	4.6
40	OBS	40.2	41.3	50.7	39.5	21.2	12.9	8.3	6.0	8.5	6.9
	EXP	47.4	48.9	44.3	30.9	22.0	15.2	14.9*	12.0*	10.1*	8.4*
	Elow							14.4	11.3	9.2	7.4
	Eup							15.3	12.8	11.0	9.5
45	OBS	73.2	95.0	109.7	81.8	45.7	37.1	25.7	22.3	19.0	16.6
	EXP	96.1	103.9	94.1	68.5	49.3	40.4	27.8*	27.3*	22.1*	18.5*
	Elow							26.9	25.7	20.1	16.3
	Eup							28.6	29.0	24.1	20.8
50	OBS	182.7	224.8	227.6	177.4	113.9	88.6	65.6	46.4	44.4	48.1
	EXP	196.1	229.6	218.0	158.8	119.0	98.5	80.8*	55.6*	54.5*	44.1*
	Elow							78.3	52.2	49.7	39.0
	Eup							83.2	59.0	59.6	49.7
55	OBS	351.9	472.4	489.0	406.9	258.0	224.8	173.2	133.6	113.7	114.2
	EXP	368.7	470.2	483.2	369.0	276.7	238.5	197.5*	162.0*	111.4*	109.4*
	Elow							191.5	152.3	101.6	96.7
	Eup							203.5	172.0	121.8	123.2
60	OBS	719.5	918.1	983.0	851.3	622.9	560.5	482.3	361.3	298.0	266.4
	EXP	662.8	902.7	1010.4	835.2	656.4	566.6	488.5*	404.4*	331.7*	228.1*
	Elow							473.7	380.3	302.5	201.7
	Eup							503.2	429.3	362.8	257.0
65	OBS	1050.4	1589.6	1827.2	1623.3	1406.2	1267.3	1117.9	918.0	690.3	660.9
	EXP	1055.5	1534.6	1834.5	1651.6	1405.1	1271.2	1097.3*	945.9*	783.2*	642.4*
	Elow							1064.0	889.5	714.2	568.1
	Eup							1130.5	1004.1	856.5	723.8
70	OBS	1619.5	2337.7	2882.2	2712.3	2619.5	2555.9	2332.6	1984.2	1571.5	1256.5
	EXP	1538.9	2289.2	2921.4	2809.2	2602.8	2548.9	2306.0*	1990.5*	1715.9*	1420.7*
	Elow							2236.2	1871.8	1564.8	1256.3
	Eup							2375.8	2112.8	1876.5	1600.7
75	OBS	2120.8	3150.8	4207.2	4227.8	4475.6	4713.6	4430.0	3858.5	3089.6	2490.3
	EXP	2120.8	3267.4	4266.4	4379.5	4334.0	4622.4	4526.6*	4095.2*	3535.0*	3047.4*
	Elow							4389.6	3851.1	3223.6	2694.8
	Eup							4663.7	4346.9	3865.8	3433.5
30-79	OBS	386.7	542.7	640.6	582.7	517.5	497.9	446.5	373.2	298.0	253.7
	EXP	386.4	542.2	642.1	584.4	517.7	498.4	453.3*	394.0*	333.4*	277.6*
	Elow							439.5	370.5	304.1	245.5
	Eup							467.0	418.2	364.6	312.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	34.0	27.0	57.0	45.0	34.0	36.0	27.0	14.0	17.0	15.0
	EXP	46.6	46.0	46.3	34.1	33.2	30.2	27.5*	21.2*	16.1*	13.7*
	CHI	3.413	7.837	2.463	3.490	0.018	1.128	0.011	2.473	0.047	0.126
35 -	OBS	50.0	76.0	90.0	58.0	38.0	46.0	43.0	34.0	33.0	18.4
	EXP	75.1	78.6	69.5	54.9	40.9	46.8	42.6*	38.8*	30.5*	23.3*
	CHI	8.412	0.084	6.079	0.171	0.206	0.013	0.003	0.592	0.212	1.048
40 -	OBS	118.0	131.0	166.0	131.0	79.0	61.0	46.0	37.0	58.0	44.5
	EXP	139.3	155.3	144.8	102.5	82.2	71.5	82.3*	74.6*	68.7*	54.3*
	CHI	3.247	3.815	3.089	7.917	0.128	1.544	15.999	18.981	1.670	1.784
45 -	OBS	192.0	273.0	345.0	263.0	148.0	137.0	121.0	123.0	118.0	115.0
	EXP	251.8	298.6	296.0	220.1	159.7	149.3	130.8*	150.4*	137.4*	127.5*
	CHI	14.220	2.195	8.102	8.342	0.853	1.016	0.729	5.007	2.745	1.222
50 -	OBS	426.0	567.0	639.0	543.0	356.0	283.0	239.0	215.0	243.0	298.7
	EXP	457.3	579.0	612.0	486.3	371.9	314.5	294.3*	257.6*	298.8*	273.9*
	CHI	2.141	0.250	1.194	6.616	0.682	3.150	10.392	7.056	10.411	2.247
55 -	OBS	673.0	1042.0	1170.0	1085.0	757.0	685.0	543.0	474.0	517.0	615.2
	EXP	705.3	1037.2	1156.0	983.9	811.9	726.8	619.2*	575.0*	506.4*	589.0*
	CHI	1.477	0.023	0.170	10.384	3.708	2.404	9.384	17.731	0.223	1.167
60 -	OBS	1101.0	1609.0	2021.0	1883.0	1547.0	1561.0	1409.0	1085.0	1023.0	1174.4
	EXP	1014.3	1582.0	2077.2	1847.3	1630.2	1578.1	1426.9*	1214.4*	1138.8*	1005.6*
	CHI	7.409	0.460	1.521	0.688	4.243	0.186	0.225	13.794	11.776	28.344
65 -	OBS	1283.0	2140.0	2855.0	2961.0	2772.0	2876.0	2859.0	2475.0	1931.0	2142.8
	EXP	1289.3	2065.9	2866.4	3012.7	2769.9	2884.7	2806.1*	2550.3*	2190.8*	2083.1*
	CHI	0.031	2.658	0.045	0.887	0.002	0.026	0.996	2.226	30.814	1.713
70 -	OBS	1576.0	2320.0	3205.0	3500.0	3964.0	4279.0	4556.0	4398.0	3743.0	3153.7
	EXP	1497.6	2271.9	3248.5	3625.0	3938.7	4267.3	4504.1*	4412.0*	4087.0*	3565.8*
	CHI	4.106	1.017	0.584	4.312	0.162	0.032	0.598	0.044	28.949	47.620
75 -	OBS	1454.0	2215.0	3024.0	3474.0	4308.0	5458.0	5743.0	5947.0	5579.0	4979.4
	EXP	1454.0	2296.9	3066.6	3598.6	4171.7	5352.3	5868.3*	6311.9*	6383.3*	6093.2*
	CHI	0.000	2.921	0.592	4.317	4.453	2.086	2.675	21.092	101.345	203.602
30-79	OBS	6907.0	10400.0	13572.0	13943.0	14003.0	15422.0	15586.0	14802.0	13262.0	12557.1
	EXP	6930.6	10411.5	13583.3	13965.6	14010.3	15421.5	15802.2*	15606.3*	14857.8*	13829.4*
	O/E	0.997	0.999	0.999	0.998	0.999	1.000	0.986	0.948	0.893	0.908

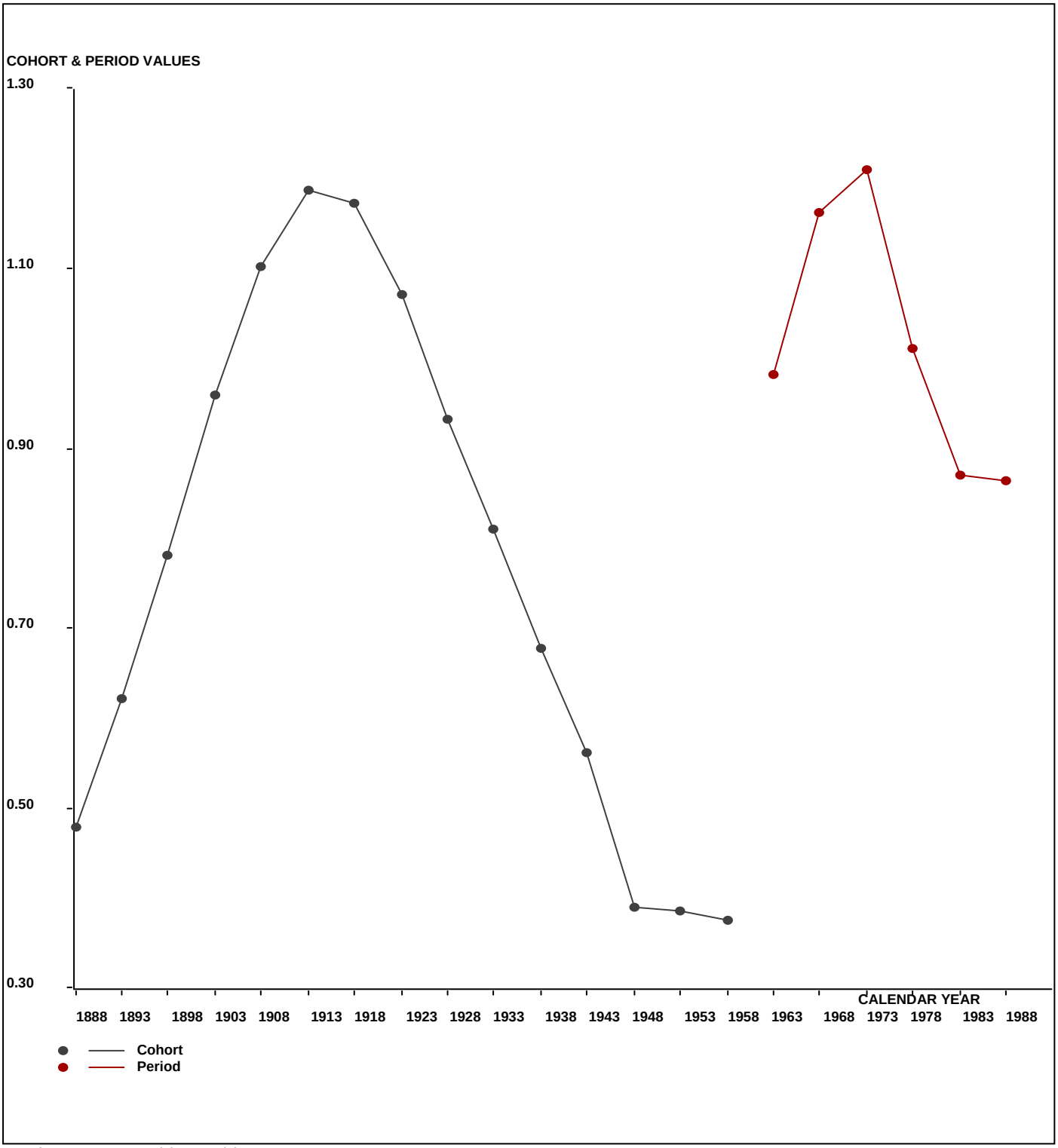
CHI SQUARE (LOG)= 607.0750 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

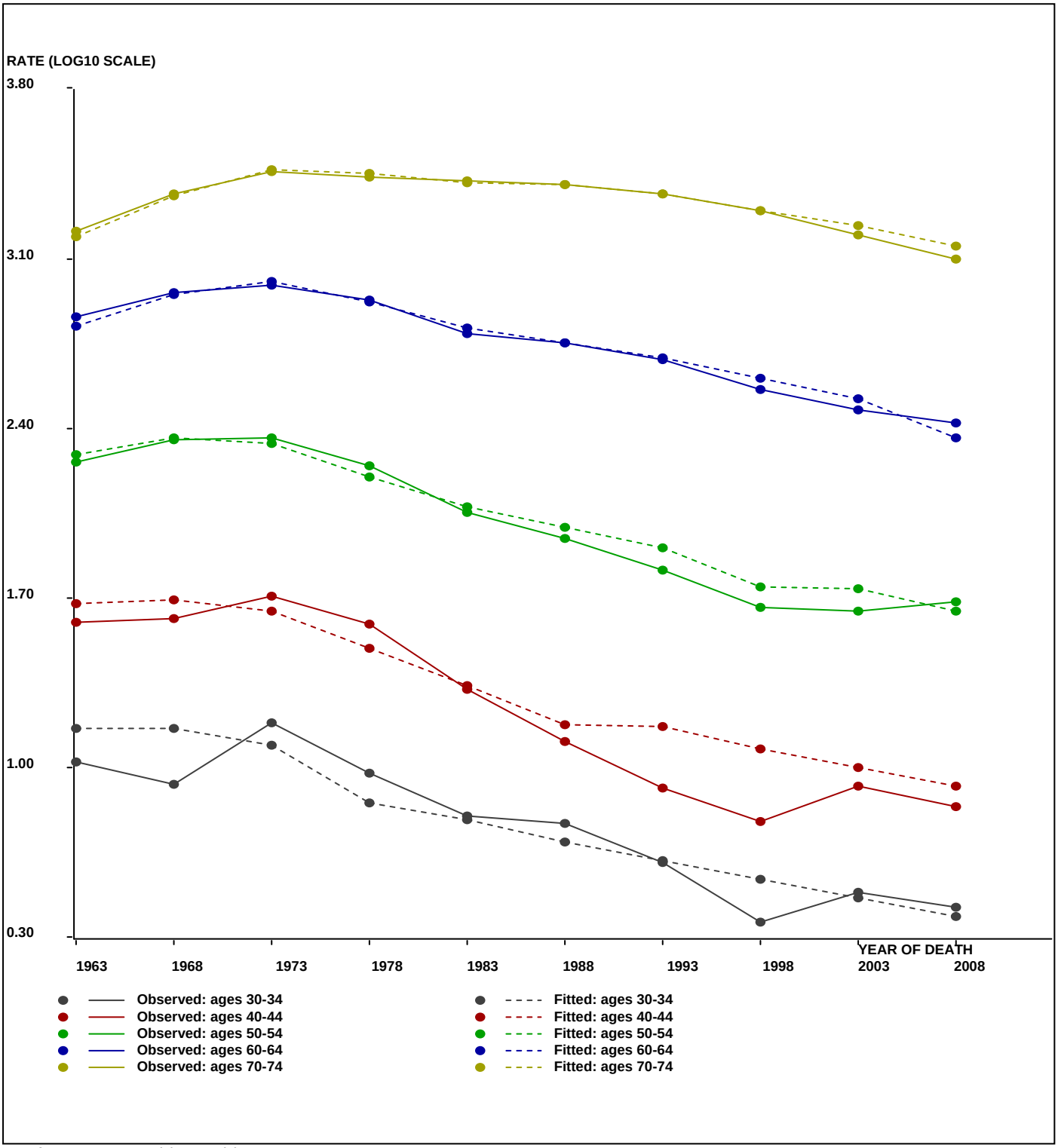


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	4.1	7.0	8.3	25.7	65.6	173.2	482.3	1117.9	2332.6	4430.0
	PRE	4.2	6.9	14.9	27.8	80.8	197.5	488.5	1097.3	2306.0	4526.6
	RES	-0.083	0.058	-6.564	-2.075	-15.182	-24.312	-6.134	20.673	26.581	-96.649
1996-	OBS	2.3	5.1	6.0	22.3	46.4	133.6	361.3	918.0	1984.2	3858.5
	PRE	3.5	5.8	12.0	27.3	55.6	162.0	404.4	945.9	1990.5	4095.2
	RES	-1.190	-0.716	-6.075	-4.976	-9.195	-28.449	-43.102	-27.945	-6.294	-236.733
2001-	OBS	3.1	5.2	8.5	19.0	44.4	113.7	298.0	690.3	1571.5	3089.6
	PRE	2.9	4.8	10.1	22.1	54.5	111.4	331.7	783.2	1715.9	3535.0
	RES	0.158	0.404	-1.570	-3.120	-10.182	2.337	-33.734	-92.881	-144.416	-445.415
2006-	OBS	2.7	3.2	6.9	16.6	48.1	114.2	266.4	660.9	1256.5	2490.3
	PRE	2.4	4.0	8.4	18.5	44.1	109.4	228.1	642.4	1420.7	3047.4
	RES	0.234	-0.857	-1.525	-1.807	3.998	4.869	38.301	18.424	-164.183	-557.051

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	27.0	43.0	46.0	121.0	239.0	543.0	1409.0	2859.0	4556.0	5743.0
	PRE	27.5	42.6	82.3	130.8	294.3	619.2	1426.9	2806.1	4504.1	5868.3
	CHI	0.011	0.003	15.999	0.729	10.392	9.384	0.225	0.996	0.598	2.675
1996-	OBS	14.0	34.0	37.0	123.0	215.0	474.0	1085.0	2475.0	4398.0	5947.0
	PRE	21.2	38.8	74.6	150.4	257.6	575.0	1214.4	2550.3	4412.0	6311.9
	CHI	2.473	0.592	18.981	5.007	7.056	17.731	13.794	2.226	0.044	21.092
2001-	OBS	17.0	33.0	58.0	118.0	243.0	517.0	1023.0	1931.0	3743.0	5579.0
	PRE	16.1	30.5	68.7	137.4	298.8	506.4	1138.8	2190.8	4087.0	6383.3
	CHI	0.047	0.212	1.670	2.745	10.411	0.223	11.776	30.814	28.949	101.345
2006-	OBS	15.0	18.4	44.5	115.0	298.7	615.2	1174.4	2142.8	3153.7	4979.4
	PRE	13.7	23.3	54.3	127.5	273.9	589.0	1005.6	2083.1	3565.8	6093.2
	CHI	0.126	1.048	1.784	1.222	2.247	1.167	28.344	1.713	47.620	203.602

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	4180.00	81.96	51	P, C	99.49	22435.90	0.0000
AGE-PERIOD	39.41	0.88	45	Cohort	46.24	209.14	0.0000
AGE-COHORT	60.79	1.69	36	Period	65.15	322.67	0.0000
PERIOD-COHORT	25.25	0.63	40	Age	16.09	133.97	0.0000
FULL AGE-PERIOD-COHORT	21.19	0.66	32			112.43	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.415343	26.022122
35	1.802593	63.473639
40	2.175378	149.753698
45	2.503551	318.824274
50	2.818348	658.185547
55	3.117121	1309.546736
60	3.413274	2589.847099
65	3.683071	4820.261941
70	3.930667	8524.461512
75	4.172089	14862.403883

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.128605	1.344638
1966	0.089107	1.227742
1971	0.038358	1.092340
1976	-0.017391	0.960746
1981	-0.087195	0.818097
1986	-0.170862	0.674742

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.025796	1.061196
1891	0.022046	1.052073
1896	0.025070	1.059423
1901	0.015648	1.036689
1906	0.005594	1.012965
1911	-0.003704	0.991506
1916	-0.017086	0.961421
1921	-0.044279	0.903069
1926	-0.052060	0.887033
1931	-0.054200	0.882674
1936	-0.079708	0.832322
1941	-0.103371	0.788187
1946	-0.186175	0.651366
1951	-0.192260	0.642303
1956	-0.136653	0.730041

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	96.0	78.0	70.0	79.0	81.0	77.0
	EXP	95.5	82.1	80.3	74.5	73.1	77.0
	CHI	0.0	0.2	1.3	0.3	0.9	0.0
35 -	OBS	211.0	223.0	174.0	193.0	170.0	141.0
	EXP	241.2	215.0	182.3	173.7	154.5	149.6
	CHI	3.8	0.3	0.4	2.1	1.5	0.5
40 -	OBS	447.0	530.0	468.0	438.0	364.0	283.0
	EXP	540.2	515.3	454.0	381.1	348.9	304.7
	CHI	16.1	0.4	0.4	8.5	0.7	1.5
45 -	OBS	940.0	1039.0	1014.0	943.0	680.0	587.0
	EXP	1065.8	1034.1	972.6	845.1	686.4	613.8
	CHI	14.8	0.0	1.8	11.3	0.1	1.2
50 -	OBS	1922.0	1952.0	1901.0	1833.0	1494.0	1124.0
	EXP	1970.2	1969.4	1890.1	1755.3	1476.9	1167.3
	CHI	1.2	0.2	0.1	3.4	0.2	1.6
55 -	OBS	3246.0	3575.0	3449.0	3336.0	2937.0	2267.0
	EXP	3285.8	3505.2	3414.8	3253.9	2942.0	2415.0
	CHI	0.5	1.4	0.3	2.1	0.0	9.1
60 -	OBS	5583.0	5828.0	5999.0	5854.0	5368.0	4623.0
	EXP	5540.1	5767.5	6063.0	5796.6	5362.5	4727.5
	CHI	0.3	0.6	0.7	0.6	0.0	2.3
65 -	OBS	8956.0	9064.0	9222.0	9454.0	8797.0	7954.0
	EXP	8866.0	9018.1	9218.1	9540.7	8831.2	7973.9
	CHI	0.9	0.2	0.0	0.8	0.1	0.0
70 -	OBS	12928.0	13001.0	13030.0	12980.0	13052.0	12017.0
	EXP	12745.3	13000.9	12964.0	13149.0	13212.9	11939.7
	CHI	2.6	0.0	0.3	2.2	2.0	0.5
75 -	OBS	15972.0	16433.0	16769.0	16709.0	16882.0	16756.0
	EXP	15972.0	16618.0	16859.8	16864.9	16739.9	16471.4
	CHI	0.0	2.1	0.5	1.4	1.2	4.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	162271.87	4056.80	40	P, C	99.06	0.0000
AGE-PERIOD	1393.61	34.84	40	Cohort	-8.98	0.0000
AGE-COHORT	6020.91	150.52	40	Period	74.77	0.0000
PERIOD-COHORT	1530.62	38.27	40	Age	0.77	0.0000
FULL AGE-PERIOD-COHORT	1518.78	37.97	40			0.0000

AGE	EFFECT
30	26.022122
35	63.473639
40	149.753698
45	318.824274
50	658.185547
55	1309.546736
60	2589.847099
65	4820.261941
70	8524.461512
75	14862.403883

PERIOD	EFFECT	LOWER	UPPER
% Period Change	82.4771	79.4771	85.4771
1961	1.344638		
1966	1.227742		
1971	1.092340		
1976	0.960746		
1981	0.818097		
1986	0.674742		
1991	0.556508	0.536266	0.576750
1996	0.458991	0.426208	0.492989
2001	0.378563	0.338738	0.421393
2006	0.312228	0.269219	0.360194

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.061196	1.000000	
1891	1.052073	2.000000	
1896	1.059423	4.000000	
1901	1.036689	8.000000	
1906	1.012965	16.000000	
1911	0.991506	32.000000	
1916	0.961421	64.000000	
1921	0.903069	128.000000	
1926	0.887033	256.000000	
1931	0.882674	512.000000	
1936	0.832322	1024.000000	
1941	0.788187	2048.000000	
1946	0.651366	4096.000000	
1951	0.642303	8192.000000	
1956	0.593394	EXTRAPOLATION	0.730041
1961	0.551755	EXTRAPOLATION	
1966	0.513038	EXTRAPOLATION	
1971	0.477038	EXTRAPOLATION	
1976	0.443563	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	31.1	25.3	19.5	17.3	15.2	12.8	10.6	8.2	7.7	6.3
	EXP	30.9	26.6	22.4	16.3	13.7	10.4	8.0*	6.1*	4.7*	3.6*
	Elow							7.7	5.7	4.2	3.1
	Eup							8.3	6.6	5.2	4.2
35	OBS	66.2	71.3	55.1	53.4	37.2	25.9	24.1	22.0	17.8	21.1
	EXP	75.7	68.8	57.7	48.1	33.8	27.5	21.0*	16.1*	12.3*	9.5*
	Elow							20.2	14.9	11.0	8.2
	Eup							21.7	17.3	13.7	10.9
40	OBS	150.5	167.8	148.8	137.6	100.8	61.1	52.9	55.9	46.2	40.5
	EXP	181.8	163.1	144.4	119.8	96.6	65.8	53.5*	40.8*	31.3*	24.0*
	Elow							51.6	37.9	28.0	20.7
	Eup							55.5	43.8	34.8	27.7
45	OBS	363.5	355.2	322.1	301.7	215.1	162.2	121.0	95.4	87.7	87.5
	EXP	412.2	353.5	308.9	270.4	217.1	169.6	115.6*	94.0*	71.6*	54.9*
	Elow							111.4	87.3	64.1	47.4
	Eup							119.8	101.0	79.7	63.4
50	OBS	856.0	770.0	653.0	585.7	480.8	355.9	271.6	224.2	169.4	155.9
	EXP	877.5	776.9	649.3	560.9	475.3	369.6	288.7*	196.8*	160.0*	121.9*
	Elow							278.2	182.7	143.2	105.1
	Eup							299.2	211.4	178.1	140.7
55	OBS	1762.1	1625.9	1389.1	1164.9	948.7	732.1	593.8	455.7	343.1	282.0
	EXP	1783.7	1594.1	1375.3	1136.2	950.3	779.9	606.6*	473.8*	322.9*	262.6*
	Elow							584.5	439.9	288.9	226.4
	Eup							628.6	508.8	359.4	303.0
60	OBS	3638.1	3254.7	2775.3	2415.9	1915.3	1515.8	1189.5	898.3	668.3	517.4
	EXP	3610.2	3220.9	2805.0	2392.2	1913.4	1550.1	1272.2*	989.4*	772.8*	526.7*
	Elow							1225.9	918.7	691.5	454.2
	Eup							1318.4	1062.7	860.2	607.6
65	OBS	6936.4	6166.4	5335.9	4550.0	3776.6	2929.8	2280.1	1813.8	1299.9	956.5
	EXP	6866.7	6135.2	5333.6	4591.7	3791.3	2937.2	2379.5*	1952.9*	1518.8*	1186.2*
	Elow							2292.9	1813.4	1359.0	1022.8
	Eup							2466.0	2097.5	1690.6	1368.5
70	OBS	12232.0	11087.8	9702.4	8189.4	6830.4	5565.7	4298.8	3415.5	2559.0	1909.2
	EXP	12059.2	11087.8	9653.2	8296.0	6914.6	5529.9	4284.1*	3470.7*	2848.4*	2215.3*
	Elow							4128.3	3222.8	2548.8	1910.1
	Eup							4439.9	3727.7	3170.7	2555.6
75	OBS	21207.5	18983.6	17106.9	14666.0	12421.0	10114.9	8329.4	6761.6	5014.1	3505.9
	EXP	21207.5	19197.4	17199.5	14802.9	12316.5	9943.1	7952.0*	6160.5*	4990.8*	4096.0*
	Elow							7662.7	5720.5	4465.7	3531.8
	Eup							8241.2	6616.8	5555.4	4725.3
30-79	OBS	2652.6	2393.7	2095.7	1797.1	1484.6	1180.8	937.2	747.1	556.5	418.6
	EXP	2652.0	2392.5	2095.4	1795.4	1484.8	1184.6	939.7*	742.0*	588.4*	459.8*
	Elow							905.5	689.0	526.5	396.5
	Eup							973.8	797.0	655.0	530.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	96.0	78.0	70.0	79.0	81.0	77.0	69.0	49.0	42.0	35.1
	EXP	95.5	82.1	80.3	74.5	73.1	62.6	51.9*	36.7*	25.5*	20.1*
	CHI	0.003	0.203	1.316	0.275	0.863	3.319	5.625	4.158	10.648	11.190
35 -	OBS	211.0	223.0	174.0	193.0	170.0	141.0	148.0	146.0	110.0	119.9
	EXP	241.2	215.0	182.3	173.7	154.5	149.6	128.9*	106.5*	76.2*	53.8*
	CHI	3.778	0.296	0.374	2.138	1.546	0.496	2.820	14.641	15.042	81.379
40 -	OBS	447.0	530.0	468.0	438.0	364.0	283.0	293.0	348.0	312.0	257.4
	EXP	540.2	515.3	454.0	381.1	348.9	304.7	296.4*	254.0*	211.4*	152.4*
	CHI	16.064	0.421	0.429	8.487	0.656	1.539	0.038	34.812	47.911	72.290
45 -	OBS	940.0	1039.0	1014.0	943.0	680.0	587.0	566.0	531.0	550.0	600.0
	EXP	1065.8	1034.1	972.6	845.1	686.4	613.8	540.6*	523.1*	448.9*	376.5*
	CHI	14.840	0.023	1.765	11.335	0.059	1.166	1.193	0.119	22.746	132.725
50 -	OBS	1922.0	1952.0	1901.0	1833.0	1494.0	1124.0	987.0	1045.0	942.0	978.1
	EXP	1970.2	1969.4	1890.1	1755.3	1476.9	1167.3	1049.3*	917.3*	890.1*	765.0*
	CHI	1.181	0.155	0.063	3.436	0.198	1.609	3.696	17.779	3.021	59.375
55 -	OBS	3246.0	3575.0	3449.0	3336.0	2937.0	2267.0	1882.0	1645.0	1587.0	1560.5
	EXP	3285.8	3505.2	3414.8	3253.9	2942.0	2415.0	1922.4*	1710.0*	1493.8*	1453.2*
	CHI	0.482	1.389	0.342	2.073	0.009	9.074	0.848	2.474	5.818	7.930
60 -	OBS	5583.0	5828.0	5999.0	5854.0	5368.0	4623.0	3637.0	2805.0	2382.0	2366.0
	EXP	5540.1	5767.5	6063.0	5796.6	5362.5	4727.5	3889.7*	3089.4*	2754.4*	2408.5*
	CHI	0.332	0.635	0.676	0.568	0.006	2.312	16.415	26.180	50.348	0.749
65 -	OBS	8956.0	9064.0	9222.0	9454.0	8797.0	7954.0	6706.0	5338.0	3923.0	3312.2
	EXP	8866.0	9018.1	9218.1	9540.7	8831.2	7973.9	6998.3*	5747.3*	4583.5*	4107.6*
	CHI	0.914	0.233	0.002	0.788	0.133	0.050	12.205	29.148	95.183	154.027
70 -	OBS	12928.0	13001.0	13030.0	12980.0	13052.0	12017.0	10813.0	9289.0	7035.0	5413.0
	EXP	12745.3	13000.9	12964.0	13149.0	13212.9	11939.7	10776.0*	9438.9*	7830.7*	6280.8*
	CHI	2.618	0.000	0.336	2.171	1.959	0.500	0.127	2.380	80.845	119.898
75 -	OBS	15972.0	16433.0	16769.0	16709.0	16882.0	16756.0	15596.0	14842.0	12072.0	8678.0
	EXP	15972.0	16618.0	16859.8	16864.9	16739.9	16471.4	14889.3*	13522.6*	12015.8*	10138.8*
	CHI	0.000	2.060	0.489	1.442	1.206	4.919	33.541	128.741	0.262	210.461
30-79	OBS	50301.0	51723.0	52096.0	51819.0	49825.0	45829.0	40697.0	36038.0	28955.0	23320.2
	EXP	50322.0	51725.7	52098.9	51834.9	49828.3	45825.6	40542.7*	35345.7*	30330.3*	25756.5*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	1.004	1.020	0.955	0.905

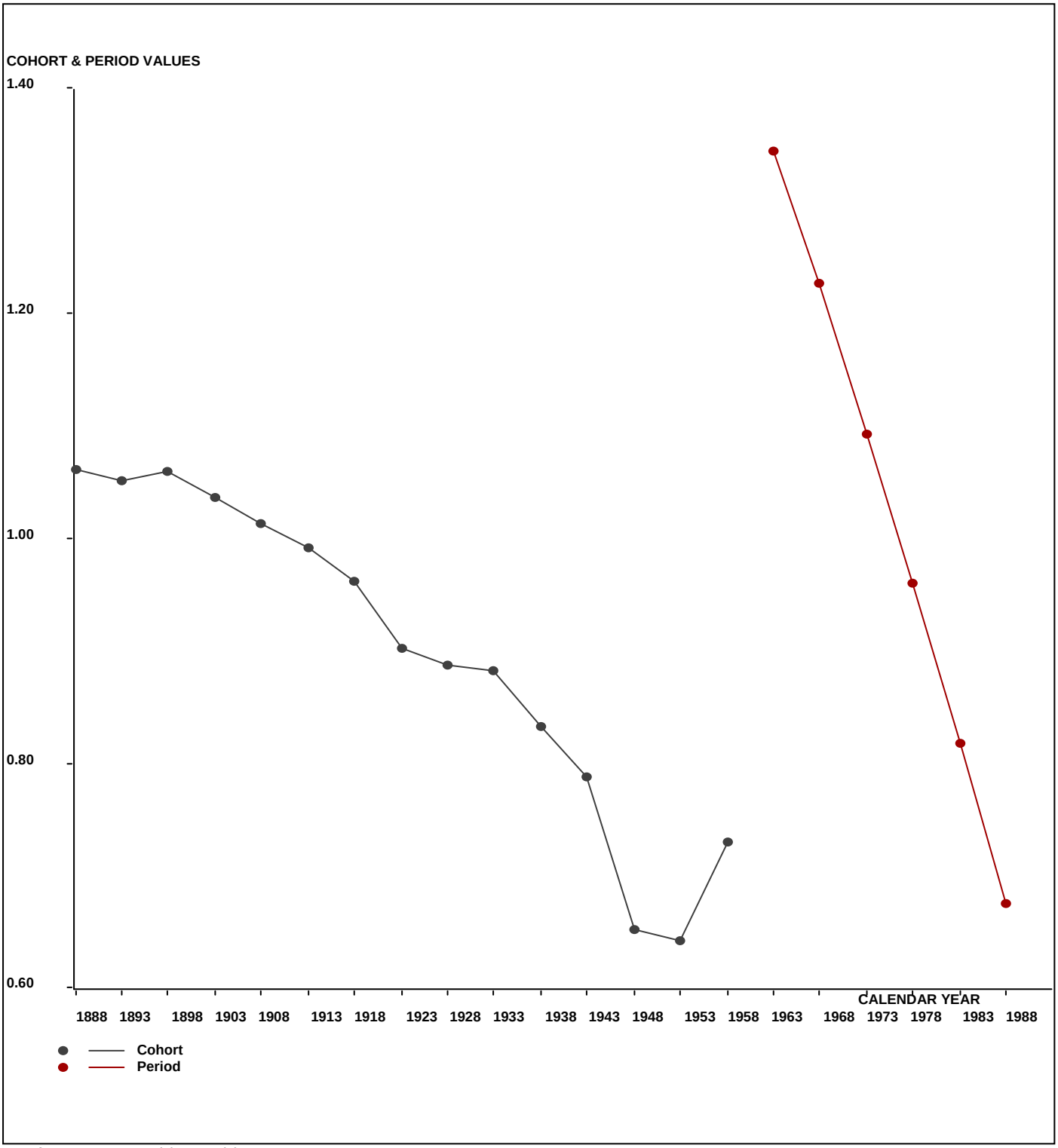
CHI SQUARE (LOG)= 1518.7847 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

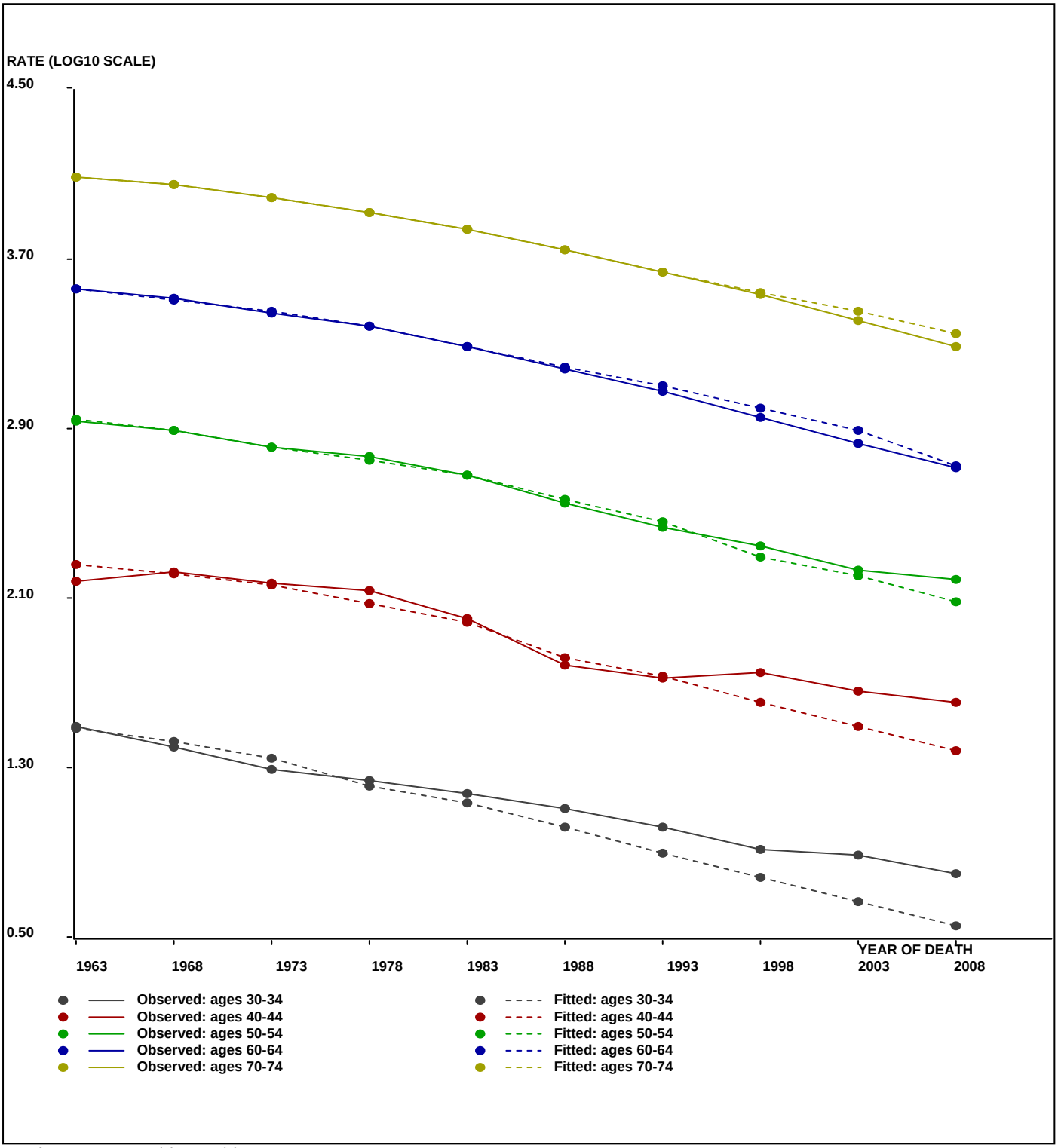


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	10.6	24.1	52.9	121.0	271.6	593.8	1189.5	2280.1	4298.8	8329.4
	PRE	8.0	21.0	53.5	115.6	288.7	606.6	1272.2	2379.5	4284.1	7952.0
	RES	2.630	3.100	-0.607	5.430	-17.133	-12.737	-82.644	-99.368	14.708	377.422
1996-	OBS	8.2	22.0	55.9	95.4	224.2	455.7	898.3	1813.8	3415.5	6761.6
	PRE	6.1	16.1	40.8	94.0	196.8	473.8	989.4	1952.9	3470.7	6160.5
	RES	2.064	5.960	15.101	1.417	27.395	-18.019	-91.079	-139.074	-55.114	601.096
2001-	OBS	7.7	17.8	46.2	87.7	169.4	343.1	668.3	1299.9	2559.0	5014.1
	PRE	4.7	12.3	31.3	71.6	160.0	322.9	772.8	1518.8	2848.4	4990.8
	RES	3.036	5.479	14.892	16.121	9.323	20.152	-104.476	-218.867	-289.422	23.324
2006-	OBS	6.3	21.1	40.5	87.5	155.9	282.0	517.4	956.5	1909.2	3505.9
	PRE	3.6	9.5	24.0	54.9	121.9	262.6	526.7	1186.2	2215.3	4096.0
	RES	2.689	11.632	16.520	32.612	33.974	19.400	-9.289	-229.707	-306.075	-590.139

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	69.0	148.0	293.0	566.0	987.0	1882.0	3637.0	6706.0	10813.0	15596.0
	PRE	51.9	128.9	296.4	540.6	1049.3	1922.4	3889.7	6998.3	10776.0	14889.3
	CHI	5.625	2.820	0.038	1.193	3.696	0.848	16.415	12.205	0.127	33.541
1996-	OBS	49.0	146.0	348.0	531.0	1045.0	1645.0	2805.0	5338.0	9289.0	14842.0
	PRE	36.7	106.5	254.0	523.1	917.3	1710.0	3089.4	5747.3	9438.9	13522.6
	CHI	4.158	14.641	34.812	0.119	17.779	2.474	26.180	29.148	2.380	128.741
2001-	OBS	42.0	110.0	312.0	550.0	942.0	1587.0	2382.0	3923.0	7035.0	12072.0
	PRE	25.5	76.2	211.4	448.9	890.1	1493.8	2754.4	4583.5	7830.7	12015.8
	CHI	10.648	15.042	47.911	22.746	3.021	5.818	50.348	95.183	80.845	0.262
2006-	OBS	35.1	119.9	257.4	600.0	978.1	1560.5	2366.0	3312.2	5413.0	8678.0
	PRE	20.1	53.8	152.4	376.5	765.0	1453.2	2408.5	4107.6	6280.8	10138.8
	CHI	11.190	81.379	72.290	132.725	59.375	7.930	0.749	154.027	119.898	210.461

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	2869.96	56.27	51	P, C	99.16	15542.79	0.0000
AGE-PERIOD	49.71	1.10	45	Cohort	51.54	265.31	0.0000
AGE-COHORT	42.75	1.19	36	Period	43.66	227.36	0.0000
PERIOD-COHORT	26.76	0.67	40	Age	9.99	142.58	0.0000
FULL AGE-PERIOD-COHORT	24.09	0.75	32			128.06	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.696474	49.713509
35	1.916849	82.575110
40	2.134941	136.439667
45	2.373968	236.574566
50	2.562149	364.879435
55	2.737357	546.207101
60	2.955875	903.389114
65	3.199195	1581.958338
70	3.481627	3031.283422
75	3.766575	5842.186336

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.131706	1.354272
1966	0.072632	1.182039
1971	0.042009	1.101562
1976	-0.030204	0.932817
1981	-0.115183	0.767038
1986	-0.183717	0.655064

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.111791	1.293574
1891	0.095692	1.246499
1896	0.067087	1.167044
1901	0.031627	1.075540
1906	-0.000693	0.998406
1911	-0.039669	0.912706
1916	-0.072984	0.845310
1921	-0.122056	0.754994
1926	-0.130554	0.740366
1931	-0.115652	0.766210
1936	-0.126741	0.746894
1941	-0.123445	0.752584
1946	-0.144255	0.717372
1951	-0.128362	0.744111
1956	-0.170847	0.674766

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	110.0	138.0	167.0	160.0	161.0	132.0
	EXP	159.4	135.5	147.7	152.1	151.6	132.0
	CHI	15.3	0.0	2.5	0.4	0.6	0.0
35 -	OBS	219.0	239.0	231.0	232.0	212.0	209.0
	EXP	263.8	233.8	214.6	209.5	207.6	218.9
	CHI	7.6	0.1	1.3	2.4	0.1	0.4
40 -	OBS	322.0	407.0	409.0	310.0	290.0	284.0
	EXP	414.4	377.3	362.1	302.5	284.6	296.8
	CHI	20.6	2.3	6.1	0.2	0.1	0.6
45 -	OBS	638.0	643.0	634.0	576.0	435.0	369.0
	EXP	700.3	617.6	607.4	528.5	428.5	422.2
	CHI	5.5	1.0	1.2	4.3	0.1	6.7
50 -	OBS	1003.0	898.0	924.0	818.0	664.0	529.0
	EXP	1012.6	924.2	883.4	788.6	666.4	563.8
	CHI	0.1	0.7	1.9	1.1	0.0	2.1
55 -	OBS	1336.0	1289.0	1337.0	1109.0	969.0	785.0
	EXP	1360.5	1295.7	1262.9	1101.7	960.3	848.9
	CHI	0.4	0.0	4.4	0.0	0.1	4.8
60 -	OBS	2074.0	1935.0	1930.0	1695.0	1504.0	1279.0
	EXP	2019.3	1909.1	1963.3	1726.1	1466.2	1336.3
	CHI	1.5	0.4	0.6	0.6	1.0	2.5
65 -	OBS	3363.0	2996.0	2923.0	2730.0	2394.0	2092.0
	EXP	3228.3	2956.3	3007.0	2798.5	2389.2	2124.1
	CHI	5.6	0.5	2.3	1.7	0.0	0.5
70 -	OBS	5471.0	4868.0	4809.0	4528.0	3951.0	3659.0
	EXP	5408.3	4903.2	4823.1	4474.6	4055.1	3624.1
	CHI	0.7	0.3	0.0	0.6	2.7	0.3
75 -	OBS	7708.0	7388.0	7259.0	6596.0	6108.0	6002.0
	EXP	7708.0	7451.4	7362.2	6677.9	6080.9	5786.2
	CHI	0.0	0.5	1.4	1.0	0.1	8.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	60100.19	1502.50	40	P, C	97.36	0.0000
AGE-PERIOD	1748.67	43.72	40	Cohort	9.26	0.0000
AGE-COHORT	1095.68	27.39	40	Period	-44.82	0.0000
PERIOD-COHORT	1361.40	34.04	40	Age	-16.55	0.0000
FULL AGE-PERIOD-COHORT	1586.74	39.67	40			0.0000

AGE	EFFECT
30	49.713509
35	82.575110
40	136.439667
45	236.574566
50	364.879435
55	546.207101
60	903.389114
65	1581.958338
70	3031.283422
75	5842.186336

PERIOD	EFFECT	LOWER	UPPER
% Period Change	85.4018	82.4018	88.4018
1961	1.354272		
1966	1.182039		
1971	1.101562		
1976	0.932817		
1981	0.767038		
1986	0.655064		
1991	0.559436	0.539784	0.579088
1996	0.477768	0.444791	0.511924
2001	0.408022	0.366516	0.452550
2006	0.348458	0.302016	0.400062

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.293574	1.000000	
1891	1.246499	2.000000	
1896	1.167044	4.000000	
1901	1.075540	8.000000	
1906	0.998406	16.000000	
1911	0.912706	32.000000	
1916	0.845310	64.000000	
1921	0.754994	128.000000	
1926	0.740366	256.000000	
1931	0.766210	512.000000	
1936	0.746894	1024.000000	
1941	0.752584	2048.000000	
1946	0.717372	4096.000000	
1951	0.744111	8192.000000	
1956	0.728035	EXTRAPOLATION	0.674766
1961	0.721921	EXTRAPOLATION	
1966	0.715858	EXTRAPOLATION	
1971	0.709846	EXTRAPOLATION	
1976	0.703884	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	35.6	44.7	46.6	35.0	30.1	22.0	18.6	13.9	11.8	7.4
	EXP	51.6	43.9	41.2	33.3	28.4	23.7	20.1*	17.0*	14.4*	12.2*
	Elow							19.4	15.8	12.9	10.6
	Eup							20.8	18.2	16.0	14.0
35	OBS	68.7	76.5	73.1	64.2	46.4	38.4	29.9	25.8	20.2	14.0
	EXP	82.8	74.8	67.9	58.0	45.4	40.3	33.6*	28.5*	24.1*	20.4*
	Elow							32.5	26.5	21.7	17.7
	Eup							34.8	30.5	26.8	23.4
40	OBS	108.4	128.8	130.1	97.4	80.3	61.4	47.3	45.8	36.3	33.4
	EXP	139.5	119.4	115.2	95.1	78.8	64.1	56.8*	47.5*	40.2*	34.0*
	Elow							54.8	44.2	36.1	29.5
	Eup							58.8	50.9	44.6	39.1
45	OBS	246.7	219.8	201.4	184.3	137.6	101.9	93.9	69.0	58.9	56.1
	EXP	270.8	211.1	192.9	169.1	135.5	116.6	94.9*	84.1*	70.3*	59.5*
	Elow							91.6	78.3	63.1	51.6
	Eup							98.3	90.1	77.9	68.3
50	OBS	446.7	354.2	317.4	261.4	213.7	167.5	135.1	119.3	92.8	77.7
	EXP	451.0	364.6	303.5	252.0	214.4	178.5	153.6*	125.1*	110.8*	92.6*
	Elow							148.2	116.4	99.5	80.2
	Eup							159.0	134.0	122.9	106.3
55	OBS	725.2	586.2	538.5	387.2	313.0	253.5	213.0	182.0	142.0	123.4
	EXP	738.5	589.3	508.6	384.7	310.2	274.2	228.2*	196.4*	159.9*	141.6*
	Elow							220.2	182.8	143.6	122.8
	Eup							236.2	210.4	177.3	162.6
60	OBS	1351.5	1080.6	892.9	699.5	536.6	419.4	364.0	314.5	253.3	199.6
	EXP	1315.9	1066.1	908.3	712.3	523.2	438.1	387.2*	322.4*	277.4*	225.8*
	Elow							373.6	300.1	249.2	195.7
	Eup							400.8	345.4	307.7	259.3
65	OBS	2604.6	2038.2	1691.3	1313.9	1027.8	770.6	699.4	614.7	480.8	396.7
	EXP	2500.3	2011.2	1739.8	1346.9	1025.7	782.4	655.2*	579.1*	482.1*	414.9*
	Elow							632.2	539.1	433.1	359.6
	Eup							678.2	620.5	534.7	476.3
70	OBS	5176.5	4151.6	3580.9	2856.8	2067.6	1694.7	1473.8	1286.9	1030.1	815.7
	EXP	5117.1	4181.6	3591.4	2823.1	2122.1	1678.5	1280.3*	1072.2*	947.7*	788.9*
	Elow							1235.4	998.2	851.3	683.8
	Eup							1325.3	1148.9	1051.1	905.8
75	OBS	10234.6	8534.7	7405.3	5789.5	4494.0	3623.2	3287.7	2868.7	2252.9	1765.8
	EXP	10234.6	8607.9	7510.5	5861.4	4474.0	3492.9	2762.8*	2107.3*	1764.8*	1559.8*
	Elow							2665.7	1961.9	1585.3	1351.9
	Eup							2859.8	2258.0	1957.4	1790.8
30-79	OBS	1161.3	952.1	825.3	649.5	498.5	395.8	348.5	302.5	239.6	193.1
	EXP	1160.0	952.2	825.3	649.1	498.4	399.1	323.8*	266.4*	226.6*	193.7*
	Elow							312.4	248.0	203.6	167.9
	Eup							335.1	285.5	251.4	222.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	110.0	138.0	167.0	160.0	161.0	132.0	121.0	83.0	64.0	41.0
	EXP	159.4	135.5	147.7	152.1	151.6	142.4	130.4*	101.7*	78.2*	68.0*
	CHI	15.325	0.047	2.528	0.406	0.582	0.762	0.684	3.441	2.573	10.729
35 -	OBS	219.0	239.0	231.0	232.0	212.0	209.0	184.0	171.0	125.0	79.4
	EXP	263.8	233.8	214.6	209.5	207.6	218.9	206.9*	188.7*	149.0*	116.1*
	CHI	7.597	0.117	1.260	2.410	0.093	0.449	2.530	1.663	3.865	11.624
40 -	OBS	322.0	407.0	409.0	310.0	290.0	284.0	262.0	285.0	245.0	212.4
	EXP	414.4	377.3	362.1	302.5	284.6	296.8	314.5*	295.5*	271.6*	216.3*
	CHI	20.596	2.346	6.068	0.184	0.104	0.550	8.751	0.374	2.601	0.069
45 -	OBS	638.0	643.0	634.0	576.0	435.0	369.0	439.0	384.0	369.0	384.5
	EXP	700.3	617.6	607.4	528.5	428.5	422.2	444.1*	468.1*	440.5*	407.9*
	CHI	5.541	1.042	1.162	4.263	0.098	6.696	0.059	15.103	11.612	1.344
50 -	OBS	1003.0	898.0	924.0	818.0	664.0	529.0	491.0	556.0	516.0	487.3
	EXP	1012.6	924.2	883.4	788.6	666.4	563.8	558.3*	583.0*	616.2*	580.7*
	CHI	0.092	0.743	1.867	1.096	0.008	2.146	8.120	1.247	16.287	15.017
55 -	OBS	1336.0	1289.0	1337.0	1109.0	969.0	785.0	675.0	657.0	657.0	682.7
	EXP	1360.5	1295.7	1262.9	1101.7	960.3	848.9	723.3*	708.9*	739.6*	783.7*
	CHI	0.440	0.035	4.352	0.049	0.079	4.809	3.226	3.799	9.222	13.006
60 -	OBS	2074.0	1935.0	1930.0	1695.0	1504.0	1279.0	1113.0	982.0	903.0	912.6
	EXP	2019.3	1909.1	1963.3	1726.1	1466.2	1336.3	1184.0*	1006.6*	988.8*	1032.6*
	CHI	1.483	0.352	0.563	0.560	0.973	2.453	4.255	0.601	7.441	13.950
65 -	OBS	3363.0	2996.0	2923.0	2730.0	2394.0	2092.0	2057.0	1809.0	1451.0	1373.5
	EXP	3228.3	2956.3	3007.0	2798.5	2389.2	2124.1	1927.1*	1704.3*	1454.9*	1436.5*
	CHI	5.623	0.534	2.345	1.678	0.009	0.484	8.759	6.431	0.011	2.767
70 -	OBS	5471.0	4868.0	4809.0	4528.0	3951.0	3659.0	3707.0	3500.0	2832.0	2312.6
	EXP	5408.3	4903.2	4823.1	4474.6	4055.1	3624.1	3220.5*	2916.1*	2605.3*	2236.8*
	CHI	0.728	0.252	0.041	0.638	2.674	0.336	73.503	116.925	19.733	2.571
75 -	OBS	7708.0	7388.0	7259.0	6596.0	6108.0	6002.0	6156.0	6297.0	5424.0	4370.9
	EXP	7708.0	7451.4	7362.2	6677.9	6080.9	5786.2	5173.0*	4625.7*	4249.1*	3861.0*
	CHI	0.000	0.539	1.447	1.003	0.121	8.045	186.795	603.825	324.890	67.343
30-79	OBS	22244.0	20801.0	20623.0	18754.0	16688.0	15340.0	15205.0	14724.0	12586.0	10856.9
	EXP	22274.8	20804.0	20633.6	18760.0	16690.4	15363.6	13882.0*	12598.6*	11593.0*	10739.6*
	O/E	0.999	1.000	0.999	1.000	1.000	0.998	1.095	1.169	1.086	1.011

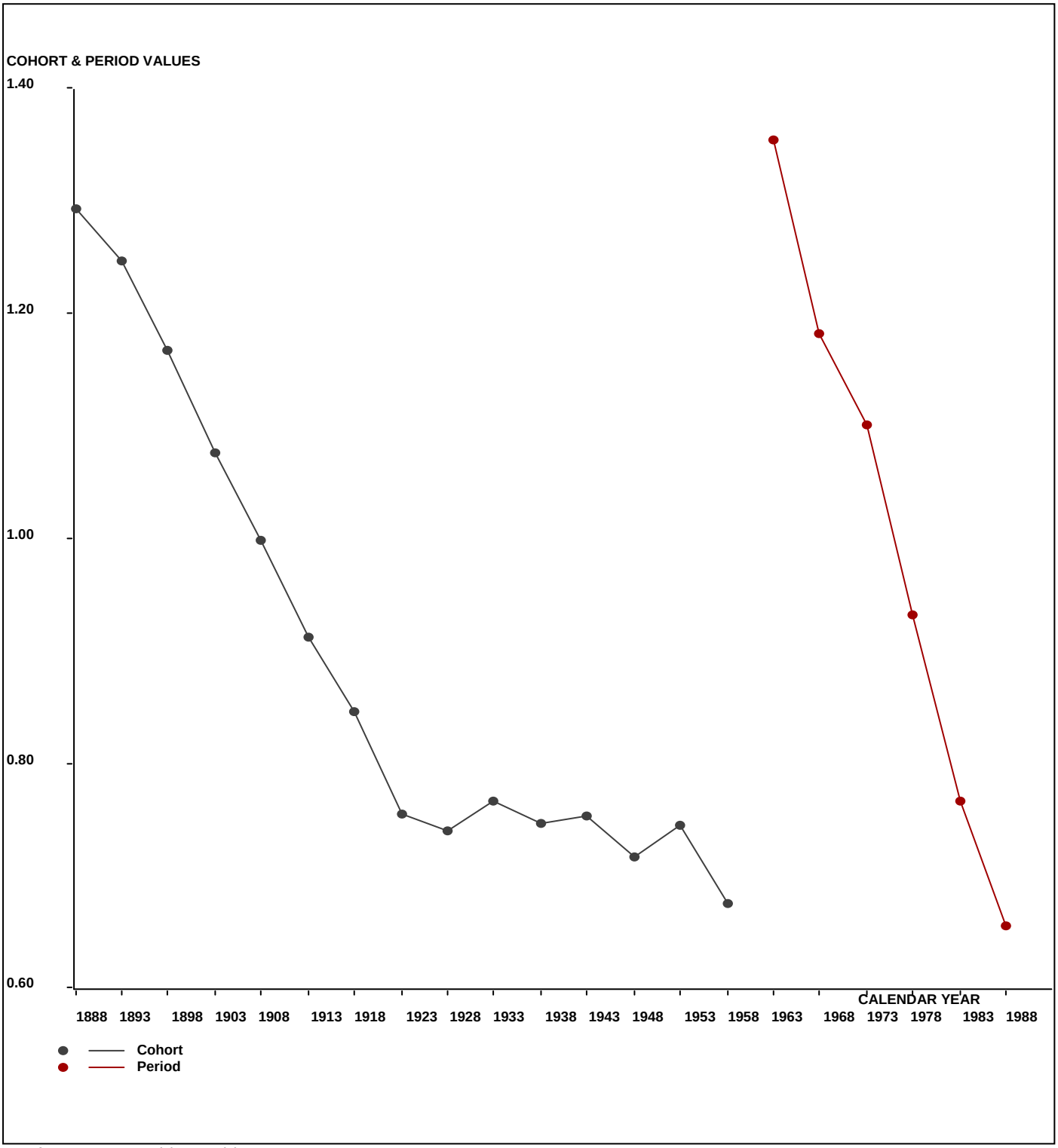
CHI SQUARE (LOG)= 1586.7417 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

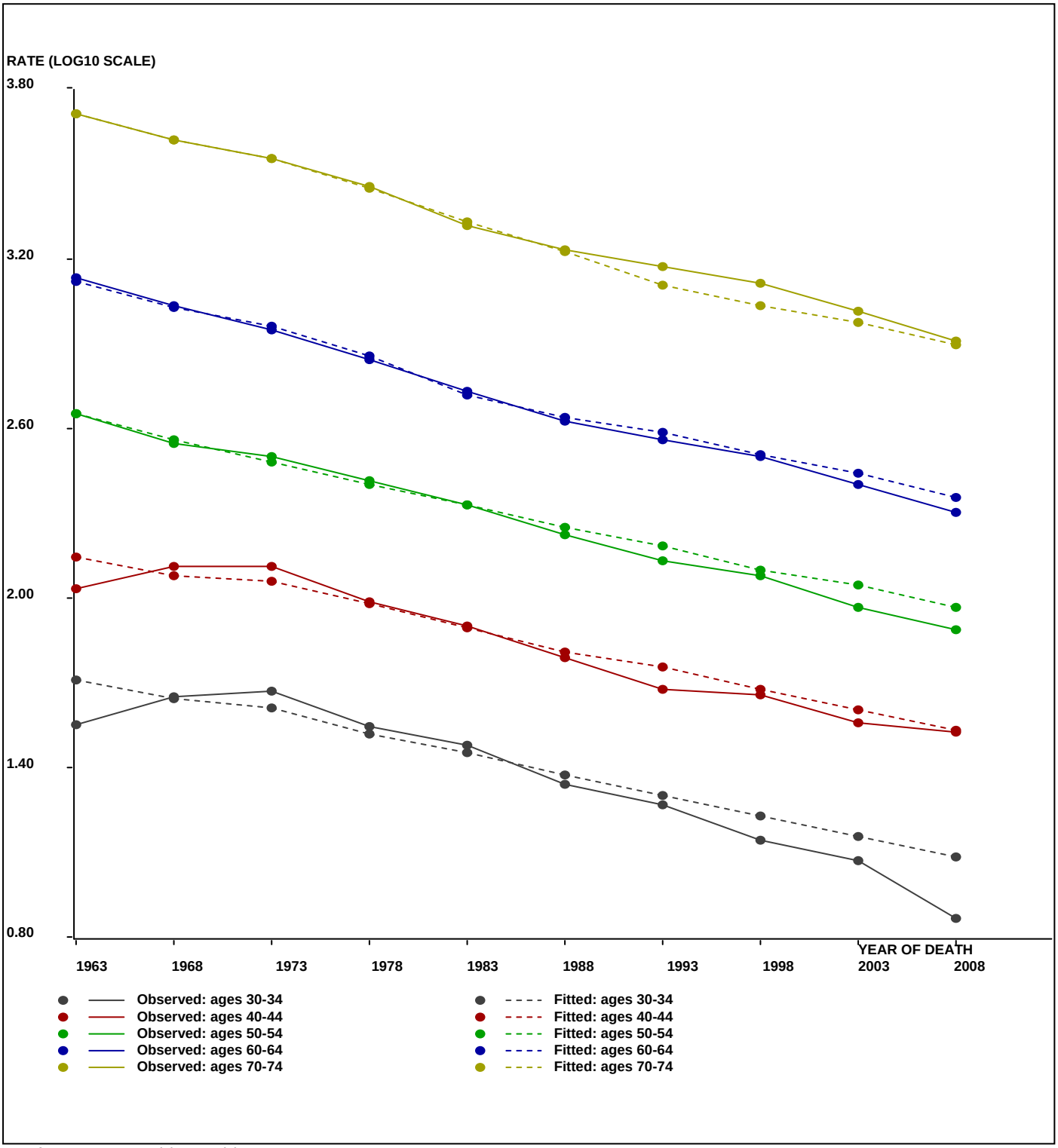


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	18.6	29.9	47.3	93.9	135.1	213.0	364.0	699.4	1473.8	3287.7
	PRE	20.1	33.6	56.8	94.9	153.6	228.2	387.2	655.2	1280.3	2762.8
	RES	-1.453	-3.719	-9.475	-1.093	-18.526	-15.241	-23.213	44.175	193.425	524.993
1996-	OBS	13.9	25.8	45.8	69.0	119.3	182.0	314.5	614.7	1286.9	2868.7
	PRE	17.0	28.5	47.5	84.1	125.1	196.4	322.4	579.1	1072.2	2107.3
	RES	-3.127	-2.673	-1.688	-15.108	-5.784	-14.377	-7.876	35.574	214.706	761.380
2001-	OBS	11.8	20.2	36.3	58.9	92.8	142.0	253.3	480.8	1030.1	2252.9
	PRE	14.4	24.1	40.2	70.3	110.8	159.9	277.4	482.1	947.7	1764.8
	RES	-2.612	-3.884	-3.933	-11.410	-18.011	-17.852	-24.065	-1.295	82.477	488.008
2006-	OBS	7.4	14.0	33.4	56.1	77.7	123.4	199.6	396.7	815.7	1765.8
	PRE	12.2	20.4	34.0	59.5	92.6	141.6	225.8	414.9	788.9	1559.8
	RES	-4.843	-6.462	-0.608	-3.416	-14.886	-18.245	-26.248	-18.207	26.748	206.002

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	121.0	184.0	262.0	439.0	491.0	675.0	1113.0	2057.0	3707.0	6156.0
	PRE	130.4	206.9	314.5	444.1	558.3	723.3	1184.0	1927.1	3220.5	5173.0
	CHI	0.684	2.530	8.751	0.059	8.120	3.226	4.255	8.759	73.503	186.795
1996-	OBS	83.0	171.0	285.0	384.0	556.0	657.0	982.0	1809.0	3500.0	6297.0
	PRE	101.7	188.7	295.5	468.1	583.0	708.9	1006.6	1704.3	2916.1	4625.7
	CHI	3.441	1.663	0.374	15.103	1.247	3.799	0.601	6.431	116.925	603.825
2001-	OBS	64.0	125.0	245.0	369.0	516.0	657.0	903.0	1451.0	2832.0	5424.0
	PRE	78.2	149.0	271.6	440.5	616.2	739.6	988.8	1454.9	2605.3	4249.1
	CHI	2.573	3.865	2.601	11.612	16.287	9.222	7.441	0.011	19.733	324.890
2006-	OBS	41.0	79.4	212.4	384.5	487.3	682.7	912.6	1373.5	2312.6	4370.9
	PRE	68.0	116.1	216.3	407.9	580.7	783.7	1032.6	1436.5	2236.8	3861.0
	CHI	10.729	11.624	0.069	1.344	15.017	13.006	13.950	2.767	2.571	67.343

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1687.39	33.09	51	P, C	99.43	9473.60	0.0000
AGE-PERIOD	68.91	1.53	45	Cohort	85.98	369.37	0.0000
AGE-COHORT	15.08	0.42	36	Period	35.95	80.17	0.0000
PERIOD-COHORT	37.08	0.93	40	Age	73.95	198.83	0.0000
FULL AGE-PERIOD-COHORT	9.66	0.30	32			51.44	0.0161

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.684399	4.835025
35	1.186764	15.373181
40	1.629828	42.641101
45	1.983454	96.261901
50	2.307408	202.958984
55	2.548147	353.302622
60	2.758057	572.870933
65	2.952193	895.763074
70	3.108595	1284.089716
75	3.220125	1660.064478

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.165864	0.682552
1966	-0.139011	0.726087
1971	-0.080730	0.830366
1976	-0.021906	0.950811
1981	0.032521	1.077757
1986	0.053633	1.131445

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.533190	0.292961
1891	-0.498923	0.317013
1896	-0.421587	0.378803
1901	-0.345938	0.450881
1906	-0.243566	0.570734
1911	-0.108304	0.779284
1916	-0.005301	0.987868
1921	0.082409	1.208951
1926	0.154398	1.426914
1931	0.210242	1.622713
1936	0.259594	1.818002
1941	0.290518	1.952171
1946	0.255639	1.801518
1951	0.251275	1.783507
1956	0.302849	2.008394

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	25.0	19.0	24.0	23.0	55.0	66.0
	EXP	16.6	19.7	28.1	37.9	49.7	66.0
	CHI	4.3	0.0	0.6	5.8	0.6	0.0
35 -	OBS	52.0	74.0	64.0	93.0	136.0	163.0
	EXP	47.7	56.6	73.3	103.1	136.4	168.7
	CHI	0.4	5.3	1.2	1.0	0.0	0.2
40 -	OBS	98.0	155.0	162.0	220.0	334.0	414.0
	EXP	104.5	139.6	180.7	234.6	324.1	402.3
	CHI	0.4	1.7	1.9	0.9	0.3	0.3
45 -	OBS	152.0	227.0	378.0	478.0	594.0	773.0
	EXP	167.8	247.2	359.1	464.3	596.3	769.6
	CHI	1.5	1.6	1.0	0.4	0.0	0.0
50 -	OBS	239.0	366.0	573.0	866.0	1099.0	1344.0
	EXP	242.4	369.0	593.1	861.7	1103.0	1318.4
	CHI	0.0	0.0	0.7	0.0	0.0	0.5
55 -	OBS	232.0	457.0	740.0	1134.0	1715.0	1986.0
	EXP	253.5	439.6	719.6	1163.1	1682.1	2008.6
	CHI	1.8	0.7	0.6	0.7	0.6	0.3
60 -	OBS	288.0	397.0	820.0	1339.0	2124.0	2742.0
	EXP	270.5	425.1	801.3	1303.9	2092.0	2820.8
	CHI	1.1	1.9	0.4	0.9	0.5	2.2
65 -	OBS	300.0	441.0	727.0	1350.0	2204.0	3368.0
	EXP	299.0	431.1	733.7	1379.1	2221.5	3326.4
	CHI	0.0	0.2	0.1	0.6	0.1	0.5
70 -	OBS	305.0	412.0	642.0	1166.0	2012.0	3078.0
	EXP	293.7	414.1	645.6	1104.4	2060.8	3098.9
	CHI	0.4	0.0	0.0	3.4	1.2	0.1
75 -	OBS	250.0	319.0	513.0	786.0	1379.0	2468.0
	EXP	250.0	330.8	511.9	810.8	1387.9	2424.7
	CHI	0.0	0.4	0.0	0.8	0.1	0.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	51342.83	1283.57	40	P, C	88.45	0.0000
AGE-PERIOD	28929.62	723.24	40	Cohort	79.50	0.0000
AGE-COHORT	18026.63	450.67	40	Period	67.10	0.0000
PERIOD-COHORT	13883.86	347.10	40	Age	57.29	0.0000
FULL AGE-PERIOD-COHORT	5930.28	148.26	40			0.0000

AGE	EFFECT
30	4.835025
35	15.373181
40	42.641101
45	96.261901
50	202.958984
55	353.302622
60	572.870933
65	895.763074
70	1284.089716
75	1660.064478

PERIOD	EFFECT	LOWER	UPPER
% Period Change	104.9814	101.9814	107.9814
1961	0.682552		
1966	0.726087		
1971	0.830366		
1976	0.950811		
1981	1.077757		
1986	1.131445		
1991	1.187806	1.153863	1.221750
1996	1.246976	1.176726	1.319263
2001	1.309093	1.200042	1.424558
2006	1.374304	1.223819	1.538258

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.292961	1.000000	
1891	0.317013	2.000000	
1896	0.378803	4.000000	
1901	0.450881	8.000000	
1906	0.570734	16.000000	
1911	0.779284	32.000000	
1916	0.987868	64.000000	
1921	1.208951	128.000000	
1926	1.426914	256.000000	
1931	1.622713	512.000000	
1936	1.818002	1024.000000	
1941	1.952171	2048.000000	
1946	1.801518	4096.000000	
1951	1.783507	8192.000000	
1956	1.915431	EXTRAPOLATION	2.008394
1961	1.985913	EXTRAPOLATION	
1966	2.058989	EXTRAPOLATION	
1971	2.134753	EXTRAPOLATION	
1976	2.213305	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	8.1	6.2	6.7	5.0	10.3	11.0	12.6	6.4	4.6	3.0
	EXP	5.4	6.4	7.8	8.3	9.3	10.5	11.4*	12.4*	13.5*	14.7*
	Elow							11.1	11.7	12.4	13.1
	Eup							11.7	13.1	14.7	16.5
35	OBS	16.3	23.7	20.3	25.7	29.8	30.0	38.5	34.4	24.0	12.1
	EXP	15.0	18.1	23.2	28.5	29.8	31.0	35.0*	38.1*	41.4*	45.1*
	Elow							34.0	35.9	38.0	40.2
	Eup							36.0	40.3	45.1	50.5
40	OBS	33.0	49.1	51.5	69.1	92.4	89.4	93.7	107.3	87.6	53.0
	EXP	35.2	44.2	57.5	73.7	89.7	86.9	90.3*	101.8*	110.9*	120.7*
	Elow							87.8	96.1	101.6	107.4
	Eup							92.9	107.8	120.6	135.1
45	OBS	58.8	77.6	120.1	152.9	187.9	213.6	218.1	207.5	218.6	189.1
	EXP	64.9	84.5	114.1	148.5	188.6	212.6	206.0*	214.1*	241.4*	262.7*
	Elow							200.1	202.0	221.3	234.0
	Eup							211.9	226.5	262.7	294.1
50	OBS	106.4	144.4	196.8	276.7	353.7	425.6	417.4	396.0	378.5	385.9
	EXP	108.0	145.6	203.7	275.4	355.0	417.5	470.6*	455.9*	473.9*	534.3*
	Elow							457.2	430.3	434.4	475.8
	Eup							484.1	482.4	515.7	598.0
55	OBS	125.9	207.8	298.0	396.0	554.0	641.4	709.6	733.6	664.3	612.5
	EXP	137.6	199.9	289.8	406.1	543.3	648.7	762.9*	860.0*	833.2*	866.0*
	Elow							741.1	811.6	763.8	771.2
	Eup							784.7	909.9	906.7	969.3
60	OBS	187.7	221.7	379.4	552.6	757.9	899.0	1070.1	1114.5	1133.2	1068.6
	EXP	176.3	237.4	370.7	538.1	746.4	924.9	1104.2*	1298.7*	1464.0*	1418.3*
	Elow							1072.6	1225.5	1342.1	1263.0
	Eup							1135.7	1374.0	1593.1	1587.5
65	OBS	232.3	300.0	420.6	649.7	946.2	1240.6	1458.6	1590.6	1628.6	1684.8
	EXP	231.6	293.3	424.5	663.7	953.7	1225.3	1518.2*	1812.6*	2131.9*	2403.2*
	Elow							1474.8	1710.4	1954.3	2140.1
	Eup							1561.6	1917.6	2319.9	2689.9
70	OBS	288.6	351.4	478.0	735.7	1052.9	1425.6	1778.3	2006.2	2154.1	2251.4
	EXP	277.8	353.2	480.8	696.8	1078.5	1435.2	1844.0*	2284.8*	2727.8*	3208.3*
	Elow							1791.3	2156.1	2500.5	2857.0
	Eup							1896.6	2417.3	2968.4	3591.0
75	OBS	331.9	368.5	523.3	689.9	1014.6	1489.8	1878.9	2248.7	2525.3	2723.3
	EXP	331.9	382.1	522.2	711.7	1021.1	1463.7	1947.9*	2502.6*	3100.9*	3702.1*
	Elow							1892.2	2361.6	2842.6	3296.7
	Eup							2003.6	2647.7	3374.5	4143.8
30-79	OBS	103.8	135.5	193.0	273.3	378.3	471.8	545.4	583.9	594.0	590.2
	EXP	104.2	135.9	193.1	273.4	378.0	472.0	569.0*	664.0*	752.7*	832.2*
	Elow							552.7	626.6	690.0	741.1
	Eup							585.2	702.5	819.1	931.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	25.0	19.0	24.0	23.0	55.0	66.0	82.0	38.0	25.0	17.0
	EXP	16.6	19.7	28.1	37.9	49.7	62.9	74.1*	74.3*	73.4*	82.0*
	CHI	4.313	0.025	0.594	5.842	0.575	0.148	0.843	17.704	31.887	51.556
35 -	OBS	52.0	74.0	64.0	93.0	136.0	163.0	237.0	228.0	148.0	68.7
	EXP	47.7	56.6	73.3	103.1	136.4	168.7	215.1*	252.2*	256.0*	256.5*
	CHI	0.388	5.335	1.178	0.996	0.001	0.194	2.220	2.331	45.548	137.463
40 -	OBS	98.0	155.0	162.0	220.0	334.0	414.0	519.0	668.0	592.0	336.6
	EXP	104.5	139.6	180.7	234.6	324.1	402.3	500.1*	634.2*	749.1*	766.7*
	CHI	0.406	1.703	1.931	0.907	0.301	0.339	0.712	1.803	32.945	241.285
45 -	OBS	152.0	227.0	378.0	478.0	594.0	773.0	1020.0	1155.0	1370.0	1296.1
	EXP	167.8	247.2	359.1	464.3	596.3	769.6	963.5*	1191.5*	1513.1*	1800.8*
	CHI	1.494	1.649	0.997	0.407	0.009	0.015	3.309	1.117	13.526	141.432
50 -	OBS	239.0	366.0	573.0	866.0	1099.0	1344.0	1517.0	1846.0	2105.0	2420.9
	EXP	242.4	369.0	593.1	861.7	1103.0	1318.4	1710.5*	2125.4*	2635.7*	3351.5*
	CHI	0.047	0.025	0.682	0.021	0.014	0.496	21.879	36.724	106.840	258.416
55 -	OBS	232.0	457.0	740.0	1134.0	1715.0	1986.0	2249.0	2648.0	3073.0	3388.9
	EXP	253.5	439.6	719.6	1163.1	1682.1	2008.6	2417.9*	3104.4*	3854.4*	4791.6*
	CHI	1.829	0.691	0.578	0.726	0.645	0.253	11.799	67.092	158.417	410.646
60 -	OBS	288.0	397.0	820.0	1339.0	2124.0	2742.0	3272.0	3480.0	4039.0	4886.4
	EXP	270.5	425.1	801.3	1303.9	2092.0	2820.8	3376.1*	4055.2*	5218.3*	6485.6*
	CHI	1.126	1.857	0.437	0.948	0.490	2.201	3.209	81.588	266.518	394.323
65 -	OBS	300.0	441.0	727.0	1350.0	2204.0	3368.0	4290.0	4681.0	4915.0	5833.9
	EXP	299.0	431.1	733.7	1379.1	2221.5	3326.4	4465.2*	5334.3*	6433.6*	8321.7*
	CHI	0.003	0.229	0.061	0.613	0.138	0.520	6.877	80.020	358.465	743.739
70 -	OBS	305.0	412.0	642.0	1166.0	2012.0	3078.0	4473.0	5456.0	5922.0	6383.2
	EXP	293.7	414.1	645.6	1104.4	2060.8	3098.9	4638.2*	6213.9*	7499.0*	9096.1*
	CHI	0.438	0.011	0.021	3.430	1.157	0.141	5.883	92.429	331.617	809.136
75 -	OBS	250.0	319.0	513.0	786.0	1379.0	2468.0	3518.0	4936.0	6080.0	6740.9
	EXP	250.0	330.8	511.9	810.8	1387.9	2424.7	3647.3*	5493.3*	7465.9*	9163.8*
	CHI	0.000	0.419	0.003	0.759	0.057	0.773	4.583	56.545	257.257	640.595
30-79	OBS	1941.0	2867.0	4643.0	7455.0	11652.0	16402.0	21177.0	25136.0	28269.0	31372.6
	EXP	1945.8	2872.7	4646.3	7462.8	11653.7	16401.4	22008.1*	28478.6*	35698.3*	44116.3*
	O/E	0.998	0.998	0.999	0.999	1.000	1.000	0.962	0.883	0.792	0.711

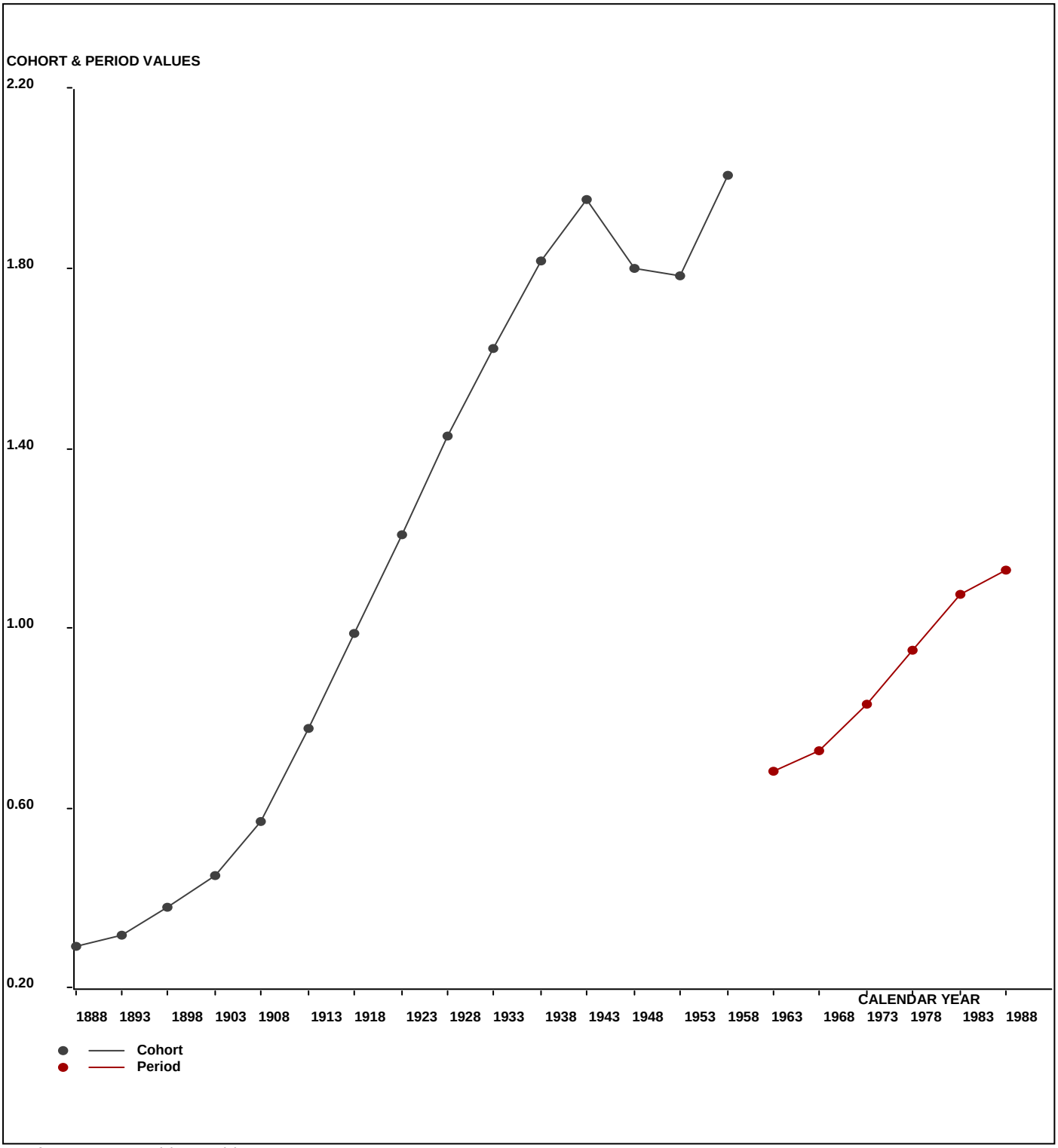
CHI SQUARE (LOG)= 5930.2765 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

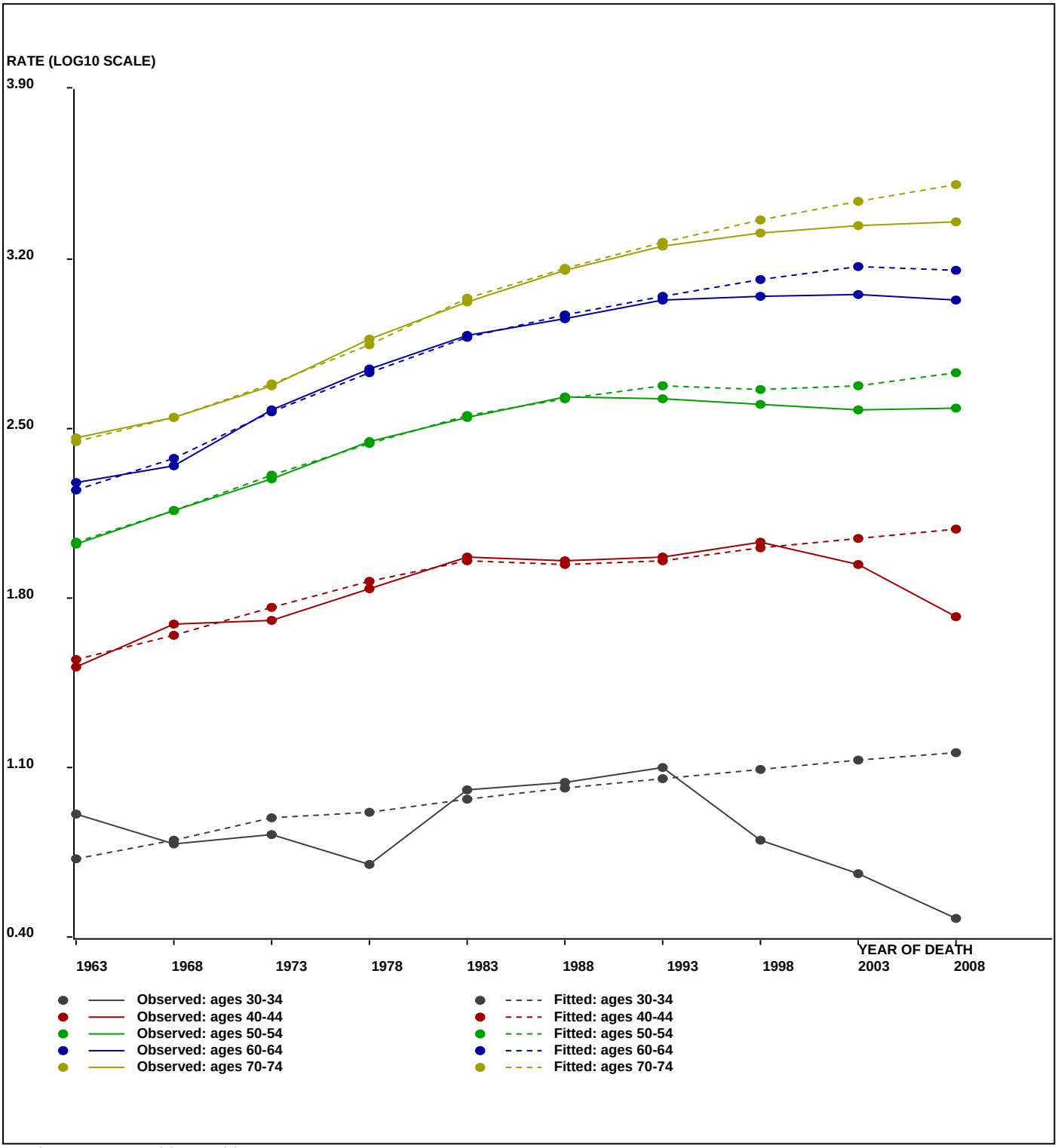


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	12.6	38.5	93.7	218.1	417.4	709.6	1070.1	1458.6	1778.3	1878.9
	PRE	11.4	35.0	90.3	206.0	470.6	762.9	1104.2	1518.2	1844.0	1947.9
	RES	1.216	3.553	3.409	12.071	-53.227	-53.296	-34.042	-59.582	-65.671	-69.049
1996-	OBS	6.4	34.4	107.3	207.5	396.0	733.6	1114.5	1590.6	2006.2	2248.7
	PRE	12.4	38.1	101.8	214.1	455.9	860.0	1298.7	1812.6	2284.8	2502.6
	RES	-6.061	-3.660	5.431	-6.554	-59.932	-126.436	-184.211	-222.000	-278.660	-253.905
2001-	OBS	4.6	24.0	87.6	218.6	378.5	664.3	1133.2	1628.6	2154.1	2525.3
	PRE	13.5	41.4	110.9	241.4	473.9	833.2	1464.0	2131.9	2727.8	3100.9
	RES	-8.908	-17.479	-23.248	-22.821	-95.406	-168.918	-330.859	-503.215	-573.621	-575.621
2006-	OBS	3.0	12.1	53.0	189.1	385.9	612.5	1068.6	1684.8	2251.4	2723.3
	PRE	14.7	45.1	120.7	262.7	534.3	866.0	1418.3	2403.2	3208.3	3702.1
	RES	-11.659	-33.020	-67.688	-73.628	-148.353	-253.511	-349.727	-718.453	-956.875	-978.824

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	82.0	237.0	519.0	1020.0	1517.0	2249.0	3272.0	4290.0	4473.0	3518.0
	PRE	74.1	215.1	500.1	963.5	1710.5	2417.9	3376.1	4465.2	4638.2	3647.3
	CHI	0.843	2.220	0.712	3.309	21.879	11.799	3.209	6.877	5.883	4.583
1996-	OBS	38.0	228.0	668.0	1155.0	1846.0	2648.0	3480.0	4681.0	5456.0	4936.0
	PRE	74.3	252.2	634.2	1191.5	2125.4	3104.4	4055.2	5334.3	6213.9	5493.3
	CHI	17.704	2.331	1.803	1.117	36.724	67.092	81.588	80.020	92.429	56.545
2001-	OBS	25.0	148.0	592.0	1370.0	2105.0	3073.0	4039.0	4915.0	5922.0	6080.0
	PRE	73.4	256.0	749.1	1513.1	2635.7	3854.4	5218.3	6433.6	7499.0	7465.9
	CHI	31.887	45.548	32.945	13.526	106.840	158.417	266.518	358.465	331.617	257.257
2006-	OBS	17.0	68.7	336.6	1296.1	2420.9	3388.9	4886.4	5833.9	6383.2	6740.9
	PRE	82.0	256.5	766.7	1800.8	3351.5	4791.6	6485.6	8321.7	9096.1	9163.8
	CHI	51.556	137.463	241.285	141.432	258.416	410.646	394.323	743.739	809.136	640.595

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	375.82	7.37	51	P, C	95.99	2037.43	0.0000
AGE-PERIOD	160.73	3.57	45	Cohort	90.63	879.41	0.0000
AGE-COHORT	52.55	1.46	36	Period	71.34	280.74	0.0000
PERIOD-COHORT	60.65	1.52	40	Age	75.17	324.62	0.0000
FULL AGE-PERIOD-COHORT	15.06	0.47	32			80.42	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.158516	14.405075
35	1.247411	17.677085
40	1.411308	25.781490
45	1.600468	39.853611
50	1.823681	66.631654
55	2.087414	122.296546
60	2.320666	209.250365
65	2.592051	390.886446
70	2.861129	726.321667
75	3.089054	1227.591834

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.089857	0.813098
1966	0.012978	1.030333
1971	0.064869	1.161098
1976	0.008114	1.018858
1981	-0.045746	0.900024
1986	0.008421	1.019580

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.299725	0.501505
1891	-0.279556	0.525345
1896	-0.232042	0.586081
1901	-0.158048	0.694947
1906	-0.051974	0.887210
1911	0.045912	1.111506
1916	0.114531	1.301761
1921	0.114185	1.300724
1926	0.107797	1.281731
1931	0.070728	1.176868
1936	-0.024304	0.945575
1941	-0.155768	0.698606
1946	-0.240361	0.574962
1951	-0.359323	0.437196
1956	-0.440450	0.362702

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	21.0	38.0	48.0	43.0	38.0	32.0
	EXP	42.6	43.3	41.9	38.6	30.3	32.0
	CHI	11.0	0.7	0.9	0.5	2.0	0.0
35 -	OBS	51.0	77.0	60.0	53.0	40.0	33.0
	EXP	58.7	67.0	61.3	45.5	41.8	42.9
	CHI	1.0	1.5	0.0	1.2	0.1	2.3
40 -	OBS	73.0	85.0	115.0	101.0	60.0	67.0
	EXP	81.0	107.6	110.8	79.1	58.6	70.0
	CHI	0.8	4.7	0.2	6.1	0.0	0.1
45 -	OBS	109.0	154.0	186.0	172.0	102.0	85.0
	EXP	109.1	156.2	186.7	149.4	107.2	102.8
	CHI	0.0	0.0	0.0	3.4	0.3	3.1
50 -	OBS	117.0	220.0	320.0	274.0	226.0	189.0
	EXP	135.2	226.6	292.9	272.3	219.3	202.9
	CHI	2.5	0.2	2.5	0.0	0.2	0.9
55 -	OBS	156.0	317.0	452.0	509.0	425.0	422.0
	EXP	162.5	308.0	459.0	464.2	436.8	454.4
	CHI	0.3	0.3	0.1	4.3	0.3	2.3
60 -	OBS	200.0	344.0	587.0	610.0	684.0	871.0
	EXP	181.4	342.5	583.7	672.5	686.6	834.0
	CHI	1.9	0.0	0.0	5.8	0.0	1.6
65 -	OBS	252.0	435.0	696.0	943.0	1070.0	1343.0
	EXP	240.5	411.4	695.9	919.8	1066.8	1407.3
	CHI	0.5	1.4	0.0	0.6	0.0	2.9
70 -	OBS	349.0	524.0	775.0	997.0	1341.0	2150.0
	EXP	327.9	514.3	787.1	1040.6	1388.4	2081.4
	CHI	1.4	0.2	0.2	1.8	1.6	2.3
75 -	OBS	377.0	553.0	797.0	958.0	1379.0	2332.0
	EXP	377.0	575.2	818.9	990.3	1332.3	2304.6
	CHI	0.0	0.9	0.6	1.1	1.6	0.3

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	8315.56	207.89	40	P, C	81.67	0.0000
AGE-PERIOD	21845.68	546.14	40	Cohort	93.02	0.0000
AGE-COHORT	3348.18	83.70	40	Period	54.49	0.0000
PERIOD-COHORT	4605.84	115.15	40	Age	66.91	0.0000
FULL AGE-PERIOD-COHORT	1523.92	38.10	40			0.0000

AGE	EFFECT
30	14.405075
35	17.677085
40	25.781490
45	39.853611
50	66.631654
55	122.296546
60	209.250365
65	390.886446
70	726.321667
75	1227.591834

PERIOD	EFFECT	LOWER	UPPER
% Period Change	113.2837	110.2837	116.2837
1961	0.813098		
1966	1.030333		
1971	1.161098		
1976	1.018858		
1981	0.900024		
1986	1.019580		
1991	1.155018	1.124430	1.185605
1996	1.308446	1.240063	1.378665
2001	1.482256	1.367587	1.603162
2006	1.679154	1.508225	1.864216

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.501505	1.000000	
1891	0.525345	2.000000	
1896	0.586081	4.000000	
1901	0.694947	8.000000	
1906	0.887210	16.000000	
1911	1.111506	32.000000	
1916	1.301761	64.000000	
1921	1.300724	128.000000	
1926	1.281731	256.000000	
1931	1.176868	512.000000	
1936	0.945575	1024.000000	
1941	0.698606	2048.000000	
1946	0.574962	4096.000000	
1951	0.437196	8192.000000	
1956	0.369422	EXTRAPOLATION	0.362702
1961	0.301358	EXTRAPOLATION	
1966	0.245834	EXTRAPOLATION	
1971	0.200540	EXTRAPOLATION	
1976	0.163591	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	6.8	12.3	13.4	9.4	7.1	5.3	3.7	4.0	3.1	3.2
	EXP	13.8	14.0	11.7	8.4	5.7	5.4	5.0*	4.6*	4.3*	4.0*
	Elow							4.9	4.4	4.0	3.6
	Eup							5.1	4.9	4.6	4.4
35	OBS	16.0	24.6	19.0	14.7	8.8	6.1	5.9	4.4	3.2	2.9
	EXP	18.4	21.4	19.4	12.6	9.1	7.9	7.5*	7.0*	6.4*	6.0*
	Elow							7.3	6.6	5.9	5.3
	Eup							7.7	7.3	7.0	6.6
40	OBS	24.6	26.9	36.6	31.7	16.6	14.5	10.1	7.7	7.8	6.1
	EXP	27.3	34.0	35.2	24.8	16.2	15.1	13.0*	12.5*	11.5*	10.6*
	Elow							12.7	11.8	10.6	9.6
	Eup							13.4	13.1	12.5	11.8
45	OBS	42.2	52.6	59.1	55.0	32.3	23.5	21.8	17.6	16.1	20.0
	EXP	42.2	53.4	59.3	47.8	33.9	28.4	26.5*	22.8*	21.8*	20.2*
	Elow							25.8	21.6	20.1	18.1
	Eup							27.2	24.0	23.6	22.4
50	OBS	52.1	86.8	109.9	87.6	72.7	59.8	51.5	51.3	37.4	47.6
	EXP	60.2	89.4	100.6	87.0	70.6	64.2	53.8*	50.1*	43.2*	41.3*
	Elow							52.3	47.5	39.8	37.1
	Eup							55.2	52.8	46.7	45.9
55	OBS	84.7	144.2	182.0	177.7	137.3	136.3	126.2	120.8	103.1	102.3
	EXP	88.2	140.1	184.8	162.1	141.1	146.7	133.6*	111.8*	104.2*	89.8*
	Elow							130.0	105.9	96.2	80.6
	Eup							137.1	117.8	112.7	99.7
60	OBS	130.3	192.1	271.6	251.7	244.1	285.6	292.4	261.0	253.3	241.2
	EXP	118.2	191.3	270.1	277.5	245.0	273.5	284.4*	258.9*	216.7*	202.0*
	Elow							276.9	245.4	199.9	181.5
	Eup							292.0	272.8	234.4	224.3
65	OBS	195.2	295.9	402.7	453.8	459.4	494.7	550.1	572.2	524.9	487.9
	EXP	186.3	279.9	402.7	442.7	458.0	518.4	578.7*	601.9*	547.9*	458.5*
	Elow							563.4	570.5	505.5	411.9
	Eup							594.0	634.2	592.5	509.1
70	OBS	330.2	446.9	577.1	629.0	701.8	995.8	998.3	1060.4	1039.6	964.6
	EXP	310.3	438.6	586.1	656.6	726.6	964.0	1091.2*	1218.1*	1267.0*	1153.2*
	Elow							1062.3	1154.4	1169.0	1035.8
	Eup							1120.1	1283.5	1370.4	1280.3
75	OBS	500.6	638.8	813.1	840.9	1014.6	1407.7	1729.9	1820.0	1720.8	1668.5
	EXP	500.6	664.5	835.4	869.2	980.2	1391.2	1845.8*	2089.3*	2332.2*	2425.9*
	Elow							1796.9	1980.1	2151.8	2179.0
	Eup							1894.6	2201.4	2522.5	2693.3
30-79	OBS	89.5	128.2	165.2	165.4	163.2	196.2	209.5	213.4	200.4	192.0
	EXP	89.6	128.1	165.1	165.5	163.5	197.1	222.6*	234.3*	235.9*	223.1*
	Elow							216.7	222.0	217.7	200.4
	Eup							228.5	246.8	255.2	247.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	21.0	38.0	48.0	43.0	38.0	32.0	24.0	24.0	17.0	18.1
	EXP	42.6	43.3	41.9	38.6	30.3	32.6	32.6*	27.7*	23.3*	22.1*
	CHI	10.953	0.653	0.898	0.504	1.965	0.011	2.258	0.498	1.680	0.715
35 -	OBS	51.0	77.0	60.0	53.0	40.0	33.0	36.0	29.0	20.0	16.3
	EXP	58.7	67.0	61.3	45.5	41.8	42.9	46.4*	46.2*	39.8*	33.8*
	CHI	1.008	1.492	0.027	1.244	0.077	2.266	2.329	6.394	9.844	9.097
40 -	OBS	73.0	85.0	115.0	101.0	60.0	67.0	56.0	48.0	53.0	38.5
	EXP	81.0	107.6	110.8	79.1	58.6	70.0	72.1*	77.6*	77.8*	67.6*
	CHI	0.789	4.736	0.161	6.094	0.035	0.125	3.587	11.289	7.916	12.544
45 -	OBS	109.0	154.0	186.0	172.0	102.0	85.0	102.0	98.0	101.0	137.0
	EXP	109.1	156.2	186.7	149.4	107.2	102.8	123.8*	126.9*	136.8*	138.2*
	CHI	0.000	0.032	0.003	3.428	0.256	3.068	3.839	6.574	9.367	0.011
50 -	OBS	117.0	220.0	320.0	274.0	226.0	189.0	187.0	239.0	208.0	298.7
	EXP	135.2	226.6	292.9	272.3	219.3	202.9	195.4*	233.7*	240.2*	259.3*
	CHI	2.452	0.189	2.499	0.011	0.204	0.948	0.362	0.121	4.309	5.991
55 -	OBS	156.0	317.0	452.0	509.0	425.0	422.0	400.0	436.0	477.0	566.0
	EXP	162.5	308.0	459.0	464.2	436.8	454.4	423.3*	403.5*	482.1*	496.8*
	CHI	0.262	0.265	0.106	4.333	0.317	2.309	1.283	2.616	0.055	9.646
60 -	OBS	200.0	344.0	587.0	610.0	684.0	871.0	894.0	815.0	903.0	1103.0
	EXP	181.4	342.5	583.7	672.5	686.6	834.0	869.7*	808.4*	772.3*	923.8*
	CHI	1.897	0.006	0.018	5.808	0.009	1.641	0.681	0.054	22.106	34.771
65 -	OBS	252.0	435.0	696.0	943.0	1070.0	1343.0	1618.0	1684.0	1584.0	1689.6
	EXP	240.5	411.4	695.9	919.8	1066.8	1407.3	1701.9*	1771.4*	1653.4*	1587.8*
	CHI	0.549	1.353	0.000	0.586	0.010	2.942	4.140	4.314	2.910	6.529
70 -	OBS	349.0	524.0	775.0	997.0	1341.0	2150.0	2511.0	2884.0	2858.0	2734.9
	EXP	327.9	514.3	787.1	1040.6	1388.4	2081.4	2744.7*	3312.8*	3483.2*	3269.6*
	CHI	1.357	0.184	0.185	1.828	1.621	2.260	19.905	55.496	112.203	87.454
75 -	OBS	377.0	553.0	797.0	958.0	1379.0	2332.0	3239.0	3995.0	4143.0	4130.1
	EXP	377.0	575.2	818.9	990.3	1332.3	2304.6	3456.0*	4586.1*	5615.2*	6004.8*
	CHI	0.000	0.856	0.584	1.052	1.637	0.326	13.626	76.176	385.961	585.268
30-79	OBS	1705.0	2747.0	4036.0	4660.0	5365.0	7524.0	9067.0	10252.0	10364.0	10732.2
	EXP	1716.0	2752.0	4038.2	4672.1	5368.0	7532.8	9665.9*	11394.2*	12524.0*	12803.8*
	O/E	0.994	0.998	0.999	0.997	0.999	0.999	0.938	0.900	0.828	0.838

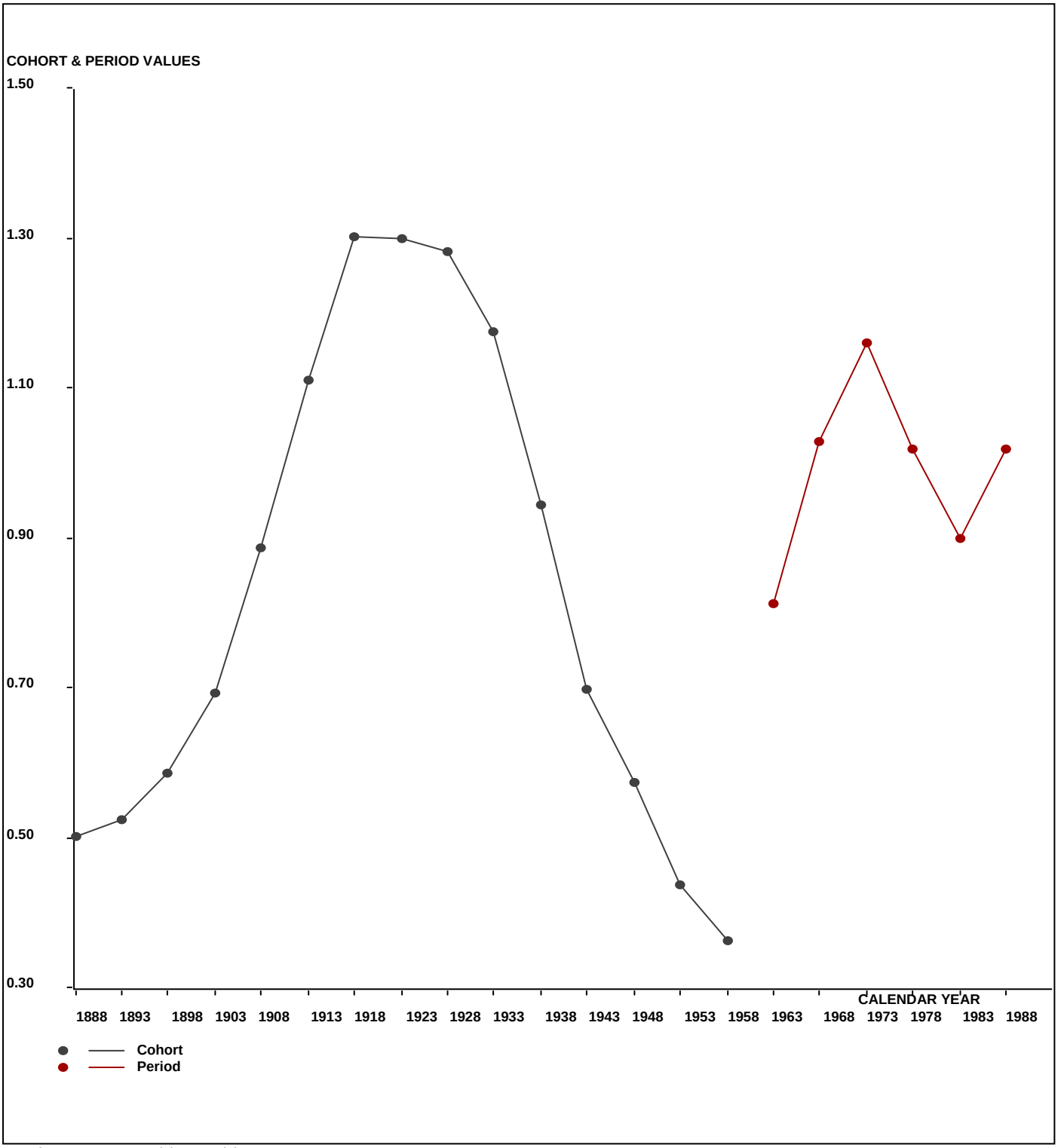
CHI SQUARE (LOG)= 1523.9197 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

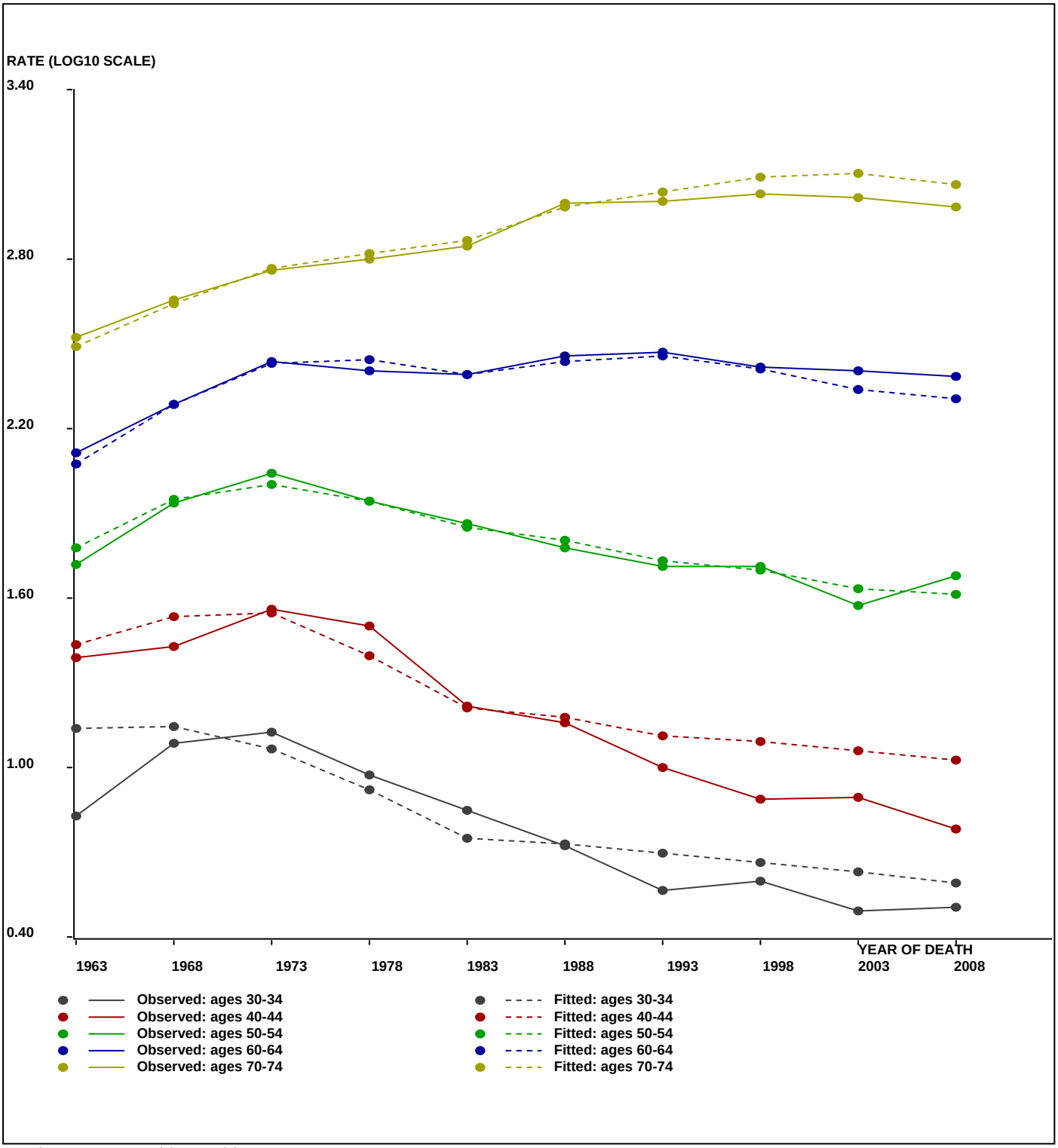


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Canada COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	3.7	5.9	10.1	21.8	51.5	126.2	292.4	550.1	998.3	1729.9
	PRE	5.0	7.5	13.0	26.5	53.8	133.6	284.4	578.7	1091.2	1845.8
	RES	-1.320	-1.690	-2.904	-4.661	-2.313	-7.353	7.959	-28.540	-92.926	-115.898
1996-	OBS	4.0	4.4	7.7	17.6	51.3	120.8	261.0	572.2	1060.4	1820.0
	PRE	4.6	7.0	12.5	22.8	50.1	111.8	258.9	601.9	1218.1	2089.3
	RES	-0.621	-2.594	-4.753	-5.189	1.143	9.001	2.117	-29.706	-157.658	-269.268
2001-	OBS	3.1	3.2	7.8	16.1	37.4	103.1	253.3	524.9	1039.6	1720.8
	PRE	4.3	6.4	11.5	21.8	43.2	104.2	216.7	547.9	1267.0	2332.2
	RES	-1.151	-3.204	-3.673	-5.711	-5.783	-1.113	36.658	-22.983	-227.403	-611.456
2006-	OBS	3.2	2.9	6.1	20.0	47.6	102.3	241.2	487.9	964.6	1668.5
	PRE	4.0	6.0	10.6	20.2	41.3	89.8	202.0	458.5	1153.2	2425.9
	RES	-0.712	-3.086	-4.584	-0.179	6.283	12.511	39.194	29.403	-188.607	-757.358

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	24.0	36.0	56.0	102.0	187.0	400.0	894.0	1618.0	2511.0	3239.0
	PRE	32.6	46.4	72.1	123.8	195.4	423.3	869.7	1701.9	2744.7	3456.0
	CHI	2.258	2.329	3.587	3.839	0.362	1.283	0.681	4.140	19.905	13.626
1996-	OBS	24.0	29.0	48.0	98.0	239.0	436.0	815.0	1684.0	2884.0	3995.0
	PRE	27.7	46.2	77.6	126.9	233.7	403.5	808.4	1771.4	3312.8	4586.1
	CHI	0.498	6.394	11.289	6.574	0.121	2.616	0.054	4.314	55.496	76.176
2001-	OBS	17.0	20.0	53.0	101.0	208.0	477.0	903.0	1584.0	2858.0	4143.0
	PRE	23.3	39.8	77.8	136.8	240.2	482.1	772.3	1653.4	3483.2	5615.2
	CHI	1.680	9.844	7.916	9.367	4.309	0.055	22.106	2.910	112.203	385.961
2006-	OBS	18.1	16.3	38.5	137.0	298.7	566.0	1103.0	1689.6	2734.9	4130.1
	PRE	22.1	33.8	67.6	138.2	259.3	496.8	923.8	1587.8	3269.6	6004.8
	CHI	0.715	9.097	12.544	0.011	5.991	9.646	34.771	6.529	87.454	585.268

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	879.50	17.25	51	P, C	91.42	4672.86	0.0000
AGE-PERIOD	262.40	5.83	45	Cohort	71.24	1392.31	0.0000
AGE-COHORT	310.20	8.62	36	Period	75.67	1645.80	0.0000
PERIOD-COHORT	96.74	2.42	40	Age	21.99	513.16	0.0000
FULL AGE-PERIOD-COHORT	75.46	2.36	32			400.31	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.695999	49.659067
35	2.112413	129.542767
40	2.467229	293.243902
45	2.740888	550.665343
50	2.970896	935.182640
55	3.181669	1519.388587
60	3.388537	2446.455699
65	3.585964	3854.461673
70	3.774446	5949.027651
75	3.944892	8808.295312

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.004966	1.011501
1966	0.004234	1.009796
1971	0.027301	1.064881
1976	0.018518	1.043561
1981	-0.003946	0.990956
1986	-0.057204	0.876589

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.042864	0.906016
1891	-0.020912	0.952989
1896	0.000741	1.001707
1901	0.022109	1.052225
1906	0.014983	1.035102
1911	-0.001177	0.997294
1916	-0.020257	0.954427
1921	0.022096	1.052194
1926	-0.017735	0.959987
1931	-0.010768	0.975510
1936	-0.058088	0.874806
1941	-0.065680	0.859646
1946	-0.019206	0.956740
1951	0.000872	1.002009
1956	0.010256	1.023896

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	509.0	338.0	281.0	494.0	499.0	468.0
	EXP	411.2	358.2	347.1	480.6	544.0	468.0
	CHI	23.3	1.1	12.6	0.4	3.7	0.0
35 -	OBS	1093.0	1117.0	902.0	936.0	1093.0	1287.0
	EXP	1088.6	1085.1	983.4	868.1	1168.0	1244.6
	CHI	0.0	0.9	6.7	5.3	4.8	1.4
40 -	OBS	2058.0	2485.0	2507.0	2240.0	1787.0	2359.0
	EXP	2174.3	2464.2	2559.0	2128.6	1816.7	2300.8
	CHI	6.2	0.2	1.1	5.8	0.5	1.5
45 -	OBS	2678.0	4006.0	4710.0	4778.0	3685.0	2952.0
	EXP	2920.7	4020.9	4752.7	4532.4	3665.9	2933.7
	CHI	20.2	0.1	0.4	13.3	0.1	0.1
50 -	OBS	6287.0	4616.0	7053.0	7871.0	7081.0	5241.0
	EXP	6711.8	4796.0	6919.6	7516.6	6955.9	5277.0
	CHI	26.9	6.8	2.6	16.7	2.3	0.2
55 -	OBS	10445.0	10287.0	7865.0	10861.0	10976.0	8952.0
	EXP	10812.7	10275.7	7700.3	10338.2	10860.9	9432.3
	CHI	12.5	0.0	3.5	26.4	1.2	24.5
60 -	OBS	15502.0	15888.0	15720.0	11086.0	14543.0	13758.0
	EXP	15170.4	15695.1	15841.5	11045.0	14531.2	14226.9
	CHI	7.2	2.4	0.9	0.2	0.0	15.5
65 -	OBS	16423.0	20833.0	22681.0	21003.0	14328.0	17542.0
	EXP	16158.7	20388.5	22425.6	21282.6	14469.2	18105.1
	CHI	4.3	9.7	2.9	3.7	1.4	17.5
70 -	OBS	16581.0	19639.0	26358.0	27084.0	25460.0	16799.0
	EXP	16182.6	19732.6	26390.8	27446.9	25719.7	16460.6
	CHI	9.8	0.4	0.0	4.8	2.6	7.0
75 -	OBS	15872.0	16320.0	21500.0	26838.0	28622.0	26788.0
	EXP	15872.0	16728.3	21673.7	27600.3	28352.2	25751.6
	CHI	0.0	10.0	1.4	21.1	2.6	41.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	126995.62	3174.89	40	P, C	93.28	0.0000
AGE-PERIOD	8696.52	217.41	40	Cohort	1.83	0.0000
AGE-COHORT	61217.88	1530.45	40	Period	86.05	0.0000
PERIOD-COHORT	9965.34	249.13	40	Age	14.33	0.0000
FULL AGE-PERIOD-COHORT	8537.64	213.44	40			0.0000

AGE	EFFECT
30	49.659067
35	129.542767
40	293.243902
45	550.665343
50	935.182640
55	1519.388587
60	2446.455699
65	3854.461673
70	5949.027651
75	8808.295312

PERIOD	EFFECT	LOWER	UPPER
% Period Change	88.4590	85.4590	91.4590
1961	1.011501		
1966	1.009796		
1971	1.064881		
1976	1.043561		
1981	0.990956		
1986	0.876589		
1991	0.775422	0.749124	0.801720
1996	0.685931	0.640194	0.733245
2001	0.606767	0.547104	0.670618
2006	0.536740	0.467549	0.613341

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.906016	1.000000	
1891	0.952989	2.000000	
1896	1.001707	4.000000	
1901	1.052225	8.000000	
1906	1.035102	16.000000	
1911	0.997294	32.000000	
1916	0.954427	64.000000	
1921	1.052194	128.000000	
1926	0.959987	256.000000	
1931	0.975510	512.000000	
1936	0.874806	1024.000000	
1941	0.859646	2048.000000	
1946	0.956740	4096.000000	
1951	1.002009	8192.000000	
1956	1.002075	EXTRAPOLATION	1.023896
1961	1.022606	EXTRAPOLATION	
1966	1.043559	EXTRAPOLATION	
1971	1.064940	EXTRAPOLATION	
1976	1.086760	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	60.7	41.4	36.8	51.0	45.2	44.6	29.8	23.2	20.3	18.0
	EXP	49.0	43.9	45.5	49.6	49.3	43.6	39.4*	35.5*	32.1*	29.0*
	Elow							38.0	33.2	28.9	25.2
	Eup							40.7	38.0	35.5	33.1
35	OBS	126.3	131.4	110.7	125.3	114.9	117.7	100.6	79.9	63.8	51.8
	EXP	125.8	127.6	120.7	116.2	122.8	113.8	100.7*	90.9*	82.0*	74.0*
	Elow							97.2	84.8	74.0	64.5
	Eup							104.1	97.1	90.7	84.6
40	OBS	295.4	286.7	298.4	281.7	245.7	252.2	212.0	201.3	156.5	118.1
	EXP	312.1	284.3	304.6	267.7	249.8	245.9	227.8*	201.6*	182.0*	164.3*
	Elow							220.1	188.1	164.1	143.1
	Eup							235.6	215.5	201.1	187.7
45	OBS	487.4	582.9	557.9	591.0	479.9	417.5	358.6	346.2	299.8	243.0
	EXP	531.6	585.1	562.9	560.6	477.4	415.0	408.5*	378.5*	334.8*	302.2*
	Elow							394.7	353.2	301.9	263.3
	Eup							422.4	404.6	370.1	345.4
50	OBS	883.7	867.5	1068.0	981.0	920.3	712.2	575.9	536.2	475.4	397.8
	EXP	943.4	901.3	1047.8	936.9	904.0	717.1	623.4*	613.7*	568.6*	503.0*
	Elow							602.2	572.8	512.7	438.2
	Eup							644.5	656.1	628.4	574.8
55	OBS	1536.7	1531.8	1577.3	1752.7	1460.7	1233.1	913.5	810.3	682.9	613.6
	EXP	1590.8	1530.1	1544.2	1668.3	1445.4	1299.3	1030.7*	895.9*	882.0*	817.2*
	Elow							995.7	836.2	795.3	711.8
	Eup							1065.6	957.7	974.9	933.8
60	OBS	2660.7	2588.6	2578.2	2445.7	2552.9	1990.9	1626.0	1328.1	1045.0	836.8
	EXP	2603.8	2557.1	2598.1	2436.7	2550.9	2058.7	1850.6*	1468.0*	1276.1*	1256.3*
	Elow							1787.8	1370.1	1150.6	1094.4
	Eup							1913.3	1569.3	1410.4	1435.6
65	OBS	3969.3	4184.8	4297.0	3958.8	3610.0	3444.6	2609.3	2223.6	1674.1	1270.7
	EXP	3905.4	4095.5	4248.6	4011.5	3645.5	3555.1	2869.2*	2579.1*	2046.0*	1778.5*
	Elow							2771.9	2407.2	1844.8	1549.2
	Eup							2966.6	2757.1	2261.3	2032.3
70	OBS	5875.7	5989.0	6657.6	6341.1	5819.9	5079.5	4556.2	3582.0	2971.4	1988.0
	EXP	5734.6	6017.6	6665.9	6426.1	5879.3	4977.2	4853.8*	3917.3*	3521.3*	2793.3*
	Elow							4689.2	3656.1	3175.0	2433.2
	Eup							5018.4	4187.6	3891.8	3192.0
75	OBS	8072.2	8269.6	9320.5	9404.9	9121.0	8010.3	6752.4	6264.6	4868.8	3695.8
	EXP	8072.2	8476.4	9395.8	9672.1	9035.0	7700.4	6518.9*	6357.2*	5130.7*	4612.0*
	Elow							6297.8	5933.3	4626.2	4017.5
	Eup							6740.0	6795.7	5670.6	5270.2
30-79	OBS	1548.1	1577.2	1684.7	1647.7	1533.0	1330.9	1093.8	945.1	759.7	583.7
	EXP	1550.3	1580.9	1683.8	1643.2	1533.5	1334.4	1169.3*	1031.6*	892.3*	789.3*
	Elow							1129.6	962.8	804.6	687.5
	Eup							1209.0	1102.8	986.2	901.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	509.0	338.0	281.0	494.0	499.0	468.0	319.0	252.0	223.0	175.8
	EXP	411.2	358.2	347.1	480.6	544.0	458.0	421.4*	386.5*	352.9*	282.6*
	CHI	23.256	1.144	12.598	0.371	3.722	0.217	24.866	46.801	47.793	40.339
35 -	OBS	1093.0	1117.0	902.0	936.0	1093.0	1287.0	1055.0	851.0	700.0	577.5
	EXP	1088.6	1085.1	983.4	868.1	1168.0	1244.6	1056.0*	967.6*	899.5*	825.3*
	CHI	0.018	0.939	6.730	5.316	4.811	1.443	0.001	14.053	44.244	74.392
40 -	OBS	2058.0	2485.0	2507.0	2240.0	1787.0	2359.0	2295.0	2082.0	1661.0	1299.6
	EXP	2174.3	2464.2	2559.0	2128.6	1816.7	2300.8	2466.2*	2084.7*	1930.8*	1807.2*
	CHI	6.222	0.175	1.056	5.831	0.487	1.474	11.878	0.004	37.692	142.590
45 -	OBS	2678.0	4006.0	4710.0	4778.0	3685.0	2952.0	3292.0	3665.0	3059.0	2558.6
	EXP	2920.7	4020.9	4752.7	4532.4	3665.9	2933.7	3750.7*	4006.4*	3416.1*	3182.7*
	CHI	20.160	0.055	0.383	13.305	0.100	0.114	56.091	29.087	37.329	122.371
50 -	OBS	6287.0	4616.0	7053.0	7871.0	7081.0	5241.0	3952.0	4782.0	4929.0	3985.8
	EXP	6711.8	4796.0	6919.6	7516.6	6955.9	5277.0	4278.0*	5473.4*	5895.3*	5039.7*
	CHI	26.886	6.757	2.573	16.710	2.250	0.246	24.847	87.339	158.394	220.376
55 -	OBS	10445.0	10287.0	7865.0	10861.0	10976.0	8952.0	6419.0	5338.0	5921.0	6186.6
	EXP	10812.7	10275.7	7700.3	10338.2	10860.9	9432.3	7242.7*	5901.7*	7647.2*	8238.9*
	CHI	12.506	0.012	3.524	26.441	1.220	24.457	93.673	53.846	389.669	511.224
60 -	OBS	15502.0	15888.0	15720.0	11086.0	14543.0	13758.0	11002.0	8730.0	6551.0	6956.0
	EXP	15170.4	15695.1	15841.5	11045.0	14531.2	14226.9	12521.4*	9649.9*	7999.8*	10443.4*
	CHI	7.248	2.370	0.931	0.152	0.010	15.457	184.374	87.691	262.380	1164.583
65 -	OBS	16423.0	20833.0	22681.0	21003.0	14328.0	17542.0	16237.0	13598.0	10146.0	7425.8
	EXP	16158.7	20388.5	22425.6	21282.6	14469.2	18105.1	17854.7*	15772.3*	12399.9*	10393.4*
	CHI	4.323	9.690	2.908	3.673	1.378	17.516	146.564	299.732	409.687	847.336
70 -	OBS	16581.0	19639.0	26358.0	27084.0	25460.0	16799.0	20046.0	19172.0	16012.0	10804.9
	EXP	16182.6	19732.6	26390.8	27446.9	25719.7	16460.6	21355.5*	20967.1*	18975.4*	15182.1*
	CHI	9.807	0.444	0.041	4.798	2.622	6.956	80.294	153.693	462.789	1262.005
75 -	OBS	15872.0	16320.0	21500.0	26838.0	28622.0	26788.0	17419.0	22264.0	21240.0	16709.9
	EXP	15872.0	16728.3	21673.7	27600.3	28352.2	25751.6	16816.6*	22593.2*	22382.5*	20852.3*
	CHI	0.000	9.964	1.393	21.056	2.567	41.709	21.577	4.796	58.322	822.916
30-79	OBS	87448.0	95529.0	109577.0	113191.0	108074.0	96146.0	82036.0	80734.0	70442.0	56680.5
	EXP	87503.0	95544.8	109593.6	113239.4	108083.7	96190.8	87763.0*	87802.8*	81899.4*	76247.6*
	O/E	0.999	1.000	1.000	1.000	1.000	1.000	0.935	0.919	0.860	0.743

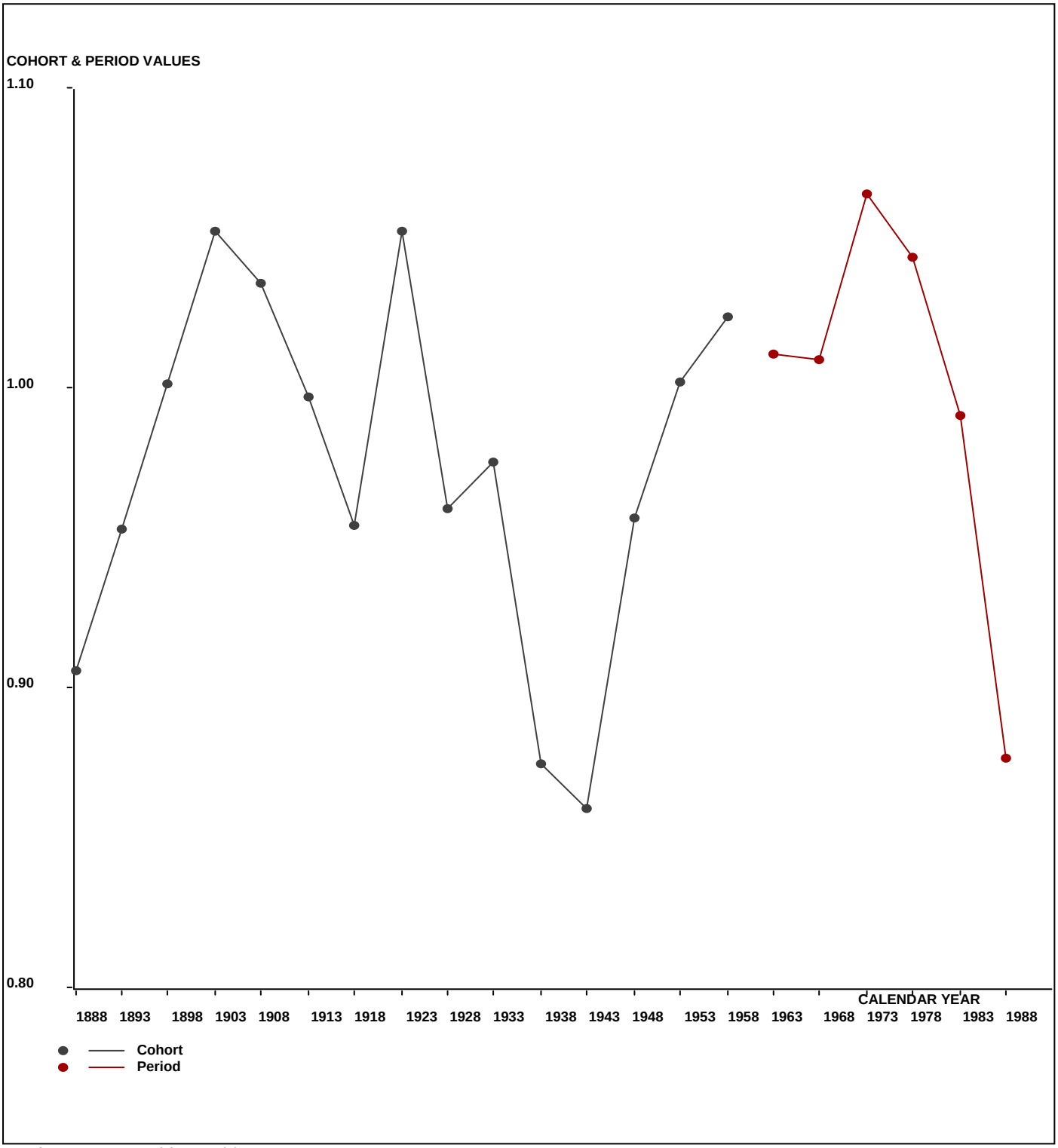
CHI SQUARE (LOG)= 8537.6386 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

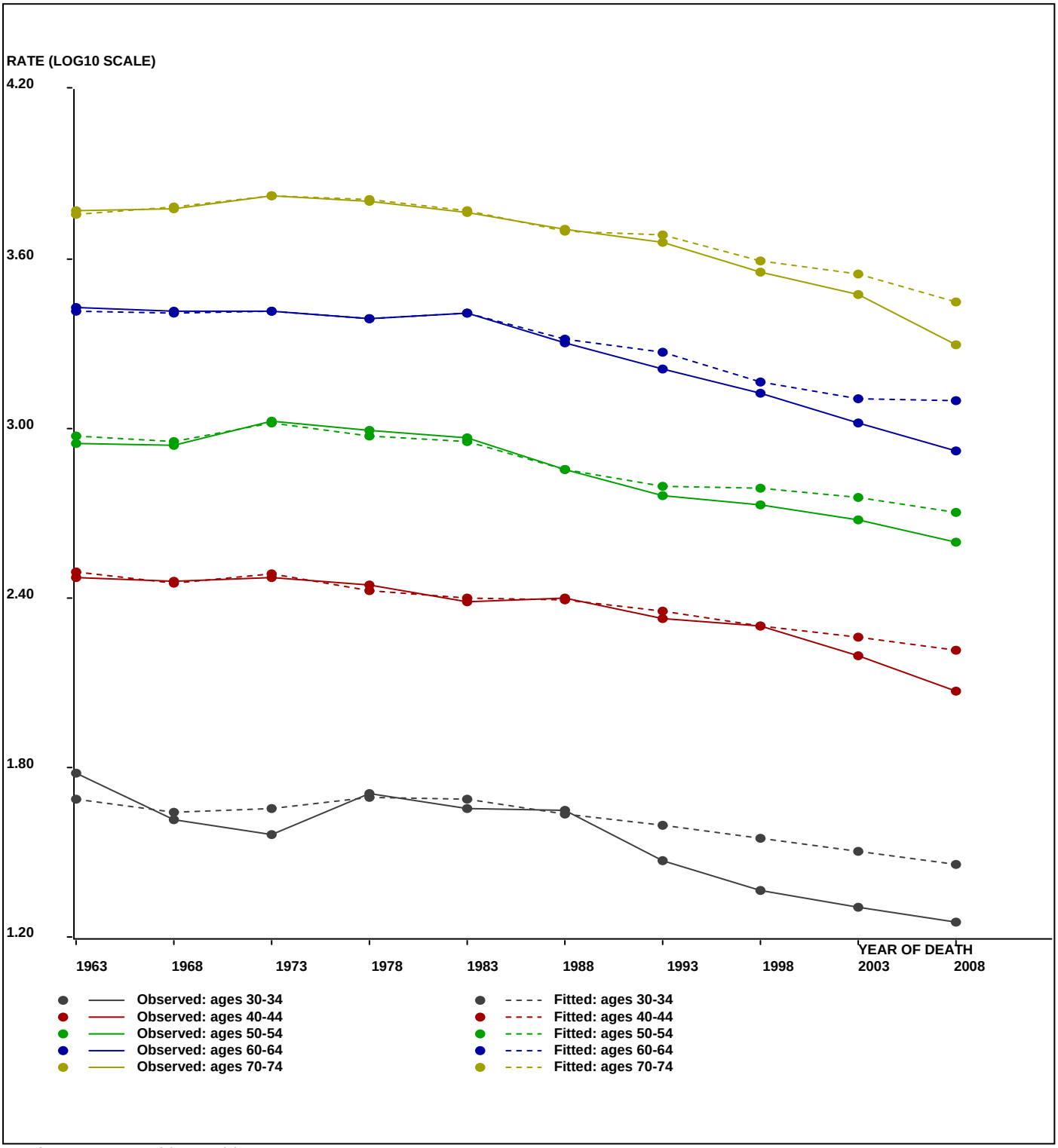


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	29.8	100.6	212.0	358.6	575.9	913.5	1626.0	2609.3	4556.2	6752.4
	PRE	39.4	100.7	227.8	408.5	623.4	1030.7	1850.6	2869.2	4853.8	6518.9
	RES	-9.566	-0.091	-15.813	-49.959	-47.508	-117.213	-224.559	-259.959	-297.623	233.509
1996-	OBS	23.2	79.9	201.3	346.2	536.2	810.3	1328.1	2223.6	3582.0	6264.6
	PRE	35.5	90.9	201.6	378.5	613.7	895.9	1468.0	2579.1	3917.3	6357.2
	RES	-12.370	-10.951	-0.265	-32.249	-77.526	-85.577	-139.941	-355.545	-335.389	-92.619
2001-	OBS	20.3	63.8	156.5	299.8	475.4	682.9	1045.0	1674.1	2971.4	4868.8
	PRE	32.1	82.0	182.0	334.8	568.6	882.0	1276.1	2046.0	3521.3	5130.7
	RES	-11.809	-18.192	-25.422	-35.000	-93.198	-199.104	-231.103	-371.890	-549.916	-261.904
2006-	OBS	18.0	51.8	118.1	243.0	397.8	613.6	836.8	1270.7	1988.0	3695.8
	PRE	29.0	74.0	164.3	302.2	503.0	817.2	1256.3	1778.5	2793.3	4612.0
	RES	-10.945	-22.231	-46.137	-59.266	-105.182	-203.552	-419.526	-507.804	-805.353	-916.196

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	319.0	1055.0	2295.0	3292.0	3952.0	6419.0	11002.0	16237.0	20046.0	17419.0
	PRE	421.4	1056.0	2466.2	3750.7	4278.0	7242.7	12521.4	17854.7	21355.5	16816.6
	CHI	24.866	0.001	11.878	56.091	24.847	93.673	184.374	146.564	80.294	21.577
1996-	OBS	252.0	851.0	2082.0	3665.0	4782.0	5338.0	8730.0	13598.0	19172.0	22264.0
	PRE	386.5	967.6	2084.7	4006.4	5473.4	5901.7	9649.9	15772.3	20967.1	22593.2
	CHI	46.801	14.053	0.004	29.087	87.339	53.846	87.691	299.732	153.693	4.796
2001-	OBS	223.0	700.0	1661.0	3059.0	4929.0	5921.0	6551.0	10146.0	16012.0	21240.0
	PRE	352.9	899.5	1930.8	3416.1	5895.3	7647.2	7999.8	12399.9	18975.4	22382.5
	CHI	47.793	44.244	37.692	37.329	158.394	389.669	262.380	409.687	462.789	58.322
2006-	OBS	175.8	577.5	1299.6	2558.6	3985.8	6186.6	6956.0	7425.8	10804.9	16709.9
	PRE	282.6	825.3	1807.2	3182.7	5039.7	8238.9	10443.4	10393.4	15182.1	20852.3
	CHI	40.339	74.392	142.590	122.371	220.376	511.224	1164.583	847.336	1262.005	822.916

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	8065.49	158.15	51	P, C	99.72	43597.69	0.0000
AGE-PERIOD	261.26	5.81	45	Cohort	91.50	1388.10	0.0000
AGE-COHORT	609.82	16.94	36	Period	96.36	3237.35	0.0000
PERIOD-COHORT	89.75	2.24	40	Age	75.25	476.08	0.0000
FULL AGE-PERIOD-COHORT	22.21	0.69	32			117.80	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.658981	45.601707
35	1.944384	87.980011
40	2.233321	171.127791
45	2.516154	328.211561
50	2.769585	588.281036
55	3.000538	1001.240302
60	3.251210	1783.239902
65	3.507774	3219.393588
70	3.781422	6045.352449
75	4.050990	11245.801673

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.074653	1.187552
1966	0.073391	1.184107
1971	0.063698	1.157973
1976	-0.022369	0.949798
1981	-0.102486	0.789793
1986	-0.214868	0.609721

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.031569	1.075396
1891	0.039200	1.094460
1896	0.034458	1.082575
1901	0.036978	1.088875
1906	0.004503	1.010423
1911	-0.035458	0.921600
1916	-0.073578	0.844155
1921	-0.050477	0.890272
1926	-0.083966	0.824203
1931	-0.055000	0.881050
1936	-0.068106	0.854858
1941	-0.037793	0.916657
1946	0.018025	1.042376
1951	0.082135	1.208188
1956	0.105235	1.274192

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	394.0	362.0	375.0	455.0	478.0	372.0
	EXP	400.4	377.0	369.6	437.7	480.1	372.0
	CHI	0.1	0.6	0.1	0.7	0.0	0.0
35 -	OBS	716.0	739.0	722.0	612.0	702.0	711.0
	EXP	745.2	780.5	709.7	572.2	688.8	708.9
	CHI	1.1	2.2	0.2	2.8	0.3	0.0
40 -	OBS	1149.0	1390.0	1572.0	1155.0	934.0	986.0
	EXP	1260.5	1447.8	1466.6	1104.8	901.0	1017.5
	CHI	9.9	2.3	7.6	2.3	1.2	1.0
45 -	OBS	1743.0	2491.0	2632.0	2313.0	1647.0	1214.0
	EXP	1807.6	2377.8	2644.7	2220.6	1701.7	1296.9
	CHI	2.3	5.4	0.1	3.8	1.8	5.3
50 -	OBS	4540.0	2967.0	4175.0	3773.0	3090.0	2261.0
	EXP	4580.7	3129.0	4004.9	3694.8	3149.7	2256.3
	CHI	0.4	8.4	7.2	1.7	1.1	0.0
55 -	OBS	8102.0	7370.0	4878.0	5293.0	4981.0	3806.0
	EXP	8166.0	7337.7	4880.4	5246.3	4897.4	3904.7
	CHI	0.5	0.1	0.0	0.4	1.4	2.5
60 -	OBS	13429.0	13218.0	11459.0	6469.0	7245.0	6127.0
	EXP	13434.6	13095.3	11603.4	6480.8	7142.7	6192.8
	CHI	0.0	1.2	1.8	0.0	1.5	0.7
65 -	OBS	17288.0	20827.0	19833.0	15022.0	8503.0	8560.0
	EXP	17124.6	20664.4	19882.6	14950.9	8519.1	8899.7
	CHI	1.6	1.3	0.1	0.3	0.0	13.0
70 -	OBS	22323.0	25397.0	30235.0	24604.0	18979.0	10539.0
	EXP	22172.9	25411.8	30178.3	24780.0	19249.5	10290.5
	CHI	1.0	0.0	0.1	1.3	3.8	6.0
75 -	OBS	28239.0	28611.0	32370.0	32974.0	28327.0	21479.0
	EXP	28239.0	28762.0	32519.7	33189.1	28162.1	21132.8
	CHI	0.0	0.8	0.7	1.4	1.0	5.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	244059.41	6101.49	40	P, C	99.23	0.0000
AGE-PERIOD	8126.94	203.17	40	Cohort	76.82	0.0000
AGE-COHORT	18119.04	452.98	40	Period	89.60	0.0000
PERIOD-COHORT	1682.10	42.05	40	Age	-12.02	0.0000
FULL AGE-PERIOD-COHORT	1884.22	47.11	40			0.0000

AGE	EFFECT
30	45.601707
35	87.980011
40	171.127791
45	328.211561
50	588.281036
55	1001.240302
60	1783.239902
65	3219.393588
70	6045.352449
75	11245.801673

PERIOD	EFFECT	LOWER	UPPER
% Period Change	77.2001	74.2001	80.2001
1961	1.187552		
1966	1.184107		
1971	1.157973		
1976	0.949798		
1981	0.789793		
1986	0.609721		
1991	0.470706	0.452414	0.488997
1996	0.363385	0.335692	0.392176
2001	0.280534	0.249084	0.314526
2006	0.216573	0.184820	0.252250

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.075396	1.000000	
1891	1.094460	2.000000	
1896	1.082575	4.000000	
1901	1.088875	8.000000	
1906	1.010423	16.000000	
1911	0.921600	32.000000	
1916	0.844155	64.000000	
1921	0.890272	128.000000	
1926	0.824203	256.000000	
1931	0.881050	512.000000	
1936	0.854858	1024.000000	
1941	0.916657	2048.000000	
1946	1.042376	4096.000000	
1951	1.208188	8192.000000	
1956	1.263984	EXTRAPOLATION	1.274192
1961	1.368365	EXTRAPOLATION	
1966	1.481366	EXTRAPOLATION	
1971	1.603698	EXTRAPOLATION	
1976	1.736133	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	46.9	44.3	49.1	46.9	43.3	35.4	29.2	24.5	17.0	15.1
	EXP	47.7	46.2	48.4	45.1	43.5	35.1	29.4*	24.5*	20.5*	17.1*
	Elow							28.2	22.7	18.2	14.6
	Eup							30.5	26.5	23.0	20.0
35	OBS	82.7	86.9	88.6	81.9	73.8	65.0	56.3	42.9	31.7	24.0
	EXP	86.1	91.8	87.1	76.6	72.4	64.8	52.3*	43.7*	36.6*	30.6*
	Elow							50.3	40.4	32.5	26.1
	Eup							54.4	47.2	41.0	35.6
40	OBS	164.9	160.3	187.1	145.3	128.4	105.4	96.0	86.0	64.2	50.7
	EXP	180.9	167.0	174.6	138.9	123.9	108.8	97.3*	78.6*	65.7*	54.9*
	Elow							93.5	72.6	58.3	46.9
	Eup							101.1	84.8	73.7	63.9
45	OBS	317.3	362.5	311.7	286.1	214.5	171.7	147.8	130.3	107.2	91.9
	EXP	329.0	346.0	313.2	274.7	221.6	183.4	161.0*	144.1*	116.4*	97.3*
	Elow							154.8	133.1	103.3	83.0
	Eup							167.3	155.5	130.5	113.3
50	OBS	638.1	557.6	632.2	470.3	401.6	307.3	232.9	201.9	174.6	153.2
	EXP	643.8	588.0	606.5	460.5	409.4	306.6	253.8*	222.8*	199.4*	161.0*
	Elow							244.0	205.8	177.0	137.4
	Eup							263.7	240.5	223.6	187.6
55	OBS	1192.0	1097.4	978.2	854.2	662.9	524.3	385.5	325.0	261.8	230.2
	EXP	1201.4	1092.6	978.7	846.6	651.8	537.9	402.9*	333.5*	292.8*	262.0*
	Elow							387.2	308.1	260.0	223.6
	Eup							418.5	359.9	328.3	305.1
60	OBS	2304.9	2153.5	1879.4	1427.2	1271.8	886.6	710.0	569.6	431.8	358.3
	EXP	2305.9	2133.6	1903.1	1429.8	1253.9	896.1	739.5*	554.0*	458.6*	402.6*
	Elow							710.8	511.7	407.2	343.5
	Eup							768.3	597.8	514.1	468.9
65	OBS	4178.4	4183.6	3757.4	2831.4	2142.3	1680.8	1200.4	1107.9	840.7	617.1
	EXP	4138.9	4150.9	3766.8	2818.0	2146.4	1747.5	1249.0*	1030.7*	772.1*	639.1*
	Elow							1200.5	952.2	685.5	545.4
	Eup							1297.5	1112.4	865.6	744.4
70	OBS	7910.5	7744.9	7636.8	5760.5	4338.4	3186.7	2557.9	2046.9	1691.1	1221.1
	EXP	7857.3	7749.4	7622.5	5801.7	4400.3	3111.5	2533.3*	1810.6*	1494.2*	1119.2*
	Elow							2434.9	1672.6	1326.7	955.1
	Eup							2631.8	1954.1	1675.2	1303.6
75	OBS	14361.9	14497.6	14032.7	11555.2	9027.0	6422.7	4776.6	4201.5	3190.2	2461.0
	EXP	14361.9	14574.1	14097.7	11630.5	8974.4	6319.2	4468.5*	3638.1*	2600.2*	2145.8*
	Elow							4294.9	3360.9	2308.7	1831.2
	Eup							4642.2	3926.4	2915.3	2499.3
30-79	OBS	1756.3	1723.6	1639.2	1294.4	1018.3	754.6	578.7	494.1	387.4	301.3
	EXP	1756.4	1725.4	1638.7	1293.4	1018.4	755.7	578.3*	458.2*	361.6*	296.7*
	Elow							555.8	423.2	321.1	253.2
	Eup							600.8	494.5	405.5	345.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	394.0	362.0	375.0	455.0	478.0	372.0	312.0	266.0	187.0	147.2
	EXP	400.4	377.0	369.6	437.7	480.1	369.0	314.3*	266.9*	225.6*	167.3*
	CHI	0.102	0.594	0.078	0.686	0.009	0.024	0.017	0.003	6.606	2.405
35 -	OBS	716.0	739.0	722.0	612.0	702.0	711.0	591.0	457.0	348.0	267.2
	EXP	745.2	780.5	709.7	572.2	688.8	708.9	549.1*	465.9*	400.9*	340.6*
	CHI	1.147	2.204	0.214	2.772	0.253	0.006	3.194	0.168	6.990	15.807
40 -	OBS	1149.0	1390.0	1572.0	1155.0	934.0	986.0	1039.0	890.0	681.0	557.5
	EXP	1260.5	1447.8	1466.6	1104.8	901.0	1017.5	1053.4*	813.0*	697.1*	604.1*
	CHI	9.855	2.305	7.569	2.282	1.208	0.975	0.196	7.300	0.371	3.591
45 -	OBS	1743.0	2491.0	2632.0	2313.0	1647.0	1214.0	1357.0	1379.0	1094.0	968.2
	EXP	1807.6	2377.8	2644.7	2220.6	1701.7	1296.9	1478.5*	1525.3*	1187.4*	1024.2*
	CHI	2.312	5.388	0.061	3.841	1.758	5.298	9.982	14.040	7.349	3.063
50 -	OBS	4540.0	2967.0	4175.0	3773.0	3090.0	2261.0	1598.0	1801.0	1810.0	1534.6
	EXP	4580.7	3129.0	4004.9	3694.8	3149.7	2256.3	1741.9*	1987.3*	2067.4*	1613.5*
	CHI	0.362	8.388	7.225	1.655	1.132	0.010	11.892	17.465	32.045	3.859
55 -	OBS	8102.0	7370.0	4878.0	5293.0	4981.0	3806.0	2709.0	2141.0	2270.0	2321.4
	EXP	8166.0	7337.7	4880.4	5246.3	4897.4	3904.7	2831.1*	2197.0*	2538.4*	2641.4*
	CHI	0.502	0.142	0.001	0.416	1.428	2.496	5.270	1.426	28.388	38.776
60 -	OBS	13429.0	13218.0	11459.0	6469.0	7245.0	6127.0	4804.0	3744.0	2707.0	2978.5
	EXP	13434.6	13095.3	11603.4	6480.8	7142.7	6192.8	5003.9*	3641.4*	2874.8*	3346.5*
	CHI	0.002	1.150	1.796	0.022	1.466	0.699	7.983	2.893	9.789	40.459
65 -	OBS	17288.0	20827.0	19833.0	15022.0	8503.0	8560.0	7470.0	6775.0	5095.0	3606.6
	EXP	17124.6	20664.4	19882.6	14950.9	8519.1	8899.7	7772.2*	6303.2*	4679.2*	3735.0*
	CHI	1.559	1.279	0.123	0.338	0.030	12.965	11.748	35.317	36.944	4.416
70 -	OBS	22323.0	25397.0	30235.0	24604.0	18979.0	10539.0	11254.0	10956.0	9113.0	6636.9
	EXP	22172.9	25411.8	30178.3	24780.0	19249.5	10290.5	11146.1*	9691.0*	8051.9*	6083.2*
	CHI	1.016	0.009	0.107	1.251	3.802	6.000	1.045	165.111	139.838	50.407
75 -	OBS	28239.0	28611.0	32370.0	32974.0	28327.0	21479.0	12322.0	14932.0	13917.0	11126.9
	EXP	28239.0	28762.0	32519.7	33189.1	28162.1	21132.8	11527.3*	12929.7*	11343.3*	9702.0*
	CHI	0.000	0.793	0.689	1.394	0.966	5.670	54.785	310.067	583.944	209.274
30-79	OBS	97923.0	103372.0	108251.0	92670.0	74886.0	56055.0	43456.0	43341.0	37222.0	30145.0
	EXP	97931.6	103383.2	108259.8	92677.2	74892.0	56069.2	43417.8*	39820.7*	34066.0*	29257.7*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	1.001	1.088	1.093	1.030

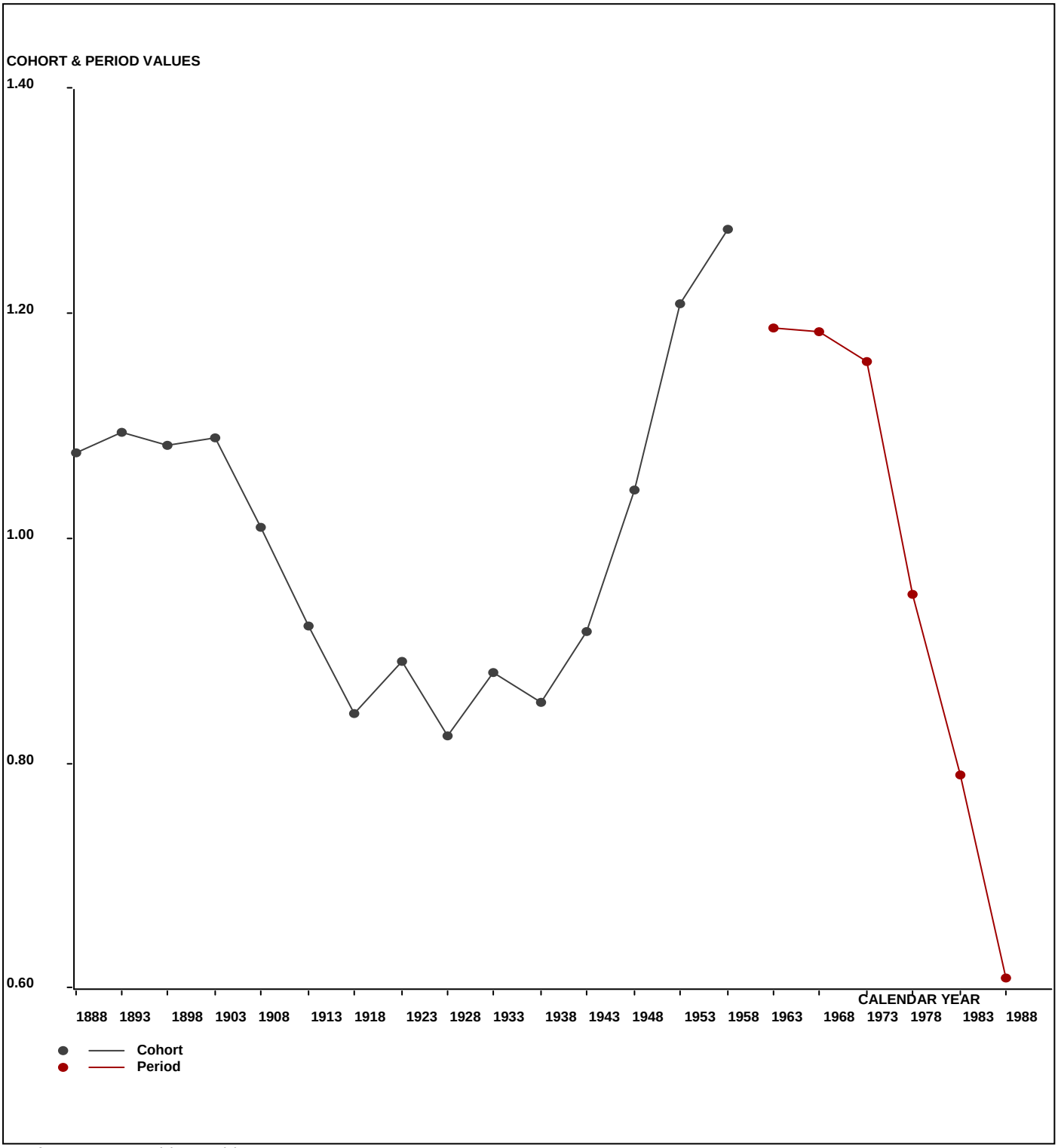
CHI SQUARE (LOG)= 1884.2225 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

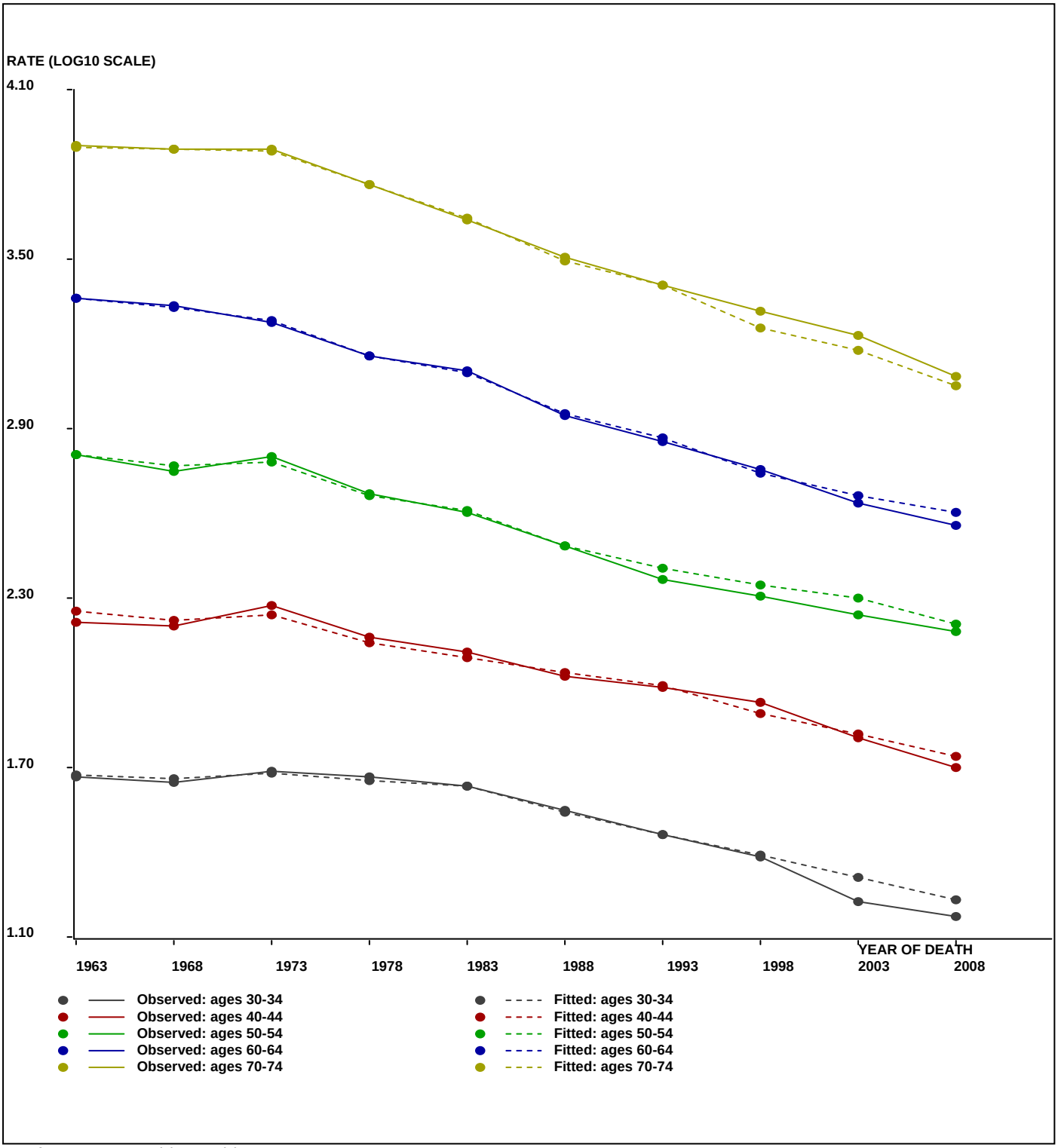


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	29.2	56.3	96.0	147.8	232.9	385.5	710.0	1200.4	2557.9	4776.6
	PRE	29.4	52.3	97.3	161.0	253.8	402.9	739.5	1249.0	2533.3	4468.5
	RES	-0.215	3.992	-1.329	-13.232	-20.973	-17.382	-29.539	-48.558	24.525	308.057
1996-	OBS	24.5	42.9	86.0	130.3	201.9	325.0	569.6	1107.9	2046.9	4201.5
	PRE	24.5	43.7	78.6	144.1	222.8	333.5	554.0	1030.7	1810.6	3638.1
	RES	-0.083	-0.832	7.448	-13.825	-20.890	-8.495	15.613	77.153	236.334	563.395
2001-	OBS	17.0	31.7	64.2	107.2	174.6	261.8	431.8	840.7	1691.1	3190.2
	PRE	20.5	36.6	65.7	116.4	199.4	292.8	458.6	772.1	1494.2	2600.2
	RES	-3.511	-4.827	-1.515	-9.155	-24.824	-30.962	-26.760	68.602	196.911	589.964
2006-	OBS	15.1	24.0	50.7	91.9	153.2	230.2	358.3	617.1	1221.1	2461.0
	PRE	17.1	30.6	54.9	97.3	161.0	262.0	402.6	639.1	1119.2	2145.8
	RES	-2.056	-6.583	-4.233	-5.319	-7.875	-31.742	-44.264	-21.977	101.883	315.153

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	312.0	591.0	1039.0	1357.0	1598.0	2709.0	4804.0	7470.0	11254.0	12322.0
	PRE	314.3	549.1	1053.4	1478.5	1741.9	2831.1	5003.9	7772.2	11146.1	11527.3
	CHI	0.017	3.194	0.196	9.982	11.892	5.270	7.983	11.748	1.045	54.785
1996-	OBS	266.0	457.0	890.0	1379.0	1801.0	2141.0	3744.0	6775.0	10956.0	14932.0
	PRE	266.9	465.9	813.0	1525.3	1987.3	2197.0	3641.4	6303.2	9691.0	12929.7
	CHI	0.003	0.168	7.300	14.040	17.465	1.426	2.893	35.317	165.111	310.067
2001-	OBS	187.0	348.0	681.0	1094.0	1810.0	2270.0	2707.0	5095.0	9113.0	13917.0
	PRE	225.6	400.9	697.1	1187.4	2067.4	2538.4	2874.8	4679.2	8051.9	11343.3
	CHI	6.606	6.990	0.371	7.349	32.045	28.388	9.789	36.944	139.838	583.944
2006-	OBS	147.2	267.2	557.5	968.2	1534.6	2321.4	2978.5	3606.6	6636.9	11126.9
	PRE	167.3	340.6	604.1	1024.2	1613.5	2641.4	3346.5	3735.0	6083.2	9702.0
	CHI	2.405	15.807	3.591	3.063	3.859	38.776	40.459	4.416	50.407	209.274

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	2632.14	51.61	51	P, C	99.13	14126.77	0.0000
AGE-PERIOD	217.78	4.84	45	Cohort	89.49	1157.08	0.0000
AGE-COHORT	75.38	2.09	36	Period	69.64	399.89	0.0000
PERIOD-COHORT	34.08	0.85	40	Age	32.84	180.85	0.0000
FULL AGE-PERIOD-COHORT	22.89	0.72	32			121.51	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.107097	12.796666
35	1.670968	46.877931
40	2.150769	141.504108
45	2.531895	340.325902
50	2.836120	685.677319
55	3.071399	1178.688614
60	3.259278	1816.677390
65	3.398075	2500.775511
70	3.482805	3039.519344
75	3.535869	3434.546057

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.124398	0.750935
1966	-0.081585	0.828734
1971	-0.037560	0.917150
1976	0.024106	1.057075
1981	0.047521	1.115632
1986	0.064179	1.159254

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.203502	0.625890
1891	-0.120384	0.757907
1896	-0.038714	0.914716
1901	0.001629	1.003757
1906	0.002911	1.006725
1911	-0.011747	0.973313
1916	-0.022609	0.949272
1921	0.013677	1.031993
1926	0.021388	1.050481
1931	0.055553	1.136457
1936	0.044698	1.108405
1941	0.074514	1.187174
1946	0.105817	1.275900
1951	0.108151	1.282777
1956	0.143989	1.393121

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	125.0	101.0	102.0	165.0	160.0	217.0
	EXP	91.6	96.0	106.4	167.3	202.0	217.0
	CHI	12.1	0.3	0.2	0.0	8.7	0.0
35 -	OBS	347.0	343.0	376.0	445.0	606.0	799.0
	EXP	320.0	375.4	388.3	439.4	634.6	762.5
	CHI	2.3	2.8	0.4	0.1	1.3	1.7
40 -	OBS	693.0	1030.0	1307.0	1321.0	1365.0	1988.0
	EXP	764.0	1067.9	1239.0	1318.3	1363.0	1958.0
	CHI	6.6	1.3	3.7	0.0	0.0	0.5
45 -	OBS	1255.0	1916.0	2700.0	3506.0	3254.0	3308.0
	EXP	1332.8	2000.3	2768.3	3305.6	3231.7	3311.3
	CHI	4.5	3.6	1.7	12.2	0.2	0.0
50 -	OBS	3500.0	2748.0	4373.0	6238.0	6673.0	6465.0
	EXP	3565.6	2870.3	4285.7	6108.8	6689.0	6483.1
	CHI	1.2	5.2	1.8	2.7	0.0	0.1
55 -	OBS	6102.0	6267.0	5126.0	8131.0	10544.0	11002.0
	EXP	6056.6	6384.9	5117.1	7967.9	10379.7	11273.3
	CHI	0.3	2.2	0.0	3.3	2.6	6.5
60 -	OBS	8057.0	9488.0	9874.0	8268.0	11877.0	15067.0
	EXP	7978.0	9302.8	9887.9	8263.1	11914.9	15288.2
	CHI	0.8	3.7	0.0	0.0	0.1	3.2
65 -	OBS	7138.0	10508.0	12161.0	13589.0	10481.0	15171.0
	EXP	7107.2	10356.1	12187.7	13650.6	10511.6	15236.2
	CHI	0.1	2.2	0.1	0.3	0.1	0.3
70 -	OBS	4867.0	7583.0	11094.0	13611.0	14401.0	11272.0
	EXP	4881.7	7555.6	11078.2	13815.5	14438.5	11062.0
	CHI	0.0	0.1	0.0	3.0	0.1	4.0
75 -	OBS	3174.0	4272.0	6588.0	10148.0	12102.0	13251.0
	EXP	3174.0	4257.3	6646.5	10399.2	12104.8	12959.7
	CHI	0.0	0.1	0.5	6.1	0.0	6.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	10398.09	259.95	40	P, C	-195.97	0.0000
AGE-PERIOD	22090.95	552.27	40	Cohort	-39.31	0.0000
AGE-COHORT	68485.35	1712.13	40	Period	55.06	0.0000
PERIOD-COHORT	28178.00	704.45	40	Age	-9.22	0.0000
FULL AGE-PERIOD-COHORT	30775.30	769.38	40			0.0000

AGE	EFFECT
30	12.796666
35	46.877931
40	141.504108
45	340.325902
50	685.677319
55	1178.688614
60	1816.677390
65	2500.775511
70	3039.519344
75	3434.546057

PERIOD	EFFECT	LOWER	UPPER
% Period Change	103.9101	100.9101	106.9101
1961	0.750935		
1966	0.828734		
1971	0.917150		
1976	1.057075		
1981	1.115632		
1986	1.159254		
1991	1.204581	1.169804	1.239359
1996	1.251681	1.180450	1.325000
2001	1.300623	1.191193	1.416558
2006	1.351478	1.202033	1.514443

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.625890	1.000000	
1891	0.757907	2.000000	
1896	0.914716	4.000000	
1901	1.003757	8.000000	
1906	1.006725	16.000000	
1911	0.973313	32.000000	
1916	0.949272	64.000000	
1921	1.031993	128.000000	
1926	1.050481	256.000000	
1931	1.136457	512.000000	
1936	1.108405	1024.000000	
1941	1.187174	2048.000000	
1946	1.275900	4096.000000	
1951	1.282777	8192.000000	
1956	1.342589	EXTRAPOLATION	1.393121
1961	1.395030	EXTRAPOLATION	
1966	1.449520	EXTRAPOLATION	
1971	1.506137	EXTRAPOLATION	
1976	1.564966	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	14.9	12.4	13.4	17.0	14.5	20.7	15.4	11.2	10.8	9.2
	EXP	10.9	11.8	13.9	17.3	18.3	19.9	21.5*	23.2*	25.1*	27.1*
	Elow							20.9	21.9	23.0	24.1
	Eup							22.1	24.6	27.3	30.3
35	OBS	40.1	40.3	46.1	59.6	63.7	73.0	77.9	62.8	43.1	34.8
	EXP	37.0	44.2	47.7	58.8	66.7	69.7	75.8*	81.9*	88.4*	95.4*
	Elow							73.6	77.2	80.9	84.9
	Eup							78.0	86.6	96.3	106.9
40	OBS	99.5	118.8	155.6	166.1	187.7	212.5	227.1	244.2	182.4	129.9
	EXP	109.7	123.2	147.5	165.8	187.4	209.3	218.7*	237.8*	256.7*	277.2*
	Elow							212.3	224.3	235.1	246.6
	Eup							225.0	251.7	279.6	310.6
45	OBS	228.4	278.8	319.8	433.6	423.7	467.9	525.1	525.5	519.0	370.4
	EXP	242.6	291.1	327.9	408.8	420.8	468.4	523.1*	546.4*	594.3*	641.6*
	Elow							508.0	515.3	544.3	570.7
	Eup							538.2	578.4	647.3	719.0
50	OBS	491.9	516.4	662.2	777.5	867.3	878.6	914.2	929.7	922.2	902.9
	EXP	501.2	539.4	649.0	761.4	869.3	881.0	980.6*	1095.0*	1144.0*	1244.1*
	Elow							952.2	1032.7	1047.7	1106.6
	Eup							1008.9	1159.2	1246.0	1394.2
55	OBS	897.7	933.2	1028.0	1312.1	1403.2	1515.5	1415.1	1452.6	1416.6	1425.8
	EXP	891.1	950.8	1026.2	1285.8	1381.4	1552.9	1573.7*	1751.5*	1956.0*	2043.4*
	Elow							1528.3	1651.8	1791.4	1817.5
	Eup							1619.2	1854.1	2130.3	2289.8
60	OBS	1382.9	1545.8	1619.4	1824.0	2084.9	2180.3	2288.0	2028.0	1975.3	1898.4
	EXP	1369.3	1515.7	1621.7	1822.9	2091.6	2212.3	2486.9*	2520.4*	2805.1*	3132.6*
	Elow							2415.1	2377.0	2569.1	2786.2
	Eup							2558.8	2668.0	3055.1	3510.3
65	OBS	1725.2	2110.8	2303.9	2561.3	2640.7	2979.0	2856.4	2879.8	2510.4	2421.0
	EXP	1717.8	2080.3	2309.0	2573.0	2648.4	2991.8	3164.5*	3557.3*	3605.2*	4012.3*
	Elow							3073.1	3354.9	3301.8	3568.7
	Eup							3255.8	3765.7	3926.5	4496.2
70	OBS	1724.7	2312.5	2802.2	3186.7	3291.9	3408.3	3625.9	3394.4	3252.7	2917.0
	EXP	1729.9	2304.1	2798.2	3234.6	3300.5	3344.8	3778.5*	3996.6*	4492.7*	4553.2*
	Elow							3669.4	3769.1	4114.7	4049.7
	Eup							3887.6	4230.7	4893.2	5102.2
75	OBS	1614.2	2164.7	2856.0	3556.2	3856.6	3962.4	3967.5	3984.9	3635.8	3624.7
	EXP	1614.2	2157.2	2881.3	3644.2	3857.5	3875.3	3927.3*	4436.5*	4692.6*	5275.1*
	Elow							3813.9	4184.0	4297.7	4691.8
	Eup							4040.7	4696.4	5110.8	5911.2
30-79	OBS	613.2	723.7	836.0	983.4	1052.6	1120.5	1136.1	1108.0	1039.8	979.3
	EXP	614.4	725.4	835.6	981.8	1052.6	1121.3	1208.4*	1310.8*	1414.6*	1530.6*
	Elow							1173.5	1236.2	1295.6	1361.3
	Eup							1243.3	1387.6	1540.7	1715.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	125.0	101.0	102.0	165.0	160.0	217.0	165.0	122.0	119.0	89.5
	EXP	91.6	96.0	106.4	167.3	202.0	209.1	230.1*	252.4*	275.7*	264.0*
	CHI	12.138	0.261	0.182	0.032	8.749	0.296	18.420	67.402	89.031	115.356
35 -	OBS	347.0	343.0	376.0	445.0	606.0	799.0	817.0	669.0	473.0	388.2
	EXP	320.0	375.4	388.3	439.4	634.6	762.5	795.3*	871.7*	969.1*	1063.5*
	CHI	2.274	2.800	0.391	0.070	1.286	1.744	0.591	47.116	253.998	428.806
40 -	OBS	693.0	1030.0	1307.0	1321.0	1365.0	1988.0	2458.0	2526.0	1935.0	1429.7
	EXP	764.0	1067.9	1239.0	1318.3	1363.0	1958.0	2366.7*	2459.5*	2724.4*	3050.1*
	CHI	6.594	1.344	3.733	0.006	0.003	0.459	3.524	1.798	228.741	860.817
45 -	OBS	1255.0	1916.0	2700.0	3506.0	3254.0	3308.0	4821.0	5563.0	5295.0	3900.6
	EXP	1332.8	2000.3	2768.3	3305.6	3231.7	3311.3	4802.2*	5784.3*	6063.3*	6756.5*
	CHI	4.544	3.553	1.683	12.151	0.153	0.003	0.074	8.467	97.357	1207.133
50 -	OBS	3500.0	2748.0	4373.0	6238.0	6673.0	6465.0	6274.0	8291.0	9562.0	9046.5
	EXP	3565.6	2870.3	4285.7	6108.8	6689.0	6483.1	6729.1*	9766.0*	11861.5*	12465.6*
	CHI	1.205	5.214	1.778	2.733	0.038	0.051	30.785	222.778	445.791	937.791
55 -	OBS	6102.0	6267.0	5126.0	8131.0	10544.0	11002.0	9944.0	9569.0	12282.0	14375.4
	EXP	6056.6	6384.9	5117.1	7967.9	10379.7	11273.3	11059.0*	11537.7*	16958.5*	20602.7*
	CHI	0.340	2.177	0.015	3.339	2.600	6.529	112.408	335.910	1289.582	1882.233
60 -	OBS	8057.0	9488.0	9874.0	8268.0	11877.0	15067.0	15481.0	13331.0	12383.0	15781.4
	EXP	7978.0	9302.8	9887.9	8263.1	11914.9	15288.2	16827.2*	16567.7*	17585.0*	26040.6*
	CHI	0.783	3.686	0.020	0.003	0.120	3.201	107.704	632.342	1538.870	4041.832
65 -	OBS	7138.0	10508.0	12161.0	13589.0	10481.0	15171.0	17775.0	17611.0	15215.0	14148.3
	EXP	7107.2	10356.1	12187.7	13650.6	10511.6	15236.2	19691.7*	21754.0*	21849.7*	23448.2*
	CHI	0.133	2.227	0.059	0.278	0.089	0.279	186.564	789.037	2014.631	3688.454
70 -	OBS	4867.0	7583.0	11094.0	13611.0	14401.0	11272.0	15953.0	18168.0	17528.0	15854.3
	EXP	4881.7	7555.6	11078.2	13815.5	14438.5	11062.0	16624.4*	21391.2*	24210.3*	24747.0*
	CHI	0.044	0.099	0.022	3.028	0.097	3.985	27.119	485.656	1844.370	3195.535
75 -	OBS	3174.0	4272.0	6588.0	10148.0	12102.0	13251.0	10235.0	14162.0	15861.0	16388.4
	EXP	3174.0	4257.3	6646.5	10399.2	12104.8	12959.7	10131.2*	15767.0*	20471.0*	23850.5*
	CHI	0.000	0.050	0.516	6.068	0.001	6.549	1.063	163.381	1038.151	2334.678
30-79	OBS	35258.0	44256.0	53701.0	65422.0	71463.0	78540.0	83923.0	90012.0	90653.0	91402.3
	EXP	35271.5	44266.8	53705.2	65435.7	71469.9	78543.5	89257.0*	106151.5*	122968.5*	142288.6*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.940	0.848	0.737	0.642

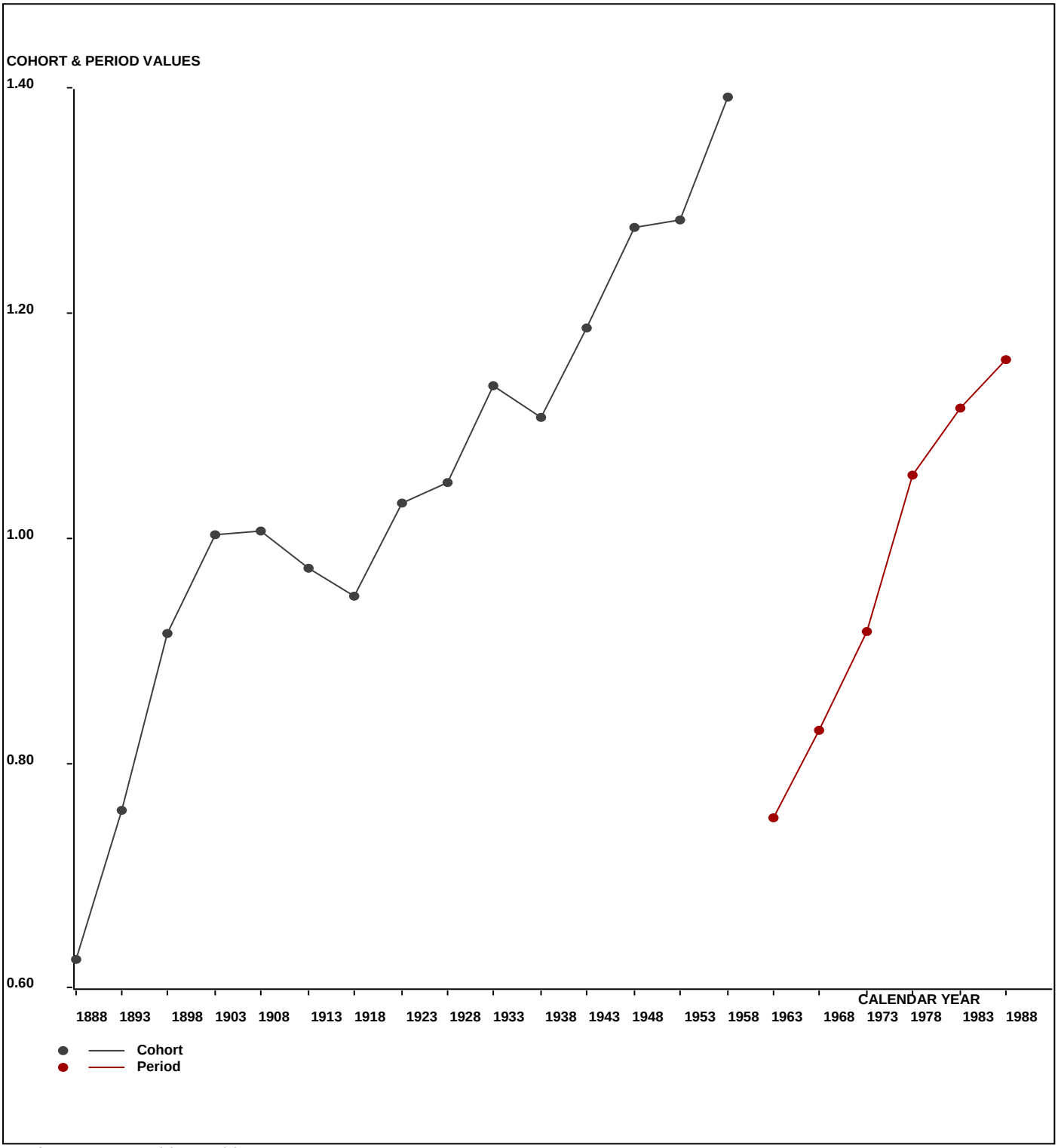
CHI SQUARE (LOG)= 30775.2962 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

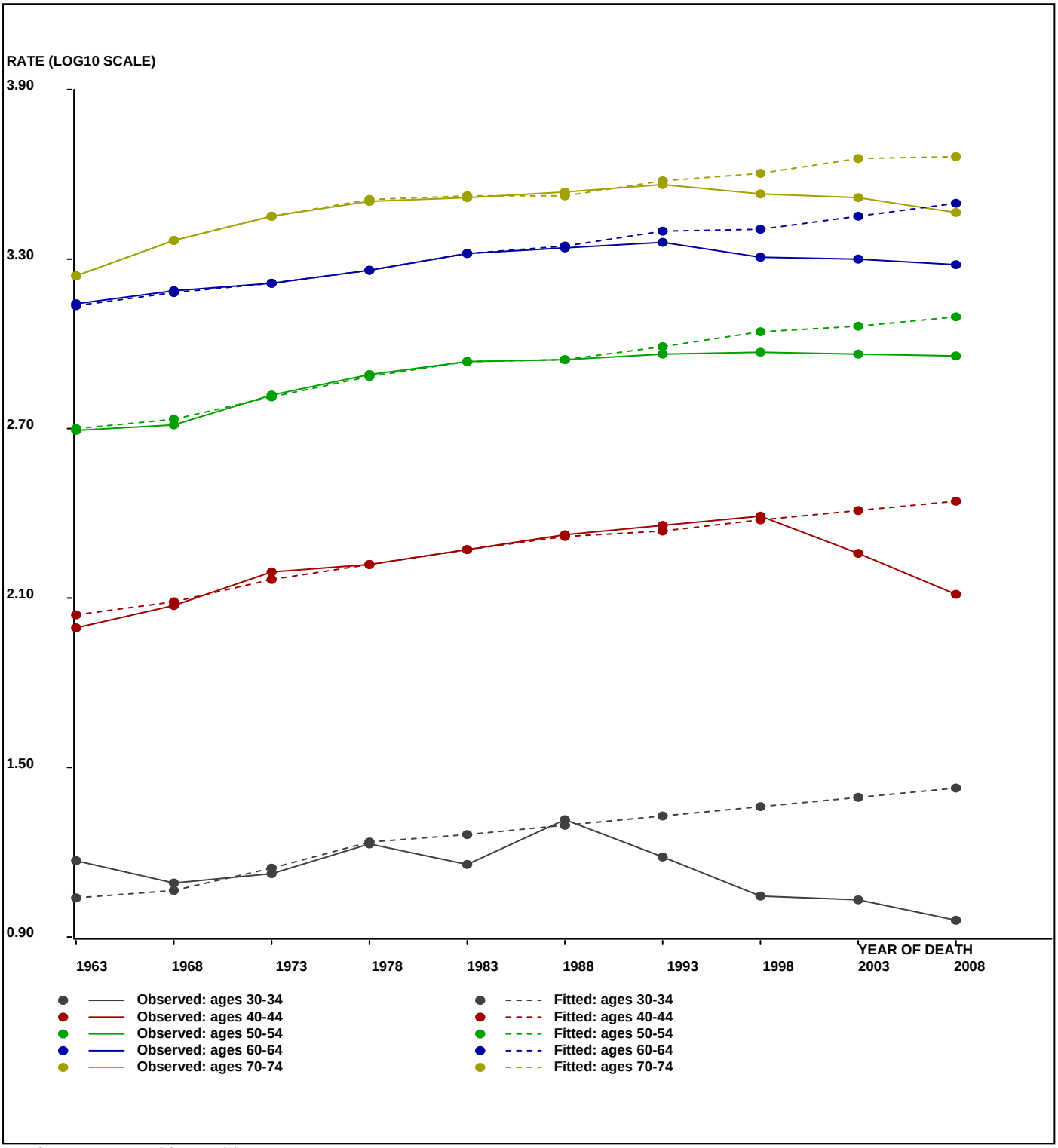


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	15.4	77.9	227.1	525.1	914.2	1415.1	2288.0	2856.4	3625.9	3967.5
	PRE	21.5	75.8	218.7	523.1	980.6	1573.7	2486.9	3164.5	3778.5	3927.3
	RES	-6.084	2.067	8.438	2.052	-66.323	-158.663	-198.965	-308.015	-152.608	40.228
1996-	OBS	11.2	62.8	244.2	525.5	929.7	1452.6	2028.0	2879.8	3394.4	3984.9
	PRE	23.2	81.9	237.8	546.4	1095.0	1751.5	2520.4	3557.3	3996.6	4436.5
	RES	-11.997	-19.031	6.429	-20.907	-165.389	-298.854	-492.396	-677.486	-602.191	-451.613
2001-	OBS	10.8	43.1	182.4	519.0	922.2	1416.6	1975.3	2510.4	3252.7	3635.8
	PRE	25.1	88.4	256.7	594.3	1144.0	1956.0	2805.1	3605.2	4492.7	4692.6
	RES	-14.246	-45.244	-74.394	-75.304	-221.778	-539.384	-829.799	-1094.711	-1240.034	-1056.744
2006-	OBS	9.2	34.8	129.9	370.4	902.9	1425.8	1898.4	2421.0	2917.0	3624.7
	PRE	27.1	95.4	277.2	641.6	1244.1	2043.4	3132.6	4012.3	4553.2	5275.1
	RES	-17.890	-60.590	-147.267	-271.210	-341.247	-617.638	-1234.147	-1591.351	-1636.149	-1650.425

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	165.0	817.0	2458.0	4821.0	6274.0	9944.0	15481.0	17775.0	15953.0	10235.0
	PRE	230.1	795.3	2366.7	4802.2	6729.1	11059.0	16827.2	19691.7	16624.4	10131.2
	CHI	18.420	0.591	3.524	0.074	30.785	112.408	107.704	186.564	27.119	1.063
1996-	OBS	122.0	669.0	2526.0	5563.0	8291.0	9569.0	13331.0	17611.0	18168.0	14162.0
	PRE	252.4	871.7	2459.5	5784.3	9766.0	11537.7	16567.7	21754.0	21391.2	15767.0
	CHI	67.402	47.116	1.798	8.467	222.778	335.910	632.342	789.037	485.656	163.381
2001-	OBS	119.0	473.0	1935.0	5295.0	9562.0	12282.0	12383.0	15215.0	17528.0	15861.0
	PRE	275.7	969.1	2724.4	6063.3	11861.5	16958.5	17585.0	21849.7	24210.3	20471.0
	CHI	89.031	253.998	228.741	97.357	445.791	1289.582	1538.870	2014.631	1844.370	1038.151
2006-	OBS	89.5	388.2	1429.7	3900.6	9046.5	14375.4	15781.4	14148.3	15854.3	16388.4
	PRE	264.0	1063.5	3050.1	6756.5	12465.6	20602.7	26040.6	23448.2	24747.0	23850.5
	CHI	115.356	428.806	860.817	1207.133	937.791	1882.233	4041.832	3688.454	3195.535	2334.678

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	2965.85	58.15	51	P, C	99.21	16017.53	0.0000
AGE-PERIOD	237.06	5.27	45	Cohort	90.17	1260.84	0.0000
AGE-COHORT	736.44	20.46	36	Period	96.83	3920.24	0.0000
PERIOD-COHORT	131.47	3.29	40	Age	82.27	698.28	0.0000
FULL AGE-PERIOD-COHORT	23.31	0.73	32			123.67	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.339349	21.844823
35	1.579010	37.932358
40	1.847825	70.440855
45	2.114931	130.295944
50	2.359894	229.030806
55	2.597442	395.769348
60	2.831662	678.674794
65	3.081887	1207.499895
70	3.337179	2173.594916
75	3.601685	3996.544709

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.050521	1.123365
1966	0.103860	1.270163
1971	0.105087	1.273758
1976	-0.015982	0.963870
1981	-0.190670	0.644660
1986	-0.210487	0.615904

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.123087	0.753205
1891	-0.070032	0.851074
1896	-0.012457	0.971724
1901	0.024808	1.058785
1906	0.032580	1.077903
1911	0.014979	1.035092
1916	0.002809	1.006490
1921	0.033299	1.079689
1926	-0.011752	0.973302
1931	-0.046229	0.899023
1936	-0.114054	0.769035
1941	-0.152088	0.704550
1946	-0.211905	0.613896
1951	-0.149585	0.708622
1956	-0.145735	0.714932

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	161.0	149.0	176.0	146.0	105.0	101.0
	EXP	185.1	174.3	149.7	125.3	110.1	101.0
	CHI	3.1	3.7	4.6	3.4	0.2	0.0
35 -	OBS	352.0	366.0	320.0	198.0	122.0	186.0
	EXP	358.9	368.3	302.8	192.4	142.8	181.1
	CHI	0.1	0.0	1.0	0.2	3.0	0.1
40 -	OBS	608.0	716.0	673.0	451.0	228.0	246.0
	EXP	595.2	754.9	677.6	415.2	232.7	249.2
	CHI	0.3	2.0	0.0	3.1	0.1	0.0
45 -	OBS	761.0	1252.0	1393.0	957.0	473.0	369.0
	EXP	809.4	1228.0	1363.8	912.9	496.1	399.7
	CHI	2.9	0.5	0.6	2.1	1.1	2.4
50 -	OBS	1806.0	1466.0	2254.0	1804.0	940.0	789.0
	EXP	1894.7	1558.0	2080.0	1723.9	1021.3	798.3
	CHI	4.2	5.4	14.6	3.7	6.5	0.1
55 -	OBS	3200.0	3507.0	2568.0	2603.0	1755.0	1652.0
	EXP	3257.3	3494.4	2530.1	2552.2	1865.9	1590.9
	CHI	1.0	0.0	0.6	1.0	6.6	2.3
60 -	OBS	4747.0	5779.0	5359.0	3014.0	2594.0	2852.0
	EXP	4703.0	5703.1	5455.8	2984.4	2690.9	2811.5
	CHI	0.4	1.0	1.7	0.3	3.5	0.6
65 -	OBS	5487.0	8196.0	8754.0	6439.0	3087.0	3911.0
	EXP	5453.6	8084.2	8750.9	6391.5	3109.6	4089.3
	CHI	0.2	1.5	0.0	0.4	0.2	7.8
70 -	OBS	5992.0	8853.0	11497.0	9369.0	6449.0	4546.0
	EXP	5864.3	8797.2	11605.7	9645.5	6345.0	4456.2
	CHI	2.8	0.4	1.0	7.9	1.7	1.8
75 -	OBS	6649.0	8396.0	11321.0	11590.0	8961.0	8538.0
	EXP	6649.0	8526.1	11410.8	11638.8	8714.7	8520.6
	CHI	0.0	2.0	0.7	0.2	7.0	0.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	71634.05	1790.85	40	P, C	91.72	0.0000
AGE-PERIOD	8801.45	220.04	40	Cohort	32.62	0.0000
AGE-COHORT	1908.77	47.72	40	Period	-210.71	0.0000
PERIOD-COHORT	7899.18	197.48	40	Age	24.92	0.0000
FULL AGE-PERIOD-COHORT	5930.73	148.27	40			0.0000

AGE	EFFECT
30	21.844823
35	37.932358
40	70.440855
45	130.295944
50	229.030806
55	395.769348
60	678.674794
65	1207.499895
70	2173.594916
75	3996.544709

PERIOD	EFFECT	LOWER	UPPER
% Period Change	95.5394	92.5394	98.5394
1961	1.123365		
1966	1.270163		
1971	1.273758		
1976	0.963870		
1981	0.644660		
1986	0.615904		
1991	0.588431	0.569954	0.606908
1996	0.562183	0.527432	0.598043
2001	0.537106	0.488082	0.589308
2006	0.513148	0.451668	0.580701

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.753205	1.000000	
1891	0.851074	2.000000	
1896	0.971724	4.000000	
1901	1.058785	8.000000	
1906	1.077903	16.000000	
1911	1.035092	32.000000	
1916	1.006490	64.000000	
1921	1.079689	128.000000	
1926	0.973302	256.000000	
1931	0.899023	512.000000	
1936	0.769035	1024.000000	
1941	0.704550	2048.000000	
1946	0.613896	4096.000000	
1951	0.708622	8192.000000	
1956	0.640501	EXTRAPOLATION	0.714932
1961	0.612890	EXTRAPOLATION	
1966	0.586468	EXTRAPOLATION	
1971	0.561186	EXTRAPOLATION	
1976	0.536994	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	19.2	18.2	23.0	15.1	9.5	9.6	9.6	7.4	4.1	2.8
	EXP	22.1	21.3	19.6	12.9	10.0	8.6	7.9*	7.2*	6.6*	6.0*
	Elow							7.6	6.8	6.0	5.3
	Eup							8.1	7.7	7.2	6.8
35	OBS	40.7	43.0	39.3	26.5	12.8	17.0	14.2	13.5	6.9	6.0
	EXP	41.5	43.3	37.2	25.8	15.0	16.6	14.3*	13.1*	11.9*	10.9*
	Elow							13.8	12.3	10.9	9.6
	Eup							14.7	13.9	13.1	12.4
40	OBS	87.3	82.6	80.1	56.7	31.4	26.3	25.3	18.5	12.7	10.1
	EXP	85.4	87.1	80.7	52.2	32.0	26.6	29.4*	25.4*	23.2*	21.2*
	Elow							28.4	23.8	21.1	18.7
	Eup							30.3	27.0	25.4	24.0
45	OBS	138.5	182.2	165.0	118.4	61.6	52.2	46.2	44.0	26.4	19.9
	EXP	147.3	178.7	161.5	112.9	64.6	56.5	47.1*	51.9*	44.8*	41.0*
	Elow							45.6	48.7	40.7	36.1
	Eup							48.5	55.2	49.2	46.4
50	OBS	253.8	275.5	341.3	224.9	122.2	107.2	78.7	84.1	56.0	51.3
	EXP	266.3	292.8	315.0	214.9	132.7	108.5	95.0*	79.0*	87.2*	75.3*
	Elow							92.0	74.2	79.2	66.3
	Eup							97.9	84.1	95.6	85.2
55	OBS	470.8	522.2	515.0	420.1	233.6	227.6	178.5	159.2	100.9	95.9
	EXP	479.2	520.3	507.4	411.9	248.3	219.1	179.1*	156.8*	130.5*	143.9*
	Elow							173.5	147.1	118.6	126.7
	Eup							184.7	166.8	143.2	162.9
60	OBS	814.8	941.5	878.9	664.9	455.4	412.7	373.6	326.2	198.6	164.4
	EXP	807.2	929.2	894.8	658.4	472.4	406.8	359.0*	293.4*	256.8*	213.8*
	Elow							347.8	275.3	233.4	188.2
	Eup							370.3	312.1	281.8	241.9
65	OBS	1326.2	1646.3	1658.5	1213.7	777.8	768.0	693.4	687.5	355.9	300.2
	EXP	1318.1	1623.9	1657.9	1204.7	783.5	803.0	691.6*	610.3*	498.8*	436.6*
	Elow							669.8	572.6	453.2	384.3
	Eup							713.3	649.2	547.2	494.0
70	OBS	2123.4	2699.8	2903.9	2193.5	1474.2	1374.6	1326.0	1212.2	711.3	541.3
	EXP	2078.1	2682.8	2931.4	2258.3	1450.4	1347.4	1380.9*	1189.3*	1049.6*	857.8*
	Elow							1337.6	1115.8	953.8	755.0
	Eup							1424.3	1265.2	1151.6	970.7
75	OBS	3381.6	4254.4	4907.8	4061.5	2855.6	2553.1	2389.1	2235.8	1245.9	1052.1
	EXP	3381.6	4320.3	4946.7	4078.6	2777.1	2547.9	2367.0*	2425.8*	2089.3*	1843.7*
	Elow							2292.6	2275.9	1898.6	1622.8
	Eup							2441.3	2580.6	2292.3	2086.5
30-79	OBS	529.3	640.8	676.1	518.1	337.9	313.0	285.2	265.8	152.6	126.5
	EXP	529.4	642.1	675.2	517.2	339.5	313.0	288.5*	263.7*	229.2*	200.4*
	Elow							279.4	247.4	208.3	176.4
	Eup							297.6	280.5	251.5	226.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	161.0	149.0	176.0	146.0	105.0	101.0	103.0	81.0	45.0	27.2
	EXP	185.1	174.3	149.7	125.3	110.1	90.5	84.3*	78.3*	72.4*	58.7*
	CHI	3.148	3.661	4.621	3.417	0.236	1.222	4.148	0.092	10.374	16.919
35 -	OBS	352.0	366.0	320.0	198.0	122.0	186.0	149.0	144.0	76.0	66.5
	EXP	358.9	368.3	302.8	192.4	142.8	181.1	150.0*	139.2*	131.0*	121.7*
	CHI	0.134	0.015	0.979	0.162	3.019	0.133	0.006	0.167	23.109	25.070
40 -	OBS	608.0	716.0	673.0	451.0	228.0	246.0	274.0	191.0	135.0	110.6
	EXP	595.2	754.9	677.6	415.2	232.7	249.2	317.9*	262.3*	246.1*	233.2*
	CHI	0.275	2.004	0.032	3.093	0.094	0.040	6.067	19.400	50.126	64.491
45 -	OBS	761.0	1252.0	1393.0	957.0	473.0	369.0	424.0	466.0	269.0	209.1
	EXP	809.4	1228.0	1363.8	912.9	496.1	399.7	432.1*	549.5*	457.3*	431.5*
	CHI	2.890	0.469	0.625	2.132	1.071	2.362	0.153	12.677	77.556	114.633
50 -	OBS	1806.0	1466.0	2254.0	1804.0	940.0	789.0	540.0	750.0	581.0	514.0
	EXP	1894.7	1558.0	2080.0	1723.9	1021.3	798.3	651.6*	704.9*	903.8*	754.2*
	CHI	4.155	5.434	14.555	3.726	6.476	0.107	19.118	2.880	115.308	76.510
55 -	OBS	3200.0	3507.0	2568.0	2603.0	1755.0	1652.0	1254.0	1049.0	875.0	966.7
	EXP	3257.3	3494.4	2530.1	2552.2	1865.9	1590.9	1258.5*	1032.6*	1131.4*	1451.0*
	CHI	1.009	0.046	0.569	1.010	6.596	2.345	0.016	0.260	58.107	161.638
60 -	OBS	4747.0	5779.0	5359.0	3014.0	2594.0	2852.0	2528.0	2144.0	1245.0	1366.5
	EXP	4703.0	5703.1	5455.8	2984.4	2690.9	2811.5	2429.3*	1928.8*	1610.0*	1777.2*
	CHI	0.412	1.010	1.719	0.294	3.493	0.584	4.013	24.019	82.759	94.929
65 -	OBS	5487.0	8196.0	8754.0	6439.0	3087.0	3911.0	4315.0	4204.0	2157.0	1754.6
	EXP	5453.6	8084.2	8750.9	6391.5	3109.6	4089.3	4303.4*	3732.1*	3022.8*	2551.2*
	CHI	0.204	1.547	0.001	0.353	0.165	7.771	0.031	59.666	248.002	248.759
70 -	OBS	5992.0	8853.0	11497.0	9369.0	6449.0	4546.0	5834.0	6488.0	3833.0	2941.8
	EXP	5864.3	8797.2	11605.7	9645.5	6345.0	4456.2	6075.8*	6365.8*	5655.9*	4662.1*
	CHI	2.781	0.354	1.017	7.924	1.705	1.811	9.621	2.347	587.511	634.760
75 -	OBS	6649.0	8396.0	11321.0	11590.0	8961.0	8538.0	6163.0	7946.0	5435.0	4756.9
	EXP	6649.0	8526.1	11410.8	11638.8	8714.7	8520.6	6106.0*	8621.3*	9114.3*	8336.1*
	CHI	0.000	1.985	0.706	0.204	6.961	0.036	0.533	52.888	1485.266	1536.798
30-79	OBS	29763.0	38680.0	44315.0	36571.0	24714.0	23190.0	21584.0	23463.0	14651.0	12713.9
	EXP	29770.6	38688.4	44327.1	36582.0	24729.1	23187.1	21808.9*	23414.8*	22345.1*	20377.1*
	O/E	1.000	1.000	1.000	1.000	0.999	1.000	0.990	1.002	0.656	0.624

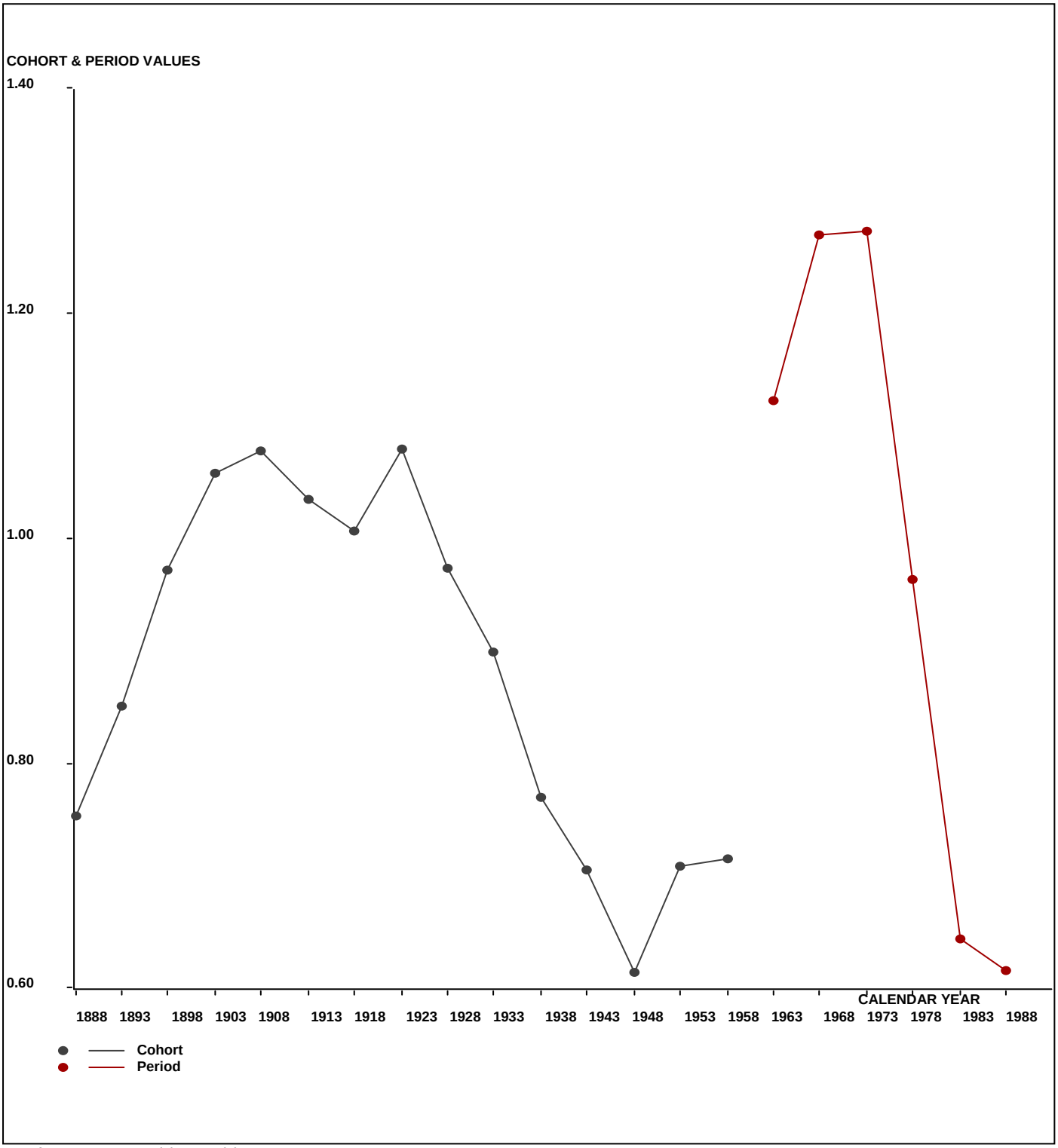
CHI SQUARE (LOG)= 5930.7292 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

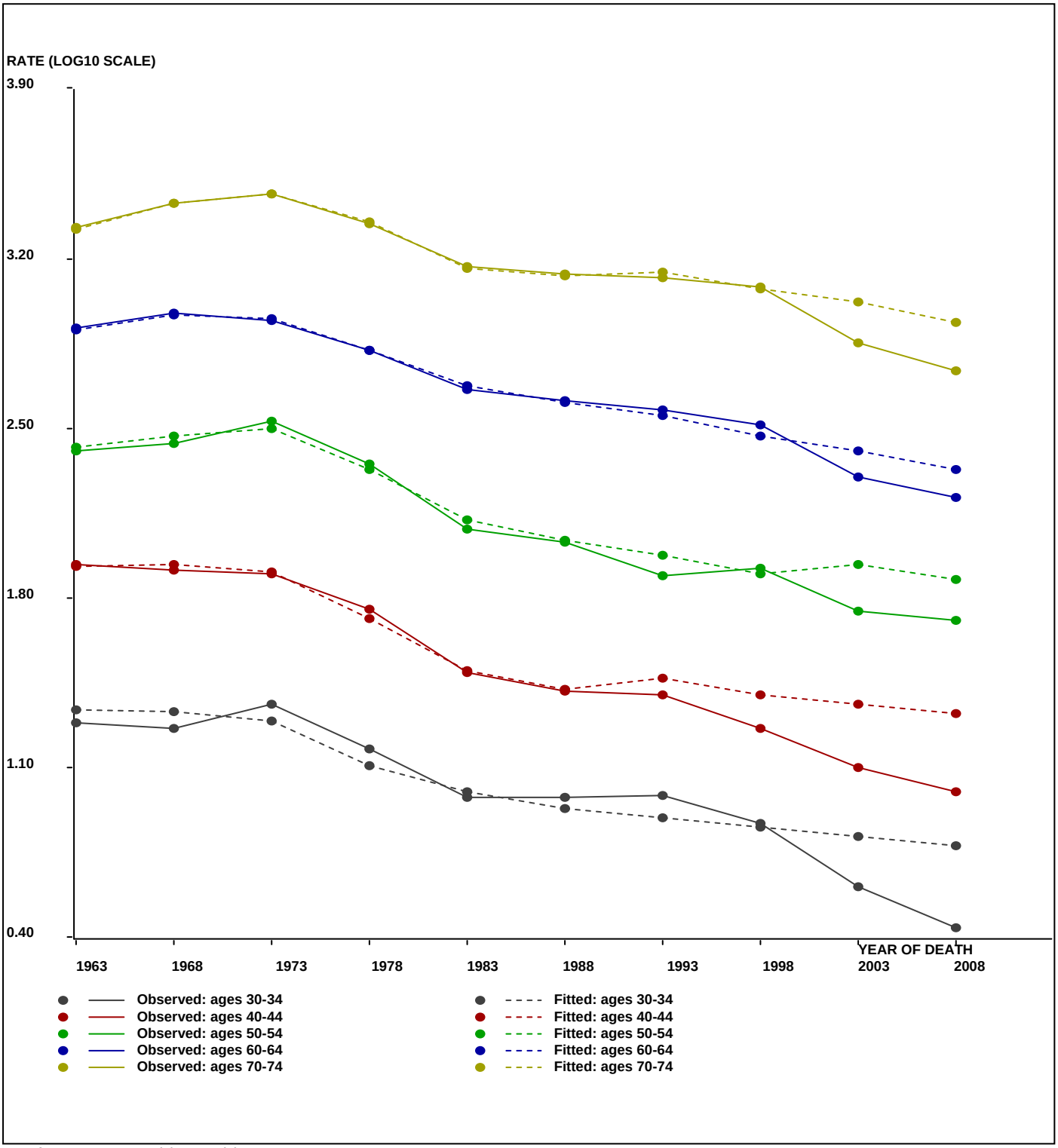


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	9.6	14.2	25.3	46.2	78.7	178.5	373.6	693.4	1326.0	2389.1
	PRE	7.9	14.3	29.4	47.1	95.0	179.1	359.0	691.6	1380.9	2367.0
	RES	1.747	-0.093	-4.058	-0.885	-16.264	-0.645	14.593	1.860	-54.952	22.104
1996-	OBS	7.4	13.5	18.5	44.0	84.1	159.2	326.2	687.5	1212.2	2235.8
	PRE	7.2	13.1	25.4	51.9	79.0	156.8	293.4	610.3	1189.3	2425.8
	RES	0.247	0.453	-6.898	-7.884	5.052	2.486	32.743	77.166	22.835	-190.001
2001-	OBS	4.1	6.9	12.7	26.4	56.0	100.9	198.6	355.9	711.3	1245.9
	PRE	6.6	11.9	23.2	44.8	87.2	130.5	256.8	498.8	1049.6	2089.3
	RES	-2.492	-5.018	-10.466	-18.459	-31.135	-29.573	-58.227	-142.861	-338.273	-843.400
2006-	OBS	2.8	6.0	10.1	19.9	51.3	95.9	164.4	300.2	541.3	1052.1
	PRE	6.0	10.9	21.2	41.0	75.3	143.9	213.8	436.6	857.8	1843.7
	RES	-3.231	-4.957	-11.147	-21.121	-23.975	-48.033	-49.411	-136.319	-316.507	-791.634

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	103.0	149.0	274.0	424.0	540.0	1254.0	2528.0	4315.0	5834.0	6163.0
	PRE	84.3	150.0	317.9	432.1	651.6	1258.5	2429.3	4303.4	6075.8	6106.0
	CHI	4.148	0.006	6.067	0.153	19.118	0.016	4.013	0.031	9.621	0.533
1996-	OBS	81.0	144.0	191.0	466.0	750.0	1049.0	2144.0	4204.0	6488.0	7946.0
	PRE	78.3	139.2	262.3	549.5	704.9	1032.6	1928.8	3732.1	6365.8	8621.3
	CHI	0.092	0.167	19.400	12.677	2.880	0.260	24.019	59.666	2.347	52.888
2001-	OBS	45.0	76.0	135.0	269.0	581.0	875.0	1245.0	2157.0	3833.0	5435.0
	PRE	72.4	131.0	246.1	457.3	903.8	1131.4	1610.0	3022.8	5655.9	9114.3
	CHI	10.374	23.109	50.126	77.556	115.308	58.107	82.759	248.002	587.511	1485.266
2006-	OBS	27.2	66.5	110.6	209.1	514.0	966.7	1366.5	1754.6	2941.8	4756.9
	PRE	58.7	121.7	233.2	431.5	754.2	1451.0	1777.2	2551.2	4662.1	8336.1
	CHI	16.919	25.070	64.491	114.633	76.510	161.638	94.929	248.759	634.760	1536.798

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1129.18	22.14	51	P, C	98.04	6021.85	0.0000
AGE-PERIOD	259.79	5.77	45	Cohort	91.48	1379.14	0.0000
AGE-COHORT	55.51	1.54	36	Period	60.13	294.44	0.0000
PERIOD-COHORT	70.82	1.77	40	Age	68.75	376.09	0.0000
FULL AGE-PERIOD-COHORT	22.13	0.69	32			117.49	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.059193	11.460218
35	1.363336	23.085301
40	1.675434	47.362459
45	1.957335	90.643050
50	2.221454	166.515059
55	2.508596	322.549373
60	2.826073	669.997159
65	3.129130	1346.264079
70	3.420926	2635.879207
75	3.678602	4770.918398

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.050268	1.122711
1966	0.015563	1.036485
1971	0.026096	1.061929
1976	-0.010811	0.975414
1981	-0.026273	0.941297
1986	-0.068216	0.854642

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.032416	0.928077
1891	-0.014074	0.968113
1896	0.022027	1.052027
1901	0.041678	1.100722
1906	0.028417	1.067621
1911	-0.007308	0.983314
1916	-0.049036	0.893231
1921	-0.057773	0.875441
1926	-0.119633	0.759218
1931	-0.112619	0.771580
1936	-0.160937	0.690340
1941	-0.205141	0.623532
1946	-0.234924	0.582205
1951	-0.257963	0.552124
1956	-0.234239	0.583124

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	101.0	70.0	44.0	41.0	58.0	61.0
	EXP	80.2	63.3	53.6	60.0	64.4	61.0
	CHI	5.4	0.7	1.7	6.0	0.6	0.0
35 -	OBS	177.0	163.0	107.0	105.0	107.0	124.0
	EXP	167.8	151.4	131.0	100.7	117.9	118.0
	CHI	0.5	0.9	4.4	0.2	1.0	0.3
40 -	OBS	327.0	319.0	285.0	271.0	180.0	243.0
	EXP	326.9	320.5	317.3	247.0	200.2	218.3
	CHI	0.0	0.0	3.3	2.3	2.0	2.8
45 -	OBS	465.0	622.0	635.0	532.0	436.0	366.0
	EXP	516.9	577.8	622.0	550.0	451.8	343.3
	CHI	5.2	3.4	0.3	0.6	0.6	1.5
50 -	OBS	1260.0	873.0	1116.0	1086.0	959.0	746.0
	EXP	1378.5	869.7	1067.8	1032.1	958.5	741.1
	CHI	10.2	0.0	2.2	2.8	0.0	0.0
55 -	OBS	2709.0	2443.0	1682.0	1940.0	1889.0	1665.0
	EXP	2837.2	2416.4	1672.2	1861.9	1892.4	1652.6
	CHI	5.8	0.3	0.1	3.3	0.0	0.1
60 -	OBS	5531.0	5264.0	4974.0	3168.0	3705.0	3384.0
	EXP	5672.2	5243.0	4939.3	3084.5	3633.9	3457.7
	CHI	3.5	0.1	0.2	2.3	1.4	1.6
65 -	OBS	9487.0	10031.0	10201.0	8489.0	5745.0	6090.0
	EXP	9408.7	9865.6	10089.2	8654.7	5692.1	6342.0
	CHI	0.7	2.8	1.2	3.2	0.5	10.0
70 -	OBS	14118.0	15139.0	17551.0	16516.0	14960.0	9195.0
	EXP	13805.7	15104.7	17596.8	16586.2	15093.3	9297.2
	CHI	7.1	0.1	0.1	0.3	1.2	1.1
75 -	OBS	17856.0	18292.0	22584.0	24533.0	24848.0	21895.0
	EXP	17856.0	18610.5	22697.2	24514.7	24786.2	21549.2
	CHI	0.0	5.5	0.6	0.0	0.2	5.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	96361.37	2409.03	40	P, C	91.16	0.0000
AGE-PERIOD	7456.67	186.42	40	Cohort	-14.18	0.0000
AGE-COHORT	17226.78	430.67	40	Period	50.58	0.0000
PERIOD-COHORT	11729.74	293.24	40	Age	27.41	0.0000
FULL AGE-PERIOD-COHORT	8514.27	212.86	40			0.0000

AGE	EFFECT
30	11.460218
35	23.085301
40	47.362459
45	90.643050
50	166.515059
55	322.549373
60	669.997159
65	1346.264079
70	2635.879207
75	4770.918398

PERIOD	EFFECT	LOWER	UPPER
% Period Change	90.7941	87.7941	93.7941
1961	1.122711		
1966	1.036485		
1971	1.061929		
1976	0.975414		
1981	0.941297		
1986	0.854642		
1991	0.775964	0.750325	0.801604
1996	0.704530	0.658741	0.751857
2001	0.639671	0.578335	0.705197
2006	0.580783	0.507744	0.661433

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.928077	1.000000	
1891	0.968113	2.000000	
1896	1.052027	4.000000	
1901	1.100722	8.000000	
1906	1.067621	16.000000	
1911	0.983314	32.000000	
1916	0.893231	64.000000	
1921	0.875441	128.000000	
1926	0.759218	256.000000	
1931	0.771580	512.000000	
1936	0.690340	1024.000000	
1941	0.623532	2048.000000	
1946	0.582205	4096.000000	
1951	0.552124	8192.000000	
1956	0.510887	EXTRAPOLATION	0.583124
1961	0.475539	EXTRAPOLATION	
1966	0.442637	EXTRAPOLATION	
1971	0.412011	EXTRAPOLATION	
1976	0.383505	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	12.5	9.1	6.2	4.4	5.4	5.7	4.2	6.4	4.3	3.7
	EXP	9.9	8.2	7.6	6.5	6.0	5.0	4.2*	3.6*	3.0*	2.6*
	Elow							4.1	3.3	2.7	2.2
	Eup							4.4	3.8	3.3	2.9
35	OBS	20.8	19.9	13.8	14.6	11.5	11.4	15.4	11.0	12.2	10.2
	EXP	19.7	18.5	16.9	14.0	12.7	10.9	9.2*	7.7*	6.5*	5.5*
	Elow							8.8	7.2	5.9	4.8
	Eup							9.5	8.3	7.2	6.3
40	OBS	46.6	37.1	34.9	35.0	25.0	26.2	23.3	26.7	23.3	24.4
	EXP	46.6	37.3	38.8	31.9	27.8	23.6	20.3*	17.0*	14.4*	12.2*
	Elow							19.6	15.9	13.0	10.6
	Eup							21.0	18.2	15.9	13.9
45	OBS	81.8	88.5	74.6	66.0	56.8	51.5	42.5	45.3	46.4	42.4
	EXP	90.9	82.2	73.1	68.2	58.9	48.3	40.9*	35.3*	29.6*	25.0*
	Elow							39.6	33.0	26.8	21.9
	Eup							42.3	37.6	32.7	28.5
50	OBS	168.0	154.8	161.8	129.7	121.0	98.9	73.8	74.3	66.3	68.0
	EXP	183.8	154.2	154.8	123.3	120.9	98.2	80.6*	68.3*	58.8*	49.4*
	Elow							77.9	63.9	53.2	43.2
	Eup							83.2	72.9	64.8	56.3
55	OBS	369.1	332.4	307.7	287.0	230.1	214.3	150.9	121.1	102.0	88.5
	EXP	386.6	328.7	306.0	275.4	230.5	212.7	172.8*	141.7*	120.1*	103.4*
	Elow							167.1	132.5	108.6	90.4
	Eup							178.5	151.2	132.4	117.8
60	OBS	807.4	744.4	704.5	599.5	562.9	425.5	345.8	251.4	197.0	145.4
	EXP	828.0	741.4	699.6	583.7	552.1	434.7	401.1*	325.9*	267.2*	226.5*
	Elow							387.9	304.7	241.6	198.1
	Eup							414.4	347.8	294.6	258.0
65	OBS	1603.3	1561.7	1543.2	1266.5	1142.4	967.2	698.5	588.1	407.5	282.9
	EXP	1590.1	1535.9	1526.3	1291.3	1131.9	1007.3	793.1*	731.8*	594.5*	487.5*
	Elow							766.9	684.3	537.5	426.2
	Eup							819.3	781.0	655.4	555.2
70	OBS	2929.8	2880.7	3073.0	2733.3	2418.2	1990.1	1561.9	1143.0	878.7	585.2
	EXP	2865.0	2874.2	3081.1	2744.9	2439.7	2012.2	1790.6*	1409.9*	1301.0*	1056.8*
	Elow							1731.4	1318.3	1176.2	923.9
	Eup							1849.7	1504.6	1434.2	1203.6
75	OBS	4971.1	4705.4	5303.4	5126.2	4806.5	4073.7	3163.9	2574.4	1841.3	1342.8
	EXP	4971.1	4787.3	5330.0	5122.3	4794.5	4009.4	3306.8*	2942.6*	2317.0*	2137.9*
	Elow							3197.5	2751.3	2094.8	1869.1
	Eup							3416.1	3140.2	2554.3	2434.8
30-79	OBS	612.8	585.1	607.4	545.2	494.0	413.7	319.2	255.6	193.0	143.1
	EXP	614.8	584.0	606.9	544.1	493.9	415.2	350.7*	299.0*	250.2*	214.8*
	Elow							339.1	279.6	226.2	187.8
	Eup							362.3	319.1	275.8	244.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	101.0	70.0	44.0	41.0	58.0	61.0	46.0	70.0	47.0	36.1
	EXP	80.2	63.3	53.6	60.0	64.4	53.4	46.4*	39.0*	33.1*	25.1*
	CHI	5.392	0.719	1.706	6.028	0.643	1.068	0.004	24.722	5.795	4.855
35 -	OBS	177.0	163.0	107.0	105.0	107.0	124.0	166.0	121.0	135.0	114.0
	EXP	167.8	151.4	131.0	100.7	117.9	118.0	98.4*	85.2*	72.4*	61.7*
	CHI	0.502	0.894	4.387	0.187	1.011	0.300	46.377	15.092	54.107	44.283
40 -	OBS	327.0	319.0	285.0	271.0	180.0	243.0	252.0	286.0	259.0	273.3
	EXP	326.9	320.5	317.3	247.0	200.2	218.3	219.8*	182.8*	159.8*	136.2*
	CHI	0.000	0.007	3.286	2.335	2.045	2.789	4.712	58.244	61.527	138.145
45 -	OBS	465.0	622.0	635.0	532.0	436.0	366.0	391.0	486.0	498.0	471.3
	EXP	516.9	577.8	622.0	550.0	451.8	343.3	376.8*	378.5*	318.1*	278.0*
	CHI	5.215	3.386	0.273	0.590	0.551	1.496	0.533	30.506	101.738	134.353
50 -	OBS	1260.0	873.0	1116.0	1086.0	959.0	746.0	519.0	675.0	711.0	726.8
	EXP	1378.5	869.7	1067.8	1032.1	958.5	741.1	566.6*	620.9*	630.5*	528.4*
	CHI	10.193	0.013	2.177	2.811	0.000	0.032	3.998	4.721	10.276	74.533
55 -	OBS	2709.0	2443.0	1682.0	1940.0	1889.0	1665.0	1121.0	838.0	925.0	942.6
	EXP	2837.2	2416.4	1672.2	1861.9	1892.4	1652.6	1283.9*	980.3*	1089.5*	1101.4*
	CHI	5.794	0.292	0.057	3.280	0.006	0.093	20.679	20.653	24.844	22.889
60 -	OBS	5531.0	5264.0	4974.0	3168.0	3705.0	3384.0	2625.0	1821.0	1350.0	1302.2
	EXP	5672.2	5243.0	4939.3	3084.5	3633.9	3457.7	3044.9*	2360.7*	1831.4*	2029.3*
	CHI	3.516	0.084	0.244	2.260	1.393	1.570	57.915	123.366	126.535	260.494
65 -	OBS	9487.0	10031.0	10201.0	8489.0	5745.0	6090.0	5343.0	4293.0	2891.0	1892.0
	EXP	9408.7	9865.6	10089.2	8654.7	5692.1	6342.0	6066.9*	5341.8*	4217.3*	3260.1*
	CHI	0.651	2.774	1.240	3.172	0.491	10.010	86.371	205.913	417.113	574.138
70 -	OBS	14118.0	15139.0	17551.0	16516.0	14960.0	9195.0	9253.0	8189.0	6147.0	3980.6
	EXP	13805.7	15104.7	17596.8	16586.2	15093.3	9297.2	10608.0*	10101.2*	9101.2*	7188.3*
	CHI	7.064	0.078	0.119	0.298	1.178	1.123	173.078	361.994	958.901	1431.417
75 -	OBS	17856.0	18292.0	22584.0	24533.0	24848.0	21895.0	12924.0	13747.0	12051.0	8714.6
	EXP	17856.0	18610.5	22697.2	24514.7	24786.2	21549.2	13507.6*	15713.3*	15164.3*	13874.6*
	CHI	0.000	5.452	0.565	0.014	0.154	5.550	25.213	246.045	639.163	1919.025
30-79	OBS	52031.0	53216.0	59179.0	56681.0	52887.0	43769.0	32640.0	30526.0	25014.0	18453.5
	EXP	52050.2	53222.8	59186.3	56691.8	52890.8	43772.9	35819.4*	35803.5*	32617.6*	28483.0*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.911	0.853	0.767	0.648

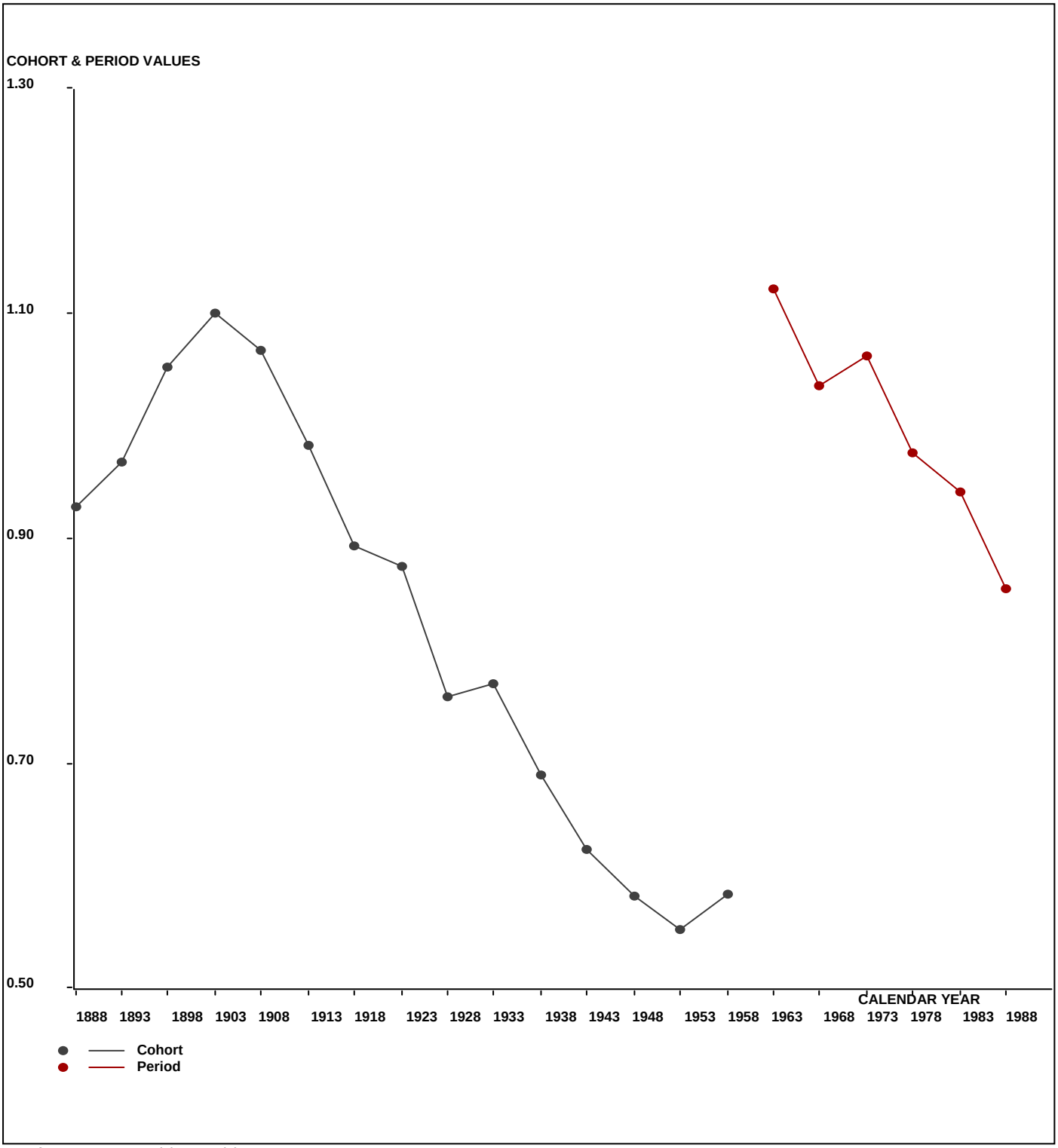
CHI SQUARE (LOG)= 8514.2661 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

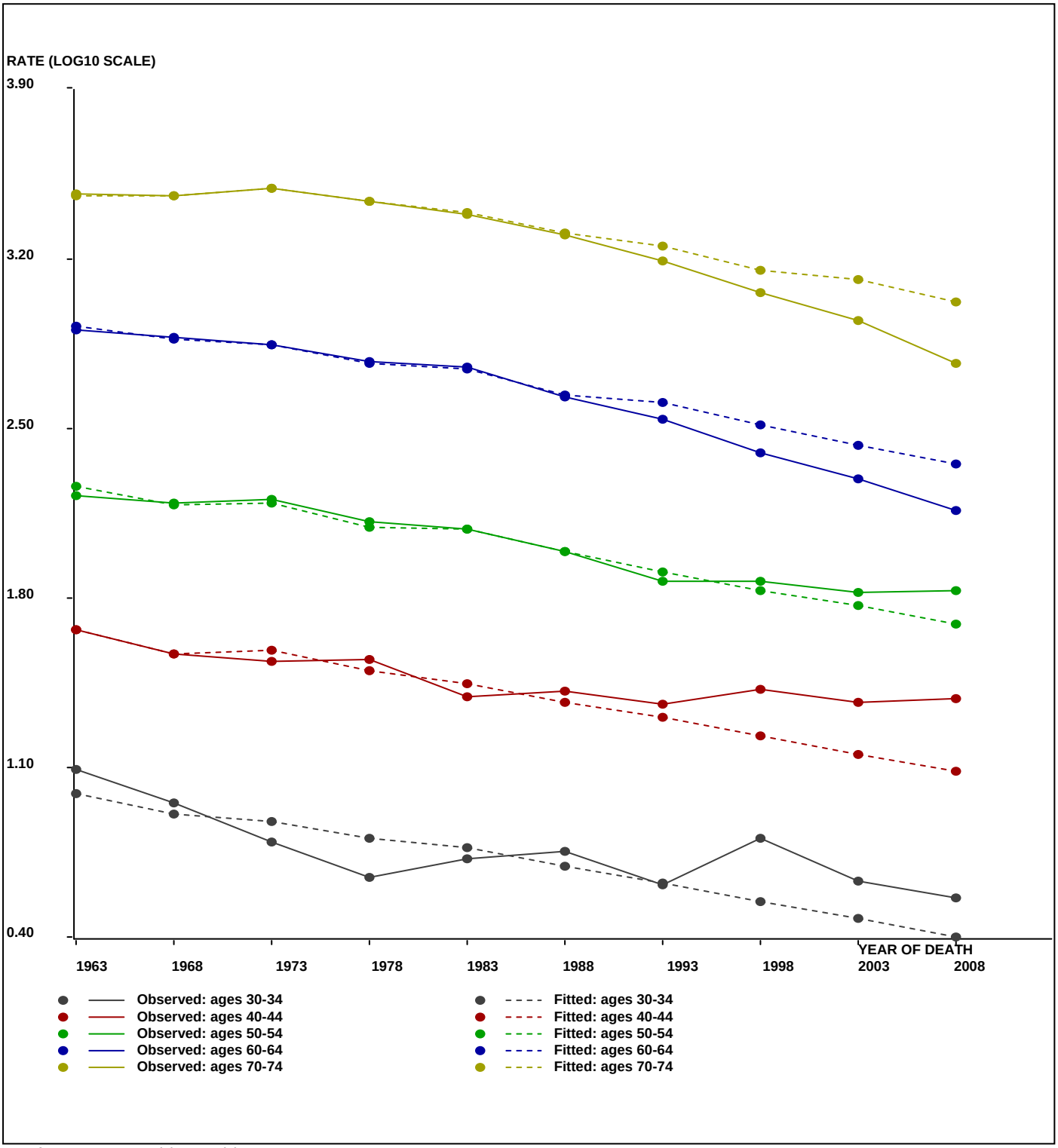


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	4.2	15.4	23.3	42.5	73.8	150.9	345.8	698.5	1561.9	3163.9
	PRE	4.2	9.2	20.3	40.9	80.6	172.8	401.1	793.1	1790.6	3306.8
	RES	-0.038	6.282	2.971	1.540	-6.768	-21.927	-55.322	-94.633	-228.717	-142.866
1996-	OBS	6.4	11.0	26.7	45.3	74.3	121.1	251.4	588.1	1143.0	2574.4
	PRE	3.6	7.7	17.0	35.3	68.3	141.7	325.9	731.8	1409.9	2942.6
	RES	2.847	3.256	9.622	10.009	5.956	-20.567	-74.493	-143.684	-266.904	-368.215
2001-	OBS	4.3	12.2	23.3	46.4	66.3	102.0	197.0	407.5	878.7	1841.3
	PRE	3.0	6.5	14.4	29.6	58.8	120.1	267.2	594.5	1301.0	2317.0
	RES	1.263	5.650	8.939	16.752	7.508	-18.139	-70.243	-186.964	-422.281	-475.686
2006-	OBS	3.7	10.2	24.4	42.4	68.0	88.5	145.4	282.9	585.2	1342.8
	PRE	2.6	5.5	12.2	25.0	49.4	103.4	226.5	487.5	1056.8	2137.9
	RES	1.123	4.679	12.264	17.403	18.557	-14.910	-81.170	-204.594	-471.598	-795.109

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	46.0	166.0	252.0	391.0	519.0	1121.0	2625.0	5343.0	9253.0	12924.0
	PRE	46.4	98.4	219.8	376.8	566.6	1283.9	3044.9	6066.9	10608.0	13507.6
	CHI	0.004	46.377	4.712	0.533	3.998	20.679	57.915	86.371	173.078	25.213
1996-	OBS	70.0	121.0	286.0	486.0	675.0	838.0	1821.0	4293.0	8189.0	13747.0
	PRE	39.0	85.2	182.8	378.5	620.9	980.3	2360.7	5341.8	10101.2	15713.3
	CHI	24.722	15.092	58.244	30.506	4.721	20.653	123.366	205.913	361.994	246.045
2001-	OBS	47.0	135.0	259.0	498.0	711.0	925.0	1350.0	2891.0	6147.0	12051.0
	PRE	33.1	72.4	159.8	318.1	630.5	1089.5	1831.4	4217.3	9101.2	15164.3
	CHI	5.795	54.107	61.527	101.738	10.276	24.844	126.535	417.113	958.901	639.163
2006-	OBS	36.1	114.0	273.3	471.3	726.8	942.6	1302.2	1892.0	3980.6	8714.6
	PRE	25.1	61.7	136.2	278.0	528.4	1101.4	2029.3	3260.1	7188.3	13874.6
	CHI	4.855	44.283	138.145	134.353	74.533	22.889	260.494	574.138	1431.417	1919.025

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	9450.37	185.30	51	P, C	99.66	51455.31	0.0000
AGE-PERIOD	377.25	8.38	45	Cohort	91.40	2005.52	0.0000
AGE-COHORT	257.77	7.16	36	Period	87.41	1367.95	0.0000
PERIOD-COHORT	170.52	4.26	40	Age	80.97	904.69	0.0000
FULL AGE-PERIOD-COHORT	32.44	1.01	32			172.10	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.606157	40.379096
35	1.842938	69.652708
40	2.117651	131.114592
45	2.393630	247.531059
50	2.604463	402.219002
55	2.788236	614.095423
60	3.005587	1012.948572
65	3.273263	1876.130208
70	3.577811	3782.779618
75	3.892640	7809.795016

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.086726	1.221028
1966	0.059930	1.147968
1971	0.044942	1.109027
1976	-0.043024	0.905682
1981	-0.104269	0.786559
1986	-0.202708	0.627035

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.042003	1.101546
1891	0.054600	1.133966
1896	0.063754	1.158122
1901	0.039816	1.096015
1906	-0.002834	0.993497
1911	-0.063444	0.864085
1916	-0.128254	0.744297
1921	-0.135377	0.732189
1926	-0.211922	0.613873
1931	-0.206491	0.621598
1936	-0.218068	0.605246
1941	-0.185939	0.651720
1946	-0.127442	0.745689
1951	-0.085435	0.821420
1956	-0.018741	0.957766

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	243.0	190.0	215.0	272.0	281.0	259.0
	EXP	247.6	216.4	206.0	251.5	282.2	259.0
	CHI	0.1	3.2	0.4	1.7	0.0	0.0
35 -	OBS	406.0	358.0	371.0	337.0	408.0	390.0
	EXP	445.3	407.5	361.8	294.8	380.8	388.8
	CHI	3.5	6.0	0.2	6.1	1.9	0.0
40 -	OBS	746.0	756.0	812.0	631.0	489.0	516.0
	EXP	823.1	794.6	739.0	556.6	484.1	567.9
	CHI	7.2	1.9	7.2	9.9	0.0	4.8
45 -	OBS	1192.0	1424.0	1477.0	1214.0	946.0	657.0
	EXP	1279.3	1461.6	1434.2	1123.5	903.8	719.0
	CHI	6.0	1.0	1.3	7.3	2.0	5.3
50 -	OBS	3092.0	1894.0	2403.0	1981.0	1531.0	1039.0
	EXP	3182.4	1938.7	2252.9	1871.7	1558.5	1151.5
	CHI	2.6	1.0	10.0	6.4	0.5	11.0
55 -	OBS	5384.0	4427.0	2825.0	2899.0	2454.0	1765.0
	EXP	5466.9	4477.6	2770.5	2752.8	2434.3	1859.7
	CHI	1.3	0.6	1.1	7.8	0.2	4.8
60 -	OBS	9391.0	8182.0	6865.0	3593.0	3826.0	2999.0
	EXP	9286.7	8169.8	6853.1	3608.0	3839.6	3101.1
	CHI	1.2	0.0	0.0	0.1	0.0	3.4
65 -	OBS	15911.0	15146.0	13879.0	9617.0	5511.0	5239.0
	EXP	15698.2	15162.1	13664.2	9840.9	5523.3	5423.2
	CHI	2.9	0.0	3.4	5.1	0.0	6.3
70 -	OBS	25291.0	26724.0	26194.0	20322.0	15766.0	8257.0
	EXP	25239.2	26429.6	26260.6	20566.9	15905.2	8156.9
	CHI	0.1	3.3	0.2	2.9	1.2	1.2
75 -	OBS	37731.0	39470.0	42202.0	37079.0	31647.0	23225.0
	EXP	37731.0	39521.9	42715.4	37101.3	31550.2	22742.6
	CHI	0.0	0.1	6.2	0.0	0.3	10.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	222020.92	5550.52	40	P, C	98.40	0.0000
AGE-PERIOD	12798.52	319.96	40	Cohort	72.33	0.0000
AGE-COHORT	4436.36	110.91	40	Period	20.17	0.0000
PERIOD-COHORT	3425.57	85.64	40	Age	-3.39	0.0000
FULL AGE-PERIOD-COHORT	3541.53	88.54	40			0.0000

AGE	EFFECT
30	40.379096
35	69.652708
40	131.114592
45	247.531059
50	402.219002
55	614.095423
60	1012.948572
65	1876.130208
70	3782.779618
75	7809.795016

PERIOD	EFFECT	LOWER	UPPER
% Period Change	79.7187	76.7187	82.7187
1961	1.221028		
1966	1.147968		
1971	1.109027		
1976	0.905682		
1981	0.786559		
1986	0.627035		
1991	0.499864	0.481053	0.518676
1996	0.398486	0.369058	0.429042
2001	0.317668	0.283137	0.354898
2006	0.253241	0.217219	0.293567

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.101546	1.000000	
1891	1.133966	2.000000	
1896	1.158122	4.000000	
1901	1.096015	8.000000	
1906	0.993497	16.000000	
1911	0.864085	32.000000	
1916	0.744297	64.000000	
1921	0.732189	128.000000	
1926	0.613873	256.000000	
1931	0.621598	512.000000	
1936	0.605246	1024.000000	
1941	0.651720	2048.000000	
1946	0.745689	4096.000000	
1951	0.821420	8192.000000	
1956	0.844612	EXTRAPOLATION	0.957766
1961	0.894185	EXTRAPOLATION	
1966	0.946668	EXTRAPOLATION	
1971	1.002231	EXTRAPOLATION	
1976	1.061056	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	30.1	24.6	30.5	29.5	26.0	24.2	17.8	19.4	13.5	11.6
	EXP	30.6	28.1	29.2	27.3	26.1	21.4	18.0*	15.2*	12.9*	10.8*
	Elow							17.4	14.1	11.5	9.3
	Eup							18.7	16.4	14.4	12.6
35	OBS	47.6	43.7	47.9	47.0	43.8	36.0	36.7	31.3	24.8	20.9
	EXP	52.2	49.7	46.8	41.1	40.9	35.9	29.4*	24.8*	20.9*	17.7*
	Elow							28.3	23.0	18.7	15.2
	Eup							30.5	26.7	23.4	20.5
40	OBS	106.2	87.9	99.3	81.5	67.9	55.7	51.7	53.7	46.9	38.1
	EXP	117.2	92.4	90.4	71.9	67.2	61.3	53.8*	44.1*	37.2*	31.4*
	Elow							51.8	40.9	33.2	27.0
	Eup							55.9	47.5	41.6	36.4
45	OBS	209.6	202.7	173.5	150.6	123.3	92.4	75.0	70.5	67.7	57.4
	EXP	225.0	208.1	168.5	139.4	117.8	101.2	92.3*	81.0*	66.4*	56.1*
	Elow							88.8	75.0	59.2	48.1
	Eup							95.7	87.2	74.2	65.0
50	OBS	412.3	335.7	348.4	236.7	193.2	137.7	120.2	99.6	92.2	88.6
	EXP	424.4	343.7	326.6	223.6	196.7	152.6	131.0*	119.5*	105.0*	86.0*
	Elow							126.1	110.7	93.5	73.8
	Eup							136.0	128.7	117.3	99.7
55	OBS	733.7	602.3	516.9	428.9	298.9	227.2	169.0	146.6	124.1	104.9
	EXP	745.0	609.1	506.9	407.2	296.5	239.4	185.8*	159.5*	145.5*	127.7*
	Elow							178.8	147.7	129.7	109.6
	Eup							192.8	171.7	162.5	148.1
60	OBS	1370.8	1157.0	972.4	680.0	581.3	377.1	310.6	255.0	201.8	164.7
	EXP	1355.6	1155.3	970.7	682.8	583.4	389.9	314.7*	244.3*	209.7*	191.3*
	Elow							302.9	226.3	186.9	164.1
	Eup							326.6	263.0	234.3	221.7
65	OBS	2689.0	2358.0	2099.6	1434.8	1095.9	832.1	590.0	508.8	397.8	319.7
	EXP	2653.0	2360.5	2067.1	1468.2	1098.4	861.3	575.7*	464.7*	360.7*	309.6*
	Elow							554.0	430.4	321.5	265.6
	Eup							597.4	500.3	403.0	358.9
70	OBS	5248.4	5085.2	4586.4	3363.2	2548.5	1787.1	1411.1	1124.4	897.7	682.6
	EXP	5237.7	5029.2	4598.0	3403.7	2571.0	1765.4	1384.5*	925.3*	747.0*	579.8*
	Elow							1332.4	857.0	665.8	497.3
	Eup							1436.6	996.3	834.5	672.1
75	OBS	10504.3	10153.1	9910.2	7747.7	6121.6	4321.2	3162.2	2682.8	2070.7	1595.2
	EXP	10504.3	10166.5	10030.8	7752.3	6102.9	4231.4	2905.6*	2278.6*	1523.0*	1229.4*
	Elow							2796.3	2110.4	1357.4	1054.5
	Eup							3015.0	2453.4	1701.5	1425.1
30-79	OBS	1171.0	1077.4	997.1	747.5	584.6	418.2	319.9	270.0	216.3	172.5
	EXP	1173.2	1079.0	993.6	744.9	584.5	421.8	313.2*	243.0*	188.1*	155.9*
	Elow							301.4	225.0	167.7	133.7
	Eup							325.0	261.6	210.2	180.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	243.0	190.0	215.0	272.0	281.0	259.0	195.0	212.0	148.0	113.7
	EXP	247.6	216.4	206.0	251.5	282.2	228.4	198.1*	166.1*	141.1*	106.6*
	CHI	0.085	3.226	0.395	1.672	0.005	4.099	0.048	12.704	0.341	0.479
35 -	OBS	406.0	358.0	371.0	337.0	408.0	390.0	395.0	345.0	275.0	233.8
	EXP	445.3	407.5	361.8	294.8	380.8	388.8	316.3*	273.2*	232.0*	197.5*
	CHI	3.462	6.015	0.233	6.056	1.946	0.004	19.584	18.844	7.955	6.664
40 -	OBS	746.0	756.0	812.0	631.0	489.0	516.0	560.0	576.0	520.0	425.6
	EXP	823.1	794.6	739.0	556.6	484.1	567.9	583.2*	473.2*	413.2*	351.5*
	CHI	7.225	1.876	7.209	9.946	0.049	4.751	0.923	22.321	27.616	15.624
45 -	OBS	1192.0	1424.0	1477.0	1214.0	946.0	657.0	690.0	757.0	727.0	637.2
	EXP	1279.3	1461.6	1434.2	1123.5	903.8	719.0	849.0*	869.9*	713.2*	622.5*
	CHI	5.952	0.965	1.274	7.283	1.966	5.345	29.793	14.643	0.267	0.347
50 -	OBS	3092.0	1894.0	2403.0	1981.0	1531.0	1039.0	845.0	905.0	989.0	947.1
	EXP	3182.4	1938.7	2252.9	1871.7	1558.5	1151.5	921.5*	1086.4*	1125.2*	920.0*
	CHI	2.566	1.032	10.005	6.378	0.486	10.998	6.351	30.295	16.495	0.798
55 -	OBS	5384.0	4427.0	2825.0	2899.0	2454.0	1765.0	1256.0	1014.0	1126.0	1116.5
	EXP	5466.9	4477.6	2770.5	2752.8	2434.3	1859.7	1380.6*	1103.3*	1319.4*	1360.3*
	CHI	1.256	0.572	1.070	7.769	0.160	4.826	11.243	7.234	28.348	43.683
60 -	OBS	9391.0	8182.0	6865.0	3593.0	3826.0	2999.0	2358.0	1847.0	1383.0	1475.3
	EXP	9286.7	8169.8	6853.1	3608.0	3839.6	3101.1	2389.1*	1769.8*	1437.2*	1713.4*
	CHI	1.170	0.018	0.021	0.063	0.048	3.363	0.404	3.366	2.043	33.080
65 -	OBS	15911.0	15146.0	13879.0	9617.0	5511.0	5239.0	4513.0	3714.0	2822.0	2137.7
	EXP	15698.2	15162.1	13664.2	9840.9	5523.3	5423.2	4403.7*	3392.0*	2558.9*	2070.6*
	CHI	2.885	0.017	3.377	5.094	0.027	6.260	2.712	30.560	27.051	2.177
70 -	OBS	25291.0	26724.0	26194.0	20322.0	15766.0	8257.0	8360.0	8056.0	6280.0	4642.8
	EXP	25239.2	26429.6	26260.6	20566.9	15905.2	8156.9	8202.1*	6629.6*	5225.5*	3943.7*
	CHI	0.106	3.279	0.169	2.917	1.219	1.228	3.039	306.921	212.798	123.938
75 -	OBS	37731.0	39470.0	42202.0	37079.0	31647.0	23225.0	12917.0	14326.0	13552.0	10352.3
	EXP	37731.0	39521.9	42715.4	37101.3	31550.2	22742.6	11868.8*	12167.8*	9967.5*	7978.2*
	CHI	0.000	0.068	6.171	0.013	0.297	10.232	92.566	382.785	1289.038	706.450
30-79	OBS	99387.0	98571.0	97243.0	77945.0	62859.0	44346.0	32089.0	31752.0	27822.0	22082.0
	EXP	99399.6	98579.8	97257.7	77968.0	62862.1	44339.3	31112.5*	27931.4*	23133.2*	19264.2*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	1.031	1.137	1.203	1.146

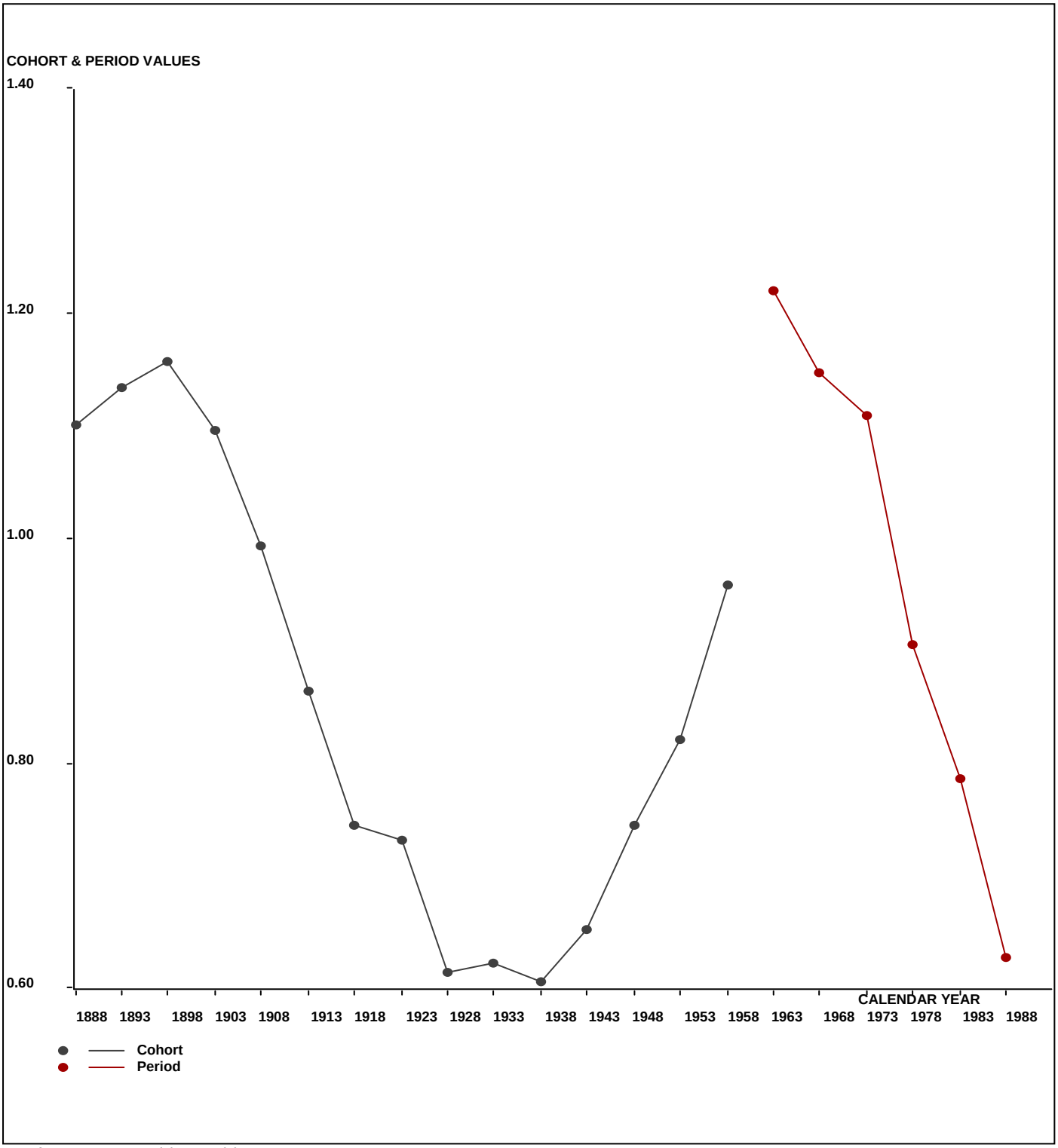
CHI SQUARE (LOG)= 3541.5307 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

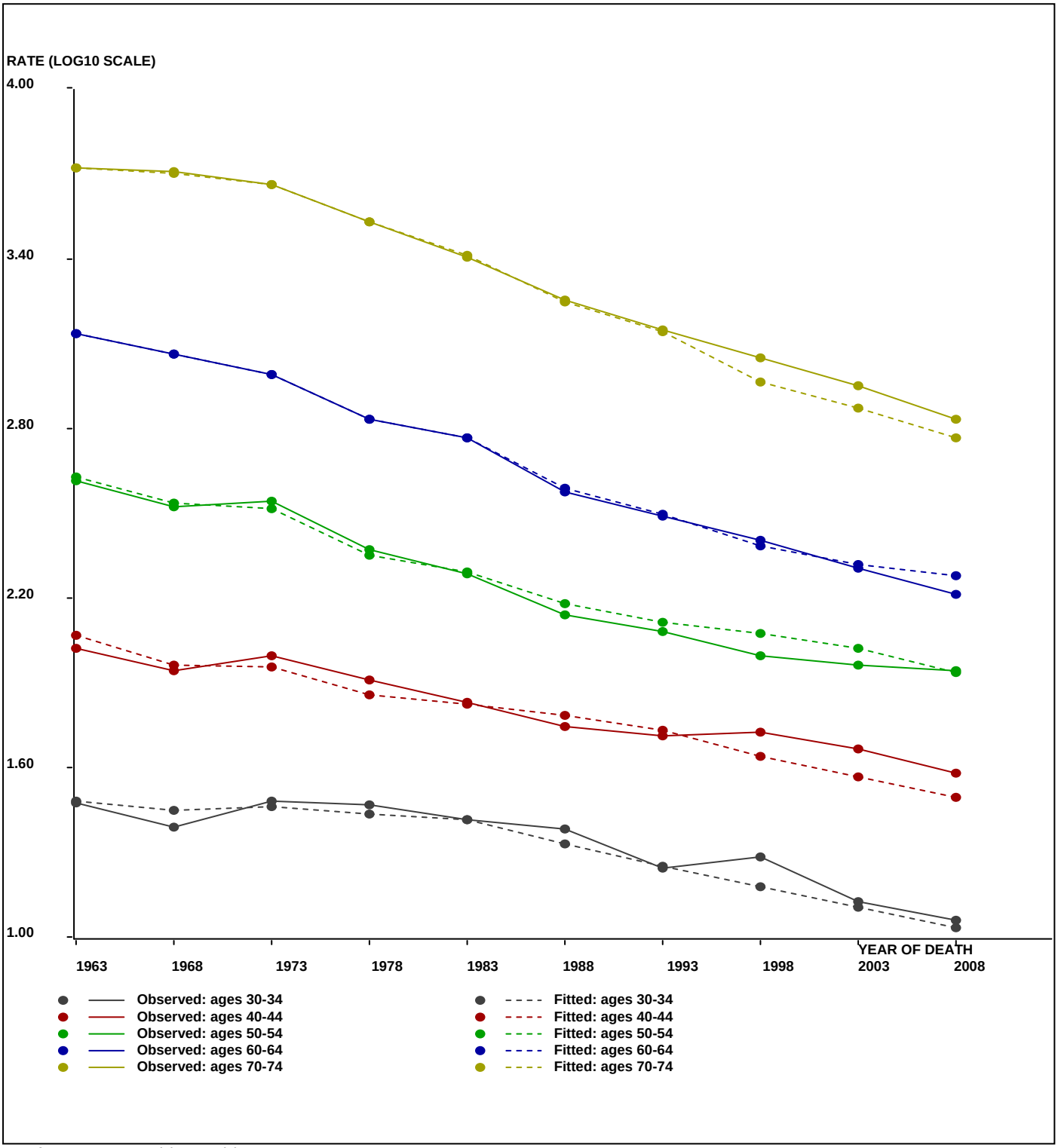


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	17.8	36.7	51.7	75.0	120.2	169.0	310.6	590.0	1411.1	3162.2
PRE	18.0	29.4	53.8	92.3	131.0	185.8	314.7	575.7	1384.5	2905.6
RES	-0.282	7.317	-2.142	-17.283	-10.878	-16.766	-4.095	14.285	26.651	256.602
1996- OBS	19.4	31.3	53.7	70.5	99.6	146.6	255.0	508.8	1124.4	2682.8
PRE	15.2	24.8	44.1	81.0	119.5	159.5	244.3	464.7	925.3	2278.6
RES	4.213	6.518	9.584	-10.512	-19.958	-12.914	10.654	44.109	199.101	404.153
2001- OBS	13.5	24.8	46.9	67.7	92.2	124.1	201.8	397.8	897.7	2070.7
PRE	12.9	20.9	37.2	66.4	105.0	145.5	209.7	360.7	747.0	1523.0
RES	0.632	3.879	9.629	1.285	-12.707	-21.322	-7.907	37.088	150.735	547.684
2006- OBS	11.6	20.9	38.1	57.4	88.6	104.9	164.7	319.7	682.6	1595.2
PRE	10.8	17.7	31.4	56.1	86.0	127.7	191.3	309.6	579.8	1229.4
RES	0.728	3.247	6.627	1.323	2.534	-22.892	-26.579	10.040	102.785	365.822

Observed and predicted deaths (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	195.0	395.0	560.0	690.0	845.0	1256.0	2358.0	4513.0	8360.0	12917.0
PRE	198.1	316.3	583.2	849.0	921.5	1380.6	2389.1	4403.7	8202.1	11868.8
CHI	0.048	19.584	0.923	29.793	6.351	11.243	0.404	2.712	3.039	92.566
1996- OBS	212.0	345.0	576.0	757.0	905.0	1014.0	1847.0	3714.0	8056.0	14326.0
PRE	166.1	273.2	473.2	869.9	1086.4	1103.3	1769.8	3392.0	6629.6	12167.8
CHI	12.704	18.844	22.321	14.643	30.295	7.234	3.366	30.560	306.921	382.785
2001- OBS	148.0	275.0	520.0	727.0	989.0	1126.0	1383.0	2822.0	6280.0	13552.0
PRE	141.1	232.0	413.2	713.2	1125.2	1319.4	1437.2	2558.9	5225.5	9967.5
CHI	0.341	7.955	27.616	0.267	16.495	28.348	2.043	27.051	212.798	1289.038
2006- OBS	113.7	233.8	425.6	637.2	947.1	1116.5	1475.3	2137.7	4642.8	10352.3
PRE	106.6	197.5	351.5	622.5	920.0	1360.3	1713.4	2070.6	3943.7	7978.2
CHI	0.479	6.664	15.624	0.347	0.798	43.683	33.080	2.177	123.938	706.450

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	161.45	3.17	51	P, C	93.05	859.53	0.0000
AGE-PERIOD	24.78	0.55	45	Cohort	54.69	131.62	0.0000
AGE-COHORT	43.73	1.21	36	Period	74.33	232.44	0.0000
PERIOD-COHORT	12.86	0.32	40	Age	12.67	68.41	0.0034
FULL AGE-PERIOD-COHORT	11.23	0.35	32			59.71	0.0021

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.625924	4.225946
35	0.985677	9.675580
40	1.294134	19.684937
45	1.581273	38.130529
50	1.853071	71.296913
55	2.030840	107.359316
60	2.200180	158.555018
65	2.344899	221.258118
70	2.459907	288.341318
75	2.561932	364.696511

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.028206	0.937117
1966	-0.035800	0.920873
1971	-0.046190	0.899104
1976	-0.037572	0.917125
1981	0.016876	1.039623
1986	0.086032	1.219080

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.014239	0.967744
1891	-0.011414	0.974060
1896	0.004498	1.010412
1901	-0.006673	0.984753
1906	-0.008087	0.981552
1911	-0.026343	0.941146
1916	-0.016885	0.961867
1921	0.031194	1.074469
1926	0.024934	1.059092
1931	0.038408	1.092465
1936	0.016487	1.038694
1941	0.017632	1.041436
1946	0.084351	1.214369
1951	-0.038516	0.915133
1956	-0.000185	0.999573

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	34.0	46.0	25.0	33.0	38.0	55.0
	EXP	35.0	31.2	27.9	43.4	43.5	55.0
	CHI	0.0	7.0	0.3	2.5	0.7	0.0
35 -	OBS	100.0	79.0	55.0	75.0	91.0	122.0
	EXP	81.9	79.8	69.9	66.3	113.9	117.0
	CHI	4.0	0.0	3.2	1.2	4.6	0.2
40 -	OBS	137.0	162.0	140.0	162.0	126.0	298.0
	EXP	139.2	165.1	158.1	145.2	153.5	270.0
	CHI	0.0	0.1	2.1	1.9	4.9	2.9
45 -	OBS	215.0	231.0	305.0	321.0	299.0	362.0
	EXP	195.5	265.0	309.0	308.0	315.8	344.1
	CHI	2.0	4.4	0.1	0.5	0.9	0.9
50 -	OBS	481.0	372.0	451.0	594.0	631.0	675.0
	EXP	471.5	356.3	475.1	579.6	641.7	681.1
	CHI	0.2	0.7	1.2	0.4	0.2	0.1
55 -	OBS	734.0	675.0	520.0	706.0	950.0	1127.0
	EXP	724.7	683.9	507.5	715.1	970.5	1111.0
	CHI	0.1	0.1	0.3	0.1	0.4	0.2
60 -	OBS	991.0	1007.0	932.0	734.0	1210.0	1621.0
	EXP	1002.4	1013.5	947.2	739.1	1165.7	1628.2
	CHI	0.1	0.0	0.2	0.0	1.7	0.0
65 -	OBS	1190.0	1277.0	1303.0	1309.0	1110.0	1846.0
	EXP	1239.6	1288.8	1290.7	1280.0	1112.6	1824.8
	CHI	2.0	0.1	0.1	0.7	0.0	0.2
70 -	OBS	1272.0	1442.0	1492.0	1518.0	1766.0	1520.0
	EXP	1268.3	1409.9	1458.1	1568.4	1745.3	1562.2
	CHI	0.0	0.7	0.8	1.6	0.2	1.1
75 -	OBS	1188.0	1268.0	1427.0	1565.0	1958.0	2213.0
	EXP	1188.0	1271.7	1410.9	1576.3	1923.9	2248.9
	CHI	0.0	0.0	0.2	0.1	0.6	0.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	58563.08	1464.08	40	P, C	81.30	0.0000
AGE-PERIOD	6250.56	156.26	40	Cohort	-75.17	0.0000
AGE-COHORT	24290.39	607.26	40	Period	54.92	0.0000
PERIOD-COHORT	9989.84	249.75	40	Age	-9.60	0.0000
FULL AGE-PERIOD-COHORT	10949.02	273.73	40			0.0000

AGE	EFFECT
30	4.225946
35	9.675580
40	19.684937
45	38.130529
50	71.296913
55	107.359316
60	158.555018
65	221.258118
70	288.341318
75	364.696511

PERIOD	EFFECT	LOWER	UPPER
% Period Change	117.2617	114.2617	120.2617
1961	0.937117		
1966	0.920873		
1971	0.899104		
1976	0.917125		
1981	1.039623		
1986	1.219080		
1991	1.429515	1.392942	1.466087
1996	1.676273	1.591600	1.763141
2001	1.965627	1.818589	2.120384
2006	2.304928	2.077951	2.550010

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.967744	1.000000	
1891	0.974060	2.000000	
1896	1.010412	4.000000	
1901	0.984753	8.000000	
1906	0.981552	16.000000	
1911	0.941146	32.000000	
1916	0.961867	64.000000	
1921	1.074469	128.000000	
1926	1.059092	256.000000	
1931	1.092465	512.000000	
1936	1.038694	1024.000000	
1941	1.041436	2048.000000	
1946	1.214369	4096.000000	
1951	0.915133	8192.000000	
1956	0.949645	EXTRAPOLATION	0.999573
1961	0.918230	EXTRAPOLATION	
1966	0.887855	EXTRAPOLATION	
1971	0.858484	EXTRAPOLATION	
1976	0.830084	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	4.2	6.0	3.5	3.6	3.5	5.1	6.4	6.6	6.4	6.7
	EXP	4.3	4.0	4.0	4.7	4.0	4.9	5.5*	6.3*	7.1*	8.1*
	Elow							5.4	6.0	6.6	7.3
	Eup							5.7	6.6	7.7	8.9
35	OBS	11.7	9.6	7.1	10.5	9.8	11.3	23.3	26.2	28.4	26.1
	EXP	9.6	9.7	9.0	9.2	12.2	10.8	13.1*	14.9*	16.9*	19.1*
	Elow							12.8	14.1	15.6	17.3
	Eup							13.5	15.7	18.2	21.2
40	OBS	19.5	18.8	17.1	20.9	17.5	32.2	47.1	75.3	84.7	79.1
	EXP	19.8	19.2	19.3	18.8	21.3	29.1	25.8*	31.3*	35.5*	40.3*
	Elow							25.1	29.8	32.9	36.3
	Eup							26.4	33.0	38.3	44.6
45	OBS	37.8	32.9	35.8	39.8	39.0	50.9	74.4	106.8	176.7	183.8
	EXP	34.4	37.7	36.3	38.2	41.2	48.4	66.2*	58.5*	71.2*	80.7*
	Elow							64.5	55.5	65.9	72.8
	Eup							67.9	61.5	76.8	89.3
50	OBS	64.1	65.9	65.4	71.0	79.6	89.5	108.9	146.6	222.3	320.4
	EXP	62.9	63.2	68.9	69.3	81.0	90.3	106.1*	145.1*	128.2*	156.1*
	Elow							103.4	137.8	118.7	140.7
	Eup							108.9	152.7	138.3	172.7
55	OBS	100.0	91.8	95.1	104.4	115.7	145.0	144.9	201.3	259.9	387.6
	EXP	98.8	93.0	92.8	105.8	118.2	143.0	159.4*	187.4*	256.3*	226.5*
	Elow							155.3	178.0	237.1	204.2
	Eup							163.5	197.1	276.4	250.5
60	OBS	144.7	142.4	132.0	138.9	183.8	203.8	229.0	249.3	308.9	403.7
	EXP	146.3	143.3	134.2	139.9	177.1	204.7	247.6*	276.1*	324.6*	443.8*
	Elow							241.3	262.1	300.3	400.1
	Eup							253.9	290.4	350.1	491.0
65	OBS	201.1	198.8	197.1	195.3	220.7	293.2	308.9	363.7	383.3	476.8
	EXP	209.5	200.6	195.3	191.0	221.3	289.8	335.0*	405.2*	451.7*	531.1*
	Elow							326.4	384.7	417.9	478.8
	Eup							343.6	426.2	487.3	587.6
70	OBS	264.0	274.4	261.2	251.2	285.5	329.0	409.8	440.4	521.2	555.6
	EXP	263.2	268.3	255.3	259.6	282.1	338.1	442.9*	511.9*	619.2*	690.3*
	Elow							431.6	486.0	572.9	622.3
	Eup							454.2	538.4	667.9	763.7
75	OBS	330.7	326.2	335.1	327.0	378.7	411.7	450.2	553.2	589.6	726.0
	EXP	330.7	327.1	331.3	329.4	372.2	418.4	501.5*	656.9*	759.2*	918.3*
	Elow							488.6	623.7	702.4	827.9
	Eup							514.3	690.9	819.0	1016.0
30-79	OBS	82.6	81.2	79.6	82.4	93.7	112.6	130.9	161.2	200.2	248.8
	EXP	82.4	81.3	80.0	82.1	94.3	112.3	134.2*	159.4*	184.7*	213.4*
	Elow							130.8	151.4	170.8	192.4
	Eup							137.7	167.7	199.2	236.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	34.0	46.0	25.0	33.0	38.0	55.0	70.0	72.0	70.0	66.0
	EXP	35.0	31.2	27.9	43.4	43.5	52.3	60.9*	68.6*	78.2*	79.4*
	CHI	0.026	7.042	0.307	2.494	0.694	0.144	1.365	0.172	0.869	2.263
35 -	OBS	100.0	79.0	55.0	75.0	91.0	122.0	251.0	289.0	315.0	291.8
	EXP	81.9	79.8	69.9	66.3	113.9	117.0	141.3*	164.0*	187.1*	213.9*
	CHI	4.001	0.008	3.187	1.154	4.587	0.216	85.216	95.353	87.517	28.360
40 -	OBS	137.0	162.0	140.0	162.0	126.0	298.0	510.0	807.0	940.0	884.4
	EXP	139.2	165.1	158.1	145.2	153.5	270.0	279.0*	336.0*	394.2*	450.5*
	CHI	0.034	0.058	2.070	1.938	4.934	2.910	191.330	660.065	755.876	417.991
45 -	OBS	215.0	231.0	305.0	321.0	299.0	362.0	685.0	1147.0	1897.0	2041.0
	EXP	195.5	265.0	309.0	308.0	315.8	344.1	609.1*	628.0*	764.3*	896.3*
	CHI	1.955	4.370	0.052	0.547	0.895	0.932	9.453	428.973	1678.475	1462.092
50 -	OBS	481.0	372.0	451.0	594.0	631.0	675.0	766.0	1333.0	2383.0	3425.8
	EXP	471.5	356.3	475.1	579.6	641.7	681.1	746.5*	1319.3*	1375.0*	1668.9*
	CHI	0.189	0.696	1.222	0.356	0.180	0.054	0.511	0.143	738.978	1849.624
55 -	OBS	734.0	675.0	520.0	706.0	950.0	1127.0	1077.0	1393.0	2357.0	4127.3
	EXP	724.7	683.9	507.5	715.1	970.5	1111.0	1184.6*	1296.6*	2324.3*	2411.4*
	CHI	0.119	0.117	0.310	0.117	0.431	0.232	9.768	7.162	0.459	1220.996
60 -	OBS	991.0	1007.0	932.0	734.0	1210.0	1621.0	1738.0	1806.0	2117.0	3615.7
	EXP	1002.4	1013.5	947.2	739.1	1165.7	1628.2	1879.6*	1999.9*	2224.4*	3975.2*
	CHI	0.129	0.042	0.244	0.035	1.683	0.032	10.663	18.800	5.182	32.516
65 -	OBS	1190.0	1277.0	1303.0	1309.0	1110.0	1846.0	2363.0	2655.0	2719.0	3188.2
	EXP	1239.6	1288.8	1290.7	1280.0	1112.6	1824.8	2562.4*	2957.5*	3204.6*	3551.6*
	CHI	1.988	0.108	0.117	0.655	0.006	0.247	15.518	30.944	73.583	37.177
70 -	OBS	1272.0	1442.0	1492.0	1518.0	1766.0	1520.0	2428.0	3155.0	3646.0	3779.0
	EXP	1268.3	1409.9	1458.1	1568.4	1745.3	1562.2	2623.8*	3667.5*	4331.6*	4695.4*
	CHI	0.011	0.729	0.790	1.621	0.245	1.139	14.610	71.613	108.520	178.869
75 -	OBS	1188.0	1268.0	1427.0	1565.0	1958.0	2213.0	1839.0	2954.0	3859.0	4711.7
	EXP	1188.0	1271.7	1410.9	1576.3	1923.9	2248.9	2048.4*	3507.6*	4968.9*	5959.6*
	CHI	0.000	0.011	0.184	0.081	0.604	0.574	21.397	87.370	247.929	261.319
30-79	OBS	6342.0	6559.0	6650.0	7017.0	8179.0	9839.0	11727.0	15611.0	20303.0	26130.9
	EXP	6346.1	6565.2	6654.4	7021.6	8186.5	9839.4	12135.4*	15944.9*	19852.6*	23902.2*
	O/E	0.999	0.999	0.999	0.999	0.999	1.000	0.966	0.979	1.023	1.093

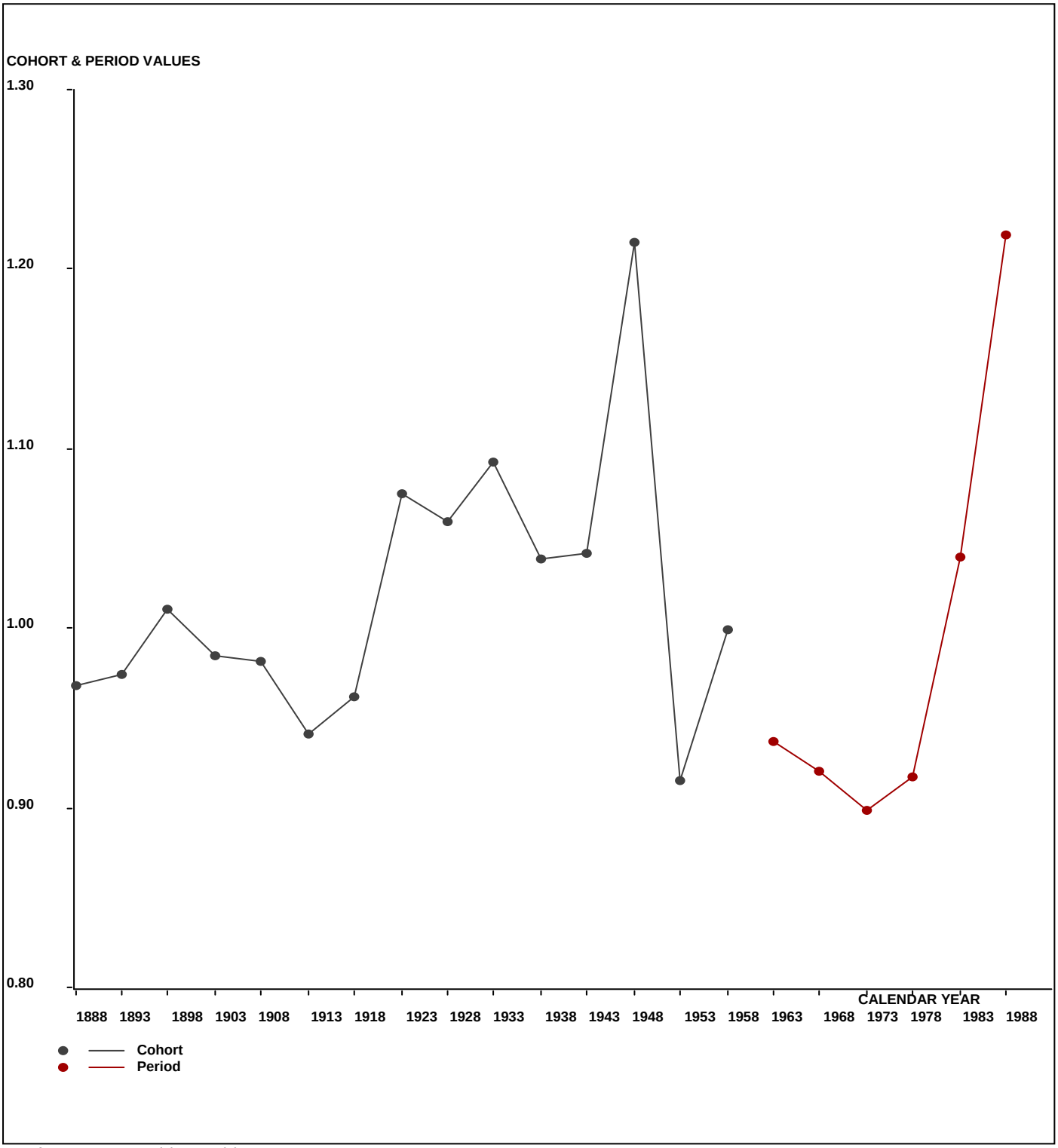
CHI SQUARE (LOG)= 10949.0210 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

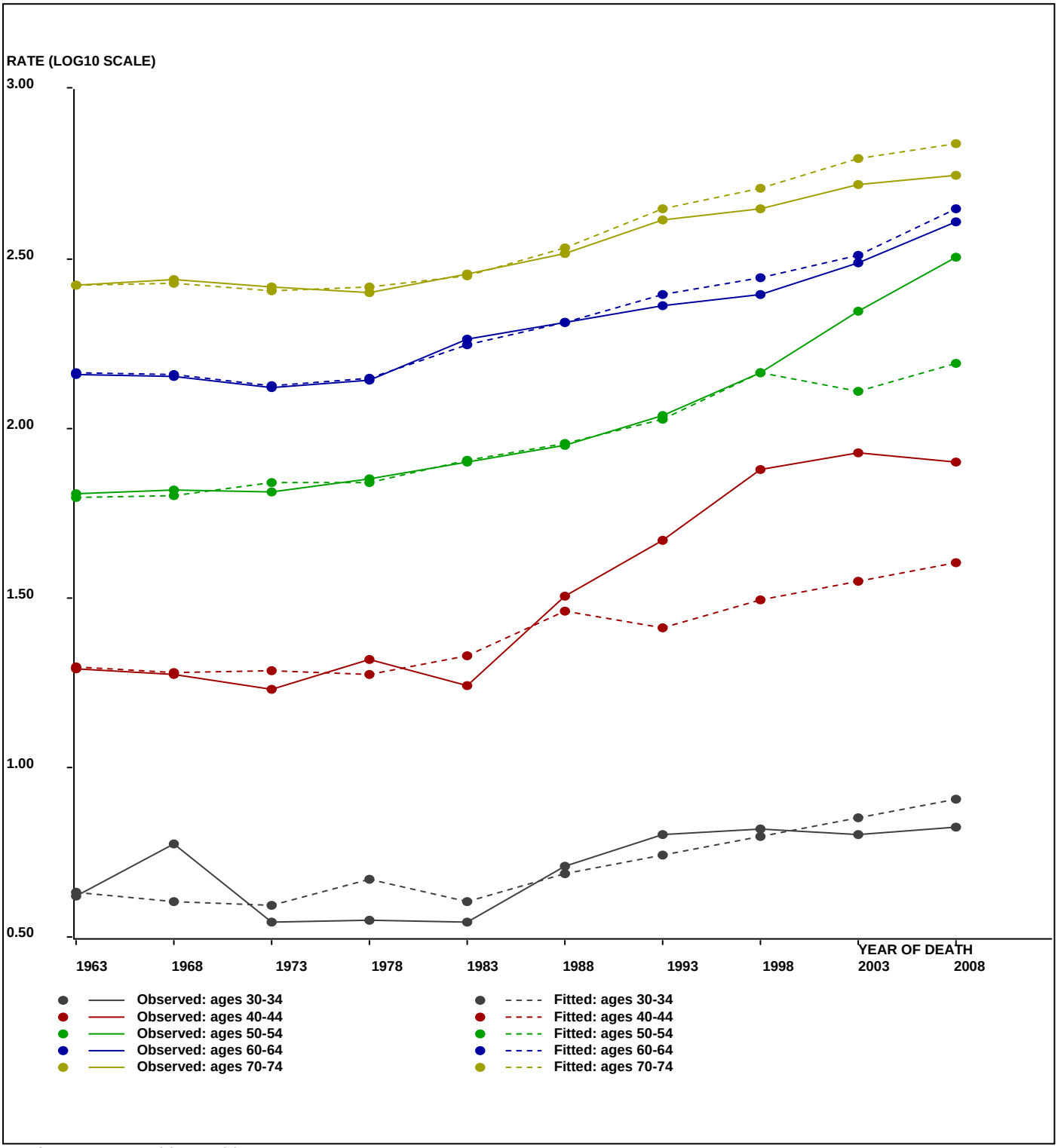


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	6.4	23.3	47.1	74.4	108.9	144.9	229.0	308.9	409.8	450.2
	PRE	5.5	13.1	25.8	66.2	106.1	159.4	247.6	335.0	442.9	501.5
	RES	0.830	10.201	21.327	8.246	2.777	-14.476	-18.651	-26.069	-33.048	-51.252
1996-	OBS	6.6	26.2	75.3	106.8	146.6	201.3	249.3	363.7	440.4	553.2
	PRE	6.3	14.9	31.3	58.5	145.1	187.4	276.1	405.2	511.9	656.9
	RES	0.315	11.357	43.918	48.344	1.511	13.929	-26.766	-41.445	-71.531	-103.669
2001-	OBS	6.4	28.4	84.7	176.7	222.3	259.9	308.9	383.3	521.2	589.6
	PRE	7.1	16.9	35.5	71.2	128.2	256.3	324.6	451.7	619.2	759.2
	RES	-0.752	11.550	49.201	105.475	94.020	3.601	-15.666	-68.453	-98.004	-169.589
2006-	OBS	6.7	26.1	79.1	183.8	320.4	387.6	403.7	476.8	555.6	726.0
	PRE	8.1	19.1	40.3	80.7	156.1	226.5	443.8	531.1	690.3	918.3
	RES	-1.365	6.971	38.805	103.075	164.293	161.140	-40.138	-54.339	-134.735	-192.297

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	70.0	251.0	510.0	685.0	766.0	1077.0	1738.0	2363.0	2428.0	1839.0
	PRE	60.9	141.3	279.0	609.1	746.5	1184.6	1879.6	2562.4	2623.8	2048.4
	CHI	1.365	85.216	191.330	9.453	0.511	9.768	10.663	15.518	14.610	21.397
1996-	OBS	72.0	289.0	807.0	1147.0	1333.0	1393.0	1806.0	2655.0	3155.0	2954.0
	PRE	68.6	164.0	336.0	628.0	1319.3	1296.6	1999.9	2957.5	3667.5	3507.6
	CHI	0.172	95.353	660.065	428.973	0.143	7.162	18.800	30.944	71.613	87.370
2001-	OBS	70.0	315.0	940.0	1897.0	2383.0	2357.0	2117.0	2719.0	3646.0	3859.0
	PRE	78.2	187.1	394.2	764.3	1375.0	2324.3	2224.4	3204.6	4331.6	4968.9
	CHI	0.869	87.517	755.876	1678.475	738.978	0.459	5.182	73.583	108.520	247.929
2006-	OBS	66.0	291.8	884.4	2041.0	3425.8	4127.3	3615.7	3188.2	3779.0	4711.7
	PRE	79.4	213.9	450.5	896.3	1668.9	2411.4	3975.2	3551.6	4695.4	5959.6
	CHI	2.263	28.360	417.991	1462.092	1849.624	1220.996	32.516	37.177	178.869	261.319

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1565.55	30.70	51	P, C	99.21	8460.11	0.0000
AGE-PERIOD	101.82	2.26	45	Cohort	87.79	541.76	0.0000
AGE-COHORT	323.46	8.99	36	Period	96.16	1723.55	0.0000
PERIOD-COHORT	27.12	0.68	40	Age	54.16	144.02	0.0000
FULL AGE-PERIOD-COHORT	12.43	0.39	32			65.94	0.0004

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.039616	10.955098
35	1.235465	17.197485
40	1.408099	25.591664
45	1.652262	44.901588
50	1.845031	69.989218
55	2.063735	115.806918
60	2.305603	202.116917
65	2.557682	361.145687
70	2.840466	692.573354
75	3.104470	1271.949896

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.015689	1.036786
1966	0.085905	1.218723
1971	0.101731	1.263953
1976	-0.012395	0.971862
1981	-0.191442	0.643514
1986	-0.176293	0.666357

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.101429	1.263076
1891	0.061965	1.153359
1896	0.033633	1.080521
1901	-0.007597	0.982659
1906	-0.050427	0.890375
1911	-0.064506	0.861975
1916	-0.066104	0.858809
1921	0.004333	1.010026
1926	-0.020985	0.952829
1931	0.022713	1.053691
1936	0.039644	1.095579
1941	-0.058550	0.873877
1946	-0.036496	0.919398
1951	0.048517	1.118193
1956	0.081213	1.205627

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	98.0	118.0	94.0	85.0	74.0	94.0
	EXP	96.7	112.8	85.4	90.3	85.3	94.0
	CHI	0.0	0.2	0.9	0.3	1.5	0.0
35 -	OBS	136.0	165.0	190.0	106.0	101.0	149.0
	EXP	144.9	181.1	184.3	104.7	94.8	138.9
	CHI	0.5	1.4	0.2	0.0	0.4	0.7
40 -	OBS	169.0	278.0	295.0	192.0	101.0	144.0
	EXP	188.2	255.6	278.7	211.0	103.7	145.2
	CHI	2.0	2.0	1.0	1.7	0.1	0.0
45 -	OBS	214.0	405.0	474.0	367.0	236.0	178.0
	EXP	227.4	388.3	460.2	370.7	242.8	185.8
	CHI	0.8	0.7	0.4	0.0	0.2	0.3
50 -	OBS	434.0	395.0	618.0	541.0	412.0	399.0
	EXP	469.1	413.2	616.3	542.5	376.1	385.5
	CHI	2.6	0.8	0.0	0.0	3.4	0.5
55 -	OBS	769.0	857.0	690.0	833.0	601.0	594.0
	EXP	784.5	894.2	687.1	768.4	583.0	631.8
	CHI	0.3	1.6	0.0	5.4	0.6	2.3
60 -	OBS	1398.0	1585.0	1529.0	892.0	912.0	974.0
	EXP	1410.7	1551.0	1554.6	891.4	864.6	1020.7
	CHI	0.1	0.7	0.4	0.0	2.6	2.1
65 -	OBS	2417.0	2822.0	2776.0	1982.0	1007.0	1409.0
	EXP	2393.9	2778.1	2686.6	2027.8	1003.7	1530.4
	CHI	0.2	0.7	3.0	1.0	0.0	9.6
70 -	OBS	4067.0	4815.0	4842.0	3587.0	2358.0	1855.0
	EXP	3990.8	4792.9	4912.9	3621.3	2376.6	1831.2
	CHI	1.5	0.1	1.0	0.3	0.1	0.3
75 -	OBS	5983.0	6873.0	7352.0	5852.0	3691.0	4083.0
	EXP	5983.0	6950.4	7397.5	5813.5	3767.6	3926.7
	CHI	0.0	0.9	0.3	0.3	1.6	6.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	26824.95	670.62	40	P, C	50.65	0.0000
AGE-PERIOD	11003.83	275.10	40	Cohort	-20.30	0.0000
AGE-COHORT	2130.97	53.27	40	Period	-521.19	0.0000
PERIOD-COHORT	12068.79	301.72	40	Age	-9.68	0.0000
FULL AGE-PERIOD-COHORT	13237.28	330.93	40			0.0000

AGE	EFFECT
30	10.955098
35	17.197485
40	25.591664
45	44.901588
50	69.989218
55	115.806918
60	202.116917
65	361.145687
70	692.573354
75	1271.949896

PERIOD	EFFECT	LOWER	UPPER
% Period Change	103.5497	100.5497	106.5497
1961	1.036786		
1966	1.218723		
1971	1.263953		
1976	0.971862		
1981	0.643514		
1986	0.666357		
1991	0.690011	0.670020	0.710001
1996	0.714504	0.673703	0.756505
2001	0.739867	0.677407	0.806054
2006	0.766130	0.681131	0.858848

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.263076	1.000000	
1891	1.153359	2.000000	
1896	1.080521	4.000000	
1901	0.982659	8.000000	
1906	0.890375	16.000000	
1911	0.861975	32.000000	
1916	0.858809	64.000000	
1921	1.010026	128.000000	
1926	0.952829	256.000000	
1931	1.053691	512.000000	
1936	1.095579	1024.000000	
1941	0.873877	2048.000000	
1946	0.919398	4096.000000	
1951	1.118193	8192.000000	
1956	1.093198	EXTRAPOLATION	1.205627
1961	1.129554	EXTRAPOLATION	
1966	1.167119	EXTRAPOLATION	
1971	1.205933	EXTRAPOLATION	
1976	1.246039	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	12.1	15.3	13.3	9.2	6.8	8.8	6.7	5.1	2.5	1.5
	EXP	12.0	14.6	12.1	9.8	7.9	8.0	8.5*	9.1*	9.8*	10.5*
	Elow							8.3	8.6	8.9	9.3
	Eup							8.8	9.7	10.6	11.7
35	OBS	15.9	20.1	24.6	14.8	10.8	13.7	8.6	10.1	4.2	3.5
	EXP	17.0	22.1	23.8	14.6	10.2	12.8	13.0*	13.9*	14.9*	15.9*
	Elow							12.6	13.1	13.6	14.1
	Eup							13.3	14.7	16.2	17.8
40	OBS	24.1	32.3	36.1	24.8	14.0	15.5	16.5	15.5	8.2	5.8
	EXP	26.8	29.7	34.1	27.2	14.4	15.7	19.7*	20.0*	21.4*	22.9*
	Elow							19.2	18.8	19.6	20.3
	Eup							20.3	21.2	23.3	25.7
45	OBS	37.6	57.7	55.7	45.5	30.8	25.0	21.3	24.8	15.2	13.3
	EXP	40.0	55.3	54.1	46.0	31.7	26.1	28.5*	35.9*	36.3*	38.9*
	Elow							27.7	33.8	33.3	34.5
	Eup							29.3	38.0	39.6	43.6
50	OBS	57.9	70.0	89.6	64.6	52.0	52.9	38.5	36.2	24.0	22.0
	EXP	62.5	73.3	89.4	64.8	47.5	51.1	42.2*	46.0*	57.9*	58.6*
	Elow							41.0	43.4	53.0	52.1
	Eup							43.4	48.7	63.1	65.7
55	OBS	104.8	116.6	126.2	123.2	73.2	76.4	66.7	58.5	34.7	32.2
	EXP	106.9	121.7	125.7	113.7	71.0	81.3	87.5*	72.3*	78.8*	99.2*
	Elow							85.0	68.2	72.1	88.2
	Eup							90.1	76.6	85.8	111.2
60	OBS	204.1	224.1	216.6	168.8	138.6	122.5	115.4	106.7	58.8	51.8
	EXP	205.9	219.3	220.2	168.7	131.4	128.3	147.0*	158.2*	130.7*	142.4*
	Elow							142.7	149.2	119.6	126.6
	Eup							151.2	167.5	142.4	159.6
65	OBS	408.5	439.3	420.0	295.7	200.3	223.8	206.8	229.5	105.6	96.8
	EXP	404.6	432.5	406.4	302.5	199.6	243.1	237.4*	271.9*	292.7*	241.8*
	Elow							230.6	256.4	268.0	215.0
	Eup							244.3	287.9	318.9	271.0
70	OBS	844.0	916.2	847.8	593.6	381.2	401.5	411.5	375.2	216.0	171.6
	EXP	828.2	912.0	860.2	599.3	384.2	396.3	482.7*	471.5*	539.9*	581.3*
	Elow							468.7	444.6	494.3	516.8
	Eup							496.7	499.2	588.2	651.7
75	OBS	1665.7	1768.0	1726.5	1222.8	714.0	759.7	765.5	770.6	371.0	354.3
	EXP	1665.7	1787.9	1737.1	1214.7	728.8	730.6	753.7*	917.9*	896.7*	1026.8*
	Elow							731.9	865.5	821.0	912.9
	Eup							775.6	971.9	976.9	1151.1
30-79	OBS	185.1	204.2	200.9	147.4	96.5	100.0	94.8	92.9	49.0	43.4
	EXP	185.7	204.2	200.5	147.3	95.9	100.9	108.2*	117.0*	121.7*	129.1*
	Elow							105.0	110.4	111.4	114.7
	Eup							111.3	123.9	132.6	144.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	98.0	118.0	94.0	85.0	74.0	94.0	73.0	56.0	27.0	14.9
	EXP	96.7	112.8	85.4	90.3	85.3	85.2	93.7*	99.6*	107.3*	102.7*
	CHI	0.018	0.236	0.865	0.308	1.492	0.902	4.580	19.085	60.049	75.066
35 -	OBS	136.0	165.0	190.0	106.0	101.0	149.0	93.0	111.0	47.0	39.6
	EXP	144.9	181.1	184.3	104.7	94.8	138.9	139.5*	152.8*	164.5*	177.5*
	CHI	0.546	1.426	0.176	0.016	0.401	0.740	15.516	11.439	83.933	107.159
40 -	OBS	169.0	278.0	295.0	192.0	101.0	144.0	179.0	166.0	91.0	64.5
	EXP	188.2	255.6	278.7	211.0	103.7	145.2	213.9*	214.4*	237.3*	255.9*
	CHI	1.956	1.968	0.957	1.715	0.069	0.011	5.696	10.911	90.174	143.147
45 -	OBS	214.0	405.0	474.0	367.0	236.0	178.0	196.0	266.0	163.0	147.8
	EXP	227.4	388.3	460.2	370.7	242.8	185.8	262.1*	385.1*	390.0*	431.5*
	CHI	0.784	0.721	0.412	0.037	0.191	0.331	16.682	36.858	132.125	186.564
50 -	OBS	434.0	395.0	618.0	541.0	412.0	399.0	271.0	329.0	257.0	234.9
	EXP	469.1	413.2	616.3	542.5	376.1	385.5	296.8*	417.9*	620.8*	626.9*
	CHI	2.619	0.806	0.005	0.004	3.425	0.476	2.242	18.923	213.185	245.078
55 -	OBS	769.0	857.0	690.0	833.0	601.0	594.0	496.0	405.0	315.0	342.6
	EXP	784.5	894.2	687.1	768.4	583.0	631.8	650.5*	500.3*	714.5*	1056.4*
	CHI	0.307	1.551	0.012	5.426	0.559	2.260	36.715	18.137	223.370	482.338
60 -	OBS	1398.0	1585.0	1529.0	892.0	912.0	974.0	876.0	773.0	403.0	463.6
	EXP	1410.7	1551.0	1554.6	891.4	864.6	1020.7	1115.5*	1146.2*	895.6*	1275.2*
	CHI	0.114	0.746	0.423	0.000	2.594	2.134	51.406	121.495	270.916	516.552
65 -	OBS	2417.0	2822.0	2776.0	1982.0	1007.0	1409.0	1582.0	1675.0	749.0	647.0
	EXP	2393.9	2778.1	2686.6	2027.8	1003.7	1530.4	1816.3*	1984.6*	2076.7*	1616.8*
	CHI	0.222	0.695	2.977	1.034	0.011	9.629	30.217	48.302	848.805	581.744
70 -	OBS	4067.0	4815.0	4842.0	3587.0	2358.0	1855.0	2438.0	2688.0	1511.0	1167.4
	EXP	3990.8	4792.9	4912.9	3621.3	2376.6	1831.2	2859.5*	3378.1*	3777.2*	3954.0*
	CHI	1.455	0.102	1.022	0.324	0.146	0.308	62.137	140.964	1359.626	1963.874
75 -	OBS	5983.0	6873.0	7352.0	5852.0	3691.0	4083.0	3127.0	4115.0	2428.0	2299.5
	EXP	5983.0	6950.4	7397.5	5813.5	3767.6	3926.7	3078.9*	4901.7*	5868.6*	6663.6*
	CHI	0.000	0.861	0.279	0.256	1.558	6.224	0.752	126.258	2017.131	2858.132
30-79	OBS	15685.0	18313.0	18860.0	14437.0	9493.0	9879.0	9331.0	10584.0	5991.0	5421.8
	EXP	15689.1	18317.6	18863.5	14441.5	9498.2	9881.4	10526.7*	13180.6*	14852.3*	16160.6*
	O/E	1.000	1.000	1.000	1.000	0.999	1.000	0.886	0.803	0.403	0.335

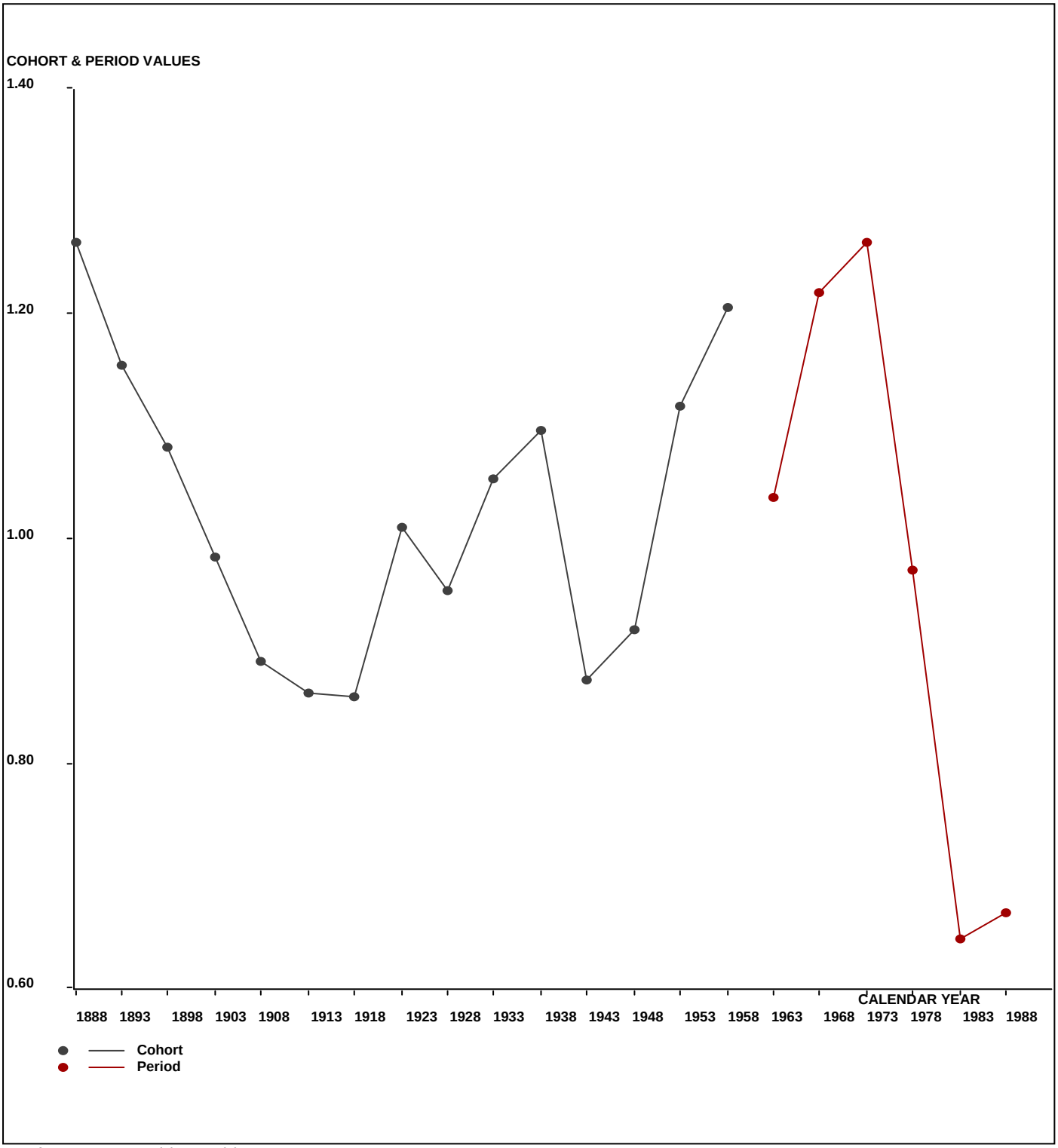
CHI SQUARE (LOG)= 13237.2831 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

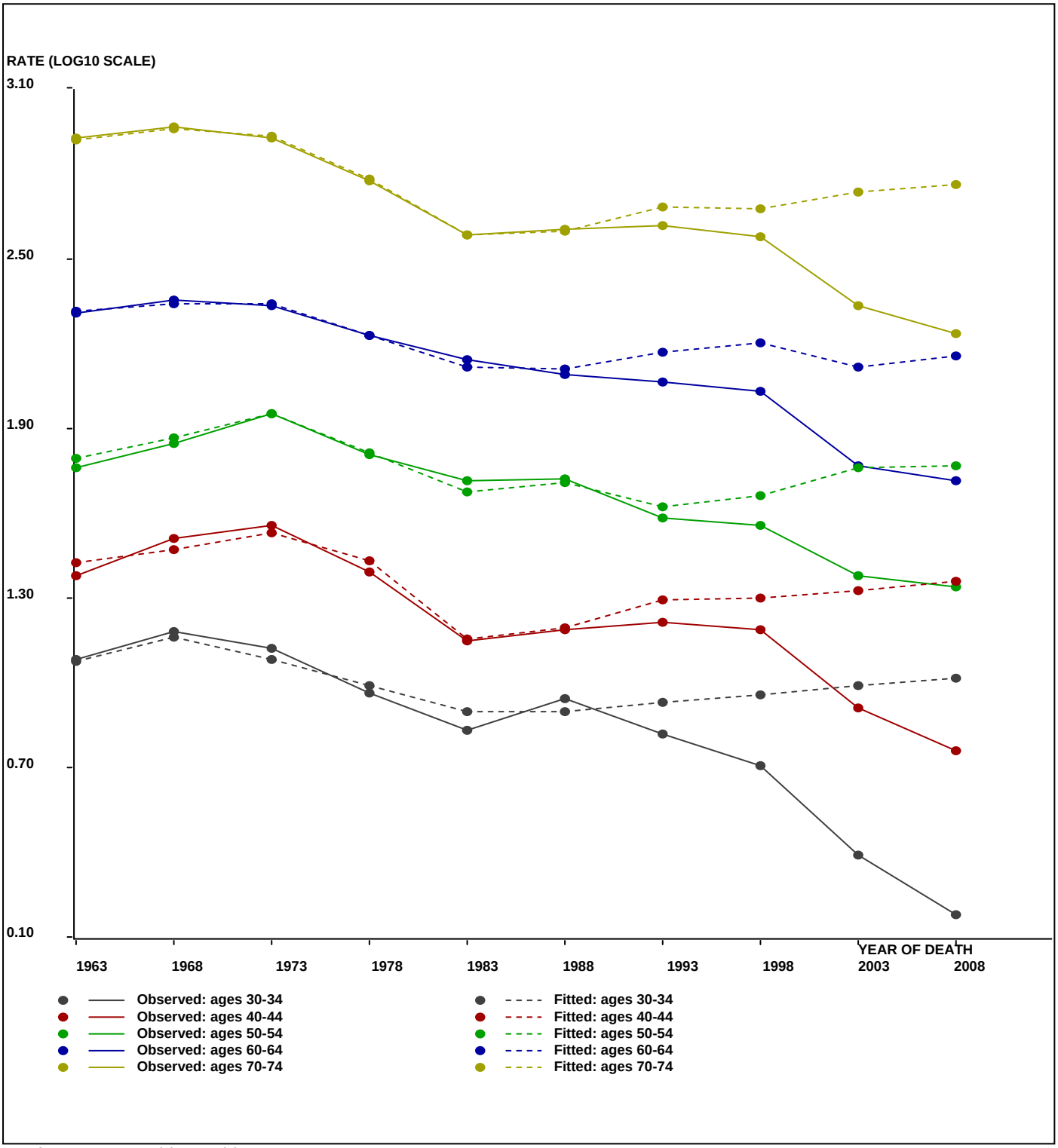


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

France COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	6.7	8.6	16.5	21.3	38.5	66.7	115.4	206.8	411.5	765.5
	PRE	8.5	13.0	19.7	28.5	42.2	87.5	147.0	237.4	482.7	753.7
	RES	-1.888	-4.326	-3.222	-7.186	-3.668	-20.798	-31.547	-30.626	-71.151	11.782
1996-	OBS	5.1	10.1	15.5	24.8	36.2	58.5	106.7	229.5	375.2	770.6
	PRE	9.1	13.9	20.0	35.9	46.0	72.3	158.2	271.9	471.5	917.9
	RES	-3.999	-3.797	-4.510	-11.098	-9.783	-13.768	-51.512	-42.418	-96.318	-147.321
2001-	OBS	2.5	4.2	8.2	15.2	24.0	34.7	58.8	105.6	216.0	371.0
	PRE	9.8	14.9	21.4	36.3	57.9	78.8	130.7	292.7	539.9	896.7
	RES	-7.314	-10.607	-13.185	-21.139	-33.932	-44.046	-71.874	-187.155	-323.936	-525.700
2006-	OBS	1.5	3.5	5.8	13.3	22.0	32.2	51.8	96.8	171.6	354.3
	PRE	10.5	15.9	22.9	38.9	58.6	99.2	142.4	241.8	581.3	1026.8
	RES	-8.941	-12.345	-17.115	-25.549	-36.652	-67.036	-90.610	-145.033	-409.685	-672.469

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	73.0	93.0	179.0	196.0	271.0	496.0	876.0	1582.0	2438.0	3127.0
	PRE	93.7	139.5	213.9	262.1	296.8	650.5	1115.5	1816.3	2859.5	3078.9
	CHI	4.580	15.516	5.696	16.682	2.242	36.715	51.406	30.217	62.137	0.752
1996-	OBS	56.0	111.0	166.0	266.0	329.0	405.0	773.0	1675.0	2688.0	4115.0
	PRE	99.6	152.8	214.4	385.1	417.9	500.3	1146.2	1984.6	3378.1	4901.7
	CHI	19.085	11.439	10.911	36.858	18.923	18.137	121.495	48.302	140.964	126.258
2001-	OBS	27.0	47.0	91.0	163.0	257.0	315.0	403.0	749.0	1511.0	2428.0
	PRE	107.3	164.5	237.3	390.0	620.8	714.5	895.6	2076.7	3777.2	5868.6
	CHI	60.049	83.933	90.174	132.125	213.185	223.370	270.916	848.805	1359.626	2017.131
2006-	OBS	14.9	39.6	64.5	147.8	234.9	342.6	463.6	647.0	1167.4	2299.5
	PRE	102.7	177.5	255.9	431.5	626.9	1056.4	1275.2	1616.8	3954.0	6663.6
	CHI	75.066	107.159	143.147	186.564	245.078	482.338	516.552	581.744	1963.874	2858.132

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1261.00	24.73	51	P, C	95.66	6732.06	0.0000
AGE-PERIOD	915.97	20.35	45	Cohort	94.03	4875.23	0.0000
AGE-COHORT	175.90	4.89	36	Period	68.90	933.54	0.0000
PERIOD-COHORT	278.48	6.96	40	Age	80.35	1479.84	0.0000
FULL AGE-PERIOD-COHORT	54.71	1.71	32			290.35	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	2.175394	149.759350
35	2.539344	346.213409
40	2.864449	731.894759
45	3.132538	1356.868647
50	3.395751	2487.428738
55	3.627116	4237.563959
60	3.843946	6981.457753
65	4.028321	10673.849095
70	4.199235	15821.033637
75	4.352631	22523.233260

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.077697	0.836187
1966	-0.020986	0.952827
1971	-0.020357	0.954208
1976	0.016854	1.039571
1981	0.052633	1.128841
1986	0.018508	1.043536

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.133661	1.360383
1891	0.078116	1.197061
1896	0.021840	1.051574
1901	-0.012156	0.972399
1906	-0.057181	0.876635
1911	-0.074024	0.843288
1916	-0.045780	0.899953
1921	-0.012753	0.971062
1926	0.008768	1.020395
1931	0.089239	1.228114
1936	0.126165	1.337102
1941	0.160190	1.446072
1946	0.182819	1.523417
1951	0.260753	1.822858
1956	0.288646	1.943776

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	334.0	329.0	273.0	408.0	685.0	633.0
	EXP	273.6	315.3	360.9	447.0	653.0	633.0
	CHI	13.3	0.6	21.4	3.4	1.6	0.0
35 -	OBS	583.0	694.0	615.0	914.0	1195.0	1315.0
	EXP	561.2	714.1	720.1	896.2	1090.5	1348.2
	CHI	0.9	0.6	15.3	0.4	10.0	0.8
40 -	OBS	925.0	1289.0	1376.0	1638.0	2153.0	1976.0
	EXP	887.7	1332.6	1484.8	1628.8	1987.3	2049.4
	CHI	1.6	1.4	8.0	0.1	13.8	2.6
45 -	OBS	1212.0	1822.0	2322.0	2904.0	3390.0	3119.0
	EXP	1248.2	1839.4	2411.1	2917.6	3132.2	3235.3
	CHI	1.1	0.2	3.3	0.1	21.2	4.2
50 -	OBS	2873.0	2418.0	3133.0	4744.0	5744.0	4744.0
	EXP	2894.2	2520.6	3263.9	4609.5	5444.3	4942.5
	CHI	0.2	4.2	5.2	3.9	16.5	8.0
55 -	OBS	4491.0	5259.0	3973.0	5830.0	7942.0	7522.0
	EXP	4439.7	5312.9	4044.6	5698.4	7767.7	7762.1
	CHI	0.6	0.5	1.3	3.0	3.9	7.4
60 -	OBS	6896.0	7743.0	7963.0	6541.0	9009.0	10045.0
	EXP	6883.4	7548.3	7968.0	6550.4	8999.7	10251.7
	CHI	0.0	5.0	0.0	0.0	0.0	4.2
65 -	OBS	7986.0	10302.0	10032.0	11332.0	8918.0	10493.0
	EXP	8129.2	10226.5	9842.3	11366.1	8974.6	10527.9
	CHI	2.5	0.6	3.7	0.1	0.4	0.1
70 -	OBS	8887.0	10686.0	11947.0	12333.0	13363.0	9445.0
	EXP	8879.4	10731.3	11757.6	12256.6	13875.3	9176.0
	CHI	0.0	0.2	3.1	0.5	18.9	7.9
75 -	OBS	9418.0	9700.0	10519.0	11824.0	11664.0	12672.0
	EXP	9418.0	9707.6	10333.5	12106.6	12192.5	12070.2
	CHI	0.0	0.0	3.3	6.6	22.9	30.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	4309.13	107.73	40	P, C	-245.50	0.0000
AGE-PERIOD	4630.94	115.77	40	Cohort	-221.49	0.0000
AGE-COHORT	76244.98	1906.12	40	Period	80.47	0.0000
PERIOD-COHORT	6247.85	156.20	40	Age	-138.29	0.0000
FULL AGE-PERIOD-COHORT	14887.92	372.20	40			0.0000

AGE	EFFECT
30	149.759350
35	346.213409
40	731.894759
45	1356.868647
50	2487.428738
55	4237.563959
60	6981.457753
65	10673.849095
70	15821.033637
75	22523.233260

PERIOD	EFFECT	LOWER	UPPER
% Period Change	92.4432	89.4432	95.4432
1961	0.836187		
1966	0.952827		
1971	0.954208		
1976	1.039571		
1981	1.128841		
1986	1.043536		
1991	0.964678	0.933372	0.995984
1996	0.891779	0.834837	0.950599
2001	0.824389	0.746705	0.907281
2006	0.762091	0.667877	0.865938

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.360383	1.000000	
1891	1.197061	2.000000	
1896	1.051574	4.000000	
1901	0.972399	8.000000	
1906	0.876635	16.000000	
1911	0.843288	32.000000	
1916	0.899953	64.000000	
1921	0.971062	128.000000	
1926	1.020395	256.000000	
1931	1.228114	512.000000	
1936	1.337102	1024.000000	
1941	1.446072	2048.000000	
1946	1.523417	4096.000000	
1951	1.822858	8192.000000	
1956	1.973714	EXTRAPOLATION	1.943776
1961	2.186312	EXTRAPOLATION	
1966	2.421809	EXTRAPOLATION	
1971	2.682673	EXTRAPOLATION	
1976	2.971636	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	187.7	199.1	156.3	216.5	323.3	303.8	258.6	144.0	90.3	56.0
	EXP	153.8	190.8	206.6	237.2	308.2	308.5	315.9*	323.4*	331.2*	339.2*
	Elow							305.6	302.8	300.0	297.2
	Eup							326.1	344.8	364.5	385.4
35	OBS	306.9	393.7	377.3	530.8	652.4	642.4	674.5	435.3	285.5	186.2
	EXP	295.4	405.1	441.7	520.5	595.4	658.6	659.2*	675.0*	691.2*	707.8*
	Elow							637.8	631.9	626.1	620.3
	Eup							680.6	719.5	760.7	804.3
40	OBS	619.2	688.3	794.9	1023.1	1294.3	1121.8	1250.4	1040.6	788.6	546.1
	EXP	594.3	711.6	857.7	1017.3	1194.7	1163.5	1287.0*	1288.2*	1319.1*	1350.8*
	Elow							1245.2	1206.0	1194.8	1183.8
	Eup							1328.8	1373.2	1451.8	1534.9
45	OBS	991.5	1243.5	1272.3	1724.3	2216.6	1973.9	2129.7	1774.7	1486.0	1217.7
	EXP	1021.1	1255.4	1321.1	1732.3	2048.0	2047.6	1994.1*	2205.7*	2207.8*	2260.8*
	Elow							1929.4	2064.9	1999.7	1981.3
	Eup							2058.8	2351.2	2429.8	2568.8
50	OBS	1741.2	2046.2	2212.4	2715.6	3638.2	3331.3	3199.5	2831.6	2487.2	2372.9
	EXP	1754.0	2133.0	2304.8	2638.6	3448.4	3470.7	3469.9*	3379.3*	3738.0*	3741.5*
	Elow							3357.3	3163.5	3385.7	3278.9
	Eup							3582.6	3602.2	4113.8	4251.3
55	OBS	3142.2	3370.4	3574.6	4376.6	4990.6	5262.8	5074.6	4197.6	3708.9	3616.7
	EXP	3106.3	3404.9	3639.0	4277.8	4881.1	5430.8	5465.9*	5464.7*	5321.9*	5886.8*
	Elow							5288.5	5115.7	4820.4	5159.0
	Eup							5643.3	5825.1	5857.0	6688.9
60	OBS	5687.1	5981.9	5614.2	6522.2	7660.8	7284.1	7733.5	6756.0	5786.8	5508.0
	EXP	5676.7	5831.5	5617.8	6531.6	7652.9	7434.0	8271.2*	8324.7*	8322.8*	8105.3*
	Elow							8002.8	7793.1	7538.5	7103.3
	Eup							8539.6	8873.8	9159.6	9209.8
65	OBS	9220.3	9962.6	9100.7	9329.3	10775.3	10780.3	10549.0	10156.9	8919.9	8226.4
	EXP	9385.6	9889.6	8928.6	9357.3	10843.6	10816.2	10506.8*	11690.1*	11765.7*	11763.0*
	Elow							10165.9	10943.6	10657.0	10308.8
	Eup							10847.8	12461.1	12948.7	13365.9
70	OBS	15849.8	15785.3	14916.3	14507.9	14504.5	15293.6	15859.4	14575.3	14137.5	13238.8
	EXP	15836.3	15852.2	14679.9	14418.1	15060.6	14858.1	14820.6*	14396.6*	16017.9*	16121.5*
	Elow							14339.6	13477.4	14508.5	14128.5
	Eup							15301.5	15346.2	17628.5	18318.3
75	OBS	25620.9	25669.7	23005.9	22236.8	21322.5	20808.7	23238.2	22198.2	21485.6	21276.1
	EXP	25620.9	25689.8	22600.3	22768.2	22288.6	19820.5	19553.9*	19504.5*	18946.6*	21080.3*
	Elow							18919.3	18259.1	17161.2	18474.2
	Eup							20188.4	20791.0	20851.7	23952.8
30-79	OBS	3816.1	4012.2	3825.0	4139.2	4625.1	4549.6	4690.1	4205.4	3785.7	3546.7
	EXP	3819.0	4017.3	3832.8	4137.6	4615.4	4559.6	4615.1*	4699.5*	4810.3*	4949.5*
	Elow							4465.3	4399.4	4357.0	4337.6
	Eup							4764.9	5009.5	5294.0	5624.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	334.0	329.0	273.0	408.0	685.0	633.0	426.0	234.0	167.0	119.0
	EXP	273.6	315.3	360.9	447.0	653.0	642.7	520.4*	525.7*	612.2*	720.5*
	CHI	13.335	0.599	21.414	3.401	1.570	0.148	17.109	161.820	323.753	502.148
35 -	OBS	583.0	694.0	615.0	914.0	1195.0	1315.0	1364.0	710.0	462.0	344.0
	EXP	561.2	714.1	720.1	896.2	1090.5	1348.2	1333.1*	1101.0*	1118.5*	1307.3*
	CHI	0.850	0.566	15.327	0.355	10.008	0.818	0.717	138.854	385.321	709.866
40 -	OBS	925.0	1289.0	1376.0	1638.0	2153.0	1976.0	2465.0	2049.0	1259.0	875.0
	EXP	887.7	1332.6	1484.8	1628.8	1987.3	2049.4	2537.1*	2536.7*	2105.9*	2164.3*
	CHI	1.565	1.429	7.970	0.052	13.813	2.630	2.049	93.755	340.610	768.013
45 -	OBS	1212.0	1822.0	2322.0	2904.0	3390.0	3119.0	3566.0	3355.0	2805.0	1882.0
	EXP	1248.2	1839.4	2411.1	2917.6	3132.2	3235.3	3338.9*	4169.8*	4167.6*	3494.0*
	CHI	1.051	0.165	3.291	0.063	21.226	4.182	15.452	159.210	445.479	743.743
50 -	OBS	2873.0	2418.0	3133.0	4744.0	5744.0	4744.0	4716.0	4461.0	4422.0	4227.0
	EXP	2894.2	2520.6	3263.9	4609.5	5444.3	4942.5	5114.6*	5323.8*	6645.7*	6664.9*
	CHI	0.155	4.173	5.249	3.926	16.494	7.973	31.060	139.831	744.080	891.757
55 -	OBS	4491.0	5259.0	3973.0	5830.0	7942.0	7522.0	6558.0	5689.0	5357.0	5920.0
	EXP	4439.7	5312.9	4044.6	5698.4	7767.7	7762.1	7063.7*	7406.3*	7686.8*	9635.8*
	CHI	0.593	0.547	1.267	3.039	3.911	7.428	36.210	398.188	706.130	1432.874
60 -	OBS	6896.0	7743.0	7963.0	6541.0	9009.0	10045.0	9638.0	7753.0	6983.0	7100.0
	EXP	6883.4	7548.3	7968.0	6550.4	8999.7	10251.7	10308.1*	9553.2*	10043.2*	10448.0*
	CHI	0.023	5.020	0.003	0.014	0.010	4.168	43.564	339.223	932.430	1072.871
65 -	OBS	7986.0	10302.0	10032.0	11332.0	8918.0	10493.0	11905.0	10663.0	8679.0	8527.0
	EXP	8129.2	10226.5	9842.3	11366.1	8974.6	10527.9	11857.4*	12272.5*	11447.9*	12192.7*
	CHI	2.524	0.557	3.656	0.102	0.357	0.116	0.191	211.092	669.709	1102.107
70 -	OBS	8887.0	10686.0	11947.0	12333.0	13363.0	9445.0	11863.0	12666.0	11711.0	10305.0
	EXP	8879.4	10731.3	11757.6	12256.6	13875.3	9176.0	11085.9*	12510.8*	13268.7*	12548.9*
	CHI	0.006	0.191	3.050	0.476	18.918	7.883	54.470	1.926	182.865	401.247
75 -	OBS	9418.0	9700.0	10519.0	11824.0	11664.0	12672.0	9517.0	11683.0	13072.0	12775.0
	EXP	9418.0	9707.6	10333.5	12106.6	12192.5	12070.2	8008.1*	10265.3*	11527.2*	12657.4*
	CHI	0.000	0.006	3.329	6.595	22.906	30.003	284.303	195.787	207.013	1.093
30-79	OBS	43605.0	50242.0	52153.0	58468.0	64063.0	61964.0	62018.0	59263.0	54917.0	52074.0
	EXP	43614.6	50248.6	52186.8	58477.1	64117.1	62006.2	61167.2*	65665.0*	68623.6*	71833.9*
	O/E	1.000	1.000	0.999	1.000	0.999	0.999	1.014	0.903	0.800	0.725

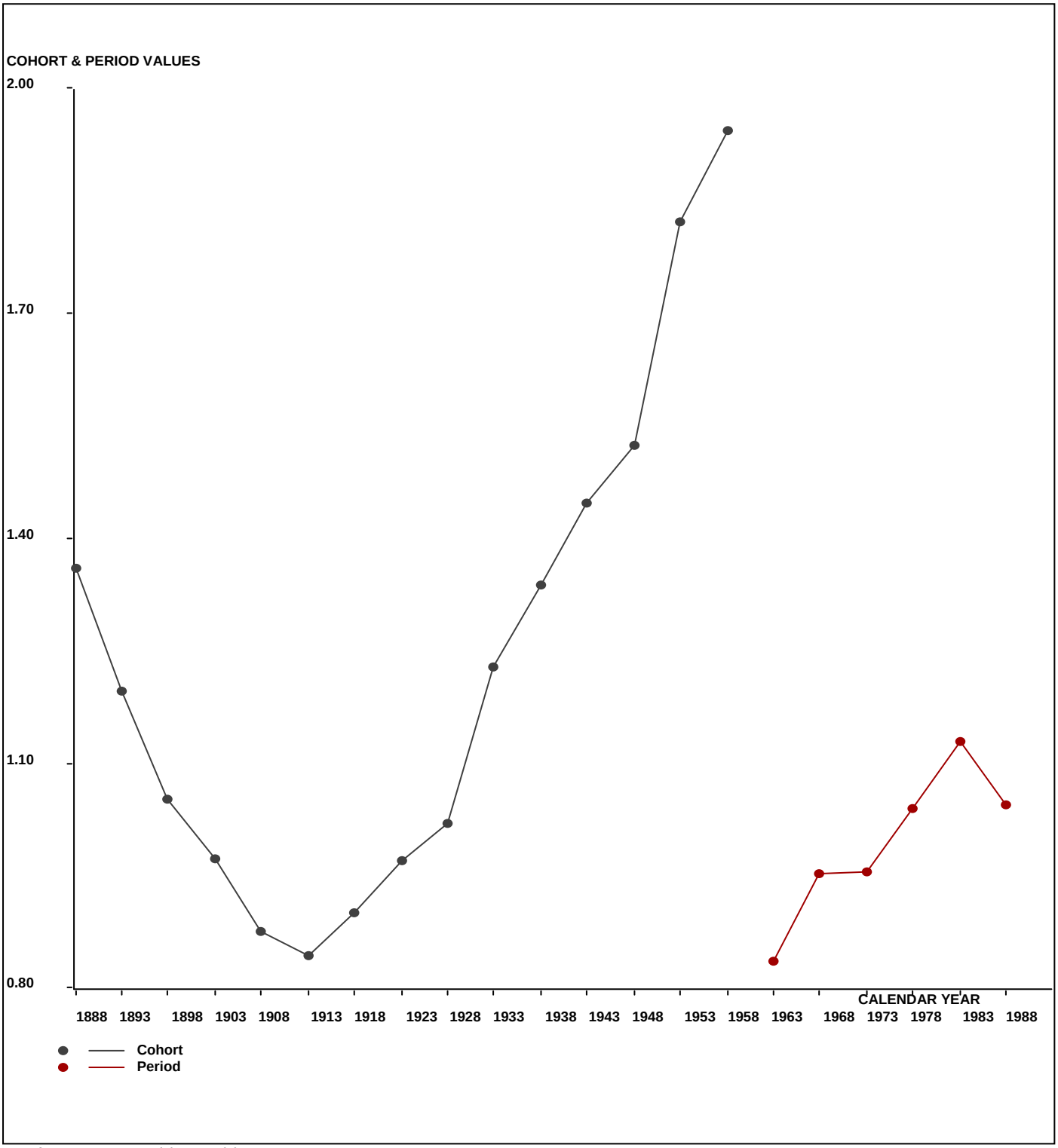
CHI SQUARE (LOG)= 14887.9203 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

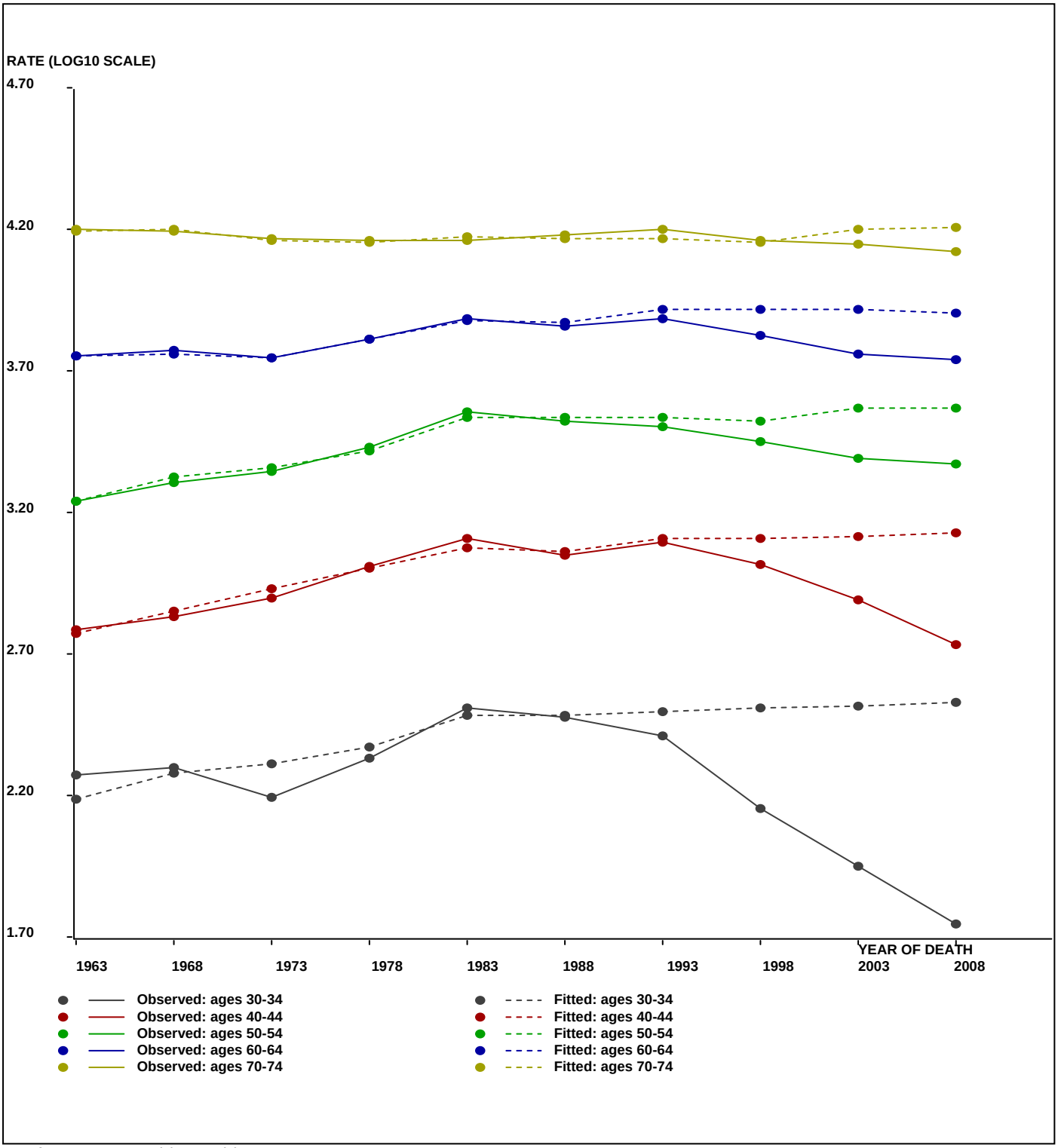


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	258.6	674.5	1250.4	2129.7	3199.5	5074.6	7733.5	10549.0	15859.4	23238.2
PRE	315.9	659.2	1287.0	1994.1	3469.9	5465.9	8271.2	10506.8	14820.6	19553.9
RES	-57.273	15.291	-36.571	135.655	-270.409	-391.343	-537.704	42.214	1038.863	3684.330
1996- OBS	144.0	435.3	1040.6	1774.7	2831.6	4197.6	6756.0	10156.9	14575.3	22198.2
PRE	323.4	675.0	1288.2	2205.7	3379.3	5464.7	8324.7	11690.1	14396.6	19504.5
RES	-179.456	-239.717	-247.659	-430.998	-547.668	-1267.088	-1568.687	-1533.154	178.640	2693.646
2001- OBS	90.3	285.5	788.6	1486.0	2487.2	3708.9	5786.8	8919.9	14137.5	21485.6
PRE	331.2	691.2	1319.1	2207.8	3738.0	5321.9	8322.8	11765.7	16017.9	18946.6
RES	-240.855	-405.706	-530.516	-721.817	-1250.760	-1613.010	-2535.951	-2845.757	-1880.428	2539.024
2006- OBS	56.0	186.2	546.1	1217.7	2372.9	3616.7	5508.0	8226.4	13238.8	21276.1
PRE	339.2	707.8	1350.8	2260.8	3741.5	5886.8	8105.3	11763.0	16121.5	21080.3
RES	-283.137	-521.568	-804.684	-1043.048	-1368.571	-2270.058	-2597.335	-3536.541	-2882.763	195.862

Observed and predicted deaths (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	426.0	1364.0	2465.0	3566.0	4716.0	6558.0	9638.0	11905.0	11863.0	9517.0
PRE	520.4	1333.1	2537.1	3338.9	5114.6	7063.7	10308.1	11857.4	11085.9	8008.1
CHI	17.109	0.717	2.049	15.452	31.060	36.210	43.564	0.191	54.470	284.303
1996- OBS	234.0	710.0	2049.0	3355.0	4461.0	5689.0	7753.0	10663.0	12666.0	11683.0
PRE	525.7	1101.0	2536.7	4169.8	5323.8	7406.3	9553.2	12272.5	12510.8	10265.3
CHI	161.820	138.854	93.755	159.210	139.831	398.188	339.223	211.092	1.926	195.787
2001- OBS	167.0	462.0	1259.0	2805.0	4422.0	5357.0	6983.0	8679.0	11711.0	13072.0
PRE	612.2	1118.5	2105.9	4167.6	6645.7	7686.8	10043.2	11447.9	13268.7	11527.2
CHI	323.753	385.321	340.610	445.479	744.080	706.130	932.430	669.709	182.865	207.013
2006- OBS	119.0	344.0	875.0	1882.0	4227.0	5920.0	7100.0	8527.0	10305.0	12775.0
PRE	720.5	1307.3	2164.3	3494.0	6664.9	9635.8	10448.0	12192.7	12548.9	12657.4
CHI	502.148	709.866	768.013	743.743	891.757	1432.874	1072.871	1102.107	401.247	1.093

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	898.62	17.62	51	P, C	98.52	4819.10	0.0000
AGE-PERIOD	468.99	10.42	45	Cohort	97.16	2503.99	0.0000
AGE-COHORT	236.85	6.58	36	Period	94.38	1257.13	0.0000
PERIOD-COHORT	172.50	4.31	40	Age	92.29	919.54	0.0000
FULL AGE-PERIOD-COHORT	13.30	0.42	32			70.54	0.0001

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.661866	45.905591
35	1.997122	99.339603
40	2.340703	219.130559
45	2.677033	475.371823
50	2.991251	980.056306
55	3.285436	1929.462473
60	3.571702	3729.944921
65	3.812596	6495.248093
70	4.046060	11118.847123
75	4.230868	17016.408802

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.127776	0.745116
1966	-0.081529	0.828840
1971	-0.056325	0.878364
1976	0.041708	1.100798
1981	0.098521	1.254644
1986	0.040815	1.098537

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.162774	1.454703
1891	0.116053	1.306329
1896	0.054216	1.132963
1901	0.002717	1.006276
1906	-0.035315	0.921903
1911	-0.068570	0.853946
1916	-0.063786	0.863405
1921	-0.033538	0.925682
1926	-0.019675	0.955706
1931	0.054574	1.133897
1936	0.117716	1.311341
1941	0.170262	1.480002
1946	0.214182	1.637504
1951	0.278533	1.899034
1956	0.292331	1.960337

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	79.0	73.0	108.0	152.0	230.0	206.0
	EXP	69.0	82.4	104.2	156.0	231.8	206.0
	CHI	1.4	1.1	0.1	0.1	0.0	0.0
35 -	OBS	141.0	158.0	170.0	287.0	379.0	426.0
	EXP	134.4	164.6	186.5	278.7	373.8	424.2
	CHI	0.3	0.3	1.5	0.2	0.1	0.0
40 -	OBS	209.0	311.0	353.0	517.0	720.0	693.0
	EXP	225.8	325.1	377.8	506.4	676.8	694.3
	CHI	1.2	0.6	1.6	0.2	2.8	0.0
45 -	OBS	355.0	522.0	723.0	1023.0	1263.0	1163.0
	EXP	373.9	534.4	728.3	999.3	1196.1	1221.2
	CHI	1.0	0.3	0.0	0.6	3.7	2.8
50 -	OBS	1038.0	762.0	1125.0	1860.0	2254.0	1955.0
	EXP	1029.0	828.8	1128.5	1801.2	2201.2	2010.5
	CHI	0.1	5.4	0.0	1.9	1.3	1.5
55 -	OBS	1969.0	2037.0	1628.0	2667.0	3705.0	3377.0
	EXP	1894.3	2130.9	1626.4	2619.0	3681.8	3435.1
	CHI	2.9	4.1	0.0	0.9	0.1	1.0
60 -	OBS	3424.0	3700.0	3928.0	3506.0	5209.0	5329.0
	EXP	3391.2	3689.2	3968.2	3555.3	5094.3	5400.3
	CHI	0.3	0.0	0.4	0.7	2.6	0.9
65 -	OBS	4773.0	5587.0	5898.0	7471.0	5791.0	6295.0
	EXP	4749.2	5601.9	5797.9	7416.4	5823.3	6428.9
	CHI	0.1	0.0	1.7	0.4	0.2	2.8
70 -	OBS	5942.0	7144.0	7953.0	9539.0	10832.0	6673.0
	EXP	6068.3	7068.2	7871.3	9592.2	10975.2	6513.0
	CHI	2.6	0.8	0.8	0.3	1.9	3.9
75 -	OBS	6780.0	7086.0	7642.0	9922.0	10631.0	9929.0
	EXP	6780.0	6962.1	7742.7	10022.7	10766.7	9721.1
	CHI	0.0	2.2	1.3	1.0	1.7	4.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	11201.20	280.03	40	P, C	20.20	0.0000
AGE-PERIOD	3507.55	87.69	40	Cohort	-154.83	0.0000
AGE-COHORT	95372.47	2384.31	40	Period	90.63	0.0000
PERIOD-COHORT	3274.76	81.87	40	Age	-172.94	0.0000
FULL AGE-PERIOD-COHORT	8938.26	223.46	40			0.0000

AGE	EFFECT
30	45.905591
35	99.339603
40	219.130559
45	475.371823
50	980.056306
55	1929.462473
60	3729.944921
65	6495.248093
70	11118.847123
75	17016.408802

PERIOD	EFFECT	LOWER	UPPER
% Period Change	87.5577	84.5577	90.5577
1961	0.745116		
1966	0.828840		
1971	0.878364		
1976	1.100798		
1981	1.254644		
1986	1.098537		
1991	0.961853	0.928897	0.994810
1996	0.842176	0.785454	0.900876
2001	0.737390	0.664161	0.815812
2006	0.645641	0.561599	0.738781

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.454703	1.000000	
1891	1.306329	2.000000	
1896	1.132963	4.000000	
1901	1.006276	8.000000	
1906	0.921903	16.000000	
1911	0.853946	32.000000	
1916	0.863405	64.000000	
1921	0.925682	128.000000	
1926	0.955706	256.000000	
1931	1.133897	512.000000	
1936	1.311341	1024.000000	
1941	1.480002	2048.000000	
1946	1.637504	4096.000000	
1951	1.899034	8192.000000	
1956	2.116387	EXTRAPOLATION	1.960337
1961	2.383984	EXTRAPOLATION	
1966	2.685417	EXTRAPOLATION	
1971	3.024962	EXTRAPOLATION	
1976	3.407441	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	44.4	44.2	61.8	80.7	108.5	98.9	97.1	62.8	36.2	27.3
	EXP	38.8	49.9	59.7	82.7	109.4	106.7	105.3*	103.8*	102.4*	101.0*
	Elow							101.7	96.8	92.2	87.8
	Eup							108.9	111.1	113.3	115.6
35	OBS	74.2	89.6	104.3	166.7	206.9	208.1	240.8	175.3	113.7	81.8
	EXP	70.7	93.4	114.4	161.8	204.1	207.2	202.2*	199.4*	196.7*	194.0*
	Elow							195.3	186.0	177.2	168.8
	Eup							209.1	213.3	217.6	222.0
40	OBS	139.9	166.1	203.9	322.9	432.8	393.4	450.5	393.1	288.8	206.6
	EXP	151.1	173.6	218.2	316.3	406.9	394.2	400.3*	390.6*	385.2*	379.9*
	Elow							386.5	364.3	347.0	330.5
	Eup							414.0	417.8	426.2	434.7
45	OBS	290.4	356.3	396.2	607.4	825.8	736.0	816.4	681.3	575.3	397.9
	EXP	305.8	364.7	399.1	593.4	782.1	772.9	748.7*	760.3*	741.9*	731.7*
	Elow							723.1	709.1	668.2	636.4
	Eup							774.4	813.3	820.8	837.2
50	OBS	629.1	644.8	794.4	1064.7	1427.7	1372.8	1371.1	1115.9	958.4	775.8
	EXP	623.6	701.4	796.9	1031.1	1394.3	1411.8	1395.2*	1351.6*	1372.4*	1339.2*
	Elow							1347.4	1260.5	1236.1	1164.9
	Eup							1443.0	1445.8	1518.4	1532.4
55	OBS	1377.6	1305.5	1464.7	2002.1	2328.2	2362.7	2295.1	1903.6	1496.9	1191.9
	EXP	1325.4	1365.6	1463.3	1966.1	2313.6	2403.4	2433.7*	2404.9*	2329.8*	2365.7*
	Elow							2350.3	2242.9	2098.4	2057.8
	Eup							2517.1	2572.6	2577.6	2707.0
60	OBS	2823.7	2858.4	2769.4	3495.9	4429.5	3864.3	3724.7	3347.1	2733.1	2010.0
	EXP	2796.7	2850.1	2797.7	3545.1	4332.0	3916.0	4068.0*	4119.3*	4070.6*	3943.4*
	Elow							3928.7	3841.8	3666.4	3430.1
	Eup							4207.4	4406.4	4503.6	4512.3
65	OBS	5510.7	5402.9	5350.5	6150.6	6997.0	6467.4	5881.9	5459.9	4694.8	3258.0
	EXP	5483.2	5417.3	5259.6	6105.7	7036.1	6605.0	5970.8*	6202.6*	6280.7*	6206.5*
	Elow							5766.2	5784.8	5657.0	5398.6
	Eup							6175.3	6634.9	6948.7	7101.9
70	OBS	10597.5	10553.1	9929.6	11221.2	11757.3	10805.1	9969.1	8876.8	7870.9	5655.2
	EXP	10822.7	10441.1	9827.7	11283.7	11912.7	10546.0	9899.9*	8949.3*	9296.7*	9413.8*
	Elow							9560.7	8346.5	8373.5	8188.5
	Eup							10239.1	9573.0	10285.5	10771.9
75	OBS	18444.5	18752.1	16713.7	18659.8	19434.1	16304.4	15871.4	14229.4	12601.8	9639.6
	EXP	18444.5	18424.3	16934.0	18849.2	19682.2	15962.9	14131.6*	13265.8*	11991.9*	12457.6*
	Elow							13647.4	12372.3	10801.1	10836.0
	Eup							14615.8	14190.4	13267.3	14254.7
30-79	OBS	2206.4	2218.3	2148.7	2559.5	2895.6	2619.2	2516.4	2219.7	1891.8	1398.3
	EXP	2210.1	2217.6	2150.5	2559.8	2892.1	2622.4	2486.4*	2415.6*	2380.3*	2383.9*
	Elow							2401.2	2252.9	2144.0	2073.6
	Eup							2571.5	2583.9	2633.5	2727.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	79.0	73.0	108.0	152.0	230.0	206.0	160.0	102.0	67.0	58.0
	EXP	69.0	82.4	104.2	156.0	231.8	222.4	173.4*	168.7*	189.3*	214.5*
	CHI	1.450	1.081	0.137	0.100	0.013	1.209	1.038	26.389	78.987	114.225
35 -	OBS	141.0	158.0	170.0	287.0	379.0	426.0	487.0	286.0	184.0	151.0
	EXP	134.4	164.6	186.5	278.7	373.8	424.2	409.0*	325.3*	318.3*	358.3*
	CHI	0.326	0.262	1.463	0.249	0.072	0.007	14.896	4.751	56.670	119.978
40 -	OBS	209.0	311.0	353.0	517.0	720.0	693.0	888.0	774.0	461.0	331.0
	EXP	225.8	325.1	377.8	506.4	676.8	694.3	789.0*	769.1*	615.0*	608.7*
	CHI	1.246	0.609	1.630	0.221	2.753	0.002	12.412	0.031	38.551	126.707
45 -	OBS	355.0	522.0	723.0	1023.0	1263.0	1163.0	1367.0	1288.0	1086.0	615.0
	EXP	373.9	534.4	728.3	999.3	1196.1	1221.2	1253.7*	1437.3*	1400.4*	1130.8*
	CHI	0.951	0.287	0.038	0.561	3.738	2.775	10.244	15.500	70.586	235.300
50 -	OBS	1038.0	762.0	1125.0	1860.0	2254.0	1955.0	2021.0	1758.0	1704.0	1382.0
	EXP	1029.0	828.8	1128.5	1801.2	2201.2	2010.5	2056.4*	2129.3*	2440.0*	2385.6*
	CHI	0.079	5.384	0.011	1.919	1.264	1.533	0.610	64.738	222.001	422.182
55 -	OBS	1969.0	2037.0	1628.0	2667.0	3705.0	3377.0	2966.0	2580.0	2162.0	1951.0
	EXP	1894.3	2130.9	1626.4	2619.0	3681.8	3435.1	3145.1*	3259.4*	3365.1*	3872.3*
	CHI	2.942	4.139	0.002	0.878	0.147	0.983	10.198	141.621	430.114	953.290
60 -	OBS	3424.0	3700.0	3928.0	3506.0	5209.0	5329.0	4642.0	3841.0	3298.0	2591.0
	EXP	3391.2	3689.2	3968.2	3555.3	5094.3	5400.3	5069.9*	4727.2*	4912.1*	5083.2*
	CHI	0.317	0.032	0.407	0.683	2.581	0.941	36.111	166.125	530.369	1221.899
65 -	OBS	4773.0	5587.0	5898.0	7471.0	5791.0	6295.0	6638.0	5732.0	4568.0	3377.0
	EXP	4749.2	5601.9	5797.9	7416.4	5823.3	6428.9	6738.2*	6511.6*	6111.1*	6433.3*
	CHI	0.119	0.039	1.728	0.402	0.179	2.791	1.491	93.345	389.627	1451.968
70 -	OBS	5942.0	7144.0	7953.0	9539.0	10832.0	6673.0	7457.0	7714.0	6520.0	4402.0
	EXP	6068.3	7068.2	7871.3	9592.2	10975.2	6513.0	7405.2*	7777.0*	7701.1*	7327.7*
	CHI	2.628	0.813	0.847	0.295	1.867	3.930	0.362	0.510	181.142	1168.128
75 -	OBS	6780.0	7086.0	7642.0	9922.0	10631.0	9929.0	6500.0	7489.0	7667.0	5788.0
	EXP	6780.0	6962.1	7742.7	10022.7	10766.7	9721.1	5787.5*	6981.8*	7296.0*	7480.0*
	CHI	0.000	2.204	1.310	1.012	1.711	4.448	87.724	36.839	18.867	382.731
30-79	OBS	24710.0	27380.0	29528.0	36944.0	41014.0	36046.0	33126.0	31564.0	27717.0	20646.0
	EXP	24715.0	27387.6	29531.8	36947.1	41021.1	36071.1	32827.4*	34086.7*	34348.2*	34894.5*
	O/E	1.000	1.000	1.000	1.000	1.000	0.999	1.009	0.926	0.807	0.592

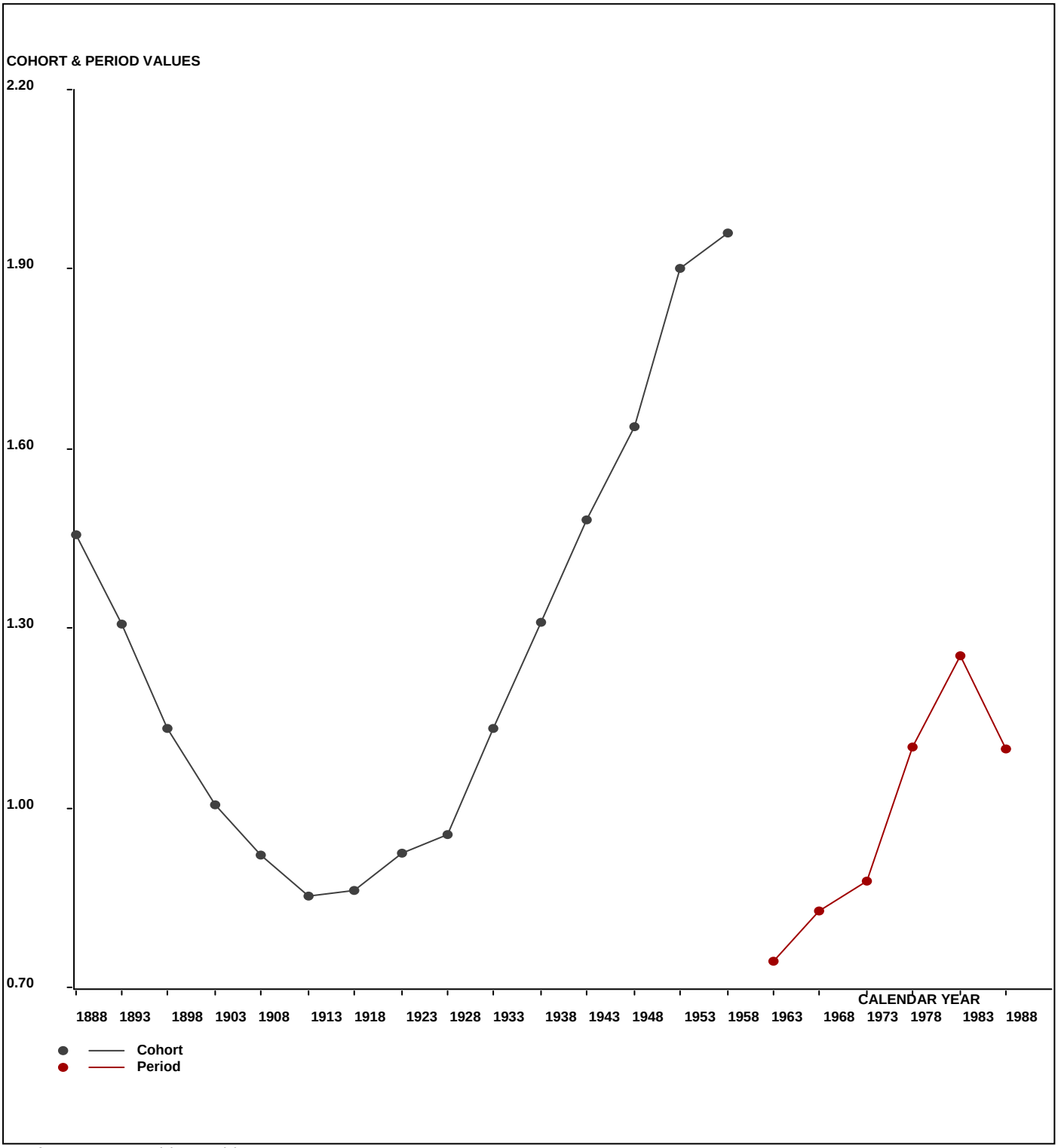
CHI SQUARE (LOG)= 8938.2576 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

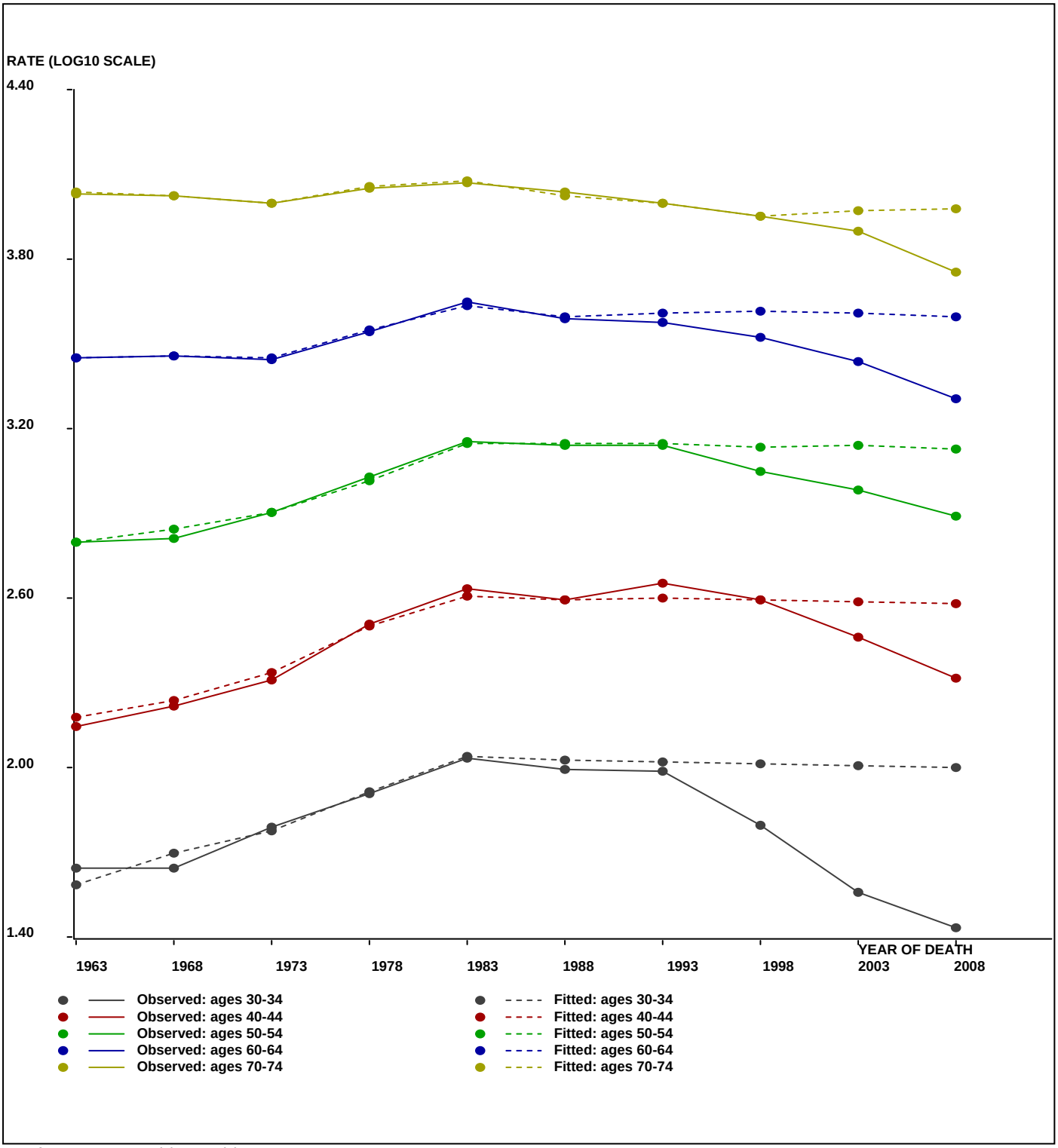


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	97.1	240.8	450.5	816.4	1371.1	2295.1	3724.7	5881.9	9969.1	15871.4
	PRE	105.3	202.2	400.3	748.7	1395.2	2433.7	4068.0	5970.8	9899.9	14131.6
	RES	-8.143	38.594	50.202	67.683	-24.021	-138.577	-343.325	-88.808	69.226	1739.828
1996-	OBS	62.8	175.3	393.1	681.3	1115.9	1903.6	3347.1	5459.9	8876.8	14229.4
	PRE	103.8	199.4	390.6	760.3	1351.6	2404.9	4119.3	6202.6	8949.3	13265.8
	RES	-41.058	-24.102	2.495	-78.954	-235.668	-501.299	-772.214	-742.631	-72.466	963.614
2001-	OBS	36.2	113.7	288.8	575.3	958.4	1496.9	2733.1	4694.8	7870.9	12601.8
	PRE	102.4	196.7	385.2	741.9	1372.4	2329.8	4070.6	6280.7	9296.7	11991.9
	RES	-66.149	-83.001	-96.448	-166.556	-413.966	-832.935	-1337.578	-1585.896	-1425.817	609.818
2006-	OBS	27.3	81.8	206.6	397.9	775.8	1191.9	2010.0	3258.0	5655.2	9639.6
	PRE	101.0	194.0	379.9	731.7	1339.2	2365.7	3943.4	6206.5	9413.8	12457.6
	RES	-73.690	-112.261	-173.339	-333.764	-563.367	-1173.783	-1933.411	-2948.569	-3758.618	-2817.922

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	160.0	487.0	888.0	1367.0	2021.0	2966.0	4642.0	6638.0	7457.0	6500.0
	PRE	173.4	409.0	789.0	1253.7	2056.4	3145.1	5069.9	6738.2	7405.2	5787.5
	CHI	1.038	14.896	12.412	10.244	0.610	10.198	36.111	1.491	0.362	87.724
1996-	OBS	102.0	286.0	774.0	1288.0	1758.0	2580.0	3841.0	5732.0	7714.0	7489.0
	PRE	168.7	325.3	769.1	1437.3	2129.3	3259.4	4727.2	6511.6	7777.0	6981.8
	CHI	26.389	4.751	0.031	15.500	64.738	141.621	166.125	93.345	0.510	36.839
2001-	OBS	67.0	184.0	461.0	1086.0	1704.0	2162.0	3298.0	4568.0	6520.0	7667.0
	PRE	189.3	318.3	615.0	1400.4	2440.0	3365.1	4912.1	6111.1	7701.1	7296.0
	CHI	78.987	56.670	38.551	70.586	222.001	430.114	530.369	389.627	181.142	18.867
2006-	OBS	58.0	151.0	331.0	615.0	1382.0	1951.0	2591.0	3377.0	4402.0	5788.0
	PRE	214.5	358.3	608.7	1130.8	2385.6	3872.3	5083.2	6433.3	7327.7	7480.0
	CHI	114.225	119.978	126.707	235.300	422.182	953.290	1221.899	1451.968	1168.128	382.731

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1519.83	29.80	51	P, C	99.39	8239.37	0.0000
AGE-PERIOD	333.51	7.41	45	Cohort	97.22	1775.39	0.0000
AGE-COHORT	22.49	0.62	36	Period	58.81	119.32	0.0000
PERIOD-COHORT	94.87	2.37	40	Age	90.24	504.20	0.0000
FULL AGE-PERIOD-COHORT	9.26	0.29	32			49.20	0.0266

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.996610	9.922237
35	1.559248	36.245026
40	2.051788	112.664754
45	2.489802	308.888782
50	2.870070	741.429933
55	3.170500	1480.811446
60	3.412475	2585.085358
65	3.595513	3940.149055
70	3.715385	5192.602810
75	3.774416	5948.613893

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.084341	0.823491
1966	-0.048262	0.894825
1971	-0.033017	0.926794
1976	0.009426	1.021942
1981	0.041831	1.101111
1986	0.035233	1.084508

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.363901	0.432613
1891	-0.214045	0.610879
1896	-0.116830	0.764134
1901	-0.062774	0.865418
1906	-0.062733	0.865500
1911	-0.095636	0.802351
1916	-0.072885	0.845503
1921	0.012057	1.028150
1926	0.085666	1.218053
1931	0.218886	1.655336
1936	0.329701	2.136491
1941	0.409558	2.567778
1946	0.500218	3.163868
1951	0.557255	3.607907
1956	0.702380	5.039416

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	29.0	45.0	37.0	52.0	73.0	113.0
	EXP	24.1	31.3	41.2	60.5	83.5	113.0
	CHI	1.0	6.0	0.4	1.2	1.3	0.0
35 -	OBS	83.0	95.0	101.0	152.0	232.0	300.0
	EXP	69.1	94.6	117.0	163.8	231.3	290.3
	CHI	2.8	0.0	2.2	0.8	0.0	0.3
40 -	OBS	147.0	227.0	297.0	399.0	518.0	688.0
	EXP	142.5	230.0	299.2	393.8	529.9	680.9
	CHI	0.1	0.0	0.0	0.1	0.3	0.1
45 -	OBS	264.0	396.0	607.0	914.0	1097.0	1386.0
	EXP	262.9	416.4	636.4	880.0	1111.3	1359.2
	CHI	0.0	1.0	1.4	1.3	0.2	0.5
50 -	OBS	838.0	652.0	958.0	1592.0	2168.0	2454.0
	EXP	808.3	662.9	1000.5	1612.3	2133.6	2446.4
	CHI	1.1	0.2	1.8	0.3	0.6	0.0
55 -	OBS	1507.0	1634.0	1267.0	2085.0	3268.0	3726.0
	EXP	1508.5	1658.9	1289.7	2072.6	3160.6	3799.6
	CHI	0.0	0.4	0.4	0.1	3.6	1.4
60 -	OBS	2203.0	2650.0	2775.0	2246.0	3431.0	4636.0
	EXP	2233.9	2591.5	2726.5	2240.1	3441.6	4709.2
	CHI	0.4	1.3	0.9	0.0	0.0	1.1
65 -	OBS	2166.0	3172.0	3490.0	3887.0	2976.0	4331.0
	EXP	2147.5	3155.2	3484.0	3924.3	3036.0	4276.3
	CHI	0.2	0.1	0.0	0.4	1.2	0.7
70 -	OBS	1421.0	2325.0	3336.0	3909.0	4256.0	3025.0
	EXP	1464.6	2403.6	3335.7	3904.3	4226.5	2940.5
	CHI	1.3	2.6	0.0	0.0	0.2	2.4
75 -	OBS	779.0	1271.0	1984.0	2811.0	3032.0	3105.0
	EXP	779.0	1228.7	1926.2	2797.4	3101.2	3152.2
	CHI	0.0	1.5	1.7	0.1	1.5	0.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	17274.82	431.87	40	P, C	-60.41	0.0000
AGE-PERIOD	17464.85	436.62	40	Cohort	-58.66	0.0000
AGE-COHORT	55215.36	1380.38	40	Period	49.81	0.0000
PERIOD-COHORT	21999.66	549.99	40	Age	-25.96	0.0000
FULL AGE-PERIOD-COHORT	27710.01	692.75	40			0.0000

AGE	EFFECT
30	9.922237
35	36.245026
40	112.664754
45	308.888782
50	741.429933
55	1480.811446
60	2585.085358
65	3940.149055
70	5192.602810
75	5948.613893

PERIOD	EFFECT	LOWER	UPPER
% Period Change	98.4921	95.4921	101.4921
1961	0.823491		
1966	0.894825		
1971	0.926794		
1976	1.021942		
1981	1.101111		
1986	1.084508		
1991	1.068154	1.035619	1.100690
1996	1.052048	0.988934	1.117113
2001	1.036184	0.944354	1.133781
2006	1.020559	0.901784	1.150699

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.432613	1.000000	
1891	0.610879	2.000000	
1896	0.764134	4.000000	
1901	0.865418	8.000000	
1906	0.865500	16.000000	
1911	0.802351	32.000000	
1916	0.845503	64.000000	
1921	1.028150	128.000000	
1926	1.218053	256.000000	
1931	1.655336	512.000000	
1936	2.136491	1024.000000	
1941	2.567778	2048.000000	
1946	3.163868	4096.000000	
1951	3.607907	8192.000000	
1956	4.447901	EXTRAPOLATION	5.039416
1961	5.378921	EXTRAPOLATION	
1966	6.504820	EXTRAPOLATION	
1971	7.866389	EXTRAPOLATION	
1976	9.512957	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	16.3	27.2	21.2	27.6	34.5	54.2	29.1	23.4	14.1	8.9
	EXP	13.5	19.0	23.6	32.1	39.4	47.9	57.0*	67.9*	80.9*	96.3*
	Elow							55.3	63.8	73.7	85.1
	Eup							58.7	72.1	88.5	108.6
35	OBS	43.7	53.9	62.0	88.3	126.7	146.5	155.3	129.4	65.5	44.4
	EXP	36.4	53.7	71.8	95.1	126.3	141.8	172.2*	205.1*	244.3*	291.0*
	Elow							167.0	192.8	222.6	257.1
	Eup							177.4	217.8	267.3	328.1
40	OBS	98.4	121.2	171.6	249.2	311.4	390.6	501.2	464.2	340.1	197.2
	EXP	95.4	122.8	172.8	246.0	318.5	386.6	434.2*	527.2*	627.9*	747.9*
	Elow							421.0	495.6	572.3	660.9
	Eup							447.4	559.8	687.1	843.3
45	OBS	216.0	270.3	332.6	542.7	717.3	877.2	1006.9	1074.3	959.4	715.6
	EXP	215.1	284.2	348.7	522.5	726.7	860.2	1043.9*	1172.4*	1423.6*	1695.6*
	Elow							1012.1	1102.1	1297.5	1498.3
	Eup							1075.7	1245.0	1557.7	1911.9
50	OBS	507.9	551.7	676.5	911.3	1373.2	1723.3	1900.3	1776.0	1819.6	1727.9
	EXP	489.9	560.9	706.5	922.9	1351.4	1717.9	2033.6*	2467.9*	2771.8*	3365.6*
	Elow							1971.6	2319.8	2526.2	2973.9
	Eup							2095.5	2620.5	3032.9	3794.8
55	OBS	1054.4	1047.2	1139.9	1565.2	2053.6	2606.9	2931.2	2718.9	2694.6	2785.8
	EXP	1055.4	1063.2	1160.4	1555.9	1986.1	2658.4	3379.4*	4000.3*	4854.6*	5452.5*
	Elow							3276.4	3760.3	4424.4	4817.9
	Eup							3482.3	4247.7	5311.9	6147.8
60	OBS	1816.8	2047.3	1956.5	2239.6	2917.6	3361.8	3855.5	4108.7	3579.2	3662.4
	EXP	1842.3	2002.1	1922.3	2233.7	2926.6	3414.9	4570.8*	5810.5*	6878.1*	8347.0*
	Elow							4431.6	5461.9	6268.6	7375.6
	Eup							4710.1	6169.8	7526.0	9411.4
65	OBS	2500.8	3067.5	3166.0	3200.0	3595.8	4449.6	4667.1	4874.1	4715.4	4273.9
	EXP	2479.4	3051.2	3160.6	3230.8	3668.3	4393.4	5126.4*	6861.7*	8722.7*	10325.4*
	Elow							4970.3	6450.1	7949.7	9123.7
	Eup							5282.6	7286.1	9544.3	11642.1
70	OBS	2534.3	3434.5	4165.1	4598.3	4619.6	4898.2	5399.7	5379.7	5134.2	5055.3
	EXP	2612.2	3550.5	4164.8	4592.8	4587.5	4761.4	5702.6*	6654.1*	8906.5*	11322.0*
	Elow							5528.9	6254.9	8117.2	10004.3
	Eup							5876.3	7065.6	9745.4	12765.8
75	OBS	2119.2	3363.5	4339.2	5286.5	5542.7	5098.7	5501.3	5428.4	5419.1	5279.5
	EXP	2119.2	3251.7	4212.8	5261.0	5669.1	5176.2	5372.4*	6434.4*	7507.9*	10049.4*
	Elow							5208.7	6048.4	6842.5	8879.8
	Eup							5536.0	6832.3	8215.1	11330.9
30-79	OBS	789.6	963.5	1078.3	1281.7	1530.5	1772.4	1961.5	1956.7	1846.5	1758.3
	EXP	790.7	964.2	1080.0	1281.0	1532.0	1769.4	2139.5*	2625.7*	3203.3*	3876.2*
	Elow							2074.4	2468.2	2919.5	3425.1
	Eup							2204.7	2788.1	3505.1	4370.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	29.0	45.0	37.0	52.0	73.0	113.0	48.0	38.0	26.0	19.0
	EXP	24.1	31.3	41.2	60.5	83.5	99.7	93.9*	110.4*	149.5*	204.6*
	CHI	1.013	5.950	0.436	1.184	1.326	1.764	22.450	47.439	102.015	168.407
35 -	OBS	83.0	95.0	101.0	152.0	232.0	300.0	314.0	211.0	106.0	82.0
	EXP	69.1	94.6	117.0	163.8	231.3	290.3	348.2*	334.5*	395.3*	537.4*
	CHI	2.813	0.001	2.185	0.846	0.002	0.322	3.367	45.623	211.732	385.958
40 -	OBS	147.0	227.0	297.0	399.0	518.0	688.0	988.0	914.0	543.0	316.0
	EXP	142.5	230.0	299.2	393.8	529.9	680.9	855.9*	1038.1*	1002.5*	1198.3*
	CHI	0.143	0.038	0.016	0.068	0.266	0.074	20.384	14.843	210.595	649.654
45 -	OBS	264.0	396.0	607.0	914.0	1097.0	1386.0	1686.0	2031.0	1811.0	1106.0
	EXP	262.9	416.4	636.4	880.0	1111.3	1359.2	1747.9*	2216.5*	2687.3*	2620.6*
	CHI	0.005	0.997	1.356	1.310	0.185	0.530	2.191	15.517	285.770	875.406
50 -	OBS	838.0	652.0	958.0	1592.0	2168.0	2454.0	2801.0	2798.0	3235.0	3078.0
	EXP	808.3	662.9	1000.5	1612.3	2133.6	2446.4	2997.4*	3887.9*	4928.0*	5995.4*
	CHI	1.090	0.179	1.803	0.255	0.555	0.024	12.872	305.552	581.616	1419.617
55 -	OBS	1507.0	1634.0	1267.0	2085.0	3268.0	3726.0	3788.0	3685.0	3892.0	4560.0
	EXP	1508.5	1658.9	1289.7	2072.6	3160.6	3799.6	4367.2*	5421.6*	7011.8*	8924.9*
	CHI	0.001	0.375	0.400	0.074	3.648	1.425	76.825	556.272	1388.140	2134.739
60 -	OBS	2203.0	2650.0	2775.0	2246.0	3431.0	4636.0	4805.0	4715.0	4319.0	4721.0
	EXP	2233.9	2591.5	2726.5	2240.1	3441.6	4709.2	5696.5*	6667.9*	8299.9*	10759.6*
	CHI	0.428	1.320	0.862	0.016	0.033	1.138	139.518	571.988	1909.348	3389.012
65 -	OBS	2166.0	3172.0	3490.0	3887.0	2976.0	4331.0	5267.0	5117.0	4588.0	4430.0
	EXP	2147.5	3155.2	3484.0	3924.3	3036.0	4276.3	5785.3*	7203.6*	8487.1*	10702.7*
	CHI	0.160	0.090	0.010	0.355	1.185	0.699	46.441	604.426	1791.294	3676.319
70 -	OBS	1421.0	2325.0	3336.0	3909.0	4256.0	3025.0	4039.0	4675.0	4253.0	3935.0
	EXP	1464.6	2403.6	3335.7	3904.3	4226.5	2940.5	4265.6*	5782.4*	7377.9*	8813.0*
	CHI	1.300	2.568	0.000	0.006	0.206	2.426	12.041	212.090	1323.521	2699.996
75 -	OBS	779.0	1271.0	1984.0	2811.0	3032.0	3105.0	2253.0	2857.0	3297.0	3170.0
	EXP	779.0	1228.7	1926.2	2797.4	3101.2	3152.2	2200.2*	3386.5*	4567.9*	6034.0*
	CHI	0.000	1.454	1.734	0.066	1.542	0.707	1.267	82.778	353.577	1359.411
30-79	OBS	9437.0	12467.0	14852.0	18047.0	21051.0	23764.0	25989.0	27041.0	26070.0	25417.0
	EXP	9440.4	12473.1	14856.5	18049.1	21055.5	23754.4	28358.3*	36049.5*	44907.1*	55790.6*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.916	0.750	0.581	0.456

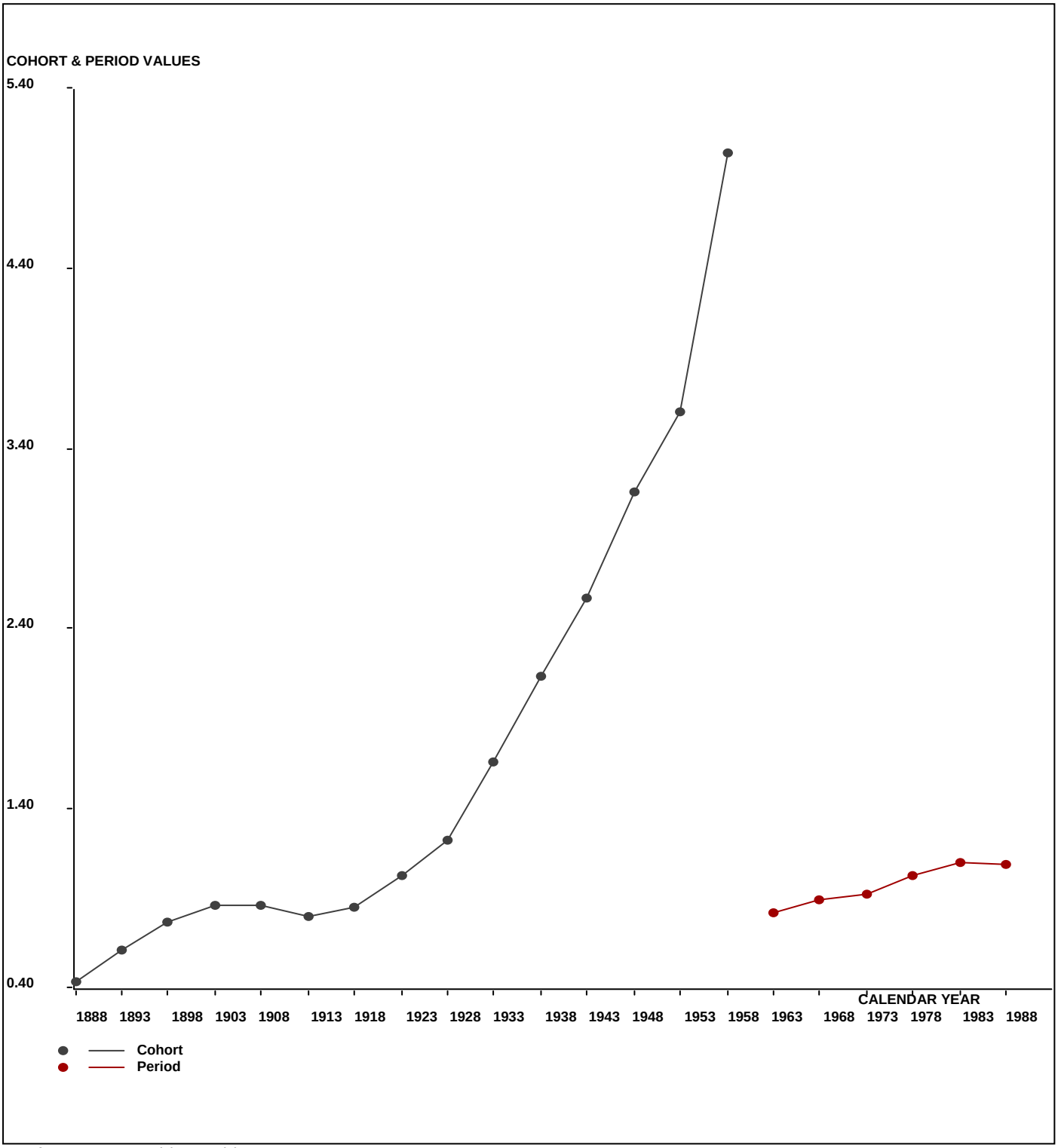
CHI SQUARE (LOG)= 27710.0093 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

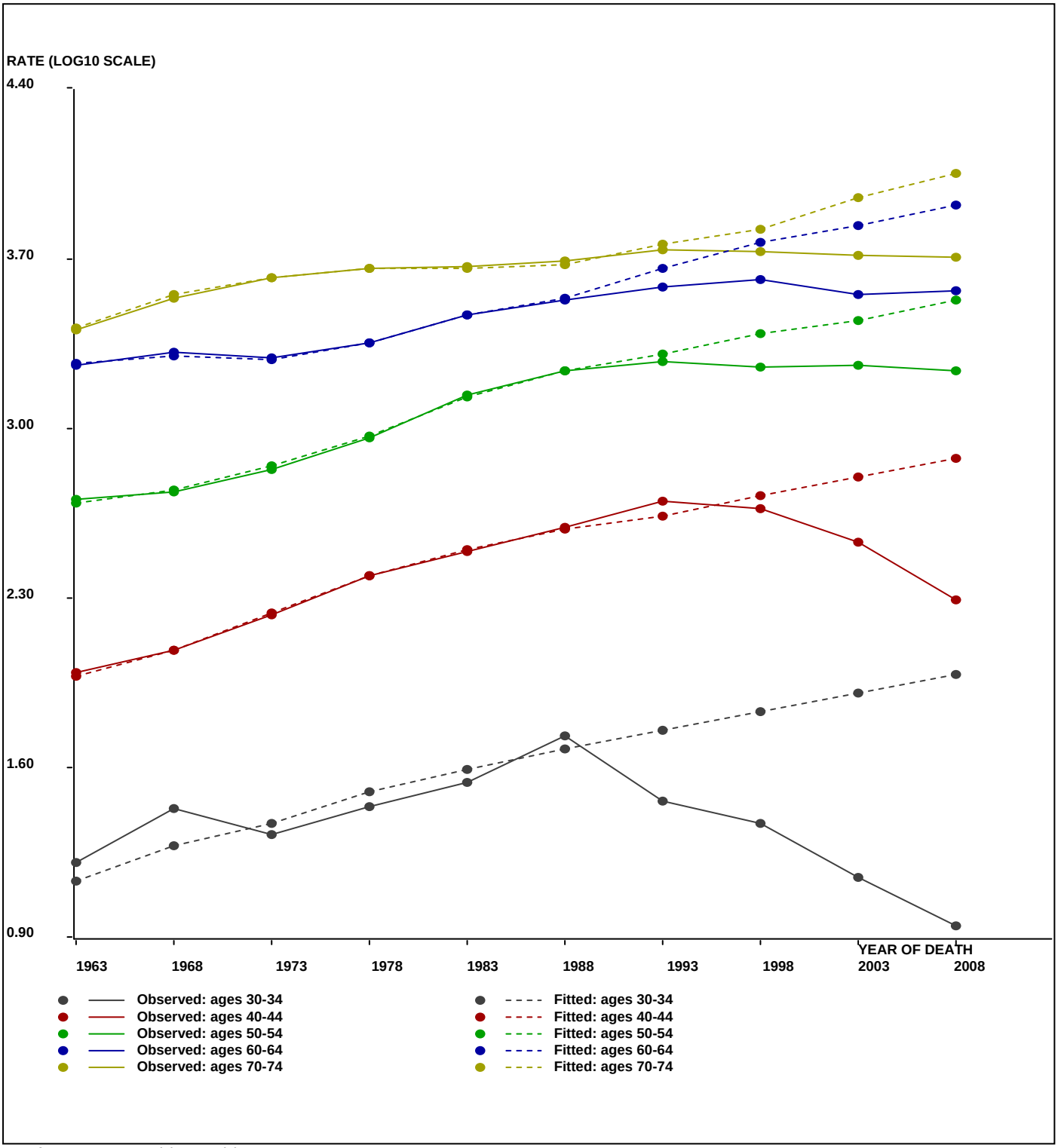


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	29.1	155.3	501.2	1006.9	1900.3	2931.2	3855.5	4667.1	5399.7	5501.3
	PRE	57.0	172.2	434.2	1043.9	2033.6	3379.4	4570.8	5126.4	5702.6	5372.4
	RES	-27.872	-16.933	67.005	-36.962	-133.263	-448.212	-715.329	-459.305	-302.977	128.923
1996-	OBS	23.4	129.4	464.2	1074.3	1776.0	2718.9	4108.7	4874.1	5379.7	5428.4
	PRE	67.9	205.1	527.2	1172.4	2467.9	4000.3	5810.5	6861.7	6654.1	6434.4
	RES	-44.520	-75.743	-63.040	-98.100	-691.842	-1281.360	-1701.801	-1987.604	-1274.358	-1005.985
2001-	OBS	14.1	65.5	340.1	959.4	1819.6	2694.6	3579.2	4715.4	5134.2	5419.1
	PRE	80.9	244.3	627.9	1423.6	2771.8	4854.6	6878.1	8722.7	8906.5	7507.9
	RES	-66.810	-178.791	-287.811	-464.239	-952.239	-2160.009	-3298.952	-4007.326	-3772.318	-2088.837
2006-	OBS	8.9	44.4	197.2	715.6	1727.9	2785.8	3662.4	4273.9	5055.3	5279.5
	PRE	96.3	291.0	747.9	1695.6	3365.6	5452.5	8347.0	10325.4	11322.0	10049.4
	RES	-87.387	-246.584	-550.701	-980.025	-1637.722	-2666.638	-4684.579	-6051.580	-6266.766	-4769.923

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	48.0	314.0	988.0	1686.0	2801.0	3788.0	4805.0	5267.0	4039.0	2253.0
	PRE	93.9	348.2	855.9	1747.9	2997.4	4367.2	5696.5	5785.3	4265.6	2200.2
	CHI	22.450	3.367	20.384	2.191	12.872	76.825	139.518	46.441	12.041	1.267
1996-	OBS	38.0	211.0	914.0	2031.0	2798.0	3685.0	4715.0	5117.0	4675.0	2857.0
	PRE	110.4	334.5	1038.1	2216.5	3887.9	5421.6	6667.9	7203.6	5782.4	3386.5
	CHI	47.439	45.623	14.843	15.517	305.552	556.272	571.988	604.426	212.090	82.778
2001-	OBS	26.0	106.0	543.0	1811.0	3235.0	3892.0	4319.0	4588.0	4253.0	3297.0
	PRE	149.5	395.3	1002.5	2687.3	4928.0	7011.8	8299.9	8487.1	7377.9	4567.9
	CHI	102.015	211.732	210.595	285.770	581.616	1388.140	1909.348	1791.294	1323.521	353.577
2006-	OBS	19.0	82.0	316.0	1106.0	3078.0	4560.0	4721.0	4430.0	3935.0	3170.0
	PRE	204.6	537.4	1198.3	2620.6	5995.4	8924.9	10759.6	10702.7	8813.0	6034.0
	CHI	168.407	385.958	649.654	875.406	1419.617	2134.739	3389.012	3676.319	2699.996	1359.411

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	694.23	13.61	51	P, C	98.65	3736.65	0.0000
AGE-PERIOD	79.19	1.76	45	Cohort	88.16	420.96	0.0000
AGE-COHORT	165.54	4.60	36	Period	94.34	879.57	0.0000
PERIOD-COHORT	23.15	0.58	40	Age	59.51	123.59	0.0000
FULL AGE-PERIOD-COHORT	9.37	0.29	32			49.95	0.0225

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.207668	16.131267
35	1.555783	35.956947
40	1.918582	82.905252
45	2.232337	170.740708
50	2.545563	351.206850
55	2.815778	654.301039
60	3.062092	1153.697258
65	3.289012	1945.414649
70	3.516940	3288.061054
75	3.725049	5309.440809

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.182951	0.656220
1966	-0.120188	0.758249
1971	-0.108965	0.778099
1976	0.068694	1.171369
1981	0.103194	1.268218
1986	0.041837	1.101126

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.096738	0.800317
1891	-0.059495	0.871977
1896	0.006043	1.014013
1901	0.047370	1.115243
1906	0.034146	1.081798
1911	-0.021886	0.950854
1916	-0.030340	0.932524
1921	-0.037681	0.916894
1926	-0.034009	0.924678
1931	0.014096	1.032989
1936	0.052690	1.128990
1941	0.073596	1.184667
1946	0.068491	1.170822
1951	0.069681	1.174036
1956	0.164032	1.458923

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	17.0	31.0	33.0	24.0	49.0	54.0
	EXP	19.5	22.8	26.0	41.7	50.9	54.0
	CHI	0.3	2.9	1.9	7.5	0.1	0.0
35 -	OBS	39.0	46.0	50.0	85.0	104.0	97.0
	EXP	41.4	49.6	51.5	85.9	97.8	95.2
	CHI	0.1	0.3	0.0	0.0	0.4	0.0
40 -	OBS	58.0	116.0	128.0	160.0	209.0	195.0
	EXP	74.5	108.9	115.4	175.5	207.2	188.3
	CHI	3.7	0.5	1.4	1.4	0.0	0.2
45 -	OBS	103.0	169.0	239.0	352.0	390.0	343.0
	EXP	127.7	173.9	224.2	347.9	373.9	351.9
	CHI	4.8	0.1	1.0	0.0	0.7	0.2
50 -	OBS	367.0	291.0	375.0	634.0	742.0	612.0
	EXP	361.6	293.5	354.8	664.5	726.4	621.7
	CHI	0.1	0.0	1.1	1.4	0.3	0.2
55 -	OBS	652.0	764.0	521.0	922.0	1252.0	1036.0
	EXP	663.9	736.1	527.7	936.1	1221.1	1063.7
	CHI	0.2	1.1	0.1	0.2	0.8	0.7
60 -	OBS	1052.0	1234.0	1206.0	1240.0	1590.0	1598.0
	EXP	1023.8	1225.0	1210.7	1263.8	1577.6	1619.9
	CHI	0.8	0.1	0.0	0.4	0.1	0.3
65 -	OBS	1117.0	1670.0	1866.0	2619.0	1890.0	1912.0
	EXP	1121.2	1701.1	1805.1	2632.0	1904.2	1911.8
	CHI	0.0	0.6	2.1	0.1	0.1	0.0
70 -	OBS	1078.0	1722.0	2183.0	3545.0	3647.0	2153.0
	EXP	1054.9	1711.4	2285.3	3542.0	3653.0	2085.1
	CHI	0.5	0.1	4.6	0.0	0.0	2.2
75 -	OBS	1025.0	1303.0	1909.0	3789.0	3922.0	3375.0
	EXP	1025.0	1326.5	1915.4	3688.1	3984.7	3385.3
	CHI	0.0	0.4	0.0	2.8	1.0	0.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	1819.67	45.49	40	P, C	41.02	0.0000
AGE-PERIOD	4106.94	102.67	40	Cohort	73.87	0.0000
AGE-COHORT	20479.27	511.98	40	Period	94.76	0.0000
PERIOD-COHORT	2142.15	53.55	40	Age	49.90	0.0000
FULL AGE-PERIOD-COHORT	1073.29	26.83	40			0.0000

AGE	EFFECT
30	16.131267
35	35.956947
40	82.905252
45	170.740708
50	351.206850
55	654.301039
60	1153.697258
65	1945.414649
70	3288.061054
75	5309.440809

PERIOD	EFFECT	LOWER	UPPER
% Period Change	86.8246	83.8246	89.8246
1961	0.656220		
1966	0.758249		
1971	0.778099		
1976	1.171369		
1981	1.268218		
1986	1.101126		
1991	0.956048	0.923014	0.989082
1996	0.830085	0.773713	0.888439
2001	0.720718	0.648562	0.798037
2006	0.625761	0.543655	0.716834

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.800317	1.000000	
1891	0.871977	2.000000	
1896	1.014013	4.000000	
1901	1.115243	8.000000	
1906	1.081798	16.000000	
1911	0.950854	32.000000	
1916	0.932524	64.000000	
1921	0.916894	128.000000	
1926	0.924678	256.000000	
1931	1.032989	512.000000	
1936	1.128990	1024.000000	
1941	1.184667	2048.000000	
1946	1.170822	4096.000000	
1951	1.174036	8192.000000	
1956	1.219073	EXTRAPOLATION	1.458923
1961	1.250461	EXTRAPOLATION	
1966	1.282658	EXTRAPOLATION	
1971	1.315683	EXTRAPOLATION	
1976	1.349559	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	9.6	18.8	18.9	12.7	23.1	25.9	29.1	20.9	16.2	11.8
	EXP	10.9	13.8	14.9	22.1	24.0	21.7	19.3*	17.2*	15.3*	13.6*
	Elow							18.6	16.0	13.8	11.8
	Eup							20.0	18.4	16.9	15.6
35	OBS	20.5	26.1	30.7	49.4	56.8	47.4	50.9	53.3	40.8	31.9
	EXP	21.8	28.2	31.6	49.9	53.4	46.5	41.9*	37.3*	33.2*	29.6*
	Elow							40.5	34.8	29.9	25.7
	Eup							43.4	39.9	36.8	33.9
40	OBS	38.8	61.9	73.9	99.9	125.6	110.7	120.2	108.7	95.2	119.8
	EXP	49.9	58.1	66.6	109.6	124.6	106.9	93.1*	83.9*	74.7*	66.5*
	Elow							89.8	78.2	67.2	57.8
	Eup							96.3	89.8	82.7	76.2
45	OBS	84.3	115.3	131.0	209.0	255.0	217.1	215.6	177.2	192.3	240.7
	EXP	104.5	118.7	122.8	206.6	244.5	222.7	191.1*	166.4*	150.0*	133.6*
	Elow							184.5	155.1	135.0	116.1
	Eup							197.7	178.1	166.1	153.0
50	OBS	222.4	246.3	264.8	362.9	470.0	429.8	426.1	328.8	312.7	435.1
	EXP	219.1	248.3	250.6	380.4	460.1	436.6	397.8*	341.3*	297.2*	267.9*
	Elow							384.0	318.2	267.4	232.8
	Eup							411.5	365.3	329.1	306.9
55	OBS	456.2	489.6	468.8	692.1	786.7	724.8	822.5	576.3	571.2	680.0
	EXP	464.5	471.7	474.8	702.7	767.3	744.2	706.2*	643.4*	552.1*	480.7*
	Elow							681.8	599.7	496.8	417.6
	Eup							730.6	688.7	611.4	550.7
60	OBS	867.6	953.3	850.3	1236.4	1352.1	1158.8	1245.3	1012.6	944.7	1106.3
	EXP	844.3	946.3	853.6	1260.2	1341.5	1174.7	1139.4*	1081.2*	985.0*	845.3*
	Elow							1100.0	1007.8	886.4	734.4
	Eup							1178.7	1157.2	1090.7	968.3
65	OBS	1289.6	1615.0	1692.8	2156.1	2283.6	1964.4	1953.9	1643.1	1464.6	1639.1
	EXP	1294.5	1645.1	1637.5	2166.8	2300.7	1964.1	1719.8*	1668.1*	1583.0*	1442.2*
	Elow							1660.4	1554.8	1424.5	1252.9
	Eup							1779.2	1785.4	1752.8	1652.1
70	OBS	1922.6	2543.7	2725.6	4170.2	3958.5	3486.2	3315.5	2567.3	2430.1	2679.9
	EXP	1881.5	2528.1	2853.3	4166.6	3965.0	3376.3	2882.3*	2523.8*	2447.9*	2322.9*
	Elow							2782.7	2352.4	2202.9	2018.1
	Eup							2981.9	2701.2	2710.6	2661.0
75	OBS	2788.4	3448.2	4175.1	7125.8	7169.7	5542.1	5357.2	4218.1	3499.3	4142.0
	EXP	2788.4	3510.5	4189.2	6936.0	7284.3	5559.0	4733.6*	4041.0*	3538.4*	3432.0*
	Elow							4570.0	3766.6	3184.1	2981.7
	Eup							4897.1	4325.1	3918.0	3931.5
30-79	OBS	476.5	581.3	618.1	924.7	969.9	824.7	827.9	655.5	598.2	697.6
	EXP	477.3	582.1	618.4	926.1	969.5	823.3	729.6*	656.6*	599.7*	550.7*
	Elow							704.4	612.0	539.7	478.5
	Eup							754.8	702.8	664.0	630.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	17.0	31.0	33.0	24.0	49.0	54.0	48.0	34.0	30.0	25.0
	EXP	19.5	22.8	26.0	41.7	50.9	45.1	31.8*	27.9*	28.3*	28.9*
	CHI	0.309	2.934	1.903	7.510	0.070	1.747	8.290	1.327	0.105	0.536
35 -	OBS	39.0	46.0	50.0	85.0	104.0	97.0	103.0	87.0	66.0	59.0
	EXP	41.4	49.6	51.5	85.9	97.8	95.2	84.7*	60.9*	53.8*	54.7*
	CHI	0.144	0.267	0.043	0.010	0.394	0.036	3.930	11.210	2.773	0.342
40 -	OBS	58.0	116.0	128.0	160.0	209.0	195.0	237.0	214.0	152.0	192.0
	EXP	74.5	108.9	115.4	175.5	207.2	188.3	183.4*	165.2*	119.3*	106.6*
	CHI	3.659	0.468	1.386	1.375	0.016	0.241	15.638	14.416	8.975	68.385
45 -	OBS	103.0	169.0	239.0	352.0	390.0	343.0	361.0	335.0	363.0	372.0
	EXP	127.7	173.9	224.2	347.9	373.9	351.9	320.0*	314.6*	283.2*	206.5*
	CHI	4.786	0.139	0.978	0.047	0.695	0.226	5.250	1.328	22.500	132.676
50 -	OBS	367.0	291.0	375.0	634.0	742.0	612.0	628.0	518.0	556.0	775.0
	EXP	361.6	293.5	354.8	664.5	726.4	621.7	586.3*	537.7*	528.3*	477.3*
	CHI	0.081	0.021	1.147	1.404	0.335	0.153	2.965	0.725	1.448	185.746
55 -	OBS	652.0	764.0	521.0	922.0	1252.0	1036.0	1063.0	781.0	825.0	1113.0
	EXP	663.9	736.1	527.7	936.1	1221.1	1063.7	912.7*	872.0*	797.5*	786.8*
	CHI	0.212	1.058	0.084	0.213	0.784	0.722	24.757	9.504	0.951	135.216
60 -	OBS	1052.0	1234.0	1206.0	1240.0	1590.0	1598.0	1552.0	1162.0	1140.0	1426.0
	EXP	1023.8	1225.0	1210.7	1263.8	1577.6	1619.9	1420.0*	1240.8*	1188.7*	1089.6*
	CHI	0.776	0.067	0.018	0.450	0.097	0.297	12.276	4.998	1.992	103.882
65 -	OBS	1117.0	1670.0	1866.0	2619.0	1890.0	1912.0	2205.0	1725.0	1425.0	1699.0
	EXP	1121.2	1701.1	1805.1	2632.0	1904.2	1911.8	1940.9*	1751.3*	1540.2*	1494.9*
	CHI	0.016	0.570	2.053	0.064	0.105	0.000	35.942	0.393	8.616	27.877
70 -	OBS	1078.0	1722.0	2183.0	3545.0	3647.0	2153.0	2480.0	2231.0	2013.0	2086.0
	EXP	1054.9	1711.4	2285.3	3542.0	3653.0	2085.1	2156.0*	2193.2*	2027.8*	1808.2*
	CHI	0.504	0.065	4.579	0.003	0.010	2.210	48.694	0.652	0.108	42.690
75 -	OBS	1025.0	1303.0	1909.0	3789.0	3922.0	3375.0	2194.0	2220.0	2129.0	2487.0
	EXP	1025.0	1326.5	1915.4	3688.1	3984.7	3385.3	1938.6*	2126.8*	2152.8*	2060.7*
	CHI	0.000	0.417	0.021	2.760	0.987	0.031	33.650	4.084	0.263	88.176
30-79	OBS	5508.0	7346.0	8510.0	13370.0	13795.0	11375.0	10871.0	9307.0	8699.0	10234.0
	EXP	5513.6	7348.8	8516.0	13377.6	13796.7	11368.1	9574.4*	9290.3*	8719.7*	8114.1*
	O/E	0.999	1.000	0.999	0.999	1.000	1.001	1.135	1.002	0.998	1.261

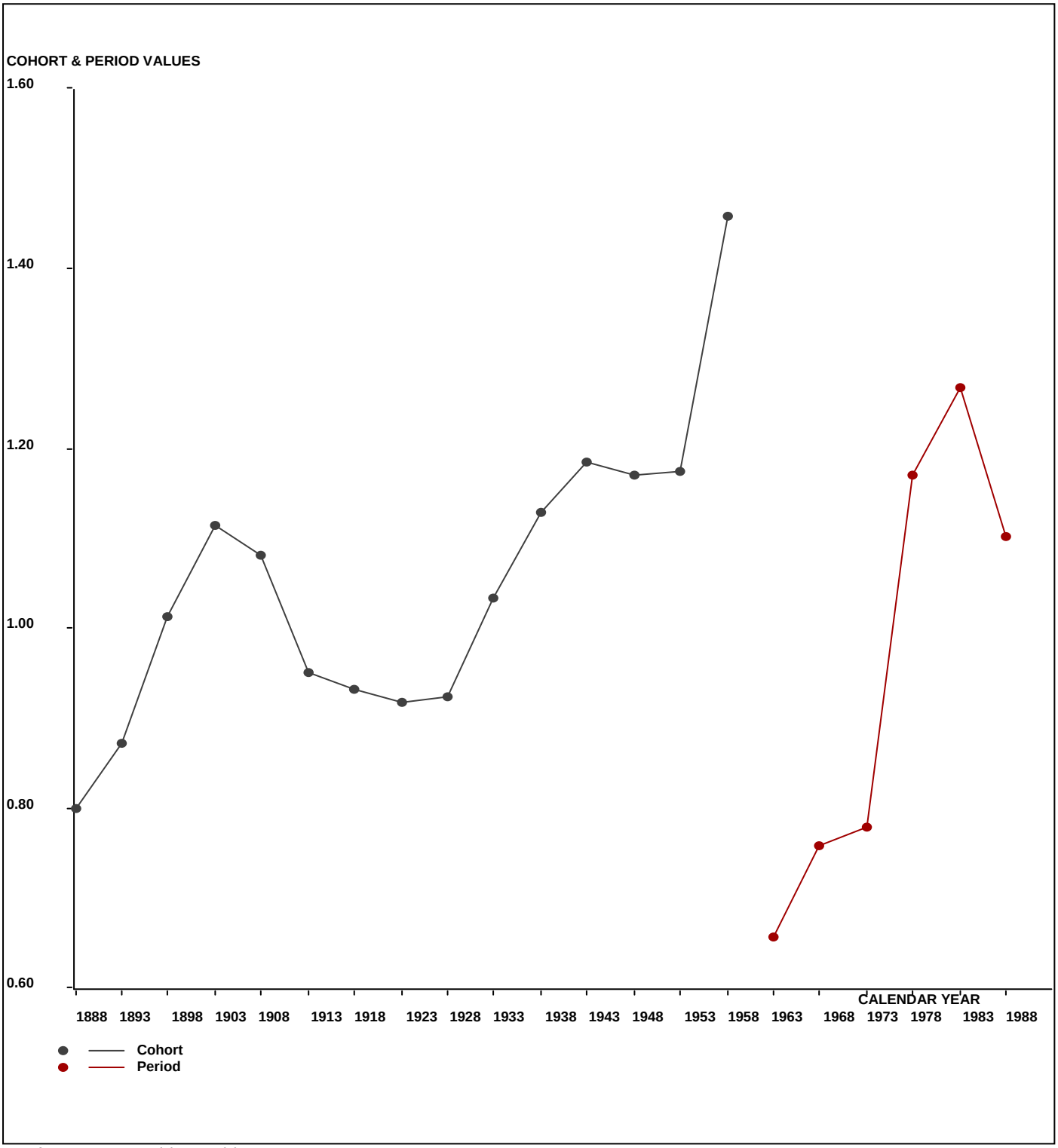
CHI SQUARE (LOG)= 1073.2863 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

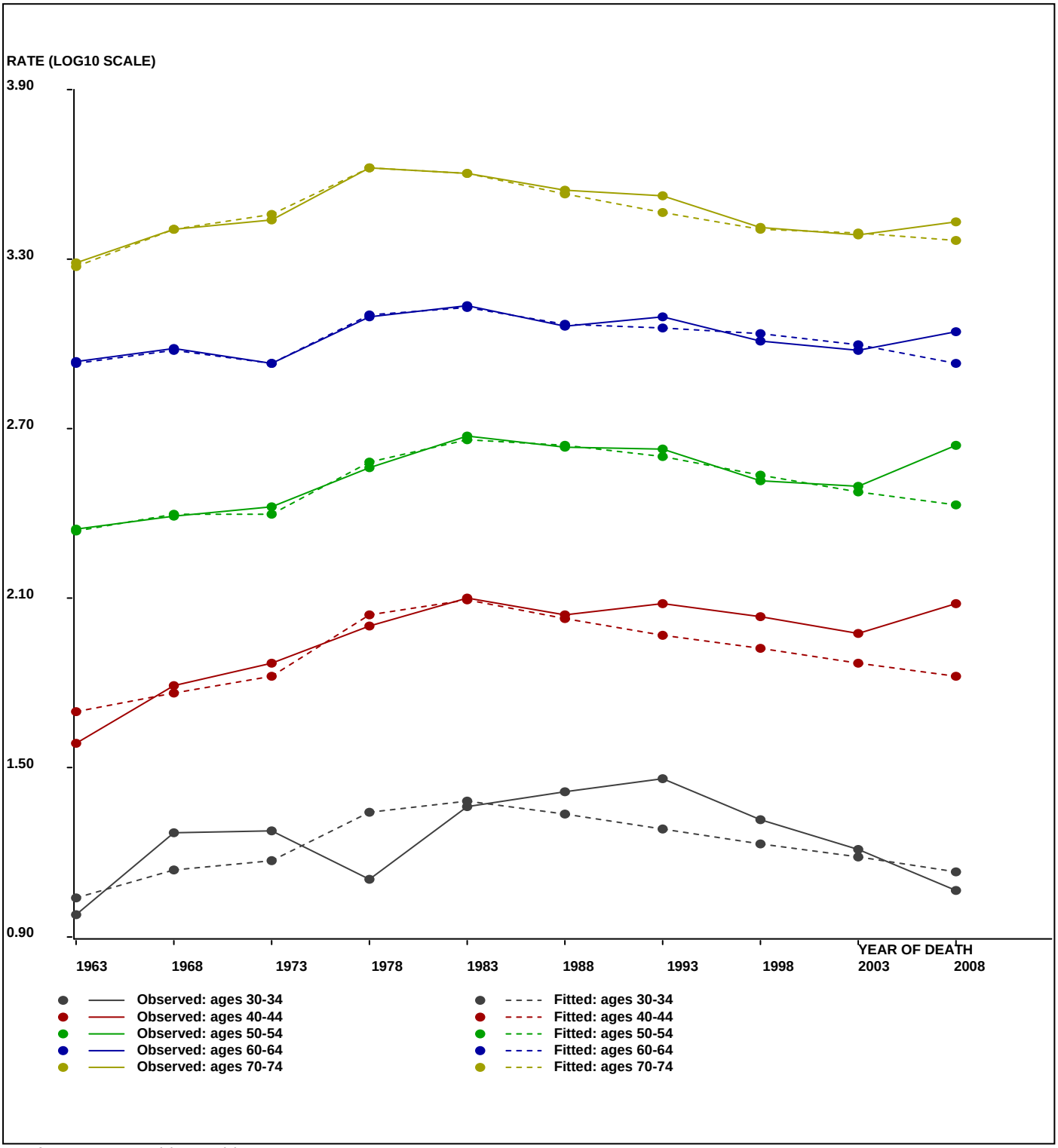


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	29.1	50.9	120.2	215.6	426.1	822.5	1245.3	1953.9	3315.5	5357.2
	PRE	19.3	41.9	93.1	191.1	397.8	706.2	1139.4	1719.8	2882.3	4733.6
	RES	9.851	9.025	27.170	24.479	28.286	116.316	105.938	234.037	433.167	623.650
1996-	OBS	20.9	53.3	108.7	177.2	328.8	576.3	1012.6	1643.1	2567.3	4218.1
	PRE	17.2	37.3	83.9	166.4	341.3	643.4	1081.2	1668.1	2523.8	4041.0
	RES	3.745	16.016	24.783	10.811	-12.530	-67.170	-68.625	-25.005	43.509	177.072
2001-	OBS	16.2	40.8	95.2	192.3	312.7	571.2	944.7	1464.6	2430.1	3499.3
	PRE	15.3	33.2	74.7	150.0	297.2	552.1	985.0	1583.0	2447.9	3538.4
	RES	0.934	7.548	20.495	42.286	15.555	19.064	-40.320	-118.393	-17.857	-39.081
2006-	OBS	11.8	31.9	119.8	240.7	435.1	680.0	1106.3	1639.1	2679.9	4142.0
	PRE	13.6	29.6	66.5	133.6	267.9	480.7	845.3	1442.2	2322.9	3432.0
	RES	-1.855	2.340	53.293	107.095	167.141	199.271	260.996	196.944	356.928	709.932

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	48.0	103.0	237.0	361.0	628.0	1063.0	1552.0	2205.0	2480.0	2194.0
	PRE	31.8	84.7	183.4	320.0	586.3	912.7	1420.0	1940.9	2156.0	1938.6
	CHI	8.290	3.930	15.638	5.250	2.965	24.757	12.276	35.942	48.694	33.650
1996-	OBS	34.0	87.0	214.0	335.0	518.0	781.0	1162.0	1725.0	2231.0	2220.0
	PRE	27.9	60.9	165.2	314.6	537.7	872.0	1240.8	1751.3	2193.2	2126.8
	CHI	1.327	11.210	14.416	1.328	0.725	9.504	4.998	0.393	0.652	4.084
2001-	OBS	30.0	66.0	152.0	363.0	556.0	825.0	1140.0	1425.0	2013.0	2129.0
	PRE	28.3	53.8	119.3	283.2	528.3	797.5	1188.7	1540.2	2027.8	2152.8
	CHI	0.105	2.773	8.975	22.500	1.448	0.951	1.992	8.616	0.108	0.263
2006-	OBS	25.0	59.0	192.0	372.0	775.0	1113.0	1426.0	1699.0	2086.0	2487.0
	PRE	28.9	54.7	106.6	206.5	477.3	786.8	1089.6	1494.9	1808.2	2060.7
	CHI	0.536	0.342	68.385	132.676	185.746	135.216	103.882	27.877	42.690	88.176

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	894.54	17.54	51	P, C	89.11	4767.23	0.0000
AGE-PERIOD	262.85	5.84	45	Cohort	62.95	1399.91	0.0000
AGE-COHORT	133.69	3.71	36	Period	27.16	715.95	0.0000
PERIOD-COHORT	114.05	2.85	40	Age	14.62	611.70	0.0000
FULL AGE-PERIOD-COHORT	97.38	3.04	32			521.25	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.880670	75.974937
35	2.145466	139.786708
40	2.388530	244.641428
45	2.641002	437.524010
50	2.889799	775.888530
55	3.173136	1489.828723
60	3.447406	2801.602165
65	3.714519	5182.257421
70	3.966700	9261.893551
75	4.193981	15630.790369

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.029354	1.069926
1966	0.030045	1.071631
1971	-0.016632	0.962426
1976	-0.022261	0.950034
1981	-0.009011	0.979466
1986	-0.013727	0.968886

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.119914	1.317995
1891	0.066986	1.166773
1896	0.042934	1.103911
1901	0.003865	1.008938
1906	-0.030453	0.932282
1911	-0.052620	0.885890
1916	-0.026130	0.941609
1921	-0.014012	0.968251
1926	-0.036044	0.920357
1931	-0.000766	0.998238
1936	-0.002873	0.993407
1941	-0.044138	0.903363
1946	-0.011275	0.974373
1951	0.008860	1.020611
1956	0.033923	1.081243

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	231.0	147.0	51.0	77.0	133.0	164.0
	EXP	149.6	141.2	117.8	130.3	158.2	164.0
	CHI	44.3	0.2	37.9	21.8	4.0	0.0
35 -	OBS	352.0	260.0	149.0	150.0	270.0	305.0
	EXP	280.5	273.6	231.4	212.6	243.2	282.8
	CHI	18.2	0.7	29.4	18.4	2.9	1.7
40 -	OBS	519.0	486.0	300.0	319.0	429.0	425.0
	EXP	422.5	486.5	425.2	396.7	376.8	412.9
	CHI	22.1	0.0	36.9	15.2	7.2	0.4
45 -	OBS	729.0	650.0	611.0	708.0	801.0	689.0
	EXP	608.6	745.6	768.6	741.2	715.2	650.7
	CHI	23.8	12.2	32.3	1.5	10.3	2.3
50 -	OBS	1540.0	1009.0	1018.0	1240.0	1343.0	1252.0
	EXP	1365.4	1054.2	1162.5	1317.1	1313.1	1214.1
	CHI	22.3	1.9	18.0	4.5	0.7	1.2
55 -	OBS	2531.0	2469.0	1546.0	2109.0	2598.0	2404.0
	EXP	2370.2	2537.7	1752.8	2141.1	2492.4	2384.4
	CHI	10.9	1.9	24.4	0.5	4.5	0.2
60 -	OBS	4046.0	4201.0	4098.0	3110.0	4033.0	4358.0
	EXP	4268.7	4220.3	4059.1	3079.8	3896.6	4330.3
	CHI	11.6	0.1	0.4	0.3	4.8	0.2
65 -	OBS	6586.0	7291.0	6437.0	6982.0	5289.0	6475.0
	EXP	6966.5	7181.8	6383.8	6798.0	5279.5	6464.5
	CHI	20.8	1.7	0.4	5.0	0.0	0.0
70 -	OBS	9196.0	10494.0	9926.0	9754.0	10521.0	7908.0
	EXP	9381.4	10559.4	9772.5	9622.4	10626.7	7841.5
	CHI	3.7	0.4	2.4	1.8	1.1	0.6
75 -	OBS	11998.0	11960.0	12508.0	12267.0	12220.0	13338.0
	EXP	11998.0	11777.9	12080.3	12315.0	12557.3	13578.2
	CHI	0.0	2.8	15.1	0.2	9.1	4.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	6894.33	172.36	40	P, C	48.08	0.0000
AGE-PERIOD	2289.48	57.24	40	Cohort	-56.35	0.0000
AGE-COHORT	2889.03	72.23	40	Period	-23.90	0.0000
PERIOD-COHORT	2094.80	52.37	40	Age	-70.88	0.0000
FULL AGE-PERIOD-COHORT	3579.56	89.49	40			0.0000

AGE	EFFECT
30	75.974937
35	139.786708
40	244.641428
45	437.524010
50	775.888530
55	1489.828723
60	2801.602165
65	5182.257421
70	9261.893551
75	15630.790369

PERIOD	EFFECT	LOWER	UPPER
% Period Change	98.9198	95.9198	101.9198
1961	1.069926		
1966	1.071631		
1971	0.962426		
1976	0.950034		
1981	0.979466		
1986	0.968886		
1991	0.958420	0.929353	0.987486
1996	0.948066	0.891433	1.006444
2001	0.937825	0.855061	1.025765
2006	0.927694	0.820172	1.045457

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.317995	1.000000	
1891	1.166773	2.000000	
1896	1.103911	4.000000	
1901	1.008938	8.000000	
1906	0.932282	16.000000	
1911	0.885890	32.000000	
1916	0.941609	64.000000	
1921	0.968251	128.000000	
1926	0.920357	256.000000	
1931	0.998238	512.000000	
1936	0.993407	1024.000000	
1941	0.903363	2048.000000	
1946	0.974373	4096.000000	
1951	1.020611	8192.000000	
1956	1.022223	EXTRAPOLATION	1.081243
1961	1.039479	EXTRAPOLATION	
1966	1.057027	EXTRAPOLATION	
1971	1.074871	EXTRAPOLATION	
1976	1.093016	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	125.3	84.2	28.6	41.6	63.9	79.6	58.7	43.3	25.0	12.7
	EXP	81.1	80.9	66.1	70.3	75.9	75.2	75.7*	76.1*	76.6*	77.0*
	Elow							73.4	71.6	69.8	68.1
	Eup							78.0	80.8	83.8	86.8
35	OBS	172.7	142.1	86.0	84.6	148.1	149.1	172.1	135.9	86.2	48.3
	EXP	137.6	149.5	133.6	120.0	133.4	138.2	137.0*	137.8*	138.6*	139.4*
	Elow							132.8	129.5	126.3	123.2
	Eup							141.1	146.2	151.6	157.1
40	OBS	311.4	241.0	165.8	185.6	246.4	237.7	267.1	253.3	203.6	148.4
	EXP	253.4	241.3	235.0	230.9	216.5	231.0	239.3*	237.1*	238.5*	239.9*
	Elow							232.0	222.9	217.4	212.1
	Eup							246.6	251.7	260.9	270.3
45	OBS	528.0	395.8	308.1	396.3	476.8	405.5	467.7	416.5	378.4	309.1
	EXP	440.8	454.0	387.5	414.9	425.7	382.9	408.6*	423.4*	419.4*	421.9*
	Elow							396.2	398.1	382.4	373.0
	Eup							421.0	449.4	458.8	475.5
50	OBS	829.5	749.3	633.2	638.7	775.9	770.1	752.2	632.1	599.1	559.6
	EXP	735.4	782.9	723.0	678.4	758.6	746.8	671.8*	716.7*	742.6*	735.8*
	Elow							651.4	673.9	677.1	650.5
	Eup							692.1	760.9	812.3	829.2
55	OBS	1586.9	1376.1	1190.9	1349.9	1399.9	1452.8	1474.7	1171.4	1020.2	929.7
	EXP	1486.1	1414.4	1350.1	1370.4	1343.0	1440.9	1418.5*	1276.0*	1361.4*	1410.6*
	Elow							1375.4	1199.7	1241.2	1247.1
	Eup							1461.5	1354.5	1489.1	1589.7
60	OBS	2866.5	2786.1	2411.6	2530.8	2750.0	2514.2	2672.7	2288.4	1947.6	1659.2
	EXP	3024.3	2799.0	2388.7	2506.2	2657.0	2498.2	2680.4*	2638.6*	2373.5*	2532.4*
	Elow							2599.1	2481.0	2164.0	2238.9
	Eup							2761.7	2801.1	2596.1	2853.9
65	OBS	5786.5	5688.3	4688.5	4479.6	4788.1	4869.5	4506.7	4485.3	3810.1	3164.5
	EXP	6120.8	5603.1	4649.8	4361.5	4779.5	4861.6	4571.2*	4904.5*	4828.0*	4343.0*
	Elow							4432.6	4611.5	4401.9	3839.6
	Eup							4709.8	5206.5	5280.7	4894.3
70	OBS	11333.7	10888.8	9134.8	8315.4	7956.6	8521.4	8507.8	7792.9	7472.1	6597.5
	EXP	11562.2	10956.7	8993.6	8203.2	8036.5	8449.7	8594.9*	8081.6*	8670.7*	8535.6*
	Elow							8334.3	7598.8	7905.5	7546.3
	Eup							8855.6	8579.2	9483.8	9619.1
75	OBS	22041.9	19846.1	17194.6	14924.1	13889.7	13179.0	14797.1	14946.1	13952.1	13568.2
	EXP	22041.9	19544.0	16606.7	14982.5	14273.1	13416.3	14106.1*	14348.5*	13491.5*	14475.1*
	Elow							13678.3	13491.4	12300.8	12797.4
	Eup							14533.9	15232.0	14756.6	16312.5
30-79	OBS	2524.6	2337.9	1969.1	1870.8	1907.8	1894.2	1952.4	1819.1	1644.8	1472.9
	EXP	2524.2	2342.0	1993.7	1879.6	1898.0	1887.0	1907.6*	1900.8*	1884.6*	1897.3*
	Elow							1849.8	1787.3	1718.3	1677.4
	Eup							1965.5	2017.9	2061.3	2138.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	231.0	147.0	51.0	77.0	133.0	164.0	96.0	69.0	45.0	26.0
	EXP	149.6	141.2	117.8	130.3	158.2	155.0	123.8*	121.3*	137.7*	157.4*
	CHI	44.279	0.238	37.889	21.777	4.014	0.517	6.258	22.534	62.410	109.738
35 -	OBS	352.0	260.0	149.0	150.0	270.0	305.0	351.0	224.0	138.0	87.0
	EXP	280.5	273.6	231.4	212.6	243.2	282.8	279.4*	227.1*	221.9*	251.0*
	CHI	18.208	0.673	29.362	18.445	2.950	1.747	18.358	0.043	31.725	107.152
40 -	OBS	519.0	486.0	300.0	319.0	429.0	425.0	539.0	516.0	335.0	237.0
	EXP	422.5	486.5	425.2	396.7	376.8	412.9	482.8*	483.0*	392.4*	383.2*
	CHI	22.066	0.001	36.885	15.230	7.232	0.354	6.538	2.258	8.388	55.800
45 -	OBS	729.0	650.0	611.0	708.0	801.0	689.0	822.0	833.0	762.0	503.0
	EXP	608.6	745.6	768.6	741.2	715.2	650.7	718.2*	846.8*	844.6*	686.6*
	CHI	23.832	12.248	32.313	1.487	10.304	2.251	15.015	0.223	8.085	49.087
50 -	OBS	1540.0	1009.0	1018.0	1240.0	1343.0	1252.0	1250.0	1097.0	1176.0	1104.0
	EXP	1365.4	1054.2	1162.5	1317.1	1313.1	1214.1	1116.3*	1243.8*	1457.7*	1451.6*
	CHI	22.337	1.940	17.958	4.508	0.683	1.182	16.014	17.330	54.423	83.231
55 -	OBS	2531.0	2469.0	1546.0	2109.0	2598.0	2404.0	2317.0	1908.0	1723.0	1771.0
	EXP	2370.2	2537.7	1752.8	2141.1	2492.4	2384.4	2228.7*	2078.4*	2299.2*	2687.0*
	CHI	10.913	1.859	24.392	0.481	4.472	0.161	3.499	13.963	144.419	312.247
60 -	OBS	4046.0	4201.0	4098.0	3110.0	4033.0	4358.0	4194.0	3468.0	3054.0	2688.0
	EXP	4268.7	4220.3	4059.1	3079.8	3896.6	4330.3	4206.1*	3998.7*	3721.9*	4102.6*
	CHI	11.617	0.089	0.374	0.297	4.774	0.178	0.035	70.426	119.849	487.785
65 -	OBS	6586.0	7291.0	6437.0	6982.0	5289.0	6475.0	7125.0	6589.0	5408.0	4670.0
	EXP	6966.5	7181.8	6383.8	6798.0	5279.5	6464.5	7227.0*	7204.8*	6852.8*	6409.1*
	CHI	20.784	1.660	0.443	4.982	0.017	0.017	1.439	52.634	304.631	471.894
70 -	OBS	9196.0	10494.0	9926.0	9754.0	10521.0	7908.0	9860.0	10845.0	9799.0	8424.0
	EXP	9381.4	10559.4	9772.5	9622.4	10626.7	7841.5	9961.0*	11246.6*	11370.9*	10898.6*
	CHI	3.662	0.405	2.410	1.799	1.052	0.564	1.023	14.343	217.295	561.870
75 -	OBS	11998.0	11960.0	12508.0	12267.0	12220.0	13338.0	10570.0	14132.0	15772.0	14834.0
	EXP	11998.0	11777.9	12080.3	12315.0	12557.3	13578.2	10076.4*	13567.0*	15251.3*	15825.4*
	CHI	0.000	2.816	15.141	0.187	9.059	4.248	24.178	23.534	17.779	62.109
30-79	OBS	37728.0	38967.0	36644.0	36716.0	37637.0	37318.0	37124.0	39681.0	38212.0	34344.0
	EXP	37811.2	38978.3	36754.1	36754.1	37659.0	37314.4	36419.6*	41017.4*	42550.4*	42852.5*
	O/E	0.998	1.000	0.997	0.999	0.999	1.000	1.019	0.967	0.898	0.801

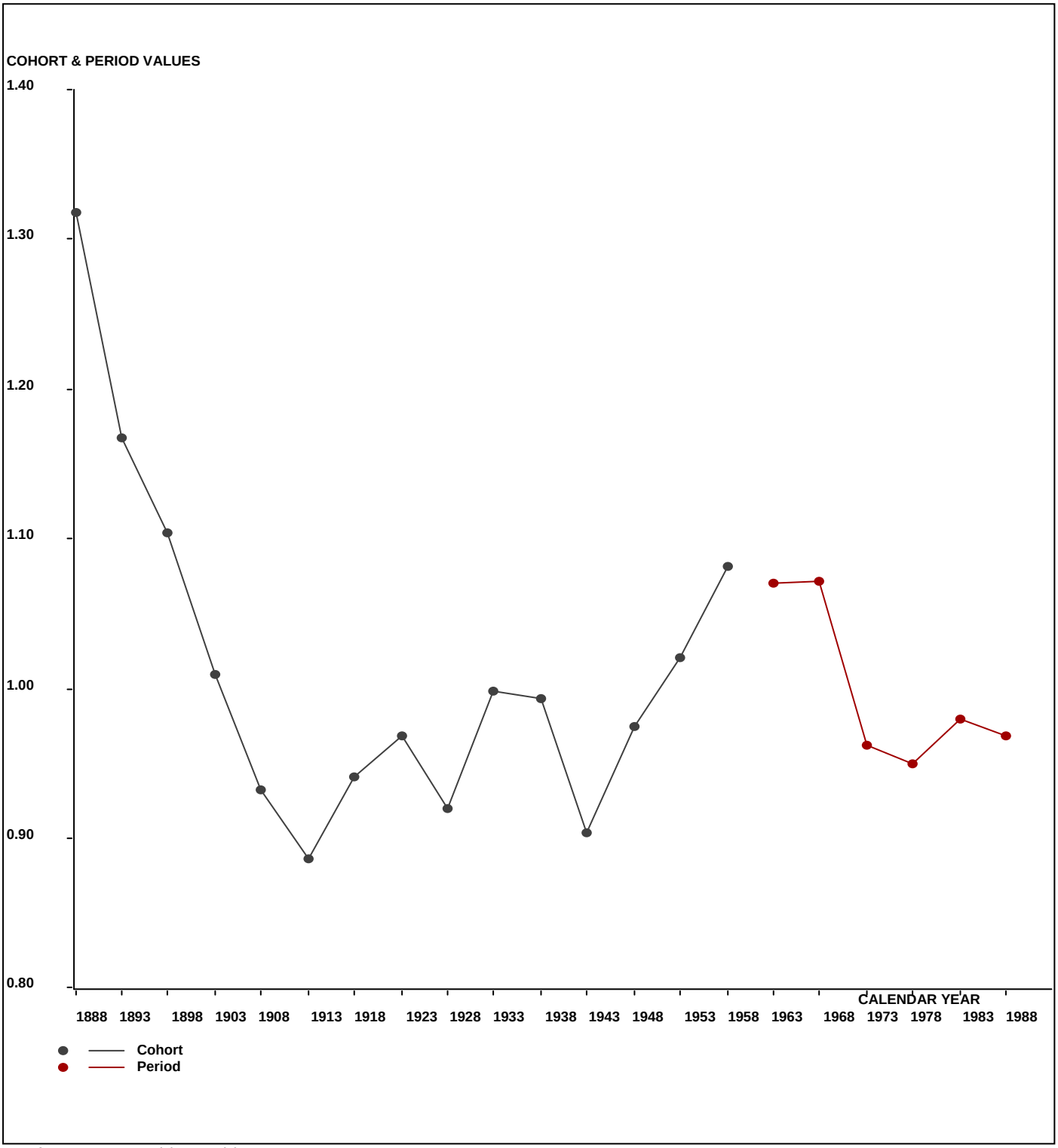
CHI SQUARE (LOG)= 3579.5623 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

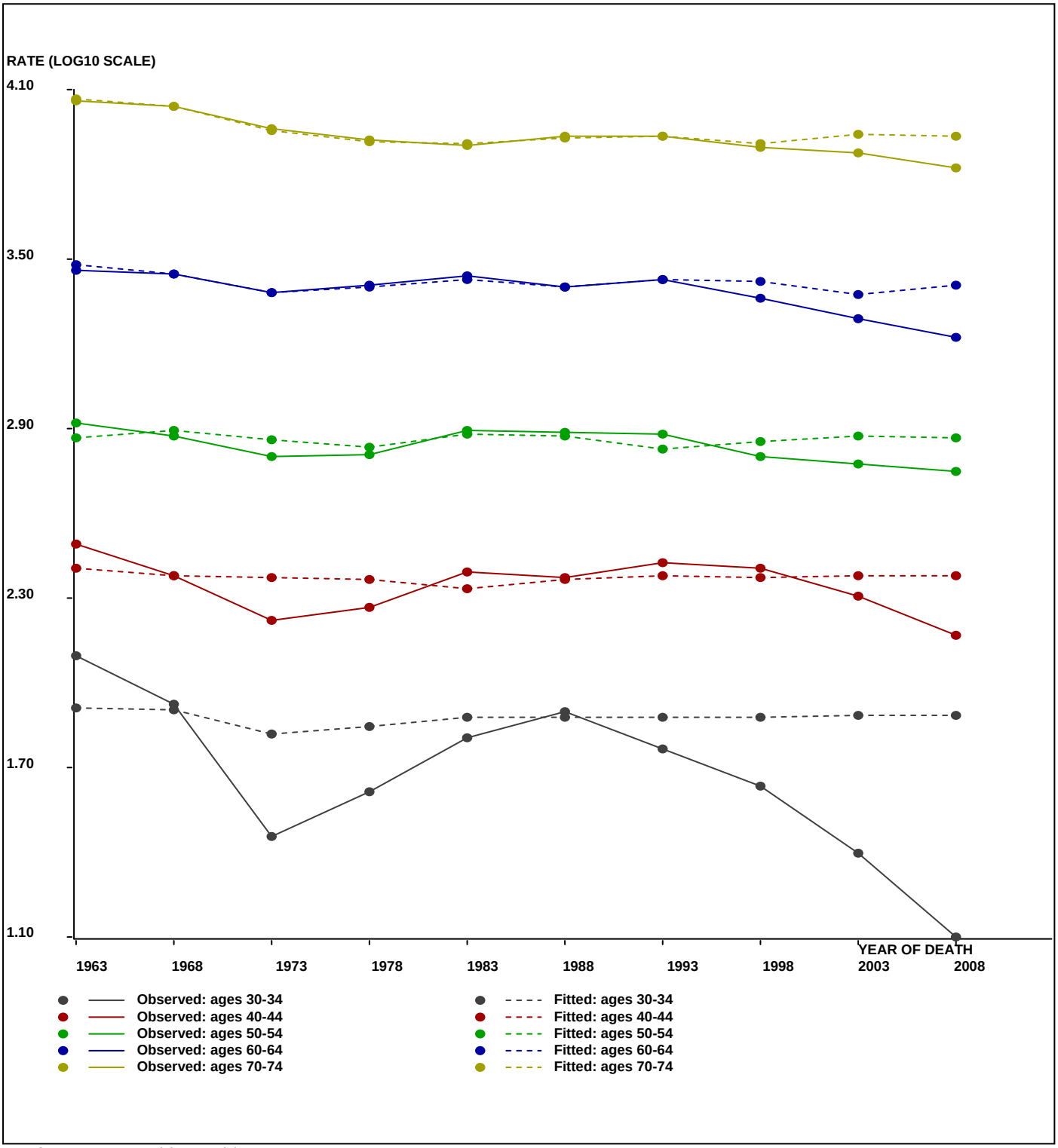


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	58.7	172.1	267.1	467.7	752.2	1474.7	2672.7	4506.7	8507.8	14797.1
	PRE	75.7	137.0	239.3	408.6	671.8	1418.5	2680.4	4571.2	8594.9	14106.1
	RES	-17.015	35.106	27.847	59.079	80.458	56.201	-7.718	-64.494	-87.114	690.979
1996-	OBS	43.3	135.9	253.3	416.5	632.1	1171.4	2288.4	4485.3	7792.9	14946.1
	PRE	76.1	137.8	237.1	423.4	716.7	1276.0	2638.6	4904.5	8081.6	14348.5
	RES	-32.819	-1.892	16.211	-6.878	-84.604	-104.584	-350.172	-419.194	-288.610	597.599
2001-	OBS	25.0	86.2	203.6	378.4	599.1	1020.2	1947.6	3810.1	7472.1	13952.1
	PRE	76.6	138.6	238.5	419.4	742.6	1361.4	2373.5	4828.0	8670.7	13491.5
	RES	-51.559	-52.395	-34.871	-41.037	-143.497	-341.196	-425.918	-1017.933	-1198.625	460.642
2006-	OBS	12.7	48.3	148.4	309.1	559.6	929.7	1659.2	3164.5	6597.5	13568.2
	PRE	77.0	139.4	239.9	421.9	735.8	1410.6	2532.4	4343.0	8535.6	14475.1
	RES	-64.316	-91.074	-91.539	-112.814	-176.186	-480.861	-873.211	-1178.448	-1938.049	-906.820

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	96.0	351.0	539.0	822.0	1250.0	2317.0	4194.0	7125.0	9860.0	10570.0
	PRE	123.8	279.4	482.8	718.2	1116.3	2228.7	4206.1	7227.0	9961.0	10076.4
	CHI	6.258	18.358	6.538	15.015	16.014	3.499	0.035	1.439	1.023	24.178
1996-	OBS	69.0	224.0	516.0	833.0	1097.0	1908.0	3468.0	6589.0	10845.0	14132.0
	PRE	121.3	227.1	483.0	846.8	1243.8	2078.4	3998.7	7204.8	11246.6	13567.0
	CHI	22.534	0.043	2.258	0.223	17.330	13.963	70.426	52.634	14.343	23.534
2001-	OBS	45.0	138.0	335.0	762.0	1176.0	1723.0	3054.0	5408.0	9799.0	15772.0
	PRE	137.7	221.9	392.4	844.6	1457.7	2299.2	3721.9	6852.8	11370.9	15251.3
	CHI	62.410	31.725	8.388	8.085	54.423	144.419	119.849	304.631	217.295	17.779
2006-	OBS	26.0	87.0	237.0	503.0	1104.0	1771.0	2688.0	4670.0	8424.0	14834.0
	PRE	157.4	251.0	383.2	686.6	1451.6	2687.0	4102.6	6409.1	10898.6	15825.4
	CHI	109.738	107.152	55.800	49.087	83.231	312.247	487.785	471.894	561.870	62.109

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	395.36	7.75	51	P, C	95.05	2108.53	0.0000
AGE-PERIOD	231.74	5.15	45	Cohort	91.56	1242.76	0.0000
AGE-COHORT	169.82	4.72	36	Period	88.48	901.25	0.0000
PERIOD-COHORT	86.82	2.17	40	Age	77.47	467.48	0.0000
FULL AGE-PERIOD-COHORT	19.56	0.61	32			103.83	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.595467	39.397341
35	1.906694	80.666618
40	2.247559	176.831388
45	2.560290	363.320526
50	2.858520	721.971708
55	3.100942	1261.658901
60	3.373038	2360.685243
65	3.654382	4512.136407
70	3.931903	8548.754131
75	4.169202	14763.915143

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.033520	0.925720
1966	-0.042285	0.907225
1971	-0.054605	0.881851
1976	0.020539	1.048429
1981	0.067893	1.169210
1986	0.017025	1.039981

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.098293	1.253988
1891	0.101484	1.263235
1896	0.071051	1.177746
1901	0.025722	1.061015
1906	-0.019117	0.956937
1911	-0.062820	0.865327
1916	-0.061256	0.868449
1921	-0.060818	0.869324
1926	-0.098710	0.796691
1931	-0.038684	0.914779
1936	-0.008622	0.980343
1941	0.051093	1.124846
1946	0.166945	1.468740
1951	0.228251	1.691418
1956	0.285718	1.930713

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	58.0	57.0	74.0	104.0	173.0	163.0
	EXP	61.5	61.2	69.7	112.4	162.3	163.0
	CHI	0.2	0.3	0.3	0.6	0.7	0.0
35 -	OBS	116.0	100.0	123.0	177.0	277.0	279.0
	EXP	121.2	122.5	120.8	168.6	252.5	290.3
	CHI	0.2	4.1	0.0	0.4	2.4	0.4
40 -	OBS	220.0	202.0	254.0	368.0	431.0	465.0
	EXP	237.2	257.7	258.1	312.3	404.8	482.9
	CHI	1.2	12.0	0.1	9.9	1.7	0.7
45 -	OBS	370.0	441.0	508.0	685.0	732.0	681.0
	EXP	403.3	470.6	506.2	622.5	699.6	722.2
	CHI	2.7	1.9	0.0	6.3	1.5	2.4
50 -	OBS	1158.0	732.0	860.0	1220.0	1353.0	1101.0
	EXP	1073.7	765.9	889.9	1170.7	1336.6	1196.7
	CHI	6.6	1.5	1.0	2.1	0.2	7.7
55 -	OBS	1826.0	1680.0	1240.0	1849.0	2246.0	1931.0
	EXP	1782.6	1777.1	1254.4	1796.5	2181.0	1986.2
	CHI	1.1	5.3	0.2	1.5	1.9	1.5
60 -	OBS	3356.0	3078.0	3039.0	2596.0	3577.0	3326.0
	EXP	3272.7	3090.2	3061.1	2641.3	3519.0	3390.3
	CHI	2.1	0.0	0.2	0.8	1.0	1.2
65 -	OBS	5603.0	5578.0	5281.0	6369.0	5041.0	5387.0
	EXP	5599.1	5567.0	5227.7	6380.3	5061.0	5424.3
	CHI	0.0	0.0	0.5	0.0	0.1	0.3
70 -	OBS	7947.0	8871.0	8771.0	10062.0	11305.0	7308.0
	EXP	8111.3	8803.0	8691.5	10060.6	11436.9	7165.2
	CHI	3.3	0.5	0.7	0.0	1.5	2.8
75 -	OBS	9329.0	10358.0	11082.0	13323.0	14446.0	13617.0
	EXP	9329.0	10196.6	11154.4	13499.3	14533.0	13446.7
	CHI	0.0	2.6	0.5	2.3	0.5	2.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	30031.04	750.78	40	P, C	60.30	0.0000
AGE-PERIOD	2540.46	63.51	40	Cohort	-369.28	0.0000
AGE-COHORT	59145.43	1478.64	40	Period	79.84	0.0000
PERIOD-COHORT	4863.70	121.59	40	Age	-145.12	0.0000
FULL AGE-PERIOD-COHORT	11921.83	298.05	40			0.0000

AGE	EFFECT
30	39.397341
35	80.666618
40	176.831388
45	363.320526
50	721.971708
55	1261.658901
60	2360.685243
65	4512.136407
70	8548.754131
75	14763.915143

PERIOD	EFFECT	LOWER	UPPER
% Period Change	88.9473	85.9473	91.9473
1961	0.925720		
1966	0.907225		
1971	0.881851		
1976	1.048429		
1981	1.169210		
1986	1.039981		
1991	0.925035	0.893835	0.956234
1996	0.822793	0.768227	0.879231
2001	0.731852	0.660270	0.808429
2006	0.650963	0.567485	0.743329

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.253988	1.000000	
1891	1.263235	2.000000	
1896	1.177746	4.000000	
1901	1.061015	8.000000	
1906	0.956937	16.000000	
1911	0.865327	32.000000	
1916	0.868449	64.000000	
1921	0.869324	128.000000	
1926	0.796691	256.000000	
1931	0.914779	512.000000	
1936	0.980343	1024.000000	
1941	1.124846	2048.000000	
1946	1.468740	4096.000000	
1951	1.691418	8192.000000	
1956	1.912742	EXTRAPOLATION	1.930713
1961	2.205113	EXTRAPOLATION	
1966	2.542174	EXTRAPOLATION	
1971	2.930756	EXTRAPOLATION	
1976	3.378735	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	31.5	32.6	41.5	56.2	83.1	79.1	58.7	40.2	26.7	21.5
	EXP	33.4	35.0	39.1	60.7	77.9	78.4	80.4*	82.4*	84.5*	86.7*
	Elow							77.7	76.9	76.2	75.5
	Eup							83.1	88.1	93.3	98.9
35	OBS	56.9	54.7	71.0	99.9	151.9	136.4	140.2	114.0	64.3	40.5
	EXP	59.5	66.9	69.7	95.1	138.5	141.9	142.7*	146.4*	150.1*	153.9*
	Elow							137.9	136.7	135.4	134.2
	Eup							147.5	156.4	165.8	175.7
40	OBS	132.0	100.2	140.4	214.2	247.6	260.1	253.8	210.6	170.8	97.7
	EXP	142.3	127.8	142.6	181.8	232.6	270.1	276.7*	278.3*	285.4*	292.6*
	Elow							267.3	259.8	257.5	255.1
	Eup							286.0	297.4	315.2	334.2
45	OBS	268.0	268.5	256.1	383.5	435.7	400.8	372.7	336.5	296.5	207.1
	EXP	292.1	286.5	255.3	348.5	416.4	425.0	493.6*	505.6*	508.6*	521.5*
	Elow							477.0	472.1	458.8	454.6
	Eup							510.3	540.3	561.8	595.5
50	OBS	623.7	543.6	534.9	628.4	781.7	677.2	587.3	502.5	418.8	285.4
	EXP	578.3	568.8	553.5	603.0	772.2	736.1	751.2*	872.5*	893.7*	898.9*
	Elow							725.9	814.6	806.3	783.7
	Eup							776.6	932.3	987.2	1026.5
55	OBS	1144.9	936.3	955.2	1183.5	1210.2	1166.9	965.5	811.6	629.4	453.6
	EXP	1117.6	990.5	966.2	1149.9	1175.2	1200.3	1144.1*	1167.7*	1356.2*	1389.1*
	Elow							1105.5	1090.2	1223.5	1211.0
	Eup							1182.7	1247.8	1498.1	1586.3
60	OBS	2377.7	2041.4	1788.4	2112.5	2439.0	1918.9	1749.3	1466.2	1100.7	790.7
	EXP	2318.7	2049.4	1801.4	2149.4	2399.5	1955.9	1997.6*	1904.2*	1943.4*	2257.0*
	Elow							1930.2	1777.9	1753.3	1967.6
	Eup							2065.0	2034.8	2146.7	2577.3
65	OBS	4922.8	4351.8	3846.5	4086.3	4563.5	4051.3	3252.4	2850.2	2198.1	1534.1
	EXP	4919.4	4343.3	3807.7	4093.6	4581.6	4079.3	3325.3*	3396.2*	3237.3*	3303.9*
	Elow							3213.1	3170.9	2920.7	2880.2
	Eup							3437.4	3629.1	3576.0	3772.7
70	OBS	9794.4	9204.7	8071.9	8578.0	8549.5	7874.9	6795.9	5495.7	4694.2	3027.0
	EXP	9996.9	9134.2	7998.7	8576.8	8649.2	7721.0	6874.5*	5603.8*	5723.2*	5455.5*
	Elow							6642.7	5232.2	5163.5	4755.9
	Eup							7106.4	5988.2	6322.1	6229.6
75	OBS	17138.6	17187.8	15234.3	16208.8	16419.9	13454.7	12908.6	11230.8	8979.7	6438.4
	EXP	17138.6	16920.0	15333.7	16423.4	16518.8	13286.4	11860.5*	10560.2*	8608.2*	8791.7*
	Elow							11460.5	9859.9	7766.3	7664.3
	Eup							12260.6	11284.6	9509.0	10039.2
30-79	OBS	1998.1	1858.5	1673.6	1851.5	1965.4	1712.9	1520.8	1290.5	1035.5	715.2
	EXP	1999.7	1861.9	1674.9	1847.7	1960.4	1719.9	1576.6*	1477.1*	1429.9*	1462.9*
	Elow							1523.4	1379.1	1290.1	1275.3
	Eup							1629.7	1578.4	1579.5	1670.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	58.0	57.0	74.0	104.0	173.0	163.0	96.0	64.0	48.0	44.0
	EXP	61.5	61.2	69.7	112.4	162.3	161.5	131.5*	131.3*	151.9*	177.1*
	CHI	0.201	0.285	0.265	0.623	0.707	0.014	9.576	34.468	71.103	100.025
35 -	OBS	116.0	100.0	123.0	177.0	277.0	279.0	286.0	188.0	103.0	73.0
	EXP	121.2	122.5	120.8	168.6	252.5	290.3	291.2*	241.3*	240.3*	277.1*
	CHI	0.227	4.124	0.041	0.418	2.368	0.438	0.092	11.771	78.476	150.351
40 -	OBS	220.0	202.0	254.0	368.0	431.0	465.0	512.0	429.0	281.0	156.0
	EXP	237.2	257.7	258.1	312.3	404.8	482.9	558.2*	566.9*	469.5*	467.5*
	CHI	1.248	12.046	0.065	9.933	1.692	0.663	3.827	33.551	75.686	207.539
45 -	OBS	370.0	441.0	508.0	685.0	732.0	681.0	655.0	673.0	597.0	337.0
	EXP	403.3	470.6	506.2	622.5	699.6	722.2	867.6*	1011.3*	1024.2*	848.7*
	CHI	2.745	1.860	0.006	6.285	1.501	2.353	52.105	113.180	178.166	308.504
50 -	OBS	1158.0	732.0	860.0	1220.0	1353.0	1101.0	976.0	872.0	822.0	563.0
	EXP	1073.7	765.9	889.9	1170.7	1336.6	1196.7	1248.3*	1514.1*	1754.2*	1773.5*
	CHI	6.614	1.505	1.003	2.073	0.202	7.653	59.416	272.291	495.345	826.208
55 -	OBS	1826.0	1680.0	1240.0	1849.0	2246.0	1931.0	1517.0	1322.0	1063.0	864.0
	EXP	1782.6	1777.1	1254.4	1796.5	2181.0	1986.2	1797.7*	1902.0*	2290.4*	2646.1*
	CHI	1.058	5.306	0.165	1.533	1.935	1.532	43.821	176.860	657.750	1200.232
60 -	OBS	3356.0	3078.0	3039.0	2596.0	3577.0	3326.0	2745.0	2222.0	1726.0	1281.0
	EXP	3272.7	3090.2	3061.1	2641.3	3519.0	3390.3	3134.7*	2885.7*	3047.4*	3656.5*
	CHI	2.119	0.048	0.160	0.778	0.957	1.218	48.448	152.645	572.965	1543.282
65 -	OBS	5603.0	5578.0	5281.0	6369.0	5041.0	5387.0	5142.0	4187.0	3120.0	2264.0
	EXP	5599.1	5567.0	5227.7	6380.3	5061.0	5424.3	5257.2*	4989.1*	4595.0*	4875.7*
	CHI	0.003	0.022	0.544	0.020	0.079	0.256	2.525	128.944	473.483	1399.012
70 -	OBS	7947.0	8871.0	8771.0	10062.0	11305.0	7308.0	7876.0	7648.0	6156.0	3865.0
	EXP	8111.3	8803.0	8691.5	10060.6	11436.9	7165.2	7967.1*	7798.5*	7505.5*	6965.9*
	CHI	3.330	0.525	0.727	0.000	1.520	2.847	1.042	2.905	242.648	1380.357
75 -	OBS	9329.0	10358.0	11082.0	13323.0	14446.0	13617.0	9221.0	10619.0	10151.0	7039.0
	EXP	9329.0	10196.6	11154.4	13499.3	14533.0	13446.7	8472.3*	9985.0*	9731.1*	9611.9*
	CHI	0.000	2.554	0.469	2.303	0.521	2.157	66.158	40.253	18.119	688.704
30-79	OBS	29983.0	31097.0	31232.0	36753.0	39581.0	34258.0	29026.0	28224.0	24067.0	16486.0
	EXP	29991.7	31111.8	31233.7	36764.6	39586.7	34266.2	29725.8*	31025.2*	30809.5*	31300.0*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.976	0.910	0.781	0.527

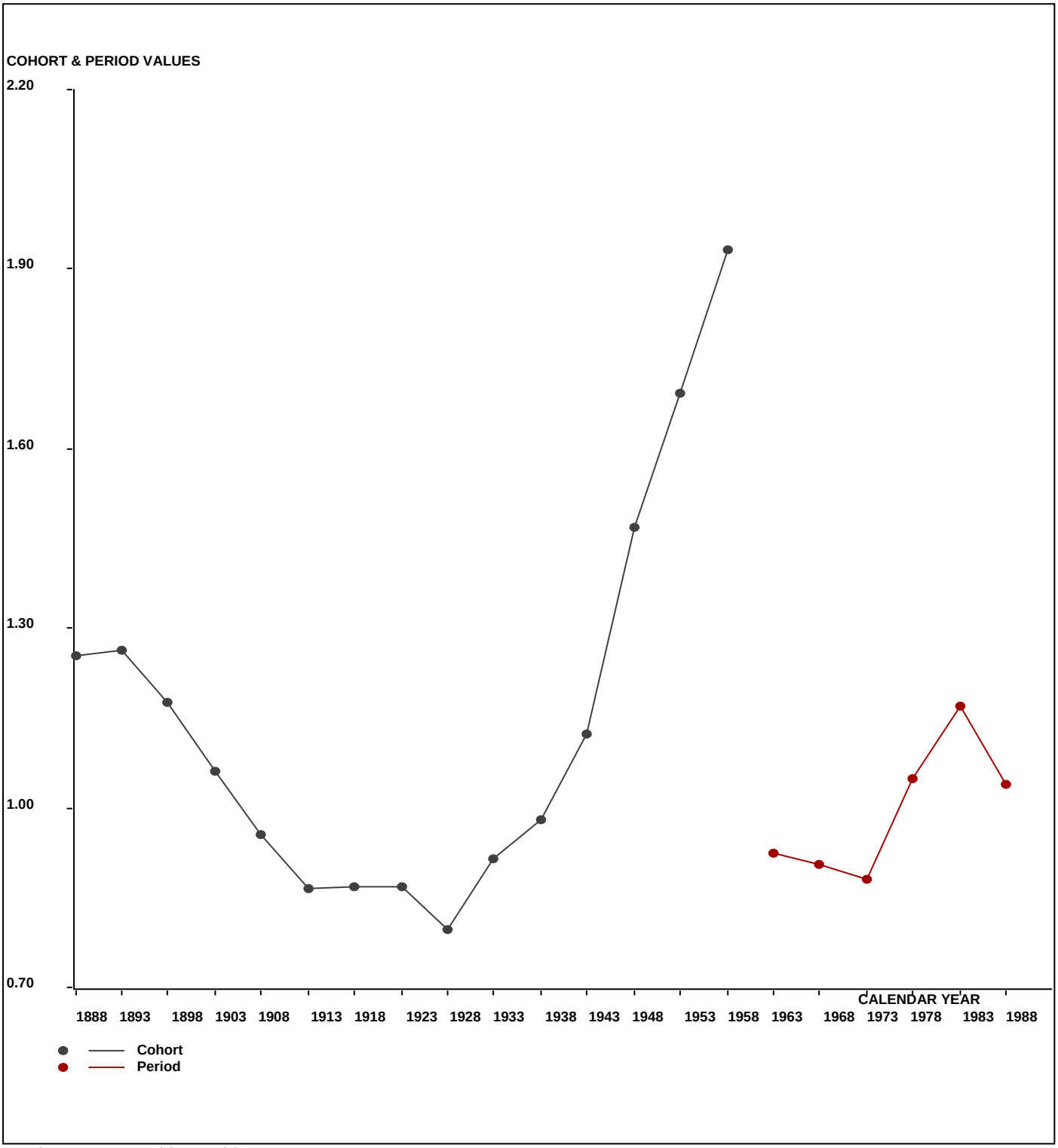
CHI SQUARE (LOG)= 11921.8325 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

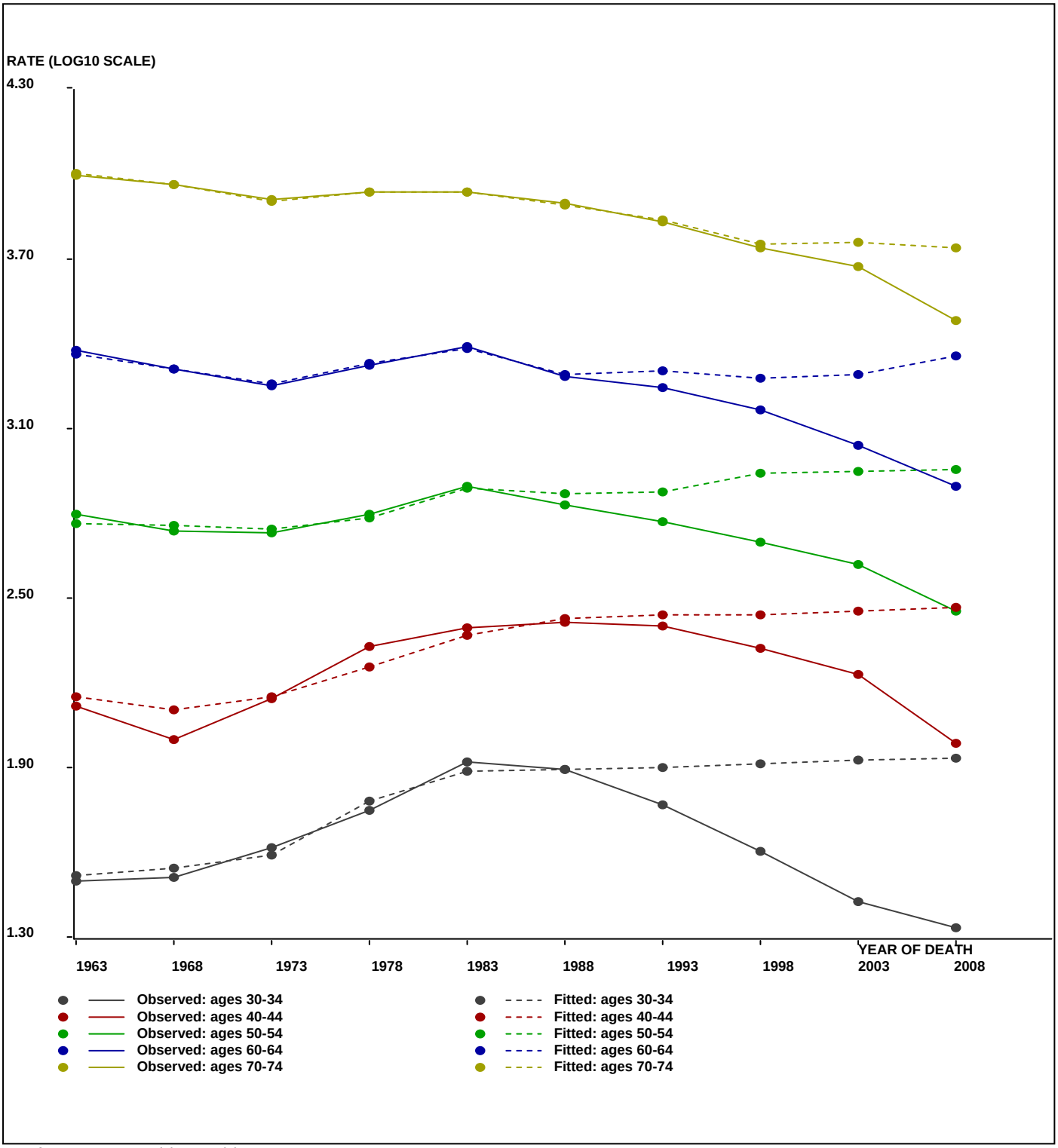


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	58.7	140.2	253.8	372.7	587.3	965.5	1749.3	3252.4	6795.9	12908.6
	PRE	80.4	142.7	276.7	493.6	751.2	1144.1	1997.6	3325.3	6874.5	11860.5
	RES	-21.688	-2.533	-22.907	-120.968	-163.891	-178.634	-248.342	-72.870	-78.614	1048.077
1996-	OBS	40.2	114.0	210.6	336.5	502.5	811.6	1466.2	2850.2	5495.7	11230.8
	PRE	82.4	146.4	278.3	505.6	872.5	1167.7	1904.2	3396.2	5603.8	10560.2
	RES	-42.228	-32.326	-67.702	-169.150	-369.996	-356.071	-437.949	-545.984	-108.149	670.501
2001-	OBS	26.7	64.3	170.8	296.5	418.8	629.4	1100.7	2198.1	4694.2	8979.7
	PRE	84.5	150.1	285.4	508.6	893.7	1356.2	1943.4	3237.3	5723.2	8608.2
	RES	-57.807	-85.760	-114.577	-212.127	-474.913	-726.750	-842.666	-1039.185	-1029.060	371.452
2006-	OBS	21.5	40.5	97.7	207.1	285.4	453.6	790.7	1534.1	3027.0	6438.4
	PRE	86.7	153.9	292.6	521.5	898.9	1389.1	2257.0	3303.9	5455.5	8791.7
	RES	-65.123	-113.357	-194.979	-314.437	-613.570	-935.571	-1466.320	-1769.789	-2428.539	-2353.346

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	96.0	286.0	512.0	655.0	976.0	1517.0	2745.0	5142.0	7876.0	9221.0
	PRE	131.5	291.2	558.2	867.6	1248.3	1797.7	3134.7	5257.2	7967.1	8472.3
	CHI	9.576	0.092	3.827	52.105	59.416	43.821	48.448	2.525	1.042	66.158
1996-	OBS	64.0	188.0	429.0	673.0	872.0	1322.0	2222.0	4187.0	7648.0	10619.0
	PRE	131.3	241.3	566.9	1011.3	1514.1	1902.0	2885.7	4989.1	7798.5	9985.0
	CHI	34.468	11.771	33.551	113.180	272.291	176.860	152.645	128.944	2.905	40.253
2001-	OBS	48.0	103.0	281.0	597.0	822.0	1063.0	1726.0	3120.0	6156.0	10151.0
	PRE	151.9	240.3	469.5	1024.2	1754.2	2290.4	3047.4	4595.0	7505.5	9731.1
	CHI	71.103	78.476	75.686	178.166	495.345	657.750	572.965	473.483	242.648	18.119
2006-	OBS	44.0	73.0	156.0	337.0	563.0	864.0	1281.0	2264.0	3865.0	7039.0
	PRE	177.1	277.1	467.5	848.7	1773.5	2646.1	3656.5	4875.7	6965.9	9611.9
	CHI	100.025	150.351	207.539	308.504	826.208	1200.232	1543.282	1399.012	1380.357	688.704

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	263.56	5.17	51	P, C	96.26	1413.59	0.0000
AGE-PERIOD	34.87	0.77	45	Cohort	71.75	185.40	0.0000
AGE-COHORT	15.16	0.42	36	Period	35.06	80.85	0.0000
PERIOD-COHORT	15.37	0.38	40	Age	35.94	81.77	0.0001
FULL AGE-PERIOD-COHORT	9.85	0.31	32			52.41	0.0129

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.976920	9.482446
35	1.345881	22.175898
40	1.684632	48.376262
45	1.996748	99.254017
50	2.215302	164.173268
55	2.439936	275.382307
60	2.601720	399.686648
65	2.746319	557.595553
70	2.875973	751.576889
75	2.958520	908.909139

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.098625	0.796847
1966	-0.095647	0.802331
1971	-0.058950	0.873072
1976	-0.016353	0.963046
1981	0.037176	1.089371
1986	0.104382	1.271693

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.093329	0.806624
1891	-0.043040	0.905648
1896	-0.019526	0.956035
1901	-0.017319	0.960906
1906	-0.046212	0.899058
1911	-0.061239	0.868483
1916	-0.007301	0.983329
1921	0.007994	1.018577
1926	0.011753	1.027431
1931	0.088269	1.225374
1936	0.145495	1.397960
1941	0.165658	1.464393
1946	0.249382	1.775750
1951	0.285706	1.930661
1956	0.248172	1.770812

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	27.0	20.0	18.0	26.0	34.0	44.0
	EXP	17.1	18.6	21.6	30.0	41.5	44.0
	CHI	5.8	0.1	0.6	0.5	1.4	0.0
35 -	OBS	48.0	36.0	47.0	42.0	74.0	118.0
	EXP	37.0	39.9	46.9	55.4	78.2	111.4
	CHI	3.3	0.4	0.0	3.3	0.2	0.4
40 -	OBS	72.0	82.0	77.0	100.0	144.0	203.0
	EXP	65.4	80.4	93.6	111.9	134.3	195.3
	CHI	0.7	0.0	3.0	1.3	0.7	0.3
45 -	OBS	123.0	137.0	144.0	211.0	256.0	319.0
	EXP	107.4	133.2	176.6	209.2	253.9	314.1
	CHI	2.3	0.1	6.0	0.0	0.0	0.1
50 -	OBS	227.0	165.0	228.0	303.0	383.0	482.0
	EXP	210.9	174.4	234.7	315.4	379.3	474.5
	CHI	1.2	0.5	0.2	0.5	0.0	0.1
55 -	OBS	294.0	356.0	314.0	427.0	567.0	711.0
	EXP	314.7	344.3	306.9	422.0	572.0	710.1
	CHI	1.4	0.4	0.2	0.1	0.0	0.0
60 -	OBS	437.0	440.0	501.0	463.0	623.0	937.0
	EXP	432.0	434.7	515.0	465.1	650.4	905.2
	CHI	0.1	0.1	0.4	0.0	1.2	1.1
65 -	OBS	437.0	534.0	602.0	758.0	670.0	978.0
	EXP	483.5	551.0	600.9	726.9	659.8	960.4
	CHI	4.5	0.5	0.0	1.3	0.2	0.3
70 -	OBS	434.0	555.0	700.0	769.0	949.0	849.0
	EXP	440.1	555.6	685.1	763.3	940.2	872.2
	CHI	0.1	0.0	0.3	0.0	0.1	0.6
75 -	OBS	318.0	404.0	595.0	688.0	791.0	959.0
	EXP	318.0	398.0	551.9	691.4	783.2	1015.9
	CHI	0.0	0.1	3.4	0.0	0.1	3.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	29229.99	730.75	40	P, C	86.51	0.0000
AGE-PERIOD	3945.34	98.63	40	Cohort	0.03	0.0000
AGE-COHORT	1541.06	38.53	40	Period	-155.94	0.0000
PERIOD-COHORT	3789.03	94.73	40	Age	-4.10	0.0000
FULL AGE-PERIOD-COHORT	3944.23	98.61	40			0.0000

AGE	EFFECT
30	9.482446
35	22.175898
40	48.376262
45	99.254017
50	164.173268
55	275.382307
60	399.686648
65	557.595553
70	751.576889
75	908.909139

PERIOD	EFFECT	LOWER	UPPER
% Period Change	116.7364	113.7364	119.7364
1961	0.796847		
1966	0.802331		
1971	0.873072		
1976	0.963046		
1981	1.089371		
1986	1.271693		
1991	1.484529	1.446378	1.522679
1996	1.732986	1.645058	1.823202
2001	2.023026	1.871031	2.183037
2006	2.361608	2.128043	2.613890

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.806624	1.000000	
1891	0.905648	2.000000	
1896	0.956035	4.000000	
1901	0.960906	8.000000	
1906	0.899058	16.000000	
1911	0.868483	32.000000	
1916	0.983329	64.000000	
1921	1.018577	128.000000	
1926	1.027431	256.000000	
1931	1.225374	512.000000	
1936	1.397960	1024.000000	
1941	1.464393	2048.000000	
1946	1.775750	4096.000000	
1951	1.930661	8192.000000	
1956	2.159715	EXTRAPOLATION	1.770812
1961	2.413875	EXTRAPOLATION	
1966	2.697947	EXTRAPOLATION	
1971	3.015448	EXTRAPOLATION	
1976	3.370314	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	14.6	11.5	10.1	14.0	16.3	21.4	25.7	16.3	12.2	8.8
	EXP	9.3	10.6	12.1	16.2	19.9	26.0	34.0*	44.3*	57.8*	75.5*
	Elow							33.1	42.1	53.5	68.0
	Eup							34.9	46.6	62.4	83.5
35	OBS	23.6	19.7	27.1	23.7	40.6	57.7	80.9	84.3	50.0	39.4
	EXP	18.2	21.8	27.1	31.3	42.9	54.4	71.1*	92.8*	121.0*	157.9*
	Elow							69.3	88.1	111.9	142.3
	Eup							72.9	97.6	130.6	174.8
40	OBS	43.2	40.7	42.6	58.2	82.7	113.5	172.0	216.5	196.3	132.7
	EXP	39.3	39.9	51.8	65.1	77.2	109.2	138.7*	181.1*	236.2*	308.2*
	Elow							135.1	171.9	218.5	277.7
	Eup							142.2	190.5	254.9	341.2
45	OBS	89.1	83.4	72.6	118.1	152.4	187.7	277.6	359.5	426.1	413.6
	EXP	77.8	81.1	89.0	117.1	151.2	184.8	261.6*	332.1*	433.7*	565.8*
	Elow							254.9	315.2	401.1	509.9
	Eup							268.4	349.4	468.0	626.3
50	OBS	122.3	122.5	141.8	156.1	221.3	296.5	371.9	501.9	613.9	800.4
	EXP	113.6	129.5	146.0	162.4	219.2	291.9	356.9*	505.2*	641.2*	837.3*
	Elow							347.7	479.6	593.0	754.5
	Eup							366.1	531.5	691.9	926.8
55	OBS	184.3	198.4	241.9	273.3	305.5	429.7	522.5	619.5	773.9	1012.2
	EXP	197.3	191.9	236.4	270.1	308.2	429.1	571.5*	698.9*	989.3*	1255.6*
	Elow							556.8	663.4	915.0	1131.4
	Eup							586.2	735.2	1067.5	1389.7
60	OBS	309.6	291.8	294.8	376.8	424.8	540.6	730.9	785.9	884.5	1198.7
	EXP	306.0	288.3	303.1	378.5	443.5	522.2	727.1*	968.3*	1184.1*	1676.1*
	Elow							708.4	919.2	1095.1	1510.4
	Eup							745.8	1018.7	1277.7	1855.2
65	OBS	383.9	416.6	438.5	486.3	606.5	735.5	763.5	991.1	1058.9	1189.2
	EXP	424.8	429.9	437.7	466.4	597.3	722.3	850.5*	1184.1*	1576.9*	1928.3*
	Elow							828.6	1124.0	1458.5	1737.6
	Eup							872.3	1245.7	1701.7	2134.3
70	OBS	534.9	575.9	644.2	655.6	717.7	914.9	1067.4	1097.3	1236.8	1325.1
	EXP	542.4	576.5	630.5	650.7	711.1	939.8	1136.5*	1338.2*	1863.1*	2481.3*
	Elow							1107.3	1270.3	1723.1	2235.9
	Eup							1165.7	1407.9	2010.5	2746.3
75	OBS	584.2	670.4	817.9	837.0	899.1	947.6	1254.3	1332.6	1283.6	1409.5
	EXP	584.2	660.4	758.7	841.1	890.2	1003.8	1326.8*	1604.4*	1889.2*	2630.2*
	Elow							1292.7	1523.0	1747.2	2370.1
	Eup							1360.9	1687.9	2038.6	2911.2
30-79	OBS	163.9	169.6	187.4	212.7	253.2	320.0	400.9	469.4	521.2	606.9
	EXP	163.9	169.9	188.6	213.8	253.5	319.4	410.3*	528.8*	690.2*	908.1*
	Elow							399.7	501.9	638.4	818.3
	Eup							420.8	556.3	744.8	1005.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	27.0	20.0	18.0	26.0	34.0	44.0	42.0	26.0	22.0	18.0
	EXP	17.1	18.6	21.6	30.0	41.5	53.7	55.6*	70.6*	104.0*	154.2*
	CHI	5.775	0.110	0.607	0.542	1.369	1.740	3.325	28.192	64.663	120.350
35 -	OBS	48.0	36.0	47.0	42.0	74.0	118.0	165.0	139.0	80.0	71.0
	EXP	37.0	39.9	46.9	55.4	78.2	111.4	145.0*	152.9*	193.8*	284.4*
	CHI	3.270	0.379	0.000	3.253	0.226	0.393	2.746	1.271	66.843	160.095
40 -	OBS	72.0	82.0	77.0	100.0	144.0	203.0	347.0	441.0	323.0	212.0
	EXP	65.4	80.4	93.6	111.9	134.3	195.3	279.7*	368.8*	388.7*	492.4*
	CHI	0.656	0.031	2.956	1.268	0.695	0.303	16.169	14.119	11.095	159.674
45 -	OBS	123.0	137.0	144.0	211.0	256.0	319.0	488.0	719.0	858.0	673.0
	EXP	107.4	133.2	176.6	209.2	253.9	314.1	459.9*	664.2*	873.3*	920.7*
	CHI	2.273	0.108	6.008	0.015	0.017	0.077	1.718	4.519	0.267	66.662
50 -	OBS	227.0	165.0	228.0	303.0	383.0	482.0	618.0	871.0	1205.0	1579.0
	EXP	210.9	174.4	234.7	315.4	379.3	474.5	593.1*	876.7*	1258.6*	1652.0*
	CHI	1.223	0.508	0.193	0.485	0.036	0.118	1.047	0.038	2.281	3.223
55 -	OBS	294.0	356.0	314.0	427.0	567.0	711.0	821.0	1009.0	1307.0	1928.0
	EXP	314.7	344.3	306.9	422.0	572.0	710.1	897.9*	1138.3*	1670.8*	2391.7*
	CHI	1.356	0.398	0.163	0.058	0.044	0.001	6.594	14.695	79.208	89.909
60 -	OBS	437.0	440.0	501.0	463.0	623.0	937.0	1147.0	1191.0	1387.0	1942.0
	EXP	432.0	434.7	515.0	465.1	650.4	905.2	1140.9*	1467.4*	1856.7*	2715.4*
	CHI	0.059	0.064	0.380	0.010	1.156	1.119	0.032	52.067	118.839	220.287
65 -	OBS	437.0	534.0	602.0	758.0	670.0	978.0	1207.0	1456.0	1503.0	1755.0
	EXP	483.5	551.0	600.9	726.9	659.8	960.4	1344.6*	1739.5*	2238.3*	2845.7*
	CHI	4.468	0.525	0.002	1.331	0.158	0.323	14.077	46.191	241.552	418.065
70 -	OBS	434.0	555.0	700.0	769.0	949.0	849.0	1237.0	1527.0	1622.0	1692.0
	EXP	440.1	555.6	685.1	763.3	940.2	872.2	1317.1*	1862.3*	2443.3*	3168.2*
	CHI	0.084	0.001	0.322	0.042	0.082	0.616	4.870	60.369	276.091	687.833
75 -	OBS	318.0	404.0	595.0	688.0	791.0	959.0	896.0	1260.0	1451.0	1541.0
	EXP	318.0	398.0	551.9	691.4	783.2	1015.9	947.8*	1517.0*	2135.6*	2875.6*
	CHI	0.000	0.090	3.370	0.016	0.078	3.192	2.829	43.538	219.464	619.420
30-79	OBS	2417.0	2729.0	3226.0	3787.0	4491.0	5600.0	6968.0	8639.0	9758.0	11411.0
	EXP	2426.0	2730.1	3233.3	3790.7	4493.0	5612.8	7181.7*	9857.9*	13163.1*	17500.4*
	O/E	0.996	1.000	0.998	0.999	1.000	0.998	0.970	0.876	0.741	0.652

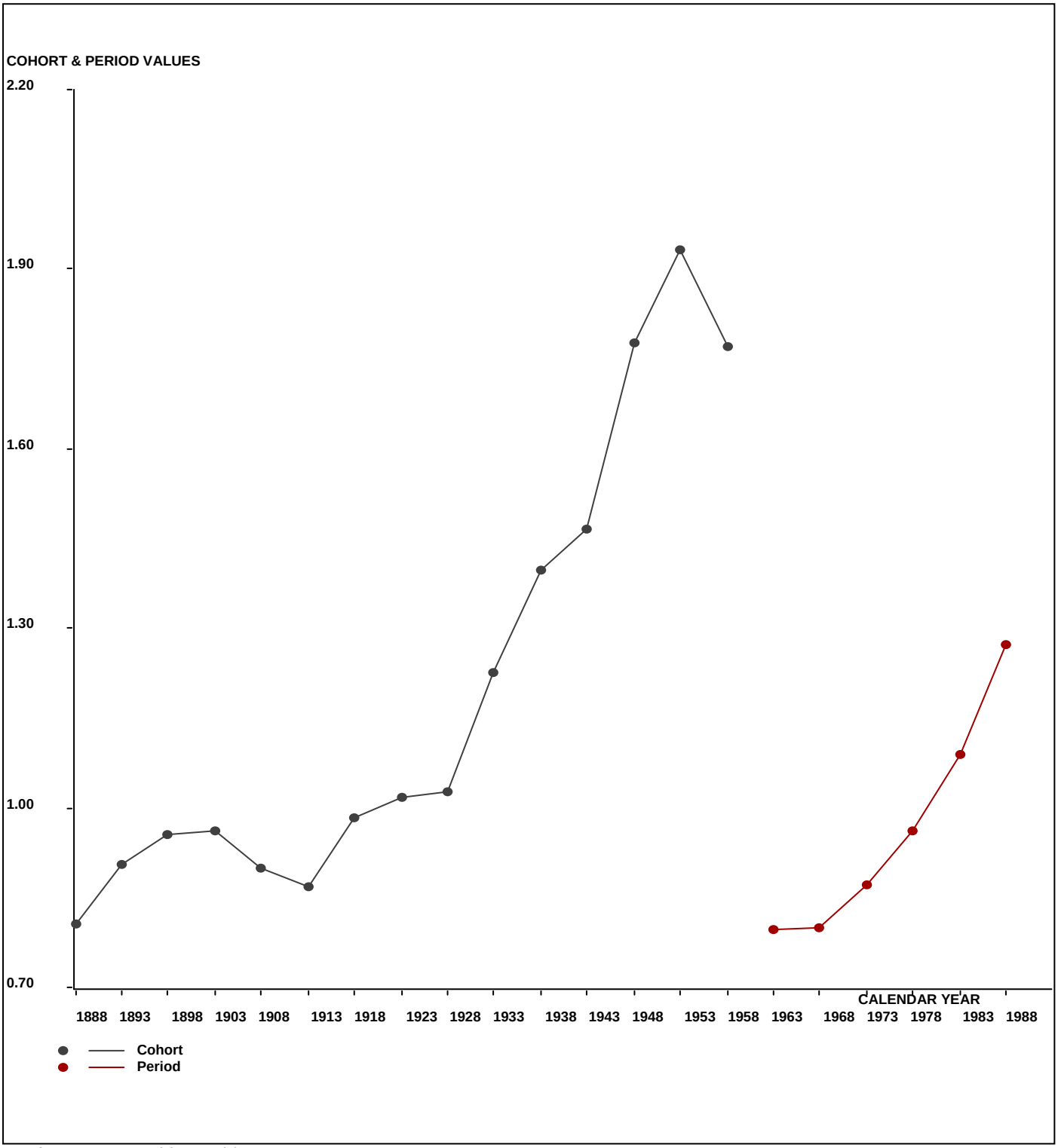
CHI SQUARE (LOG)= 3944.2270 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

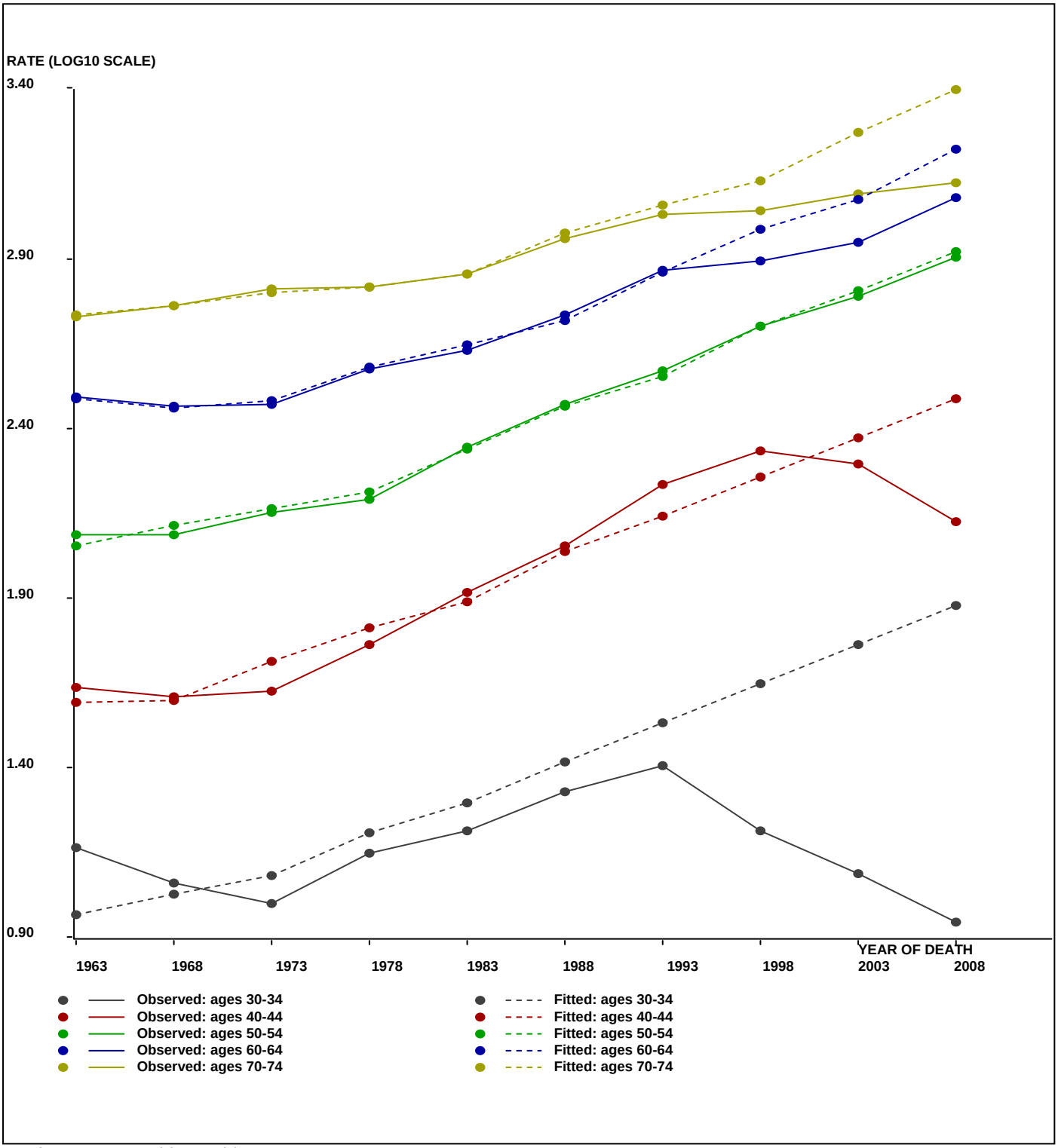


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	25.7	80.9	172.0	277.6	371.9	522.5	730.9	763.5	1067.4	1254.3
	PRE	34.0	71.1	138.7	261.6	356.9	571.5	727.1	850.5	1136.5	1326.8
	RES	-8.310	9.782	33.334	15.992	14.997	-48.974	3.864	-87.020	-69.103	-72.485
1996-	OBS	16.3	84.3	216.5	359.5	501.9	619.5	785.9	991.1	1097.3	1332.6
	PRE	44.3	92.8	181.1	332.1	505.2	698.9	968.3	1184.1	1338.2	1604.4
	RES	-28.012	-8.456	35.424	27.392	-3.310	-79.403	-182.396	-192.954	-240.937	-271.801
2001-	OBS	12.2	50.0	196.3	426.1	613.9	773.9	884.5	1058.9	1236.8	1283.6
	PRE	57.8	121.0	236.2	433.7	641.2	989.3	1184.1	1576.9	1863.1	1889.2
	RES	-45.611	-71.079	-39.913	-7.581	-27.301	-215.399	-299.559	-518.038	-626.295	-605.614
2006-	OBS	8.8	39.4	132.7	413.6	800.4	1012.2	1198.7	1189.2	1325.1	1409.5
	PRE	75.5	157.9	308.2	565.8	837.3	1255.6	1676.1	1928.3	2481.3	2630.2
	RES	-66.667	-118.492	-175.522	-152.244	-36.984	-243.443	-477.403	-739.111	-1156.140	-1220.741

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	42.0	165.0	347.0	488.0	618.0	821.0	1147.0	1207.0	1237.0	896.0
	PRE	55.6	145.0	279.7	459.9	593.1	897.9	1140.9	1344.6	1317.1	947.8
	CHI	3.325	2.746	16.169	1.718	1.047	6.594	0.032	14.077	4.870	2.829
1996-	OBS	26.0	139.0	441.0	719.0	871.0	1009.0	1191.0	1456.0	1527.0	1260.0
	PRE	70.6	152.9	368.8	664.2	876.7	1138.3	1467.4	1739.5	1862.3	1517.0
	CHI	28.192	1.271	14.119	4.519	0.038	14.695	52.067	46.191	60.369	43.538
2001-	OBS	22.0	80.0	323.0	858.0	1205.0	1307.0	1387.0	1503.0	1622.0	1451.0
	PRE	104.0	193.8	388.7	873.3	1258.6	1670.8	1856.7	2238.3	2443.3	2135.6
	CHI	64.663	66.843	11.095	0.267	2.281	79.208	118.839	241.552	276.091	219.464
2006-	OBS	18.0	71.0	212.0	673.0	1579.0	1928.0	1942.0	1755.0	1692.0	1541.0
	PRE	154.2	284.4	492.4	920.7	1652.0	2391.7	2715.4	2845.7	3168.2	2875.6
	CHI	120.350	160.095	159.674	66.662	3.223	89.909	220.287	418.065	687.833	619.420

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	290.71	5.70	51	P, C	95.01	1566.68	0.0000
AGE-PERIOD	46.21	1.03	45	Cohort	68.60	246.76	0.0000
AGE-COHORT	111.16	3.09	36	Period	86.95	592.06	0.0000
PERIOD-COHORT	28.88	0.72	40	Age	49.76	154.01	0.0000
FULL AGE-PERIOD-COHORT	14.51	0.45	32			77.02	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.934425	8.598547
35	1.221036	16.635521
40	1.528657	33.779815
45	1.793044	62.093180
50	2.040001	109.648024
55	2.288307	194.226030
60	2.516570	328.525991
65	2.775994	597.026630
70	3.019944	1046.994232
75	3.263672	1835.150748

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.244800	0.569115
1966	-0.131452	0.738836
1971	-0.103208	0.788482
1976	0.101677	1.263797
1981	0.096616	1.249153
1986	0.037856	1.091078

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.130063	1.349157
1891	0.053693	1.131599
1896	0.018200	1.042797
1901	0.037957	1.091332
1906	-0.003158	0.992755
1911	-0.051023	0.889154
1916	-0.029915	0.933437
1921	-0.066284	0.858452
1926	-0.037173	0.917966
1931	0.050830	1.124165
1936	0.086785	1.221196
1941	0.108653	1.284261
1946	0.087927	1.224411
1951	0.097209	1.250860
1956	0.218891	1.655356

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	8.0	14.0	18.0	27.0	24.0	32.0
	EXP	10.1	13.5	15.5	24.6	28.0	32.0
	CHI	0.5	0.0	0.4	0.2	0.6	0.0
35 -	OBS	14.0	24.0	30.0	41.0	51.0	50.0
	EXP	17.7	25.3	27.7	47.9	46.4	46.4
	CHI	0.8	0.1	0.2	1.0	0.5	0.3
40 -	OBS	23.0	38.0	62.0	79.0	113.0	73.0
	EXP	27.5	46.2	54.2	89.6	94.3	80.7
	CHI	0.7	1.5	1.1	1.3	3.7	0.7
45 -	OBS	37.0	75.0	108.0	159.0	150.0	130.0
	EXP	45.5	64.7	89.1	157.6	159.1	147.8
	CHI	1.6	1.6	4.0	0.0	0.5	2.2
50 -	OBS	92.0	100.0	118.0	244.0	267.0	253.0
	EXP	103.0	101.8	119.3	247.0	266.5	237.5
	CHI	1.2	0.0	0.0	0.0	0.0	1.0
55 -	OBS	146.0	241.0	187.0	317.0	444.0	387.0
	EXP	175.0	228.9	185.6	329.2	413.3	394.2
	CHI	4.8	0.6	0.0	0.5	2.3	0.1
60 -	OBS	277.0	349.0	450.0	456.0	537.0	530.0
	EXP	288.0	363.3	391.4	476.3	516.7	570.3
	CHI	0.4	0.6	8.8	0.9	0.8	2.9
65 -	OBS	432.0	613.0	681.0	1014.0	748.0	729.0
	EXP	403.3	617.0	641.6	1045.7	769.0	743.6
	CHI	2.0	0.0	2.4	1.0	0.6	0.3
70 -	OBS	581.0	816.0	908.0	1536.0	1487.0	1037.0
	EXP	547.1	777.4	979.0	1540.9	1537.7	989.6
	CHI	2.1	1.9	5.1	0.0	1.7	2.3
75 -	OBS	767.0	889.0	1026.0	2162.0	2007.0	1818.0
	EXP	767.0	924.6	1097.6	2080.4	2002.2	1801.8
	CHI	0.0	1.4	4.7	3.2	0.0	0.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	1564.67	39.12	40	P, C	5.22	0.0000
AGE-PERIOD	4545.77	113.64	40	Cohort	67.37	0.0000
AGE-COHORT	10222.05	255.55	40	Period	85.49	0.0000
PERIOD-COHORT	3254.58	81.36	40	Age	54.43	0.0000
FULL AGE-PERIOD-COHORT	1483.06	37.08	40			0.0000

AGE	EFFECT
30	8.598547
35	16.635521
40	33.779815
45	62.093180
50	109.648024
55	194.226030
60	328.525991
65	597.026630
70	1046.994232
75	1835.150748

PERIOD	EFFECT	LOWER	UPPER
% Period Change	87.3454	84.3454	90.3454
1961	0.569115		
1966	0.738836		
1971	0.788482		
1976	1.263797		
1981	1.249153		
1986	1.091078		
1991	0.953007	0.920275	0.985739
1996	0.832408	0.776210	0.890570
2001	0.727070	0.654697	0.804590
2006	0.635063	0.552207	0.726910

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.349157	1.000000	
1891	1.131599	2.000000	
1896	1.042797	4.000000	
1901	1.091332	8.000000	
1906	0.992755	16.000000	
1911	0.889154	32.000000	
1916	0.933437	64.000000	
1921	0.858452	128.000000	
1926	0.917966	256.000000	
1931	1.124165	512.000000	
1936	1.221196	1024.000000	
1941	1.284261	2048.000000	
1946	1.224411	4096.000000	
1951	1.250860	8192.000000	
1956	1.304180	EXTRAPOLATION	1.655356
1961	1.342948	EXTRAPOLATION	
1966	1.382868	EXTRAPOLATION	
1971	1.423976	EXTRAPOLATION	
1976	1.466305	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	4.3	8.0	10.1	14.6	11.5	15.5	15.3	17.6	9.5	11.7
	EXP	5.5	7.8	8.7	13.3	13.4	12.2	11.0*	9.9*	8.9*	8.0*
	Elow							10.6	9.2	8.0	7.0
	Eup							11.4	10.6	9.9	9.2
35	OBS	6.9	13.1	17.3	23.1	28.0	24.4	33.3	26.1	20.6	17.2
	EXP	8.7	13.8	16.0	27.0	25.4	22.7	20.7*	18.6*	16.7*	15.0*
	Elow							20.0	17.3	15.1	13.1
	Eup							21.4	19.9	18.5	17.2
40	OBS	13.8	18.8	34.3	46.0	64.9	40.8	47.6	40.3	62.0	41.3
	EXP	16.5	22.9	29.9	52.1	54.2	45.1	40.3*	36.7*	33.0*	29.7*
	Elow							38.9	34.2	29.7	25.8
	Eup							41.7	39.2	36.5	34.0
45	OBS	26.8	45.7	54.5	89.0	89.3	76.5	92.7	78.5	100.8	119.2
	EXP	33.0	39.4	44.9	88.2	94.7	87.0	72.5*	64.7*	58.9*	53.0*
	Elow							70.0	60.3	53.0	46.0
	Eup							74.9	69.2	65.2	60.6
50	OBS	49.6	74.3	73.4	125.7	154.3	155.6	146.8	134.8	147.2	229.6
	EXP	55.5	75.6	74.2	127.2	154.0	146.1	134.2*	111.8*	99.7*	90.8*
	Elow							129.6	104.2	89.8	79.0
	Eup							138.8	119.6	110.4	103.9
55	OBS	91.5	134.3	144.0	202.9	239.2	233.9	255.9	217.9	228.0	308.2
	EXP	109.7	127.6	143.0	210.7	222.7	238.2	226.0*	207.6*	172.9*	154.3*
	Elow							218.3	193.6	155.7	134.2
	Eup							233.8	222.1	191.3	176.6
60	OBS	196.3	231.5	264.8	371.1	366.2	305.8	386.8	360.3	336.1	432.1
	EXP	204.0	241.0	230.3	387.6	352.3	329.0	352.0*	334.0*	306.8*	255.5*
	Elow							339.9	311.4	276.2	222.1
	Eup							364.1	357.3	339.5	292.4
65	OBS	379.6	478.3	496.0	650.6	677.2	548.2	548.4	543.9	487.5	611.2
	EXP	354.3	481.4	467.3	670.9	696.1	559.2	522.3*	558.7*	530.1*	486.9*
	Elow							504.4	521.0	477.3	423.4
	Eup							540.2	597.7	586.6	557.3
70	OBS	716.1	846.7	835.6	1309.5	1124.6	1117.4	931.9	763.8	780.8	968.0
	EXP	674.3	806.7	900.9	1313.6	1162.9	1066.3	856.6*	800.0*	855.8*	812.0*
	Elow							827.1	746.0	770.6	706.0
	Eup							886.0	855.9	947.0	929.4
75	OBS	1409.1	1475.2	1410.4	2630.3	2281.2	1796.3	1762.5	1455.3	1233.1	1512.9
	EXP	1409.1	1534.3	1508.9	2531.1	2275.8	1780.3	1632.5*	1311.4*	1224.8*	1310.1*
	Elow							1576.4	1222.8	1102.9	1139.2
	Eup							1688.6	1403.0	1355.4	1499.6
30-79	OBS	158.6	190.7	196.9	308.2	297.2	259.3	260.6	228.5	221.6	278.5
	EXP	159.5	190.9	196.7	309.9	296.6	259.3	236.2*	215.7*	204.2*	192.4*
	Elow							228.1	201.1	183.8	167.3
	Eup							244.3	230.8	225.9	220.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	8.0	14.0	18.0	27.0	24.0	32.0	25.0	28.0	17.0	24.0
	EXP	10.1	13.5	15.5	24.6	28.0	25.2	18.0*	15.8*	16.0*	16.4*
	CHI	0.453	0.015	0.393	0.225	0.568	1.828	2.717	9.493	0.062	3.563
35 -	OBS	14.0	24.0	30.0	41.0	51.0	50.0	68.0	43.0	33.0	31.0
	EXP	17.7	25.3	27.7	47.9	46.4	46.4	42.2*	30.7*	26.8*	27.1*
	CHI	0.778	0.065	0.184	0.982	0.459	0.272	15.806	4.967	1.442	0.565
40 -	OBS	23.0	38.0	62.0	79.0	113.0	73.0	96.0	82.0	102.0	66.0
	EXP	27.5	46.2	54.2	89.6	94.3	80.7	81.2*	74.7*	54.3*	47.4*
	CHI	0.739	1.454	1.131	1.250	3.695	0.731	2.680	0.713	41.990	7.307
45 -	OBS	37.0	75.0	108.0	159.0	150.0	130.0	163.0	157.0	203.0	194.0
	EXP	45.5	64.7	89.1	157.6	159.1	147.8	127.4*	129.3*	118.6*	86.2*
	CHI	1.602	1.647	3.994	0.013	0.523	2.155	9.979	5.927	60.129	134.907
50 -	OBS	92.0	100.0	118.0	244.0	267.0	253.0	244.0	234.0	289.0	453.0
	EXP	103.0	101.8	119.3	247.0	266.5	237.5	223.0*	193.9*	195.7*	179.2*
	CHI	1.177	0.033	0.015	0.035	0.001	1.009	1.977	8.277	44.445	418.538
55 -	OBS	146.0	241.0	187.0	317.0	444.0	387.0	402.0	355.0	385.0	587.0
	EXP	175.0	228.9	185.6	329.2	413.3	394.2	355.2*	338.2*	292.0*	293.9*
	CHI	4.812	0.636	0.011	0.453	2.277	0.132	6.178	0.834	29.605	292.314
60 -	OBS	277.0	349.0	450.0	456.0	537.0	530.0	607.0	546.0	527.0	700.0
	EXP	288.0	363.3	391.4	476.3	516.7	570.3	552.3*	506.1*	481.0*	413.8*
	CHI	0.420	0.566	8.777	0.861	0.801	2.853	5.416	3.146	4.393	197.859
65 -	OBS	432.0	613.0	681.0	1014.0	748.0	729.0	867.0	799.0	692.0	902.0
	EXP	403.3	617.0	641.6	1045.7	769.0	743.6	825.7*	820.7*	752.4*	718.6*
	CHI	2.046	0.026	2.417	0.958	0.572	0.285	2.062	0.574	4.851	46.820
70 -	OBS	581.0	816.0	908.0	1536.0	1487.0	1037.0	1080.0	1063.0	1024.0	1236.0
	EXP	547.1	777.4	979.0	1540.9	1537.7	989.6	992.7*	1113.4*	1122.2*	1036.8*
	CHI	2.101	1.915	5.144	0.015	1.671	2.275	7.679	2.278	8.601	38.283
75 -	OBS	767.0	889.0	1026.0	2162.0	2007.0	1818.0	1259.0	1376.0	1394.0	1654.0
	EXP	767.0	924.6	1097.6	2080.4	2002.2	1801.8	1166.1*	1239.9*	1384.6*	1432.4*
	CHI	0.000	1.373	4.676	3.197	0.012	0.145	7.394	14.931	0.064	34.295
30-79	OBS	2377.0	3159.0	3588.0	6035.0	5828.0	5039.0	4811.0	4683.0	4666.0	5847.0
	EXP	2384.3	3162.9	3601.1	6039.0	5833.2	5037.2	4383.8*	4462.7*	4443.7*	4251.6*
	O/E	0.997	0.999	0.996	0.999	0.999	1.000	1.097	1.049	1.050	1.375

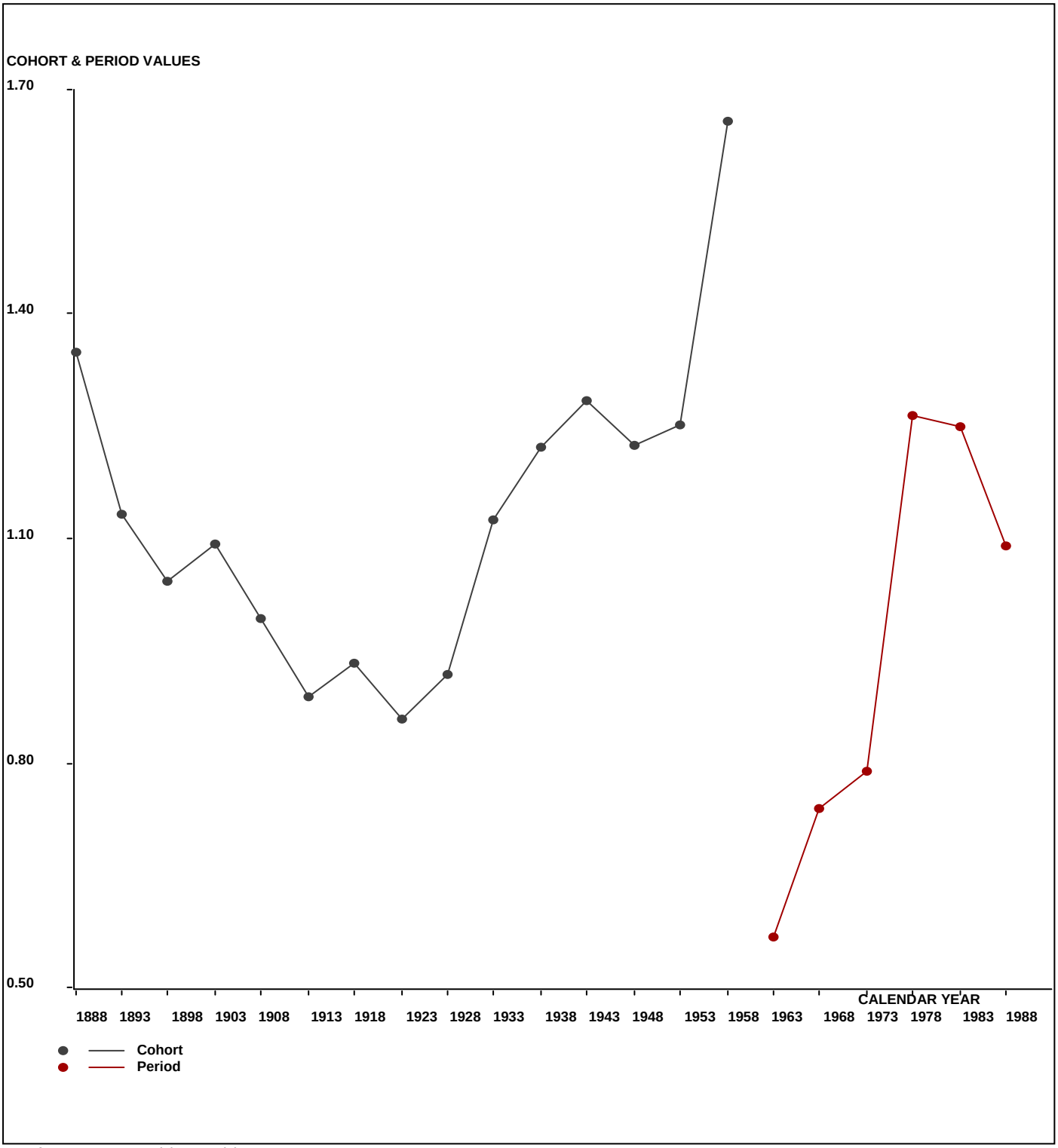
CHI SQUARE (LOG)= 1483.0613 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

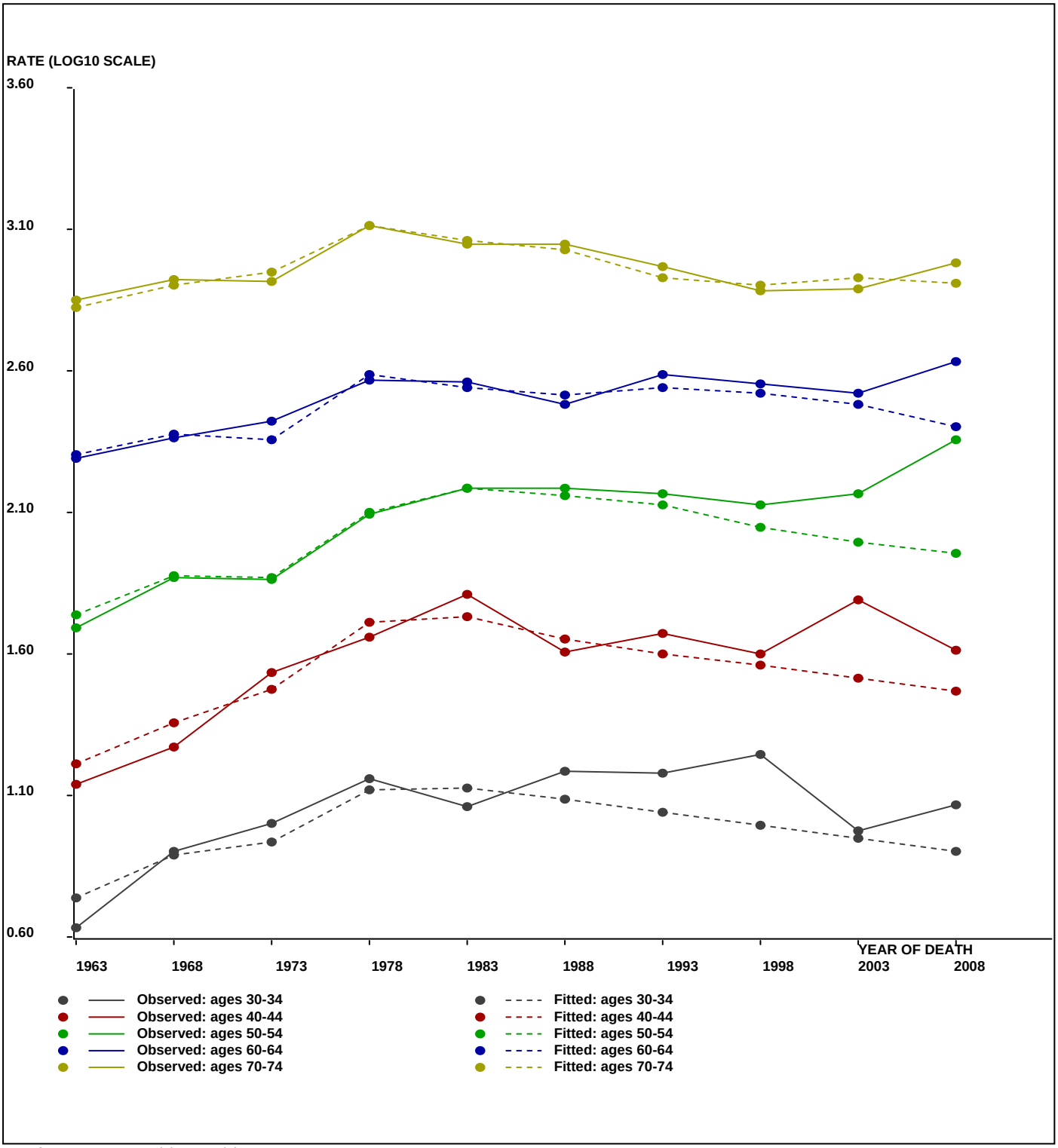


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Hungary COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	15.3	33.3	47.6	92.7	146.8	255.9	386.8	548.4	931.9	1762.5
	PRE	11.0	20.7	40.3	72.5	134.2	226.0	352.0	522.3	856.6	1632.5
	RES	4.275	12.657	7.313	20.282	12.635	29.813	34.854	26.100	75.335	129.992
1996-	OBS	17.6	26.1	40.3	78.5	134.8	217.9	360.3	543.9	763.8	1455.3
	PRE	9.9	18.6	36.7	64.7	111.8	207.6	334.0	558.7	800.0	1311.4
	RES	7.680	7.485	3.582	13.842	23.087	10.311	26.330	-14.779	-36.187	143.903
2001-	OBS	9.5	20.6	62.0	100.8	147.2	228.0	336.1	487.5	780.8	1233.1
	PRE	8.9	16.7	33.0	58.9	99.7	172.9	306.8	530.1	855.8	1224.8
	RES	0.552	3.881	29.014	41.929	47.519	55.054	29.317	-42.565	-74.919	8.322
2006-	OBS	11.7	17.2	41.3	119.2	229.6	308.2	432.1	611.2	968.0	1512.9
	PRE	8.0	15.0	29.7	53.0	90.8	154.3	255.5	486.9	812.0	1310.1
	RES	3.736	2.172	11.649	66.259	138.803	153.872	176.633	124.292	156.029	202.724

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	25.0	68.0	96.0	163.0	244.0	402.0	607.0	867.0	1080.0	1259.0
	PRE	18.0	42.2	81.2	127.4	223.0	355.2	552.3	825.7	992.7	1166.1
	CHI	2.717	15.806	2.680	9.979	1.977	6.178	5.416	2.062	7.679	7.394
1996-	OBS	28.0	43.0	82.0	157.0	234.0	355.0	546.0	799.0	1063.0	1376.0
	PRE	15.8	30.7	74.7	129.3	193.9	338.2	506.1	820.7	1113.4	1239.9
	CHI	9.493	4.967	0.713	5.927	8.277	0.834	3.146	0.574	2.278	14.931
2001-	OBS	17.0	33.0	102.0	203.0	289.0	385.0	527.0	692.0	1024.0	1394.0
	PRE	16.0	26.8	54.3	118.6	195.7	292.0	481.0	752.4	1122.2	1384.6
	CHI	0.062	1.442	41.990	60.129	44.445	29.605	4.393	4.851	8.601	0.064
2006-	OBS	24.0	31.0	66.0	194.0	453.0	587.0	700.0	902.0	1236.0	1654.0
	PRE	16.4	27.1	47.4	86.2	179.2	293.9	413.8	718.6	1036.8	1432.4
	CHI	3.563	0.565	7.307	134.907	418.538	292.314	197.859	46.820	38.283	34.295

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	7056.70	138.37	51	P, C	99.38	37718.62	0.0000
AGE-PERIOD	660.45	14.68	45	Cohort	93.38	3504.49	0.0000
AGE-COHORT	739.74	20.55	36	Period	94.09	3924.82	0.0000
PERIOD-COHORT	81.25	2.03	40	Age	46.16	430.92	0.0000
FULL AGE-PERIOD-COHORT	43.75	1.37	32			231.97	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.956599	90.489706
35	2.298608	198.887771
40	2.631290	427.848362
45	2.912172	816.905696
50	3.168874	1475.279664
55	3.391594	2463.736994
60	3.603647	4014.640115
65	3.793205	6211.624819
70	3.977172	9487.942627
75	4.152178	14196.406420

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.095373	1.245583
1966	0.029701	1.070783
1971	-0.002797	0.993580
1976	0.027605	1.065626
1981	-0.052974	0.885168
1986	-0.125179	0.749585

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.091235	1.233772
1891	0.042048	1.101661
1896	0.015121	1.035431
1901	-0.003762	0.991375
1906	-0.029630	0.934049
1911	-0.028175	0.937185
1916	0.000315	1.000725
1921	0.009487	1.022086
1926	0.020477	1.048278
1931	0.012173	1.028425
1936	-0.042668	0.906425
1941	-0.033170	0.926467
1946	-0.046581	0.898295
1951	-0.051520	0.888138
1956	-0.132278	0.737432

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	1113.0	789.0	661.0	839.0	648.0	487.0
	EXP	1035.1	802.7	729.8	805.2	685.2	487.0
	CHI	5.9	0.2	6.5	1.4	2.0	0.0
35 -	OBS	2431.0	1909.0	1586.0	1759.0	1450.0	1311.0
	EXP	2375.8	1950.4	1638.5	1726.0	1483.1	1275.4
	CHI	1.3	0.9	1.7	0.6	0.7	1.0
40 -	OBS	3937.0	4392.0	3869.0	3783.0	3181.0	2678.0
	EXP	4099.6	4344.9	3881.7	3753.7	3085.6	2679.7
	CHI	6.4	0.5	0.0	0.2	2.9	0.0
45 -	OBS	6320.0	6541.0	7808.0	7969.0	6068.0	4847.0
	EXP	6767.4	6589.1	7575.2	7841.4	5890.6	4912.2
	CHI	29.6	0.4	7.2	2.1	5.3	0.9
50 -	OBS	13018.0	10183.0	11090.0	14449.0	11630.0	8629.0
	EXP	13666.6	10123.5	10721.1	14248.0	11490.9	8774.5
	CHI	30.8	0.3	12.7	2.8	1.7	2.4
55 -	OBS	19297.0	18658.0	15083.0	18376.0	18903.0	15233.0
	EXP	19297.0	18659.7	14874.5	18324.0	18867.8	15531.6
	CHI	0.0	0.0	2.9	0.1	0.1	5.7
60 -	OBS	26662.0	25347.0	26179.0	23762.0	22997.0	23545.0
	EXP	26237.4	25158.5	25988.7	23972.7	23018.3	24129.3
	CHI	6.9	1.4	1.4	1.9	0.0	14.2
65 -	OBS	31963.0	30788.0	31659.0	37294.0	27231.0	26674.0
	EXP	31759.2	30725.1	31534.8	37636.4	27083.6	26873.6
	CHI	1.3	0.1	0.5	3.1	0.8	1.5
70 -	OBS	38847.0	33548.0	34247.0	40688.0	38581.0	29098.0
	EXP	38394.2	33348.2	34854.7	40729.1	38818.9	28874.2
	CHI	5.3	1.2	10.6	0.0	1.5	1.7
75 -	OBS	44355.0	34582.0	32165.0	38886.0	35353.0	37728.0
	EXP	44355.0	35040.5	32572.4	38774.8	35626.7	36720.1
	CHI	0.0	6.0	5.1	0.3	2.1	27.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	274386.72	6859.67	40	P, C	98.85	0.0000
AGE-PERIOD	7690.38	192.26	40	Cohort	58.82	0.0000
AGE-COHORT	32499.35	812.48	40	Period	90.25	0.0000
PERIOD-COHORT	2344.22	58.61	40	Age	-35.11	0.0000
FULL AGE-PERIOD-COHORT	3167.27	79.18	40			0.0000

AGE	EFFECT
30	90.489706
35	198.887771
40	427.848362
45	816.905696
50	1475.279664
55	2463.736994
60	4014.640115
65	6211.624819
70	9487.942627
75	14196.406420

PERIOD	EFFECT	LOWER	UPPER
% Period Change	84.6828	81.6828	87.6828
1961	1.245583		
1966	1.070783		
1971	0.993580		
1976	1.065626		
1981	0.885168		
1986	0.749585		
1991	0.634769	0.612282	0.657257
1996	0.537540	0.500129	0.576301
2001	0.455204	0.408519	0.505317
2006	0.385479	0.333690	0.443076

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.233772	1.000000	
1891	1.101661	2.000000	
1896	1.035431	4.000000	
1901	0.991375	8.000000	
1906	0.934049	16.000000	
1911	0.937185	32.000000	
1916	1.000725	64.000000	
1921	1.022086	128.000000	
1926	1.048278	256.000000	
1931	1.028425	512.000000	
1936	0.906425	1024.000000	
1941	0.926467	2048.000000	
1946	0.898295	4096.000000	
1951	0.888138	8192.000000	
1956	0.866583	EXTRAPOLATION	0.737432
1961	0.848143	EXTRAPOLATION	
1966	0.830096	EXTRAPOLATION	
1971	0.812433	EXTRAPOLATION	
1976	0.795146	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	124.6	86.3	75.4	90.3	67.3	50.0	36.6	26.3	23.9	22.1
	EXP	115.9	87.8	83.3	86.6	71.1	58.8	48.7*	40.4*	33.5*	27.7*
	Elow							47.0	37.6	30.0	24.0
	Eup							50.4	43.3	37.1	31.9
35	OBS	265.7	214.4	173.4	200.1	154.6	136.1	101.7	75.6	61.3	53.2
	EXP	259.7	219.0	179.1	196.4	158.1	132.4	109.4*	90.7*	75.2*	62.3*
	Elow							105.5	84.4	67.4	53.9
	Eup							113.3	97.2	83.4	71.6
40	OBS	523.1	485.5	435.8	416.5	361.7	287.9	248.4	188.4	147.3	117.9
	EXP	544.7	480.3	437.2	413.3	350.9	288.1	241.2*	199.3*	165.2*	136.9*
	Elow							232.7	185.4	148.2	118.5
	Eup							249.7	213.7	183.4	157.4
45	OBS	950.9	887.5	877.0	909.8	675.2	559.8	492.2	395.6	320.1	249.1
	EXP	1018.3	894.0	850.8	895.3	655.4	567.3	465.8*	390.0*	322.2*	267.1*
	Elow							449.3	362.9	289.2	231.2
	Eup							482.3	418.1	357.7	307.0
50	OBS	1640.4	1590.1	1549.7	1671.2	1359.2	985.8	866.4	680.0	566.9	456.3
	EXP	1722.2	1580.8	1498.2	1648.0	1343.0	1002.4	867.6*	712.4*	596.4*	492.8*
	Elow							836.9	662.8	535.3	426.6
	Eup							898.3	763.7	662.1	566.5
55	OBS	2866.4	2472.2	2484.0	2691.0	2290.4	1862.8	1420.2	1210.3	907.7	763.0
	EXP	2866.4	2472.4	2449.7	2683.4	2286.1	1899.3	1417.6*	1227.0*	1007.4*	843.5*
	Elow							1367.3	1141.6	904.1	730.2
	Eup							1467.8	1315.4	1118.3	969.5
60	OBS	5037.7	4045.4	3765.7	4243.6	3628.8	3078.2	2573.0	1918.7	1561.6	1169.4
	EXP	4957.4	4015.3	3738.3	4281.2	3632.1	3154.6	2620.8*	1956.1*	1693.1*	1390.2*
	Elow							2528.0	1820.0	1519.5	1203.4
	Eup							2713.7	2097.1	1879.5	1597.9
65	OBS	8062.6	6607.4	5787.4	6147.0	5532.3	4723.6	4171.1	3406.5	2433.2	1930.2
	EXP	8011.2	6593.9	5764.7	6203.5	5502.3	4759.0	4133.3*	3433.9*	2563.0*	2218.4*
	Elow							3986.9	3194.9	2300.1	1920.3
	Eup							4279.7	3681.5	2845.1	2549.8
70	OBS	13173.0	10582.5	9182.8	9434.3	7822.7	7172.3	6437.8	5522.4	4383.7	3091.1
	EXP	13019.5	10519.5	9345.7	9443.8	7870.9	7117.2	6155.7*	5346.4*	4441.7*	3315.2*
	Elow							5937.6	4974.3	3986.2	2869.8
	Eup							6373.7	5731.9	4930.7	3810.5
75	OBS	21816.6	16527.5	14422.4	15040.6	11647.3	10246.7	10308.7	8911.1	7551.3	6007.9
	EXP	21816.6	16746.6	14605.0	14997.6	11737.5	9973.0	9018.0*	7799.7*	6774.2*	5628.0*
	Elow							8698.5	7256.8	6079.5	4871.8
	Eup							9337.4	8362.1	7520.0	6468.9
30-79	OBS	3315.0	2711.6	2455.5	2606.4	2165.5	1847.4	1640.3	1353.3	1074.1	831.4
	EXP	3315.4	2712.2	2455.2	2605.9	2164.1	1851.7	1577.7*	1319.0*	1090.6*	890.8*
	Elow							1521.8	1227.2	978.7	771.1
	Eup							1633.6	1414.1	1210.7	1023.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	1113.0	789.0	661.0	839.0	648.0	487.0	398.0	303.0	281.4	243.0
	EXP	1035.1	802.7	729.8	805.2	685.2	572.3	529.2*	465.9*	393.5*	304.6*
	CHI	5.856	0.235	6.478	1.415	2.015	12.711	32.517	56.968	31.942	12.457
35 -	OBS	2431.0	1909.0	1586.0	1759.0	1450.0	1311.0	983.0	813.0	728.4	651.0
	EXP	2375.8	1950.4	1638.5	1726.0	1483.1	1275.4	1057.4*	975.3*	893.7*	761.9*
	CHI	1.285	0.878	1.682	0.631	0.739	0.996	5.230	26.998	30.569	16.155
40 -	OBS	3937.0	4392.0	3869.0	3783.0	3181.0	2678.0	2367.0	1798.0	1604.4	1436.0
	EXP	4099.6	4344.9	3881.7	3753.7	3085.6	2679.7	2298.7*	1901.9*	1799.1*	1667.2*
	CHI	6.450	0.512	0.041	0.229	2.950	0.001	2.026	5.680	21.062	32.070
45 -	OBS	6320.0	6541.0	7808.0	7969.0	6068.0	4847.0	4505.0	3711.0	3053.2	2752.0
	EXP	6767.4	6589.1	7575.2	7841.4	5890.6	4912.2	4263.3*	3658.4*	3074.1*	2950.3*
	CHI	29.583	0.351	7.152	2.076	5.344	0.865	13.703	0.756	0.141	13.327
50 -	OBS	13018.0	10183.0	11090.0	14449.0	11630.0	8629.0	7321.0	6097.0	5249.6	4365.0
	EXP	13666.6	10123.5	10721.1	14248.0	11490.9	8774.5	7331.1*	6387.5*	5522.8*	4714.0*
	CHI	30.780	0.349	12.697	2.835	1.684	2.411	0.014	13.208	13.514	25.834
55 -	OBS	19297.0	18658.0	15083.0	18376.0	18903.0	15233.0	11966.0	9902.0	7983.6	6999.0
	EXP	19297.0	18659.7	14874.5	18324.0	18867.8	15531.6	11944.0*	10038.4*	8860.9*	7737.5*
	CHI	0.000	0.000	2.923	0.148	0.066	5.739	0.041	1.852	86.860	70.478
60 -	OBS	26662.0	25347.0	26179.0	23762.0	22997.0	23545.0	19712.0	15347.0	12295.6	10013.0
	EXP	26237.4	25158.5	25988.7	23972.7	23018.3	24129.3	20077.9*	15646.4*	13330.9*	11903.1*
	CHI	6.872	1.413	1.393	1.852	0.020	14.151	6.668	5.730	80.397	300.128
65 -	OBS	31963.0	30788.0	31659.0	37294.0	27231.0	26674.0	28622.0	23818.0	18156.8	14322.0
	EXP	31759.2	30725.1	31534.8	37636.4	27083.6	26873.6	28362.7*	24009.8*	19124.9*	16460.3*
	CHI	1.308	0.129	0.489	3.116	0.802	1.482	2.371	1.532	49.003	277.774
70 -	OBS	38847.0	33548.0	34247.0	40688.0	38581.0	29098.0	30884.0	32469.0	27071.2	20984.0
	EXP	38394.2	33348.2	34854.7	40729.1	38818.9	28874.2	29530.3*	31434.1*	27429.5*	22504.9*
	CHI	5.341	1.197	10.596	0.041	1.457	1.735	62.053	34.071	4.681	102.780
75 -	OBS	44355.0	34582.0	32165.0	38886.0	35353.0	37728.0	31873.0	33798.0	35807.0	30958.0
	EXP	44355.0	35040.5	32572.4	38774.8	35626.7	36720.1	27882.3*	29582.5*	32122.4*	29000.2*
	CHI	0.000	6.000	5.095	0.319	2.102	27.664	571.167	600.702	422.638	132.173
30-79	OBS	187943.0	166737.0	164347.0	187805.0	166042.0	150230.0	138631.0	128056.0	112231.2	92723.0
	EXP	187987.3	166742.5	164371.3	187811.3	166050.6	150342.8	133276.9*	124100.2*	112551.7*	98003.9*
	O/E	1.000	1.000	1.000	1.000	1.000	0.999	1.040	1.032	0.997	0.946

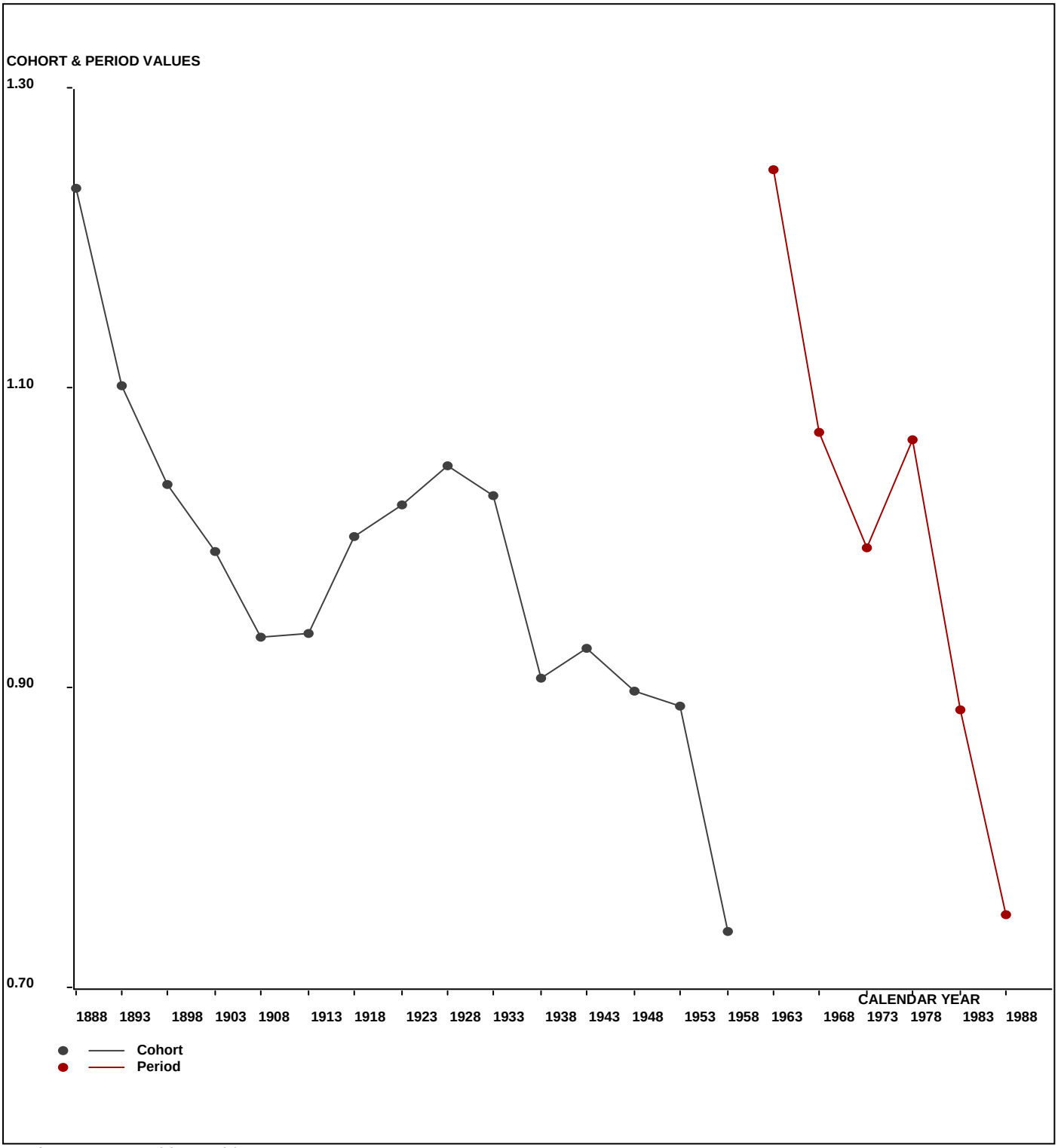
CHI SQUARE (LOG)= 3167.2712 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

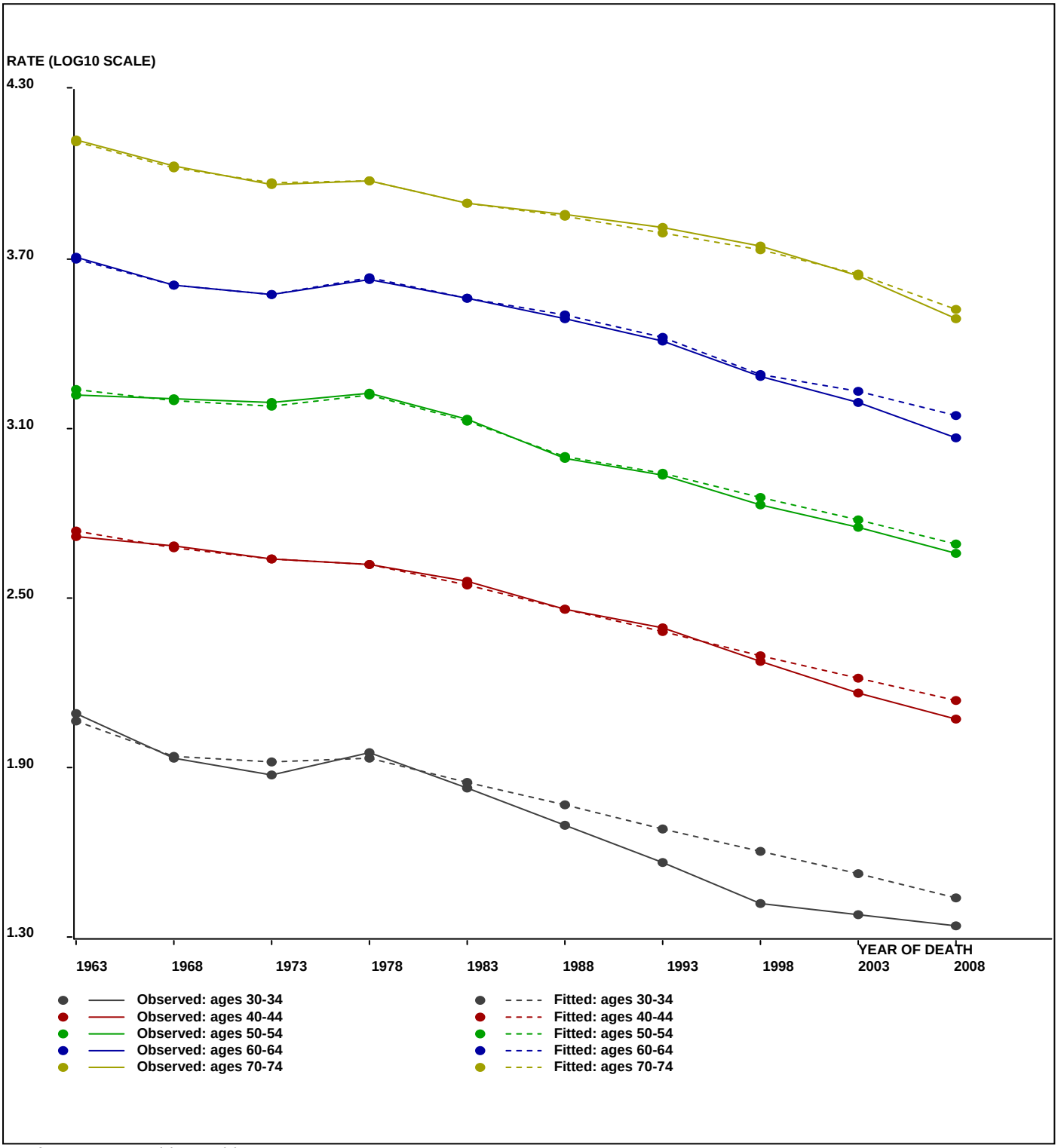


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	36.6	101.7	248.4	492.2	866.4	1420.2	2573.0	4171.1	6437.8	10308.7
	PRE	48.7	109.4	241.2	465.8	867.6	1417.6	2620.8	4133.3	6155.7	9018.0
	RES	-12.076	-7.694	7.161	26.408	-1.192	2.612	-47.761	37.792	282.178	1290.702
1996-	OBS	26.3	75.6	188.4	395.6	680.0	1210.3	1918.7	3406.5	5522.4	8911.1
	PRE	40.4	90.7	199.3	390.0	712.4	1227.0	1956.1	3433.9	5346.4	7799.7
	RES	-14.119	-15.087	-10.891	5.607	-32.394	-16.667	-37.434	-27.434	176.015	1111.447
2001-	OBS	23.9	61.3	147.3	320.1	566.9	907.7	1561.6	2433.2	4383.7	7551.3
	PRE	33.5	75.2	165.2	322.2	596.4	1007.4	1693.1	2563.0	4441.7	6774.2
	RES	-9.534	-13.899	-17.873	-2.186	-29.503	-99.745	-131.484	-129.734	-58.027	777.036
2006-	OBS	22.1	53.2	117.9	249.1	456.3	763.0	1169.4	1930.2	3091.1	6007.9
	PRE	27.7	62.3	136.9	267.1	492.8	843.5	1390.2	2218.4	3315.2	5628.0
	RES	-5.609	-9.069	-18.988	-17.950	-36.483	-80.501	-220.745	-288.180	-224.037	379.946

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	398.0	983.0	2367.0	4505.0	7321.0	11966.0	19712.0	28622.0	30884.0	31873.0
	PRE	529.2	1057.4	2298.7	4263.3	7331.1	11944.0	20077.9	28362.7	29530.3	27882.3
	CHI	32.517	5.230	2.026	13.703	0.014	0.041	6.668	2.371	62.053	571.167
1996-	OBS	303.0	813.0	1798.0	3711.0	6097.0	9902.0	15347.0	23818.0	32469.0	33798.0
	PRE	465.9	975.3	1901.9	3658.4	6387.5	10038.4	15646.4	24009.8	31434.1	29582.5
	CHI	56.968	26.998	5.680	0.756	13.208	1.852	5.730	1.532	34.071	600.702
2001-	OBS	281.4	728.4	1604.4	3053.2	5249.6	7983.6	12295.6	18156.8	27071.2	35807.0
	PRE	393.5	893.7	1799.1	3074.1	5522.8	8860.9	13330.9	19124.9	27429.5	32122.4
	CHI	31.942	30.569	21.062	0.141	13.514	86.860	80.397	49.003	4.681	422.638
2006-	OBS	243.0	651.0	1436.0	2752.0	4365.0	6999.0	10013.0	14322.0	20984.0	30958.0
	PRE	304.6	761.9	1667.2	2950.3	4714.0	7737.5	11903.1	16460.3	22504.9	29000.2
	CHI	12.457	16.155	32.070	13.327	25.834	70.478	300.128	277.774	102.780	132.173

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	5857.88	114.86	51	P, C	97.60	31383.96	0.0000
AGE-PERIOD	239.69	5.33	45	Cohort	41.26	1272.50	0.0000
AGE-COHORT	325.09	9.03	36	Period	56.69	1725.90	0.0000
PERIOD-COHORT	167.63	4.19	40	Age	16.01	889.49	0.0000
FULL AGE-PERIOD-COHORT	140.79	4.40	32			747.06	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.659431	45.649013
35	1.936021	86.302099
40	2.239931	173.752579
45	2.518965	330.343066
50	2.785318	609.983868
55	3.046503	1113.018879
60	3.327043	2123.454157
65	3.599172	3973.486308
70	3.871870	7445.090705
75	4.128582	13445.646568

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.081813	1.207293
1966	0.044968	1.109093
1971	0.012948	1.030262
1976	0.005276	1.012222
1981	-0.048544	0.894244
1986	-0.129030	0.742967

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.037824	1.090998
1891	0.047801	1.116353
1896	0.035370	1.084851
1901	0.027500	1.065369
1906	0.008921	1.020754
1911	-0.016582	0.962537
1916	-0.031245	0.930583
1921	-0.079691	0.832356
1926	-0.076356	0.838773
1931	-0.078176	0.835265
1936	-0.107298	0.781091
1941	-0.075270	0.840873
1946	-0.078579	0.834489
1951	-0.020550	0.953783
1956	0.019031	1.044795

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	333.0	356.0	387.0	360.0	405.0	345.0
	EXP	411.1	361.4	346.5	358.5	375.0	345.0
	CHI	14.8	0.1	4.7	0.0	2.4	0.0
35 -	OBS	723.0	710.0	665.0	687.0	636.0	557.0
	EXP	799.5	712.0	635.3	645.7	604.0	589.1
	CHI	7.3	0.0	1.4	2.6	1.7	1.7
40 -	OBS	1081.0	1445.0	1391.0	1365.0	1222.0	967.0
	EXP	1314.2	1462.3	1327.6	1247.8	1149.0	1002.0
	CHI	41.4	0.2	3.0	11.0	4.6	1.2
45 -	OBS	2089.0	2212.0	2730.0	2693.0	2161.0	1618.0
	EXP	2466.6	2247.5	2541.6	2446.3	2073.7	1787.0
	CHI	57.8	0.6	14.0	24.9	3.7	16.0
50 -	OBS	5018.0	3920.0	4086.0	4939.0	3975.0	2852.0
	EXP	5625.2	4031.7	3743.2	4477.5	3898.3	3098.7
	CHI	65.5	3.1	31.4	47.6	1.5	19.6
55 -	OBS	8963.0	8729.0	6731.0	6857.0	6995.0	5309.0
	EXP	9234.0	8967.5	6479.4	6403.5	6890.1	5648.4
	CHI	8.0	6.3	9.8	32.1	1.6	20.4
60 -	OBS	14978.0	15146.0	14745.0	11291.0	9898.0	9400.0
	EXP	14455.0	15062.6	14639.2	11200.2	10016.6	10121.8
	CHI	18.9	0.5	0.8	0.7	1.4	51.5
65 -	OBS	21015.0	22473.0	22865.0	23189.0	16036.0	13405.0
	EXP	20631.2	21877.0	22858.8	23487.6	16275.8	13875.9
	CHI	7.1	16.2	0.0	3.8	3.5	16.0
70 -	OBS	30206.0	28735.0	30141.0	32803.0	30996.0	21228.0
	EXP	29590.8	28397.9	30476.6	33176.1	31605.5	20883.2
	CHI	12.8	4.0	3.7	4.2	11.8	5.7
75 -	OBS	36006.0	34206.0	32781.0	36676.0	37797.0	36972.0
	EXP	36006.0	34833.2	33515.6	37487.5	37252.9	35403.7
	CHI	0.0	11.3	16.1	17.6	7.9	69.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	287264.36	7181.61	40	P, C	97.48	0.0000
AGE-PERIOD	4128.25	103.21	40	Cohort	-75.52	0.0000
AGE-COHORT	42516.09	1062.90	40	Period	82.96	0.0000
PERIOD-COHORT	8003.44	200.09	40	Age	9.47	0.0000
FULL AGE-PERIOD-COHORT	7245.88	181.15	40			0.0000

AGE	EFFECT
30	45.649013
35	86.302099
40	173.752579
45	330.343066
50	609.983868
55	1113.018879
60	2123.454157
65	3973.486308
70	7445.090705
75	13445.646568

PERIOD	EFFECT	LOWER	UPPER
% Period Change	83.0833	80.0833	86.0833
1961	1.207293		
1966	1.109093		
1971	1.030262		
1976	1.012222		
1981	0.894244		
1986	0.742967		
1991	0.617282	0.594993	0.639571
1996	0.512859	0.476490	0.550564
2001	0.426100	0.381590	0.473944
2006	0.354018	0.305590	0.407987

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.090998	1.000000	
1891	1.116353	2.000000	
1896	1.084851	4.000000	
1901	1.065369	8.000000	
1906	1.020754	16.000000	
1911	0.962537	32.000000	
1916	0.930583	64.000000	
1921	0.832356	128.000000	
1926	0.838773	256.000000	
1931	0.835265	512.000000	
1936	0.781091	1024.000000	
1941	0.840873	2048.000000	
1946	0.834489	4096.000000	
1951	0.953783	8192.000000	
1956	0.950915	EXTRAPOLATION	1.044795
1961	0.982708	EXTRAPOLATION	
1966	1.015564	EXTRAPOLATION	
1971	1.049519	EXTRAPOLATION	
1976	1.084609	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	37.3	38.9	44.2	38.7	42.1	35.4	28.5	21.6	15.5	14.8
	EXP	46.0	39.5	39.5	38.6	38.9	32.3	27.7*	23.8*	20.4*	17.5*
	Elow							26.7	22.1	18.3	15.1
	Eup							28.7	25.5	22.7	20.2
35	OBS	79.0	79.7	72.7	78.2	67.8	57.8	52.8	34.9	30.7	25.0
	EXP	87.4	79.9	69.4	73.5	64.4	61.2	50.7*	43.5*	37.3*	32.1*
	Elow							48.8	40.4	33.4	27.7
	Eup							52.5	46.7	41.5	37.0
40	OBS	143.6	159.7	156.7	150.3	139.0	104.0	86.0	70.9	52.8	47.1
	EXP	174.6	161.6	149.5	137.4	130.7	107.7	102.3*	84.7*	72.8*	62.5*
	Elow							98.6	78.7	65.2	53.9
	Eup							106.0	91.0	80.9	72.0
45	OBS	314.3	300.1	306.6	307.5	240.5	186.9	156.6	116.0	103.9	76.8
	EXP	371.1	305.0	285.5	279.3	230.7	206.4	170.2*	161.6*	133.9*	114.9*
	Elow							164.0	150.1	119.9	99.2
	Eup							176.3	173.5	148.9	132.4
50	OBS	632.3	612.1	571.0	571.3	464.6	325.8	264.6	205.7	170.2	133.5
	EXP	708.8	629.6	523.1	517.9	455.6	354.0	316.6*	261.1*	247.9*	205.3*
	Elow							305.2	242.5	222.0	177.3
	Eup							328.0	280.3	275.7	236.6
55	OBS	1331.4	1156.6	1108.5	1004.2	847.5	649.2	461.8	371.9	281.3	222.4
	EXP	1371.6	1188.2	1067.1	937.8	834.8	690.7	536.6*	480.0*	395.8*	375.8*
	Elow							517.3	446.0	354.4	324.4
	Eup							556.0	515.3	440.2	433.1
60	OBS	2830.0	2417.3	2121.0	2016.4	1561.8	1228.9	951.6	670.3	547.8	398.1
	EXP	2731.2	2404.0	2105.8	2000.2	1580.5	1323.3	1094.8*	850.6*	760.8*	627.3*
	Elow							1055.3	790.3	681.3	541.5
	Eup							1134.4	913.2	846.3	723.0
65	OBS	5301.0	4823.0	4179.8	3822.2	3257.9	2373.9	1812.0	1448.8	1033.5	795.6
	EXP	5204.2	4695.0	4178.7	3871.4	3306.6	2457.3	2057.3*	1702.1*	1322.5*	1182.8*
	Elow							1983.0	1581.4	1184.3	1021.0
	Eup							2131.6	1827.3	1471.0	1363.2
70	OBS	10242.8	9064.3	8081.8	7606.0	6284.7	5232.5	3748.6	3016.9	2294.9	1664.9
	EXP	10034.2	8957.9	8171.8	7692.5	6408.3	5147.5	3825.3*	3202.7*	2649.8*	2058.7*
	Elow							3687.2	2975.6	2373.0	1777.1
	Eup							3963.4	3438.1	2947.3	2372.6
75	OBS	17710.0	16347.8	14698.6	14185.8	12452.5	10041.4	8558.9	6218.9	5073.5	3953.7
	EXP	17710.0	16647.6	15027.9	14499.7	12273.2	9615.4	7723.6*	5739.7*	4805.5*	3975.9*
	Elow							7444.7	5332.7	4303.5	3432.0
	Eup							8002.5	6161.7	5345.1	4582.0
30-79	OBS	2144.3	1937.1	1739.6	1647.4	1388.4	1096.1	859.3	654.7	512.8	390.7
	EXP	2144.4	1938.3	1739.8	1645.7	1388.2	1101.7	882.2*	710.0*	593.0*	495.9*
	Elow							850.3	659.7	531.0	428.1
	Eup							914.0	762.2	659.6	571.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	333.0	356.0	387.0	360.0	405.0	345.0	310.0	249.0	182.8	163.0
	EXP	411.1	361.4	346.5	358.5	375.0	314.0	300.8*	274.4*	240.0*	192.5*
	CHI	14.830	0.082	4.743	0.007	2.401	3.061	0.282	2.343	13.653	4.518
35 -	OBS	723.0	710.0	665.0	687.0	636.0	557.0	510.0	375.0	365.6	306.0
	EXP	799.5	712.0	635.3	645.7	604.0	589.1	489.6*	467.8*	444.1*	392.3*
	CHI	7.321	0.005	1.389	2.642	1.698	1.746	0.850	18.416	13.876	18.966
40 -	OBS	1081.0	1445.0	1391.0	1365.0	1222.0	967.0	820.0	677.0	575.0	573.0
	EXP	1314.2	1462.3	1327.6	1247.8	1149.0	1002.0	974.9*	808.6*	792.4*	760.7*
	CHI	41.365	0.206	3.030	11.013	4.641	1.225	24.618	21.430	59.648	46.335
45 -	OBS	2089.0	2212.0	2730.0	2693.0	2161.0	1618.0	1433.0	1088.0	991.4	848.0
	EXP	2466.6	2247.5	2541.6	2446.3	2073.7	1787.0	1557.4*	1515.8*	1276.9*	1269.5*
	CHI	57.804	0.562	13.971	24.877	3.673	15.978	9.941	120.735	63.817	139.955
50 -	OBS	5018.0	3920.0	4086.0	4939.0	3975.0	2852.0	2236.0	1844.0	1576.2	1277.0
	EXP	5625.2	4031.7	3743.2	4477.5	3898.3	3098.7	2675.3*	2340.8*	2295.5*	1964.2*
	CHI	65.538	3.092	31.385	47.563	1.508	19.645	72.149	105.431	225.395	240.430
55 -	OBS	8963.0	8729.0	6731.0	6857.0	6995.0	5309.0	3891.0	3043.0	2474.0	2040.0
	EXP	9234.0	8967.5	6479.4	6403.5	6890.1	5648.4	4521.6*	3927.0*	3480.9*	3447.5*
	CHI	7.953	6.343	9.770	32.110	1.596	20.391	87.955	198.985	291.269	574.615
60 -	OBS	14978.0	15146.0	14745.0	11291.0	9898.0	9400.0	7290.0	5362.0	4313.2	3409.0
	EXP	14455.0	15062.6	14639.2	11200.2	10016.6	10121.8	8387.5*	6804.1*	5990.5*	5371.3*
	CHI	18.921	0.462	0.764	0.736	1.404	51.474	143.614	305.632	469.615	716.912
65 -	OBS	21015.0	22473.0	22865.0	23189.0	16036.0	13405.0	12434.0	10130.0	7712.2	5903.0
	EXP	20631.2	21877.0	22858.8	23487.6	16275.8	13875.9	14117.2*	11901.3*	9868.3*	8776.6*
	CHI	7.139	16.236	0.002	3.796	3.534	15.983	200.692	263.623	471.068	940.890
70 -	OBS	30206.0	28735.0	30141.0	32803.0	30996.0	21228.0	17983.0	17738.0	14172.0	11302.0
	EXP	29590.8	28397.9	30476.6	33176.1	31605.5	20883.2	18350.8*	18830.1*	16363.4*	13975.6*
	CHI	12.790	4.002	3.695	4.195	11.754	5.693	7.373	63.344	293.478	511.459
75 -	OBS	36006.0	34206.0	32781.0	36676.0	37797.0	36972.0	26463.0	23587.0	24057.6	20373.0
	EXP	36006.0	34833.2	33515.6	37487.5	37252.9	35403.7	23880.3*	21769.4*	22786.9*	20487.1*
	CHI	0.000	11.295	16.099	17.565	7.947	69.474	279.315	151.753	70.862	0.635
30-79	OBS	120412.0	117932.0	116522.0	120860.0	110121.0	92653.0	73370.0	64093.0	56420.0	46194.0
	EXP	120533.5	117953.1	116563.7	120930.6	110141.0	92723.8	75255.6*	68639.3*	63538.9*	56637.3*
	O/E	0.999	1.000	1.000	0.999	1.000	0.999	0.975	0.934	0.888	0.816

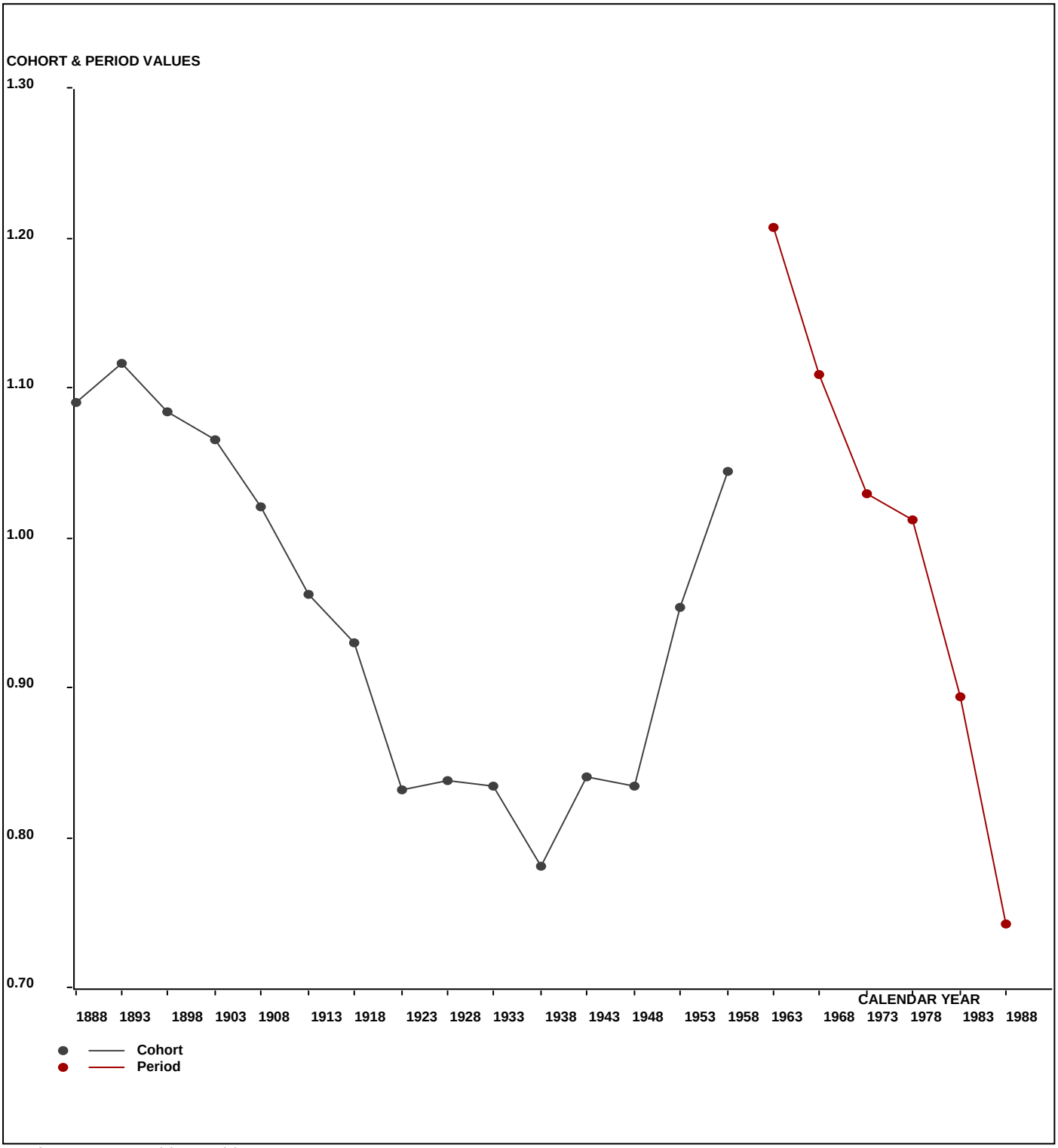
CHI SQUARE (LOG)= 7245.8794 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

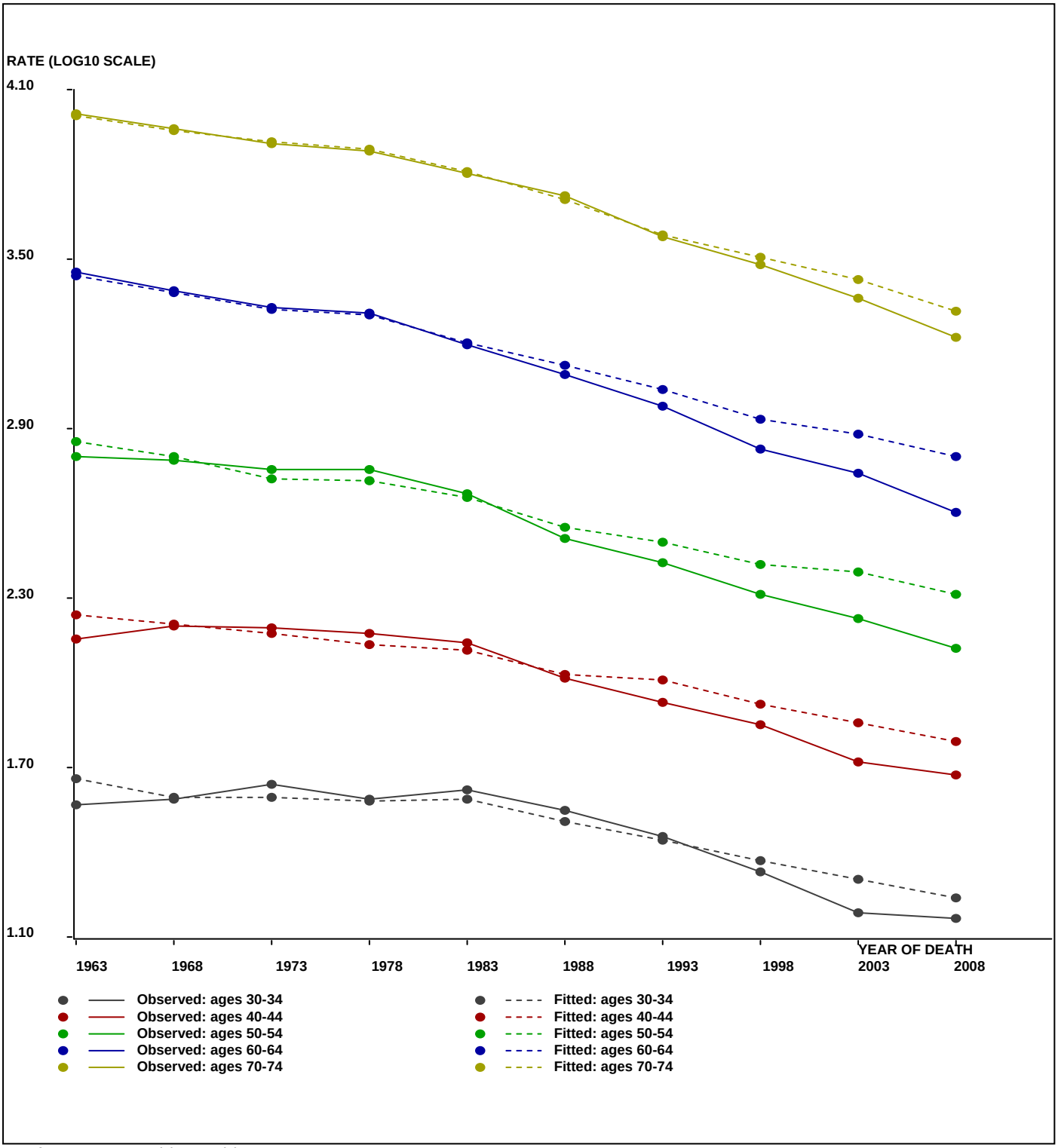


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	28.5	52.8	86.0	156.6	264.6	461.8	951.6	1812.0	3748.6	8558.9
	PRE	27.7	50.7	102.3	170.2	316.6	536.6	1094.8	2057.3	3825.3	7723.6
	RES	0.848	2.111	-16.256	-13.595	-51.994	-74.847	-143.263	-245.296	-76.675	835.309
1996-	OBS	21.6	34.9	70.9	116.0	205.7	371.9	670.3	1448.8	3016.9	6218.9
	PRE	23.8	43.5	84.7	161.6	261.1	480.0	850.6	1702.1	3202.7	5739.7
	RES	-2.197	-8.630	-13.794	-45.605	-55.404	-108.047	-180.284	-253.331	-185.754	479.219
2001-	OBS	15.5	30.7	52.8	103.9	170.2	281.3	547.8	1033.5	2294.9	5073.5
	PRE	20.4	37.3	72.8	133.9	247.9	395.8	760.8	1322.5	2649.8	4805.5
	RES	-4.869	-6.601	-19.961	-29.924	-77.681	-114.481	-213.023	-288.939	-354.860	267.981
2006-	OBS	14.8	25.0	47.1	76.8	133.5	222.4	398.1	795.6	1664.9	3953.7
	PRE	17.5	32.1	62.5	114.9	205.3	375.8	627.3	1182.8	2058.7	3975.9
	RES	-2.685	-7.051	-15.417	-38.158	-71.843	-153.432	-229.182	-387.287	-393.839	-22.143

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	310.0	510.0	820.0	1433.0	2236.0	3891.0	7290.0	12434.0	17983.0	26463.0
	PRE	300.8	489.6	974.9	1557.4	2675.3	4521.6	8387.5	14117.2	18350.8	23880.3
	CHI	0.282	0.850	24.618	9.941	72.149	87.955	143.614	200.692	7.373	279.315
1996-	OBS	249.0	375.0	677.0	1088.0	1844.0	3043.0	5362.0	10130.0	17738.0	23587.0
	PRE	274.4	467.8	808.6	1515.8	2340.8	3927.0	6804.1	11901.3	18830.1	21769.4
	CHI	2.343	18.416	21.430	120.735	105.431	198.985	305.632	263.623	63.344	151.753
2001-	OBS	182.8	365.6	575.0	991.4	1576.2	2474.0	4313.2	7712.2	14172.0	24057.6
	PRE	240.0	444.1	792.4	1276.9	2295.5	3480.9	5990.5	9868.3	16363.4	22786.9
	CHI	13.653	13.876	59.648	63.817	225.395	291.269	469.615	471.068	293.478	70.862
2006-	OBS	163.0	306.0	573.0	848.0	1277.0	2040.0	3409.0	5903.0	11302.0	20373.0
	PRE	192.5	392.3	760.7	1269.5	1964.2	3447.5	5371.3	8776.6	13975.6	20487.1
	CHI	4.518	18.966	46.335	139.955	240.430	574.615	716.912	940.890	511.459	0.635

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	5849.16	114.69	51	P, C	99.22	32306.05	0.0000
AGE-PERIOD	1082.97	24.07	45	Cohort	95.78	5825.96	0.0000
AGE-COHORT	141.95	3.94	36	Period	67.78	753.09	0.0000
PERIOD-COHORT	184.70	4.62	40	Age	75.24	981.62	0.0000
FULL AGE-PERIOD-COHORT	45.73	1.43	32			242.53	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.308941	20.367650
35	1.767228	58.509674
40	2.191681	155.482254
45	2.572782	373.922970
50	2.883635	764.953642
55	3.142646	1388.821044
60	3.354829	2263.751338
65	3.512986	3258.259100
70	3.619794	4166.720438
75	3.674940	4730.854078

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.080598	0.830619
1966	-0.049926	0.891402
1971	-0.023957	0.946331
1976	0.018249	1.042914
1981	0.031701	1.075725
1986	0.020936	1.049387

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.605394	0.248088
1891	-0.404725	0.393799
1896	-0.207494	0.620163
1901	-0.089764	0.813272
1906	-0.036251	0.919918
1911	-0.021546	0.951598
1916	0.024722	1.058576
1921	0.068974	1.172125
1926	0.106155	1.276894
1931	0.114784	1.302518
1936	0.054623	1.134026
1941	0.056274	1.138345
1946	-0.001345	0.996907
1951	-0.081089	0.829681
1956	-0.169044	0.677572

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	174.0	184.0	196.0	204.0	189.0	141.0
	EXP	196.8	188.2	192.2	196.9	175.1	141.0
	CHI	2.6	0.1	0.1	0.3	1.1	0.0
35 -	OBS	581.0	560.0	588.0	652.0	576.0	476.0
	EXP	567.7	605.0	574.4	610.6	588.4	490.7
	CHI	0.3	3.3	0.3	2.8	0.3	0.4
40 -	OBS	1010.0	1517.0	1761.0	1797.0	1681.0	1518.0
	EXP	1139.3	1601.1	1701.6	1670.2	1674.4	1513.0
	CHI	14.7	4.4	2.1	9.6	0.0	0.0
45 -	OBS	1923.0	2742.0	4132.0	4619.0	4246.0	3814.0
	EXP	2185.1	2879.4	4022.8	4449.0	4099.5	3867.6
	CHI	31.4	6.6	3.0	6.5	5.2	0.7
50 -	OBS	4656.0	4456.0	6178.0	9145.0	9312.0	7673.0
	EXP	4798.2	4622.5	6071.9	8807.2	9170.7	7968.7
	CHI	4.2	6.0	1.9	13.0	2.2	11.0
55 -	OBS	7413.0	8768.0	8398.0	11736.0	15810.0	15209.0
	EXP	7144.1	8891.1	8447.8	11593.2	15744.4	15523.6
	CHI	10.1	1.7	0.3	1.8	0.3	6.4
60 -	OBS	8374.0	11930.0	14203.0	13895.0	18021.0	22745.0
	EXP	8093.4	11631.0	14172.1	13994.3	18089.1	23201.7
	CHI	9.7	7.7	0.1	0.7	0.3	9.0
65 -	OBS	6622.0	11148.0	15396.0	19641.0	18176.0	22704.0
	EXP	6653.7	11006.4	15516.4	19618.3	18262.9	22631.2
	CHI	0.2	1.8	0.9	0.0	0.4	0.2
70 -	OBS	4007.0	7393.0	11862.0	16799.0	20845.0	19412.0
	EXP	4019.2	7302.2	11959.7	17240.5	21036.3	18778.2
	CHI	0.0	1.1	0.8	11.3	1.7	21.4
75 -	OBS	1982.0	3487.0	6132.0	10038.0	14189.0	17789.0
	EXP	1982.0	3474.8	6192.1	10374.1	14209.9	17394.3
	CHI	0.0	0.0	0.6	10.9	0.0	9.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	39657.41	991.44	40	P, C	58.09	0.0000
AGE-PERIOD	79249.31	1981.23	40	Cohort	79.03	0.0000
AGE-COHORT	69907.74	1747.69	40	Period	76.23	0.0000
PERIOD-COHORT	33771.99	844.30	40	Age	50.79	0.0000
FULL AGE-PERIOD-COHORT	16618.88	415.47	40			0.0000

AGE	EFFECT
30	20.367650
35	58.509674
40	155.482254
45	373.922970
50	764.953642
55	1388.821044
60	2263.751338
65	3258.259100
70	4166.720438
75	4730.854078

PERIOD	EFFECT	LOWER	UPPER
% Period Change	97.5516	94.5516	100.5516
1961	0.830619		
1966	0.891402		
1971	0.946331		
1976	1.042914		
1981	1.075725		
1986	1.049387		
1991	1.023693	0.992212	1.055175
1996	0.998629	0.938152	1.060995
2001	0.974179	0.887038	1.066847
2006	0.950327	0.838708	1.072732

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.248088	1.000000	
1891	0.393799	2.000000	
1896	0.620163	4.000000	
1901	0.813272	8.000000	
1906	0.919918	16.000000	
1911	0.951598	32.000000	
1916	1.058576	64.000000	
1921	1.172125	128.000000	
1926	1.276894	256.000000	
1931	1.302518	512.000000	
1936	1.134026	1024.000000	
1941	1.138345	2048.000000	
1946	0.996907	4096.000000	
1951	0.829681	8192.000000	
1956	0.798343	EXTRAPOLATION	0.677572
1961	0.733964	EXTRAPOLATION	
1966	0.674776	EXTRAPOLATION	
1971	0.620361	EXTRAPOLATION	
1976	0.570334	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	19.5	20.1	22.4	21.9	19.6	14.5	12.3	8.4	6.8	7.0
	EXP	22.0	20.6	21.9	21.2	18.2	17.1	15.3*	13.7*	12.3*	11.0*
	Elow							14.8	12.9	11.2	9.7
	Eup							15.8	14.6	13.5	12.5
35	OBS	63.5	62.9	64.3	74.2	61.4	49.4	37.6	29.8	23.4	19.2
	EXP	62.1	67.9	62.8	69.5	62.7	50.9	47.8*	42.9*	38.5*	34.5*
	Elow							46.3	40.3	35.0	30.4
	Eup							49.3	45.6	42.1	38.9
40	OBS	134.2	167.7	198.3	197.8	191.2	163.2	133.9	98.0	75.5	55.4
	EXP	151.4	177.0	191.6	183.9	190.4	162.7	132.1*	124.0*	111.2*	99.7*
	Elow							128.0	116.5	101.2	88.0
	Eup							136.1	131.7	121.7	112.5
45	OBS	289.3	372.1	464.1	527.4	472.4	440.5	345.8	280.5	212.4	155.2
	EXP	328.8	390.7	451.8	507.9	456.1	446.7	381.6*	309.8*	290.8*	260.8*
	Elow							369.9	291.0	264.8	230.2
	Eup							393.3	329.2	318.5	294.4
50	OBS	586.7	695.8	863.3	1057.8	1088.3	876.5	785.0	644.0	513.3	393.1
	EXP	604.6	721.8	848.5	1018.7	1071.8	910.3	891.4*	761.5*	618.3*	580.4*
	Elow							864.0	715.4	563.0	512.2
	Eup							918.8	809.1	677.1	655.1
55	OBS	1101.1	1161.8	1383.1	1718.6	1915.6	1859.8	1455.1	1263.5	1025.6	856.3
	EXP	1061.2	1178.1	1391.3	1697.7	1907.7	1898.3	1612.3*	1578.8*	1348.8*	1095.0*
	Elow							1562.7	1483.2	1228.1	966.4
	Eup							1661.9	1677.4	1477.1	1236.1
60	OBS	1582.2	1904.0	2043.0	2481.5	2843.6	2973.6	2694.2	2065.3	1881.0	1548.6
	EXP	1529.2	1856.3	2038.6	2499.2	2854.3	3033.3	3018.4*	2563.6*	2510.4*	2144.6*
	Elow							2925.6	2408.4	2285.8	1892.8
	Eup							3111.3	2723.7	2749.2	2420.9
65	OBS	1670.4	2392.5	2814.5	3237.4	3692.6	4020.6	3967.4	3505.7	2756.8	2493.4
	EXP	1678.4	2362.1	2836.5	3233.6	3710.3	4007.7	4259.0*	4238.1*	3599.5*	3524.8*
	Elow							4128.0	3981.5	3277.6	3110.8
	Eup							4390.0	4502.8	3941.9	3978.8
70	OBS	1358.8	2332.1	3180.6	3895.2	4226.5	4784.8	4937.6	4767.9	4324.5	3443.0
	EXP	1362.9	2303.4	3206.8	3997.5	4265.3	4628.6	4999.6*	5313.2*	5287.1*	4490.5*
	Elow							4845.9	4991.4	4814.2	3963.0
	Eup							5153.4	5645.0	5790.0	5068.8
75	OBS	974.9	1666.5	2749.5	3882.6	4674.7	4831.4	5343.4	5481.7	5399.4	5007.7
	EXP	974.9	1660.7	2776.4	4012.6	4681.6	4724.2	5126.6*	5537.6*	5884.8*	5855.9*
	Elow							4969.0	5202.2	5358.4	5168.1
	Eup							5284.3	5883.4	6444.6	6610.2
30-79	OBS	634.2	829.5	1020.0	1241.3	1369.9	1398.8	1323.1	1174.9	1021.4	865.6
	EXP	635.4	830.5	1019.9	1240.8	1369.3	1400.6	1406.0*	1364.0*	1275.8*	1154.2*
	Elow							1362.8	1281.4	1161.7	1018.6
	Eup							1449.3	1449.2	1397.2	1302.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	174.0	184.0	196.0	204.0	189.0	141.0	134.0	97.0	79.6	77.0
	EXP	196.8	188.2	192.2	196.9	175.1	166.1	166.2*	158.4*	144.7*	121.2*
	CHI	2.637	0.093	0.074	0.259	1.107	3.802	6.248	23.782	29.317	16.139
35 -	OBS	581.0	560.0	588.0	652.0	576.0	476.0	363.0	320.0	278.8	235.0
	EXP	567.7	605.0	574.4	610.6	588.4	490.7	462.1*	461.3*	457.4*	422.0*
	CHI	0.311	3.340	0.323	2.808	0.263	0.439	21.270	43.258	69.719	82.838
40 -	OBS	1010.0	1517.0	1761.0	1797.0	1681.0	1518.0	1276.0	935.0	822.8	675.0
	EXP	1139.3	1601.1	1701.6	1670.2	1674.4	1513.0	1258.5*	1182.9*	1210.8*	1214.2*
	CHI	14.681	4.417	2.072	9.619	0.026	0.017	0.242	51.964	124.337	239.446
45 -	OBS	1923.0	2742.0	4132.0	4619.0	4246.0	3814.0	3165.0	2631.0	2025.8	1714.0
	EXP	2185.1	2879.4	4022.8	4449.0	4099.5	3867.6	3492.6*	2906.2*	2774.2*	2881.1*
	CHI	31.438	6.552	2.966	6.498	5.232	0.743	30.724	26.060	201.885	472.751
50 -	OBS	4656.0	4456.0	6178.0	9145.0	9312.0	7673.0	6633.0	5774.0	4753.2	3760.0
	EXP	4798.2	4622.5	6071.9	8807.2	9170.7	7968.7	7532.3*	6828.4*	5725.1*	5551.4*
	CHI	4.214	5.994	1.854	12.957	2.178	10.972	107.363	162.810	164.990	578.052
55 -	OBS	7413.0	8768.0	8398.0	11736.0	15810.0	15209.0	12260.0	10337.0	9020.6	7855.0
	EXP	7144.1	8891.1	8447.8	11593.2	15744.4	15523.6	13584.6*	12916.7*	11863.1*	10045.1*
	CHI	10.118	1.705	0.293	1.760	0.273	6.376	129.158	515.213	681.087	477.488
60 -	OBS	8374.0	11930.0	14203.0	13895.0	18021.0	22745.0	20640.0	16520.0	14810.2	13260.0
	EXP	8093.4	11631.0	14172.1	13994.3	18089.1	23201.7	23124.1*	20506.0*	19765.9*	18363.2*
	CHI	9.730	7.684	0.067	0.704	0.256	8.991	266.860	774.821	1242.488	1418.219
65 -	OBS	6622.0	11148.0	15396.0	19641.0	18176.0	22704.0	27224.0	24512.0	20571.6	18501.0
	EXP	6653.7	11006.4	15516.4	19618.3	18262.9	22631.2	29225.4*	29632.9*	26859.8*	26153.7*
	CHI	0.151	1.823	0.934	0.026	0.414	0.234	137.053	884.939	1472.145	2239.220
70 -	OBS	4007.0	7393.0	11862.0	16799.0	20845.0	19412.0	23687.0	28033.0	26705.4	23373.0
	EXP	4019.2	7302.2	11959.7	17240.5	21036.3	18778.2	23984.5*	31238.9*	32650.1*	30483.3*
	CHI	0.037	1.130	0.799	11.307	1.739	21.392	3.691	328.998	1082.371	1658.493
75 -	OBS	1982.0	3487.0	6132.0	10038.0	14189.0	17789.0	16521.0	20791.0	25603.2	25804.0
	EXP	1982.0	3474.8	6192.1	10374.1	14209.9	17394.3	15850.8*	21002.8*	27904.9*	30174.8*
	CHI	0.000	0.043	0.583	10.892	0.031	8.954	28.336	2.135	189.850	633.118
30-79	OBS	36742.0	52185.0	68846.0	88526.0	103045.0	111481.0	111903.0	109950.0	104671.2	95254.0
	EXP	36779.6	52201.5	68851.0	88554.2	103050.7	111535.2	118681.2*	126834.4*	129356.0*	125410.0*
	O/E	0.999	1.000	1.000	1.000	1.000	1.000	0.943	0.867	0.809	0.760

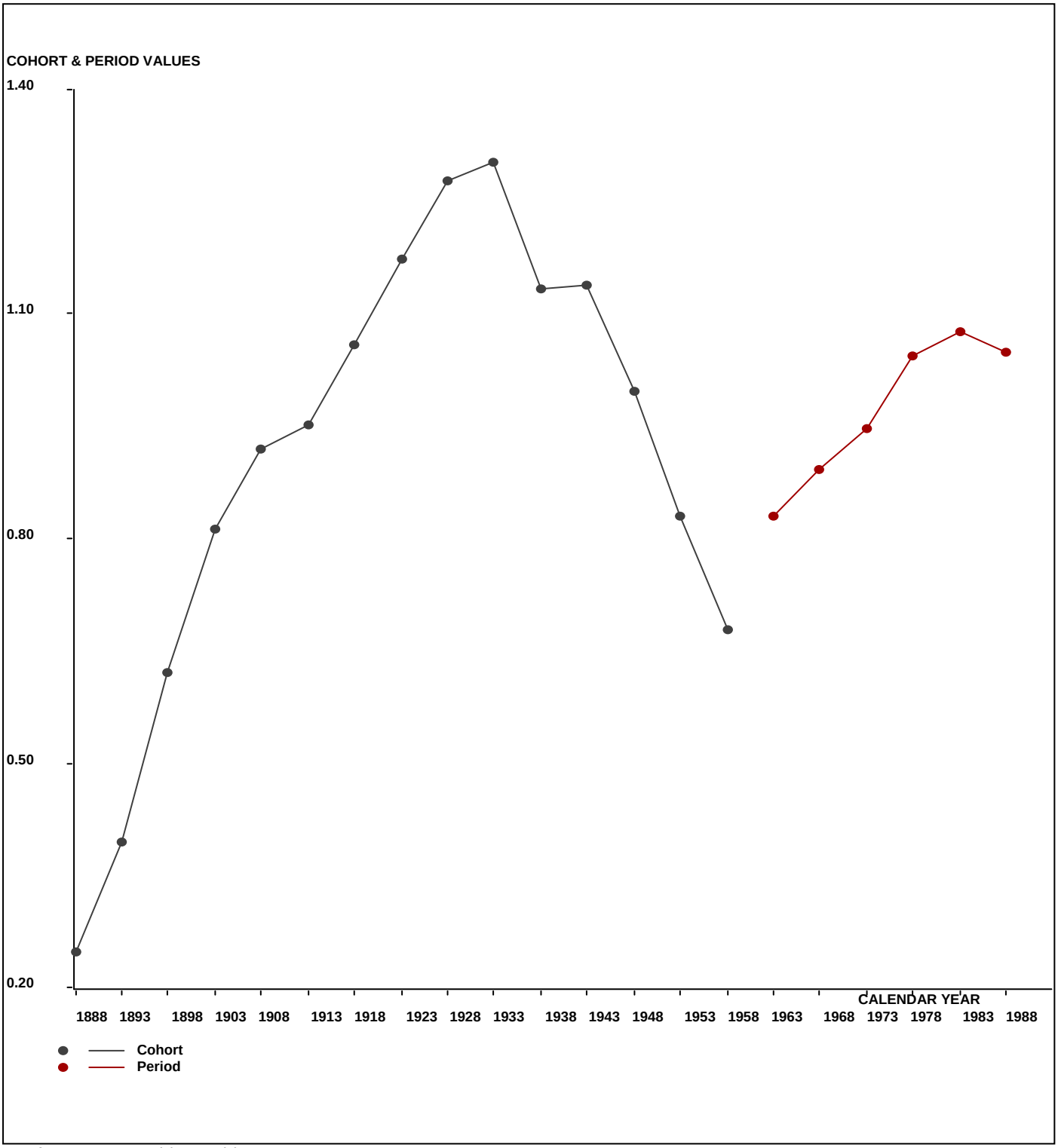
CHI SQUARE (LOG)= 16618.8763 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

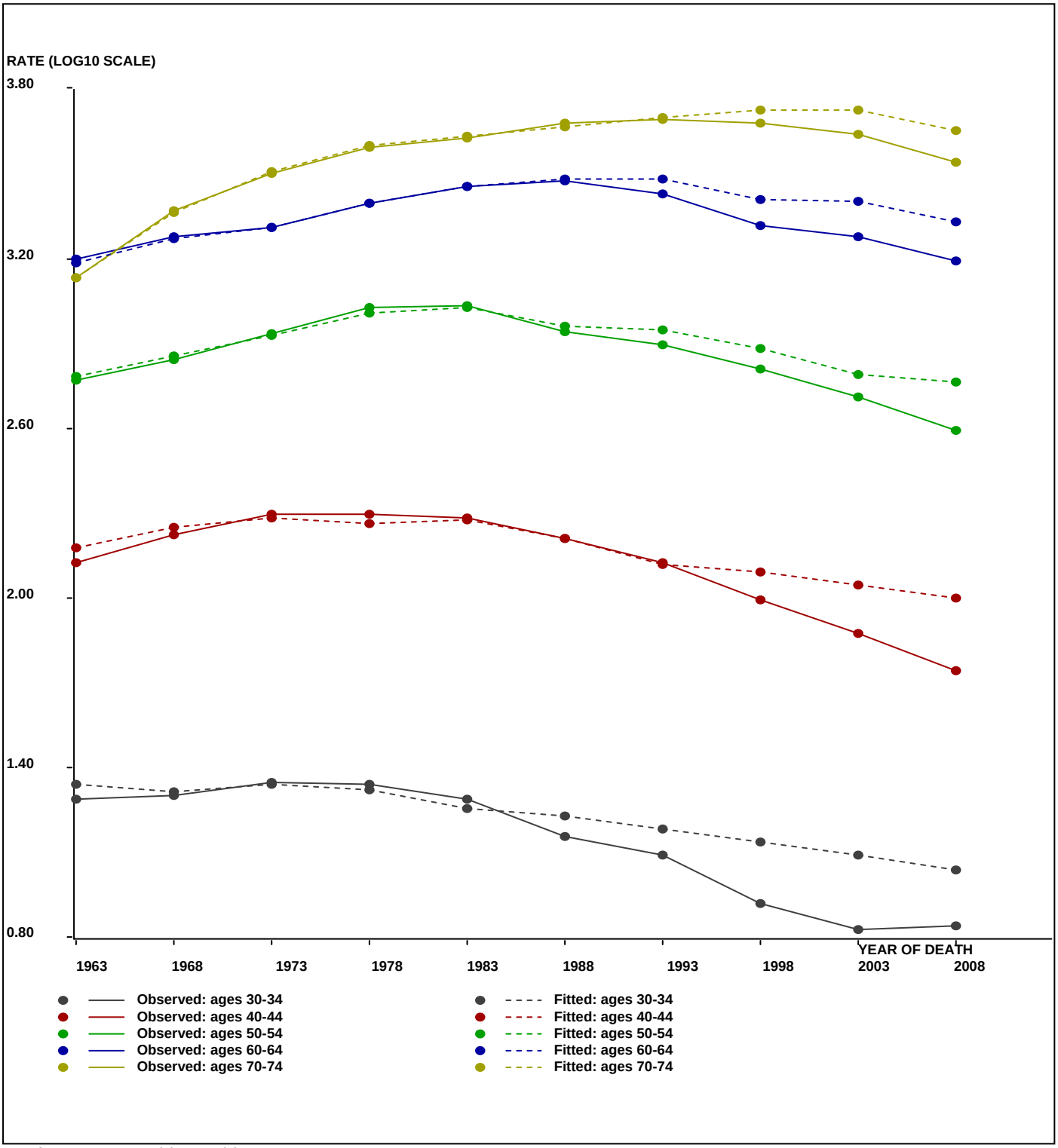


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	12.3	37.6	133.9	345.8	785.0	1455.1	2694.2	3967.4	4937.6	5343.4
	PRE	15.3	47.8	132.1	381.6	891.4	1612.3	3018.4	4259.0	4999.6	5126.6
	RES	-2.967	-10.258	1.832	-35.791	-106.425	-157.209	-324.259	-291.658	-62.019	216.757
1996-	OBS	8.4	29.8	98.0	280.5	644.0	1263.5	2065.3	3505.7	4767.9	5481.7
	PRE	13.7	42.9	124.0	309.8	761.5	1578.8	2563.6	4238.1	5313.2	5537.6
	RES	-5.319	-13.133	-25.980	-29.338	-117.591	-315.313	-498.329	-732.392	-545.259	-55.830
2001-	OBS	6.8	23.4	75.5	212.4	513.3	1025.6	1881.0	2756.8	4324.5	5399.4
	PRE	12.3	38.5	111.2	290.8	618.3	1348.8	2510.4	3599.5	5287.1	5884.8
	RES	-5.540	-15.016	-35.625	-78.451	-104.960	-323.178	-629.403	-842.696	-962.637	-485.398
2006-	OBS	7.0	19.2	55.4	155.2	393.1	856.3	1548.6	2493.4	3443.0	5007.7
	PRE	11.0	34.5	99.7	260.8	580.4	1095.0	2144.6	3524.8	4490.5	5855.9
	RES	-4.028	-15.284	-44.276	-105.650	-187.276	-238.746	-596.010	-1031.369	-1047.409	-848.234

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	134.0	363.0	1276.0	3165.0	6633.0	12260.0	20640.0	27224.0	23687.0	16521.0
	PRE	166.2	462.1	1258.5	3492.6	7532.3	13584.6	23124.1	29225.4	23984.5	15850.8
	CHI	6.248	21.270	0.242	30.724	107.363	129.158	266.860	137.053	3.691	28.336
1996-	OBS	97.0	320.0	935.0	2631.0	5774.0	10337.0	16520.0	24512.0	28033.0	20791.0
	PRE	158.4	461.3	1182.9	2906.2	6828.4	12916.7	20506.0	29632.9	31238.9	21002.8
	CHI	23.782	43.258	51.964	26.060	162.810	515.213	774.821	884.939	328.998	2.135
2001-	OBS	79.6	278.8	822.8	2025.8	4753.2	9020.6	14810.2	20571.6	26705.4	25603.2
	PRE	144.7	457.4	1210.8	2774.2	5725.1	11863.1	19765.9	26859.8	32650.1	27904.9
	CHI	29.317	69.719	124.337	201.885	164.990	681.087	1242.488	1472.145	1082.371	189.850
2006-	OBS	77.0	235.0	675.0	1714.0	3760.0	7855.0	13260.0	18501.0	23373.0	25804.0
	PRE	121.2	422.0	1214.2	2881.1	5551.4	10045.1	18363.2	26153.7	30483.3	30174.8
	CHI	16.139	82.838	239.446	472.751	578.052	477.488	1418.219	2239.220	1658.493	633.118

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	4023.74	78.90	51	P, C	98.94	22006.15	0.0000
AGE-PERIOD	1526.10	33.91	45	Cohort	97.21	8176.28	0.0000
AGE-COHORT	255.06	7.09	36	Period	83.32	1354.62	0.0000
PERIOD-COHORT	441.50	11.04	40	Age	90.36	2354.56	0.0000
FULL AGE-PERIOD-COHORT	42.55	1.33	32			225.84	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.564306	36.669611
35	1.721465	52.658073
40	1.983322	96.232574
45	2.263799	183.568732
50	2.524218	334.362908
55	2.790621	617.477638
60	3.040748	1098.368086
65	3.278995	1901.058078
70	3.511967	3250.623073
75	3.729765	5367.415265

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.037160	1.089331
1966	0.078273	1.197492
1971	0.040627	1.098063
1976	-0.005093	0.988341
1981	-0.084164	0.823826
1986	-0.106675	0.782213

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.146993	0.712865
1891	-0.078094	0.835422
1896	0.023201	1.054875
1901	0.073804	1.185235
1906	0.067852	1.169101
1911	0.022449	1.053049
1916	-0.009969	0.977307
1921	-0.101330	0.791900
1926	-0.179526	0.661416
1931	-0.299639	0.501604
1936	-0.443902	0.359831
1941	-0.570943	0.268570
1946	-0.674911	0.211392
1951	-0.610917	0.244953
1956	-0.619943	0.239915

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	175.0	145.0	99.0	76.0	65.0	67.0
	EXP	178.9	144.4	94.7	71.2	71.3	67.0
	CHI	0.1	0.0	0.2	0.3	0.6	0.0
35 -	OBS	308.0	276.0	205.0	131.0	98.0	103.0
	EXP	347.1	281.7	190.3	122.9	86.0	97.2
	CHI	4.4	0.1	1.1	0.5	1.7	0.3
40 -	OBS	541.0	692.0	488.0	377.0	190.0	129.0
	EXP	624.8	689.6	470.6	310.9	187.2	148.0
	CHI	11.2	0.0	0.6	14.1	0.0	2.4
45 -	OBS	1093.0	1254.0	1315.0	915.0	460.0	318.0
	EXP	1298.8	1282.9	1187.0	797.1	489.1	333.9
	CHI	32.6	0.7	13.8	17.4	1.7	0.8
50 -	OBS	2906.0	2402.0	2247.0	2010.0	1182.0	761.0
	EXP	3043.8	2505.9	2080.6	1889.7	1182.2	823.8
	CHI	6.2	4.3	13.3	7.7	0.0	4.8
55 -	OBS	5342.0	5807.0	4048.0	3401.0	2805.0	1842.0
	EXP	5294.0	5876.6	4023.5	3300.1	2776.9	1981.2
	CHI	0.4	0.8	0.1	3.1	0.3	9.8
60 -	OBS	7820.0	9688.0	8782.0	5998.0	4407.0	4086.0
	EXP	7505.4	9634.7	8829.4	5940.7	4541.2	4346.6
	CHI	13.2	0.3	0.3	0.6	4.0	15.6
65 -	OBS	8588.0	12681.0	13436.0	11976.0	7475.0	6613.0
	EXP	8660.2	12572.5	13350.2	12003.9	7534.0	6649.7
	CHI	0.6	0.9	0.6	0.1	0.5	0.2
70 -	OBS	8867.0	13200.0	15479.0	15861.0	13943.0	10345.0
	EXP	8723.8	13017.2	15777.8	16198.8	13908.2	10081.5
	CHI	2.4	2.6	5.7	7.0	0.1	6.9
75 -	OBS	8474.0	11090.0	13753.0	16121.0	15837.0	16521.0
	EXP	8474.0	11235.3	13865.7	16255.7	15691.1	16278.6
	CHI	0.0	1.9	0.9	1.1	1.4	3.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	129643.95	3241.10	40	P, C	98.82	0.0000
AGE-PERIOD	15258.26	381.46	40	Cohort	89.95	0.0000
AGE-COHORT	3532.43	88.31	40	Period	56.59	0.0000
PERIOD-COHORT	7486.17	187.15	40	Age	79.52	0.0000
FULL AGE-PERIOD-COHORT	1533.29	38.33	40			0.0000

AGE	EFFECT
30	36.669611
35	52.658073
40	96.232574
45	183.568732
50	334.362908
55	617.477638
60	1098.368086
65	1901.058078
70	3250.623073
75	5367.415265

PERIOD	EFFECT	LOWER	UPPER
% Period Change	94.9488	91.9488	97.9488
1961	1.089331		
1966	1.197492		
1971	1.098063		
1976	0.988341		
1981	0.823826		
1986	0.782213		
1991	0.742702	0.719235	0.766168
1996	0.705186	0.661328	0.750452
2001	0.669566	0.608083	0.735059
2006	0.635745	0.559125	0.719981

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.712865	1.000000	
1891	0.835422	2.000000	
1896	1.054875	4.000000	
1901	1.185235	8.000000	
1906	1.169101	16.000000	
1911	1.053049	32.000000	
1916	0.977307	64.000000	
1921	0.791900	128.000000	
1926	0.661416	256.000000	
1931	0.501604	512.000000	
1936	0.359831	1024.000000	
1941	0.268570	2048.000000	
1946	0.211392	4096.000000	
1951	0.244953	8192.000000	
1956	0.189422	EXTRAPOLATION	0.239915
1961	0.161888	EXTRAPOLATION	
1966	0.138357	EXTRAPOLATION	
1971	0.118246	EXTRAPOLATION	
1976	0.101058	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	19.6	15.9	11.3	8.2	6.7	6.9	5.4	4.2	3.5	1.5
	EXP	20.0	15.8	10.8	7.7	7.4	5.4	4.4*	3.6*	2.9*	2.4*
	Elow							4.3	3.4	2.6	2.1
	Eup							4.5	3.8	3.2	2.7
35	OBS	33.7	31.0	22.4	14.9	10.4	10.7	7.7	6.4	4.7	4.1
	EXP	37.9	31.6	20.8	14.0	9.2	10.1	7.4*	6.0*	4.9*	4.0*
	Elow							7.2	5.6	4.4	3.5
	Eup							7.6	6.4	5.4	4.5
40	OBS	71.9	76.5	55.0	41.5	21.6	13.9	13.1	11.8	8.5	8.5
	EXP	83.0	76.2	53.0	34.2	21.3	15.9	17.5*	12.9*	10.4*	8.5*
	Elow							17.0	12.1	9.5	7.4
	Eup							18.1	13.7	11.5	9.6
45	OBS	164.5	170.2	147.7	104.5	51.2	36.7	23.8	22.0	16.2	13.0
	EXP	195.4	174.1	133.3	91.0	54.4	38.6	28.8*	31.7*	23.3*	18.9*
	Elow							27.9	29.7	21.1	16.6
	Eup							29.7	33.7	25.6	21.4
50	OBS	366.2	375.1	314.0	232.5	138.1	86.9	61.5	46.5	35.1	31.5
	EXP	383.6	391.3	290.7	218.6	138.2	94.1	66.7*	49.8*	54.8*	40.3*
	Elow							64.6	46.7	49.8	35.4
	Eup							68.8	53.0	60.2	45.6
55	OBS	793.5	769.4	666.7	498.1	339.9	225.2	147.8	115.1	76.1	66.3
	EXP	786.4	778.7	662.6	483.3	336.5	242.3	165.0*	116.9*	87.4*	96.2*
	Elow							159.8	109.7	79.4	84.6
	Eup							170.2	124.5	95.9	108.9
60	OBS	1477.6	1546.2	1263.2	1071.2	695.4	534.2	390.7	260.9	209.5	152.8
	EXP	1418.1	1537.7	1270.1	1060.9	716.6	568.3	409.2*	278.7*	197.5*	147.6*
	Elow							396.3	261.4	179.4	129.8
	Eup							422.1	296.6	216.8	167.2
65	OBS	2166.3	2721.5	2456.2	1974.0	1518.6	1171.1	926.4	681.2	450.8	377.8
	EXP	2184.5	2698.2	2440.5	1978.6	1530.6	1177.6	933.9*	672.5*	458.0*	324.6*
	Elow							904.4	630.6	416.0	285.5
	Eup							963.4	715.6	502.8	367.6
70	OBS	3006.8	4163.9	4150.4	3677.7	2827.1	2549.9	1931.3	1555.9	1189.1	872.5
	EXP	2958.2	4106.2	4230.6	3756.0	2820.0	2485.0	1911.8*	1516.2*	1091.7*	743.6*
	Elow							1851.4	1421.9	991.5	654.0
	Eup							1972.2	1613.5	1198.5	842.1
75	OBS	4168.0	5300.2	6166.7	6235.4	5217.6	4487.0	4151.9	3205.6	2710.0	2158.0
	EXP	4168.0	5369.6	6217.2	6287.5	5169.6	4421.2	3895.9*	2997.4*	2377.0*	1711.6*
	Elow							3772.8	2810.9	2158.8	1505.3
	Eup							4019.0	3189.8	2609.5	1938.4
30-79	OBS	777.5	927.4	886.9	773.7	583.7	480.3	389.5	298.8	232.2	182.1
	EXP	778.1	927.9	886.8	773.1	584.3	480.9	385.0*	291.9*	219.0*	159.7*
	Elow							372.8	273.8	198.9	140.5
	Eup							397.1	310.7	240.5	180.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	175.0	145.0	99.0	76.0	65.0	67.0	59.0	48.0	41.6	17.0
	EXP	178.9	144.4	94.7	71.2	71.3	52.9	47.9*	41.3*	34.1*	25.9*
	CHI	0.086	0.002	0.191	0.321	0.552	3.759	2.577	1.093	1.630	3.043
35 -	OBS	308.0	276.0	205.0	131.0	98.0	103.0	74.0	69.0	56.2	50.0
	EXP	347.1	281.7	190.3	122.9	86.0	97.2	71.6*	64.7*	58.0*	48.4*
	CHI	4.403	0.114	1.132	0.539	1.674	0.348	0.081	0.292	0.056	0.051
40 -	OBS	541.0	692.0	488.0	377.0	190.0	129.0	125.0	113.0	92.6	103.0
	EXP	624.8	689.6	470.6	310.9	187.2	148.0	166.8*	122.7*	113.6*	103.1*
	CHI	11.241	0.009	0.642	14.076	0.041	2.442	10.497	0.762	3.885	0.000
45 -	OBS	1093.0	1254.0	1315.0	915.0	460.0	318.0	218.0	206.0	155.0	144.0
	EXP	1298.8	1282.9	1187.0	797.1	489.1	333.9	263.8*	297.4*	222.1*	208.7*
	CHI	32.620	0.653	13.807	17.439	1.727	0.758	7.945	28.116	20.271	20.057
50 -	OBS	2906.0	2402.0	2247.0	2010.0	1182.0	761.0	520.0	417.0	324.8	301.0
	EXP	3043.8	2505.9	2080.6	1889.7	1182.2	823.8	563.6*	446.9*	507.8*	385.2*
	CHI	6.237	4.308	13.308	7.655	0.000	4.791	3.366	2.004	65.949	18.386
55 -	OBS	5342.0	5807.0	4048.0	3401.0	2805.0	1842.0	1245.0	942.0	669.4	608.0
	EXP	5294.0	5876.6	4023.5	3300.1	2776.9	1981.2	1390.4*	956.8*	768.7*	882.1*
	CHI	0.435	0.824	0.149	3.083	0.285	9.784	15.206	0.228	12.830	85.163
60 -	OBS	7820.0	9688.0	8782.0	5998.0	4407.0	4086.0	2993.0	2087.0	1649.6	1308.0
	EXP	7505.4	9634.7	8829.4	5940.7	4541.2	4346.6	3134.8*	2229.3*	1555.2*	1263.9*
	CHI	13.185	0.295	0.255	0.553	3.963	15.623	6.412	9.088	5.736	1.539
65 -	OBS	8588.0	12681.0	13436.0	11976.0	7475.0	6613.0	6357.0	4763.0	3363.6	2803.0
	EXP	8660.2	12572.5	13350.2	12003.9	7534.0	6649.7	6408.2*	4701.8*	3417.8*	2408.4*
	CHI	0.601	0.937	0.552	0.065	0.461	0.203	0.408	0.798	0.858	64.637
70 -	OBS	8867.0	13200.0	15479.0	15861.0	13943.0	10345.0	9265.0	9148.0	7343.4	5923.0
	EXP	8723.8	13017.2	15777.8	16198.8	13908.2	10081.5	9171.6*	8914.3*	6742.0*	5048.0*
	CHI	2.351	2.567	5.659	7.045	0.087	6.888	0.952	6.128	53.647	151.670
75 -	OBS	8474.0	11090.0	13753.0	16121.0	15837.0	16521.0	12837.0	12158.0	12850.4	11120.0
	EXP	8474.0	11235.3	13865.7	16255.7	15691.1	16278.6	12045.7*	11368.4*	11271.5*	8819.8*
	CHI	0.000	1.880	0.915	1.116	1.356	3.608	51.986	54.849	221.184	599.907
30-79	OBS	44114.0	57235.0	59852.0	56866.0	46462.0	40785.0	33693.0	29951.0	26546.6	22377.0
	EXP	44150.8	57240.8	59869.9	56891.0	46467.1	40793.5	33264.3*	29143.5*	24690.7*	19193.4*
	O/E	0.999	1.000	1.000	1.000	1.000	1.000	1.013	1.028	1.075	1.166

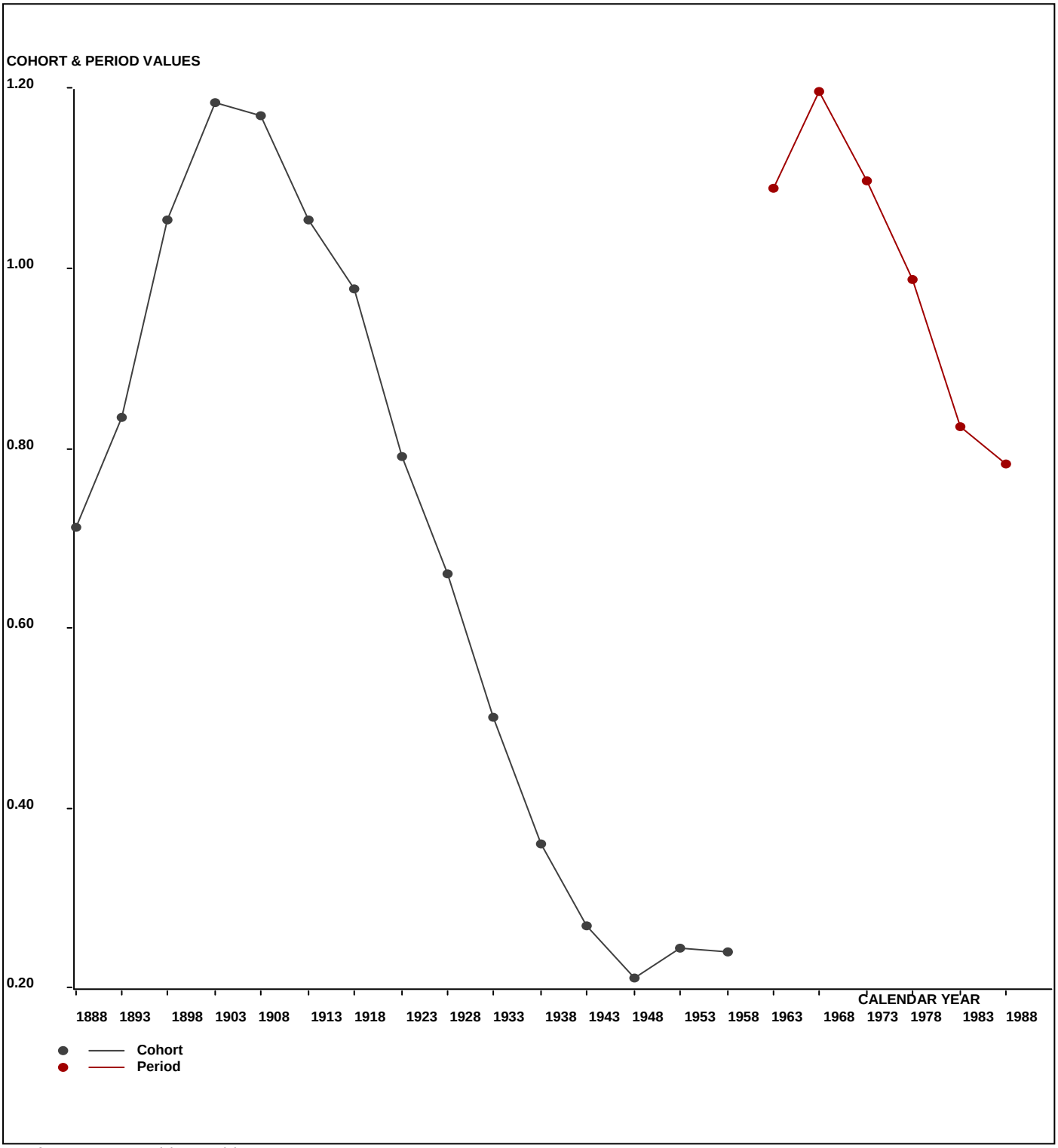
CHI SQUARE (LOG)= 1533.2861 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

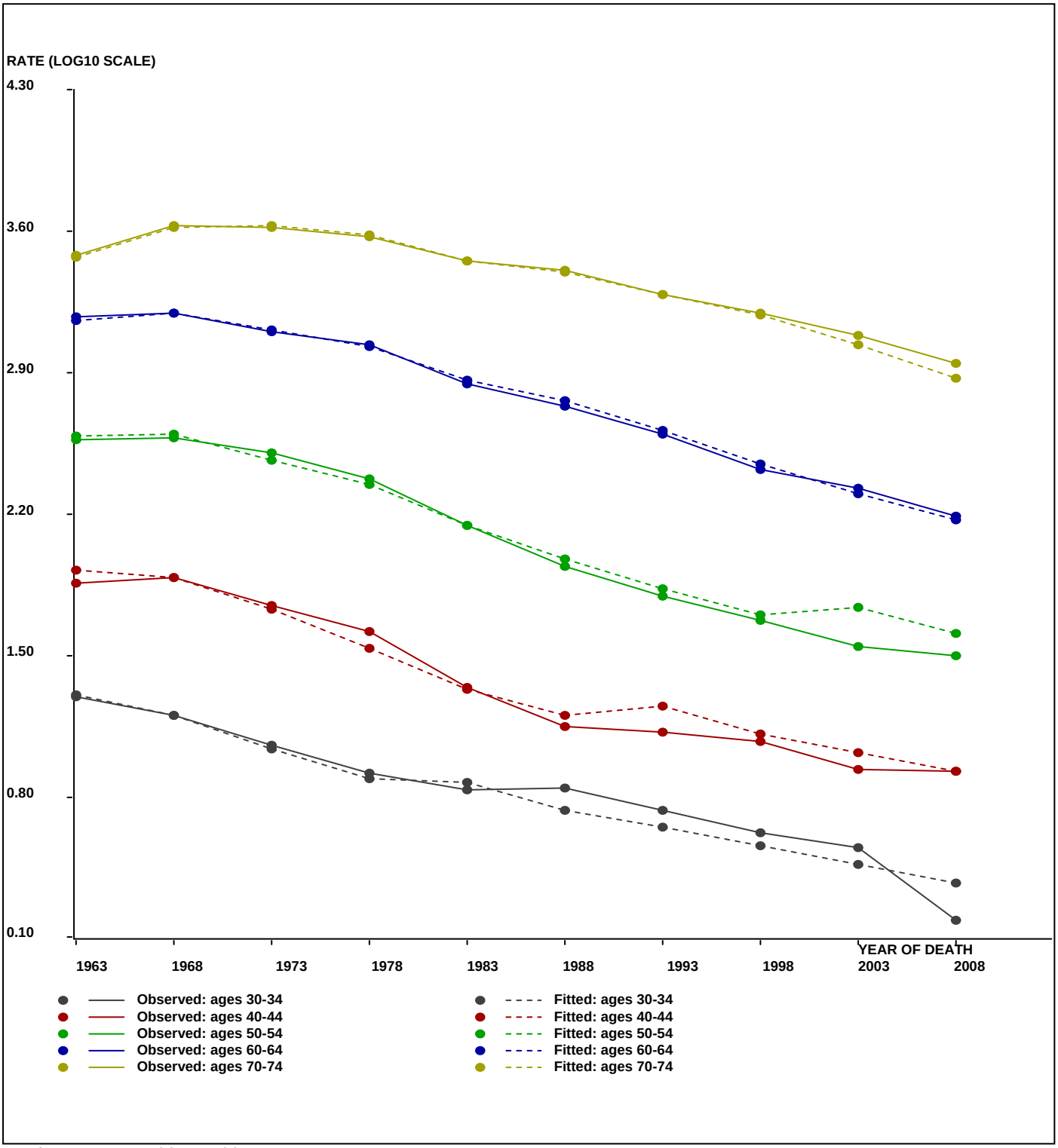


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	5.4	7.7	13.1	23.8	61.5	147.8	390.7	926.4	1931.3	4151.9
PRE	4.4	7.4	17.5	28.8	66.7	165.0	409.2	933.9	1911.8	3895.9
RES	1.023	0.249	-4.391	-5.002	-5.155	-17.257	-18.506	-7.456	19.475	255.941
1996- OBS	4.2	6.4	11.8	22.0	46.5	115.1	260.9	681.2	1555.9	3205.6
PRE	3.6	6.0	12.9	31.7	49.8	116.9	278.7	672.5	1516.2	2997.4
RES	0.582	0.404	-1.013	-9.749	-3.337	-1.806	-17.795	8.759	39.751	208.197
2001- OBS	3.5	4.7	8.5	16.2	35.1	76.1	209.5	450.8	1189.1	2710.0
PRE	2.9	4.9	10.4	23.3	54.8	87.4	197.5	458.0	1091.7	2377.0
RES	0.634	-0.152	-1.929	-7.034	-19.763	-11.291	11.995	-7.259	97.386	332.981
2006- OBS	1.5	4.1	8.5	13.0	31.5	66.3	152.8	377.8	872.5	2158.0
PRE	2.4	4.0	8.5	18.9	40.3	96.2	147.6	324.6	743.6	1711.6
RES	-0.808	0.129	-0.007	-5.857	-8.798	-29.878	5.150	53.175	128.896	446.398

Observed and predicted deaths (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	59.0	74.0	125.0	218.0	520.0	1245.0	2993.0	6357.0	9265.0	12837.0
PRE	47.9	71.6	166.8	263.8	563.6	1390.4	3134.8	6408.2	9171.6	12045.7
CHI	2.577	0.081	10.497	7.945	3.366	15.206	6.412	0.408	0.952	51.986
1996- OBS	48.0	69.0	113.0	206.0	417.0	942.0	2087.0	4763.0	9148.0	12158.0
PRE	41.3	64.7	122.7	297.4	446.9	956.8	2229.3	4701.8	8914.3	11368.4
CHI	1.093	0.292	0.762	28.116	2.004	0.228	9.088	0.798	6.128	54.849
2001- OBS	41.6	56.2	92.6	155.0	324.8	669.4	1649.6	3363.6	7343.4	12850.4
PRE	34.1	58.0	113.6	222.1	507.8	768.7	1555.2	3417.8	6742.0	11271.5
CHI	1.630	0.056	3.885	20.271	65.949	12.830	5.736	0.858	53.647	221.184
2006- OBS	17.0	50.0	103.0	144.0	301.0	608.0	1308.0	2803.0	5923.0	11120.0
PRE	25.9	48.4	103.1	208.7	385.2	882.1	1263.9	2408.4	5048.0	8819.8
CHI	3.043	0.051	0.000	20.057	18.386	85.163	1.539	64.637	151.670	599.907

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	17301.48	339.24	51	P, C	99.89	93947.51	0.0000
AGE-PERIOD	98.10	2.18	45	Cohort	80.00	520.43	0.0000
AGE-COHORT	420.72	11.69	36	Period	95.34	2232.38	0.0000
PERIOD-COHORT	22.40	0.56	40	Age	12.41	118.94	0.0000
FULL AGE-PERIOD-COHORT	19.62	0.61	32			104.16	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.403710	25.334335
35	1.622842	41.960628
40	1.913439	81.929183
45	2.208544	161.638246
50	2.510112	323.676846
55	2.805513	639.017562
60	3.127742	1341.966477
65	3.436363	2731.258650
70	3.743726	5542.763838
75	4.024108	10570.805374

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.215001	1.640595
1966	0.064896	1.161170
1971	-0.030246	0.932726
1976	-0.049296	0.892698
1981	-0.165815	0.682630
1986	-0.243869	0.570337

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.040364	1.097397
1891	0.024837	1.058857
1896	0.014922	1.034956
1901	-0.000637	0.998534
1906	-0.020009	0.954973
1911	-0.027260	0.939161
1916	-0.002404	0.994479
1921	-0.010299	0.976565
1926	-0.022406	0.949717
1931	-0.009988	0.977263
1936	-0.042086	0.907641
1941	-0.036584	0.919213
1946	-0.075703	0.840035
1951	-0.103640	0.787699
1956	-0.221843	0.600008

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	421.0	281.0	151.0	175.0	107.0	84.0
	EXP	382.7	255.0	196.8	180.0	132.1	84.0
	CHI	3.8	2.7	10.7	0.1	4.8	0.0
35 -	OBS	685.0	454.0	299.0	286.0	208.0	204.0
	EXP	639.2	443.0	337.6	312.1	228.7	182.7
	CHI	3.3	0.3	4.4	2.2	1.9	2.5
40 -	OBS	1143.0	871.0	598.0	637.0	453.0	394.0
	EXP	1084.8	869.7	689.2	626.7	464.4	370.1
	CHI	3.1	0.0	12.1	0.2	0.3	1.5
45 -	OBS	1900.0	1433.0	1304.0	1305.0	963.0	829.0
	EXP	1906.2	1486.8	1360.6	1293.2	937.0	756.2
	CHI	0.0	1.9	2.4	0.1	0.7	7.0
50 -	OBS	4312.0	2681.0	2340.0	2475.0	1965.0	1514.0
	EXP	4238.3	2630.0	2347.9	2574.8	1957.4	1542.0
	CHI	1.3	1.0	0.0	3.9	0.0	0.5
55 -	OBS	7347.0	5886.0	3933.0	4193.0	3895.0	3169.0
	EXP	7339.6	5743.3	4045.1	4343.3	3804.0	3154.8
	CHI	0.0	3.5	3.1	5.2	2.2	0.1
60 -	OBS	13567.0	10521.0	9389.0	7787.0	6841.0	6442.0
	EXP	13726.3	10546.0	9287.2	7831.1	6729.3	6429.7
	CHI	1.8	0.1	1.1	0.2	1.9	0.0
65 -	OBS	24076.0	18466.0	16167.0	16873.0	11546.0	10832.0
	EXP	24308.8	18432.0	16073.3	16922.0	11430.0	10796.0
	CHI	2.2	0.1	0.5	0.1	1.2	0.1
70 -	OBS	39861.0	30156.0	26238.0	27500.0	23362.0	17417.0
	EXP	39694.2	30180.8	26356.0	27396.1	23483.6	17424.4
	CHI	0.7	0.0	0.5	0.4	0.6	0.0
75 -	OBS	54284.0	41398.0	36706.0	38801.0	32232.0	31353.0
	EXP	54284.0	41565.4	36450.4	38559.7	32413.1	31504.2
	CHI	0.0	0.7	1.8	1.5	1.0	0.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	267552.11	6688.80	40	P, C	99.45	0.0000
AGE-PERIOD	1618.37	40.46	40	Cohort	9.48	0.0000
AGE-COHORT	2334.37	58.36	40	Period	37.25	0.0000
PERIOD-COHORT	1461.06	36.53	40	Age	-0.26	0.0000
FULL AGE-PERIOD-COHORT	1464.90	36.62	40			0.0000

AGE	EFFECT
30	25.334335
35	41.960628
40	81.929183
45	161.638246
50	323.676846
55	639.017562
60	1341.966477
65	2731.258650
70	5542.763838
75	10570.805374

PERIOD	EFFECT	LOWER	UPPER
% Period Change	83.5499	80.5499	86.5499
1961	1.640595		
1966	1.161170		
1971	0.932726		
1976	0.892698		
1981	0.682630		
1986	0.570337		
1991	0.476516	0.459406	0.493626
1996	0.398129	0.370051	0.427233
2001	0.332636	0.298076	0.369770
2006	0.277917	0.240100	0.320035

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.097397	1.000000	
1891	1.058857	2.000000	
1896	1.034956	4.000000	
1901	0.998534	8.000000	
1906	0.954973	16.000000	
1911	0.939161	32.000000	
1916	0.994479	64.000000	
1921	0.976565	128.000000	
1926	0.949717	256.000000	
1931	0.977263	512.000000	
1936	0.907641	1024.000000	
1941	0.919213	2048.000000	
1946	0.840035	4096.000000	
1951	0.787699	8192.000000	
1956	0.762642	EXTRAPOLATION	0.600008
1961	0.729218	EXTRAPOLATION	
1966	0.697259	EXTRAPOLATION	
1971	0.666701	EXTRAPOLATION	
1976	0.637482	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	44.7	29.4	16.7	18.5	11.0	8.7	8.4	6.3	4.7	4.1
	EXP	40.6	26.7	21.7	19.0	13.6	11.0	8.8*	7.0*	5.6*	4.5*
	Elow							8.5	6.5	5.0	3.9
	Eup							9.1	7.5	6.2	5.2
35	OBS	70.1	48.8	31.5	31.5	21.9	21.1	18.7	13.6	10.3	10.7
	EXP	65.4	47.6	35.5	34.4	24.1	18.9	15.2*	12.2*	9.7*	7.8*
	Elow							14.7	11.3	8.7	6.7
	Eup							15.8	13.1	10.8	9.0
40	OBS	138.3	90.5	64.8	67.5	50.2	41.8	36.8	28.8	24.7	21.8
	EXP	131.3	90.4	74.7	66.4	51.4	39.3	30.8*	24.9*	19.9*	15.9*
	Elow							29.6	23.1	17.8	13.7
	Eup							31.9	26.7	22.1	18.3
45	OBS	262.9	176.7	137.2	142.3	102.9	92.9	76.8	63.6	52.4	43.2
	EXP	263.7	183.3	143.2	141.0	100.1	84.7	64.7*	50.7*	41.0*	32.8*
	Elow							62.4	47.1	36.7	28.3
	Eup							67.0	54.4	45.6	37.7
50	OBS	507.4	381.0	293.8	263.8	216.8	164.5	141.6	113.7	97.8	85.8
	EXP	498.7	373.8	294.8	274.4	215.9	167.6	141.8*	108.3*	84.8*	68.6*
	Elow							136.7	100.6	76.0	59.3
	Eup							146.9	116.2	94.3	79.0
55	OBS	1002.2	714.2	576.3	537.8	424.2	357.8	272.9	235.8	183.0	153.1
	EXP	1001.2	696.9	592.7	557.1	414.3	356.2	276.4*	233.9*	178.6*	139.9*
	Elow							266.5	217.4	160.0	120.9
	Eup							286.3	251.0	198.5	161.1
60	OBS	2172.9	1484.6	1188.4	1184.6	909.5	728.3	613.8	464.7	383.2	285.4
	EXP	2198.4	1488.1	1175.5	1191.4	894.6	726.9	624.9*	484.9*	410.3*	313.3*
	Elow							602.5	450.7	367.7	270.7
	Eup							647.4	520.4	456.1	360.8
65	OBS	4593.1	3172.7	2447.0	2283.2	1873.0	1526.3	1283.5	1036.0	766.6	569.1
	EXP	4637.5	3166.8	2432.8	2289.9	1854.1	1521.2	1236.0*	1062.7*	824.6*	697.7*
	Elow							1191.7	987.7	738.9	602.8
	Eup							1280.4	1140.4	916.7	803.5
70	OBS	9669.1	6655.6	5139.2	4743.1	3535.1	3142.5	2602.5	2164.1	1675.0	1173.7
	EXP	9628.6	6661.1	5162.3	4725.2	3553.5	3143.8	2579.3*	2095.8*	1801.8*	1398.2*
	Elow							2486.7	1948.0	1614.6	1207.9
	Eup							2671.9	2249.0	2002.9	1610.0
75	OBS	19031.5	12944.6	10275.9	9481.7	6852.5	5634.9	5438.5	4458.4	3576.6	2757.1
	EXP	19031.5	12996.9	10204.3	9422.7	6891.0	5662.1	5009.3*	4109.9*	3339.4*	2871.0*
	Elow							4829.5	3820.1	2992.5	2480.3
	Eup							5189.2	4410.4	3712.2	3306.1
30-79	OBS	1990.6	1369.8	1072.1	1002.6	758.4	634.4	554.6	452.3	356.1	269.4
	EXP	1990.8	1369.4	1073.6	1004.1	757.3	633.9	533.0*	436.5*	357.0*	291.6*
	Elow							513.8	405.7	319.9	251.9
	Eup							552.1	468.4	396.8	335.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	421.0	281.0	151.0	175.0	107.0	84.0	90.0	72.0	53.8	44.0
	EXP	382.7	255.0	196.8	180.0	132.1	106.8	94.8*	80.4*	64.8*	48.4*
	CHI	3.832	2.651	10.664	0.136	4.764	4.855	0.243	0.870	1.859	0.393
35 -	OBS	685.0	454.0	299.0	286.0	208.0	204.0	181.0	146.0	121.0	129.0
	EXP	639.2	443.0	337.6	312.1	228.7	182.7	147.6*	131.1*	114.4*	93.8*
	CHI	3.288	0.271	4.423	2.187	1.874	2.492	7.536	1.705	0.385	13.226
40 -	OBS	1143.0	871.0	598.0	637.0	453.0	394.0	355.0	278.0	269.2	265.0
	EXP	1084.8	869.7	689.2	626.7	464.4	370.1	296.7*	239.9*	216.9*	192.8*
	CHI	3.123	0.002	12.075	0.170	0.277	1.539	11.462	6.046	12.590	27.048
45 -	OBS	1900.0	1433.0	1304.0	1305.0	963.0	829.0	718.0	610.0	508.8	485.0
	EXP	1906.2	1486.8	1360.6	1293.2	937.0	756.2	605.0*	485.9*	398.1*	367.5*
	CHI	0.020	1.949	2.352	0.108	0.721	7.013	21.125	31.723	30.779	37.598
50 -	OBS	4312.0	2681.0	2340.0	2475.0	1965.0	1514.0	1248.0	1054.0	934.6	850.0
	EXP	4238.3	2630.0	2347.9	2574.8	1957.4	1542.0	1249.9*	1003.1*	810.3*	679.6*
	CHI	1.283	0.989	0.026	3.870	0.029	0.507	0.003	2.587	19.076	42.753
55 -	OBS	7347.0	5886.0	3933.0	4193.0	3895.0	3169.0	2466.0	2050.0	1688.8	1476.0
	EXP	7339.6	5743.3	4045.1	4343.3	3804.0	3154.8	2497.2*	2033.5*	1648.1*	1348.6*
	CHI	0.008	3.545	3.106	5.204	2.178	0.064	0.390	0.133	1.003	12.026
60 -	OBS	13567.0	10521.0	9389.0	7787.0	6841.0	6442.0	5283.0	4102.0	3287.6	2624.0
	EXP	13726.3	10546.0	9287.2	7831.1	6729.3	6429.7	5378.8*	4280.2*	3520.6*	2880.5*
	CHI	1.848	0.059	1.115	0.249	1.856	0.024	1.707	7.417	15.420	22.849
65 -	OBS	24076.0	18466.0	16167.0	16873.0	11546.0	10832.0	10801.0	8567.0	6569.0	4751.0
	EXP	24308.8	18432.0	16073.3	16922.0	11430.0	10796.0	10401.4*	8787.3*	7065.6*	5825.4*
	CHI	2.230	0.063	0.546	0.142	1.178	0.120	15.349	5.524	34.908	198.142
70 -	OBS	39861.0	30156.0	26238.0	27500.0	23362.0	17417.0	17035.0	16919.0	13111.6	9645.0
	EXP	39694.2	30180.8	26356.0	27396.1	23483.6	17424.4	16883.1*	16384.9*	14104.2*	11489.7*
	CHI	0.701	0.020	0.528	0.394	0.630	0.003	1.367	17.408	69.858	296.158
75 -	OBS	54284.0	41398.0	36706.0	38801.0	32232.0	31353.0	25870.0	25756.0	25138.2	19648.0
	EXP	54284.0	41565.4	36450.4	38559.7	32413.1	31504.2	23828.4*	23742.9*	23471.2*	20460.1*
	CHI	0.000	0.675	1.792	1.510	1.011	0.726	174.927	170.683	118.393	32.233
30-79	OBS	147596.0	112147.0	97125.0	100032.0	81572.0	72238.0	64047.0	59554.0	51682.6	39917.0
	EXP	147604.0	112152.1	97144.2	100039.1	81579.4	72266.8	61382.9*	57169.1*	51414.3*	43386.2*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	1.043	1.042	1.005	0.920

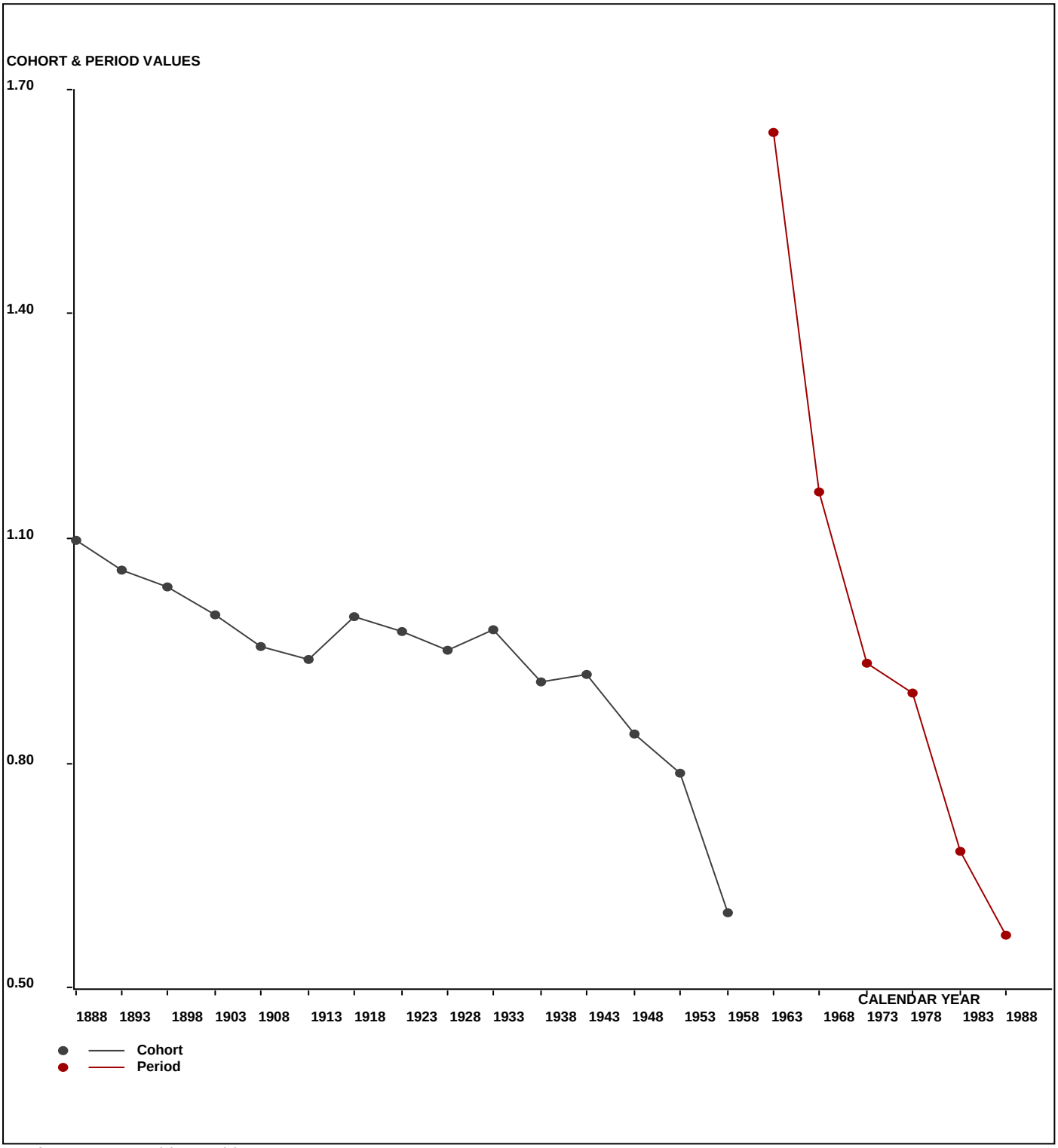
CHI SQUARE (LOG)= 1464.9008 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

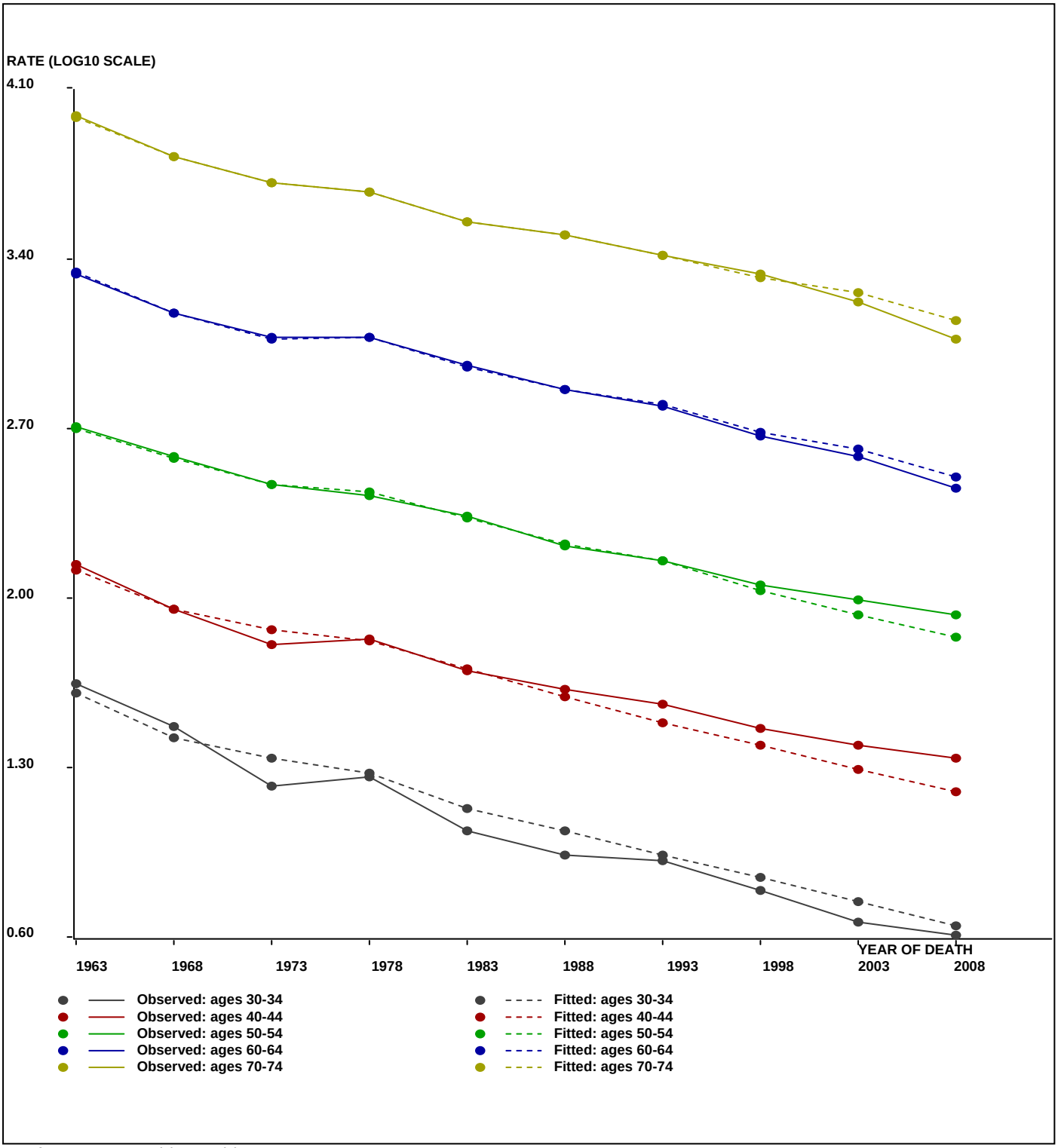


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	8.4	18.7	36.8	76.8	141.6	272.9	613.8	1283.5	2602.5	5438.5
	PRE	8.8	15.2	30.8	64.7	141.8	276.4	624.9	1236.0	2579.3	5009.3
	RES	-0.445	3.445	6.044	12.091	-0.220	-3.452	-11.134	47.482	23.212	429.202
1996-	OBS	6.3	13.6	28.8	63.6	113.7	235.8	464.7	1036.0	2164.1	4458.4
	PRE	7.0	12.2	24.9	50.7	108.3	233.9	484.9	1062.7	2095.8	4109.9
	RES	-0.732	1.390	3.949	12.953	5.497	1.894	-20.187	-26.643	68.312	348.466
2001-	OBS	4.7	10.3	24.7	52.4	97.8	183.0	383.2	766.6	1675.0	3576.6
	PRE	5.6	9.7	19.9	41.0	84.8	178.6	410.3	824.6	1801.8	3339.4
	RES	-0.952	0.565	4.787	11.401	13.013	4.406	-27.155	-57.961	-126.806	237.173
2006-	OBS	4.1	10.7	21.8	43.2	85.8	153.1	285.4	569.1	1173.7	2757.1
	PRE	4.5	7.8	15.9	32.8	68.6	139.9	313.3	697.7	1398.2	2871.0
	RES	-0.404	2.920	5.947	10.478	17.208	13.210	-27.903	-128.683	-224.473	-113.955

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	90.0	181.0	355.0	718.0	1248.0	2466.0	5283.0	10801.0	17035.0	25870.0
	PRE	94.8	147.6	296.7	605.0	1249.9	2497.2	5378.8	10401.4	16883.1	23828.4
	CHI	0.243	7.536	11.462	21.125	0.003	0.390	1.707	15.349	1.367	174.927
1996-	OBS	72.0	146.0	278.0	610.0	1054.0	2050.0	4102.0	8567.0	16919.0	25756.0
	PRE	80.4	131.1	239.9	485.9	1003.1	2033.5	4280.2	8787.3	16384.9	23742.9
	CHI	0.870	1.705	6.046	31.723	2.587	0.133	7.417	5.524	17.408	170.683
2001-	OBS	53.8	121.0	269.2	508.8	934.6	1688.8	3287.6	6569.0	13111.6	25138.2
	PRE	64.8	114.4	216.9	398.1	810.3	1648.1	3520.6	7065.6	14104.2	23471.2
	CHI	1.859	0.385	12.590	30.779	19.076	1.003	15.420	34.908	69.858	118.393
2006-	OBS	44.0	129.0	265.0	485.0	850.0	1476.0	2624.0	4751.0	9645.0	19648.0
	PRE	48.4	93.8	192.8	367.5	679.6	1348.6	2880.5	5825.4	11489.7	20460.1
	CHI	0.393	13.226	27.048	37.598	42.753	12.026	22.849	198.142	296.158	32.233

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	7798.71	152.92	51	P, C	98.42	41926.85	0.0000
AGE-PERIOD	375.20	8.34	45	Cohort	67.21	1994.37	0.0000
AGE-COHORT	181.00	5.03	36	Period	32.03	960.98	0.0000
PERIOD-COHORT	208.97	5.22	40	Age	41.13	1109.32	0.0000
FULL AGE-PERIOD-COHORT	123.03	3.84	32			653.09	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.574219	37.516234
35	1.853586	71.381551
40	2.144285	139.407141
45	2.442613	277.085296
50	2.692706	492.839996
55	2.899482	793.381878
60	3.151201	1416.448543
65	3.425594	2664.363771
70	3.727572	5340.379753
75	4.013961	10326.693942

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.082232	1.208459
1966	0.041608	1.100547
1971	0.007687	1.017857
1976	-0.007116	0.983749
1981	-0.050487	0.890251
1986	-0.112051	0.772589

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.055570	1.136500
1891	0.071500	1.178962
1896	0.065896	1.163848
1901	0.035714	1.085710
1906	0.004131	1.009558
1911	-0.036561	0.919261
1916	-0.069874	0.851386
1921	-0.138081	0.727644
1926	-0.181195	0.658878
1931	-0.198780	0.632732
1936	-0.216464	0.607485
1941	-0.187765	0.648986
1946	-0.153069	0.702961
1951	-0.081523	0.828852
1956	-0.113996	0.769138

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	205.0	264.0	239.0	251.0	279.0	216.0
	EXP	270.3	239.5	224.6	245.7	268.4	216.0
	CHI	15.8	2.5	0.9	0.1	0.4	0.0
35 -	OBS	430.0	442.0	478.0	457.0	456.0	432.0
	EXP	555.6	462.5	419.5	413.1	424.6	442.9
	CHI	28.4	0.9	8.2	4.7	2.3	0.3
40 -	OBS	808.0	922.0	905.0	912.0	781.0	675.0
	EXP	1013.1	973.0	828.6	786.5	727.5	713.9
	CHI	41.5	2.7	7.0	20.0	3.9	2.1
45 -	OBS	1762.0	1777.0	1919.0	1774.0	1453.0	1117.0
	EXP	2060.7	1800.0	1765.8	1581.7	1402.0	1239.7
	CHI	43.3	0.3	13.3	23.4	1.9	12.2
50 -	OBS	4254.0	3250.0	3236.0	3221.0	2592.0	1832.0
	EXP	4652.8	3249.3	2906.8	2997.3	2516.6	2128.7
	CHI	34.2	0.0	37.3	16.7	2.3	41.3
55 -	OBS	6845.0	6590.0	4864.0	4678.0	4394.0	3139.0
	EXP	7095.9	6615.2	4692.0	4427.8	4273.1	3435.3
	CHI	8.9	0.1	6.3	14.1	3.4	25.6
60 -	OBS	11627.0	11254.0	10441.0	7971.0	6986.0	6013.0
	EXP	11603.6	11153.2	10470.7	7798.2	6901.9	6377.9
	CHI	0.0	0.9	0.1	3.8	1.0	20.9
65 -	OBS	20305.0	18743.0	18015.0	17767.0	12153.0	10135.0
	EXP	19642.6	18529.6	18088.8	17805.8	12449.0	10629.9
	CHI	22.3	2.5	0.3	0.1	7.0	23.0
70 -	OBS	31918.0	31323.0	30399.0	30239.0	28001.0	19686.0
	EXP	31366.5	30993.0	30130.7	30750.7	28882.6	19469.3
	CHI	9.7	3.5	2.4	8.5	26.9	2.4
75 -	OBS	40454.0	42291.0	42681.0	44625.0	44376.0	42129.0
	EXP	40454.0	42851.0	43698.1	45135.4	43655.7	40807.3
	CHI	0.0	7.3	23.7	5.8	11.9	42.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	292643.27	7316.08	40	P, C	96.56	0.0000
AGE-PERIOD	6786.35	169.66	40	Cohort	-48.54	0.0000
AGE-COHORT	26055.32	651.38	40	Period	61.31	0.0000
PERIOD-COHORT	12807.06	320.18	40	Age	21.29	0.0000
FULL AGE-PERIOD-COHORT	10080.30	252.01	40			0.0000

AGE	EFFECT
30	37.516234
35	71.381551
40	139.407141
45	277.085296
50	492.839996
55	793.381878
60	1416.448543
65	2664.363771
70	5340.379753
75	10326.693942

PERIOD	EFFECT	LOWER	UPPER
% Period Change	86.7833	83.7833	89.7833
1961	1.208459		
1966	1.100547		
1971	1.017857		
1976	0.983749		
1981	0.890251		
1986	0.772589		
1991	0.670479	0.647301	0.693656
1996	0.581864	0.542330	0.622788
2001	0.504961	0.454382	0.559159
2006	0.438221	0.380696	0.502032

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.136500	1.000000	
1891	1.178962	2.000000	
1896	1.163848	4.000000	
1901	1.085710	8.000000	
1906	1.009558	16.000000	
1911	0.919261	32.000000	
1916	0.851386	64.000000	
1921	0.727644	128.000000	
1926	0.658878	256.000000	
1931	0.632732	512.000000	
1936	0.607485	1024.000000	
1941	0.648986	2048.000000	
1946	0.702961	4096.000000	
1951	0.828852	8192.000000	
1956	0.833091	EXTRAPOLATION	0.769138
1961	0.879579	EXTRAPOLATION	
1966	0.928662	EXTRAPOLATION	
1971	0.980483	EXTRAPOLATION	
1976	1.035196	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	21.8	27.6	26.4	26.5	28.8	22.3	23.9	17.2	12.5	10.0
	EXP	28.7	25.1	24.8	25.9	27.7	24.1	22.1*	20.3*	18.6*	17.0*
	Elow							21.4	18.9	16.7	14.8
	Eup							22.9	21.7	20.6	19.5
35	OBS	44.0	47.5	50.3	50.4	48.0	44.6	36.8	30.2	22.3	17.3
	EXP	56.8	49.7	44.1	45.6	44.7	45.7	39.9*	36.5*	33.5*	30.7*
	Elow							38.5	34.1	30.1	26.6
	Eup							41.2	39.1	37.1	35.1
40	OBS	97.8	95.8	98.1	96.6	86.5	71.6	60.7	55.9	38.2	30.6
	EXP	122.6	101.1	89.8	83.3	80.5	75.7	77.5*	67.6*	61.9*	56.7*
	Elow							74.8	63.0	55.7	49.3
	Eup							80.2	72.3	68.6	65.0
45	OBS	243.8	219.1	202.0	193.4	155.3	125.2	104.6	88.9	70.7	55.7
	EXP	285.1	221.9	185.8	172.5	149.9	138.9	130.6*	133.6*	116.6*	106.8*
	Elow							126.1	124.6	104.9	92.8
	Eup							135.1	143.0	129.1	122.4
50	OBS	500.6	461.9	406.3	343.3	285.9	199.1	160.7	128.2	110.9	86.9
	EXP	547.5	461.8	365.0	319.4	277.6	231.3	214.5*	201.6*	206.3*	179.9*
	Elow							207.0	187.9	185.6	156.3
	Eup							221.9	215.8	228.4	206.1
55	OBS	933.7	799.6	712.7	600.0	478.5	354.4	264.2	209.5	156.7	125.5
	EXP	967.9	802.7	687.5	567.9	465.4	387.8	323.1*	299.6*	281.6*	288.2*
	Elow							312.0	279.2	253.4	250.3
	Eup							334.3	320.7	311.9	330.1
60	OBS	1862.2	1588.0	1321.6	1212.6	928.7	679.8	497.6	357.1	288.7	207.5
	EXP	1858.4	1573.8	1325.3	1186.3	917.6	721.0	600.9*	500.7*	464.2*	436.3*
	Elow							580.1	466.7	417.7	379.1
	Eup							621.7	535.9	514.0	499.9
65	OBS	3873.7	3220.2	2726.7	2404.2	1971.4	1428.1	1064.5	815.9	565.6	444.3
	EXP	3747.3	3183.6	2737.9	2409.4	2019.4	1497.8	1177.0*	980.9*	817.3*	757.7*
	Elow							1136.3	914.3	735.4	658.3
	Eup							1217.7	1049.9	905.0	868.1
70	OBS	7742.4	6913.2	5954.2	5215.6	4237.0	3551.8	2489.3	1876.7	1438.9	1022.2
	EXP	7608.6	6840.3	5901.6	5303.8	4370.4	3512.8	2605.4*	2047.4*	1706.3*	1421.7*
	Elow							2515.3	1908.3	1535.4	1235.1
	Eup							2695.5	2191.4	1889.4	1628.7
75	OBS	14182.8	13223.8	11948.6	10904.9	9434.4	7571.7	6395.7	4554.1	3512.9	2724.4
	EXP	14182.8	13398.9	12233.3	11029.6	9281.2	7334.1	5894.8*	4372.2*	3435.8*	2863.4*
	Elow							5691.1	4075.2	3091.6	2487.5
	Eup							6098.6	4679.7	3804.5	3280.3
30-79	OBS	1606.5	1432.2	1255.1	1122.0	931.1	732.3	569.0	423.4	323.1	245.2
	EXP	1610.3	1431.9	1251.7	1117.7	930.8	740.7	593.6*	478.7*	406.0*	357.7*
	Elow							573.1	446.2	365.3	310.7
	Eup							614.1	512.4	449.5	409.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	205.0	264.0	239.0	251.0	279.0	216.0	257.0	196.0	143.6	108.0
	EXP	270.3	239.5	224.6	245.7	268.4	234.0	238.2*	231.6*	214.1*	183.4*
	CHI	15.767	2.497	0.930	0.112	0.417	1.379	1.477	5.482	23.237	30.974
35 -	OBS	430.0	442.0	478.0	457.0	456.0	432.0	356.0	325.0	262.6	209.0
	EXP	555.6	462.5	419.5	413.1	424.6	442.9	386.0*	393.0*	393.4*	370.0*
	CHI	28.410	0.908	8.151	4.661	2.323	0.270	2.338	11.768	43.465	70.026
40 -	OBS	808.0	922.0	905.0	912.0	781.0	675.0	586.0	539.0	417.0	372.0
	EXP	1013.1	973.0	828.6	786.5	727.5	713.9	747.4*	651.7*	675.9*	688.9*
	CHI	41.514	2.674	7.043	20.030	3.933	2.123	34.863	19.501	99.177	145.790
45 -	OBS	1762.0	1777.0	1919.0	1774.0	1453.0	1117.0	978.0	852.0	686.4	625.0
	EXP	2060.7	1800.0	1765.8	1581.7	1402.0	1239.7	1221.0*	1280.8*	1131.7*	1198.0*
	CHI	43.289	0.293	13.297	23.387	1.853	12.151	48.377	143.570	175.210	274.099
50 -	OBS	4254.0	3250.0	3236.0	3221.0	2592.0	1832.0	1417.0	1188.0	1059.8	861.0
	EXP	4652.8	3249.3	2906.8	2997.3	2516.6	2128.7	1890.7*	1867.9*	1970.7*	1782.2*
	CHI	34.176	0.000	37.273	16.693	2.257	41.344	118.660	247.480	421.071	476.190
55 -	OBS	6845.0	6590.0	4864.0	4678.0	4394.0	3139.0	2387.0	1822.0	1446.0	1210.0
	EXP	7095.9	6615.2	4692.0	4427.8	4273.1	3435.3	2919.8*	2605.2*	2599.5*	2778.2*
	CHI	8.874	0.096	6.303	14.134	3.420	25.562	97.220	235.439	511.827	885.192
60 -	OBS	11627.0	11254.0	10441.0	7971.0	6986.0	6013.0	4283.0	3152.0	2476.8	1908.0
	EXP	11603.6	11153.2	10470.7	7798.2	6901.9	6377.9	5172.1*	4419.2*	3982.7*	4011.9*
	CHI	0.047	0.911	0.084	3.829	1.024	20.875	152.824	363.351	569.422	1103.288
65 -	OBS	20305.0	18743.0	18015.0	17767.0	12153.0	10135.0	8958.0	6747.0	4846.6	3709.0
	EXP	19642.6	18529.6	18088.8	17805.8	12449.0	10629.9	9904.7*	8111.3*	7003.1*	6326.3*
	CHI	22.338	2.458	0.301	0.085	7.037	23.045	90.490	229.484	664.073	1082.831
70 -	OBS	31918.0	31323.0	30399.0	30239.0	28001.0	19686.0	16294.0	14672.0	11263.2	8400.0
	EXP	31366.5	30993.0	30130.7	30750.7	28882.6	19469.3	17053.9*	16006.6*	13356.4*	11683.0*
	CHI	9.697	3.514	2.389	8.514	26.912	2.411	33.857	111.275	328.056	922.523
75 -	OBS	40454.0	42291.0	42681.0	44625.0	44376.0	42129.0	30423.0	26309.0	24690.6	19415.0
	EXP	40454.0	42851.0	43698.1	45135.4	43655.7	40807.3	28040.5*	25258.2*	24148.4*	20405.5*
	CHI	0.000	7.318	23.675	5.772	11.885	42.805	202.427	43.712	12.176	48.079
30-79	OBS	118608.0	116856.0	113177.0	111895.0	101471.0	85374.0	65939.0	55802.0	47292.6	36817.0
	EXP	118715.1	116866.3	113225.6	111942.3	101501.5	85479.1	67574.4*	60825.6*	55476.0*	49427.3*
	O/E	0.999	1.000	1.000	1.000	1.000	0.999	0.976	0.917	0.852	0.745

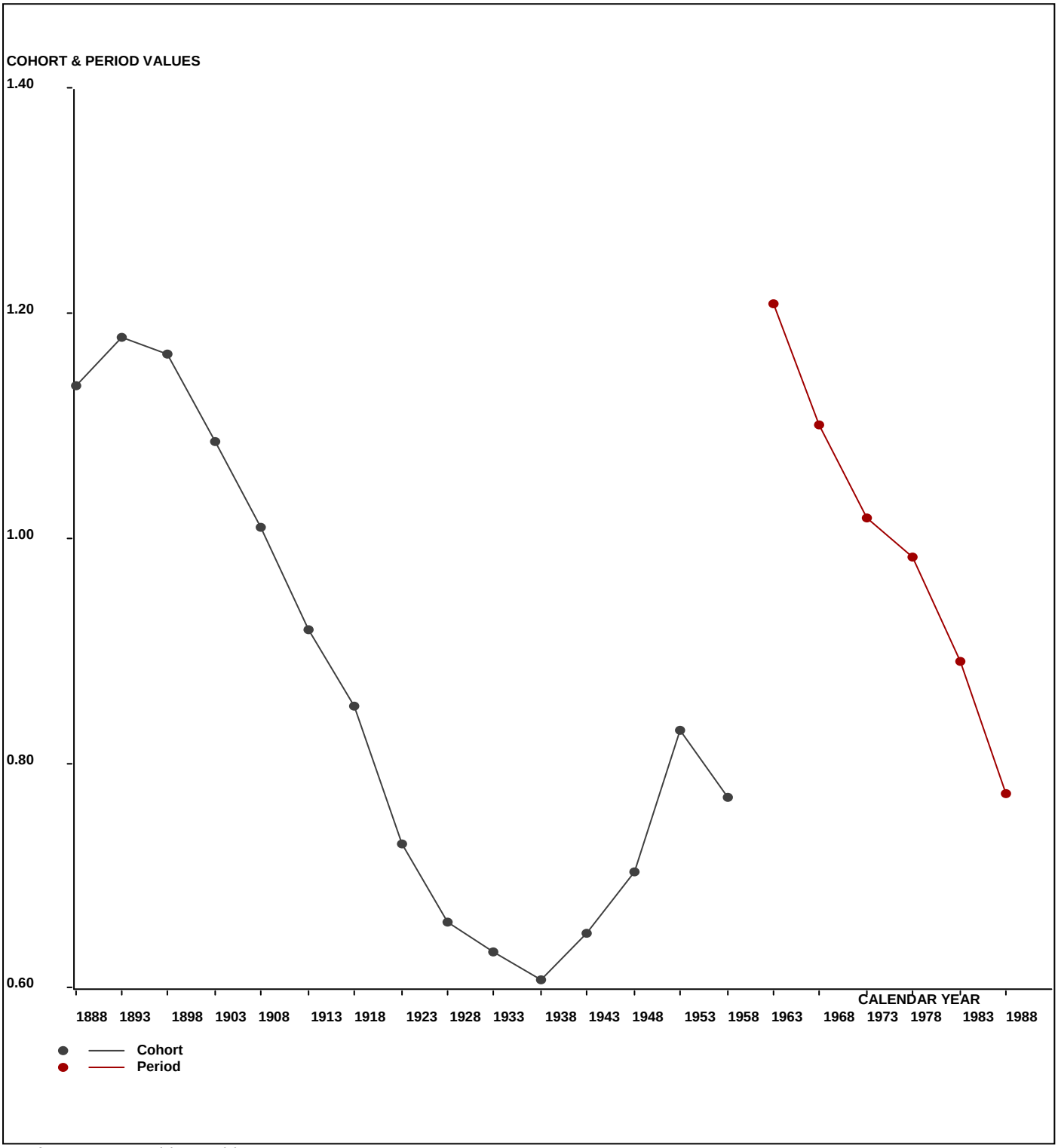
CHI SQUARE (LOG)= 10080.3010 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

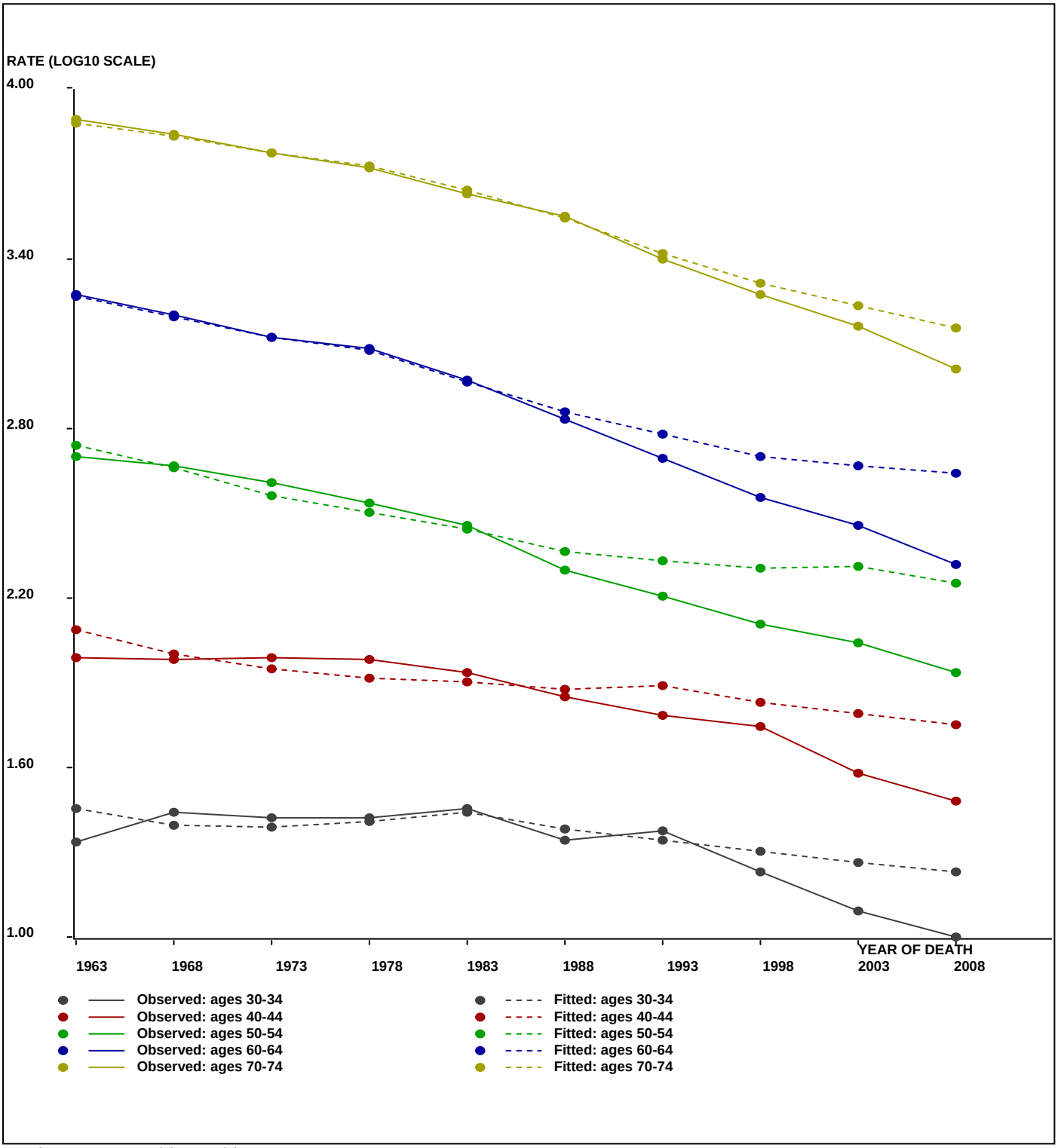


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	23.9	36.8	60.7	104.6	160.7	264.2	497.6	1064.5	2489.3	6395.7
	PRE	22.1	39.9	77.5	130.6	214.5	323.1	600.9	1177.0	2605.4	5894.8
	RES	1.742	-3.103	-16.732	-25.995	-53.725	-58.966	-103.293	-112.503	-116.088	500.857
1996-	OBS	17.2	30.2	55.9	88.9	128.2	209.5	357.1	815.9	1876.7	4554.1
	PRE	20.3	36.5	67.6	133.6	201.6	299.6	500.7	980.9	2047.4	4372.2
	RES	-3.119	-6.322	-11.689	-44.740	-73.376	-90.066	-143.566	-164.992	-170.705	181.887
2001-	OBS	12.5	22.3	38.2	70.7	110.9	156.7	288.7	565.6	1438.9	3512.9
	PRE	18.6	33.5	61.9	116.6	206.3	281.6	464.2	817.3	1706.3	3435.8
	RES	-6.119	-11.127	-23.718	-45.865	-95.346	-124.966	-175.517	-251.680	-267.410	77.150
2006-	OBS	10.0	17.3	30.6	55.7	86.9	125.5	207.5	444.3	1022.2	2724.4
	PRE	17.0	30.7	56.7	106.8	179.9	288.2	436.3	757.7	1421.7	2863.4
	RES	-6.995	-13.344	-26.099	-51.086	-93.003	-162.664	-228.822	-313.493	-399.497	-138.988

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	257.0	356.0	586.0	978.0	1417.0	2387.0	4283.0	8958.0	16294.0	30423.0
	PRE	238.2	386.0	747.4	1221.0	1890.7	2919.8	5172.1	9904.7	17053.9	28040.5
	CHI	1.477	2.338	34.863	48.377	118.660	97.220	152.824	90.490	33.857	202.427
1996-	OBS	196.0	325.0	539.0	852.0	1188.0	1822.0	3152.0	6747.0	14672.0	26309.0
	PRE	231.6	393.0	651.7	1280.8	1867.9	2605.2	4419.2	8111.3	16006.6	25258.2
	CHI	5.482	11.768	19.501	143.570	247.480	235.439	363.351	229.484	111.275	43.712
2001-	OBS	143.6	262.6	417.0	686.4	1059.8	1446.0	2476.8	4846.6	11263.2	24690.6
	PRE	214.1	393.4	675.9	1131.7	1970.7	2599.5	3982.7	7003.1	13356.4	24148.4
	CHI	23.237	43.465	99.177	175.210	421.071	511.827	569.422	664.073	328.056	12.176
2006-	OBS	108.0	209.0	372.0	625.0	861.0	1210.0	1908.0	3709.0	8400.0	19415.0
	PRE	183.4	370.0	688.9	1198.0	1782.2	2778.2	4011.9	6326.3	11683.0	20405.5
	CHI	30.974	70.026	145.790	274.099	476.190	885.192	1103.288	1082.831	922.523	48.079

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	529.35	10.38	51	P, C	98.61	2826.86	0.0000
AGE-PERIOD	61.47	1.37	45	Cohort	88.02	327.16	0.0000
AGE-COHORT	14.92	0.41	36	Period	50.65	79.19	0.0000
PERIOD-COHORT	22.82	0.57	40	Age	67.73	121.40	0.0000
FULL AGE-PERIOD-COHORT	7.36	0.23	32			39.09	0.1814

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.844078	6.983581
35	1.136511	13.693401
40	1.439477	27.509131
45	1.701092	50.244948
50	1.946581	88.426276
55	2.162204	145.279267
60	2.363019	230.684787
65	2.527752	337.094677
70	2.676085	474.334361
75	2.789147	615.384499

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.031466	0.930108
1966	-0.035080	0.922402
1971	-0.037198	0.917914
1976	-0.006429	0.985305
1981	0.014722	1.034480
1986	0.043665	1.105770

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.242997	0.571482
1891	-0.180915	0.659303
1896	-0.124117	0.751420
1901	-0.083715	0.824679
1906	-0.038954	0.914210
1911	-0.016198	0.963391
1916	0.053450	1.130968
1921	0.079115	1.199818
1926	0.083645	1.212397
1931	0.094404	1.242809
1936	0.055881	1.137316
1941	0.090997	1.233098
1946	0.036163	1.086834
1951	0.045162	1.109590
1956	-0.067845	0.855373

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	90.0	69.0	77.0	68.0	58.0	64.0
	EXP	76.1	70.0	71.6	70.8	77.7	64.0
	CHI	2.6	0.0	0.4	0.1	5.0	0.0
35 -	OBS	141.0	148.0	132.0	157.0	134.0	179.0
	EXP	151.0	146.1	135.9	150.8	146.3	162.8
	CHI	0.7	0.0	0.1	0.3	1.0	1.6
40 -	OBS	248.0	280.0	313.0	289.0	301.0	326.0
	EXP	253.7	296.1	289.6	291.0	317.0	311.7
	CHI	0.1	0.9	1.9	0.0	0.8	0.7
45 -	OBS	401.0	428.0	542.0	536.0	569.0	615.0
	EXP	382.0	451.1	531.3	564.2	553.1	611.3
	CHI	0.9	1.2	0.2	1.4	0.5	0.0
50 -	OBS	654.0	671.0	796.0	995.0	1012.0	1014.0
	EXP	673.4	649.1	775.5	991.1	1030.6	1023.4
	CHI	0.6	0.7	0.5	0.0	0.3	0.1
55 -	OBS	924.0	1051.0	1031.0	1348.0	1652.0	1773.0
	EXP	905.6	1064.0	1029.3	1339.0	1673.1	1768.4
	CHI	0.4	0.2	0.0	0.1	0.3	0.0
60 -	OBS	1079.0	1416.0	1552.0	1687.0	2171.0	2767.0
	EXP	1104.8	1378.6	1611.7	1689.8	2153.8	2735.6
	CHI	0.6	1.0	2.2	0.0	0.1	0.4
65 -	OBS	1207.0	1524.0	1849.0	2437.0	2392.0	3155.0
	EXP	1234.9	1492.5	1868.9	2364.7	2431.2	3174.0
	CHI	0.6	0.7	0.2	2.2	0.6	0.1
70 -	OBS	1233.0	1482.0	1817.0	2409.0	3182.0	3286.0
	EXP	1199.1	1489.6	1833.2	2477.2	3124.1	3287.8
	CHI	1.0	0.0	0.1	1.9	1.1	0.0
75 -	OBS	933.0	1162.0	1551.0	2056.0	2768.0	3606.0
	EXP	933.0	1196.9	1516.2	2046.3	2737.5	3647.6
	CHI	0.0	1.0	0.8	0.0	0.3	0.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	15590.78	389.77	40	P, C	88.08	0.0000
AGE-PERIOD	3861.70	96.54	40	Cohort	51.89	0.0000
AGE-COHORT	1464.02	36.60	40	Period	-26.91	0.0000
PERIOD-COHORT	1558.58	38.96	40	Age	-19.21	0.0000
FULL AGE-PERIOD-COHORT	1857.93	46.45	40			0.0000

AGE	EFFECT
30	6.983581
35	13.693401
40	27.509131
45	50.244948
50	88.426276
55	145.279267
60	230.684787
65	337.094677
70	474.334361
75	615.384499

PERIOD	EFFECT	LOWER	UPPER
% Period Change	106.8914	103.8914	109.8914
1961	0.930108		
1966	0.922402		
1971	0.917914		
1976	0.985305		
1981	1.034480		
1986	1.105770		
1991	1.181973	1.148800	1.215147
1996	1.263428	1.193505	1.335342
2001	1.350496	1.239949	1.467426
2006	1.443564	1.288201	1.612575

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.571482	1.000000	
1891	0.659303	2.000000	
1896	0.751420	4.000000	
1901	0.824679	8.000000	
1906	0.914210	16.000000	
1911	0.963391	32.000000	
1916	1.130968	64.000000	
1921	1.199818	128.000000	
1926	1.212397	256.000000	
1931	1.242809	512.000000	
1936	1.137316	1024.000000	
1941	1.233098	2048.000000	
1946	1.086834	4096.000000	
1951	1.109590	8192.000000	
1956	1.093203	EXTRAPOLATION	0.855373
1961	1.077332	EXTRAPOLATION	
1966	1.061690	EXTRAPOLATION	
1971	1.046276	EXTRAPOLATION	
1976	1.031086	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	9.6	7.2	8.5	7.2	6.0	6.6	7.2	6.7	5.5	5.6
	EXP	8.1	7.3	7.9	7.5	8.0	8.4	8.9*	9.4*	9.9*	10.4*
	Elow							8.6	8.8	9.1	9.3
	Eup							9.1	9.9	10.7	11.6
35	OBS	14.4	15.9	13.9	17.3	14.1	18.5	21.1	15.6	15.8	13.4
	EXP	15.4	15.7	14.3	16.6	15.4	16.8	17.7*	18.6*	19.6*	20.7*
	Elow							17.2	17.6	18.0	18.5
	Eup							18.2	19.7	21.3	23.1
40	OBS	30.0	29.1	33.9	30.6	33.3	34.6	35.8	45.3	45.9	39.5
	EXP	30.7	30.8	31.4	30.8	35.1	33.1	36.1*	38.0*	40.0*	42.2*
	Elow							35.1	35.9	36.7	37.6
	Eup							37.1	40.2	43.5	47.1
45	OBS	55.5	52.8	57.0	58.4	60.8	68.9	77.0	79.2	93.8	94.7
	EXP	52.9	55.6	55.9	61.5	59.1	68.5	64.5*	70.4*	74.2*	78.1*
	Elow							62.7	66.5	68.1	69.7
	Eup							66.4	74.4	80.6	87.3
50	OBS	77.0	95.4	100.0	106.0	111.6	110.2	119.8	139.0	165.3	193.4
	EXP	79.2	92.2	97.4	105.6	113.7	111.2	128.9*	121.4*	132.5*	139.5*
	Elow							125.3	114.7	121.7	124.5
	Eup							132.5	128.3	144.0	155.9
55	OBS	126.0	127.5	151.1	172.9	179.9	200.2	198.3	209.6	240.3	280.5
	EXP	123.5	129.1	150.8	171.7	182.2	199.7	195.3*	226.3*	213.2*	232.7*
	Elow							189.8	213.8	195.8	207.7
	Eup							200.8	239.2	231.7	259.9
60	OBS	172.8	199.8	196.4	256.6	288.6	312.8	315.3	291.6	341.6	383.3
	EXP	176.9	194.5	204.0	257.1	286.3	309.3	338.9*	331.5*	384.2*	361.9*
	Elow							329.4	313.1	352.7	323.0
	Eup							348.4	350.3	417.4	404.3
65	OBS	230.3	261.8	279.9	329.8	388.0	444.6	461.2	472.2	473.5	518.8
	EXP	235.6	256.4	282.9	320.0	394.4	447.2	483.1*	529.3*	517.8*	600.0*
	Elow							469.5	500.0	475.4	535.5
	Eup							496.6	559.4	562.6	670.3
70	OBS	299.1	327.1	355.9	415.5	481.5	592.9	625.2	648.0	674.5	660.2
	EXP	290.9	328.8	359.1	427.3	472.7	593.2	672.7*	726.6*	796.1*	778.8*
	Elow							653.8	686.4	731.0	694.9
	Eup							691.6	767.9	865.1	869.9
75	OBS	327.1	363.3	434.2	502.4	588.5	648.1	779.1	830.4	851.9	914.9
	EXP	327.1	374.2	424.5	500.0	582.0	655.6	822.6*	932.9*	1007.6*	1104.0*
	Elow							799.5	881.2	925.1	985.2
	Eup							845.7	985.9	1094.8	1233.3
30-79	OBS	98.1	107.7	117.0	135.1	150.5	168.9	179.5	185.6	201.0	216.6
	EXP	98.2	107.6	116.9	135.1	151.0	168.9	186.4*	199.7*	211.1*	221.6*
	Elow							181.2	188.6	193.8	197.7
	Eup							191.7	211.1	229.3	247.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	90.0	69.0	77.0	68.0	58.0	64.0	77.0	76.0	63.4	60.0
	EXP	76.1	70.0	71.6	70.8	77.7	81.8	95.8*	107.0*	113.8*	112.0*
	CHI	2.555	0.013	0.404	0.114	5.006	3.871	3.675	9.000	22.295	24.136
35 -	OBS	141.0	148.0	132.0	157.0	134.0	179.0	204.0	168.0	185.6	162.0
	EXP	151.0	146.1	135.9	150.8	146.3	162.8	171.3*	200.5*	230.7*	249.5*
	CHI	0.657	0.026	0.111	0.254	1.039	1.612	6.236	5.270	8.824	30.671
40 -	OBS	248.0	280.0	313.0	289.0	301.0	326.0	345.0	437.0	500.6	480.0
	EXP	253.7	296.1	289.6	291.0	317.0	311.7	348.1*	366.4*	436.9*	512.0*
	CHI	0.128	0.877	1.886	0.014	0.803	0.652	0.027	13.587	9.284	1.996
45 -	OBS	401.0	428.0	542.0	536.0	569.0	615.0	720.0	759.0	910.4	1062.0
	EXP	382.0	451.1	531.3	564.2	553.1	611.3	603.5*	675.1*	720.2*	876.5*
	CHI	0.941	1.180	0.214	1.414	0.458	0.022	22.496	10.421	50.233	39.242
50 -	OBS	654.0	671.0	796.0	995.0	1012.0	1014.0	1056.0	1288.0	1579.2	1916.0
	EXP	673.4	649.1	775.5	991.1	1030.6	1023.4	1136.2*	1125.1*	1266.0*	1382.3*
	CHI	0.557	0.740	0.539	0.015	0.336	0.086	5.667	23.586	77.494	206.086
55 -	OBS	924.0	1051.0	1031.0	1348.0	1652.0	1773.0	1792.0	1823.0	2218.2	2704.0
	EXP	905.6	1064.0	1029.3	1339.0	1673.1	1768.4	1764.6*	1968.1*	1968.2*	2243.4*
	CHI	0.373	0.159	0.003	0.060	0.265	0.012	0.426	10.699	31.750	94.555
60 -	OBS	1079.0	1416.0	1552.0	1687.0	2171.0	2767.0	2714.0	2574.0	2931.0	3524.0
	EXP	1104.8	1378.6	1611.7	1689.8	2153.8	2735.6	2916.7*	2925.7*	3296.1*	3327.7*
	CHI	0.603	1.013	2.209	0.004	0.138	0.361	14.084	42.283	40.438	11.584
65 -	OBS	1207.0	1524.0	1849.0	2437.0	2392.0	3155.0	3881.0	3905.0	4057.4	4331.0
	EXP	1234.9	1492.5	1868.9	2364.7	2431.2	3174.0	4065.0*	4376.9*	4436.4*	5009.7*
	CHI	0.632	0.666	0.213	2.212	0.633	0.113	8.331	50.875	32.379	91.954
70 -	OBS	1233.0	1482.0	1817.0	2409.0	3182.0	3286.0	4092.0	5066.0	5279.8	5425.0
	EXP	1199.1	1489.6	1833.2	2477.2	3124.1	3287.8	4403.1*	5680.4*	6231.9*	6399.6*
	CHI	0.957	0.039	0.143	1.880	1.074	0.001	21.975	66.459	145.474	148.424
75 -	OBS	933.0	1162.0	1551.0	2056.0	2768.0	3606.0	3706.0	4797.0	5987.6	6520.0
	EXP	933.0	1196.9	1516.2	2046.3	2737.5	3647.6	3913.1*	5389.1*	7081.9*	7867.9*
	CHI	0.000	1.015	0.800	0.046	0.340	0.474	10.958	65.048	169.087	230.921
30-79	OBS	6910.0	8231.0	9660.0	11982.0	14239.0	16785.0	18587.0	20893.0	23713.2	26184.0
	EXP	6913.6	8233.9	9663.2	11985.0	14244.3	16804.4	19417.3*	22814.4*	25782.1*	27980.6*
	O/E	0.999	1.000	1.000	1.000	1.000	0.999	0.957	0.916	0.920	0.936

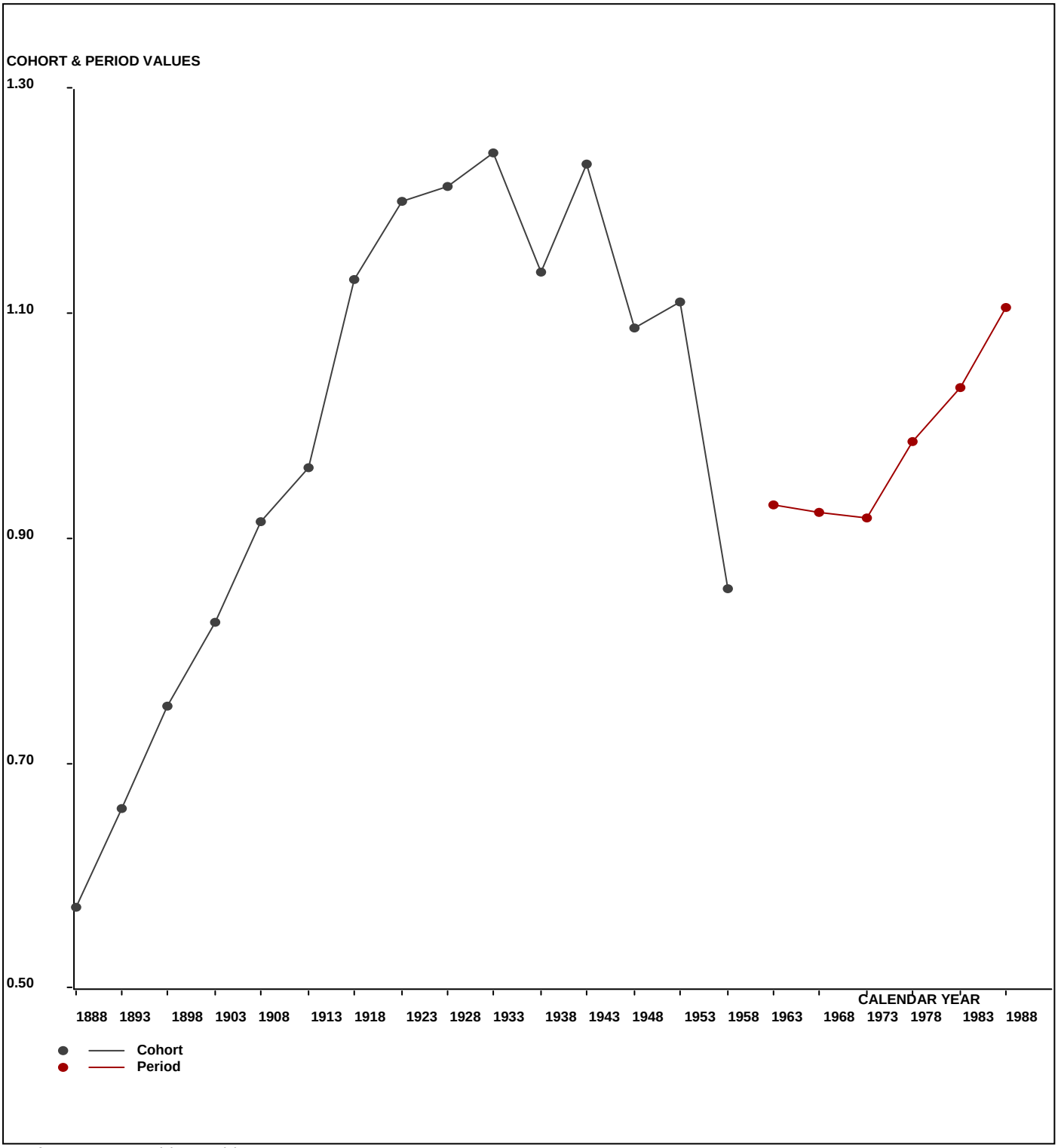
CHI SQUARE (LOG)= 1857.9301 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

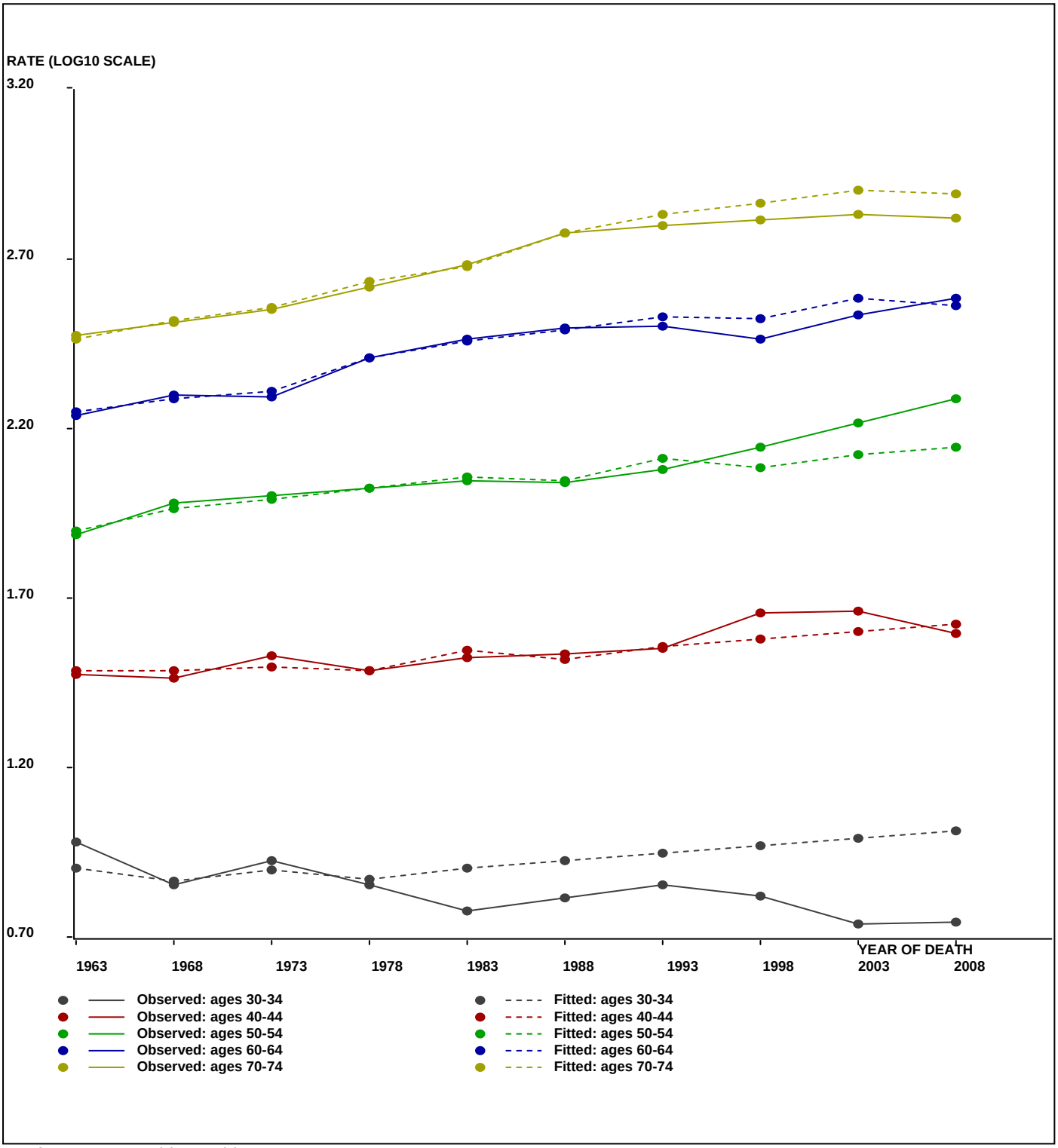


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	7.2	21.1	35.8	77.0	119.8	198.3	315.3	461.2	625.2	779.1
	PRE	8.9	17.7	36.1	64.5	128.9	195.3	338.9	483.1	672.7	822.6
	RES	-1.742	3.376	-0.318	12.462	-9.102	3.035	-23.548	-21.869	-47.522	-43.533
1996-	OBS	6.7	15.6	45.3	79.2	139.0	209.6	291.6	472.2	648.0	830.4
	PRE	9.4	18.6	38.0	70.4	121.4	226.3	331.5	529.3	726.6	932.9
	RES	-2.716	-3.022	7.316	8.751	17.580	-16.688	-39.849	-57.066	-78.590	-102.488
2001-	OBS	5.5	15.8	45.9	93.8	165.3	240.3	341.6	473.5	674.5	851.9
	PRE	9.9	19.6	40.0	74.2	132.5	213.2	384.2	517.8	796.1	1007.6
	RES	-4.368	-3.840	5.834	19.591	32.784	27.083	-42.551	-44.233	-121.636	-155.692
2006-	OBS	5.6	13.4	39.5	94.7	193.4	280.5	383.3	518.8	660.2	914.9
	PRE	10.4	20.7	42.2	78.1	139.5	232.7	361.9	600.0	778.8	1104.0
	RES	-4.826	-7.252	-2.633	16.534	53.882	47.774	21.354	-81.295	-118.598	-189.142

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	77.0	204.0	345.0	720.0	1056.0	1792.0	2714.0	3881.0	4092.0	3706.0
	PRE	95.8	171.3	348.1	603.5	1136.2	1764.6	2916.7	4065.0	4403.1	3913.1
	CHI	3.675	6.236	0.027	22.496	5.667	0.426	14.084	8.331	21.975	10.958
1996-	OBS	76.0	168.0	437.0	759.0	1288.0	1823.0	2574.0	3905.0	5066.0	4797.0
	PRE	107.0	200.5	366.4	675.1	1125.1	1968.1	2925.7	4376.9	5680.4	5389.1
	CHI	9.000	5.270	13.587	10.421	23.586	10.699	42.283	50.875	66.459	65.048
2001-	OBS	63.4	185.6	500.6	910.4	1579.2	2218.2	2931.0	4057.4	5279.8	5987.6
	PRE	113.8	230.7	436.9	720.2	1266.0	1968.2	3296.1	4436.4	6231.9	7081.9
	CHI	22.295	8.824	9.284	50.233	77.494	31.750	40.438	32.379	145.474	169.087
2006-	OBS	60.0	162.0	480.0	1062.0	1916.0	2704.0	3524.0	4331.0	5425.0	6520.0
	PRE	112.0	249.5	512.0	876.5	1382.3	2243.4	3327.7	5009.7	6399.6	7867.9
	CHI	24.136	30.671	1.996	39.242	206.086	94.555	11.584	91.954	148.424	230.921

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	2077.06	40.73	51	P, C	99.07	11210.73	0.0000
AGE-PERIOD	39.29	0.87	45	Cohort	51.05	208.51	0.0000
AGE-COHORT	100.18	2.78	36	Period	80.80	532.36	0.0000
PERIOD-COHORT	32.32	0.81	40	Age	40.50	171.52	0.0000
FULL AGE-PERIOD-COHORT	19.23	0.60	32			102.09	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.006544	10.151817
35	1.185773	15.338164
40	1.371739	23.536326
45	1.619093	41.599973
50	1.855863	71.756821
55	2.125127	133.391172
60	2.416026	260.630689
65	2.692977	493.147443
70	2.981317	957.893851
75	3.250280	1779.424518

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.113604	1.298984
1966	0.117740	1.311415
1971	0.049651	1.121118
1976	-0.043576	0.904531
1981	-0.155384	0.699224
1986	-0.218885	0.604108

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.011378	1.026545
1891	0.012298	1.028721
1896	0.020666	1.048737
1901	0.013984	1.032723
1906	0.002927	1.006763
1911	-0.005067	0.988400
1916	0.005483	1.012705
1921	-0.052639	0.885851
1926	-0.076810	0.837897
1931	-0.078759	0.834145
1936	-0.119625	0.759233
1941	-0.097668	0.798605
1946	-0.176067	0.666704
1951	-0.146125	0.714291
1956	-0.074970	0.841453

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	103.0	91.0	87.0	63.0	45.0	50.0
	EXP	103.6	96.5	82.4	58.0	49.2	50.0
	CHI	0.0	0.3	0.3	0.4	0.4	0.0
35 -	OBS	150.0	152.0	141.0	99.0	64.0	68.0
	EXP	163.2	156.1	124.1	100.4	68.0	64.1
	CHI	1.1	0.1	2.3	0.0	0.2	0.2
40 -	OBS	212.0	235.0	211.0	158.0	131.0	88.0
	EXP	223.8	248.9	203.1	152.6	118.7	89.4
	CHI	0.6	0.8	0.3	0.2	1.3	0.0
45 -	OBS	313.0	387.0	428.0	313.0	214.0	162.0
	EXP	395.6	392.0	371.3	287.8	206.6	179.1
	CHI	17.2	0.1	8.6	2.2	0.3	1.6
50 -	OBS	716.0	680.0	607.0	542.0	386.0	276.0
	EXP	783.0	670.6	567.5	510.3	379.4	302.9
	CHI	5.7	0.1	2.7	2.0	0.1	2.4
55 -	OBS	1220.0	1440.0	1115.0	856.0	688.0	558.0
	EXP	1278.9	1425.0	1033.5	833.3	717.6	595.4
	CHI	2.7	0.2	6.4	0.6	1.2	2.3
60 -	OBS	2158.0	2508.0	2224.0	1608.0	1225.0	1128.0
	EXP	2183.0	2438.7	2281.7	1569.3	1214.3	1167.0
	CHI	0.3	2.0	1.5	1.0	0.1	1.3
65 -	OBS	3567.0	3976.0	3685.0	3228.0	2097.0	1814.0
	EXP	3521.5	3887.3	3677.5	3258.2	2152.7	1872.9
	CHI	0.6	2.0	0.0	0.3	1.4	1.9
70 -	OBS	5472.0	6011.0	5582.0	4941.0	4334.0	3243.0
	EXP	5276.9	5969.1	5662.3	5057.5	4375.0	3248.0
	CHI	7.2	0.3	1.1	2.7	0.4	0.0
75 -	OBS	6768.0	7476.0	7385.0	6817.0	5986.0	6086.0
	EXP	6768.0	7677.3	7473.4	6802.1	5891.9	5911.8
	CHI	0.0	5.3	1.0	0.0	1.5	5.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	43985.72	1099.64	40	P, C	97.85	0.0000
AGE-PERIOD	1012.89	25.32	40	Cohort	6.52	0.0000
AGE-COHORT	1439.95	36.00	40	Period	34.24	0.0000
PERIOD-COHORT	1221.51	30.54	40	Age	22.48	0.0000
FULL AGE-PERIOD-COHORT	946.88	23.67	40			0.0000

AGE	EFFECT
30	10.151817
35	15.338164
40	23.536326
45	41.599973
50	71.756821
55	133.391172
60	260.630689
65	493.147443
70	957.893851
75	1779.424518

PERIOD	EFFECT	LOWER	UPPER
% Period Change	86.3969	83.3969	89.3969
1961	1.298984		
1966	1.311415		
1971	1.121118		
1976	0.904531		
1981	0.699224		
1986	0.604108		
1991	0.521931	0.503807	0.540054
1996	0.450932	0.420160	0.482792
2001	0.389591	0.350400	0.431601
2006	0.336595	0.292223	0.385838

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.026545	1.000000	
1891	1.028721	2.000000	
1896	1.048737	4.000000	
1901	1.032723	8.000000	
1906	1.006763	16.000000	
1911	0.988400	32.000000	
1916	1.012705	64.000000	
1921	0.885851	128.000000	
1926	0.837897	256.000000	
1931	0.834145	512.000000	
1936	0.759233	1024.000000	
1941	0.798605	2048.000000	
1946	0.666704	4096.000000	
1951	0.714291	8192.000000	
1956	0.671807	EXTRAPOLATION	0.841453
1961	0.647543	EXTRAPOLATION	
1966	0.624156	EXTRAPOLATION	
1971	0.601613	EXTRAPOLATION	
1976	0.579884	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	10.9	9.5	9.6	6.7	4.6	5.2	3.7	3.3	2.0	1.9
	EXP	11.0	10.1	9.1	6.1	5.1	4.1	3.4*	2.9*	2.4*	2.0*
	Elow							3.3	2.7	2.1	1.7
	Eup							3.6	3.1	2.6	2.3
35	OBS	15.3	16.3	14.8	10.9	6.7	7.0	5.1	3.9	2.7	1.7
	EXP	16.7	16.8	13.1	11.1	7.2	6.6	5.4*	4.5*	3.7*	3.1*
	Elow							5.2	4.2	3.4	2.7
	Eup							5.6	4.8	4.1	3.6
40	OBS	25.7	24.4	22.9	16.7	14.5	9.3	8.0	6.1	5.2	4.6
	EXP	27.1	25.9	22.0	16.2	13.1	9.5	8.8*	7.1*	5.9*	4.9*
	Elow							8.5	6.6	5.3	4.3
	Eup							9.1	7.6	6.6	5.7
45	OBS	43.3	47.7	45.0	34.1	22.9	18.2	13.5	11.2	8.2	7.1
	EXP	54.7	48.3	39.1	31.4	22.1	20.1	14.5*	13.4*	10.9*	9.1*
	Elow							14.0	12.5	9.8	7.9
	Eup							15.0	14.3	12.1	10.4
50	OBS	84.3	96.6	76.2	57.8	42.6	30.0	22.8	20.0	18.8	16.1
	EXP	92.1	95.3	71.3	54.4	41.9	32.9	29.9*	21.6*	20.0*	16.2*
	Elow							28.9	20.1	18.0	14.1
	Eup							30.9	23.1	22.1	18.6
55	OBS	166.4	174.7	163.4	109.8	74.9	63.0	50.1	36.7	31.3	30.7
	EXP	174.4	172.9	151.4	106.9	78.2	67.2	52.9*	48.0*	34.6*	32.1*
	Elow							51.0	44.8	31.2	27.8
	Eup							54.7	51.4	38.4	36.8
60	OBS	345.6	353.9	281.5	244.6	162.9	127.5	97.9	75.9	66.9	63.1
	EXP	349.6	344.1	288.8	238.7	161.4	131.9	113.5*	89.2*	81.1*	58.5*
	Elow							109.5	83.1	72.9	50.8
	Eup							117.4	95.5	89.8	67.0
65	OBS	680.5	683.1	557.8	436.8	340.2	255.6	210.1	176.7	140.7	129.4
	EXP	671.8	667.9	556.6	440.9	349.2	263.9	215.7*	185.5*	145.9*	132.6*
	Elow							208.2	172.8	131.2	115.1
	Eup							223.2	198.6	161.6	152.0
70	OBS	1327.3	1326.7	1093.3	852.2	655.8	585.1	456.0	380.1	332.1	269.5
	EXP	1280.0	1317.4	1109.1	872.3	662.0	586.0	442.9*	361.9*	311.3*	244.8*
	Elow							427.5	337.2	280.0	212.5
	Eup							458.3	387.5	344.9	280.6
75	OBS	2372.8	2337.6	2067.4	1665.8	1272.6	1093.8	1022.7	812.0	715.1	672.4
	EXP	2372.8	2400.6	2092.2	1662.2	1252.6	1062.5	940.5*	710.8*	580.9*	499.6*
	Elow							907.9	662.3	522.4	433.7
	Eup							973.2	761.0	643.5	572.7
30-79	OBS	280.6	283.1	240.2	189.1	141.4	117.6	98.5	79.7	68.5	61.7
	EXP	281.4	282.9	239.5	188.6	141.6	118.4	98.0*	78.7*	65.3*	54.5*
	Elow							94.6	73.4	58.8	47.3
	Eup							101.4	84.3	72.4	62.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	103.0	91.0	87.0	63.0	45.0	50.0	40.0	38.0	22.8	21.0
	EXP	103.6	96.5	82.4	58.0	49.2	39.9	36.9*	32.6*	27.4*	21.3*
	CHI	0.004	0.317	0.262	0.433	0.352	2.546	0.252	0.877	0.782	0.006
35 -	OBS	150.0	152.0	141.0	99.0	64.0	68.0	49.0	42.0	31.6	21.0
	EXP	163.2	156.1	124.1	100.4	68.0	64.1	52.1*	48.2*	43.8*	37.5*
	CHI	1.069	0.109	2.303	0.021	0.231	0.233	0.181	0.793	3.412	7.236
40 -	OBS	212.0	235.0	211.0	158.0	131.0	88.0	77.0	59.0	56.8	56.0
	EXP	223.8	248.9	203.1	152.6	118.7	89.4	84.7*	68.8*	64.8*	60.0*
	CHI	0.625	0.780	0.304	0.192	1.272	0.022	0.692	1.387	0.992	0.272
45 -	OBS	313.0	387.0	428.0	313.0	214.0	162.0	126.0	107.0	79.6	80.0
	EXP	395.6	392.0	371.3	287.8	206.6	179.1	135.3*	128.4*	105.7*	101.7*
	CHI	17.233	0.064	8.647	2.198	0.263	1.631	0.645	3.575	6.449	4.634
50 -	OBS	716.0	680.0	607.0	542.0	386.0	276.0	201.0	185.0	179.4	159.0
	EXP	783.0	670.6	567.5	510.3	379.4	302.9	263.7*	199.9*	190.8*	160.7*
	CHI	5.725	0.133	2.746	1.971	0.115	2.385	14.904	1.110	0.679	0.019
55 -	OBS	1220.0	1440.0	1115.0	856.0	688.0	558.0	453.0	319.0	289.0	296.0
	EXP	1278.9	1425.0	1033.5	833.3	717.6	595.4	477.6*	417.7*	319.8*	309.2*
	CHI	2.709	0.158	6.421	0.617	1.220	2.348	1.267	23.324	2.967	0.562
60 -	OBS	2158.0	2508.0	2224.0	1608.0	1225.0	1128.0	843.0	670.0	574.2	580.0
	EXP	2183.0	2438.7	2281.7	1569.3	1214.3	1167.0	976.6*	787.6*	695.8*	537.8*
	CHI	0.287	1.971	1.460	0.953	0.094	1.300	18.289	17.554	21.236	3.318
65 -	OBS	3567.0	3976.0	3685.0	3228.0	2097.0	1814.0	1768.0	1461.0	1205.2	1080.0
	EXP	3521.5	3887.3	3677.5	3258.2	2152.7	1872.9	1814.8*	1533.9*	1249.9*	1106.7*
	CHI	0.589	2.023	0.015	0.280	1.440	1.854	1.209	3.462	1.597	0.646
70 -	OBS	5472.0	6011.0	5582.0	4941.0	4334.0	3243.0	2985.0	2972.0	2599.4	2215.0
	EXP	5276.9	5969.1	5662.3	5057.5	4375.0	3248.0	2898.9*	2829.6*	2436.7*	2011.6*
	CHI	7.211	0.294	1.137	2.683	0.385	0.008	2.555	7.170	10.858	20.557
75 -	OBS	6768.0	7476.0	7385.0	6817.0	5986.0	6086.0	4865.0	4691.0	5026.0	4792.0
	EXP	6768.0	7677.3	7473.4	6802.1	5891.9	5911.8	4473.9*	4106.3*	4082.7*	3560.4*
	CHI	0.000	5.278	1.045	0.033	1.501	5.136	34.184	83.249	217.967	426.014
30-79	OBS	20679.0	22956.0	21465.0	18625.0	15170.0	13473.0	11407.0	10544.0	10064.0	9300.0
	EXP	20697.5	22961.6	21476.8	18629.6	15173.4	13470.5	11214.7*	10153.0*	9217.4*	7907.0*
	O/E	0.999	1.000	0.999	1.000	1.000	1.000	1.017	1.039	1.092	1.176

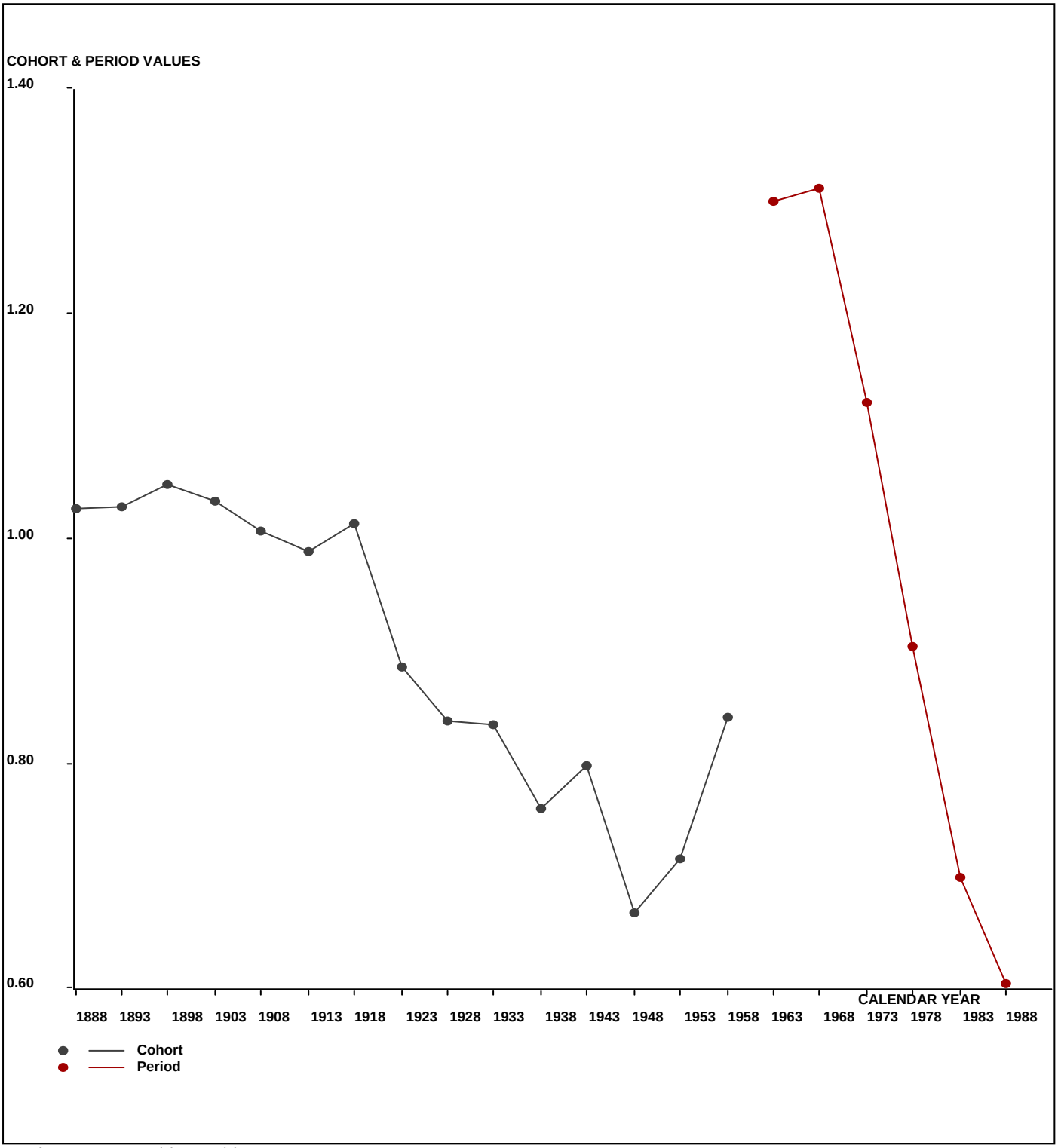
CHI SQUARE (LOG)= 946.8802 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

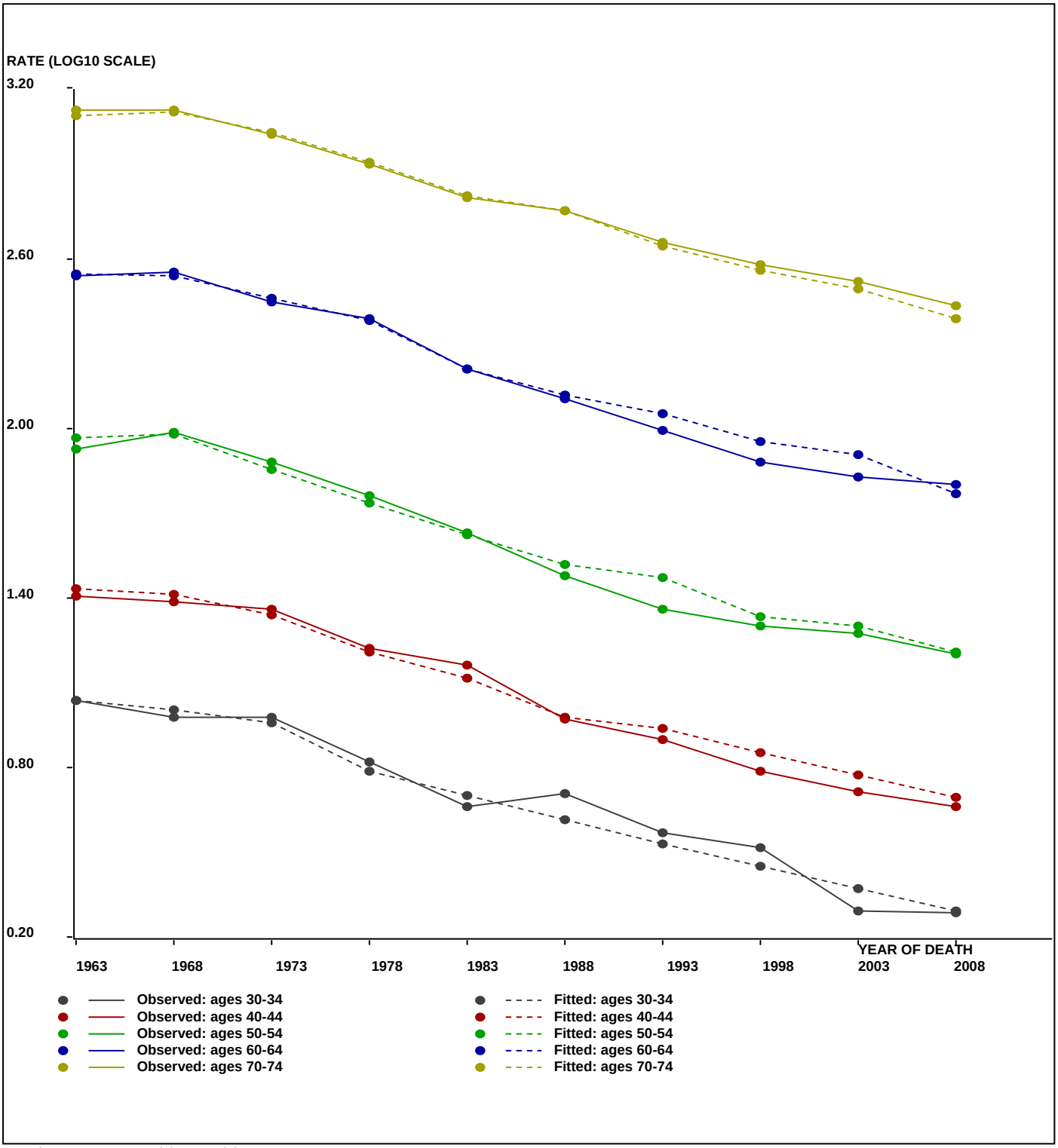


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Italy COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	3.7	5.1	8.0	13.5	22.8	50.1	97.9	210.1	456.0	1022.7
	PRE	3.4	5.4	8.8	14.5	29.9	52.9	113.5	215.7	442.9	940.5
	RES	0.284	-0.317	-0.793	-0.999	-7.111	-2.722	-15.527	-5.567	13.149	82.214
1996-	OBS	3.3	3.9	6.1	11.2	20.0	36.7	75.9	176.7	380.1	812.0
	PRE	2.9	4.5	7.1	13.4	21.6	48.0	89.2	185.5	361.9	710.8
	RES	0.468	-0.575	-1.013	-2.236	-1.608	-11.351	-13.321	-8.812	18.219	101.208
2001-	OBS	2.0	2.7	5.2	8.2	18.8	31.3	66.9	140.7	332.1	715.1
	PRE	2.4	3.7	5.9	10.9	20.0	34.6	81.1	145.9	311.3	580.9
	RES	-0.402	-1.041	-0.734	-2.689	-1.191	-3.337	-14.167	-5.214	20.779	134.215
2006-	OBS	1.9	1.7	4.6	7.1	16.1	30.7	63.1	129.4	269.5	672.4
	PRE	2.0	3.1	4.9	9.1	16.2	32.1	58.5	132.6	244.8	499.6
	RES	-0.032	-1.365	-0.333	-1.935	-0.174	-1.368	4.594	-3.203	24.746	172.818

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	40.0	49.0	77.0	126.0	201.0	453.0	843.0	1768.0	2985.0	4865.0
	PRE	36.9	52.1	84.7	135.3	263.7	477.6	976.6	1814.8	2898.9	4473.9
	CHI	0.252	0.181	0.692	0.645	14.904	1.267	18.289	1.209	2.555	34.184
1996-	OBS	38.0	42.0	59.0	107.0	185.0	319.0	670.0	1461.0	2972.0	4691.0
	PRE	32.6	48.2	68.8	128.4	199.9	417.7	787.6	1533.9	2829.6	4106.3
	CHI	0.877	0.793	1.387	3.575	1.110	23.324	17.554	3.462	7.170	83.249
2001-	OBS	22.8	31.6	56.8	79.6	179.4	289.0	574.2	1205.2	2599.4	5026.0
	PRE	27.4	43.8	64.8	105.7	190.8	319.8	695.8	1249.9	2436.7	4082.7
	CHI	0.782	3.412	0.992	6.449	0.679	2.967	21.236	1.597	10.858	217.967
2006-	OBS	21.0	21.0	56.0	80.0	159.0	296.0	580.0	1080.0	2215.0	4792.0
	PRE	21.3	37.5	60.0	101.7	160.7	309.2	537.8	1106.7	2011.6	3560.4
	CHI	0.006	7.236	0.272	4.634	0.019	0.562	3.318	0.646	20.557	426.014

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	9876.54	193.66	51	P, C	98.83	53265.96	0.0000
AGE-PERIOD	394.93	8.78	45	Cohort	70.81	2113.96	0.0000
AGE-COHORT	230.45	6.40	36	Period	49.97	1224.20	0.0000
PERIOD-COHORT	195.51	4.89	40	Age	41.03	1039.04	0.0000
FULL AGE-PERIOD-COHORT	115.30	3.60	32			612.58	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.861194	72.643107
35	2.048097	111.711310
40	2.250552	178.054238
45	2.470107	295.193891
50	2.693338	493.558004
55	2.917706	827.381992
60	3.136314	1368.717140
65	3.349473	2236.005938
70	3.565795	3679.554875
75	3.774882	5955.000562

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.141875	1.386356
1966	0.079321	1.200386
1971	-0.008153	0.981403
1976	-0.035308	0.921918
1981	-0.070296	0.850558
1986	-0.136641	0.730061

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.070728	1.176869
1891	0.058049	1.143007
1896	0.044338	1.107485
1901	0.046697	1.113517
1906	0.027461	1.065274
1911	0.011292	1.026342
1916	-0.016608	0.962481
1921	-0.060315	0.870332
1926	-0.068805	0.853484
1931	-0.087457	0.817605
1936	-0.140758	0.723172
1941	-0.222725	0.598790
1946	-0.340211	0.456866
1951	-0.398155	0.399802
1956	-0.519457	0.302373

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	1995.0	1337.0	755.0	613.0	482.0	329.0
	EXP	1637.9	1306.7	931.5	782.0	613.5	329.0
	CHI	77.9	0.7	33.5	36.5	28.2	0.0
35 -	OBS	2567.0	2109.0	1450.0	1063.0	1068.0	913.0
	EXP	2174.6	2182.9	1647.0	1341.9	1105.8	803.8
	CHI	70.8	2.5	23.6	58.0	1.3	14.8
40 -	OBS	2805.0	2873.0	2638.0	2292.0	1980.0	1672.0
	EXP	2611.4	2965.2	2825.7	2436.0	1955.4	1495.7
	CHI	14.4	2.9	12.5	8.5	0.3	20.8
45 -	OBS	4191.0	3571.0	3777.0	4276.0	3736.0	3092.0
	EXP	4295.1	3694.1	3970.6	4319.8	3662.1	2733.0
	CHI	2.5	4.1	9.4	0.4	1.5	47.2
50 -	OBS	7170.0	5815.0	4788.0	6226.0	6624.0	5328.0
	EXP	7366.8	6026.0	4917.2	6062.1	6481.9	5113.4
	CHI	5.3	7.4	3.4	4.4	3.1	9.0
55 -	OBS	11052.0	10340.0	7933.0	7529.0	9084.0	8712.0
	EXP	11284.6	10102.2	7892.7	7404.4	9020.9	8955.1
	CHI	4.8	5.6	0.2	2.1	0.4	6.6
60 -	OBS	15590.0	14903.0	12821.0	11895.0	10911.0	11735.0
	EXP	16155.7	14716.6	12720.2	11488.4	10684.4	12116.8
	CHI	19.8	2.4	0.8	14.4	4.8	12.0
65 -	OBS	19099.0	19794.0	17687.0	17468.0	15662.0	13437.0
	EXP	19253.2	19615.6	17274.4	17513.9	15752.8	13747.3
	CHI	1.2	1.6	9.9	0.1	0.5	7.0
70 -	OBS	21629.0	21563.0	21481.0	21843.0	22523.0	19238.0
	EXP	21413.6	21493.0	21283.5	22102.1	22697.7	19291.4
	CHI	2.2	0.2	1.8	3.0	1.3	0.1
75 -	OBS	20275.0	19950.0	20077.0	23755.0	24960.0	24806.0
	EXP	20275.0	20167.7	19993.7	23577.6	25077.6	24733.9
	CHI	0.0	2.3	0.3	1.3	0.6	0.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	153274.79	3831.87	40	P, C	-82.99	0.0000
AGE-PERIOD	155630.19	3890.75	40	Cohort	-80.22	0.0000
AGE-COHORT	218950.38	5473.76	40	Period	-28.10	0.0000
PERIOD-COHORT	260270.26	6506.76	40	Age	-7.76	0.0000
FULL AGE-PERIOD-COHORT	280472.31	7011.81	40			0.0000

AGE	EFFECT
30	72.643107
35	111.711310
40	178.054238
45	295.193891
50	493.558004
55	827.381992
60	1368.717140
65	2236.005938
70	3679.554875
75	5955.000562

PERIOD	EFFECT	LOWER	UPPER
% Period Change	85.8332	82.8332	88.8332
1961	1.386356		
1966	1.200386		
1971	0.981403		
1976	0.921918		
1981	0.850558		
1986	0.730061		
1991	0.626635	0.604734	0.648537
1996	0.537861	0.500920	0.576117
2001	0.461664	0.414929	0.511783
2006	0.396261	0.343699	0.454633

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.176869	1.000000	
1891	1.143007	2.000000	
1896	1.107485	4.000000	
1901	1.113517	8.000000	
1906	1.065274	16.000000	
1911	1.026342	32.000000	
1916	0.962481	64.000000	
1921	0.870332	128.000000	
1926	0.853484	256.000000	
1931	0.817605	512.000000	
1936	0.723172	1024.000000	
1941	0.598790	2048.000000	
1946	0.456866	4096.000000	
1951	0.399802	8192.000000	
1956	0.342961	EXTRAPOLATION	0.302373
1961	0.291982	EXTRAPOLATION	
1966	0.248581	EXTRAPOLATION	
1971	0.211632	EXTRAPOLATION	
1976	0.180174	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	100.3	64.5	34.6	24.0	19.4	16.0	20.1	30.6	33.0	27.9
	EXP	82.3	63.1	42.7	30.6	24.7	18.2	13.3*	9.7*	7.1*	5.2*
	Elow							12.8	9.0	6.4	4.5
	Eup							13.8	10.4	7.9	6.0
35	OBS	156.0	105.9	69.8	48.9	41.9	37.0	38.3	59.4	65.3	56.3
	EXP	132.2	109.6	79.3	61.7	43.4	32.6	24.0*	17.5*	12.8*	9.4*
	Elow							23.2	16.3	11.5	8.1
	Eup							24.8	18.8	14.2	10.7
40	OBS	230.8	176.7	133.4	111.7	91.8	66.4	82.7	110.7	119.3	121.7
	EXP	214.8	182.4	142.9	118.7	90.7	59.4	44.6*	32.8*	24.0*	17.5*
	Elow							43.0	30.6	21.6	15.2
	Eup							46.2	35.2	26.6	20.1
45	OBS	384.3	298.1	235.2	220.3	185.2	146.0	146.1	220.3	206.1	206.0
	EXP	393.9	308.4	247.3	222.5	181.6	129.0	84.5*	63.5*	46.7*	34.2*
	Elow							81.6	59.1	42.0	29.6
	Eup							87.5	68.0	51.8	39.2
50	OBS	683.5	550.3	410.5	398.9	350.8	271.5	268.8	338.2	374.2	330.5
	EXP	702.3	570.2	421.6	388.4	343.2	260.6	185.2*	121.3*	91.1*	67.1*
	Elow							178.7	113.0	81.9	58.2
	Eup							191.7	129.9	101.0	77.0
55	OBS	1196.7	1043.3	785.5	675.0	604.8	480.5	479.7	567.9	521.2	553.1
	EXP	1221.9	1019.3	781.5	663.9	600.6	493.9	374.9*	266.5*	174.5*	131.1*
	Elow							361.8	248.2	156.8	113.7
	Eup							388.0	285.4	193.5	150.4
60	OBS	2038.9	1772.4	1389.6	1257.5	1034.7	826.0	825.4	918.4	852.2	739.7
	EXP	2112.9	1750.2	1378.6	1214.5	1013.2	852.8	701.2*	532.4*	378.4*	247.8*
	Elow							676.7	495.8	340.1	214.9
	Eup							725.8	570.3	419.4	284.3
65	OBS	3405.6	3015.9	2393.5	2110.2	1819.9	1388.7	1358.3	1467.0	1284.1	1146.6
	EXP	3433.1	2988.8	2337.7	2115.7	1830.5	1420.7	1195.9*	983.3*	746.5*	530.6*
	Elow							1154.1	915.8	670.9	460.2
	Eup							1237.7	1053.2	827.6	608.7
70	OBS	5889.3	4907.6	4058.4	3571.3	3187.4	2578.4	2307.5	2372.8	2028.6	1734.7
	EXP	5830.7	4891.6	4021.1	3613.7	3212.1	2585.5	2006.8*	1689.1*	1388.9*	1054.4*
	Elow							1936.6	1573.1	1248.3	914.6
	Eup							2076.9	1809.3	1539.7	1209.8
75	OBS	9715.9	8082.4	6499.4	6159.2	5370.4	4475.1	4204.6	3940.0	3341.0	2845.9
	EXP	9715.9	8170.6	6472.4	6113.2	5395.7	4462.0	3591.6*	2787.6*	2346.4*	1929.3*
	Elow							3466.1	2596.2	2108.9	1673.4
	Eup							3717.1	2985.9	2601.1	2213.5
30-79	OBS	1436.0	1208.0	956.2	862.5	749.3	600.2	575.7	621.4	561.4	503.6
	EXP	1440.6	1208.6	954.1	860.7	749.2	601.6	476.4*	373.6*	291.9*	220.1*
	Elow							459.8	348.0	262.4	190.9
	Eup							493.1	400.2	323.6	252.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	1995.0	1337.0	755.0	613.0	482.0	329.0	398.0	649.0	789.0	639.0
	EXP	1637.9	1306.7	931.5	782.0	613.5	373.2	263.2*	206.0*	169.6*	118.8*
	CHI	77.858	0.704	33.452	36.509	28.193	5.227	69.007	952.517	2262.744	2277.986
35 -	OBS	2567.0	2109.0	1450.0	1063.0	1068.0	913.0	787.0	1176.0	1381.0	1341.0
	EXP	2174.6	2182.9	1647.0	1341.9	1105.8	803.8	493.0*	347.6*	271.2*	223.0*
	CHI	70.805	2.500	23.561	57.974	1.290	14.832	175.404	1974.065	4542.300	5605.226
40 -	OBS	2805.0	2873.0	2638.0	2292.0	1980.0	1672.0	2032.0	2265.0	2349.0	2560.0
	EXP	2611.4	2965.2	2825.7	2436.0	1955.4	1495.7	1096.7*	672.2*	472.5*	369.0*
	CHI	14.360	2.867	12.463	8.515	0.308	20.790	797.740	3774.109	7452.261	13007.164
45 -	OBS	4191.0	3571.0	3777.0	4276.0	3736.0	3092.0	3653.0	5361.0	4183.0	4019.0
	EXP	4295.1	3694.1	3970.6	4319.8	3662.1	2733.0	2112.6*	1544.9*	948.6*	666.3*
	CHI	2.523	4.104	9.442	0.443	1.491	47.156	1123.206	9426.148	11027.638	16871.508
50 -	OBS	7170.0	5815.0	4788.0	6226.0	6624.0	5328.0	5601.0	8298.0	8933.0	6632.0
	EXP	7366.8	6026.0	4917.2	6062.1	6481.9	5113.4	3858.8*	2976.0*	2174.6*	1346.2*
	CHI	5.257	7.389	3.394	4.432	3.117	9.010	786.606	9517.325	21003.950	20755.031
55 -	OBS	11052.0	10340.0	7933.0	7529.0	9084.0	8712.0	9147.0	11519.0	12394.0	12882.0
	EXP	11284.6	10102.2	7892.7	7404.4	9020.9	8955.1	7149.4*	5404.9*	4149.7*	3053.1*
	CHI	4.793	5.596	0.205	2.096	0.442	6.598	558.149	6916.502	16378.925	31643.018
60 -	OBS	15590.0	14903.0	12821.0	11895.0	10911.0	11735.0	14241.0	16764.0	16609.0	16973.0
	EXP	16155.7	14716.6	12720.2	11488.4	10684.4	12116.8	12098.5*	9717.6*	7373.8*	5686.1*
	CHI	19.811	2.362	0.798	14.388	4.806	12.031	379.394	5109.505	11566.339	22404.681
65 -	OBS	19099.0	19794.0	17687.0	17468.0	15662.0	13437.0	17861.0	23454.0	21904.0	21323.0
	EXP	19253.2	19615.6	17274.4	17513.9	15752.8	13747.3	15725.1*	15720.7*	12734.1*	9866.3*
	CHI	1.235	1.623	9.854	0.120	0.524	7.002	290.118	3804.168	6603.344	13303.415
70 -	OBS	21629.0	21563.0	21481.0	21843.0	22523.0	19238.0	19661.0	27740.0	29007.0	27066.0
	EXP	21413.6	21493.0	21283.5	22102.1	22697.7	19291.4	17098.3*	19747.0*	19859.6*	16452.3*
	CHI	2.167	0.228	1.833	3.037	1.345	0.148	384.094	3235.313	4213.298	6847.037
75 -	OBS	20275.0	19950.0	20077.0	23755.0	24960.0	24806.0	25117.0	27761.0	32757.0	34763.0
	EXP	20275.0	20167.7	19993.7	23577.6	25077.6	24733.9	21455.0*	19641.7*	23005.7*	23567.3*
	CHI	0.000	2.349	0.347	1.335	0.552	0.210	625.041	3356.272	4133.238	5318.526
30-79	OBS	106373.0	102255.0	93407.0	96960.0	97030.0	89262.0	98498.0	124987.0	130306.0	128198.0
	EXP	106467.9	102269.9	93456.5	97028.1	97052.1	89363.4	81350.5*	75978.6*	71159.4*	61348.4*
	O/E	0.999	1.000	0.999	0.999	1.000	0.999	1.211	1.645	1.831	2.090

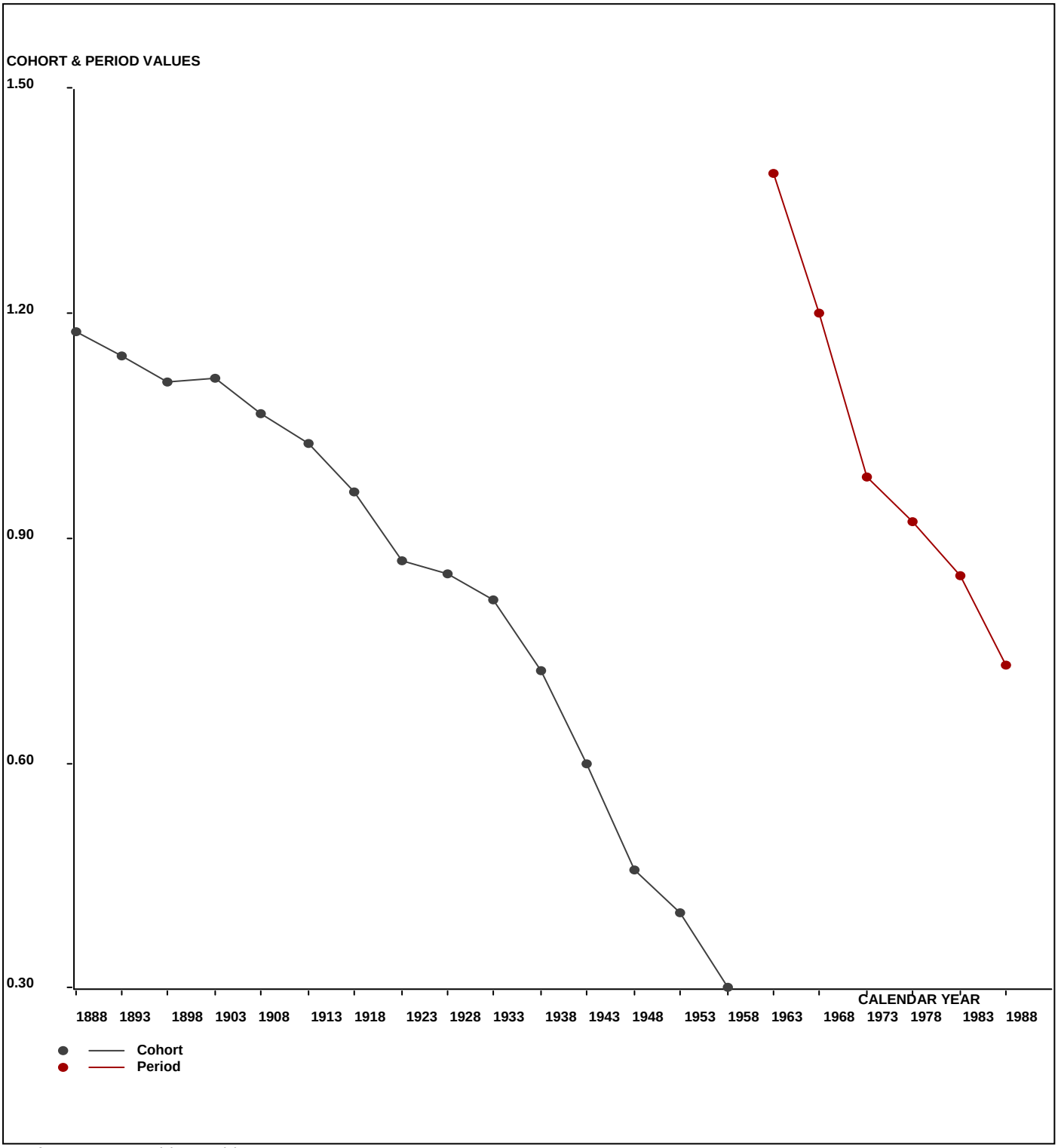
CHI SQUARE (LOG)= 280472.3125 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

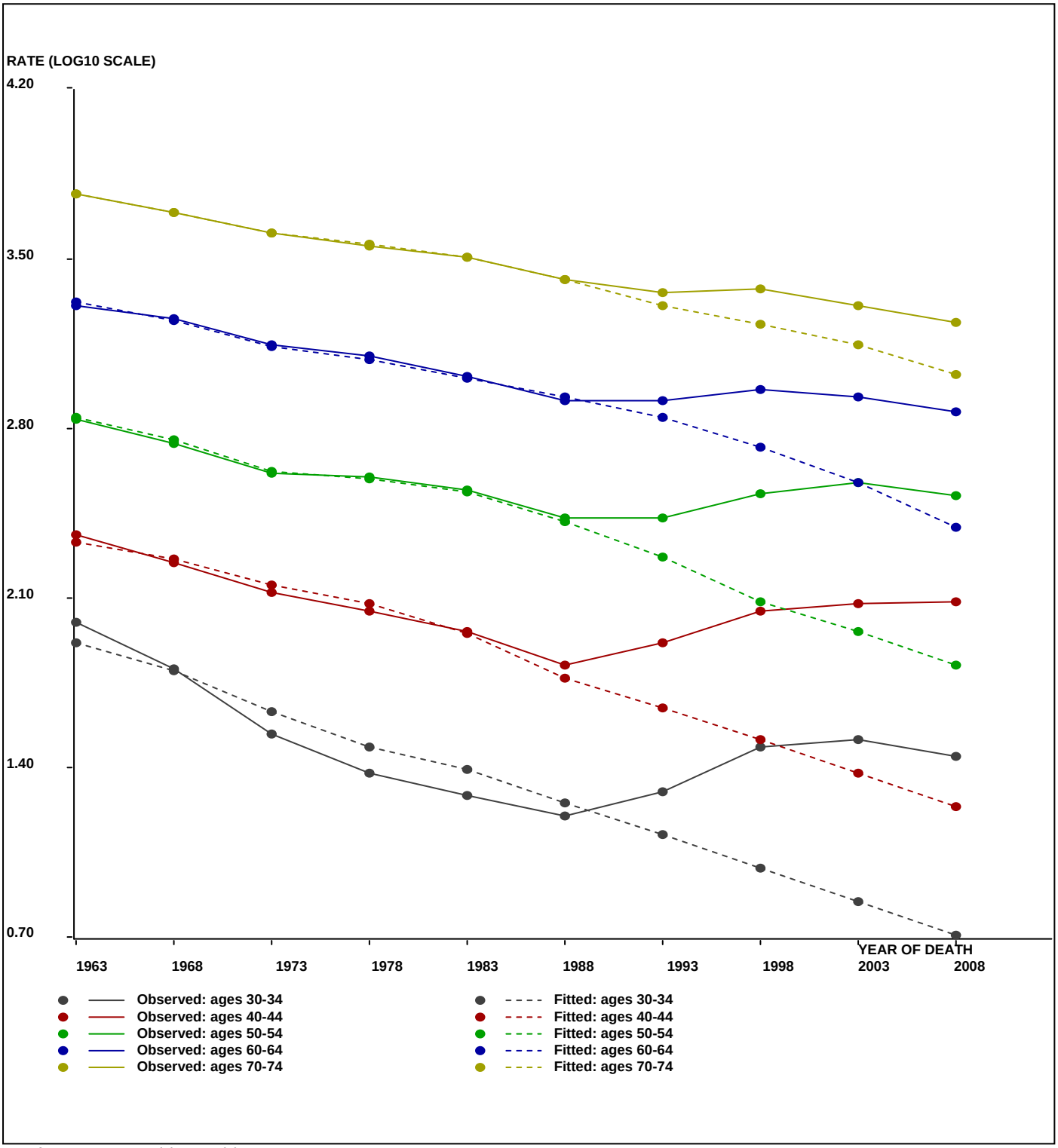


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	20.1	38.3	82.7	146.1	268.8	479.7	825.4	1358.3	2307.5	4204.6
	PRE	13.3	24.0	44.6	84.5	185.2	374.9	701.2	1195.9	2006.8	3591.6
	RES	6.805	14.321	38.046	61.622	83.615	104.762	124.180	162.433	300.772	613.026
1996-	OBS	30.6	59.4	110.7	220.3	338.2	567.9	918.4	1467.0	2372.8	3940.0
	PRE	9.7	17.5	32.8	63.5	121.3	266.5	532.4	983.3	1689.1	2787.6
	RES	20.884	41.808	77.826	156.797	216.889	301.441	386.043	483.705	683.704	1152.328
2001-	OBS	33.0	65.3	119.3	206.1	374.2	521.2	852.2	1284.1	2028.6	3341.0
	PRE	7.1	12.8	24.0	46.7	91.1	174.5	378.4	746.5	1388.9	2346.4
	RES	25.927	52.470	95.318	159.357	283.118	346.700	473.877	537.575	639.720	994.559
2006-	OBS	27.9	56.3	121.7	206.0	330.5	553.1	739.7	1146.6	1734.7	2845.9
	PRE	5.2	9.4	17.5	34.2	67.1	131.1	247.8	530.6	1054.4	1929.3
	RES	22.711	46.969	104.124	171.870	263.375	421.992	491.866	616.075	680.230	916.531

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	398.0	787.0	2032.0	3653.0	5601.0	9147.0	14241.0	17861.0	19661.0	25117.0
	PRE	263.2	493.0	1096.7	2112.6	3858.8	7149.4	12098.5	15725.1	17098.3	21455.0
	CHI	69.007	175.404	797.740	1123.206	786.606	558.149	379.394	290.118	384.094	625.041
1996-	OBS	649.0	1176.0	2265.0	5361.0	8298.0	11519.0	16764.0	23454.0	27740.0	27761.0
	PRE	206.0	347.6	672.2	1544.9	2976.0	5404.9	9717.6	15720.7	19747.0	19641.7
	CHI	952.517	1974.065	3774.109	9426.148	9517.325	6916.502	5109.505	3804.168	3235.313	3356.272
2001-	OBS	789.0	1381.0	2349.0	4183.0	8933.0	12394.0	16609.0	21904.0	29007.0	32757.0
	PRE	169.6	271.2	472.5	948.6	2174.6	4149.7	7373.8	12734.1	19859.6	23005.7
	CHI	2262.744	4542.300	7452.261	11027.638	21003.950	16378.925	11566.339	6603.344	4213.298	4133.238
2006-	OBS	639.0	1341.0	2560.0	4019.0	6632.0	12882.0	16973.0	21323.0	27066.0	34763.0
	PRE	118.8	223.0	369.0	666.3	1346.2	3053.1	5686.1	9866.3	16452.3	23567.3
	CHI	2277.986	5605.226	13007.164	16871.508	20755.031	31643.018	22404.681	13303.415	6847.037	5318.526

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	77830.42	1526.09	51	P, C	99.82	434625.48	0.0000
AGE-PERIOD	3020.01	67.11	45	Cohort	95.32	16054.56	0.0000
AGE-COHORT	1948.92	54.14	36	Period	92.74	10348.73	0.0000
PERIOD-COHORT	1408.54	35.21	40	Age	89.96	7475.21	0.0000
FULL AGE-PERIOD-COHORT	141.40	4.42	32			750.02	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	2.109942	128.807687
35	2.505809	320.485701
40	2.833817	682.051940
45	3.081062	1205.208332
50	3.287407	1938.236935
55	3.486726	3067.085958
60	3.685394	4846.113140
65	3.891715	7793.176749
70	4.105898	12761.387209
75	4.310039	20419.207837

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.121361	1.322395
1966	0.100398	1.260079
1971	0.044482	1.107852
1976	-0.037825	0.916591
1981	-0.156530	0.697381
1986	-0.282850	0.521375

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.093781	1.241026
1891	0.127017	1.339728
1896	0.122667	1.326378
1901	0.091392	1.234219
1906	0.026983	1.064102
1911	-0.039633	0.912782
1916	-0.126352	0.747563
1921	-0.212322	0.613308
1926	-0.219618	0.603089
1931	-0.189687	0.646120
1936	-0.186151	0.651401
1941	-0.213867	0.611129
1946	-0.248514	0.564268
1951	-0.203403	0.626033
1956	-0.223264	0.598047

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	1992.0	2142.0	2067.0	1740.0	1424.0	824.0
	EXP	2189.2	2190.8	1903.0	1702.6	1396.7	824.0
	CHI	17.8	1.1	14.1	0.8	0.5	0.0
35 -	OBS	3697.0	5346.0	5079.0	3996.0	3190.0	2551.0
	EXP	4205.0	5195.0	4804.5	3906.4	3212.5	2578.7
	CHI	61.4	4.4	15.7	2.1	0.2	0.3
40 -	OBS	5938.0	8602.0	10264.0	8429.0	6142.0	5038.0
	EXP	6723.7	8425.2	9655.8	8356.7	6268.1	5053.4
	CHI	91.8	3.7	38.3	0.6	2.5	0.0
45 -	OBS	12140.0	11022.0	13724.0	14253.0	10917.0	7995.0
	EXP	12991.8	11156.7	12931.1	13856.9	11042.3	8132.9
	CHI	55.9	1.6	48.6	11.3	1.4	2.3
50 -	OBS	23721.0	19383.0	15828.0	17261.0	16374.0	12734.0
	EXP	24541.9	19294.4	15360.8	16724.8	16493.2	12917.3
	CHI	27.5	0.4	14.2	17.2	0.9	2.6
55 -	OBS	40107.0	34851.0	26011.0	19767.0	19204.0	17838.0
	EXP	39857.8	34961.4	25653.0	19230.4	19374.0	18734.8
	CHI	1.6	0.3	5.0	15.0	1.5	42.9
60 -	OBS	61274.0	54721.0	44945.0	31466.0	22078.0	20735.0
	EXP	60476.8	54636.7	45215.2	31410.8	21857.0	21649.4
	CHI	10.5	0.1	1.6	0.1	2.2	38.6
65 -	OBS	77372.0	80196.0	67516.0	53462.0	34844.0	23741.0
	EXP	76658.7	79545.4	67889.3	53973.6	34964.1	24112.5
	CHI	6.6	5.3	2.1	4.8	0.4	5.7
70 -	OBS	84286.0	94111.0	91377.0	75366.0	57035.0	37548.0
	EXP	83032.2	93714.4	92358.1	76127.5	57401.9	37112.0
	CHI	18.9	1.7	10.4	7.6	2.3	5.1
75 -	OBS	69929.0	83813.0	91565.0	88610.0	71217.0	55890.0
	EXP	69929.0	85085.8	92685.9	89091.2	70425.8	53866.0
	CHI	0.0	19.0	13.6	2.6	8.9	76.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	1724151.75	43103.79	40	P, C	90.54	0.0000
AGE-PERIOD	293265.03	7331.63	40	Cohort	44.36	0.0000
AGE-COHORT	17225.91	430.65	40	Period	-847.21	0.0000
PERIOD-COHORT	180245.78	4506.14	40	Age	9.48	0.0000
FULL AGE-PERIOD-COHORT	163166.15	4079.15	40			0.0000

AGE	EFFECT
30	128.807687
35	320.485701
40	682.051940
45	1205.208332
50	1938.236935
55	3067.085958
60	4846.113140
65	7793.176749
70	12761.387209
75	20419.207837

PERIOD	EFFECT	LOWER	UPPER
% Period Change	74.7619	71.7619	77.7619
1961	1.322395		
1966	1.260079		
1971	1.107852		
1976	0.916591		
1981	0.697381		
1986	0.521375		
1991	0.389790	0.374149	0.405431
1996	0.291414	0.268496	0.315271
2001	0.217867	0.192678	0.245160
2006	0.162881	0.138269	0.190641

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.241026	1.000000	
1891	1.339728	2.000000	
1896	1.326378	4.000000	
1901	1.234219	8.000000	
1906	1.064102	16.000000	
1911	0.912782	32.000000	
1916	0.747563	64.000000	
1921	0.613308	128.000000	
1926	0.603089	256.000000	
1931	0.646120	512.000000	
1936	0.651401	1024.000000	
1941	0.611129	2048.000000	
1946	0.564268	4096.000000	
1951	0.626033	8192.000000	
1956	0.598285	EXTRAPOLATION	0.598047
1961	0.591833	EXTRAPOLATION	
1966	0.585451	EXTRAPOLATION	
1971	0.579137	EXTRAPOLATION	
1976	0.572891	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	100.1	103.4	94.7	68.1	57.3	40.2	39.3	39.1	34.0	32.3
	EXP	110.1	105.7	87.2	66.6	56.2	40.2	29.7*	22.0*	16.3*	12.0*
	Elow							28.5	20.2	14.4	10.2
	Eup							30.9	23.8	18.3	14.1
35	OBS	224.7	268.5	244.5	183.6	125.2	103.5	79.6	83.3	79.3	70.1
	EXP	255.6	260.9	231.3	179.5	126.1	104.6	74.7*	55.3*	40.9*	30.2*
	Elow							71.7	50.9	36.2	25.7
	Eup							77.7	59.8	46.0	35.4
40	OBS	488.5	529.2	519.0	410.8	284.8	200.0	182.6	157.6	150.2	141.2
	EXP	553.2	518.3	488.2	407.2	290.7	200.7	166.4*	118.9*	87.9*	65.0*
	Elow							159.8	109.6	77.8	55.2
	Eup							173.1	128.6	99.0	76.1
45	OBS	1113.3	920.2	854.6	734.2	541.3	377.5	306.7	308.1	261.5	240.5
	EXP	1191.4	931.4	805.2	713.8	547.5	384.0	265.1*	219.9*	157.1*	116.2*
	Elow							254.4	202.6	138.9	98.6
	Eup							275.7	237.9	176.8	136.0
50	OBS	2261.3	1834.2	1357.0	1105.8	867.0	648.9	527.8	446.0	444.9	368.5
	EXP	2339.6	1825.8	1316.9	1071.4	873.4	658.3	461.7*	318.7*	264.4*	188.9*
	Elow							443.2	293.7	233.8	160.3
	Eup							480.2	344.8	297.5	221.1
55	OBS	4342.9	3516.6	2575.6	1772.3	1278.6	983.8	826.7	714.1	586.1	581.0
	EXP	4315.9	3527.7	2540.1	1724.2	1290.0	1033.2	778.8*	546.2*	377.1*	312.7*
	Elow							747.5	503.3	333.5	265.5
	Eup							810.0	590.9	424.3	366.1
60	OBS	8013.7	6507.9	4871.2	3326.4	2093.7	1459.4	1301.8	1185.3	947.7	771.0
	EXP	7909.5	6497.9	4900.5	3320.6	2072.7	1523.8	1220.5*	919.9*	645.2*	445.4*
	Elow							1171.5	847.6	570.6	378.1
	Eup							1269.5	995.2	726.1	521.3
65	OBS	13796.4	12219.2	9136.6	6458.3	4048.9	2453.6	2094.1	1989.0	1603.6	1254.5
	EXP	13669.2	12120.0	9187.1	6520.1	4062.9	2492.0	1832.0*	1467.4*	1106.0*	775.7*
	Elow							1758.5	1352.0	978.1	658.5
	Eup							1905.5	1587.5	1244.6	908.0
70	OBS	22950.1	21418.9	17263.7	12322.3	8071.4	5032.3	3791.0	3609.8	2890.9	2255.1
	EXP	22608.7	21328.6	17449.0	12446.8	8123.4	4973.9	3050.8*	2242.8*	1796.4*	1354.0*
	Elow							2928.3	2066.4	1588.7	1149.4
	Eup							3173.2	2426.4	2021.4	1584.8
75	OBS	33510.5	33955.3	29641.8	22974.9	15323.0	10082.7	7903.0	7049.7	5494.7	4307.1
	EXP	33510.5	34470.9	30004.6	23099.7	15152.8	9717.5	5950.0*	3649.5*	2682.9*	2148.9*
	Elow							5711.2	3362.4	2372.8	1824.2
	Eup							6188.8	3948.2	3019.1	2515.2
30-79	OBS	5209.1	4732.2	3798.5	2791.5	1860.5	1233.9	999.6	915.2	747.6	612.9
	EXP	5202.1	4737.4	3806.4	2793.4	1859.8	1233.8	838.9*	598.5*	447.9*	335.5*
	Elow							805.2	551.4	396.1	284.8
	Eup							872.6	647.5	504.0	392.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	1992.0	2142.0	2067.0	1740.0	1424.0	824.0	778.0	829.0	812.0	740.0
	EXP	2189.2	2190.8	1903.0	1702.6	1396.7	824.3	588.5*	466.1*	388.3*	275.3*
	CHI	17.767	1.086	14.137	0.821	0.535	0.000	61.034	282.474	462.343	784.368
35 -	OBS	3697.0	5346.0	5079.0	3996.0	3190.0	2551.0	1634.0	1651.0	1678.0	1669.0
	EXP	4205.0	5195.0	4804.5	3906.4	3212.5	2578.7	1534.6*	1095.2*	864.6*	719.6*
	CHI	61.369	4.387	15.689	2.054	0.157	0.299	6.439	282.056	765.113	1252.546
40 -	OBS	5938.0	8602.0	10264.0	8429.0	6142.0	5038.0	4490.0	3225.0	2957.0	2971.0
	EXP	6723.7	8425.2	9655.8	8356.7	6268.1	5053.4	4091.7*	2433.7*	1731.3*	1368.5*
	CHI	91.823	3.708	38.308	0.625	2.536	0.047	38.766	257.262	867.700	1876.340
45 -	OBS	12140.0	11022.0	13724.0	14253.0	10917.0	7995.0	7667.0	7498.0	5307.0	4692.0
	EXP	12991.8	11156.7	12931.1	13856.9	11042.3	8132.9	6626.5*	5351.2*	3188.5*	2266.4*
	CHI	55.852	1.627	48.620	11.322	1.421	2.337	163.391	861.265	1407.655	2596.058
50 -	OBS	23721.0	19383.0	15828.0	17261.0	16374.0	12734.0	10997.0	10944.0	10620.0	7396.0
	EXP	24541.9	19294.4	15360.8	16724.8	16493.2	12917.3	9620.4*	7820.6*	6310.6*	3790.7*
	CHI	27.459	0.407	14.210	17.193	0.861	2.602	196.989	1247.431	2942.838	3428.864
55 -	OBS	40107.0	34851.0	26011.0	19767.0	19204.0	17838.0	15763.0	14484.0	13936.0	13532.0
	EXP	39857.8	34961.4	25653.0	19230.4	19374.0	18734.8	14849.5*	11079.0*	8966.1*	7284.5*
	CHI	1.558	0.349	4.997	14.975	1.492	42.931	56.197	1046.455	2754.877	5358.229
60 -	OBS	61274.0	54721.0	44945.0	31466.0	22078.0	20735.0	22459.0	21636.0	18469.0	17692.0
	EXP	60476.8	54636.7	45215.2	31410.8	21857.0	21649.4	21057.1*	16791.3*	12574.7*	10220.7*
	CHI	10.509	0.130	1.614	0.097	2.235	38.620	93.335	1397.795	2762.967	5461.571
65 -	OBS	77372.0	80196.0	67516.0	53462.0	34844.0	23741.0	27537.0	31800.0	27354.0	23329.0
	EXP	76658.7	79545.4	67889.3	53973.6	34964.1	24112.5	24090.0*	23459.7*	18866.0*	14425.9*
	CHI	6.638	5.322	2.052	4.850	0.412	5.723	493.231	2965.082	3818.790	5494.593
70 -	OBS	84286.0	94111.0	91377.0	75366.0	57035.0	37548.0	32301.0	42201.0	41337.0	35186.0
	EXP	83032.2	93714.4	92358.1	76127.5	57401.9	37112.0	25993.5*	26219.9*	25686.7*	21126.5*
	CHI	18.932	1.678	10.423	7.616	2.345	5.123	1530.554	9740.555	9535.362	9356.548
75 -	OBS	69929.0	83813.0	91565.0	88610.0	71217.0	55890.0	47210.0	49672.0	53874.0	52612.0
	EXP	69929.0	85085.8	92685.9	89091.2	70425.8	53866.0	35543.2*	25714.0*	26305.3*	26249.8*
	CHI	0.000	19.039	13.555	2.599	8.888	76.050	3829.528	22321.861	28892.700	26474.984
30-79	OBS	380456.0	394187.0	368376.0	314350.0	242425.0	184894.0	170836.0	183940.0	176344.0	159819.0
	EXP	380606.2	394205.9	368456.6	314380.9	242435.4	184981.4	143994.9*	120430.9*	104882.1*	87727.9*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	1.186	1.527	1.681	1.822

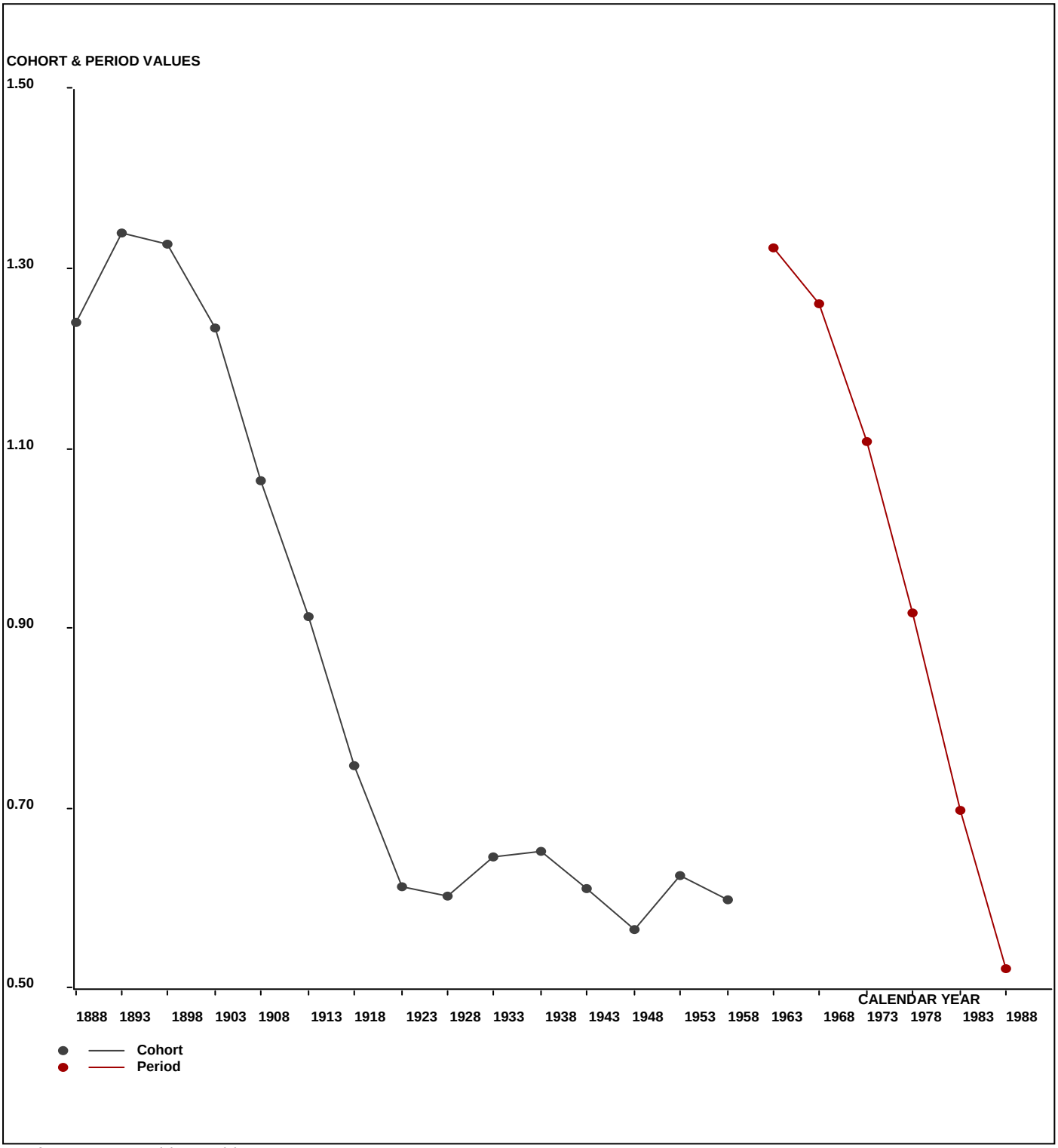
CHI SQUARE (LOG)= 163166.1465 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

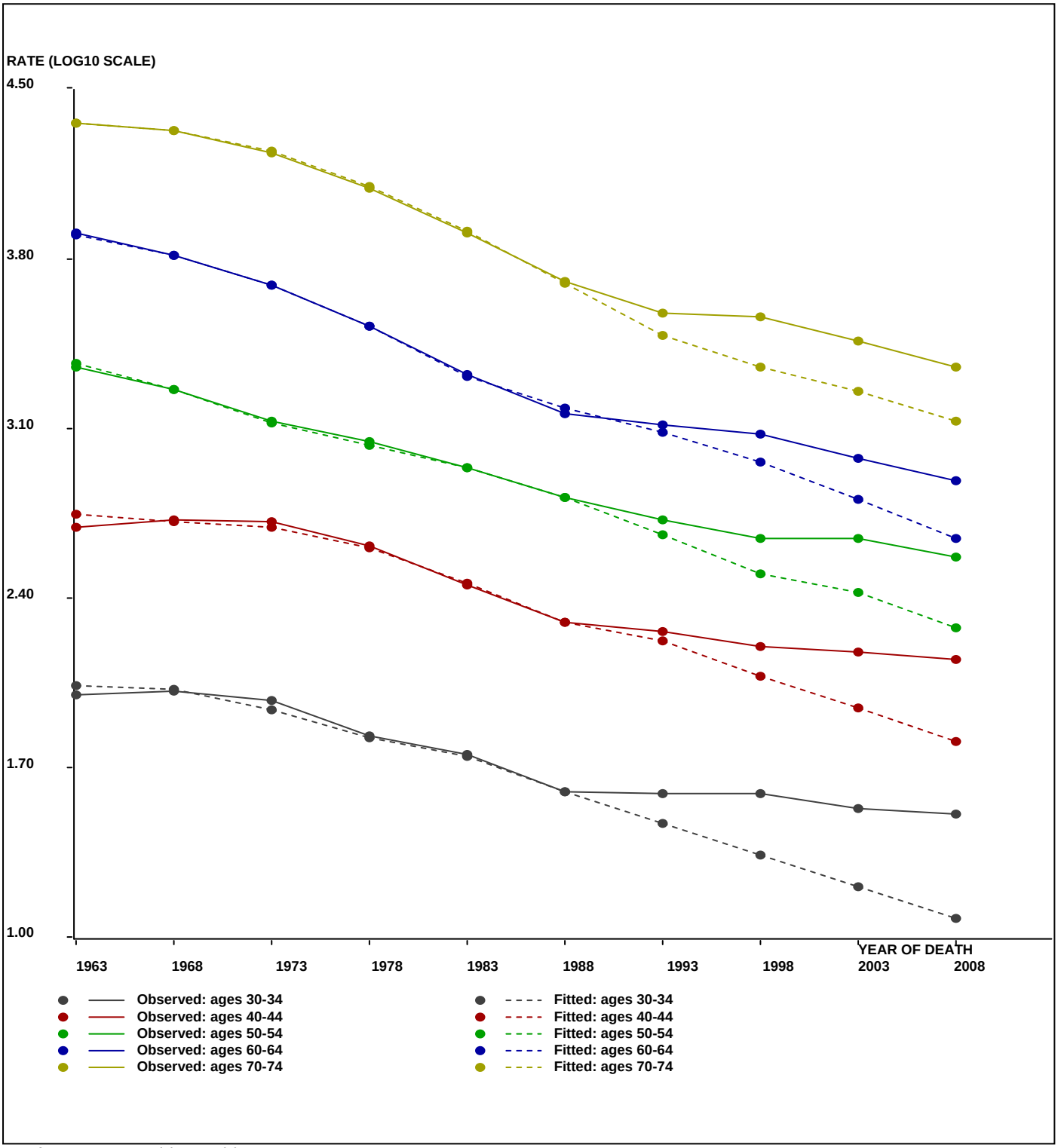


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	39.3	79.6	182.6	306.7	527.8	826.7	1301.8	2094.1	3791.0	7903.0
	PRE	29.7	74.7	166.4	265.1	461.7	778.8	1220.5	1832.0	3050.8	5950.0
	RES	9.570	4.841	16.200	41.625	66.069	47.908	81.257	262.140	740.284	1953.041
1996-	OBS	39.1	83.3	157.6	308.1	446.0	714.1	1185.3	1989.0	3609.8	7049.7
	PRE	22.0	55.3	118.9	219.9	318.7	546.2	919.9	1467.4	2242.8	3649.5
	RES	17.107	28.050	38.662	88.209	127.289	167.872	265.419	521.669	1366.994	3400.229
2001-	OBS	34.0	79.3	150.2	261.5	444.9	586.1	947.7	1603.6	2890.9	5494.7
	PRE	16.3	40.9	87.9	157.1	264.4	377.1	645.2	1106.0	1796.4	2682.9
	RES	17.734	38.453	62.259	104.381	180.528	209.003	302.452	497.595	1094.501	2811.795
2006-	OBS	32.3	70.1	141.2	240.5	368.5	581.0	771.0	1254.5	2255.1	4307.1
	PRE	12.0	30.2	65.0	116.2	188.9	312.7	445.4	775.7	1354.0	2148.9
	RES	20.288	39.885	76.156	124.344	179.639	268.229	325.589	478.756	901.077	2158.129

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	778.0	1634.0	4490.0	7667.0	10997.0	15763.0	22459.0	27537.0	32301.0	47210.0
	PRE	588.5	1534.6	4091.7	6626.5	9620.4	14849.5	21057.1	24090.0	25993.5	35543.2
	CHI	61.034	6.439	38.766	163.391	196.989	56.197	93.335	493.231	1530.554	3829.528
1996-	OBS	829.0	1651.0	3225.0	7498.0	10944.0	14484.0	21636.0	31800.0	42201.0	49672.0
	PRE	466.1	1095.2	2433.7	5351.2	7820.6	11079.0	16791.3	23459.7	26219.9	25714.0
	CHI	282.474	282.056	257.262	861.265	1247.431	1046.455	1397.795	2965.082	9740.555	22321.861
2001-	OBS	812.0	1678.0	2957.0	5307.0	10620.0	13936.0	18469.0	27354.0	41337.0	53874.0
	PRE	388.3	864.6	1731.3	3188.5	6310.6	8966.1	12574.7	18866.0	25686.7	26305.3
	CHI	462.343	765.113	867.700	1407.655	2942.838	2754.877	2762.967	3818.790	9535.362	28892.700
2006-	OBS	740.0	1669.0	2971.0	4692.0	7396.0	13532.0	17692.0	23329.0	35186.0	52612.0
	PRE	275.3	719.6	1368.5	2266.4	3790.7	7284.5	10220.7	14425.9	21126.5	26249.8
	CHI	784.368	1252.546	1876.340	2596.058	3428.864	5358.229	5461.571	5494.593	9356.548	26474.984

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	4033.79	79.09	51	P, C	99.51	22033.59	0.0000
AGE-PERIOD	591.79	13.15	45	Cohort	96.64	3157.76	0.0000
AGE-COHORT	35.54	0.99	36	Period	44.06	188.46	0.0000
PERIOD-COHORT	42.36	1.06	40	Age	53.07	224.69	0.0000
FULL AGE-PERIOD-COHORT	19.88	0.62	32			105.44	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.879989	7.585592
35	1.253214	17.914904
40	1.614627	41.174353
45	1.957301	90.636058
50	2.297234	198.259592
55	2.623917	420.646278
60	2.922098	835.792315
65	3.187231	1538.972826
70	3.408250	2560.056311
75	3.564137	3665.535861

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.063034	0.864900
1966	-0.052523	0.886087
1971	-0.041913	0.908003
1976	-0.006377	0.985423
1981	0.023780	1.056282
1986	0.034219	1.081980

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.464936	0.342818
1891	-0.324126	0.474105
1896	-0.194262	0.639349
1901	-0.080100	0.831571
1906	-0.021044	0.952700
1911	0.016329	1.038314
1916	0.040243	1.097092
1921	0.047681	1.116044
1926	0.085477	1.217523
1931	0.093457	1.240102
1936	0.058542	1.144307
1941	0.086139	1.219380
1946	0.115246	1.303905
1951	0.187246	1.539028
1956	0.102072	1.264945

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	172.0	160.0	200.0	237.0	289.0	213.0
	EXP	161.8	159.4	183.3	249.1	306.3	213.0
	CHI	0.6	0.0	1.5	0.6	1.0	0.0
35 -	OBS	294.0	378.0	424.0	471.0	599.0	752.0
	EXP	310.4	391.9	386.7	468.4	628.5	735.4
	CHI	0.9	0.5	3.6	0.0	1.4	0.4
40 -	OBS	420.0	711.0	923.0	980.0	1139.0	1503.0
	EXP	483.1	722.0	917.0	952.8	1143.6	1462.9
	CHI	8.2	0.2	0.0	0.8	0.0	1.1
45 -	OBS	884.0	969.0	1613.0	2242.0	2278.0	2517.0
	EXP	937.8	1073.6	1609.1	2150.3	2209.5	2532.5
	CHI	3.1	10.2	0.0	3.9	2.1	0.1
50 -	OBS	1892.0	2061.0	2326.0	3777.0	4945.0	4678.0
	EXP	1867.7	2036.7	2343.4	3713.0	4904.4	4816.8
	CHI	0.3	0.3	0.1	1.1	0.3	4.0
55 -	OBS	3058.0	3945.0	4263.0	5274.0	8144.0	10096.0
	EXP	3201.0	3835.5	4231.8	5159.7	8124.9	10234.2
	CHI	6.4	3.1	0.2	2.5	0.0	1.9
60 -	OBS	4663.0	5912.0	7264.0	8616.0	10341.0	15582.0
	EXP	4596.3	5932.5	7270.4	8547.3	10389.8	15642.8
	CHI	1.0	0.1	0.0	0.6	0.2	0.2
65 -	OBS	4730.0	7493.0	9915.0	12807.0	15379.0	18090.0
	EXP	4772.6	7442.5	9837.7	13034.9	15347.7	17981.7
	CHI	0.4	0.3	0.6	4.0	0.1	0.7
70 -	OBS	4057.0	6535.0	10202.0	14653.0	19648.0	22570.0
	EXP	3855.3	6372.5	10231.5	14699.8	19840.3	22674.1
	CHI	10.6	4.1	0.1	0.1	1.9	0.5
75 -	OBS	2268.0	3588.0	6450.0	11496.0	17273.0	23113.0
	EXP	2268.0	3800.9	6573.4	11584.8	17144.0	22826.7
	CHI	0.0	11.9	2.3	0.7	1.0	3.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	32092.79	802.32	40	P, C	16.80	0.0000
AGE-PERIOD	46431.65	1160.79	40	Cohort	42.49	0.0000
AGE-COHORT	50366.05	1259.15	40	Period	46.98	0.0000
PERIOD-COHORT	34980.64	874.52	40	Age	23.67	0.0000
FULL AGE-PERIOD-COHORT	26701.87	667.55	40			0.0000

AGE	EFFECT
30	7.585592
35	17.914904
40	41.174353
45	90.636058
50	198.259592
55	420.646278
60	835.792315
65	1538.972826
70	2560.056311
75	3665.535861

PERIOD	EFFECT	LOWER	UPPER
% Period Change	102.4328	99.4328	105.4328
1961	0.864900		
1966	0.886087		
1971	0.908003		
1976	0.985423		
1981	1.056282		
1986	1.081980		
1991	1.108302	1.075843	1.140762
1996	1.135265	1.069741	1.202737
2001	1.162884	1.063674	1.268080
2006	1.191175	1.057641	1.336973

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.342818	1.000000	
1891	0.474105	2.000000	
1896	0.639349	4.000000	
1901	0.831571	8.000000	
1906	0.952700	16.000000	
1911	1.038314	32.000000	
1916	1.097092	64.000000	
1921	1.116044	128.000000	
1926	1.217523	256.000000	
1931	1.240102	512.000000	
1936	1.144307	1024.000000	
1941	1.219380	2048.000000	
1946	1.303905	4096.000000	
1951	1.539028	8192.000000	
1956	1.591850	EXTRAPOLATION	1.264945
1961	1.706515	EXTRAPOLATION	
1966	1.829439	EXTRAPOLATION	
1971	1.961218	EXTRAPOLATION	
1976	2.102489	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	8.6	7.7	9.2	9.3	11.6	10.4	10.6	9.8	8.4	7.1
	EXP	8.1	7.7	8.4	9.7	12.3	13.1	14.3*	15.8*	17.3*	19.0*
	Elow							13.9	14.8	15.8	16.9
	Eup							14.8	16.7	18.9	21.3
35	OBS	17.9	19.0	20.4	21.6	23.5	30.5	29.7	26.6	24.0	20.4
	EXP	18.9	19.7	18.6	21.5	24.7	29.8	31.6*	34.7*	38.1*	41.9*
	Elow							30.7	32.7	34.9	37.2
	Eup							32.5	36.8	41.6	47.0
40	OBS	34.6	43.7	46.7	47.8	52.8	59.7	74.7	73.2	57.8	49.3
	EXP	39.7	44.4	46.4	46.4	53.0	58.1	70.2*	74.4*	81.7*	89.7*
	Elow							68.2	70.1	74.7	79.7
	Eup							72.3	78.8	89.1	100.7
45	OBS	81.1	80.9	100.4	115.5	112.9	118.8	131.3	152.5	130.6	113.7
	EXP	86.0	89.6	100.2	110.8	109.6	119.6	131.0*	158.4*	167.8*	184.2*
	Elow							127.1	149.2	153.5	163.6
	Eup							134.8	167.8	183.0	206.8
50	OBS	180.4	195.0	199.4	242.0	261.8	238.4	253.2	267.3	290.7	252.7
	EXP	178.0	192.7	200.9	237.9	259.7	245.5	267.9*	293.5*	354.8*	375.9*
	Elow							260.1	276.5	324.6	333.8
	Eup							275.8	310.9	386.9	421.9
55	OBS	331.1	398.1	422.1	472.9	542.2	556.8	502.5	514.2	502.9	549.9
	EXP	346.6	387.0	419.0	462.6	541.0	564.4	533.5*	582.3*	637.8*	771.2*
	Elow							517.9	548.7	583.4	684.7
	Eup							549.1	616.9	695.5	865.5
60	OBS	609.9	703.1	787.3	910.8	980.7	1096.7	1096.0	942.0	916.8	923.8
	EXP	601.1	705.6	788.0	903.6	985.3	1101.0	1148.7*	1085.8*	1185.2*	1298.1*
	Elow							1115.1	1023.1	1084.0	1152.6
	Eup							1182.4	1150.3	1292.4	1457.0
65	OBS	843.4	1141.7	1341.7	1547.1	1787.1	1869.6	2023.0	1884.1	1590.6	1582.1
	EXP	851.0	1134.0	1331.3	1574.6	1783.4	1858.4	2076.7*	2166.6*	2047.9*	2235.4*
	Elow							2015.8	2041.6	1873.2	1984.8
	Eup							2137.5	2295.4	2233.2	2509.0
70	OBS	1104.7	1487.3	1927.4	2395.8	2780.5	3024.9	3126.7	3249.1	2922.4	2472.7
	EXP	1049.8	1450.3	1933.0	2403.4	2807.7	3038.9	3166.6*	3538.5*	3691.8*	3489.5*
	Elow							3073.8	3334.3	3376.9	3098.3
	Eup							3259.3	3748.8	4025.8	3916.6
75	OBS	1086.8	1453.6	2088.0	2980.7	3716.4	4169.6	4574.3	4600.5	4618.5	4184.5
	EXP	1086.8	1539.9	2128.0	3003.7	3688.7	4118.0	4457.0*	4644.3*	5189.8*	5414.7*
	Elow							4326.4	4376.2	4747.0	4807.7
	Eup							4587.5	4920.3	5659.3	6077.4
30-79	OBS	293.7	368.4	444.1	541.5	624.0	671.3	702.0	690.7	646.3	602.5
	EXP	293.2	369.0	444.6	541.7	624.0	671.6	714.0*	755.1*	800.3*	842.4*
	Elow							693.1	711.5	732.0	748.0
	Eup							734.9	800.0	872.7	945.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	172.0	160.0	200.0	237.0	289.0	213.0	210.0	207.0	200.0	163.0
	EXP	161.8	159.4	183.3	249.1	306.3	268.0	284.1*	334.2*	413.3*	435.1*
	CHI	0.638	0.002	1.527	0.588	0.973	11.304	19.341	48.398	110.107	170.198
35 -	OBS	294.0	378.0	424.0	471.0	599.0	752.0	609.0	528.0	507.0	486.0
	EXP	310.4	391.9	386.7	468.4	628.5	735.4	649.0*	687.7*	806.2*	996.2*
	CHI	0.863	0.496	3.602	0.014	1.386	0.374	2.461	37.086	111.010	261.306
40 -	OBS	420.0	711.0	923.0	980.0	1139.0	1503.0	1836.0	1499.0	1137.0	1037.0
	EXP	483.1	722.0	917.0	952.8	1143.6	1462.9	1726.6*	1522.9*	1608.6*	1888.0*
	CHI	8.239	0.169	0.040	0.778	0.018	1.097	6.931	0.374	138.256	383.579
45 -	OBS	884.0	969.0	1613.0	2242.0	2278.0	2517.0	3282.0	3712.0	2650.0	2218.0
	EXP	937.8	1073.6	1609.1	2150.3	2209.5	2532.5	3274.2*	3854.1*	3405.3*	3594.1*
	CHI	3.086	10.198	0.010	3.912	2.121	0.095	0.018	5.241	167.536	526.859
50 -	OBS	1892.0	2061.0	2326.0	3777.0	4945.0	4678.0	5275.0	6558.0	6940.0	5071.0
	EXP	1867.7	2036.7	2343.4	3713.0	4904.4	4816.8	5582.8*	7201.4*	8470.2*	7544.8*
	CHI	0.317	0.289	0.129	1.102	0.336	4.002	16.972	57.476	276.430	811.131
55 -	OBS	3058.0	3945.0	4263.0	5274.0	8144.0	10096.0	9582.0	10429.0	11959.0	12808.0
	EXP	3201.0	3835.5	4231.8	5159.7	8124.9	10234.2	10172.4*	11811.0*	15167.0*	17961.5*
	CHI	6.386	3.127	0.229	2.530	0.045	1.866	34.269	161.707	678.513	1478.627
60 -	OBS	4663.0	5912.0	7264.0	8616.0	10341.0	15582.0	18909.0	17194.0	17868.0	21198.0
	EXP	4596.3	5932.5	7270.4	8547.3	10389.8	15642.8	19818.7*	19818.5*	23096.9*	29788.5*
	CHI	0.969	0.071	0.006	0.553	0.229	0.236	41.757	347.551	1183.753	2477.364
65 -	OBS	4730.0	7493.0	9915.0	12807.0	15379.0	18090.0	26602.0	30123.0	27133.0	29422.0
	EXP	4772.6	7442.5	9837.7	13034.9	15347.7	17981.7	27307.2*	34639.4*	34933.1*	41569.2*
	CHI	0.380	0.343	0.607	3.983	0.064	0.653	18.209	588.868	1741.649	3549.600
70 -	OBS	4057.0	6535.0	10202.0	14653.0	19648.0	22570.0	26641.0	37984.0	41788.0	38581.0
	EXP	3855.3	6372.5	10231.5	14699.8	19840.3	22674.1	26980.3*	41368.0*	52789.8*	54447.4*
	CHI	10.551	4.146	0.085	0.149	1.864	0.478	4.267	276.823	2292.859	4623.579
75 -	OBS	2268.0	3588.0	6450.0	11496.0	17273.0	23113.0	27325.0	32415.0	45283.0	51115.0
	EXP	2268.0	3800.9	6573.4	11584.8	17144.0	22826.7	26624.3*	32723.4*	50884.3*	66141.5*
	CHI	0.000	11.930	2.315	0.680	0.970	3.590	18.441	2.906	616.583	3413.837
30-79	OBS	22438.0	31752.0	43580.0	60553.0	80035.0	99114.0	120271.0	140649.0	155465.0	162099.0
	EXP	22453.9	31767.6	43584.2	60560.1	80039.0	99175.3	122419.6*	153960.5*	191574.5*	224366.3*
	O/E	0.999	1.000	1.000	1.000	1.000	0.999	0.982	0.914	0.812	0.722

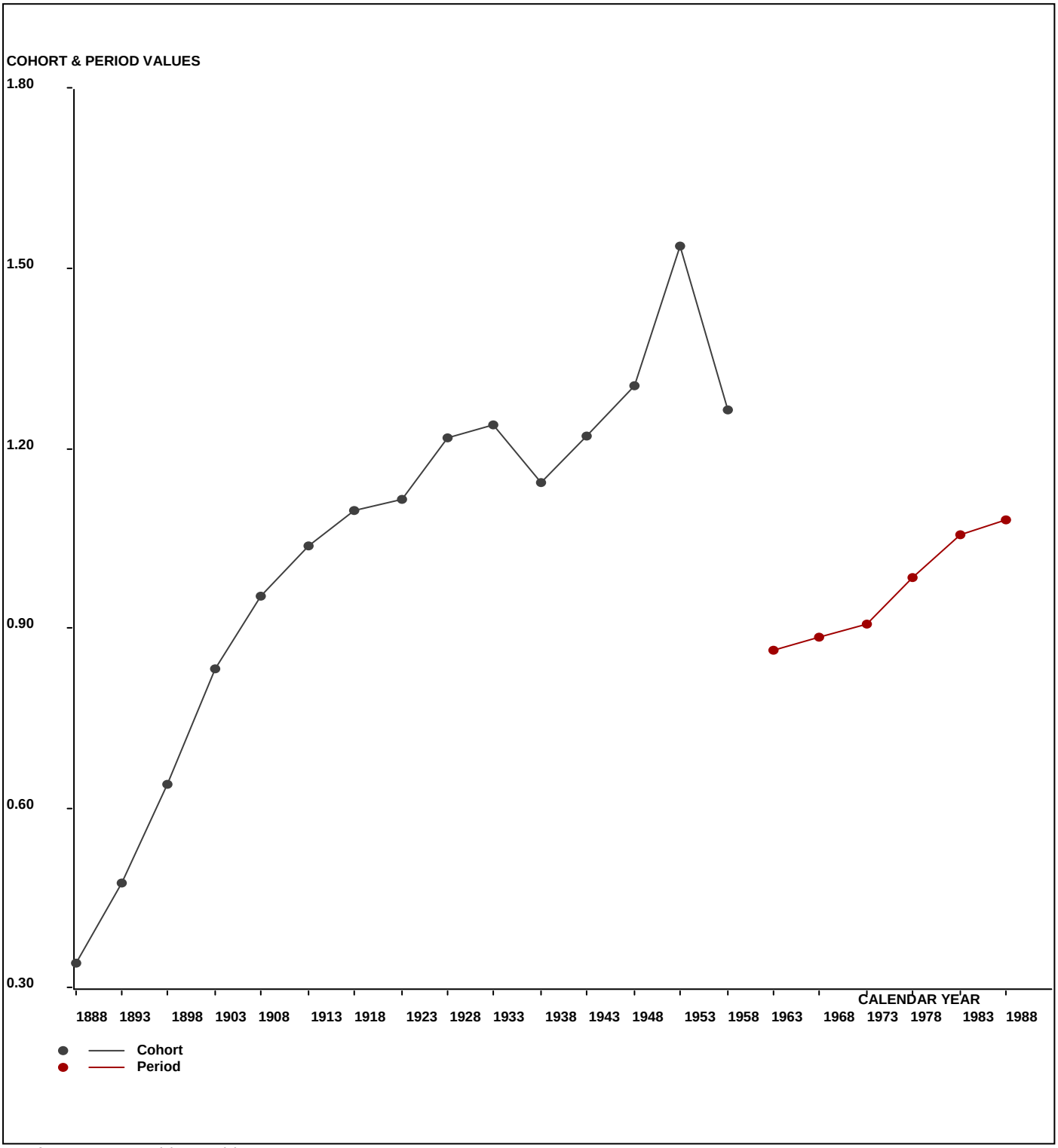
CHI SQUARE (LOG)= 26701.8736 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

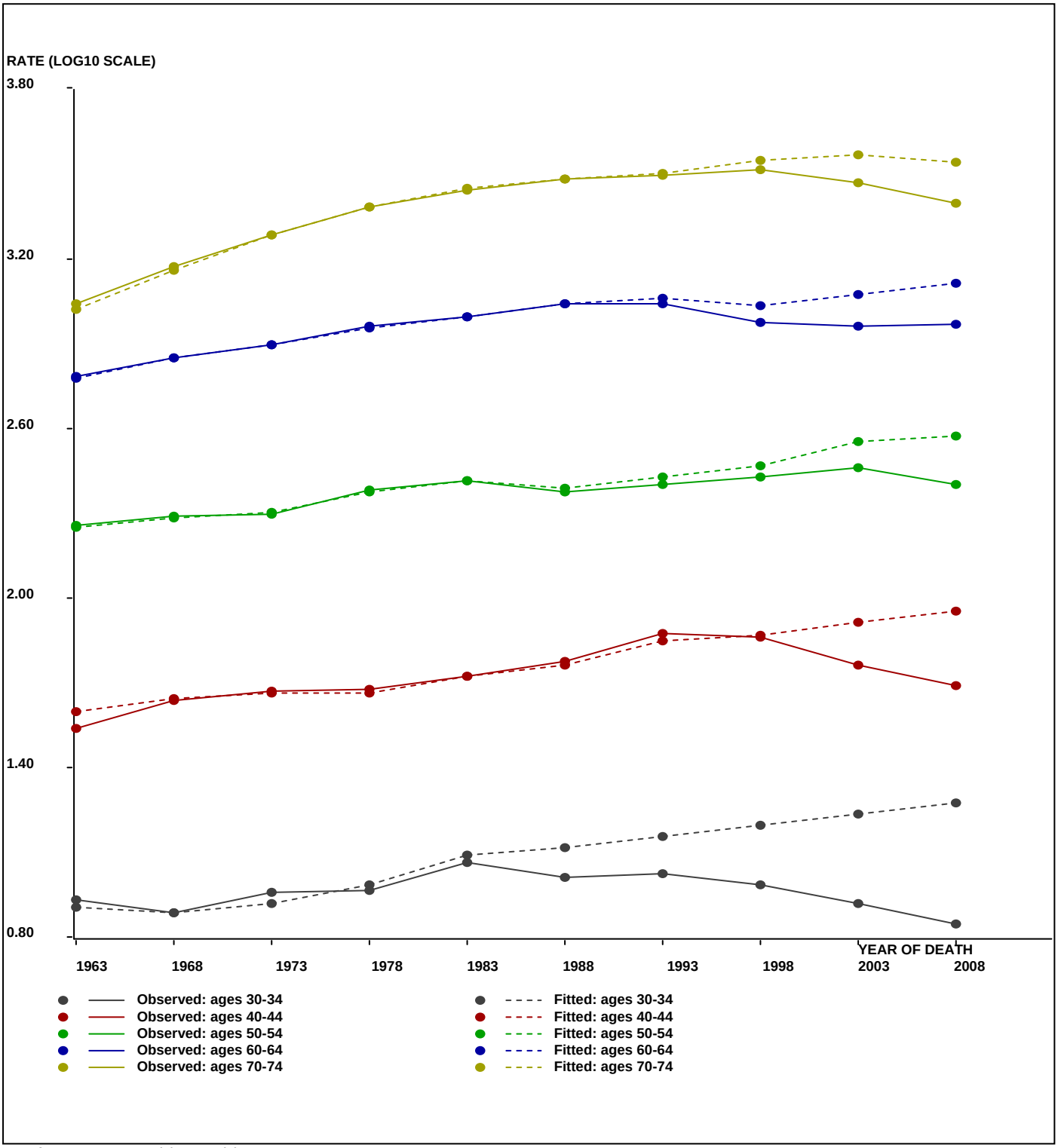


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	10.6	29.7	74.7	131.3	253.2	502.5	1096.0	2023.0	3126.7	4574.3
	PRE	14.3	31.6	70.2	131.0	267.9	533.5	1148.7	2076.7	3166.6	4457.0
	RES	-3.743	-1.946	4.450	0.311	-14.773	-30.964	-52.728	-53.626	-39.824	117.299
1996-	OBS	9.8	26.6	73.2	152.5	267.3	514.2	942.0	1884.1	3249.1	4600.5
	PRE	15.8	34.7	74.4	158.4	293.5	582.3	1085.8	2166.6	3538.5	4644.3
	RES	-5.996	-8.060	-1.166	-5.839	-26.219	-68.136	-143.785	-282.494	-289.463	-43.766
2001-	OBS	8.4	24.0	57.8	130.6	290.7	502.9	916.8	1590.6	2922.4	4618.5
	PRE	17.3	38.1	81.7	167.8	354.8	637.8	1185.2	2047.9	3691.8	5189.8
	RES	-8.929	-14.143	-23.955	-37.215	-64.101	-134.906	-268.305	-457.269	-769.409	-571.288
2006-	OBS	7.1	20.4	49.3	113.7	252.7	549.9	923.8	1582.1	2472.7	4184.5
	PRE	19.0	41.9	89.7	184.2	375.9	771.2	1298.1	2235.4	3489.5	5414.7
	RES	-11.881	-21.435	-40.443	-70.541	-123.263	-221.257	-374.361	-653.205	-1016.877	-1230.141

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	210.0	609.0	1836.0	3282.0	5275.0	9582.0	18909.0	26602.0	26641.0	27325.0
	PRE	284.1	649.0	1726.6	3274.2	5582.8	10172.4	19818.7	27307.2	26980.3	26624.3
	CHI	19.341	2.461	6.931	0.018	16.972	34.269	41.757	18.209	4.267	18.441
1996-	OBS	207.0	528.0	1499.0	3712.0	6558.0	10429.0	17194.0	30123.0	37984.0	32415.0
	PRE	334.2	687.7	1522.9	3854.1	7201.4	11811.0	19818.5	34639.4	41368.0	32723.4
	CHI	48.398	37.086	0.374	5.241	57.476	161.707	347.551	588.868	276.823	2.906
2001-	OBS	200.0	507.0	1137.0	2650.0	6940.0	11959.0	17868.0	27133.0	41788.0	45283.0
	PRE	413.3	806.2	1608.6	3405.3	8470.2	15167.0	23096.9	34933.1	52789.8	50884.3
	CHI	110.107	111.010	138.256	167.536	276.430	678.513	1183.753	1741.649	2292.859	616.583
2006-	OBS	163.0	486.0	1037.0	2218.0	5071.0	12808.0	21198.0	29422.0	38581.0	51115.0
	PRE	435.1	996.2	1888.0	3594.1	7544.8	17961.5	29788.5	41569.2	54447.4	66141.5
	CHI	170.198	261.306	383.579	526.859	811.131	1478.627	2477.364	3549.600	4623.579	3413.837

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	2348.74	46.05	51	P, C	98.35	12591.97	0.0000
AGE-PERIOD	190.42	4.23	45	Cohort	79.70	1011.87	0.0000
AGE-COHORT	1101.30	30.59	36	Period	96.49	6013.98	0.0000
PERIOD-COHORT	88.08	2.20	40	Age	56.11	467.55	0.0000
FULL AGE-PERIOD-COHORT	38.66	1.21	32			205.30	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.053106	11.300709
35	1.237437	17.275740
40	1.413076	25.886639
45	1.610913	40.823731
50	1.817477	65.686693
55	2.109712	128.739503
60	2.432683	270.821534
65	2.778043	599.850112
70	3.125270	1334.351751
75	3.436474	2731.960785

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.127195	0.746113
1966	0.136570	1.369524
1971	0.137497	1.372453
1976	0.007894	1.018343
1981	-0.099760	0.794767
1986	-0.155612	0.698857

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.067296	0.856453
1891	-0.075456	0.840512
1896	-0.043723	0.904226
1901	0.007634	1.017733
1906	0.028907	1.068827
1911	0.038073	1.091623
1916	0.026215	1.062222
1921	-0.007745	0.982325
1926	-0.020249	0.954446
1931	-0.035520	0.921468
1936	-0.059960	0.871043
1941	-0.124293	0.751115
1946	-0.169177	0.677366
1951	-0.050677	0.889862
1956	0.050478	1.123254

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	143.0	326.0	265.0	181.0	162.0	182.0
	EXP	154.5	279.3	254.2	199.2	198.5	182.0
	CHI	0.9	7.8	0.5	1.7	6.7	0.0
35 -	OBS	169.0	475.0	428.0	267.0	211.0	296.0
	EXP	202.4	434.1	429.0	287.5	236.9	264.9
	CHI	5.5	3.9	0.0	1.5	2.8	3.7
40 -	OBS	188.0	563.0	677.0	463.0	292.0	348.0
	EXP	230.6	550.0	647.5	471.2	333.2	308.6
	CHI	7.9	0.3	1.3	0.1	5.1	5.0
45 -	OBS	293.0	669.0	900.0	754.0	510.0	499.0
	EXP	352.8	657.9	858.8	743.7	570.0	453.8
	CHI	10.1	0.2	2.0	0.1	6.3	4.5
50 -	OBS	432.0	977.0	1125.0	1037.0	901.0	800.0
	EXP	561.2	1009.8	1032.9	996.6	908.5	784.6
	CHI	29.7	1.1	8.2	1.6	0.1	0.3
55 -	OBS	845.0	1865.0	2024.0	1498.0	1475.0	1437.0
	EXP	948.1	1907.4	1895.4	1436.4	1466.7	1503.3
	CHI	11.2	0.9	8.7	2.6	0.0	2.9
60 -	OBS	1555.0	3432.0	3786.0	2817.0	2130.0	2491.0
	EXP	1572.4	3333.3	3743.6	2771.1	2229.6	2566.5
	CHI	0.2	2.9	0.5	0.8	4.4	2.2
65 -	OBS	2378.0	5606.0	6360.0	5484.0	4338.0	3950.0
	EXP	2269.6	5487.3	6502.3	5519.9	4358.0	3984.6
	CHI	5.2	2.6	3.1	0.2	0.1	0.3
70 -	OBS	3315.0	7248.0	9750.0	8791.0	8220.0	7318.0
	EXP	3073.2	7260.4	9865.2	8882.9	8180.4	7390.8
	CHI	19.0	0.0	1.3	1.0	0.2	0.7
75 -	OBS	3643.0	7507.0	10374.0	10932.0	11013.0	11661.0
	EXP	3643.0	7762.3	10473.1	10920.2	10786.0	11553.0
	CHI	0.0	8.4	0.9	0.0	4.8	1.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	76613.72	1915.34	40	P, C	96.79	0.0000
AGE-PERIOD	5707.76	142.69	40	Cohort	56.90	0.0000
AGE-COHORT	1893.74	47.34	40	Period	-29.90	0.0000
PERIOD-COHORT	5252.93	131.32	40	Age	53.17	0.0000
FULL AGE-PERIOD-COHORT	2460.06	61.50	40			0.0000

AGE	EFFECT
30	11.300709
35	17.275740
40	25.886639
45	40.823731
50	65.686693
55	128.739503
60	270.821534
65	599.850112
70	1334.351751
75	2731.960785

PERIOD	EFFECT	LOWER	UPPER
% Period Change	87.9322	84.9322	90.9322
1961	0.746113		
1966	1.369524		
1971	1.372453		
1976	1.018343		
1981	0.794767		
1986	0.698857		
1991	0.614520	0.593555	0.635486
1996	0.540362	0.504119	0.577862
2001	0.475152	0.428160	0.525463
2006	0.417812	0.363646	0.477815

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.856453	1.000000	
1891	0.840512	2.000000	
1896	0.904226	4.000000	
1901	1.017733	8.000000	
1906	1.068827	16.000000	
1911	1.091623	32.000000	
1916	1.062222	64.000000	
1921	0.982325	128.000000	
1926	0.954446	256.000000	
1931	0.921468	512.000000	
1936	0.871043	1024.000000	
1941	0.751115	2048.000000	
1946	0.677366	4096.000000	
1951	0.889862	8192.000000	
1956	0.819056	EXTRAPOLATION	1.123254
1961	0.820508	EXTRAPOLATION	
1966	0.821963	EXTRAPOLATION	
1971	0.823420	EXTRAPOLATION	
1976	0.824881	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	7.2	15.7	12.1	7.1	6.5	8.9	11.2	9.2	6.6	3.1
	EXP	7.8	13.5	11.6	7.8	8.0	6.5	5.7*	5.0*	4.4*	3.9*
	Elow							5.5	4.7	4.0	3.4
	Eup							5.9	5.4	4.9	4.5
35	OBS	10.3	23.9	20.6	12.3	8.3	12.0	11.0	10.3	6.8	4.7
	EXP	12.3	21.8	20.7	13.2	9.3	10.7	8.7*	7.7*	6.7*	5.9*
	Elow							8.4	7.1	6.1	5.2
	Eup							9.0	8.2	7.5	6.8
40	OBS	15.5	34.6	34.2	22.6	13.5	13.8	14.4	10.6	7.2	6.0
	EXP	19.0	33.8	32.7	23.0	15.5	12.3	14.2*	11.5*	10.1*	8.9*
	Elow							13.7	10.7	9.1	7.7
	Eup							14.6	12.3	11.2	10.2
45	OBS	26.9	55.9	56.0	38.8	25.3	23.6	19.0	16.0	9.6	8.5
	EXP	32.4	54.9	53.5	38.3	28.3	21.4	17.0*	19.6*	15.9*	14.0*
	Elow							16.4	18.3	14.3	12.2
	Eup							17.6	21.0	17.6	16.0
50	OBS	41.2	92.5	96.5	66.4	47.7	40.8	34.9	21.8	17.4	13.7
	EXP	53.5	95.6	88.6	63.8	48.1	40.0	30.3*	24.0*	27.8*	22.5*
	Elow							29.3	22.4	25.0	19.6
	Eup							31.4	25.7	30.7	25.7
55	OBS	91.5	188.2	200.4	134.3	98.2	79.2	65.2	47.7	33.3	29.9
	EXP	102.7	192.5	187.7	128.8	97.7	82.9	68.9*	52.3*	41.4*	47.9*
	Elow							66.6	48.7	37.3	41.7
	Eup							71.3	55.9	45.8	54.7
60	OBS	203.4	408.2	410.3	297.8	202.0	175.3	159.5	112.7	78.0	63.1
	EXP	205.6	396.4	405.7	292.9	211.4	180.6	153.4*	127.5*	96.7*	76.6*
	Elow							148.1	118.9	87.1	66.7
	Eup							158.6	136.3	106.9	87.7
65	OBS	424.0	854.2	860.7	662.5	504.1	408.2	378.3	299.4	203.8	158.0
	EXP	404.7	836.1	879.9	666.8	506.4	411.8	351.8*	298.7*	248.3*	188.2*
	Elow							339.8	278.6	223.7	163.8
	Eup							363.8	319.4	274.6	215.3
70	OBS	902.6	1649.6	1842.0	1437.3	1163.3	980.8	900.9	773.3	570.8	406.5
	EXP	836.8	1652.4	1863.8	1452.4	1157.7	990.5	805.5*	688.2*	584.2*	485.6*
	Elow							778.0	642.0	526.4	422.7
	Eup							833.0	735.9	646.1	555.4
75	OBS	1745.8	3041.3	3358.3	2834.5	2369.6	2103.7	2047.8	1732.3	1401.1	1082.3
	EXP	1745.8	3144.8	3390.4	2831.4	2320.7	2084.2	1783.3*	1450.2*	1239.0*	1051.8*
	Elow							1722.5	1352.9	1116.4	915.4
	Eup							1844.1	1550.8	1370.1	1202.9
30-79	OBS	184.9	348.6	372.3	290.1	228.3	196.9	184.3	151.0	113.7	86.6
	EXP	184.3	350.3	372.7	290.0	228.1	196.8	165.5*	137.9*	116.5*	97.6*
	Elow							159.8	128.7	105.0	85.0
	Eup							171.1	147.5	128.9	111.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	143.0	326.0	265.0	181.0	162.0	182.0	221.0	195.0	157.0	71.0
	EXP	154.5	279.3	254.2	199.2	198.5	132.7	112.8*	106.5*	105.6*	89.2*
	CHI	0.863	7.796	0.458	1.666	6.710	18.306	103.658	73.622	24.976	3.717
35 -	OBS	169.0	475.0	428.0	267.0	211.0	296.0	226.0	204.0	143.0	112.0
	EXP	202.4	434.1	429.0	287.5	236.9	264.9	178.5*	151.8*	142.7*	141.5*
	CHI	5.511	3.860	0.002	1.467	2.833	3.664	12.617	17.976	0.001	6.140
40 -	OBS	188.0	563.0	677.0	463.0	292.0	348.0	354.0	216.0	142.0	127.0
	EXP	230.6	550.0	647.5	471.2	333.2	308.6	348.0*	234.5*	198.7*	187.1*
	CHI	7.875	0.306	1.345	0.143	5.100	5.026	0.103	1.457	16.172	19.286
45 -	OBS	293.0	669.0	900.0	754.0	510.0	499.0	475.0	389.0	195.0	166.0
	EXP	352.8	657.9	858.8	743.7	570.0	453.8	424.8*	477.7*	322.5*	273.0*
	CHI	10.137	0.189	1.981	0.142	6.315	4.493	5.934	16.486	50.382	41.943
50 -	OBS	432.0	977.0	1125.0	1037.0	901.0	800.0	728.0	534.0	416.0	274.0
	EXP	561.2	1009.8	1032.9	996.6	908.5	784.6	631.7*	590.0*	663.0*	451.1*
	CHI	29.750	1.066	8.204	1.638	0.061	0.301	14.666	5.308	92.014	69.553
55 -	OBS	845.0	1865.0	2024.0	1498.0	1475.0	1437.0	1244.0	967.0	793.0	696.0
	EXP	948.1	1907.4	1895.4	1436.4	1466.7	1503.3	1314.0*	1059.8*	985.3*	1114.9*
	CHI	11.217	0.945	8.722	2.644	0.047	2.923	3.729	8.131	37.530	157.365
60 -	OBS	1555.0	3432.0	3786.0	2817.0	2130.0	2491.0	2751.0	2058.0	1521.0	1449.0
	EXP	1572.4	3333.3	3743.6	2771.1	2229.6	2566.5	2645.8*	2326.7*	1883.7*	1758.8*
	CHI	0.193	2.924	0.479	0.760	4.449	2.222	4.181	31.030	69.821	54.569
65 -	OBS	2378.0	5606.0	6360.0	5484.0	4338.0	3950.0	4975.0	4786.0	3476.0	2938.0
	EXP	2269.6	5487.3	6502.3	5519.9	4358.0	3984.6	4626.4*	4775.2*	4234.9*	3500.7*
	CHI	5.181	2.569	3.116	0.234	0.092	0.300	26.272	0.024	135.992	90.450
70 -	OBS	3315.0	7248.0	9750.0	8791.0	8220.0	7318.0	7676.0	9040.0	8162.0	6342.0
	EXP	3073.2	7260.4	9865.2	8882.9	8180.4	7390.8	6863.1*	8045.4*	8353.9*	7577.1*
	CHI	19.026	0.021	1.345	0.952	0.192	0.717	96.286	122.960	4.409	201.312
75 -	OBS	3643.0	7507.0	10374.0	10932.0	11013.0	11661.0	12233.0	12206.0	13737.0	13220.0
	EXP	3643.0	7762.3	10473.1	10920.2	10786.0	11553.0	10652.8*	10217.8*	12147.6*	12848.1*
	CHI	0.000	8.398	0.937	0.013	4.776	1.010	234.386	386.880	207.955	10.764
30-79	OBS	12961.0	28668.0	35689.0	32224.0	29252.0	28982.0	30883.0	30595.0	28742.0	25395.0
	EXP	13007.9	28681.8	35702.1	32228.8	29267.8	28942.8	27798.1*	27985.3*	29037.8*	27941.4*
	O/E	0.996	1.000	1.000	1.000	0.999	1.001	1.111	1.093	0.990	0.909

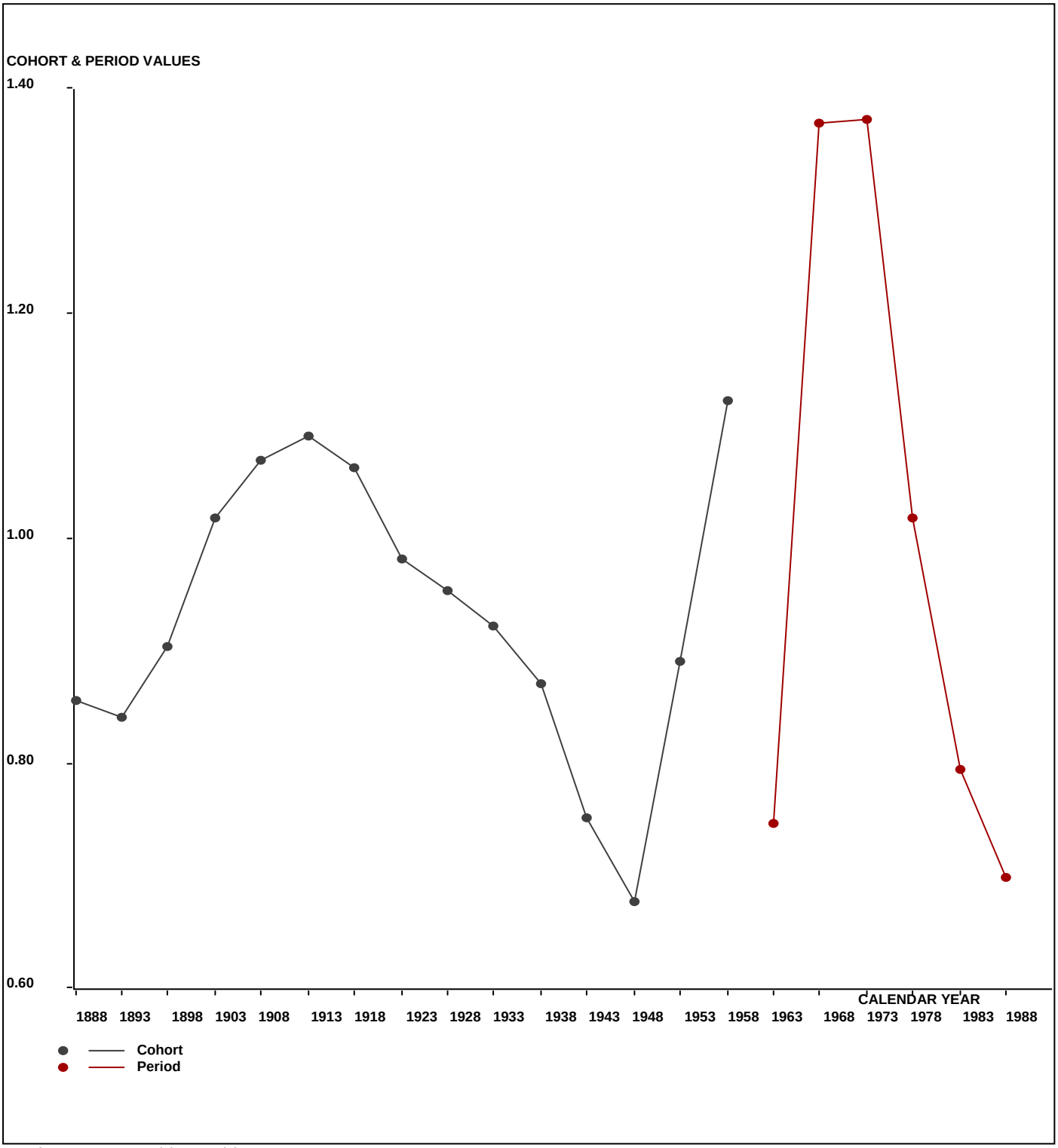
CHI SQUARE (LOG)= 2460.0554 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

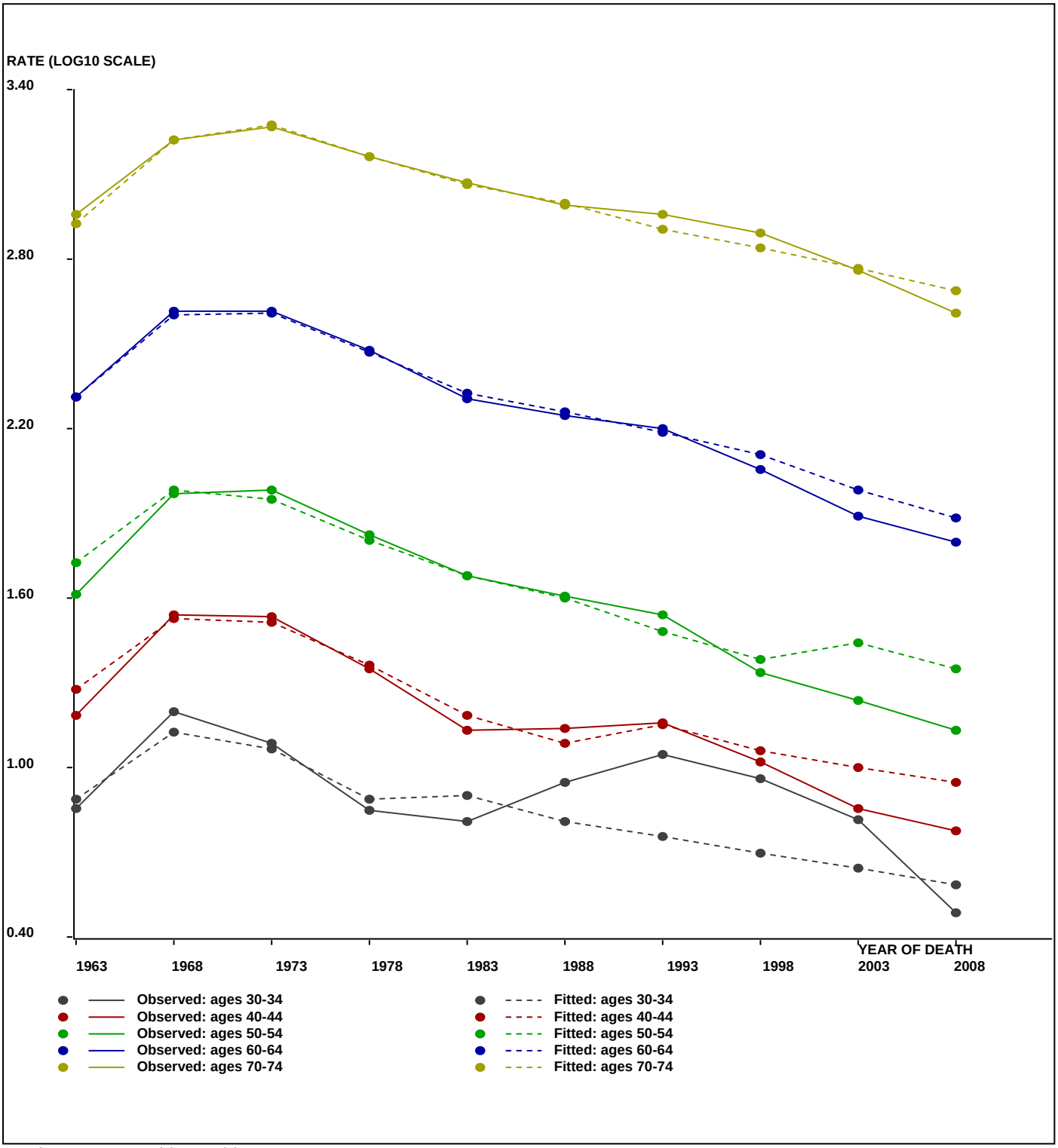


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	11.2	11.0	14.4	19.0	34.9	65.2	159.5	378.3	900.9	2047.8
	PRE	5.7	8.7	14.2	17.0	30.3	68.9	153.4	351.8	805.5	1783.3
	RES	5.461	2.311	0.244	2.008	4.620	-3.671	6.096	26.513	95.407	264.521
1996-	OBS	9.2	10.3	10.6	16.0	21.8	47.7	112.7	299.4	773.3	1732.3
	PRE	5.0	7.7	11.5	19.6	24.0	52.3	127.5	298.7	688.2	1450.2
	RES	4.174	2.636	-0.903	-3.647	-2.281	-4.577	-14.721	0.675	85.078	282.179
2001-	OBS	6.6	6.8	7.2	9.6	17.4	33.3	78.0	203.8	570.8	1401.1
	PRE	4.4	6.7	10.1	15.9	27.8	41.4	96.7	248.3	584.2	1239.0
	RES	2.150	0.013	-2.879	-6.280	-10.347	-8.087	-18.609	-44.489	-13.421	162.106
2006-	OBS	3.1	4.7	6.0	8.5	13.7	29.9	63.1	158.0	406.5	1082.3
	PRE	3.9	5.9	8.9	14.0	22.5	47.9	76.6	188.2	485.6	1051.8
	RES	-0.795	-1.238	-2.855	-5.486	-8.826	-17.983	-13.501	-30.259	-79.154	30.445

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	221.0	226.0	354.0	475.0	728.0	1244.0	2751.0	4975.0	7676.0	12233.0
	PRE	112.8	178.5	348.0	424.8	631.7	1314.0	2645.8	4626.4	6863.1	10652.8
	CHI	103.658	12.617	0.103	5.934	14.666	3.729	4.181	26.272	96.286	234.386
1996-	OBS	195.0	204.0	216.0	389.0	534.0	967.0	2058.0	4786.0	9040.0	12206.0
	PRE	106.5	151.8	234.5	477.7	590.0	1059.8	2326.7	4775.2	8045.4	10217.8
	CHI	73.622	17.976	1.457	16.486	5.308	8.131	31.030	0.024	122.960	386.880
2001-	OBS	157.0	143.0	142.0	195.0	416.0	793.0	1521.0	3476.0	8162.0	13737.0
	PRE	105.6	142.7	198.7	322.5	663.0	985.3	1883.7	4234.9	8353.9	12147.6
	CHI	24.976	0.001	16.172	50.382	92.014	37.530	69.821	135.992	4.409	207.955
2006-	OBS	71.0	112.0	127.0	166.0	274.0	696.0	1449.0	2938.0	6342.0	13220.0
	PRE	89.2	141.5	187.1	273.0	451.1	1114.9	1758.8	3500.7	7577.1	12848.1
	CHI	3.717	6.140	19.286	41.943	69.553	157.365	54.569	90.450	201.312	10.764

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	14216.29	278.75	51	P, C	98.47	79611.48	0.0000
AGE-PERIOD	1761.32	39.14	45	Cohort	87.68	9626.45	0.0000
AGE-COHORT	694.09	19.28	36	Period	68.74	3712.37	0.0000
PERIOD-COHORT	466.81	11.67	40	Age	53.51	2493.63	0.0000
FULL AGE-PERIOD-COHORT	217.00	6.78	32			1159.87	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.902489	79.889346
35	1.940134	87.123140
40	2.057209	114.079758
45	2.200626	158.717991
50	2.349852	223.795820
55	2.546187	351.711814
60	2.805268	638.657595
65	3.071755	1179.654740
70	3.350431	2240.942470
75	3.621195	4180.178454

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.235413	1.719544
1966	0.088475	1.225956
1971	-0.041854	0.908125
1976	-0.085220	0.821826
1981	-0.123263	0.752900
1986	-0.187449	0.649458

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.006840	0.984374
1891	0.016648	1.039077
1896	0.044307	1.107407
1901	0.071538	1.179065
1906	0.050352	1.122928
1911	0.027381	1.065077
1916	-0.021166	0.952431
1921	-0.096689	0.800407
1926	-0.183785	0.654960
1931	-0.290069	0.512780
1936	-0.432008	0.369821
1941	-0.605870	0.247817
1946	-0.795993	0.159958
1951	-0.945082	0.113480
1956	-1.025382	0.094323

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	1683.0	683.0	222.0	136.0	123.0	99.0
	EXP	1390.9	750.5	393.8	266.4	167.3	99.0
	CHI	61.4	6.1	74.9	63.8	11.8	0.0
35 -	OBS	2064.0	962.0	402.0	241.0	256.0	191.0
	EXP	1732.1	1079.2	606.2	387.3	265.9	156.7
	CHI	63.6	12.7	68.8	55.3	0.4	7.5
40 -	OBS	2708.0	1465.0	719.0	550.0	500.0	387.0
	EXP	2336.8	1600.1	1043.0	712.5	462.7	298.0
	CHI	59.0	11.4	100.7	37.1	3.0	26.6
45 -	OBS	3659.0	2100.0	1376.0	1134.0	979.0	726.0
	EXP	3361.9	2301.1	1642.9	1303.2	901.3	549.0
	CHI	26.3	17.6	43.3	22.0	6.7	57.0
50 -	OBS	4925.0	3311.0	2130.0	1839.0	1676.0	1342.0
	EXP	4784.0	3314.1	2370.2	2067.1	1664.1	1080.5
	CHI	4.2	0.0	24.3	25.2	0.1	63.3
55 -	OBS	6454.0	5402.0	3613.0	3147.0	2925.0	2409.0
	EXP	6606.9	5166.5	3767.3	3289.9	2926.8	2214.3
	CHI	3.5	10.7	6.3	6.2	0.0	17.1
60 -	OBS	9862.0	8093.0	6914.0	5979.0	5495.0	4688.0
	EXP	10406.8	8122.9	6735.4	5994.1	5331.5	4465.3
	CHI	28.5	0.1	4.7	0.0	5.0	11.1
65 -	OBS	13381.0	12456.0	10687.0	10861.0	9844.0	8133.0
	EXP	13914.5	12565.4	10427.0	10656.4	9677.3	8138.8
	CHI	20.5	1.0	6.5	3.9	2.9	0.0
70 -	OBS	17705.0	16323.0	15950.0	16447.0	17047.0	14424.0
	EXP	18038.5	16256.2	15670.5	16137.9	17069.0	14735.9
	CHI	6.2	0.3	5.0	5.9	0.0	6.6
75 -	OBS	21485.0	18640.0	18356.0	22055.0	23095.0	23201.0
	EXP	21485.0	18312.6	17905.4	21700.7	23492.7	23962.7
	CHI	0.0	5.9	11.3	5.8	6.7	24.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	217653.46	5441.34	40	P, C	15.15	0.0000
AGE-PERIOD	33255.89	831.40	40	Cohort	-455.31	0.0000
AGE-COHORT	260219.25	6505.48	40	Period	29.03	0.0000
PERIOD-COHORT	128894.91	3222.37	40	Age	-43.27	0.0000
FULL AGE-PERIOD-COHORT	184672.12	4616.80	40			0.0000

AGE	EFFECT
30	79.889346
35	87.123140
40	114.079758
45	158.717991
50	223.795820
55	351.711814
60	638.657595
65	1179.654740
70	2240.942470
75	4180.178454

PERIOD	EFFECT	LOWER	UPPER
% Period Change	86.2609	83.2609	89.2609
1961	1.719544		
1966	1.225956		
1971	0.908125		
1976	0.821826		
1981	0.752900		
1986	0.649458		
1991	0.560228	0.540745	0.579712
1996	0.483258	0.450229	0.517456
2001	0.416863	0.374865	0.461886
2006	0.359590	0.312116	0.412284

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.984374	1.000000	
1891	1.039077	2.000000	
1896	1.107407	4.000000	
1901	1.179065	8.000000	
1906	1.122928	16.000000	
1911	1.065077	32.000000	
1916	0.952431	64.000000	
1921	0.800407	128.000000	
1926	0.654960	256.000000	
1931	0.512780	512.000000	
1936	0.369821	1024.000000	
1941	0.247817	2048.000000	
1946	0.159958	4096.000000	
1951	0.113480	8192.000000	
1956	0.081465	EXTRAPOLATION	0.094323
1961	0.057526	EXTRAPOLATION	
1966	0.040621	EXTRAPOLATION	
1971	0.028685	EXTRAPOLATION	
1976	0.020255	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	85.2	33.0	10.1	5.4	5.0	4.9	5.7	7.5	6.3	7.3
	EXP	70.4	36.2	18.0	10.5	6.8	4.2	2.6*	1.6*	1.0*	0.6*
	Elow							2.5	1.5	0.9	0.5
	Eup							2.7	1.7	1.1	0.7
35	OBS	116.9	48.8	19.4	11.0	10.1	7.8	9.5	12.4	14.7	13.8
	EXP	98.1	54.8	29.3	17.7	10.5	6.4	4.0*	2.4*	1.5*	0.9*
	Elow							3.8	2.3	1.3	0.8
	Eup							4.1	2.6	1.6	1.0
40	OBS	182.0	83.9	36.6	26.8	23.0	15.4	19.8	23.4	24.8	26.5
	EXP	157.0	91.6	53.1	34.7	21.3	11.9	7.3*	4.5*	2.7*	1.7*
	Elow							7.0	4.2	2.5	1.4
	Eup							7.5	4.8	3.0	1.9
45	OBS	282.9	142.1	79.1	58.2	48.0	33.8	34.9	50.1	41.9	41.5
	EXP	259.9	155.7	94.4	66.9	44.2	25.5	14.2*	8.7*	5.4*	3.3*
	Elow							13.7	8.1	4.8	2.8
	Eup							14.7	9.3	6.0	3.8
50	OBS	422.0	261.1	146.2	107.2	87.0	66.8	64.2	73.1	76.8	69.7
	EXP	409.9	261.3	162.7	120.5	86.4	53.8	31.1*	17.3*	10.6*	6.6*
	Elow							30.0	16.1	9.5	5.7
	Eup							32.2	18.5	11.7	7.5
55	OBS	663.4	480.2	291.7	221.3	173.3	127.4	124.3	135.8	117.2	115.9
	EXP	679.1	459.2	304.2	231.4	173.4	117.1	72.9*	42.1*	23.5*	14.4*
	Elow							70.3	39.2	21.1	12.5
	Eup							75.4	45.1	26.0	16.5
60	OBS	1227.1	876.0	634.1	498.6	396.7	285.2	251.8	275.0	230.2	179.6
	EXP	1294.8	879.2	617.7	499.9	384.9	271.7	183.5*	114.1*	66.0*	36.7*
	Elow							177.1	106.3	59.3	31.9
	Eup							189.9	122.2	73.1	42.1
65	OBS	2160.2	1690.3	1233.0	1052.4	860.5	612.8	528.1	533.8	434.4	347.1
	EXP	2246.3	1705.2	1203.0	1032.6	845.9	613.2	432.8*	292.3*	181.9*	105.1*
	Elow							417.8	272.3	163.5	91.2
	Eup							447.9	313.0	201.5	120.5
70	OBS	3930.0	3054.9	2442.3	2107.7	1794.7	1356.8	1147.7	1076.5	845.4	708.2
	EXP	4004.0	3042.4	2399.5	2068.1	1797.0	1386.2	1004.9*	709.3*	479.0*	298.0*
	Elow							969.9	660.8	430.8	258.7
	Eup							1039.8	759.5	530.8	341.7
75	OBS	7075.7	5420.2	4309.6	4116.7	3474.3	2799.6	2468.0	2303.0	1710.8	1399.2
	EXP	7075.7	5325.0	4203.9	4050.5	3534.1	2891.5	2230.5*	1616.9*	1141.3*	770.8*
	Elow							2152.9	1506.4	1026.3	669.0
	Eup							2308.0	1731.3	1264.6	883.7
30-79	OBS	951.3	691.1	506.2	437.2	363.8	276.6	244.3	242.3	194.6	163.9
	EXP	957.6	689.9	506.1	437.7	363.5	275.8	199.5*	138.1*	92.1*	58.5*
	Elow							192.6	128.7	82.8	50.8
	Eup							206.5	147.9	102.1	67.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	1683.0	683.0	222.0	136.0	123.0	99.0	110.0	156.0	147.0	163.0
	EXP	1390.9	750.5	393.8	266.4	167.3	85.5	49.9*	32.5*	22.3*	12.9*
	CHI	61.364	6.063	74.943	63.840	11.750	2.130	72.310	469.092	696.416	1739.156
35 -	OBS	2064.0	962.0	402.0	241.0	256.0	191.0	193.0	241.0	306.0	323.0
	EXP	1732.1	1079.2	606.2	387.3	265.9	156.7	80.5*	47.1*	30.7*	21.0*
	CHI	63.599	12.726	68.770	55.281	0.365	7.532	157.104	798.840	2470.650	4352.692
40 -	OBS	2708.0	1465.0	719.0	550.0	500.0	387.0	483.0	473.0	483.0	550.0
	EXP	2336.8	1600.1	1043.0	712.5	462.7	298.0	176.6*	90.9*	53.2*	34.6*
	CHI	58.954	11.406	100.660	37.054	3.004	26.571	531.503	1606.748	3474.010	7675.053
45 -	OBS	3659.0	2100.0	1376.0	1134.0	979.0	726.0	874.0	1212.0	847.0	804.0
	EXP	3361.9	2301.1	1642.9	1303.2	901.3	549.0	355.8*	210.7*	109.0*	63.6*
	CHI	26.263	17.577	43.346	21.980	6.700	57.040	754.688	4759.234	4999.207	8618.144
50 -	OBS	4925.0	3311.0	2130.0	1839.0	1676.0	1342.0	1367.0	1810.0	1844.0	1407.0
	EXP	4784.0	3314.1	2370.2	2067.1	1664.1	1080.5	661.7*	428.6*	254.2*	132.4*
	CHI	4.156	0.003	24.347	25.178	0.085	63.272	751.624	4453.055	9940.547	12275.812
55 -	OBS	6454.0	5402.0	3613.0	3147.0	2925.0	2409.0	2467.0	2858.0	2865.0	2760.0
	EXP	6606.9	5166.5	3767.3	3289.9	2926.8	2214.3	1446.0*	886.5*	573.3*	341.6*
	CHI	3.538	10.734	6.322	6.204	0.001	17.117	720.923	4383.988	9161.737	17118.411
60 -	OBS	9862.0	8093.0	6914.0	5979.0	5495.0	4688.0	4661.0	5360.0	4784.0	4335.0
	EXP	10406.8	8122.9	6735.4	5994.1	5331.5	4465.3	3396.6*	2224.7*	1370.9*	886.6*
	CHI	28.516	0.110	4.738	0.038	5.015	11.109	470.713	4418.388	8497.685	13413.191
65 -	OBS	13381.0	12456.0	10687.0	10861.0	9844.0	8133.0	8388.0	9568.0	8247.0	7109.0
	EXP	13914.5	12565.4	10427.0	10656.4	9677.3	8138.8	6875.4*	5240.1*	3452.3*	2153.3*
	CHI	20.458	0.952	6.485	3.929	2.870	0.004	332.765	3574.456	6658.954	11405.554
70 -	OBS	17705.0	16323.0	15950.0	16447.0	17047.0	14424.0	14349.0	16219.0	14467.0	12954.0
	EXP	18038.5	16256.2	15670.5	16137.9	17069.0	14735.9	12562.8*	10686.8*	8197.5*	5451.0*
	CHI	6.164	0.275	4.985	5.920	0.028	6.603	253.970	2863.853	4794.883	10327.312
75 -	OBS	21485.0	18640.0	18356.0	22055.0	23095.0	23201.0	23354.0	26115.0	23734.0	22386.0
	EXP	21485.0	18312.6	17905.4	21700.7	23492.7	23962.7	21106.4*	18335.1*	15833.8*	12331.8*
	CHI	0.000	5.855	11.340	5.785	6.734	24.209	239.335	3301.134	3941.737	8197.252
30-79	OBS	83926.0	69435.0	60369.0	62389.0	61940.0	55600.0	56246.0	64012.0	57724.0	52791.0
	EXP	84057.3	69468.5	60561.6	62515.6	61958.7	55686.7	46711.8*	38183.0*	29897.2*	21428.8*
	O/E	0.998	1.000	0.997	0.998	1.000	0.998	1.204	1.676	1.931	2.464

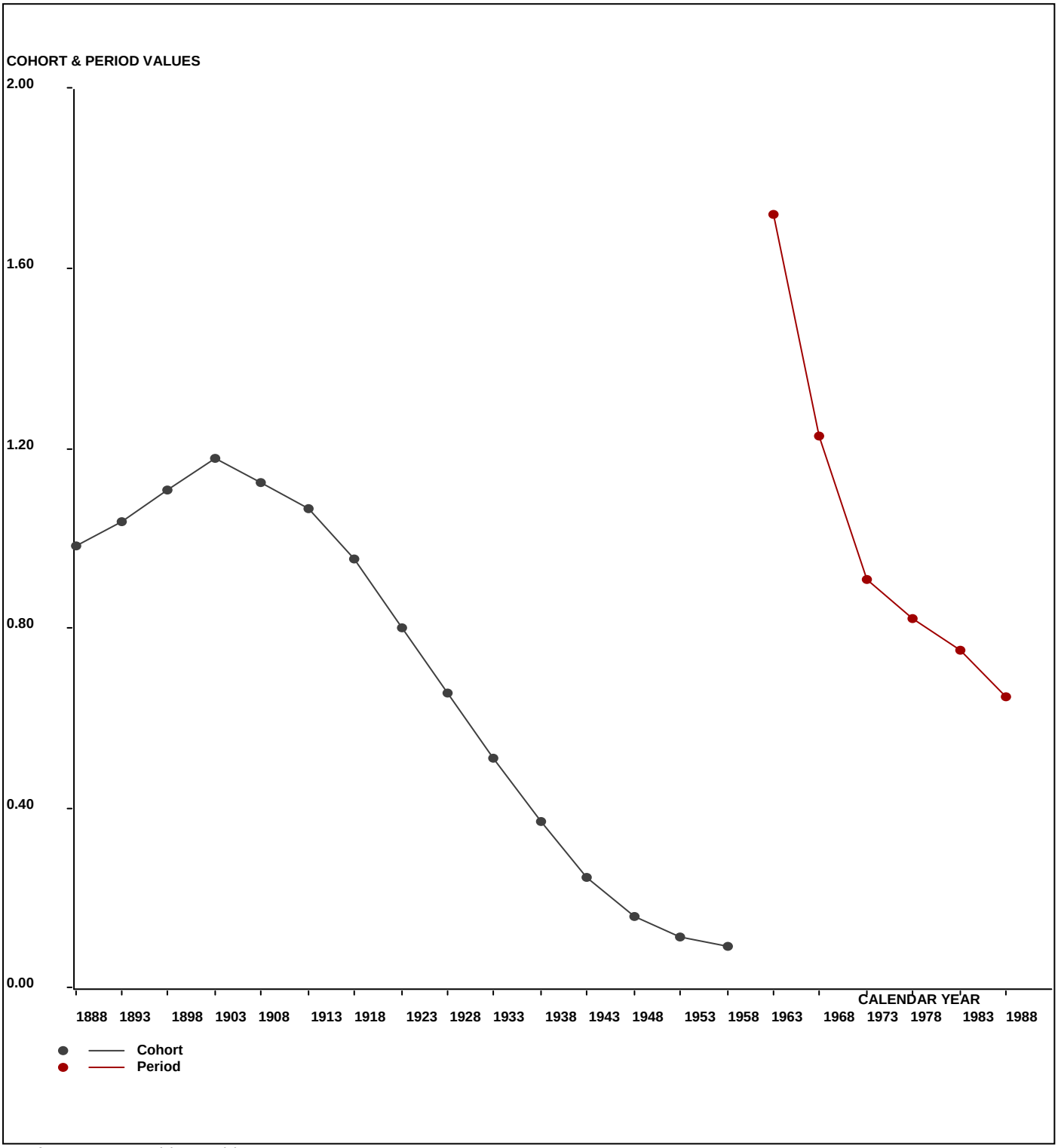
CHI SQUARE (LOG)= 184672.1227 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

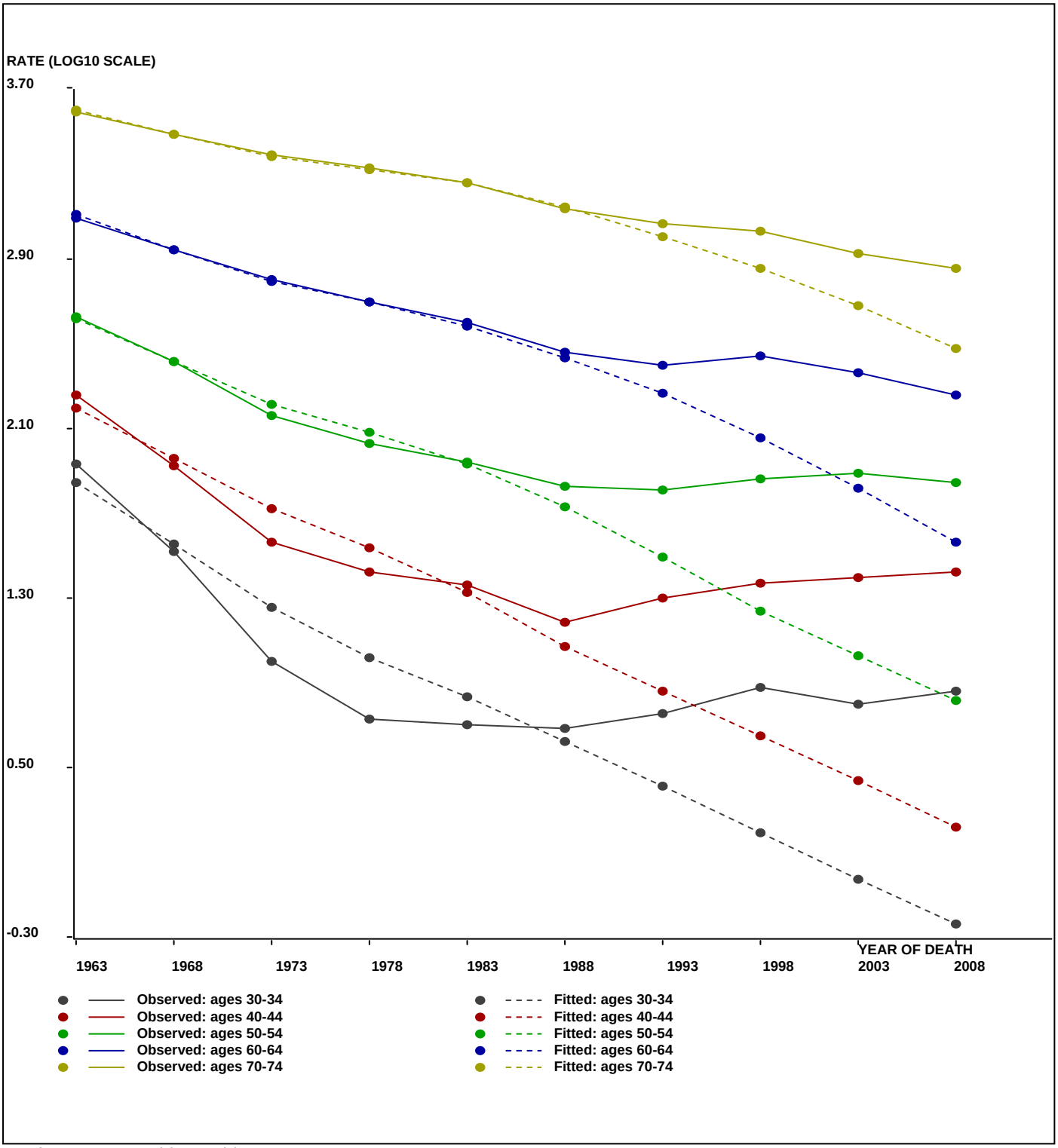


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	5.7	9.5	19.8	34.9	64.2	124.3	251.8	528.1	1147.7	2468.0
PRE	2.6	4.0	7.3	14.2	31.1	72.9	183.5	432.8	1004.9	2230.5
RES	3.099	5.554	12.581	20.714	33.113	51.452	68.300	95.226	142.875	237.514
1996- OBS	7.5	12.4	23.4	50.1	73.1	135.8	275.0	533.8	1076.5	2303.0
PRE	1.6	2.4	4.5	8.7	17.3	42.1	114.1	292.3	709.3	1616.9
RES	5.957	9.977	18.884	41.370	55.765	93.666	160.853	241.435	367.178	686.080
2001- OBS	6.3	14.7	24.8	41.9	76.8	117.2	230.2	434.4	845.4	1710.8
PRE	1.0	1.5	2.7	5.4	10.6	23.5	66.0	181.9	479.0	1141.3
RES	5.336	13.239	22.111	36.510	66.198	93.756	164.264	252.573	366.355	569.447
2006- OBS	7.3	13.8	26.5	41.5	69.7	115.9	179.6	347.1	708.2	1399.2
PRE	0.6	0.9	1.7	3.3	6.6	14.4	36.7	105.1	298.0	770.8
RES	6.744	12.950	24.815	38.216	63.138	101.591	142.887	241.936	410.189	628.425

Observed and predicted deaths (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	110.0	193.0	483.0	874.0	1367.0	2467.0	4661.0	8388.0	14349.0	23354.0
PRE	49.9	80.5	176.6	355.8	661.7	1446.0	3396.6	6875.4	12562.8	21106.4
CHI	72.310	157.104	531.503	754.688	751.624	720.923	470.713	332.765	253.970	239.335
1996- OBS	156.0	241.0	473.0	1212.0	1810.0	2858.0	5360.0	9568.0	16219.0	26115.0
PRE	32.5	47.1	90.9	210.7	428.6	886.5	2224.7	5240.1	10686.8	18335.1
CHI	469.092	798.840	1606.748	4759.234	4453.055	4383.988	4418.388	3574.456	2863.853	3301.134
2001- OBS	147.0	306.0	483.0	847.0	1844.0	2865.0	4784.0	8247.0	14467.0	23734.0
PRE	22.3	30.7	53.2	109.0	254.2	573.3	1370.9	3452.3	8197.5	15833.8
CHI	696.416	2470.650	3474.010	4999.207	9940.547	9161.737	8497.685	6658.954	4794.883	3941.737
2006- OBS	163.0	323.0	550.0	804.0	1407.0	2760.0	4335.0	7109.0	12954.0	22386.0
PRE	12.9	21.0	34.6	63.6	132.4	341.6	886.6	2153.3	5451.0	12331.8
CHI	1739.156	4352.692	7675.053	8618.144	12275.812	17118.411	13413.191	11405.554	10327.312	8197.252

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	65160.01	1277.65	51	P, C	99.96	363660.39	0.0000
AGE-PERIOD	2280.20	50.67	45	Cohort	98.84	12126.99	0.0000
AGE-COHORT	783.70	21.77	36	Period	96.62	4157.65	0.0000
PERIOD-COHORT	699.88	17.50	40	Age	96.22	3713.02	0.0000
FULL AGE-PERIOD-COHORT	26.47	0.83	32			140.38	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.856060	71.789412
35	2.219222	165.661620
40	2.567830	369.683112
45	2.866247	734.931811
50	3.096234	1248.056394
55	3.263258	1833.402681
60	3.455148	2851.991034
65	3.678361	4768.270816
70	3.918571	8290.320291
75	4.159549	14439.385448

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.125534	1.335163
1966	0.087431	1.223013
1971	0.036137	1.086769
1976	-0.032309	0.928306
1981	-0.136117	0.730942
1986	-0.251084	0.560939

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.113507	1.298693
1891	0.145983	1.399533
1896	0.132444	1.356575
1901	0.089815	1.229744
1906	0.012148	1.028366
1911	-0.061423	0.868115
1916	-0.156996	0.696634
1921	-0.248044	0.564879
1926	-0.305504	0.494875
1931	-0.309573	0.490261
1936	-0.299946	0.501250
1941	-0.290539	0.512225
1946	-0.296264	0.505517
1951	-0.250439	0.561773
1956	-0.243501	0.570820

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	963.0	962.0	873.0	783.0	706.0	465.0
	EXP	927.8	911.8	875.3	854.6	722.7	465.0
	CHI	1.3	2.8	0.0	6.0	0.4	0.0
35 -	OBS	1920.0	1907.0	1889.0	1718.0	1578.0	1290.0
	EXP	1932.2	1957.2	1869.6	1719.5	1551.0	1273.6
	CHI	0.1	1.3	0.2	0.0	0.5	0.2
40 -	OBS	4007.0	3954.0	3891.0	3494.0	3078.0	2677.0
	EXP	4149.7	3908.4	3867.3	3534.8	3008.9	2636.0
	CHI	4.9	0.5	0.1	0.5	1.6	0.6
45 -	OBS	8711.0	7473.0	6817.0	6697.0	5593.0	4472.0
	EXP	8840.8	7501.7	6878.5	6517.1	5491.5	4538.5
	CHI	1.9	0.1	0.5	5.0	1.9	1.0
50 -	OBS	16918.0	13303.0	11263.0	9878.0	8755.0	6920.0
	EXP	16884.6	13485.9	11163.7	9838.8	8614.0	7054.2
	CHI	0.1	2.5	0.9	0.2	2.3	2.6
55 -	OBS	24352.0	21924.0	17480.0	13817.0	11199.0	9191.0
	EXP	24489.7	21898.8	17189.6	13671.1	11191.7	9531.7
	CHI	0.8	0.0	4.9	1.6	0.0	12.2
60 -	OBS	36917.0	33425.0	29511.0	22245.0	16451.0	12994.0
	EXP	37635.1	33139.2	29337.8	22115.1	16312.4	13012.9
	CHI	13.7	2.5	1.0	0.8	1.2	0.0
65 -	OBS	53612.0	53446.0	46078.0	39257.0	27786.0	19835.0
	EXP	53497.4	52846.4	46190.3	39657.3	27776.6	20052.9
	CHI	0.2	6.8	0.3	4.0	0.0	2.4
70 -	OBS	70730.0	73687.0	72233.0	61534.0	49296.0	34317.0
	EXP	69790.5	73494.1	72359.0	61758.2	49967.9	34439.2
	CHI	12.6	0.5	0.2	0.8	9.0	0.4
75 -	OBS	76025.0	84044.0	90362.0	88545.0	72335.0	59098.0
	EXP	76025.0	84995.2	90670.5	88311.2	72148.8	58270.6
	CHI	0.0	10.6	1.0	0.6	0.5	11.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	1476598.84	36914.97	40	P, C	97.13	0.0000
AGE-PERIOD	97083.34	2427.08	40	Cohort	56.37	0.0000
AGE-COHORT	6091.59	152.29	40	Period	-595.27	0.0000
PERIOD-COHORT	45063.03	1126.58	40	Age	6.01	0.0000
FULL AGE-PERIOD-COHORT	42352.94	1058.82	40			0.0000

AGE	EFFECT
30	71.789412
35	165.661620
40	369.683112
45	734.931811
50	1248.056394
55	1833.402681
60	2851.991034
65	4768.270816
70	8290.320291
75	14439.385448

PERIOD	EFFECT	LOWER	UPPER
% Period Change	76.7419	73.7419	79.7419
1961	1.335163		
1966	1.223013		
1971	1.086769		
1976	0.928306		
1981	0.730942		
1986	0.560939		
1991	0.430475	0.413647	0.447304
1996	0.330355	0.305031	0.356689
2001	0.253521	0.224936	0.284430
2006	0.194557	0.165872	0.226810

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.298693	1.000000	
1891	1.399533	2.000000	
1896	1.356575	4.000000	
1901	1.229744	8.000000	
1906	1.028366	16.000000	
1911	0.868115	32.000000	
1916	0.696634	64.000000	
1921	0.564879	128.000000	
1926	0.494875	256.000000	
1931	0.490261	512.000000	
1936	0.501250	1024.000000	
1941	0.512225	2048.000000	
1946	0.505517	4096.000000	
1951	0.561773	8192.000000	
1956	0.547950	EXTRAPOLATION	0.570820
1961	0.554369	EXTRAPOLATION	
1966	0.560864	EXTRAPOLATION	
1971	0.567435	EXTRAPOLATION	
1976	0.574083	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	48.8	46.4	39.9	30.9	28.8	23.0	22.3	20.4	16.8	14.4
	EXP	47.0	44.0	40.0	33.7	29.5	22.1	17.1*	13.3*	10.3*	8.0*
	Elow							16.5	12.3	9.2	6.8
	Eup							17.8	14.4	11.6	9.3
35	OBS	108.8	96.8	91.2	78.7	62.3	52.9	38.6	36.0	32.6	30.1
	EXP	109.5	99.3	90.2	78.8	61.2	52.2	39.1*	30.3*	23.6*	18.3*
	Elow							37.5	28.0	20.9	15.6
	Eup							40.6	32.8	26.4	21.3
40	OBS	269.2	226.4	198.2	170.0	141.6	106.5	96.8	80.1	67.6	61.3
	EXP	278.8	223.7	197.0	172.0	138.4	104.8	89.4*	66.9*	52.0*	40.3*
	Elow							85.9	61.8	46.1	34.4
	Eup							92.9	72.3	58.3	47.0
45	OBS	673.5	505.8	391.7	343.7	274.2	208.1	167.3	160.3	124.5	113.6
	EXP	683.6	507.7	395.3	334.5	269.3	211.2	159.9*	136.4*	102.1*	79.3*
	Elow							153.7	125.9	90.6	67.6
	Eup							166.2	147.3	114.5	92.4
50	OBS	1449.5	1048.9	773.0	575.6	454.6	344.2	283.6	230.7	211.3	172.7
	EXP	1446.6	1063.3	766.2	573.4	447.2	350.9	275.2*	208.4*	177.7*	133.1*
	Elow							264.4	192.4	157.7	113.4
	Eup							286.0	225.0	199.4	155.1
55	OBS	2503.2	1948.8	1411.5	971.7	663.6	486.2	415.1	341.8	275.5	236.9
	EXP	2517.3	1946.6	1388.0	961.4	663.2	504.2	395.6*	310.2*	235.0*	200.4*
	Elow							380.1	286.5	208.5	170.8
	Eup							411.1	335.0	263.6	233.6
60	OBS	4593.4	3617.9	2706.6	1855.2	1187.6	790.5	654.4	554.3	422.3	319.5
	EXP	4682.7	3587.0	2690.7	1844.4	1177.6	791.7	601.9*	472.3*	370.4*	280.5*
	Elow							578.4	436.1	328.6	239.1
	Eup							625.4	509.9	415.5	327.0
65	OBS	8655.0	7252.8	5316.0	3803.9	2428.8	1494.5	1139.8	972.0	735.0	530.6
	EXP	8636.5	7171.4	5329.0	3842.6	2428.0	1510.9	1015.8*	772.3*	605.9*	475.2*
	Elow							976.1	713.1	537.6	405.1
	Eup							1055.5	833.8	679.8	554.0
70	OBS	15699.9	13790.7	11060.3	7885.5	5189.8	3228.1	2363.5	1905.9	1384.4	1037.7
	EXP	15491.3	13754.5	11079.6	7914.3	5260.6	3239.6	2015.9*	1355.3*	1030.4*	808.5*
	Elow							1937.1	1251.4	914.2	689.3
	Eup							2094.7	1463.4	1156.0	942.5
75	OBS	25037.4	24438.5	21215.3	16527.3	10881.8	7131.2	5290.0	4255.2	2992.3	2165.4
	EXP	25037.4	24715.1	21287.7	16483.7	10853.7	7031.4	4330.1*	2694.5*	1811.6*	1377.3*
	Elow							4160.9	2488.0	1607.3	1174.2
	Eup							4499.4	2909.3	2032.5	1605.6
30-79	OBS	3411.4	2954.8	2351.5	1735.0	1158.1	762.5	586.4	484.2	363.9	278.7
	EXP	3410.4	2955.7	2351.5	1734.9	1158.0	763.6	513.1*	362.8*	272.0*	211.6*
	Elow							493.0	335.0	241.3	180.4
	Eup							533.1	391.7	305.2	246.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	963.0	962.0	873.0	783.0	706.0	465.0	432.0	423.0	393.0	321.0
	EXP	927.8	911.8	875.3	854.6	722.7	446.4	332.2*	275.7*	241.3*	178.4*
	CHI	1.333	2.760	0.006	6.001	0.387	0.778	30.002	78.657	95.352	113.981
35 -	OBS	1920.0	1907.0	1889.0	1718.0	1578.0	1290.0	781.0	700.0	678.0	702.0
	EXP	1932.2	1957.2	1869.6	1719.5	1551.0	1273.6	791.4*	589.7*	489.9*	426.5*
	CHI	0.078	1.289	0.202	0.001	0.470	0.212	0.136	20.632	72.256	177.876
40 -	OBS	4007.0	3954.0	3891.0	3494.0	3078.0	2677.0	2357.0	1620.0	1315.0	1273.0
	EXP	4149.7	3908.4	3867.3	3534.8	3008.9	2636.0	2177.1*	1354.1*	1010.0*	837.8*
	CHI	4.906	0.531	0.146	0.472	1.586	0.637	14.868	52.213	92.103	226.030
45 -	OBS	8711.0	7473.0	6817.0	6697.0	5593.0	4472.0	4186.0	3881.0	2517.0	2201.0
	EXP	8840.8	7501.7	6878.5	6517.1	5491.5	4538.5	4000.8*	3301.3*	2063.8*	1535.7*
	CHI	1.906	0.110	0.550	4.966	1.875	0.975	8.572	101.812	99.506	288.220
50 -	OBS	16918.0	13303.0	11263.0	9878.0	8755.0	6920.0	6041.0	5716.0	5075.0	3487.0
	EXP	16884.6	13485.9	11163.7	9838.8	8614.0	7054.2	5861.2*	5163.2*	4268.7*	2686.1*
	CHI	0.066	2.481	0.883	0.156	2.307	2.552	5.515	59.179	152.296	238.795
55 -	OBS	24352.0	21924.0	17480.0	13817.0	11199.0	9191.0	8237.0	7194.0	6734.0	5640.0
	EXP	24489.7	21898.8	17189.6	13671.1	11191.7	9531.7	7850.2*	6529.9*	5743.5*	4770.1*
	CHI	0.775	0.029	4.905	1.556	0.005	12.178	19.054	67.541	170.836	158.631
60 -	OBS	36917.0	33425.0	29511.0	22245.0	16451.0	12994.0	12114.0	10805.0	8774.0	7712.0
	EXP	37635.1	33139.2	29337.8	22115.1	16312.4	13012.9	11142.9*	9205.0*	7695.4*	6769.6*
	CHI	13.703	2.465	1.022	0.763	1.177	0.028	84.629	278.097	151.172	131.207
65 -	OBS	53612.0	53446.0	46078.0	39257.0	27786.0	19835.0	18104.0	17424.0	13953.0	10869.0
	EXP	53497.4	52846.4	46190.3	39657.3	27776.6	20052.9	16135.0*	13843.5*	11502.7*	9733.6*
	CHI	0.246	6.802	0.273	4.040	0.003	2.367	240.276	926.082	521.947	132.436
70 -	OBS	70730.0	73687.0	72233.0	61534.0	49296.0	34317.0	29548.0	28716.0	23691.0	18981.0
	EXP	69790.5	73494.1	72359.0	61758.2	49967.9	34439.2	25203.1*	20420.7*	17633.6*	14788.4*
	CHI	12.648	0.507	0.219	0.814	9.034	0.434	749.027	3369.707	2080.824	1188.628
75 -	OBS	76025.0	84044.0	90362.0	88545.0	72335.0	59098.0	50058.0	48252.0	41514.0	34644.0
	EXP	76025.0	84995.2	90670.5	88311.2	72148.8	58270.6	40975.4*	30555.1*	25132.8*	22035.1*
	CHI	0.000	10.645	1.050	0.619	0.480	11.748	2013.260	10249.625	10676.967	7214.993
30-79	OBS	294155.0	294125.0	280397.0	247968.0	196777.0	151259.0	131858.0	124731.0	104644.0	85830.0
	EXP	294172.9	294138.8	280401.6	247977.8	196785.7	151256.0	114469.3*	91238.3*	75781.7*	63761.4*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	1.152	1.367	1.381	1.346

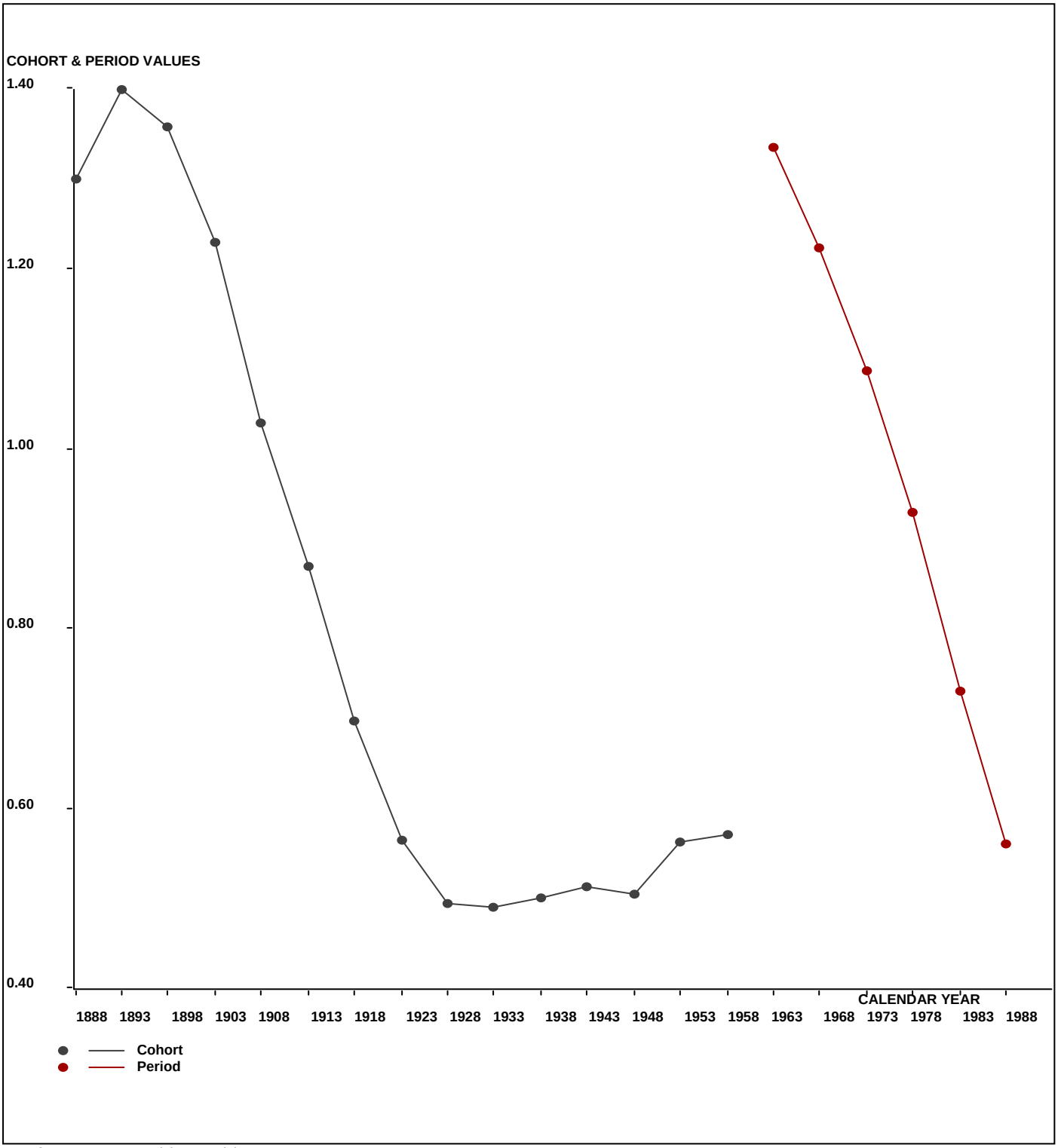
CHI SQUARE (LOG)= 42352.9381 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

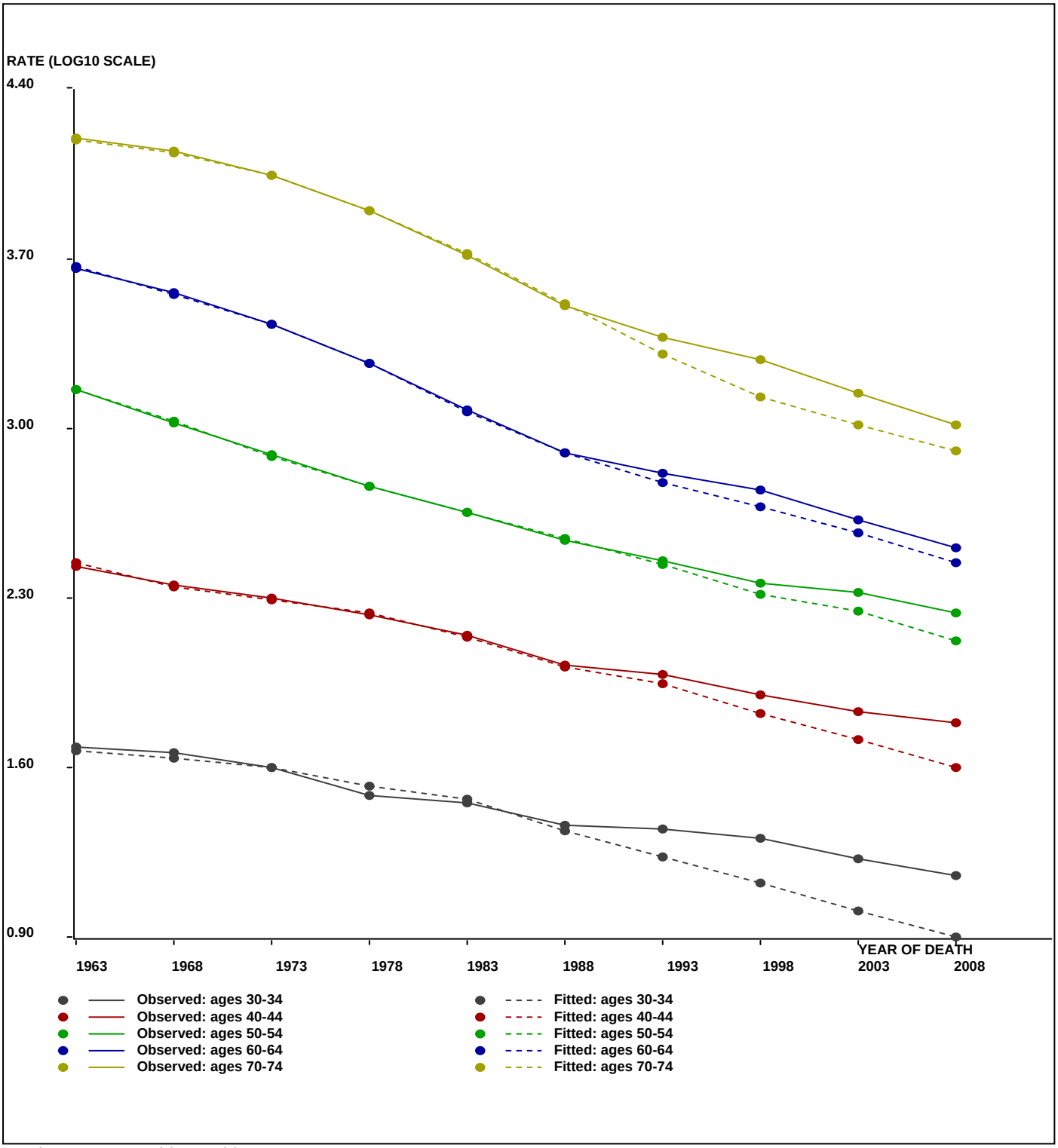


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	22.3	38.6	96.8	167.3	283.6	415.1	654.4	1139.8	2363.5	5290.0
	PRE	17.1	39.1	89.4	159.9	275.2	395.6	601.9	1015.8	2015.9	4330.1
	RES	5.149	-0.511	7.388	7.403	8.442	19.490	52.455	123.958	347.533	959.821
1996-	OBS	20.4	36.0	80.1	160.3	230.7	341.8	554.3	972.0	1905.9	4255.2
	PRE	13.3	30.3	66.9	136.4	208.4	310.2	472.3	772.3	1355.3	2694.5
	RES	7.104	5.675	13.141	23.952	22.314	31.552	82.086	199.743	550.565	1560.620
2001-	OBS	16.8	32.6	67.6	124.5	211.3	275.5	422.3	735.0	1384.4	2992.3
	PRE	10.3	23.6	52.0	102.1	177.7	235.0	370.4	605.9	1030.4	1811.6
	RES	6.492	9.047	15.690	22.418	33.574	40.524	51.909	129.075	353.964	1180.760
2006-	OBS	14.4	30.1	61.3	113.6	172.7	236.9	319.5	530.6	1037.7	2165.4
	PRE	8.0	18.3	40.3	79.3	133.1	200.4	280.5	475.2	808.5	1377.3
	RES	6.409	11.810	20.953	34.340	39.671	36.542	39.051	55.429	229.210	788.101

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	432.0	781.0	2357.0	4186.0	6041.0	8237.0	12114.0	18104.0	29548.0	50058.0
	PRE	332.2	791.4	2177.1	4000.8	5861.2	7850.2	11142.9	16135.0	25203.1	40975.4
	CHI	30.002	0.136	14.868	8.572	5.515	19.054	84.629	240.276	749.027	2013.260
1996-	OBS	423.0	700.0	1620.0	3881.0	5716.0	7194.0	10805.0	17424.0	28716.0	48252.0
	PRE	275.7	589.7	1354.1	3301.3	5163.2	6529.9	9205.0	13843.5	20420.7	30555.1
	CHI	78.657	20.632	52.213	101.812	59.179	67.541	278.097	926.082	3369.707	10249.625
2001-	OBS	393.0	678.0	1315.0	2517.0	5075.0	6734.0	8774.0	13953.0	23691.0	41514.0
	PRE	241.3	489.9	1010.0	2063.8	4268.7	5743.5	7695.4	11502.7	17633.6	25132.8
	CHI	95.352	72.256	92.103	99.506	152.296	170.836	151.172	521.947	2080.824	10676.967
2006-	OBS	321.0	702.0	1273.0	2201.0	3487.0	5640.0	7712.0	10869.0	18981.0	34644.0
	PRE	178.4	426.5	837.8	1535.7	2686.1	4770.1	6769.6	9733.6	14788.4	22035.1
	CHI	113.981	177.876	226.030	288.220	238.795	158.631	131.207	132.436	1188.628	7214.993

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	840.67	16.48	51	P, C	98.46	4555.77	0.0000
AGE-PERIOD	260.89	5.80	45	Cohort	95.04	1391.57	0.0000
AGE-COHORT	23.03	0.64	36	Period	43.86	122.15	0.0000
PERIOD-COHORT	23.48	0.59	40	Age	44.93	124.55	0.0000
FULL AGE-PERIOD-COHORT	12.93	0.40	32			68.57	0.0002

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.841718	6.945738
35	1.173159	14.899054
40	1.444132	27.805587
45	1.696123	49.673260
50	1.941936	87.485470
55	2.162578	145.404643
60	2.376352	237.876793
65	2.587751	387.035809
70	2.784738	609.169833
75	2.947624	886.389101

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.030037	0.933176
1966	-0.024867	0.944351
1971	-0.037226	0.917855
1976	-0.006823	0.984411
1981	0.017898	1.042072
1986	0.024686	1.058487

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.393489	0.404121
1891	-0.265792	0.542260
1896	-0.150247	0.707543
1901	-0.053844	0.883398
1906	-0.008506	0.980604
1911	0.029886	1.071238
1916	0.039797	1.095965
1921	0.038218	1.091987
1926	0.022505	1.053186
1931	0.025653	1.060848
1936	0.038101	1.091695
1941	0.054814	1.134524
1946	0.038497	1.092691
1951	0.089495	1.228838
1956	0.037133	1.089265

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	147.0	149.0	163.0	188.0	202.0	162.0
	EXP	135.8	148.4	158.4	189.5	218.1	162.0
	CHI	0.9	0.0	0.1	0.0	1.2	0.0
35 -	OBS	264.0	280.0	327.0	343.0	424.0	488.0
	EXP	258.5	294.1	309.3	363.2	429.9	472.8
	CHI	0.1	0.7	1.0	1.1	0.1	0.5
40 -	OBS	383.0	516.0	500.0	583.0	769.0	816.0
	EXP	421.7	483.1	531.6	614.1	714.6	808.7
	CHI	3.6	2.2	1.9	1.6	4.1	0.1
45 -	OBS	604.0	754.0	905.0	1067.0	1117.0	1240.0
	EXP	657.0	756.8	835.6	1010.7	1152.5	1282.1
	CHI	4.3	0.0	5.8	3.1	1.1	1.4
50 -	OBS	1008.0	1180.0	1285.0	1545.0	1800.0	2078.0
	EXP	1020.8	1148.4	1277.6	1556.5	1862.7	2032.2
	CHI	0.2	0.9	0.0	0.1	2.1	1.0
55 -	OBS	1245.0	1602.0	1871.0	2218.0	2701.0	3123.0
	EXP	1294.4	1654.8	1811.4	2222.7	2693.0	3086.6
	CHI	1.9	1.7	2.0	0.0	0.0	0.4
60 -	OBS	1589.0	2112.0	2488.0	3125.0	3780.0	4249.0
	EXP	1576.0	2035.1	2550.2	3077.3	3749.7	4358.7
	CHI	0.1	2.9	1.5	0.7	0.2	2.8
65 -	OBS	1650.0	2324.0	3016.0	4210.0	5042.0	5944.0
	EXP	1582.9	2379.3	3019.4	4212.2	5056.8	5937.4
	CHI	2.8	1.3	0.0	0.0	0.0	0.0
70 -	OBS	1438.0	2203.0	3255.0	4540.0	6475.0	7437.0
	EXP	1388.7	2174.9	3225.8	4588.7	6459.2	7512.5
	CHI	1.7	0.4	0.3	0.5	0.0	0.8
75 -	OBS	1015.0	1510.0	2353.0	4142.0	6043.0	8441.0
	EXP	1015.0	1561.0	2451.8	4129.7	6021.0	8329.2
	CHI	0.0	1.7	4.0	0.0	0.1	1.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	4021.77	100.54	40	P, C	30.98	0.0000
AGE-PERIOD	6236.67	155.92	40	Cohort	55.49	0.0000
AGE-COHORT	5002.56	125.06	40	Period	44.51	0.0000
PERIOD-COHORT	4080.98	102.02	40	Age	31.98	0.0000
FULL AGE-PERIOD-COHORT	2775.72	69.39	40			0.0000

AGE	EFFECT
30	6.945738
35	14.899054
40	27.805587
45	49.673260
50	87.485470
55	145.404643
60	237.876793
65	387.035809
70	609.169833
75	886.389101

PERIOD	EFFECT	LOWER	UPPER
% Period Change	101.5753	98.5753	104.5753
1961	0.933176		
1966	0.944351		
1971	0.917855		
1976	0.984411		
1981	1.042072		
1986	1.058487		
1991	1.075162	1.043407	1.106916
1996	1.092098	1.028541	1.157561
2001	1.109302	1.013887	1.210522
2006	1.126777	0.999442	1.265907

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.404121	1.000000	
1891	0.542260	2.000000	
1896	0.707543	4.000000	
1901	0.883398	8.000000	
1906	0.980604	16.000000	
1911	1.071238	32.000000	
1916	1.095965	64.000000	
1921	1.091987	128.000000	
1926	1.053186	256.000000	
1931	1.060848	512.000000	
1936	1.091695	1024.000000	
1941	1.134524	2048.000000	
1946	1.092691	4096.000000	
1951	1.228838	8192.000000	
1956	1.238939	EXTRAPOLATION	1.089265
1961	1.279403	EXTRAPOLATION	
1966	1.321189	EXTRAPOLATION	
1971	1.364340	EXTRAPOLATION	
1976	1.408900	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	7.4	7.2	7.4	7.4	8.2	8.0	7.0	6.9	6.2	5.0
	EXP	6.9	7.2	7.2	7.5	8.9	9.1	9.6*	10.0*	10.5*	11.0*
	Elow							9.3	9.4	9.6	9.8
	Eup							9.8	10.6	11.5	12.4
35	OBS	15.0	14.2	15.8	15.7	16.7	20.0	16.7	18.0	13.8	12.8
	EXP	14.6	14.9	14.9	16.6	17.0	19.4	19.8*	20.8*	21.8*	22.9*
	Elow							19.3	19.6	20.0	20.3
	Eup							20.4	22.1	23.8	25.7
40	OBS	25.7	29.5	25.5	28.4	35.4	32.5	39.8	36.5	27.3	24.1
	EXP	28.3	27.7	27.1	29.9	32.9	32.2	36.7*	37.6*	39.5*	41.4*
	Elow							35.7	35.4	36.1	36.7
	Eup							37.8	39.9	43.1	46.5
45	OBS	46.7	51.0	52.0	54.8	54.8	57.7	64.4	71.8	54.1	49.0
	EXP	50.8	51.2	48.0	51.9	56.5	59.7	58.4*	66.7*	68.3*	71.6*
	Elow							56.6	62.8	62.4	63.5
	Eup							60.1	70.7	74.5	80.5
50	OBS	86.4	93.0	88.2	90.0	93.5	103.4	110.5	116.0	111.3	93.3
	EXP	87.5	90.5	87.7	90.7	96.7	101.1	106.7*	104.4*	119.3*	122.1*
	Elow							103.6	98.3	109.0	108.3
	Eup							109.9	110.7	130.1	137.2
55	OBS	128.0	142.4	151.1	156.0	160.1	165.2	173.7	179.4	163.3	178.1
	EXP	133.1	147.1	146.3	156.3	159.6	163.3	170.7*	180.2*	176.2*	201.3*
	Elow							165.6	169.7	161.1	178.6
	Eup							175.7	191.0	192.3	226.2
60	OBS	197.7	228.6	228.2	260.6	272.9	258.5	267.7	279.9	262.9	263.2
	EXP	196.1	220.3	233.9	256.6	270.7	265.2	271.3*	283.6*	299.4*	292.9*
	Elow							263.3	267.1	273.6	259.8
	Eup							279.3	300.6	326.7	329.0
65	OBS	266.4	315.4	348.0	407.9	440.7	447.9	429.0	425.0	398.3	419.7
	EXP	255.5	322.9	348.4	408.1	442.0	447.4	438.3*	448.4*	468.7*	494.8*
	Elow							425.3	422.3	428.4	438.9
	Eup							451.2	475.3	511.5	555.9
70	OBS	319.2	412.3	498.4	581.8	681.7	699.6	694.3	657.9	624.9	620.9
	EXP	308.3	407.0	493.9	588.0	680.0	706.7	715.2*	700.7*	716.9*	749.3*
	Elow							694.1	659.9	655.2	664.7
	Eup							736.3	742.7	782.3	841.9
75	OBS	334.3	439.1	552.4	773.1	909.1	1018.6	1073.7	1046.6	929.7	923.2
	EXP	334.3	453.9	575.6	770.8	905.8	1005.1	1044.5*	1057.1*	1035.6*	1059.5*
	Elow							1013.6	995.6	946.5	939.8
	Eup							1075.3	1120.4	1130.1	1190.4
30-79	OBS	103.9	122.5	133.8	155.2	171.1	177.5	181.7	181.6	165.6	164.8
	EXP	103.8	122.6	134.0	155.2	171.2	177.7	181.6*	185.2*	190.3*	198.2*
	Elow							176.2	174.4	173.9	175.8
	Eup							186.9	196.3	207.7	222.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	147.0	149.0	163.0	188.0	202.0	162.0	135.0	142.0	144.0	112.0
	EXP	135.8	148.4	158.4	189.5	218.1	184.3	185.2*	207.7*	245.6*	245.3*
	CHI	0.930	0.003	0.133	0.012	1.183	2.689	13.630	20.807	42.048	72.462
35 -	OBS	264.0	280.0	327.0	343.0	424.0	488.0	339.0	349.0	287.0	298.0
	EXP	258.5	294.1	309.3	363.2	429.9	472.8	401.9*	404.6*	454.1*	534.2*
	CHI	0.118	0.677	1.015	1.127	0.080	0.489	9.851	7.648	61.491	104.437
40 -	OBS	383.0	516.0	500.0	583.0	769.0	816.0	970.0	738.0	530.0	501.0
	EXP	421.7	483.1	531.6	614.1	714.6	808.7	894.6*	761.3*	767.1*	859.7*
	CHI	3.552	2.244	1.876	1.570	4.137	0.066	6.352	0.712	73.300	149.675
45 -	OBS	604.0	754.0	905.0	1067.0	1117.0	1240.0	1612.0	1737.0	1093.0	949.0
	EXP	657.0	756.8	835.6	1010.7	1152.5	1282.1	1459.9*	1613.5*	1380.0*	1387.3*
	CHI	4.281	0.011	5.759	3.131	1.092	1.381	15.856	9.453	59.706	138.496
50 -	OBS	1008.0	1180.0	1285.0	1545.0	1800.0	2078.0	2354.0	2874.0	2674.0	1884.0
	EXP	1020.8	1148.4	1277.6	1556.5	1862.7	2032.2	2272.8*	2586.2*	2864.0*	2465.6*
	CHI	0.160	0.872	0.042	0.084	2.112	1.033	2.899	32.023	12.600	137.199
55 -	OBS	1245.0	1602.0	1871.0	2218.0	2701.0	3123.0	3446.0	3776.0	3992.0	4240.0
	EXP	1294.4	1654.8	1811.4	2222.7	2693.0	3086.6	3386.7*	3791.9*	4308.2*	4792.6*
	CHI	1.888	1.686	1.960	0.010	0.024	0.428	1.038	0.067	23.201	63.725
60 -	OBS	1589.0	2112.0	2488.0	3125.0	3780.0	4249.0	4956.0	5455.0	5462.0	6352.0
	EXP	1576.0	2035.1	2550.2	3077.3	3749.7	4358.7	5022.9*	5527.9*	6220.5*	7068.3*
	CHI	0.107	2.903	1.518	0.739	0.245	2.761	0.891	0.960	92.488	72.595
65 -	OBS	1650.0	2324.0	3016.0	4210.0	5042.0	5944.0	6814.0	7618.0	7562.0	8597.0
	EXP	1582.9	2379.3	3019.4	4212.2	5056.8	5937.4	6961.4*	8037.9*	8897.6*	10134.7*
	CHI	2.842	1.285	0.004	0.001	0.043	0.007	3.120	21.935	200.495	233.298
70 -	OBS	1438.0	2203.0	3255.0	4540.0	6475.0	7437.0	8680.0	9912.0	10694.0	11357.0
	EXP	1388.7	2174.9	3225.8	4588.7	6459.2	7512.5	8941.5*	10556.7*	12267.9*	13706.5*
	CHI	1.748	0.364	0.264	0.518	0.038	0.758	7.646	39.371	201.920	402.745
75 -	OBS	1015.0	1510.0	2353.0	4142.0	6043.0	8441.0	10160.0	11868.0	12898.0	14771.0
	EXP	1015.0	1561.0	2451.8	4129.7	6021.0	8329.2	9883.6*	11986.8*	14366.9*	16951.5*
	CHI	0.000	1.665	3.983	0.037	0.081	1.500	7.728	1.177	150.179	280.492
30-79	OBS	9343.0	12630.0	16163.0	21961.0	28353.0	33978.0	39466.0	44469.0	45336.0	49061.0
	EXP	9350.9	12635.8	16171.2	21964.6	28357.5	34004.5	39410.5*	45474.5*	51771.9*	58145.9*
	O/E	0.999	1.000	0.999	1.000	1.000	0.999	1.001	0.978	0.876	0.844

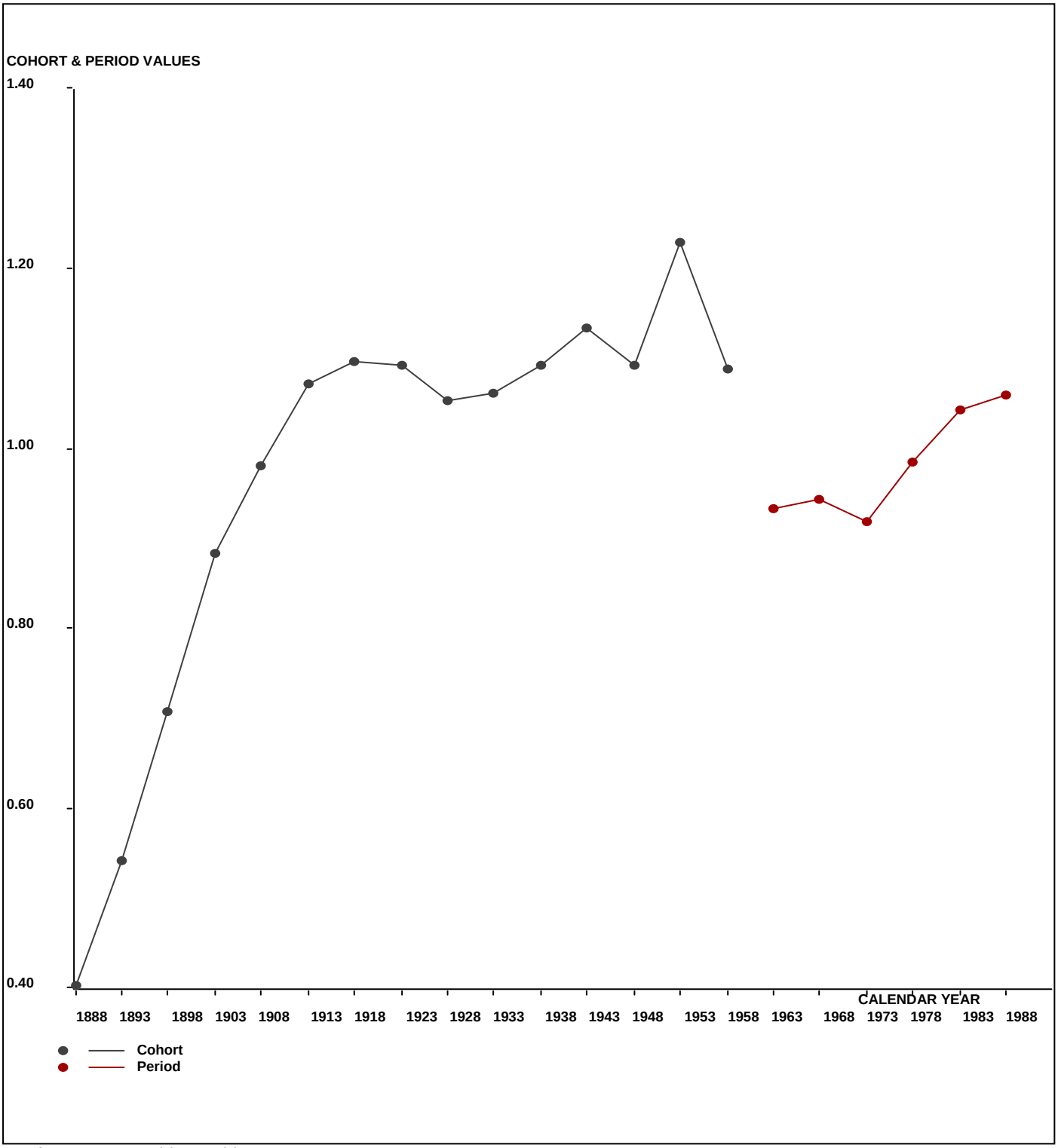
CHI SQUARE (LOG)= 2775.7159 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

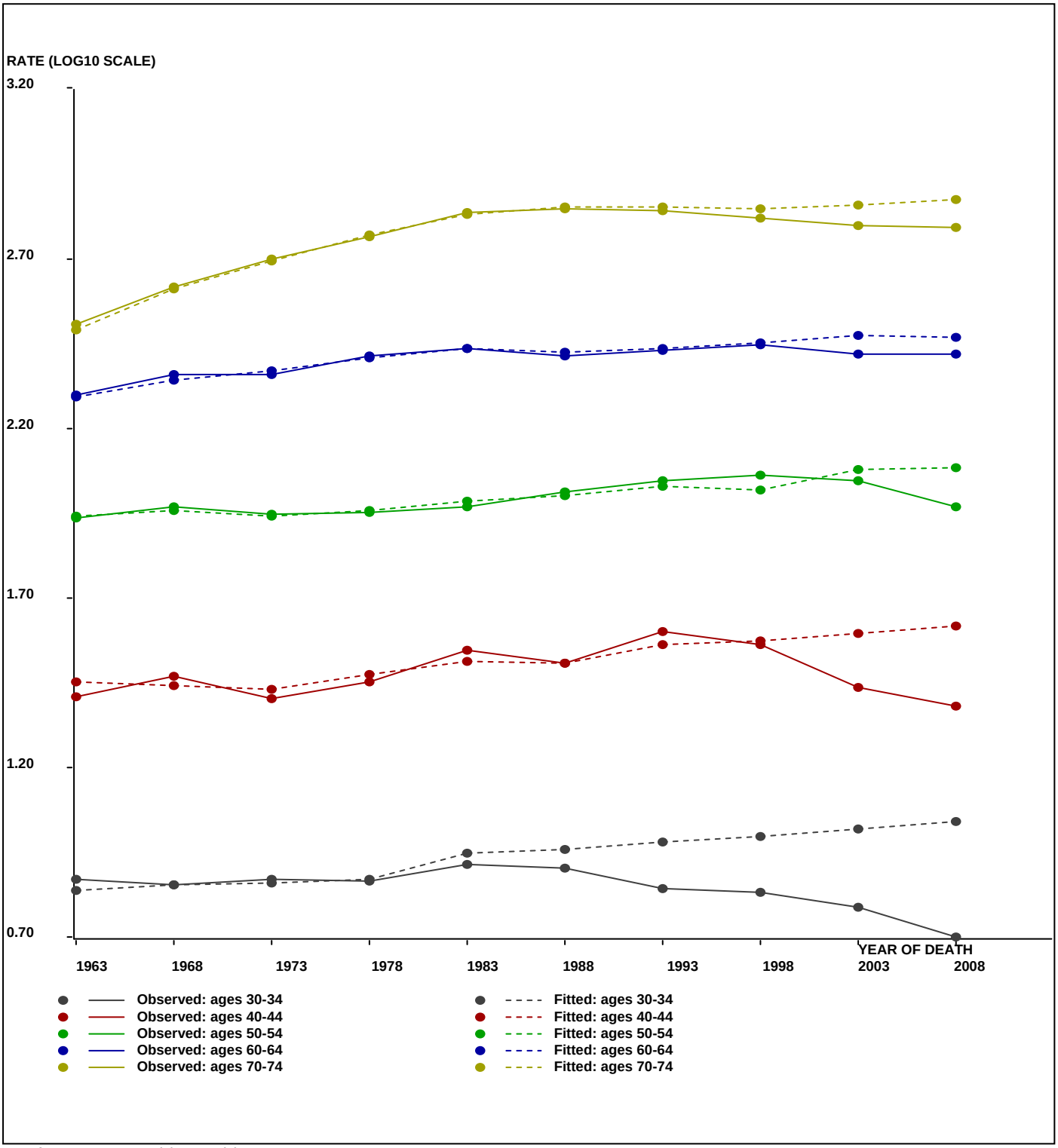


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	7.0	16.7	39.8	64.4	110.5	173.7	267.7	429.0	694.3	1073.7
	PRE	9.6	19.8	36.7	58.4	106.7	170.7	271.3	438.3	715.2	1044.5
	RES	-2.592	-3.107	3.096	6.082	3.811	2.988	-3.614	-9.277	-20.914	29.207
1996-	OBS	6.9	18.0	36.5	71.8	116.0	179.4	279.9	425.0	657.9	1046.6
	PRE	10.0	20.8	37.6	66.7	104.4	180.2	283.6	448.4	700.7	1057.1
	RES	-3.172	-2.862	-1.150	5.102	11.617	-0.757	-3.738	-23.424	-42.789	-10.475
2001-	OBS	6.2	13.8	27.3	54.1	111.3	163.3	262.9	398.3	624.9	929.7
	PRE	10.5	21.8	39.5	68.3	119.3	176.2	299.4	468.7	716.9	1035.6
	RES	-4.349	-8.035	-12.199	-14.200	-7.910	-12.934	-36.504	-70.358	-91.970	-105.877
2006-	OBS	5.0	12.8	24.1	49.0	93.3	178.1	263.2	419.7	620.9	923.2
	PRE	11.0	22.9	41.4	71.6	122.1	201.3	292.9	494.8	749.3	1059.5
	RES	-5.993	-10.127	-17.272	-22.625	-28.809	-23.216	-29.681	-75.068	-128.449	-136.292

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	135.0	339.0	970.0	1612.0	2354.0	3446.0	4956.0	6814.0	8680.0	10160.0
	PRE	185.2	401.9	894.6	1459.9	2272.8	3386.7	5022.9	6961.4	8941.5	9883.6
	CHI	13.630	9.851	6.352	15.856	2.899	1.038	0.891	3.120	7.646	7.728
1996-	OBS	142.0	349.0	738.0	1737.0	2874.0	3776.0	5455.0	7618.0	9912.0	11868.0
	PRE	207.7	404.6	761.3	1613.5	2586.2	3791.9	5527.9	8037.9	10556.7	11986.8
	CHI	20.807	7.648	0.712	9.453	32.023	0.067	0.960	21.935	39.371	1.177
2001-	OBS	144.0	287.0	530.0	1093.0	2674.0	3992.0	5462.0	7562.0	10694.0	12898.0
	PRE	245.6	454.1	767.1	1380.0	2864.0	4308.2	6220.5	8897.6	12267.9	14366.9
	CHI	42.048	61.491	73.300	59.706	12.600	23.201	92.488	200.495	201.920	150.179
2006-	OBS	112.0	298.0	501.0	949.0	1884.0	4240.0	6352.0	8597.0	11357.0	14771.0
	PRE	245.3	534.2	859.7	1387.3	2465.6	4792.6	7068.3	10134.7	13706.5	16951.5
	CHI	72.462	104.437	149.675	138.496	137.199	63.725	72.595	233.298	402.745	280.492

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1403.20	27.51	51	P, C	97.38	7522.03	0.0000
AGE-PERIOD	53.15	1.18	45	Cohort	30.93	282.84	0.0000
AGE-COHORT	648.88	18.02	36	Period	94.34	3558.55	0.0000
PERIOD-COHORT	37.08	0.93	40	Age	1.00	197.14	0.0000
FULL AGE-PERIOD-COHORT	36.71	1.15	32			195.18	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.948447	8.880694
35	1.084373	12.144305
40	1.243266	17.509171
45	1.404190	25.362383
50	1.595170	39.370420
55	1.817796	65.734909
60	2.097825	125.263577
65	2.386821	243.680543
70	2.688075	487.613184
75	2.977188	948.828704

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.130782	0.739977
1966	0.135758	1.366968
1971	0.146597	1.401512
1976	0.010571	1.024638
1981	-0.098610	0.796875
1986	-0.172191	0.672681

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.080314	1.203135
1891	0.015869	1.037217
1896	-0.007960	0.981838
1901	0.001025	1.002364
1906	-0.011347	0.974210
1911	0.007635	1.017736
1916	-0.001101	0.997467
1921	-0.010378	0.976388
1926	-0.006212	0.985799
1931	-0.005965	0.986360
1936	0.004644	1.010751
1941	-0.030046	0.933156
1946	-0.085165	0.821930
1951	-0.011785	0.973228
1956	-0.029155	0.935072

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	120.0	296.0	262.0	160.0	150.0	113.0
	EXP	128.0	254.2	254.4	189.7	168.9	113.0
	CHI	0.5	6.9	0.2	4.7	2.1	0.0
35 -	OBS	144.0	372.0	338.0	229.0	183.0	211.0
	EXP	156.4	322.6	356.4	253.5	201.5	194.0
	CHI	1.0	7.5	1.0	2.4	1.7	1.5
40 -	OBS	185.0	441.0	502.0	316.0	231.0	285.0
	EXP	188.3	412.2	475.2	372.6	283.0	243.4
	CHI	0.1	2.0	1.5	8.6	9.6	7.1
45 -	OBS	189.0	550.0	620.0	460.0	374.0	400.0
	EXP	242.1	500.1	609.8	499.4	416.6	342.2
	CHI	11.7	5.0	0.2	3.1	4.4	9.8
50 -	OBS	243.0	655.0	830.0	708.0	569.0	600.0
	EXP	346.1	680.8	785.0	682.4	596.0	538.1
	CHI	30.7	1.0	2.6	1.0	1.2	7.1
55 -	OBS	409.0	1061.0	1154.0	923.0	892.0	816.0
	EXP	461.0	1028.8	1138.0	935.2	871.4	824.5
	CHI	5.9	1.0	0.2	0.2	0.5	0.1
60 -	OBS	718.0	1542.0	2043.0	1584.0	1305.0	1288.0
	EXP	746.7	1541.2	1948.1	1535.1	1350.1	1365.3
	CHI	1.1	0.0	4.6	1.6	1.5	4.4
65 -	OBS	1153.0	2461.0	2830.0	2622.0	2250.0	2085.0
	EXP	1096.7	2460.4	2883.9	2622.5	2215.8	2124.2
	CHI	2.9	0.0	1.0	0.0	0.5	0.7
70 -	OBS	1853.0	3483.0	4383.0	3758.0	3753.0	3450.0
	EXP	1686.1	3496.9	4473.7	3798.3	3756.3	3478.1
	CHI	16.5	0.1	1.8	0.4	0.0	0.2
75 -	OBS	2565.0	4448.0	5517.0	5337.0	5036.0	5343.0
	EXP	2565.0	4626.4	5561.1	5220.9	4896.4	5383.2
	CHI	0.0	6.9	0.3	2.6	4.0	0.3

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	53075.61	1326.89	40	P, C	94.04	0.0000
AGE-PERIOD	3829.10	95.73	40	Cohort	17.45	0.0000
AGE-COHORT	6590.08	164.75	40	Period	52.04	0.0000
PERIOD-COHORT	3231.85	80.80	40	Age	2.20	0.0000
FULL AGE-PERIOD-COHORT	3160.74	79.02	40			0.0000

AGE	EFFECT
30	8.880694
35	12.144305
40	17.509171
45	25.362383
50	39.370420
55	65.734909
60	125.263577
65	243.680543
70	487.613184
75	948.828704

PERIOD	EFFECT	LOWER	UPPER
% Period Change	84.4149	81.4149	87.4149
1961	0.739977		
1966	1.366968		
1971	1.401512		
1976	1.024638		
1981	0.796875		
1986	0.672681		
1991	0.567842	0.547662	0.588023
1996	0.479343	0.445878	0.514019
2001	0.404637	0.363011	0.449329
2006	0.341574	0.295545	0.392781

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.203135	1.000000	
1891	1.037217	2.000000	
1896	0.981838	4.000000	
1901	1.002364	8.000000	
1906	0.974210	16.000000	
1911	1.017736	32.000000	
1916	0.997467	64.000000	
1921	0.976388	128.000000	
1926	0.985799	256.000000	
1931	0.986360	512.000000	
1936	1.010751	1024.000000	
1941	0.933156	2048.000000	
1946	0.821930	4096.000000	
1951	0.973228	8192.000000	
1956	0.928085	EXTRAPOLATION	0.935072
1961	0.926588	EXTRAPOLATION	
1966	0.925094	EXTRAPOLATION	
1971	0.923602	EXTRAPOLATION	
1976	0.922113	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	6.1	14.3	12.0	6.3	6.1	5.6	6.2	4.9	3.1	1.8
	EXP	6.5	12.3	11.6	7.5	6.9	5.5	4.7*	3.9*	3.3*	2.8*
	Elow							4.5	3.7	3.0	2.4
	Eup							4.8	4.2	3.7	3.2
35	OBS	8.2	18.9	16.3	10.5	7.2	8.6	7.1	5.6	3.7	3.5
	EXP	8.9	16.4	17.2	11.6	8.0	8.0	6.4*	5.4*	4.5*	3.8*
	Elow							6.2	5.0	4.1	3.3
	Eup							6.6	5.8	5.0	4.4
40	OBS	12.4	25.2	25.6	15.4	10.6	11.3	9.9	7.4	5.5	4.4
	EXP	12.7	23.6	24.2	18.1	13.0	9.7	9.7*	7.8*	6.6*	5.5*
	Elow							9.3	7.2	5.9	4.8
	Eup							10.0	8.4	7.3	6.4
45	OBS	14.6	37.2	35.6	23.6	18.3	18.6	14.2	12.0	7.1	5.6
	EXP	18.7	33.9	35.0	25.6	20.4	15.9	11.8*	11.8*	9.5*	8.0*
	Elow							11.4	11.0	8.5	6.9
	Eup							12.3	12.7	10.6	9.2
50	OBS	20.8	51.6	57.0	41.3	29.5	29.8	23.2	14.3	12.2	7.7
	EXP	29.6	53.7	53.9	39.8	30.9	26.8	20.9*	15.5*	15.5*	12.5*
	Elow							20.1	14.4	13.9	10.8
	Eup							21.6	16.6	17.2	14.4
55	OBS	42.0	94.3	93.2	64.9	52.9	43.2	39.5	24.8	16.8	13.6
	EXP	47.4	91.5	91.9	65.8	51.6	43.6	37.7*	29.4*	21.9*	21.9*
	Elow							36.4	27.4	19.6	18.9
	Eup							39.1	31.5	24.3	25.1
60	OBS	89.3	166.9	187.4	132.1	94.2	78.4	63.3	44.9	28.7	20.0
	EXP	92.9	166.8	178.7	128.0	97.5	83.1	70.2*	60.7*	47.3*	35.2*
	Elow							67.7	56.5	42.4	30.4
	Eup							72.7	65.1	52.5	40.4
65	OBS	186.1	334.0	326.5	254.1	196.7	157.1	126.7	90.6	59.5	43.6
	EXP	177.0	333.9	332.7	254.1	193.7	160.0	136.4*	115.2*	99.7*	77.7*
	Elow							131.6	107.2	89.4	67.2
	Eup							141.3	123.5	110.7	89.3
70	OBS	411.3	651.8	671.1	481.6	395.1	324.5	276.8	207.2	128.0	96.4
	EXP	374.3	654.4	685.0	486.7	395.5	327.2	270.3*	230.4*	194.6*	168.3*
	Elow							260.7	214.3	174.6	145.7
	Eup							280.0	247.1	216.1	193.6
75	OBS	844.7	1293.4	1295.3	996.2	757.6	644.7	582.3	465.4	304.5	215.3
	EXP	844.7	1345.3	1305.6	974.5	736.6	649.6	537.4*	444.1*	378.5*	319.7*
	Elow							518.3	413.1	339.5	276.6
	Eup							556.5	476.2	420.3	367.6
30-79	OBS	87.3	151.1	153.3	112.4	86.9	73.8	63.3	47.2	30.8	22.5
	EXP	87.3	151.8	153.4	112.3	87.0	73.8	61.5*	51.5*	43.3*	36.2*
	Elow							59.3	47.9	38.9	31.3
	Eup							63.7	55.2	48.1	41.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	120.0	296.0	262.0	160.0	150.0	113.0	120.0	101.0	73.0	41.0
	EXP	128.0	254.2	254.4	189.7	168.9	112.2	90.6*	81.6*	77.6*	62.2*
	CHI	0.498	6.864	0.228	4.658	2.106	0.006	9.542	4.595	0.267	7.245
35 -	OBS	144.0	372.0	338.0	229.0	183.0	211.0	143.0	108.0	76.0	81.0
	EXP	156.4	322.6	356.4	253.5	201.5	194.0	129.6*	104.8*	94.5*	89.4*
	CHI	0.981	7.550	0.950	2.363	1.706	1.496	1.383	0.095	3.635	0.782
40 -	OBS	185.0	441.0	502.0	316.0	231.0	285.0	241.0	149.0	107.0	91.0
	EXP	188.3	412.2	475.2	372.6	283.0	243.4	235.6*	157.6*	127.6*	114.9*
	CHI	0.057	2.019	1.508	8.606	9.568	7.098	0.122	0.471	3.330	4.975
45 -	OBS	189.0	550.0	620.0	460.0	374.0	400.0	356.0	290.0	143.0	109.0
	EXP	242.1	500.1	609.8	499.4	416.6	342.2	296.1*	286.4*	192.5*	155.5*
	CHI	11.650	4.969	0.171	3.115	4.359	9.773	12.108	0.046	12.745	13.913
50 -	OBS	243.0	655.0	830.0	708.0	569.0	600.0	495.0	355.0	292.0	155.0
	EXP	346.1	680.8	785.0	682.4	596.0	538.1	444.3*	384.3*	372.3*	252.0*
	CHI	30.699	0.980	2.580	0.959	1.225	7.120	5.781	2.228	17.334	37.317
55 -	OBS	409.0	1061.0	1154.0	923.0	892.0	816.0	784.0	522.0	411.0	323.0
	EXP	461.0	1028.8	1138.0	935.2	871.4	824.5	748.7*	618.9*	534.4*	520.2*
	CHI	5.868	1.006	0.224	0.158	0.485	0.088	1.667	15.164	28.492	74.748
60 -	OBS	718.0	1542.0	2043.0	1584.0	1305.0	1288.0	1172.0	876.0	596.0	483.0
	EXP	746.7	1541.2	1948.1	1535.1	1350.1	1365.3	1298.9*	1182.9*	982.8*	848.7*
	CHI	1.106	0.000	4.618	1.557	1.507	4.380	12.391	79.637	152.217	157.604
65 -	OBS	1153.0	2461.0	2830.0	2622.0	2250.0	2085.0	2013.0	1624.0	1129.0	894.0
	EXP	1096.7	2460.4	2883.9	2622.5	2215.8	2124.2	2166.7*	2065.3*	1891.9*	1591.0*
	CHI	2.894	0.000	1.006	0.000	0.526	0.724	10.905	94.287	307.650	305.338
70 -	OBS	1853.0	3483.0	4383.0	3758.0	3753.0	3450.0	3461.0	3122.0	2190.0	1763.0
	EXP	1686.1	3496.9	4473.7	3798.3	3756.3	3478.1	3379.9*	3471.6*	3330.5*	3079.3*
	CHI	16.531	0.055	1.839	0.427	0.003	0.227	1.946	35.211	390.534	562.683
75 -	OBS	2565.0	4448.0	5517.0	5337.0	5036.0	5343.0	5510.0	5277.0	4225.0	3445.0
	EXP	2565.0	4626.4	5561.1	5220.9	4896.4	5383.2	5085.5*	5035.7*	5250.8*	5114.5*
	CHI	0.000	6.882	0.350	2.582	3.978	0.300	35.430	11.567	200.399	544.955
30-79	OBS	7579.0	15309.0	18479.0	16097.0	14743.0	14591.0	14295.0	12424.0	9242.0	7385.0
	EXP	7616.3	15323.8	18485.7	16109.6	14756.2	14605.2	13876.0*	13389.1*	12854.9*	11827.7*
	O/E	0.995	0.999	1.000	0.999	0.999	0.999	1.030	0.928	0.719	0.624

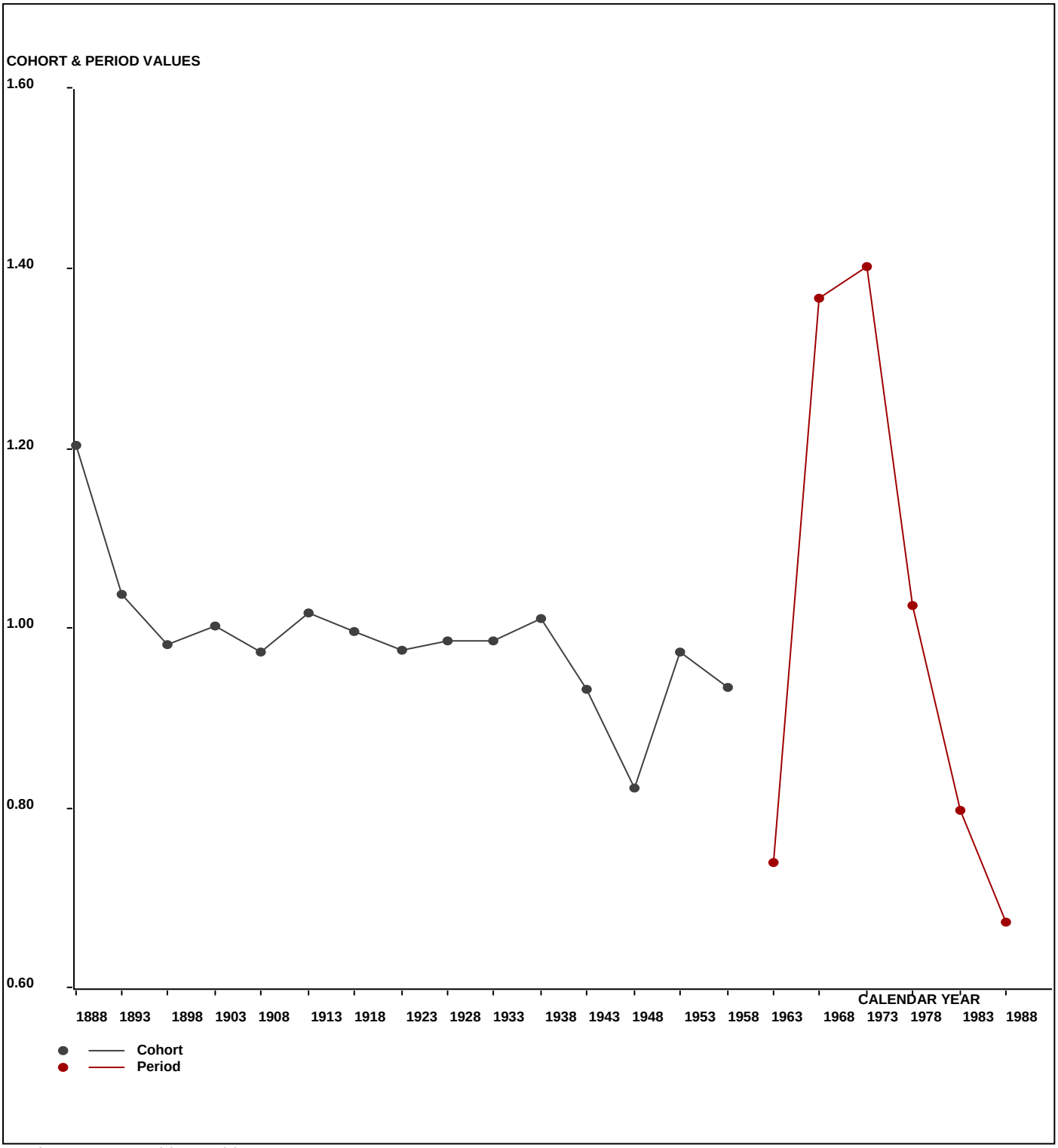
CHI SQUARE (LOG)= 3160.7390 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

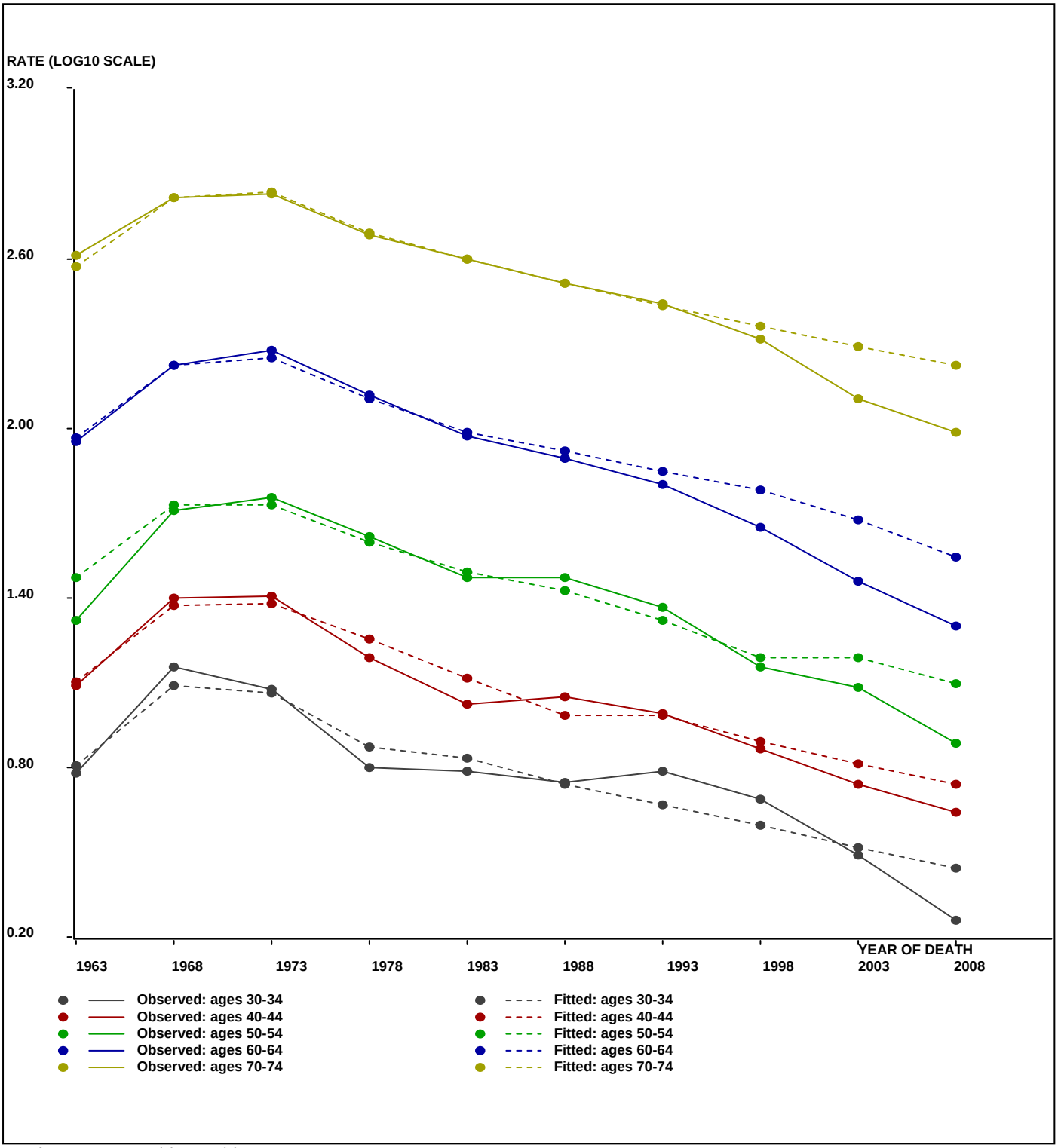


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Japan COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	6.2	7.1	9.9	14.2	23.2	39.5	63.3	126.7	276.8	582.3
	PRE	4.7	6.4	9.7	11.8	20.9	37.7	70.2	136.4	270.3	537.4
	RES	1.516	0.661	0.220	2.394	2.380	1.780	-6.853	-9.677	6.486	44.857
1996-	OBS	4.9	5.6	7.4	12.0	14.3	24.8	44.9	90.6	207.2	465.4
	PRE	3.9	5.4	7.8	11.8	15.5	29.4	60.7	115.2	230.4	444.1
	RES	0.934	0.162	-0.426	0.150	-1.181	-4.603	-15.747	-24.617	-23.205	21.284
2001-	OBS	3.1	3.7	5.5	7.1	12.2	16.8	28.7	59.5	128.0	304.5
	PRE	3.3	4.5	6.6	9.5	15.5	21.9	47.3	99.7	194.6	378.5
	RES	-0.195	-0.891	-1.060	-2.451	-3.345	-5.048	-18.614	-40.189	-66.643	-73.940
2006-	OBS	1.8	3.5	4.4	5.6	7.7	13.6	20.0	43.6	96.4	215.3
	PRE	2.8	3.8	5.5	8.0	12.5	21.9	35.2	77.7	168.3	319.7
	RES	-0.954	-0.358	-1.151	-2.401	-4.803	-8.283	-15.154	-34.027	-71.963	-104.349

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	120.0	143.0	241.0	356.0	495.0	784.0	1172.0	2013.0	3461.0	5510.0
	PRE	90.6	129.6	235.6	296.1	444.3	748.7	1298.9	2166.7	3379.9	5085.5
	CHI	9.542	1.383	0.122	12.108	5.781	1.667	12.391	10.905	1.946	35.430
1996-	OBS	101.0	108.0	149.0	290.0	355.0	522.0	876.0	1624.0	3122.0	5277.0
	PRE	81.6	104.8	157.6	286.4	384.3	618.9	1182.9	2065.3	3471.6	5035.7
	CHI	4.595	0.095	0.471	0.046	2.228	15.164	79.637	94.287	35.211	11.567
2001-	OBS	73.0	76.0	107.0	143.0	292.0	411.0	596.0	1129.0	2190.0	4225.0
	PRE	77.6	94.5	127.6	192.5	372.3	534.4	982.8	1891.9	3330.5	5250.8
	CHI	0.267	3.635	3.330	12.745	17.334	28.492	152.217	307.650	390.534	200.399
2006-	OBS	41.0	81.0	91.0	109.0	155.0	323.0	483.0	894.0	1763.0	3445.0
	PRE	62.2	89.4	114.9	155.5	252.0	520.2	848.7	1591.0	3079.3	5114.5
	CHI	7.245	0.782	4.975	13.913	37.317	74.748	157.604	305.338	562.683	544.955

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	3831.09	75.12	51	P, C	97.90	20572.74	0.0000
AGE-PERIOD	1931.52	42.92	45	Cohort	95.84	10327.95	0.0000
AGE-COHORT	229.86	6.38	36	Period	65.06	1219.52	0.0000
PERIOD-COHORT	545.72	13.64	40	Age	85.28	2901.76	0.0000
FULL AGE-PERIOD-COHORT	80.31	2.51	32			425.94	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.942325	87.563967
35	2.353195	225.525376
40	2.718735	523.281476
45	3.012158	1028.389290
50	3.265713	1843.798569
55	3.483742	3046.082412
60	3.675927	4741.620287
65	3.832612	6801.618218
70	3.938419	8677.995358
75	4.008169	10189.874860

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.067098	0.856844
1966	-0.041175	0.909548
1971	-0.041590	0.908679
1976	0.035724	1.085735
1981	0.017138	1.040252
1986	0.033451	1.080068

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.142996	1.389939
1891	0.074260	1.186479
1896	-0.009979	0.977283
1901	-0.065433	0.860136
1906	-0.092715	0.807766
1911	-0.102999	0.788863
1916	-0.078904	0.833866
1921	-0.022210	0.950146
1926	0.025387	1.060199
1931	0.107954	1.282194
1936	0.150135	1.412976
1941	0.231280	1.703255
1946	0.263492	1.834392
1951	0.315832	2.069339
1956	0.340827	2.191930

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	594.0	637.0	656.0	1080.0	1415.0	1772.0
	EXP	557.8	639.1	657.5	1028.9	1503.8	1772.0
	CHI	2.4	0.0	0.0	2.5	5.2	0.0
35 -	OBS	1010.0	1372.0	1715.0	2011.0	2478.0	4014.0
	EXP	1094.1	1502.3	1612.5	1982.6	2493.2	3928.8
	CHI	6.5	11.3	6.5	0.4	0.1	1.8
40 -	OBS	1516.0	2450.0	3525.0	4463.0	4406.0	5824.0
	EXP	1651.5	2644.9	3399.0	4353.5	4292.1	5861.3
	CHI	11.1	14.4	4.7	2.8	3.0	0.2
45 -	OBS	2121.0	3098.0	5343.0	7922.0	7906.0	8256.0
	EXP	2297.8	3359.1	5030.7	7695.9	7894.2	8399.7
	CHI	13.6	20.3	19.4	6.6	0.0	2.5
50 -	OBS	4713.0	4067.0	6128.0	10329.0	12662.0	13641.0
	EXP	4971.9	4185.6	5761.0	10252.4	12523.0	13869.1
	CHI	13.5	3.4	23.4	0.6	1.5	3.8
55 -	OBS	7570.0	8062.0	6683.0	10700.0	15121.0	19376.0
	EXP	7496.9	8167.0	6460.5	10603.3	15003.6	19790.8
	CHI	0.7	1.4	7.7	0.9	0.9	8.7
60 -	OBS	9609.0	11320.0	11684.0	10470.0	14160.0	21336.0
	EXP	9342.8	11179.1	11481.0	10823.2	14180.9	21585.7
	CHI	7.6	1.8	3.6	11.5	0.0	2.9
65 -	OBS	10055.0	12245.0	13543.0	16406.0	12589.0	17971.0
	EXP	9650.5	12096.6	13602.8	16820.8	12607.6	18045.4
	CHI	17.0	1.8	0.3	10.2	0.0	0.3
70 -	OBS	8899.0	10506.0	11346.0	16107.0	16009.0	13374.0
	EXP	9061.8	10177.5	11917.4	16083.5	16074.1	12954.3
	CHI	2.9	10.6	27.4	0.0	0.3	13.6
75 -	OBS	7292.0	7833.0	7269.0	11463.0	12087.0	13961.0
	EXP	7292.0	7673.4	8055.3	11325.7	12267.5	13348.6
	CHI	0.0	3.3	76.7	1.7	2.7	28.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	27183.46	679.59	40	P, C	-847.53	0.0000
AGE-PERIOD	222834.32	5570.86	40	Cohort	-15.59	0.0000
AGE-COHORT	274584.09	6864.60	40	Period	6.20	0.0000
PERIOD-COHORT	224774.04	5619.35	40	Age	-14.59	0.0000
FULL AGE-PERIOD-COHORT	257570.48	6439.26	40			0.0000

AGE	EFFECT
30	87.563967
35	225.525376
40	523.281476
45	1028.389290
50	1843.798569
55	3046.082412
60	4741.620287
65	6801.618218
70	8677.995358
75	10189.874860

PERIOD	EFFECT	LOWER	UPPER
% Period Change	103.8276	100.8276	106.8276
1961	0.856844		
1966	0.909548		
1971	0.908679		
1976	1.085735		
1981	1.040252		
1986	1.080068		
1991	1.121408	1.089006	1.153810
1996	1.164331	1.098019	1.232588
2001	1.208897	1.107106	1.316744
2006	1.255168	1.116268	1.406645

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.389939	1.000000	
1891	1.186479	2.000000	
1896	0.977283	4.000000	
1901	0.860136	8.000000	
1906	0.807766	16.000000	
1911	0.788863	32.000000	
1916	0.833866	64.000000	
1921	0.950146	128.000000	
1926	1.060199	256.000000	
1931	1.282194	512.000000	
1936	1.412976	1024.000000	
1941	1.703255	2048.000000	
1946	1.834392	4096.000000	
1951	2.069339	8192.000000	
1956	2.338428	EXTRAPOLATION	2.191930
1961	2.635536	EXTRAPOLATION	
1966	2.970392	EXTRAPOLATION	
1971	3.347794	EXTRAPOLATION	
1976	3.773146	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	102.5	112.2	135.2	183.1	177.4	207.3	147.4	93.9	47.1	36.7
	EXP	96.2	112.5	135.5	174.4	188.5	221.2	258.8*	302.8*	354.4*	414.7*
	Elow							251.3	285.6	324.5	368.8
	Eup							266.3	320.6	386.0	464.7
35	OBS	189.1	240.2	308.0	423.0	427.7	515.0	410.1	269.1	151.5	110.2
	EXP	204.9	263.0	289.6	417.1	430.4	504.1	591.4*	692.1*	809.8*	947.7*
	Elow							574.3	652.6	741.6	842.8
	Eup							608.5	732.6	882.1	1062.0
40	OBS	391.1	467.4	632.3	823.0	951.8	1030.2	908.8	599.5	409.0	297.5
	EXP	426.0	504.6	609.7	802.8	927.2	1036.8	1214.3*	1424.7*	1667.2*	1951.0*
	Elow							1179.2	1343.6	1526.8	1735.1
	Eup							1249.4	1508.3	1816.0	2186.4
45	OBS	678.2	819.7	1052.2	1473.7	1513.8	1859.5	1536.6	1189.7	864.5	676.4
	EXP	734.8	888.7	990.7	1431.6	1511.6	1891.9	2115.5*	2477.8*	2907.2*	3402.0*
	Elow							2054.4	2336.7	2662.4	3025.5
	Eup							2176.6	2623.1	3166.5	3812.5
50	OBS	1181.4	1358.8	1693.3	2138.2	2486.6	2767.6	2624.8	2154.9	1608.2	1258.3
	EXP	1246.3	1398.4	1591.9	2122.4	2459.3	2813.8	3521.7*	3938.1*	4612.5*	5411.8*
	Elow							3420.0	3713.8	4224.1	4812.9
	Eup							3623.5	4168.9	5024.0	6064.9
55	OBS	2128.8	2157.5	2387.5	3171.0	3385.7	4130.0	3794.2	3455.9	2474.1	2064.5
	EXP	2108.3	2185.6	2308.1	3142.4	3359.4	4218.4	4826.6*	6040.8*	6755.0*	7911.8*
	Elow							4687.1	5696.8	6186.2	7036.3
	Eup							4966.0	6395.0	7357.6	8866.6
60	OBS	3594.2	3527.6	3459.0	4152.8	4679.7	5366.8	5374.8	4657.7	4096.0	3027.2
	EXP	3494.6	3483.7	3398.9	4292.9	4686.6	5429.6	6817.8*	7800.8*	9763.3*	10917.4*
	Elow							6620.8	7356.5	8941.2	9709.3
	Eup							7014.8	8258.1	10634.3	12235.0
65	OBS	5934.3	5386.4	4970.4	5681.9	5891.2	6951.2	6758.9	6651.3	5632.1	4782.7
	EXP	5695.5	5321.1	4992.4	5825.6	5899.9	6980.0	8086.6*	10154.1*	11618.1*	14541.0*
	Elow							7852.9	9575.8	10639.9	12931.8
	Eup							8320.2	10749.4	12654.6	16295.8
70	OBS	8663.8	7962.7	6457.4	7621.9	7092.4	8068.9	8629.7	8917.9	8464.5	6506.9
	EXP	8822.3	7713.7	6782.6	7610.8	7121.3	7815.7	9246.4*	10712.3*	13451.2*	15390.6*
	Elow							8979.3	10102.2	12318.6	13687.5
	Eup							9513.6	11340.3	14651.2	17248.0
75	OBS	12135.7	11225.3	8165.7	9631.5	8436.4	9080.4	10271.9	12487.2	11907.8	10099.3
	EXP	12135.7	10996.5	9049.0	9516.1	8562.3	8682.0	9528.6*	11272.9*	13060.1*	16399.3*
	Elow							9253.3	10630.9	11960.4	14584.5
	Eup							9803.9	11933.8	14225.2	18378.4
30-79	OBS	2228.0	2171.9	2071.9	2544.2	2624.2	3026.2	2954.6	2772.9	2338.6	1873.2
	EXP	2229.1	2165.9	2083.3	2547.7	2623.6	3026.6	3565.5*	4225.4*	4995.5*	5892.4*
	Elow							3462.5	3984.7	4574.8	5240.3
	Eup							3668.5	4473.1	5441.1	6603.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	594.0	637.0	656.0	1080.0	1415.0	1772.0	1081.0	575.0	304.0	272.0
	EXP	557.8	639.1	657.5	1028.9	1503.8	1890.4	1897.5*	1853.8*	2287.1*	3075.9*
	CHI	2.354	0.007	0.004	2.540	5.239	7.419	351.356	882.123	1719.481	2555.922
35 -	OBS	1010.0	1372.0	1715.0	2011.0	2478.0	4014.0	3416.0	1922.2	912.0	700.0
	EXP	1094.1	1502.3	1612.5	1982.6	2493.2	3928.8	4926.6*	4943.9*	4875.8*	6022.1*
	CHI	6.462	11.304	6.519	0.406	0.093	1.846	463.156	1846.883	3222.428	4703.435
40 -	OBS	1516.0	2450.0	3525.0	4463.0	4406.0	5824.0	6866.0	4824.4	2852.0	1754.0
	EXP	1651.5	2644.9	3399.0	4353.5	4292.1	5861.3	9173.8*	11465.9*	11626.0*	11501.1*
	CHI	11.116	14.363	4.673	2.753	3.021	0.238	580.551	3846.979	6621.667	8260.601
45 -	OBS	2121.0	3098.0	5343.0	7922.0	7906.0	8256.0	8343.0	8584.0	6712.0	4569.0
	EXP	2297.8	3359.1	5030.7	7695.9	7894.2	8399.7	11486.1*	17878.1*	22571.7*	22980.9*
	CHI	13.610	20.297	19.384	6.644	0.018	2.457	860.076	4831.616	11143.575	14751.322
50 -	OBS	4713.0	4067.0	6128.0	10329.0	12662.0	13641.0	10968.0	11018.4	10998.0	9308.0
	EXP	4971.9	4185.6	5761.0	10252.4	12523.0	13869.1	14716.2*	20135.9*	31543.4*	40031.0*
	CHI	13.479	3.360	23.376	0.573	1.543	3.752	954.671	4128.357	13381.979	23579.314
55 -	OBS	7570.0	8062.0	6683.0	10700.0	15121.0	19376.0	17172.0	13256.0	11748.0	13148.0
	EXP	7496.9	8167.0	6460.5	10603.3	15003.6	19790.8	21844.6*	23171.2*	32075.6*	50387.9*
	CHI	0.713	1.351	7.661	0.883	0.919	8.694	999.486	4242.852	12882.420	27522.648
60 -	OBS	9609.0	11320.0	11684.0	10470.0	14160.0	21336.0	22293.0	18685.2	14094.0	13020.0
	EXP	9342.8	11179.1	11481.0	10823.2	14180.9	21585.7	28278.0*	31294.0*	33594.7*	46956.4*
	CHI	7.586	1.776	3.588	11.526	0.031	2.888	1266.705	5080.279	11319.592	24526.543
65 -	OBS	10055.0	12245.0	13543.0	16406.0	12589.0	17971.0	22483.0	23160.2	19375.0	14271.0
	EXP	9650.5	12096.6	13602.8	16820.8	12607.6	18045.4	26899.2*	35357.5*	39967.9*	43388.4*
	CHI	16.953	1.821	0.263	10.229	0.027	0.307	725.043	4207.697	10610.190	19540.284
70 -	OBS	8899.0	10506.0	11346.0	16107.0	16009.0	13374.0	17436.0	22956.0	23597.0	18345.0
	EXP	9061.8	10177.5	11917.4	16083.5	16074.1	12954.3	18682.1*	27575.2*	37498.7*	43391.1*
	CHI	2.923	10.601	27.395	0.034	0.264	13.599	83.114	773.773	5153.723	14457.086
75 -	OBS	7292.0	7833.0	7269.0	11463.0	12087.0	13961.0	11514.0	17631.4	22007.0	21098.0
	EXP	7292.0	7673.4	8055.3	11325.7	12267.5	13348.6	10680.8*	15916.8*	24136.6*	34259.0*
	CHI	0.000	3.321	76.744	1.665	2.655	28.098	65.002	184.697	187.896	5055.965
30-79	OBS	53379.0	61590.0	67892.0	90951.0	98833.0	119525.0	121572.0	122612.8	112599.0	96485.0
	EXP	53417.0	61624.7	67977.8	90969.7	98839.9	119674.1	148584.8*	189592.3*	240177.6*	301993.8*
	O/E	0.999	0.999	0.999	1.000	1.000	0.999	0.818	0.647	0.469	0.319

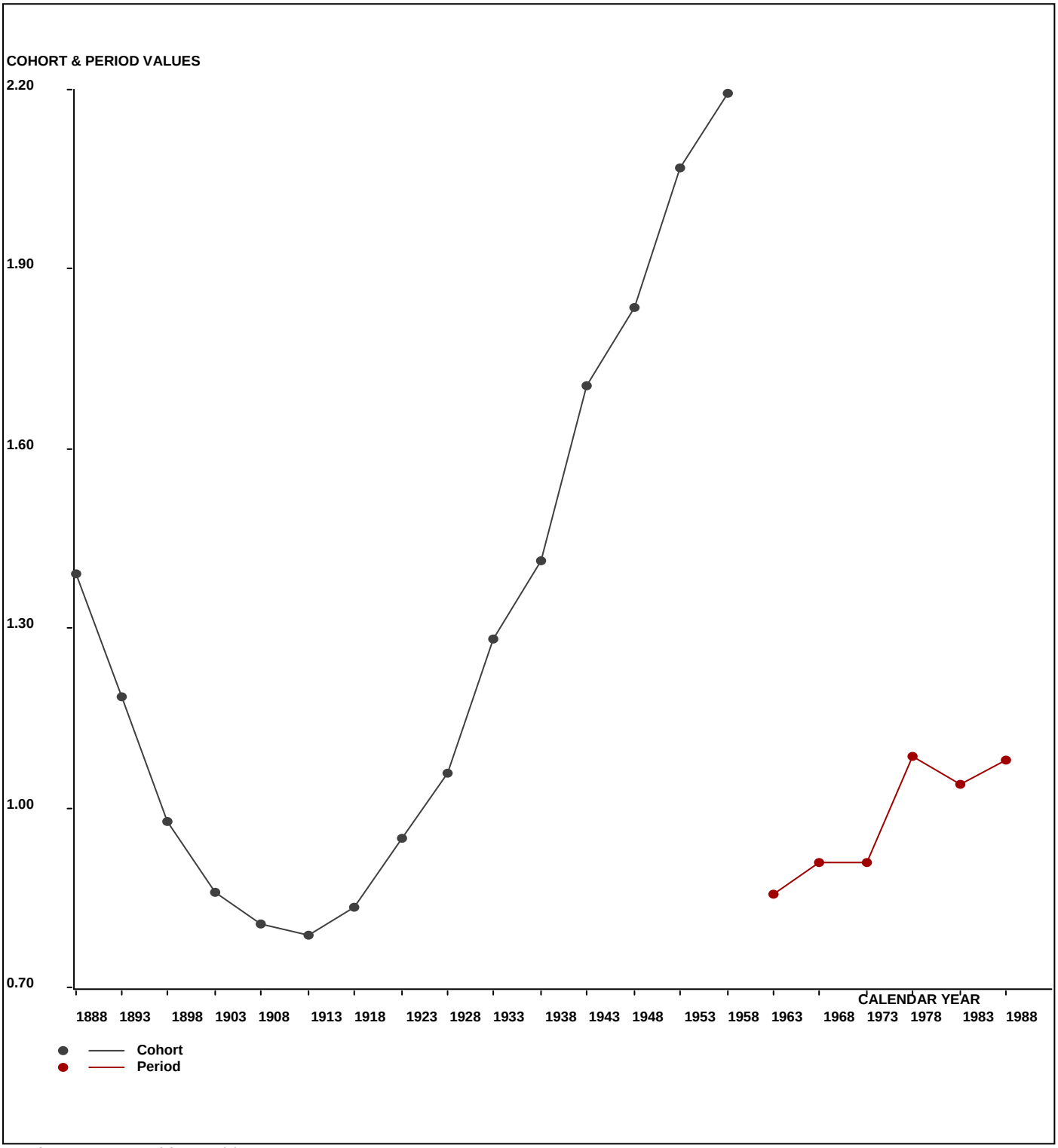
CHI SQUARE (LOG)= 257570.4836 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

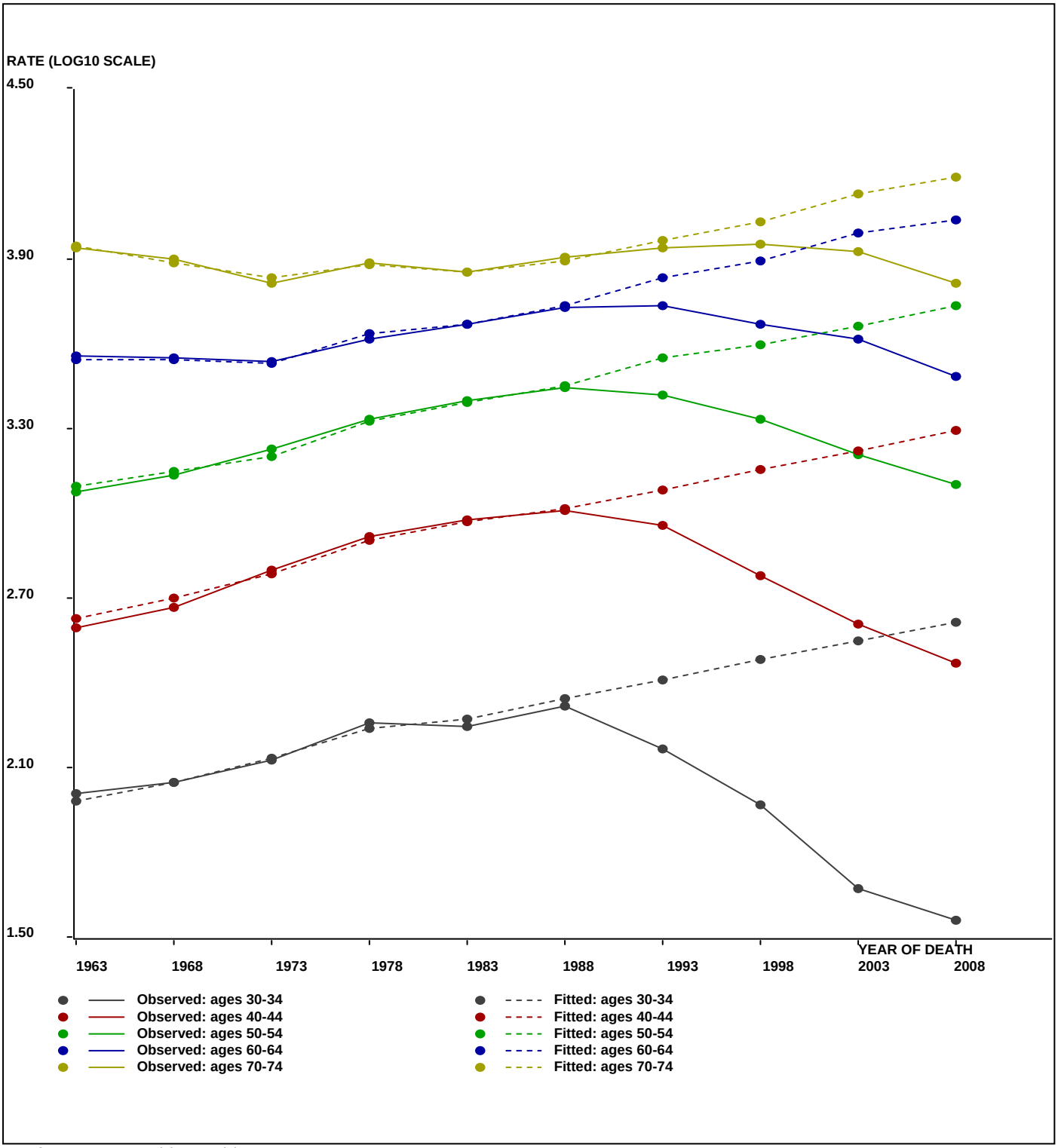


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	147.4	410.1	908.8	1536.6	2624.8	3794.2	5374.8	6758.9	8629.7	10271.9
	PRE	258.8	591.4	1214.3	2115.5	3521.7	4826.6	6817.8	8086.6	9246.4	9528.6
	RES	-111.362	-181.332	-305.476	-578.890	-896.986	-1032.420	-1442.972	-1327.624	-616.734	743.344
1996-	OBS	93.9	269.1	599.5	1189.7	2154.9	3455.9	4657.7	6651.3	8917.9	12487.2
	PRE	302.8	692.1	1424.7	2477.8	3938.1	6040.8	7800.8	10154.1	10712.3	11272.9
	RES	-208.907	-422.984	-825.263	-1288.105	-1783.141	-2584.949	-3143.049	-3502.870	-1794.447	1214.333
2001-	OBS	47.1	151.5	409.0	864.5	1608.2	2474.1	4096.0	5632.1	8464.5	11907.8
	PRE	354.4	809.8	1667.2	2907.2	4612.5	6755.0	9763.3	11618.1	13451.2	13060.1
	RES	-307.278	-658.363	-1258.234	-2042.684	-3004.280	-4280.892	-5667.290	-5986.077	-4986.715	-1152.301
2006-	OBS	36.7	110.2	297.5	676.4	1258.3	2064.5	3027.2	4782.7	6506.9	10099.3
	PRE	414.7	947.7	1951.0	3402.0	5411.8	7911.8	10917.4	14541.0	15390.6	16399.3
	RES	-378.025	-837.512	-1653.435	-2725.587	-4153.428	-5847.327	-7890.266	-9758.265	-8883.743	-6299.977

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	1081.0	3416.0	6866.0	8343.0	10968.0	17172.0	22293.0	22483.0	17436.0	11514.0
	PRE	1897.5	4926.6	9173.8	11486.1	14716.2	21844.6	28278.0	26899.2	18682.1	10680.8
	CHI	351.356	463.156	580.551	860.076	954.671	999.486	1266.705	725.043	83.114	65.002
1996-	OBS	575.0	1922.2	4824.4	8584.0	11018.4	13256.0	18685.2	23160.2	22956.0	17631.4
	PRE	1853.8	4943.9	11465.9	17878.1	20135.9	23171.2	31294.0	35357.5	27575.2	15916.8
	CHI	882.123	1846.883	3846.979	4831.616	4128.357	4242.852	5080.279	4207.697	773.773	184.697
2001-	OBS	304.0	912.0	2852.0	6712.0	10998.0	11748.0	14094.0	19375.0	23597.0	22007.0
	PRE	2287.1	4875.8	11626.0	22571.7	31543.4	32075.6	33594.7	39967.9	37498.7	24136.6
	CHI	1719.481	3222.428	6621.667	11143.575	13381.979	12882.420	11319.592	10610.190	5153.723	187.896
2006-	OBS	272.0	700.0	1754.0	4569.0	9308.0	13148.0	13020.0	14271.0	18345.0	21098.0
	PRE	3075.9	6022.1	11501.1	22980.9	40031.0	50387.9	46956.4	43388.4	43391.1	34259.0
	CHI	2555.922	4703.435	8260.601	14751.322	23579.314	27522.648	24526.543	19540.284	14457.086	5055.965

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1118.08	21.92	51	P, C	98.74	5975.52	0.0000
AGE-PERIOD	153.18	3.40	45	Cohort	90.83	813.19	0.0000
AGE-COHORT	320.48	8.90	36	Period	95.62	1702.56	0.0000
PERIOD-COHORT	57.44	1.44	40	Age	75.54	304.73	0.0000
FULL AGE-PERIOD-COHORT	14.05	0.44	32			74.52	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.748131	55.992630
35	1.972668	93.900514
40	2.209706	162.071301
45	2.452788	283.653268
50	2.703451	505.185883
55	2.937378	865.721800
60	3.173378	1490.658466
65	3.403483	2532.114518
70	3.604026	4018.150964
75	3.769049	5875.559767

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.092847	0.807520
1966	-0.161098	0.690084
1971	-0.059423	0.872121
1976	0.063397	1.157170
1981	0.025888	1.061422
1986	0.068825	1.171722

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.021559	1.050894
1891	0.049586	1.120948
1896	0.038819	1.093502
1901	0.012267	1.028649
1906	-0.015959	0.963920
1911	-0.035865	0.920735
1916	-0.030969	0.931175
1921	-0.015770	0.964339
1926	-0.007649	0.982543
1931	0.048541	1.118256
1936	0.059479	1.146777
1941	0.087408	1.222948
1946	0.064508	1.160133
1951	0.055498	1.136313
1956	-0.020462	0.953977

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	348.0	267.0	267.0	418.0	509.0	535.0
	EXP	293.2	251.7	289.7	443.5	538.8	535.0
	CHI	10.3	0.9	1.8	1.5	1.6	0.0
35 -	OBS	408.0	431.0	550.0	578.0	636.0	1003.0
	EXP	397.9	413.9	523.0	631.7	669.9	974.5
	CHI	0.3	0.7	1.4	4.6	1.7	0.8
40 -	OBS	460.0	593.0	885.0	1123.0	966.0	1302.0
	EXP	489.3	576.0	881.2	1166.4	973.9	1245.5
	CHI	1.7	0.5	0.0	1.6	0.1	2.6
45 -	OBS	679.0	666.0	1248.0	1908.0	1806.0	1884.0
	EXP	667.0	713.5	1234.2	1973.1	1803.2	1804.7
	CHI	0.2	3.2	0.2	2.1	0.0	3.5
50 -	OBS	1564.0	942.0	1512.0	2805.0	3014.0	3342.0
	EXP	1498.4	971.6	1537.6	2774.6	3053.4	3345.8
	CHI	2.9	0.9	0.4	0.3	0.5	0.0
55 -	OBS	2406.0	2048.0	1884.0	3251.0	4098.0	5344.0
	EXP	2396.2	2055.5	1967.9	3259.8	4032.2	5321.8
	CHI	0.0	0.0	3.6	0.0	1.1	0.1
60 -	OBS	3322.0	3191.0	4048.0	3995.0	4781.0	6683.0
	EXP	3310.4	3181.9	4043.3	4049.6	4616.8	6822.7
	CHI	0.0	0.0	0.0	0.7	5.8	2.9
65 -	OBS	3716.0	4031.0	5852.0	7877.0	5393.0	7338.0
	EXP	3788.5	4086.1	5799.9	7789.8	5348.0	7396.9
	CHI	1.4	0.7	0.5	1.0	0.4	0.5
70 -	OBS	3665.0	4008.0	6296.0	9518.0	8809.0	7374.0
	EXP	3735.9	4000.6	6333.7	9471.4	8863.7	7266.6
	CHI	1.3	0.0	0.2	0.2	0.3	1.6
75 -	OBS	2996.0	3241.0	5052.0	8404.0	8494.0	9648.0
	EXP	2996.0	3171.5	4988.0	8323.7	8612.7	9745.9
	CHI	0.0	1.5	0.8	0.8	1.6	1.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	17281.29	432.03	40	P, C	-65.84	0.0000
AGE-PERIOD	20941.37	523.53	40	Cohort	-36.86	0.0000
AGE-COHORT	27065.07	676.63	40	Period	-5.89	0.0000
PERIOD-COHORT	25058.57	626.46	40	Age	-14.37	0.0000
FULL AGE-PERIOD-COHORT	28659.36	716.48	40			0.0000

AGE	EFFECT
30	55.992630
35	93.900514
40	162.071301
45	283.653268
50	505.185883
55	865.721800
60	1490.658466
65	2532.114518
70	4018.150964
75	5875.559767

PERIOD	EFFECT	LOWER	UPPER
% Period Change	110.3917	107.3917	113.3917
1961	0.807520		
1966	0.690084		
1971	0.872121		
1976	1.157170		
1981	1.061422		
1986	1.171722		
1991	1.293484	1.258333	1.328636
1996	1.427900	1.351345	1.506563
2001	1.576283	1.451233	1.708318
2006	1.740086	1.558504	1.937092

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.050894	1.000000	
1891	1.120948	2.000000	
1896	1.093502	4.000000	
1901	1.028649	8.000000	
1906	0.963920	16.000000	
1911	0.920735	32.000000	
1916	0.931175	64.000000	
1921	0.964339	128.000000	
1926	0.982543	256.000000	
1931	1.118256	512.000000	
1936	1.146777	1024.000000	
1941	1.222948	2048.000000	
1946	1.160133	4096.000000	
1951	1.136313	8192.000000	
1956	1.165851	EXTRAPOLATION	0.953977
1961	1.175329	EXTRAPOLATION	
1966	1.184884	EXTRAPOLATION	
1971	1.194516	EXTRAPOLATION	
1976	1.204227	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	60.0	47.0	55.0	70.9	63.8	62.6	65.1	57.2	45.6	41.4
	EXP	50.6	44.3	59.7	75.2	67.5	76.5	85.1*	94.7*	105.4*	117.3*
	Elow							82.8	89.7	97.1	105.1
	Eup							87.4	100.0	114.3	130.6
35	OBS	76.4	75.5	98.8	121.6	109.8	128.7	120.8	108.3	96.5	83.4
	EXP	74.5	72.5	93.9	132.9	115.6	125.0	141.6*	157.6*	175.4*	195.2*
	Elow							137.8	149.1	161.5	174.8
	Eup							145.5	166.3	190.1	217.3
40	OBS	118.7	113.1	158.7	207.1	208.7	230.3	233.9	208.8	186.1	176.2
	EXP	126.2	109.9	158.1	215.1	210.4	220.3	238.2*	269.8*	300.3*	334.2*
	Elow							231.7	255.3	276.4	299.3
	Eup							244.7	284.7	325.4	372.0
45	OBS	217.1	176.2	245.8	354.9	345.8	424.3	416.8	401.3	352.5	318.9
	EXP	213.3	188.8	243.1	367.1	345.3	406.5	425.7*	460.2*	521.3*	580.1*
	Elow							414.1	435.6	479.9	519.6
	Eup							437.2	485.6	564.9	645.8
50	OBS	392.0	314.7	417.8	580.7	591.9	678.0	758.4	741.5	673.7	560.2
	EXP	375.6	324.6	424.9	574.4	599.6	678.8	799.1*	836.9*	904.9*	1024.9*
	Elow							777.4	792.0	833.1	917.9
	Eup							820.9	883.0	980.7	1140.9
55	OBS	676.6	548.1	673.1	963.5	917.6	1139.1	1139.9	1253.2	1094.5	1004.4
	EXP	673.9	550.1	703.1	966.1	902.9	1134.3	1284.2*	1511.8*	1583.1*	1711.8*
	Elow							1249.3	1430.7	1457.5	1533.1
	Eup							1319.1	1595.0	1715.8	1905.6
60	OBS	1242.6	994.4	1198.4	1584.6	1580.0	1681.0	1919.2	1988.2	2020.7	1582.6
	EXP	1238.2	991.6	1197.0	1606.2	1525.8	1716.1	2156.2*	2440.9*	2873.6*	3009.2*
	Elow							2097.6	2310.1	2645.6	2695.2
	Eup							2214.8	2575.4	3114.3	3349.9
65	OBS	2193.1	1773.2	2147.7	2728.0	2523.7	2838.3	2940.4	3367.6	3149.0	2673.0
	EXP	2235.9	1797.4	2128.6	2697.8	2502.7	2861.1	3218.1*	4043.2*	4577.2*	5388.4*
	Elow							3130.6	3826.4	4214.0	4826.1
	Eup							3305.5	4265.9	4960.6	5998.5
70	OBS	3568.1	3037.7	3583.3	4504.0	3902.6	4448.9	4869.2	5376.0	5420.5	4203.1
	EXP	3637.2	3032.1	3604.7	4481.9	3926.9	4384.1	5012.1*	5637.4*	7082.7*	8018.2*
	Elow							4875.9	5335.1	6520.9	7181.5
	Eup							5148.3	5947.9	7676.0	8926.0
75	OBS	4986.1	4644.6	5675.2	7061.2	5928.6	6275.1	7441.2	9341.4	8600.1	7173.6
	EXP	4986.1	4545.0	5603.3	6993.8	6011.4	6338.8	7076.9*	8090.5*	9099.9*	11433.0*
	Elow							6884.6	7656.8	8378.0	10240.0
	Eup							7269.2	8536.2	9862.1	12727.4
30-79	OBS	832.2	706.2	864.6	1119.9	1023.7	1148.3	1251.8	1388.4	1312.9	1088.2
	EXP	835.3	705.7	865.4	1120.1	1022.4	1149.3	1315.9*	1514.1*	1739.5*	1991.9*
	Elow							1280.2	1432.9	1601.5	1784.0
	Eup							1351.7	1597.5	1885.2	2217.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	348.0	267.0	267.0	418.0	509.0	535.0	477.0	350.0	294.0	307.0
	EXP	293.2	251.7	289.7	443.5	538.8	653.8	624.1*	579.9*	680.4*	870.3*
	CHI	10.260	0.935	1.786	1.462	1.644	21.594	34.687	91.136	219.436	364.556
35 -	OBS	408.0	431.0	550.0	578.0	636.0	1003.0	1006.0	774.0	581.0	530.0
	EXP	397.9	413.9	523.0	631.7	669.9	974.5	1179.6*	1125.8*	1055.9*	1240.3*
	CHI	0.258	0.706	1.397	4.565	1.713	0.834	25.546	109.927	213.601	406.763
40 -	OBS	460.0	593.0	885.0	1123.0	966.0	1302.0	1767.0	1680.0	1298.0	1039.0
	EXP	489.3	576.0	881.2	1166.4	973.9	1245.5	1799.6*	2171.3*	2093.8*	1969.9*
	CHI	1.750	0.502	0.016	1.611	0.064	2.559	0.592	111.161	302.472	439.898
45 -	OBS	679.0	666.0	1248.0	1908.0	1806.0	1884.0	2263.0	2895.8	2737.0	2154.0
	EXP	667.0	713.5	1234.2	1973.1	1803.2	1804.7	2311.1*	3320.8*	4047.2*	3918.8*
	CHI	0.215	3.157	0.154	2.148	0.004	3.489	1.000	54.385	424.168	794.789
50 -	OBS	1564.0	942.0	1512.0	2805.0	3014.0	3342.0	3169.0	3791.4	4607.0	4144.0
	EXP	1498.4	971.6	1537.6	2774.6	3053.4	3345.8	3339.3*	4279.0*	6188.1*	7580.9*
	CHI	2.868	0.904	0.426	0.333	0.508	0.004	8.688	55.568	403.981	1558.182
55 -	OBS	2406.0	2048.0	1884.0	3251.0	4098.0	5344.0	5159.0	4806.8	5197.0	6397.0
	EXP	2396.2	2055.5	1967.9	3259.8	4032.2	5321.8	5812.0*	5798.8*	7517.5*	10901.8*
	CHI	0.040	0.027	3.578	0.024	1.073	0.092	73.359	169.691	716.280	1861.447
60 -	OBS	3322.0	3191.0	4048.0	3995.0	4781.0	6683.0	7960.0	7975.8	6953.0	6807.0
	EXP	3310.4	3181.9	4043.3	4049.6	4616.8	6822.7	8943.0*	9792.1*	9887.7*	12942.9*
	CHI	0.041	0.026	0.006	0.737	5.837	2.860	108.055	336.915	871.036	2908.850
65 -	OBS	3716.0	4031.0	5852.0	7877.0	5393.0	7338.0	9781.0	11726.4	10833.0	7976.0
	EXP	3788.5	4086.1	5799.9	7789.8	5348.0	7396.9	10704.6*	14078.7*	15746.0*	16078.4*
	CHI	1.389	0.743	0.468	0.977	0.379	0.469	79.697	393.013	1532.955	4083.013
70 -	OBS	3665.0	4008.0	6296.0	9518.0	8809.0	7374.0	9838.0	13838.8	15111.0	11850.0
	EXP	3735.9	4000.6	6333.7	9471.4	8863.7	7266.6	10126.7*	14511.4*	19744.9*	22605.9*
	CHI	1.346	0.014	0.224	0.229	0.338	1.588	8.232	31.179	1087.543	5117.631
75 -	OBS	2996.0	3241.0	5052.0	8404.0	8494.0	9648.0	8341.0	13189.6	15894.0	14986.0
	EXP	2996.0	3171.5	4988.0	8323.7	8612.7	9745.9	7932.6*	11423.4*	16817.7*	23884.3*
	CHI	0.000	1.522	0.822	0.774	1.637	0.983	21.026	273.060	50.729	3315.113
30-79	OBS	19564.0	19418.0	27594.0	39877.0	38506.0	44453.0	49761.0	61028.6	63505.0	56190.0
	EXP	19572.8	19422.3	27598.5	39883.5	38512.6	44578.2	52772.7*	67081.2*	83779.3*	101993.3*
	O/E	1.000	1.000	1.000	1.000	1.000	0.997	0.943	0.910	0.758	0.551

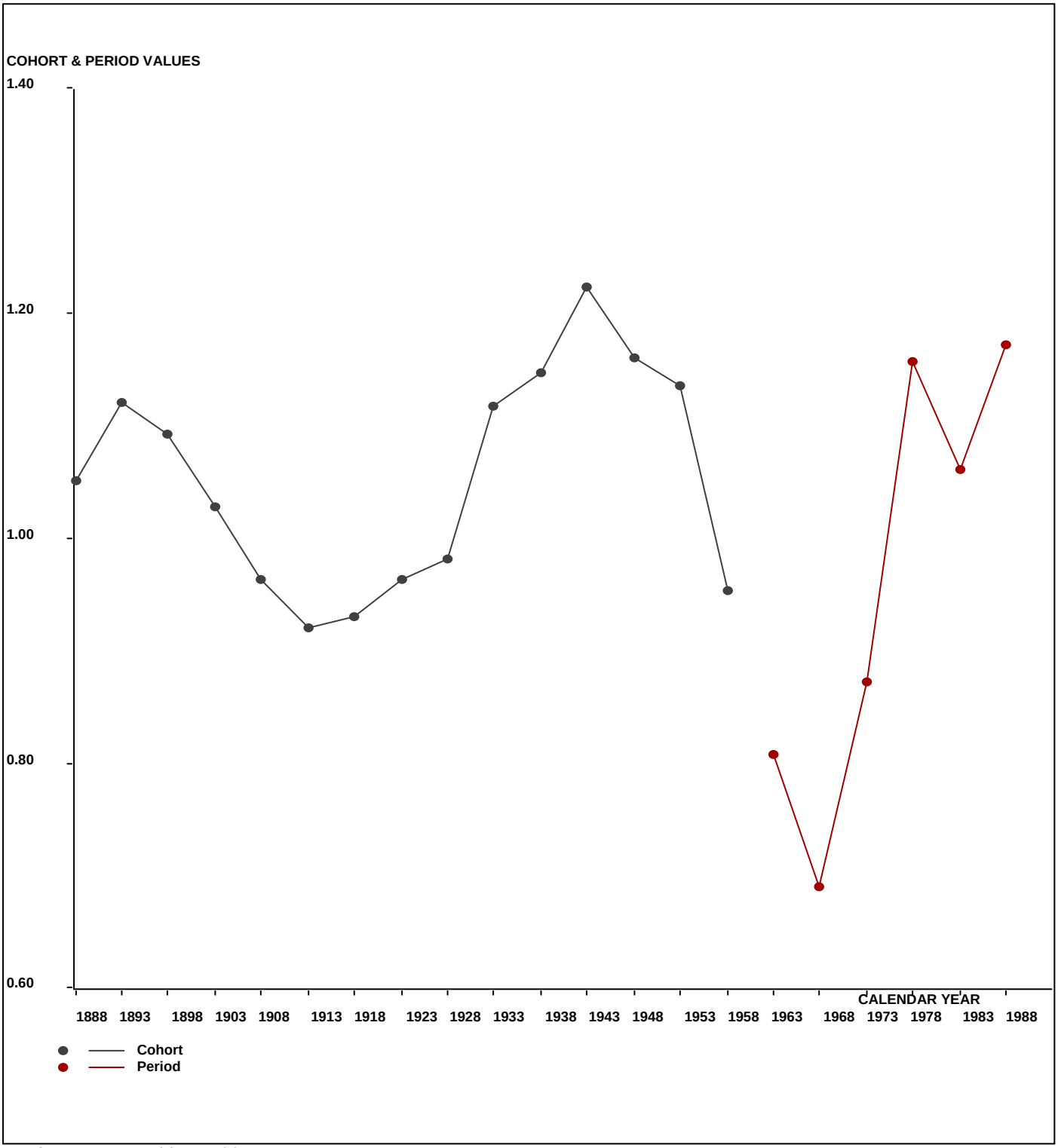
CHI SQUARE (LOG)= 28659.3602 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

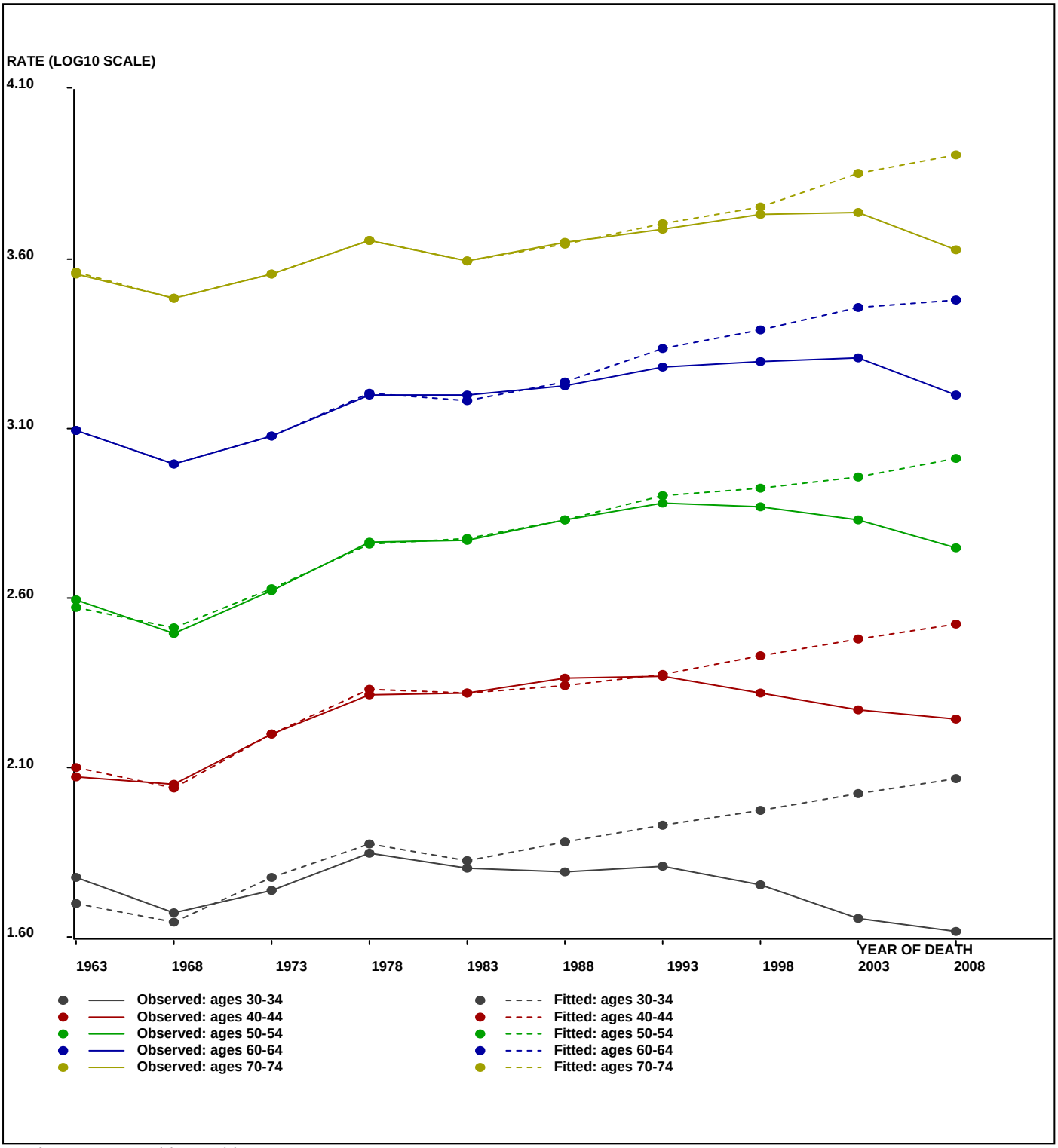


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	65.1	120.8	233.9	416.8	758.4	1139.9	1919.2	2940.4	4869.2	7441.2
	PRE	85.1	141.6	238.2	425.7	799.1	1284.2	2156.2	3218.1	5012.1	7076.9
	RES	-20.067	-20.839	-4.319	-8.855	-40.762	-144.272	-237.007	-277.671	-142.901	364.343
1996-	OBS	57.2	108.3	208.8	401.3	741.5	1253.2	1988.2	3367.6	5376.0	9341.4
	PRE	94.7	157.6	269.8	460.2	836.9	1511.8	2440.9	4043.2	5637.4	8090.5
	RES	-37.556	-49.244	-61.047	-58.898	-95.367	-258.610	-452.768	-675.531	-261.307	1250.856
2001-	OBS	45.6	96.5	186.1	352.5	673.7	1094.5	2020.7	3149.0	5420.5	8600.1
	PRE	105.4	175.4	300.3	521.3	904.9	1583.1	2873.6	4577.2	7082.7	9099.9
	RES	-59.873	-78.880	-114.123	-168.754	-231.198	-488.681	-852.885	-1428.155	-1662.252	-499.782
2006-	OBS	41.4	83.4	176.2	318.9	560.2	1004.4	1582.6	2673.0	4203.1	7173.6
	PRE	117.3	195.2	334.2	580.1	1024.9	1711.8	3009.2	5388.4	8018.2	11433.0
	RES	-75.940	-111.774	-157.909	-261.255	-464.636	-707.332	-1426.600	-2715.387	-3815.048	-4259.460

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	477.0	1006.0	1767.0	2263.0	3169.0	5159.0	7960.0	9781.0	9838.0	8341.0
	PRE	624.1	1179.6	1799.6	2311.1	3339.3	5812.0	8943.0	10704.6	10126.7	7932.6
	CHI	34.687	25.546	0.592	1.000	8.688	73.359	108.055	79.697	8.232	21.026
1996-	OBS	350.0	774.0	1680.0	2895.8	3791.4	4806.8	7975.8	11726.4	13838.8	13189.6
	PRE	579.9	1125.8	2171.3	3320.8	4279.0	5798.8	9792.1	14078.7	14511.4	11423.4
	CHI	91.136	109.927	111.161	54.385	55.568	169.691	336.915	393.013	31.179	273.060
2001-	OBS	294.0	581.0	1298.0	2737.0	4607.0	5197.0	6953.0	10833.0	15111.0	15894.0
	PRE	680.4	1055.9	2093.8	4047.2	6188.1	7517.5	9887.7	15746.0	19744.9	16817.7
	CHI	219.436	213.601	302.472	424.168	403.981	716.280	871.036	1532.955	1087.543	50.729
2006-	OBS	307.0	530.0	1039.0	2154.0	4144.0	6397.0	6807.0	7976.0	11850.0	14986.0
	PRE	870.3	1240.3	1969.9	3918.8	7580.9	10901.8	12942.9	16078.4	22605.9	23884.3
	CHI	364.556	406.763	439.898	794.789	1558.182	1861.447	2908.850	4083.013	5117.631	3315.113

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	4122.40	80.83	51	P, C	99.67	22478.83	0.0000
AGE-PERIOD	185.41	4.12	45	Cohort	92.64	984.74	0.0000
AGE-COHORT	139.14	3.86	36	Period	90.19	738.54	0.0000
PERIOD-COHORT	77.31	1.93	40	Age	82.35	410.67	0.0000
FULL AGE-PERIOD-COHORT	13.65	0.43	32			72.39	0.0001

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.226513	16.846631
35	1.756290	57.054475
40	2.217358	164.952296
45	2.630998	427.561310
50	2.963151	918.652765
55	3.227518	1688.566287
60	3.421673	2640.422723
65	3.562252	3649.657798
70	3.623096	4198.519659
75	3.609700	4070.985754

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.252293	0.559380
1966	-0.132660	0.736784
1971	-0.053076	0.884960
1976	0.009627	1.022415
1981	0.059755	1.147507
1986	0.079099	1.199772

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.229314	0.589775
1891	-0.143158	0.719187
1896	-0.065876	0.859258
1901	-0.049354	0.892578
1906	-0.049457	0.892365
1911	-0.060868	0.869225
1916	-0.041158	0.909583
1921	0.014420	1.033761
1926	0.056471	1.138861
1931	0.113237	1.297889
1936	0.114106	1.300488
1941	0.141882	1.386378
1946	0.064317	1.159624
1951	0.020062	1.047279
1956	0.038990	1.093930

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	90.0	82.0	101.0	113.0	153.0	189.0
	EXP	70.9	91.7	100.3	117.8	161.5	189.0
	CHI	5.1	1.0	0.0	0.2	0.4	0.0
35 -	OBS	204.0	310.0	358.0	378.0	437.0	567.0
	EXP	194.1	311.6	365.7	384.4	439.8	558.8
	CHI	0.5	0.0	0.2	0.1	0.0	0.1
40 -	OBS	340.0	703.0	1084.0	1213.0	1206.0	1305.0
	EXP	369.8	725.5	1056.3	1189.4	1214.8	1297.5
	CHI	2.4	0.7	0.7	0.5	0.1	0.0
45 -	OBS	654.0	1207.0	2176.0	3082.0	3347.0	3172.0
	EXP	680.3	1230.9	2188.1	3049.9	3332.3	3157.6
	CHI	1.0	0.5	0.1	0.3	0.1	0.1
50 -	OBS	1795.0	1704.0	3000.0	5228.0	7088.0	7043.0
	EXP	1781.9	1842.7	3041.5	5167.1	6967.0	7064.9
	CHI	0.1	10.4	0.6	0.7	2.1	0.1
55 -	OBS	3036.0	4022.0	3823.0	6038.0	10002.0	12132.0
	EXP	2997.2	4041.0	3804.6	6022.1	9855.3	12335.9
	CHI	0.5	0.1	0.1	0.0	2.2	3.4
60 -	OBS	3451.0	5666.0	6932.0	6172.0	9586.0	14157.0
	EXP	3524.6	5570.9	6860.8	6190.9	9477.6	14343.1
	CHI	1.5	1.6	0.7	0.1	1.2	2.4
65 -	OBS	3032.0	5604.0	7761.0	9380.0	8038.0	11671.0
	EXP	2972.3	5456.3	7853.1	9365.3	8140.2	11702.6
	CHI	1.2	4.0	1.1	0.0	1.3	0.1
70 -	OBS	1718.0	3453.0	5867.0	8094.0	9220.0	7851.0
	EXP	1734.9	3507.0	5827.1	8095.0	9452.6	7594.2
	CHI	0.2	0.8	0.3	0.0	5.7	8.7
75 -	OBS	807.0	1522.0	2749.0	4303.0	5930.0	6675.0
	EXP	807.0	1505.3	2755.7	4421.6	5972.5	6527.5
	CHI	0.0	0.2	0.0	3.2	0.3	3.3

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	33466.69	836.67	40	P, C	31.36	0.0000
AGE-PERIOD	49210.71	1230.27	40	Cohort	53.32	0.0000
AGE-COHORT	84041.53	2101.04	40	Period	72.67	0.0000
PERIOD-COHORT	33077.80	826.94	40	Age	30.56	0.0000
FULL AGE-PERIOD-COHORT	22969.92	574.25	40			0.0000

AGE	EFFECT
30	16.846631
35	57.054475
40	164.952296
45	427.561310
50	918.652765
55	1688.566287
60	2640.422723
65	3649.657798
70	4198.519659
75	4070.985754

PERIOD	EFFECT	LOWER	UPPER
% Period Change	104.5546	101.5546	107.5546
1961	0.559380		
1966	0.736784		
1971	0.884960		
1976	1.022415		
1981	1.147507		
1986	1.199772		
1991	1.254417	1.218424	1.290410
1996	1.311551	1.237366	1.387896
2001	1.371288	1.256602	1.492746
2006	1.433745	1.276138	1.605518

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.589775	1.000000	
1891	0.719187	2.000000	
1896	0.859258	4.000000	
1901	0.892578	8.000000	
1906	0.892365	16.000000	
1911	0.869225	32.000000	
1916	0.909583	64.000000	
1921	1.033761	128.000000	
1926	1.138861	256.000000	
1931	1.297889	512.000000	
1936	1.300488	1024.000000	
1941	1.386378	2048.000000	
1946	1.159624	4096.000000	
1951	1.047279	8192.000000	
1956	1.049837	EXTRAPOLATION	1.093930
1961	1.009527	EXTRAPOLATION	
1966	0.970765	EXTRAPOLATION	
1971	0.933492	EXTRAPOLATION	
1976	0.897649	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	15.5	14.4	20.8	19.2	19.2	22.1	15.8	10.8	7.7	6.7
	EXP	12.2	16.1	20.7	20.0	20.2	21.2	21.3*	21.4*	21.6*	21.7*
	Elow							20.7	20.2	19.8	19.3
	Eup							21.9	22.7	23.5	24.3
35	OBS	38.2	54.3	64.3	79.5	75.4	72.7	70.0	54.5	35.7	20.9
	EXP	36.3	54.6	65.7	80.9	75.9	71.7	75.1*	75.5*	76.0*	76.4*
	Elow							73.0	71.3	69.6	68.0
	Eup							77.3	79.9	82.7	85.5
40	OBS	87.7	134.1	194.4	223.7	260.5	230.8	236.3	195.0	152.2	104.5
	EXP	95.4	138.4	189.5	219.3	262.4	229.5	216.7*	227.1*	228.4*	229.6*
	Elow							210.5	214.3	209.3	204.3
	Eup							222.9	240.3	248.6	257.1
45	OBS	209.1	319.3	428.5	573.3	640.9	714.4	588.6	509.1	464.4	351.7
	EXP	217.5	325.7	430.9	567.4	638.1	711.2	622.0*	587.3*	615.5*	618.9*
	Elow							604.1	554.1	564.1	550.8
	Eup							639.8	621.5	670.0	693.0
50	OBS	449.9	569.3	829.0	1082.3	1391.9	1428.9	1444.5	1183.3	1080.6	893.5
	EXP	446.7	615.7	840.4	1069.7	1368.2	1433.4	1597.6*	1397.2*	1319.3*	1382.8*
	Elow							1551.8	1318.2	1209.0	1230.8
	Eup							1643.5	1478.5	1436.1	1548.4
55	OBS	853.8	1076.3	1365.8	1789.4	2239.5	2585.9	2529.7	2357.7	1940.6	1821.3
	EXP	842.9	1081.4	1359.2	1784.7	2206.7	2629.4	2754.6*	3070.3*	2685.1*	2535.4*
	Elow							2675.6	2896.7	2460.6	2256.7
	Eup							2833.7	3249.1	2923.0	2839.2
60	OBS	1290.8	1765.7	2052.2	2448.0	3168.0	3561.0	3870.8	3590.2	3459.0	2844.0
	EXP	1318.3	1736.0	2031.1	2455.5	3132.2	3607.8	4298.9*	4503.7*	5019.8*	4390.0*
	Elow							4175.5	4248.9	4600.0	3907.4
	Eup							4422.2	4765.8	5464.4	4915.9
65	OBS	1789.4	2465.1	2848.4	3248.6	3761.5	4514.3	4831.3	4824.0	4606.5	4362.5
	EXP	1754.2	2400.2	2882.2	3243.5	3809.3	4526.6	5213.9*	6212.6*	6508.6*	7254.5*
	Elow							5064.3	5861.2	5964.3	6457.0
	Eup							5363.5	6574.3	7085.1	8123.6
70	OBS	1672.6	2617.1	3339.1	3830.1	4084.7	4736.7	5241.9	5494.8	5817.6	5297.7
	EXP	1689.1	2658.0	3316.4	3830.6	4187.8	4581.8	5444.5*	6271.2*	7472.4*	7828.4*
	Elow							5288.3	5916.5	6847.5	6967.9
	Eup							5600.7	6636.3	8134.3	8766.3
75	OBS	1343.1	2181.1	3088.1	3615.5	4139.0	4341.5	4828.2	5474.0	5889.2	6006.5
	EXP	1343.1	2157.2	3095.6	3715.1	4168.7	4245.5	4645.0*	5519.6*	6357.7*	7575.5*
	Elow							4511.7	5207.4	5826.0	6742.7
	Eup							4778.3	5840.9	6920.8	8483.1
30-79	OBS	582.6	818.2	1032.8	1246.1	1483.1	1664.6	1740.5	1681.7	1614.2	1457.2
	EXP	583.2	820.2	1032.9	1246.9	1483.5	1662.3	1858.7*	2032.8*	2149.1*	2202.2*
	Elow							1805.4	1917.8	1969.4	1960.1
	Eup							1912.1	2151.1	2339.5	2466.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	90.0	82.0	101.0	113.0	153.0	189.0	116.0	66.0	50.0	50.0
	EXP	70.9	91.7	100.3	117.8	161.5	181.4	156.4*	131.3*	139.2*	160.8*
	CHI	5.137	1.022	0.005	0.199	0.449	0.320	10.446	32.473	57.137	76.361
35 -	OBS	204.0	310.0	358.0	378.0	437.0	567.0	583.0	389.6	215.0	133.0
	EXP	194.1	311.6	365.7	384.4	439.8	558.8	625.9*	539.7*	457.3*	485.2*
	CHI	0.505	0.009	0.160	0.108	0.018	0.121	2.942	41.729	128.368	255.699
40 -	OBS	340.0	703.0	1084.0	1213.0	1206.0	1305.0	1785.0	1569.0	1061.0	616.0
	EXP	369.8	725.5	1056.3	1189.4	1214.8	1297.5	1637.1*	1827.8*	1592.4*	1353.4*
	CHI	2.397	0.697	0.729	0.467	0.064	0.044	13.358	36.652	177.315	401.789
45 -	OBS	654.0	1207.0	2176.0	3082.0	3347.0	3172.0	3196.0	3673.2	3606.0	2376.0
	EXP	680.3	1230.9	2188.1	3049.9	3332.3	3157.6	3376.9*	4237.4*	4779.1*	4180.5*
	CHI	1.018	0.463	0.067	0.338	0.065	0.066	9.689	75.126	287.933	778.901
50 -	OBS	1795.0	1704.0	3000.0	5228.0	7088.0	7043.0	6036.0	6050.4	7390.0	6609.0
	EXP	1781.9	1842.7	3041.5	5167.1	6967.0	7064.9	6676.0*	7144.0*	9022.3*	10228.3*
	CHI	0.096	10.441	0.565	0.717	2.101	0.068	61.349	167.410	295.306	1280.678
55 -	OBS	3036.0	4022.0	3823.0	6038.0	10002.0	12132.0	11449.0	9043.4	9215.0	11599.0
	EXP	2997.2	4041.0	3804.6	6022.1	9855.3	12335.9	12467.2*	11777.1*	12750.2*	16147.4*
	CHI	0.502	0.089	0.089	0.042	2.182	3.371	83.164	634.529	980.176	1281.200
60 -	OBS	3451.0	5666.0	6932.0	6172.0	9586.0	14157.0	16055.0	14402.8	11902.0	12232.0
	EXP	3524.6	5570.9	6860.8	6190.9	9477.6	14343.1	17830.2*	18067.1*	17272.7*	18881.5*
	CHI	1.536	1.623	0.740	0.058	1.240	2.415	176.747	743.175	1669.924	2341.753
65 -	OBS	3032.0	5604.0	7761.0	9380.0	8038.0	11671.0	16071.0	16797.6	15847.0	13017.0
	EXP	2972.3	5456.3	7853.1	9365.3	8140.2	11702.6	17343.7*	21632.8*	22390.4*	21646.4*
	CHI	1.197	4.000	1.080	0.023	1.283	0.086	93.389	1080.747	1912.248	3440.119
70 -	OBS	1718.0	3453.0	5867.0	8094.0	9220.0	7851.0	10591.0	14144.4	16218.0	14936.0
	EXP	1734.9	3507.0	5827.1	8095.0	9452.6	7594.2	11000.4*	16143.1*	20831.3*	22070.9*
	CHI	0.165	0.832	0.274	0.000	5.724	8.682	15.240	247.465	1021.663	2306.488
75 -	OBS	807.0	1522.0	2749.0	4303.0	5930.0	6675.0	5412.0	7729.0	10884.0	12548.0
	EXP	807.0	1505.3	2755.7	4421.6	5972.5	6527.5	5206.6*	7793.4*	11749.8*	15825.6*
	CHI	0.000	0.186	0.016	3.180	0.303	3.335	8.100	0.532	63.793	678.804
30-79	OBS	15127.0	24273.0	33851.0	44001.0	55007.0	64762.0	71294.0	73865.4	76388.0	74116.0
	EXP	15133.1	24282.8	33852.9	44003.6	55013.7	64763.4	76320.5*	89293.7*	100984.4*	110980.0*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.934	0.827	0.756	0.668

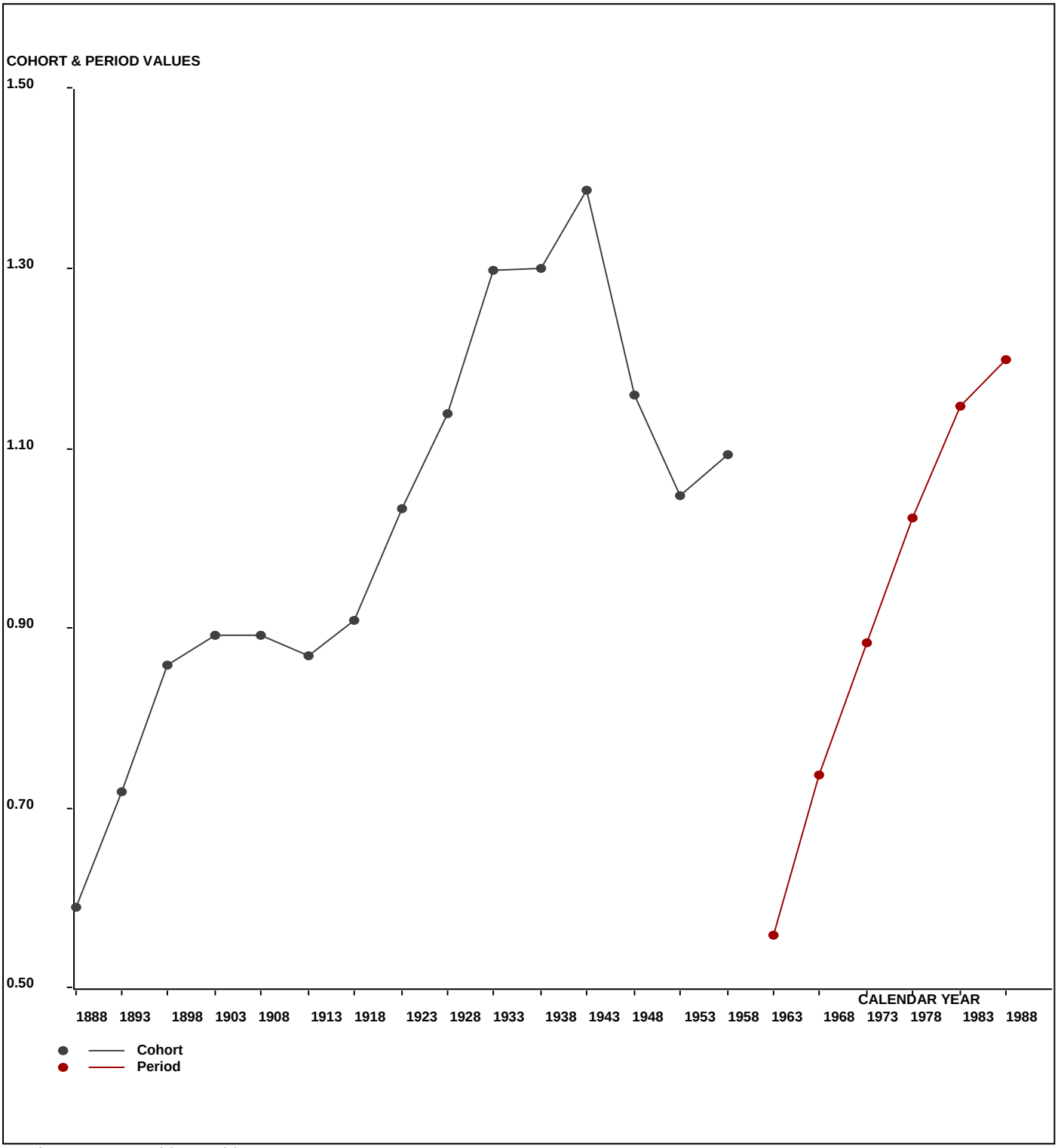
CHI SQUARE (LOG)= 22969.9193 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

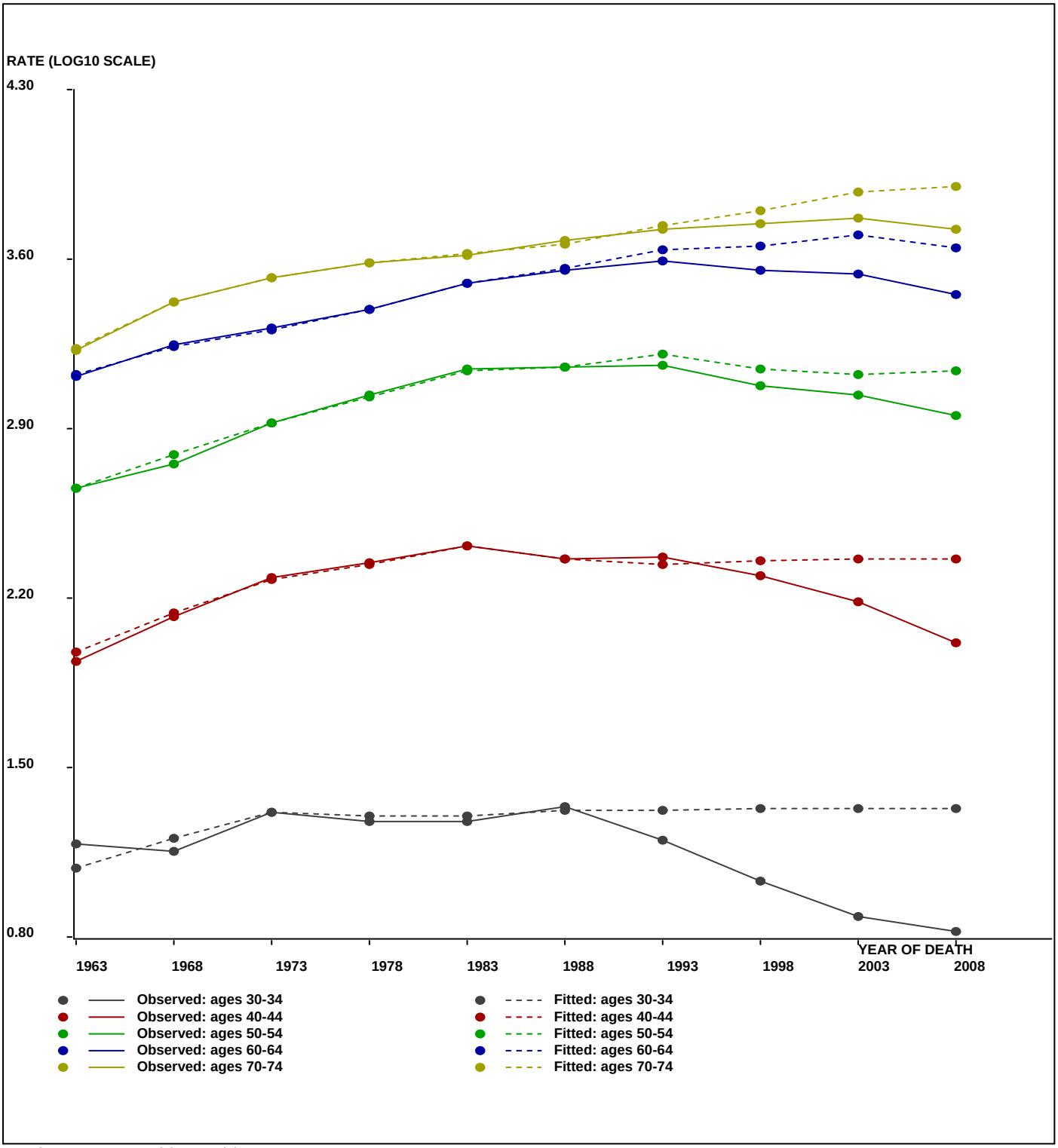


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	15.8	70.0	236.3	588.6	1444.5	2529.7	3870.8	4831.3	5241.9	4828.2
	PRE	21.3	75.1	216.7	622.0	1597.6	2754.6	4298.9	5213.9	5444.5	4645.0
	RES	-5.513	-5.151	19.575	-33.315	-153.151	-224.982	-428.006	-382.597	-202.650	183.207
1996-	OBS	10.8	54.5	195.0	509.1	1183.3	2357.7	3590.2	4824.0	5494.8	5474.0
	PRE	21.4	75.5	227.1	587.3	1397.2	3070.3	4503.7	6212.6	6271.2	5519.6
	RES	-10.667	-21.006	-32.162	-78.197	-213.882	-712.676	-913.411	-1388.609	-776.454	-45.593
2001-	OBS	7.7	35.7	152.2	464.4	1080.6	1940.6	3459.0	4606.5	5817.6	5889.2
	PRE	21.6	76.0	228.4	615.5	1319.3	2685.1	5019.8	6508.6	7472.4	6357.7
	RES	-13.818	-40.241	-76.200	-151.086	-238.682	-744.489	-1560.818	-1902.077	-1654.847	-468.458
2006-	OBS	6.7	20.9	104.5	351.7	893.5	1821.3	2844.0	4362.5	5297.7	6006.5
	PRE	21.7	76.4	229.6	618.9	1382.8	2535.4	4390.0	7254.5	7828.4	7575.5
	RES	-14.940	-55.431	-125.091	-267.126	-489.287	-714.182	-1546.020	-2892.010	-2530.697	-1568.922

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	116.0	583.0	1785.0	3196.0	6036.0	11449.0	16055.0	16071.0	10591.0	5412.0
	PRE	156.4	625.9	1637.1	3376.9	6676.0	12467.2	17830.2	17343.7	11000.4	5206.6
	CHI	10.446	2.942	13.358	9.689	61.349	83.164	176.747	93.389	15.240	8.100
1996-	OBS	66.0	389.6	1569.0	3673.2	6050.4	9043.4	14402.8	16797.6	14144.4	7729.0
	PRE	131.3	539.7	1827.8	4237.4	7144.0	11777.1	18067.1	21632.8	16143.1	7793.4
	CHI	32.473	41.729	36.652	75.126	167.410	634.529	743.175	1080.747	247.465	0.532
2001-	OBS	50.0	215.0	1061.0	3606.0	7390.0	9215.0	11902.0	15847.0	16218.0	10884.0
	PRE	139.2	457.3	1592.4	4779.1	9022.3	12750.2	17272.7	22390.4	20831.3	11749.8
	CHI	57.137	128.368	177.315	287.933	295.306	980.176	1669.924	1912.248	1021.663	63.793
2006-	OBS	50.0	133.0	616.0	2376.0	6609.0	11599.0	12232.0	13017.0	14936.0	12548.0
	PRE	160.8	485.2	1353.4	4180.5	10228.3	16147.4	18881.5	21646.4	22070.9	15825.6
	CHI	76.361	255.699	401.789	778.901	1280.678	1281.200	2341.753	3440.119	2306.488	678.804

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	881.98	17.29	51	P, C	97.53	4801.02	0.0000
AGE-PERIOD	103.29	2.30	45	Cohort	78.91	551.87	0.0000
AGE-COHORT	538.59	14.96	36	Period	95.96	2890.70	0.0000
PERIOD-COHORT	30.59	0.76	40	Age	28.79	164.29	0.0000
FULL AGE-PERIOD-COHORT	21.78	0.68	32			115.90	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.128920	13.456112
35	1.327073	21.236027
40	1.665759	46.318984
45	2.022062	105.211139
50	2.407758	255.716220
55	2.739992	549.530910
60	3.061525	1152.191258
65	3.336883	2172.113486
70	3.581492	3814.981489
75	3.767353	5852.654038

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.206149	0.622087
1966	0.035523	1.085233
1971	0.053220	1.130368
1976	0.024006	1.056833
1981	0.012216	1.028527
1986	-0.048200	0.894953

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.140778	0.723139
1891	-0.083069	0.825907
1896	-0.006636	0.984835
1901	0.003735	1.008636
1906	0.005728	1.013277
1911	-0.017377	0.960778
1916	0.000103	1.000237
1921	0.009826	1.022884
1926	0.044123	1.106936
1931	0.075612	1.190178
1936	0.039631	1.095547
1941	0.052192	1.127695
1946	-0.109988	0.776268
1951	-0.140097	0.724275
1956	-0.227250	0.592584

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	89.0	64.0	70.0	66.0	75.0	61.0
	EXP	57.8	90.9	83.2	65.1	80.0	61.0
	CHI	16.9	7.9	2.1	0.0	0.3	0.0
35 -	OBS	98.0	140.0	136.0	125.0	92.0	112.0
	EXP	78.1	156.7	146.4	120.3	98.2	107.3
	CHI	5.1	1.8	0.7	0.2	0.4	0.2
40 -	OBS	132.0	278.0	315.0	319.0	239.0	187.0
	EXP	114.3	291.7	347.4	290.8	248.7	181.9
	CHI	2.8	0.6	3.0	2.7	0.4	0.1
45 -	OBS	226.0	440.0	622.0	755.0	580.0	488.0
	EXP	204.7	441.4	668.5	711.4	619.1	471.4
	CHI	2.2	0.0	3.2	2.7	2.5	0.6
50 -	OBS	661.0	796.0	1003.0	1481.0	1562.0	1276.0
	EXP	609.7	830.8	1070.0	1445.1	1594.0	1235.8
	CHI	4.3	1.5	4.2	0.9	0.6	1.3
55 -	OBS	1270.0	2084.0	1628.0	2040.0	2887.0	2741.0
	EXP	1231.8	2141.1	1739.1	2004.5	2794.2	2746.1
	CHI	1.2	1.5	7.1	0.6	3.1	0.0
60 -	OBS	1935.0	4181.0	4225.0	3037.0	3679.0	4442.0
	EXP	1932.8	4065.8	4226.8	3070.7	3667.9	4537.8
	CHI	0.0	3.3	0.0	0.4	0.0	2.0
65 -	OBS	2187.0	5349.0	6826.0	6405.0	4813.0	5141.0
	EXP	2254.8	5405.0	6778.8	6368.3	4775.1	5140.7
	CHI	2.0	0.6	0.3	0.2	0.3	0.0
70 -	OBS	1879.0	5332.0	7752.0	8534.0	8560.0	5774.0
	EXP	2013.3	5379.7	7642.4	8633.3	8509.4	5660.3
	CHI	9.0	0.4	1.6	1.1	0.3	2.3
75 -	OBS	1582.0	3788.0	5913.0	7368.0	8634.0	7654.0
	EXP	1582.0	3660.5	5799.8	7425.0	8738.9	7737.3
	CHI	0.0	4.4	2.2	0.4	1.3	0.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	30986.80	774.67	40	P, C	88.39	0.0000
AGE-PERIOD	4217.44	105.44	40	Cohort	14.67	0.0000
AGE-COHORT	32216.47	805.41	40	Period	88.83	0.0000
PERIOD-COHORT	3964.38	99.11	40	Age	9.23	0.0000
FULL AGE-PERIOD-COHORT	3598.60	89.96	40			0.0000

AGE	EFFECT
30	13.456112
35	21.236027
40	46.318984
45	105.211139
50	255.716220
55	549.530910
60	1152.191258
65	2172.113486
70	3814.981489
75	5852.654038

PERIOD	EFFECT	LOWER	UPPER
% Period Change	87.0130	84.0130	90.0130
1961	0.622087		
1966	1.085233		
1971	1.130368		
1976	1.056833		
1981	1.028527		
1986	0.894953		
1991	0.778725	0.751877	0.805574
1996	0.677593	0.631675	0.725122
2001	0.589594	0.530689	0.652704
2006	0.513024	0.445848	0.587519

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.723139	1.000000	
1891	0.825907	2.000000	
1896	0.984835	4.000000	
1901	1.008636	8.000000	
1906	1.013277	16.000000	
1911	0.960778	32.000000	
1916	1.000237	64.000000	
1921	1.022884	128.000000	
1926	1.106936	256.000000	
1931	1.190178	512.000000	
1936	1.095547	1024.000000	
1941	1.127695	2048.000000	
1946	0.776268	4096.000000	
1951	0.724275	8192.000000	
1956	0.664873	EXTRAPOLATION	0.592584
1961	0.598167	EXTRAPOLATION	
1966	0.538153	EXTRAPOLATION	
1971	0.484160	EXTRAPOLATION	
1976	0.435584	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	15.4	11.3	14.4	11.2	9.4	7.1	6.0	5.1	3.1	3.2
	EXP	10.0	16.0	17.2	11.0	10.0	8.0	6.3*	4.9*	3.8*	3.0*
	Elow							6.1	4.6	3.5	2.6
	Eup							6.5	5.3	4.3	3.4
35	OBS	18.4	24.5	24.4	26.3	15.9	14.4	9.7	9.0	6.3	3.5
	EXP	14.6	27.4	26.3	25.3	17.0	13.8	11.0*	8.6*	6.7*	5.3*
	Elow							10.6	8.0	6.1	4.6
	Eup							11.4	9.2	7.5	6.0
40	OBS	34.1	53.0	56.5	58.8	51.6	33.1	22.6	20.7	13.8	14.9
	EXP	29.5	55.6	62.3	53.6	53.7	32.2	26.1*	20.9*	16.3*	12.8*
	Elow							25.2	19.5	14.7	11.1
	Eup							27.0	22.3	18.1	14.6
45	OBS	72.3	116.4	122.5	140.5	111.1	109.9	59.5	42.3	36.7	39.5
	EXP	65.5	116.8	131.6	132.3	118.6	106.2	63.6*	51.6*	41.2*	32.3*
	Elow							61.4	48.1	37.1	28.1
	Eup							65.8	55.3	45.7	37.0
50	OBS	165.7	265.9	277.2	306.6	306.7	258.9	157.2	117.7	101.5	92.5
	EXP	152.8	277.6	295.7	299.1	313.0	250.7	224.6*	134.5*	109.2*	87.2*
	Elow							216.8	125.4	98.3	75.8
	Eup							232.3	143.9	120.9	99.9
55	OBS	357.2	557.7	581.6	604.6	646.4	584.2	359.7	306.5	218.0	223.3
	EXP	346.4	573.0	621.3	594.1	625.6	585.3	468.8*	419.9*	251.5*	204.2*
	Elow							452.7	391.5	226.4	177.5
	Eup							485.0	449.4	278.4	233.8
60	OBS	723.8	1302.9	1250.8	1204.6	1215.9	1117.3	820.2	666.8	545.2	467.3
	EXP	723.0	1267.0	1251.3	1218.0	1212.2	1141.4	1067.9*	855.3*	766.1*	458.9*
	Elow							1031.1	797.3	689.5	398.8
	Eup							1104.7	915.3	848.1	525.5
65	OBS	1290.7	2353.0	2505.2	2218.2	2252.3	1988.5	1485.7	1332.4	1083.7	1036.2
	EXP	1330.8	2377.6	2487.9	2205.5	2234.6	1988.4	1872.4*	1751.7*	1403.0*	1256.6*
	Elow							1807.8	1633.0	1262.9	1092.1
	Eup							1936.9	1874.6	1553.2	1439.1
70	OBS	1829.3	4041.2	4411.9	4038.3	3792.3	3483.6	2406.9	2242.4	2117.8	1802.6
	EXP	1960.1	4077.4	4349.6	4085.3	3769.9	3415.0	3038.8*	2861.4*	2677.1*	2144.2*
	Elow							2934.0	2667.5	2409.6	1863.4
	Eup							3143.6	3062.1	2963.6	2455.5
75	OBS	2632.8	5428.5	6642.5	6190.8	6026.3	4978.2	3767.4	3454.5	3334.7	3158.8
	EXP	2632.8	5245.7	6515.3	6238.7	6099.5	5032.4	4558.7*	4056.5*	3819.7*	3573.6*
	Elow							4401.5	3781.6	3438.1	3105.6
	Eup							4715.9	4341.0	4228.6	4092.5
30-79	OBS	433.1	828.2	904.5	851.3	833.8	734.9	522.6	463.7	409.5	374.9
	EXP	437.6	826.6	904.5	852.0	833.6	733.8	658.1*	582.6*	506.6*	420.2*
	Elow							635.4	543.1	456.0	365.2
	Eup							680.8	623.5	560.8	481.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	89.0	64.0	70.0	66.0	75.0	61.0	44.0	31.2	20.0	24.0
	EXP	57.8	90.9	83.2	65.1	80.0	68.4	46.0*	30.0*	24.8*	22.3*
	CHI	16.891	7.941	2.101	0.012	0.309	0.809	0.083	0.045	0.925	0.129
35 -	OBS	98.0	140.0	136.0	125.0	92.0	112.0	81.0	64.0	38.0	22.0
	EXP	78.1	156.7	146.4	120.3	98.2	107.3	91.6*	61.5*	40.6*	33.5*
	CHI	5.074	1.774	0.745	0.183	0.395	0.207	1.225	0.103	0.163	3.958
40 -	OBS	132.0	278.0	315.0	319.0	239.0	187.0	171.0	166.4	96.0	88.0
	EXP	114.3	291.7	347.4	290.8	248.7	181.9	197.4*	167.9*	113.9*	75.4*
	CHI	2.755	0.639	3.023	2.728	0.379	0.142	3.521	0.014	2.817	2.111
45 -	OBS	226.0	440.0	622.0	755.0	580.0	488.0	323.0	305.0	285.0	267.0
	EXP	204.7	441.4	668.5	711.4	619.1	471.4	345.3*	372.6*	320.2*	218.1*
	CHI	2.210	0.005	3.230	2.674	2.474	0.582	1.442	12.249	3.873	10.963
50 -	OBS	661.0	796.0	1003.0	1481.0	1562.0	1276.0	657.0	602.0	694.0	684.0
	EXP	609.7	830.8	1070.0	1445.1	1594.0	1235.8	938.4*	687.7*	746.8*	645.2*
	CHI	4.311	1.459	4.197	0.894	0.642	1.310	84.368	10.690	3.729	2.334
55 -	OBS	1270.0	2084.0	1628.0	2040.0	2887.0	2741.0	1628.0	1175.8	1035.0	1422.0
	EXP	1231.8	2141.1	1739.1	2004.5	2794.2	2746.1	2121.8*	1610.7*	1194.3*	1300.4*
	CHI	1.188	1.522	7.103	0.628	3.082	0.010	114.935	117.408	21.245	11.367
60 -	OBS	1935.0	4181.0	4225.0	3037.0	3679.0	4442.0	3402.0	2675.0	1876.0	2010.0
	EXP	1932.8	4065.8	4226.8	3070.7	3667.9	4537.8	4429.2*	3431.2*	2636.0*	1973.5*
	CHI	0.002	3.265	0.001	0.371	0.034	2.024	238.221	166.662	219.118	0.673
65 -	OBS	2187.0	5349.0	6826.0	6405.0	4813.0	5141.0	4942.0	4639.6	3728.0	3092.0
	EXP	2254.8	5405.0	6778.8	6368.3	4775.1	5140.7	6228.2*	6099.6*	4826.6*	3749.7*
	CHI	2.040	0.581	0.329	0.212	0.300	0.000	265.634	349.469	250.056	115.346
70 -	OBS	1879.0	5332.0	7752.0	8534.0	8560.0	5774.0	4863.0	5772.4	5904.0	5082.0
	EXP	2013.3	5379.7	7642.4	8633.3	8509.4	5660.3	6139.8*	7365.8*	7463.0*	6045.1*
	CHI	8.957	0.422	1.571	1.142	0.301	2.283	265.521	344.685	325.659	153.449
75 -	OBS	1582.0	3788.0	5913.0	7368.0	8634.0	7654.0	4223.0	4877.6	6163.0	6599.0
	EXP	1582.0	3660.5	5799.8	7425.0	8738.9	7737.3	5109.9*	5727.5*	7059.3*	7465.4*
	CHI	0.000	4.442	2.208	0.438	1.260	0.897	153.941	126.128	113.791	100.548
30-79	OBS	10059.0	22452.0	28490.0	30130.0	31121.0	27876.0	20334.0	20309.0	19839.0	19290.0
	EXP	10079.3	22463.5	28502.5	30134.6	31125.6	27887.2	25647.6*	25554.6*	24425.4*	21528.6*
	O/E	0.998	0.999	1.000	1.000	1.000	1.000	0.793	0.795	0.812	0.896

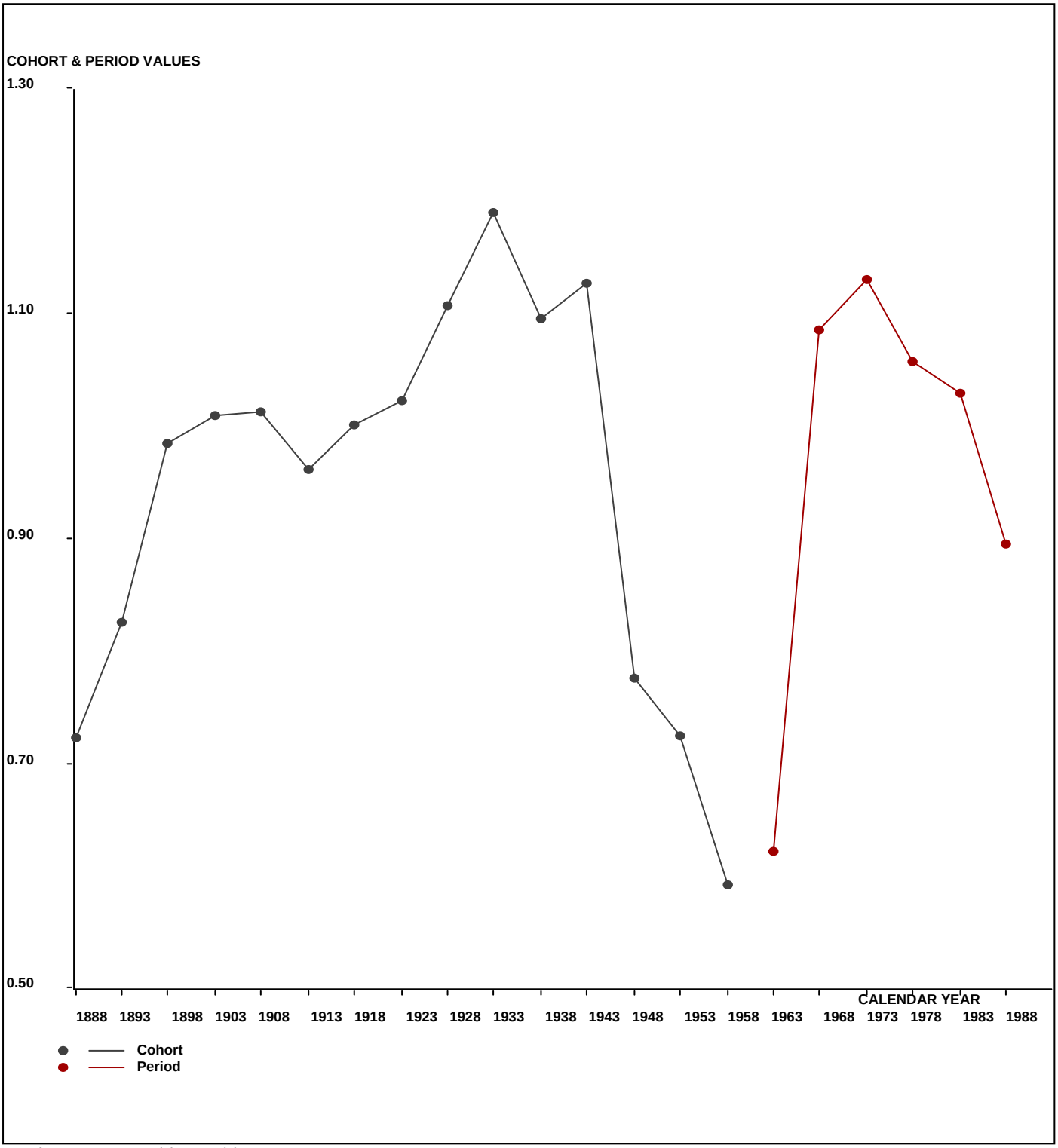
CHI SQUARE (LOG)= 3598.5990 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

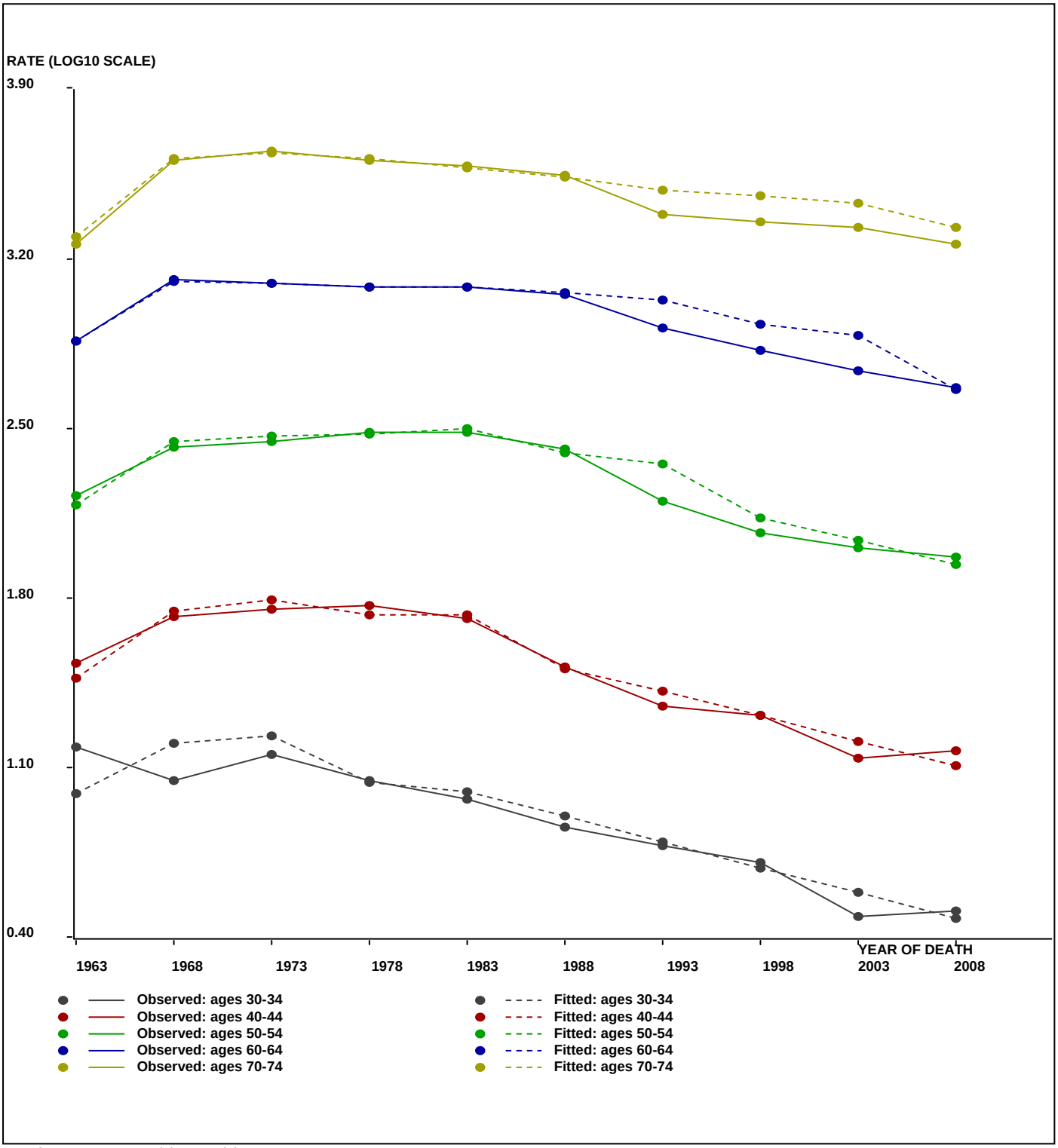


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	6.0	9.7	22.6	59.5	157.2	359.7	820.2	1485.7	2406.9	3767.4
	PRE	6.3	11.0	26.1	63.6	224.6	468.8	1067.9	1872.4	3038.8	4558.7
	RES	-0.267	-1.271	-3.490	-4.110	-67.334	-109.113	-247.656	-386.677	-631.938	-791.243
1996-	OBS	5.1	9.0	20.7	42.3	117.7	306.5	666.8	1332.4	2242.4	3454.5
	PRE	4.9	8.6	20.9	51.6	134.5	419.9	855.3	1751.7	2861.4	4056.5
	RES	0.190	0.352	-0.191	-9.363	-16.769	-113.370	-188.503	-419.292	-618.992	-601.962
2001-	OBS	3.1	6.3	13.8	36.7	101.5	218.0	545.2	1083.7	2117.8	3334.7
	PRE	3.8	6.7	16.3	41.2	109.2	251.5	766.1	1403.0	2677.1	3819.7
	RES	-0.742	-0.427	-2.569	-4.536	-7.717	-33.545	-220.870	-319.348	-559.220	-484.956
2006-	OBS	3.2	3.5	14.9	39.5	92.5	223.3	467.3	1036.2	1802.6	3158.8
	PRE	3.0	5.3	12.8	32.3	87.2	204.2	458.9	1256.6	2144.2	3573.6
	RES	0.229	-1.813	2.140	7.239	5.246	19.090	8.475	-220.403	-341.617	-414.728

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	44.0	81.0	171.0	323.0	657.0	1628.0	3402.0	4942.0	4863.0	4223.0
	PRE	46.0	91.6	197.4	345.3	938.4	2121.8	4429.2	6228.2	6139.8	5109.9
	CHI	0.083	1.225	3.521	1.442	84.368	114.935	238.221	265.634	265.521	153.941
1996-	OBS	31.2	64.0	166.4	305.0	602.0	1175.8	2675.0	4639.6	5772.4	4877.6
	PRE	30.0	61.5	167.9	372.6	687.7	1610.7	3431.2	6099.6	7365.8	5727.5
	CHI	0.045	0.103	0.014	12.249	10.690	117.408	166.662	349.469	344.685	126.128
2001-	OBS	20.0	38.0	96.0	285.0	694.0	1035.0	1876.0	3728.0	5904.0	6163.0
	PRE	24.8	40.6	113.9	320.2	746.8	1194.3	2636.0	4826.6	7463.0	7059.3
	CHI	0.925	0.163	2.817	3.873	3.729	21.245	219.118	250.056	325.659	113.791
2006-	OBS	24.0	22.0	88.0	267.0	684.0	1422.0	2010.0	3092.0	5082.0	6599.0
	PRE	22.3	33.5	75.4	218.1	645.2	1300.4	1973.5	3749.7	6045.1	7465.4
	CHI	0.129	3.958	2.111	10.963	2.334	11.367	0.673	115.346	153.449	100.548

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1942.91	38.10	51	P, C	95.92	10386.33	0.0000
AGE-PERIOD	702.70	15.62	45	Cohort	88.73	3738.82	0.0000
AGE-COHORT	454.89	12.64	36	Period	82.59	2422.40	0.0000
PERIOD-COHORT	163.67	4.09	40	Age	51.61	869.93	0.0000
FULL AGE-PERIOD-COHORT	79.21	2.48	32			421.45	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.388491	24.461947
35	1.697844	49.870498
40	2.007304	101.695956
45	2.292091	195.925419
50	2.594115	392.749126
55	2.864411	731.831691
60	3.145293	1397.309448
65	3.382365	2411.931918
70	3.572878	3740.053802
75	3.710900	5139.249266

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.045860	1.111373
1966	0.013377	1.031280
1971	-0.096590	0.800589
1976	-0.001928	0.995571
1981	-0.019701	0.955649
1986	0.033215	1.079481

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.181459	1.518654
1891	0.133742	1.360636
1896	0.062344	1.154368
1901	-0.000646	0.998513
1906	-0.045325	0.900897
1911	-0.081400	0.829086
1916	-0.056930	0.877142
1921	-0.027059	0.939595
1926	0.000333	1.000766
1931	0.032494	1.077691
1936	0.042152	1.101925
1941	0.096780	1.249627
1946	0.081965	1.207716
1951	0.085050	1.216327
1956	-0.050741	0.889731

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	261.0	148.0	100.0	119.0	180.0	196.0
	EXP	173.0	156.8	119.0	171.6	222.2	196.0
	CHI	44.8	0.5	3.0	16.1	8.0	0.0
35 -	OBS	444.0	292.0	194.0	237.0	284.0	543.0
	EXP	325.9	323.4	245.6	298.7	332.5	506.4
	CHI	42.8	3.1	10.8	12.7	7.1	2.7
40 -	OBS	547.0	583.0	460.0	542.0	550.0	842.0
	EXP	477.0	609.6	503.8	615.0	577.5	758.2
	CHI	10.3	1.2	3.8	8.7	1.3	9.3
45 -	OBS	841.0	735.0	857.0	1031.0	1149.0	1326.0
	EXP	704.7	840.8	894.2	1185.4	1118.1	1230.5
	CHI	26.4	13.3	1.5	20.1	0.9	7.4
50 -	OBS	1762.0	1320.0	1260.0	1942.0	2231.0	2556.0
	EXP	1668.2	1277.2	1275.2	2175.0	2227.2	2466.2
	CHI	5.3	1.4	0.2	25.0	0.0	3.3
55 -	OBS	3052.0	2711.0	1761.0	2710.0	3856.0	4627.0
	EXP	3030.3	2783.6	1779.7	2851.0	3755.8	4523.8
	CHI	0.2	1.9	0.2	7.0	2.7	2.4
60 -	OBS	5206.0	4948.0	4107.0	3863.0	5130.0	7719.0
	EXP	5329.7	5088.2	3917.5	4012.8	4962.9	7675.5
	CHI	2.9	3.9	9.2	5.6	5.6	0.2
65 -	OBS	7573.0	7585.0	6320.0	7919.0	6164.0	8960.0
	EXP	7636.4	7800.5	6247.0	7770.0	6119.1	8953.3
	CHI	0.5	6.0	0.9	2.9	0.3	0.0
70 -	OBS	9096.0	9575.0	8056.0	10766.0	10151.0	9174.0
	EXP	9506.1	9435.0	8070.4	10454.9	10120.6	9246.0
	CHI	17.7	2.1	0.0	9.3	0.1	0.6
75 -	OBS	9408.0	9653.0	7661.0	11147.0	10575.0	11927.0
	EXP	9408.0	9260.1	7739.4	10803.3	10851.1	12333.5
	CHI	0.0	16.7	0.8	10.9	7.0	13.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	10306.75	257.67	40	P, C	-688.60	0.0000
AGE-PERIOD	66385.89	1659.65	40	Cohort	-22.43	0.0000
AGE-COHORT	27943.44	698.59	40	Period	-190.87	0.0000
PERIOD-COHORT	66953.16	1673.83	40	Age	-21.40	0.0000
FULL AGE-PERIOD-COHORT	81279.45	2031.99	40			0.0000

AGE	EFFECT
30	24.461947
35	49.870498
40	101.695956
45	195.925419
50	392.749126
55	731.831691
60	1397.309448
65	2411.931918
70	3740.053802
75	5139.249266

PERIOD	EFFECT	LOWER	UPPER
% Period Change	112.9579	109.9579	115.9579
1961	1.111373		
1966	1.031280		
1971	0.800589		
1976	0.995571		
1981	0.955649		
1986	1.079481		
1991	1.219359	1.186974	1.251743
1996	1.377362	1.305172	1.451495
2001	1.555838	1.435139	1.683122
2006	1.757442	1.578048	1.951713

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.518654	1.000000	
1891	1.360636	2.000000	
1896	1.154368	4.000000	
1901	0.998513	8.000000	
1906	0.900897	16.000000	
1911	0.829086	32.000000	
1916	0.877142	64.000000	
1921	0.939595	128.000000	
1926	1.000766	256.000000	
1931	1.077691	512.000000	
1936	1.101925	1024.000000	
1941	1.249627	2048.000000	
1946	1.207716	4096.000000	
1951	1.216327	8192.000000	
1956	1.269825	EXTRAPOLATION	0.889731
1961	1.307771	EXTRAPOLATION	
1966	1.346851	EXTRAPOLATION	
1971	1.387099	EXTRAPOLATION	
1976	1.428549	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	44.2	26.2	20.6	20.4	23.0	23.5	19.4	12.2	7.5	7.7
	EXP	29.3	27.8	24.5	29.4	28.4	33.5	39.0*	45.4*	52.8*	61.4*
	Elow							38.0	43.0	48.7	55.1
	Eup							40.0	47.8	57.1	68.2
35	OBS	75.6	50.0	34.8	49.2	49.2	70.2	59.6	40.8	22.7	17.5
	EXP	55.5	55.4	44.0	62.0	57.6	65.5	77.2*	89.8*	104.5*	121.6*
	Elow							75.2	85.1	96.4	109.2
	Eup							79.3	94.7	113.1	135.0
40	OBS	121.8	100.4	80.1	98.3	115.7	147.2	146.2	100.8	66.6	45.2
	EXP	106.2	105.0	87.7	111.6	121.4	132.6	150.8*	177.9*	206.9*	240.7*
	Elow							146.8	168.5	190.9	216.1
	Eup							154.8	187.4	223.8	267.3
45	OBS	227.9	166.0	150.4	182.8	212.0	284.8	269.0	201.6	146.3	117.4
	EXP	191.0	189.8	157.0	210.2	206.3	264.3	288.5*	328.2*	387.1*	450.3*
	Elow							280.9	311.0	357.0	404.3
	Eup							296.2	345.9	418.7	500.1
50	OBS	382.2	367.2	291.9	349.4	405.2	484.2	470.5	383.3	295.8	220.2
	EXP	361.9	355.3	295.4	391.3	404.5	467.2	598.4*	653.3*	743.2*	876.5*
	Elow							582.6	619.1	685.6	787.0
	Eup							614.3	688.5	804.0	973.4
55	OBS	738.0	609.4	508.5	650.7	718.6	870.8	834.8	733.2	539.2	421.7
	EXP	732.7	625.7	513.9	684.6	699.9	851.4	983.3*	1259.6*	1375.1*	1564.4*
	Elow							957.2	1193.6	1268.4	1404.7
	Eup							1009.4	1327.4	1487.6	1737.3
60	OBS	1514.6	1262.4	972.3	1174.7	1296.9	1518.1	1513.6	1320.6	1033.1	758.2
	EXP	1550.6	1298.2	927.5	1220.2	1254.7	1509.5	1836.2*	2120.8*	2716.7*	2965.8*
	Elow							1787.4	2009.6	2505.9	2663.0
	Eup							1885.0	2234.9	2938.9	3293.6
65	OBS	3068.7	2415.1	1759.9	2029.0	2036.6	2448.2	2513.2	2393.0	1908.8	1476.6
	EXP	3094.3	2483.7	1739.6	1990.8	2021.8	2446.4	2943.3*	3580.2*	4135.1*	5297.0*
	Elow							2865.1	3392.6	3814.3	4756.3
	Eup							3021.4	3772.9	4473.4	5882.5
70	OBS	5411.6	4518.5	2984.5	3454.3	2972.2	3513.7	3766.8	4014.1	3753.9	2680.5
	EXP	5655.6	4452.4	2989.8	3354.5	2963.3	3541.3	4285.0*	5155.4*	6271.0*	7242.9*
	Elow							4171.2	4885.2	5784.5	6503.5
	Eup							4398.8	5432.8	6784.0	8043.5
75	OBS	8674.0	7517.3	4701.5	5271.4	4312.0	4448.0	5341.0	7161.5	6883.5	5484.6
	EXP	8674.0	7211.4	4749.6	5108.9	4424.6	4599.5	5496.7*	6651.0*	8002.0*	9733.6*
	Elow							5350.7	6302.4	7381.2	8740.1
	Eup							5642.7	7009.0	8656.6	10809.6
30-79	OBS	1160.4	967.0	679.2	794.6	765.8	893.0	933.9	947.4	815.2	619.9
	EXP	1164.5	965.3	680.1	801.5	764.1	891.0	1068.7*	1278.4*	1521.0*	1797.3*
	Elow							1040.4	1211.4	1403.0	1613.8
	Eup							1097.1	1347.2	1645.4	1996.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	261.0	148.0	100.0	119.0	180.0	196.0	139.0	72.2	47.0	56.0
	EXP	173.0	156.8	119.0	171.6	222.2	279.7	279.5*	269.6*	331.1*	444.3*
	CHI	44.782	0.492	3.020	16.101	8.024	25.063	70.598	144.566	243.776	339.371
35 -	OBS	444.0	292.0	194.0	237.0	284.0	543.0	492.0	287.4	134.0	109.0
	EXP	325.9	323.4	245.6	298.7	332.5	506.4	637.1*	633.4*	616.2*	756.1*
	CHI	42.765	3.053	10.836	12.749	7.066	2.651	33.043	188.992	377.327	553.786
40 -	OBS	547.0	583.0	460.0	542.0	550.0	842.0	1116.0	817.2	464.0	264.0
	EXP	477.0	609.6	503.8	615.0	577.5	758.2	1151.0*	1442.4*	1442.1*	1406.4*
	CHI	10.278	1.160	3.811	8.663	1.312	9.264	1.067	270.958	663.434	927.950
45 -	OBS	841.0	735.0	857.0	1031.0	1149.0	1326.0	1513.0	1506.6	1169.0	808.0
	EXP	704.7	840.8	894.2	1185.4	1118.1	1230.5	1622.7*	2453.0*	3092.0*	3099.0*
	CHI	26.378	13.318	1.547	20.116	0.855	7.404	7.415	365.160	1196.008	1693.701
50 -	OBS	1762.0	1320.0	1260.0	1942.0	2231.0	2556.0	2137.0	2102.6	2162.0	1727.0
	EXP	1668.2	1277.2	1275.2	2175.0	2227.2	2466.2	2718.3*	3583.4*	5432.3*	6873.9*
	CHI	5.280	1.436	0.182	24.963	0.007	3.269	124.312	611.943	1968.751	3853.772
55 -	OBS	3052.0	2711.0	1761.0	2710.0	3856.0	4627.0	4263.0	3224.4	2871.0	2999.0
	EXP	3030.3	2783.6	1779.7	2851.0	3755.8	4523.8	5021.6*	5539.7*	7321.7*	11125.2*
	CHI	0.155	1.894	0.197	6.973	2.676	2.356	114.600	967.699	2705.496	5935.592
60 -	OBS	5206.0	4948.0	4107.0	3863.0	5130.0	7719.0	7642.0	6434.0	4359.0	3883.0
	EXP	5329.7	5088.2	3917.5	4012.8	4962.9	7675.5	9271.0*	10332.8*	11462.7*	15189.1*
	CHI	2.872	3.866	9.170	5.591	5.623	0.247	286.233	1471.107	4402.339	8415.771
65 -	OBS	7573.0	7585.0	6320.0	7919.0	6164.0	8960.0	11762.0	11193.0	8732.0	5878.0
	EXP	7636.4	7800.5	6247.0	7770.0	6119.1	8953.3	13774.9*	16745.8*	18916.5*	21086.3*
	CHI	0.526	5.953	0.853	2.856	0.329	0.005	294.146	1841.282	5483.292	10968.803
70 -	OBS	9096.0	9575.0	8056.0	10766.0	10151.0	9174.0	12140.0	16507.8	15804.0	11174.0
	EXP	9506.1	9435.0	8070.4	10454.9	10120.6	9246.0	13810.2*	21201.1*	26400.8*	30192.4*
	CHI	17.690	2.078	0.026	9.258	0.091	0.561	201.995	1038.952	4253.344	11979.838
75 -	OBS	9408.0	9653.0	7661.0	11147.0	10575.0	11927.0	10920.0	18821.8	23506.0	19626.0
	EXP	9408.0	9260.1	7739.4	10803.3	10851.1	12333.5	11238.4*	17480.2*	27325.3*	34830.5*
	CHI	0.000	16.669	0.794	10.936	7.026	13.395	9.021	102.969	533.827	6637.217
30-79	OBS	38190.0	37550.0	30776.0	40276.0	40270.0	47870.0	52124.0	60967.0	59248.0	46524.0
	EXP	38259.2	37575.2	30791.7	40337.7	40287.0	47973.1	59524.7*	79681.5*	102340.8*	125003.2*
	O/E	0.998	0.999	0.999	0.998	1.000	0.998	0.876	0.765	0.579	0.372

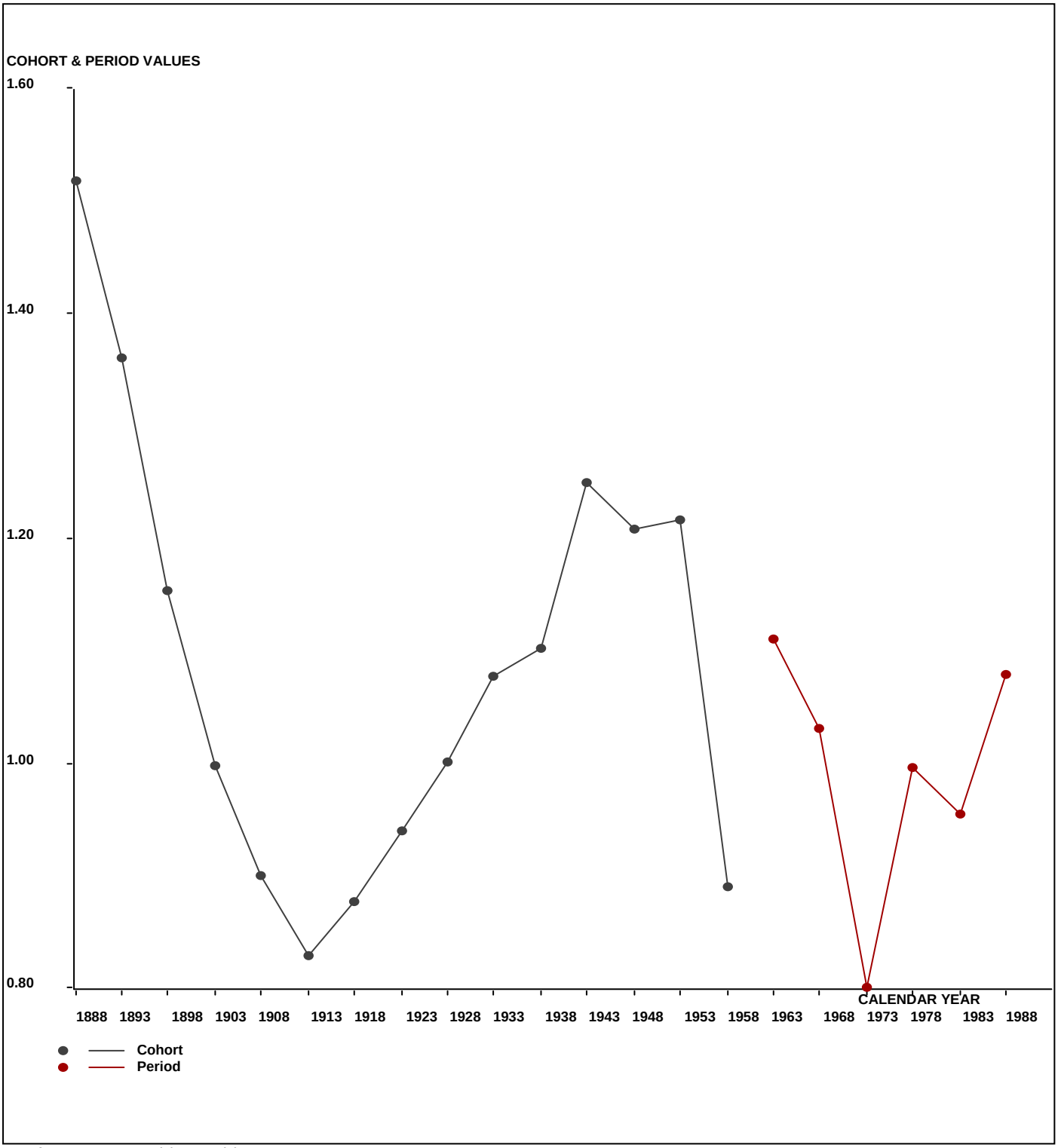
CHI SQUARE (LOG)= 81279.4515 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

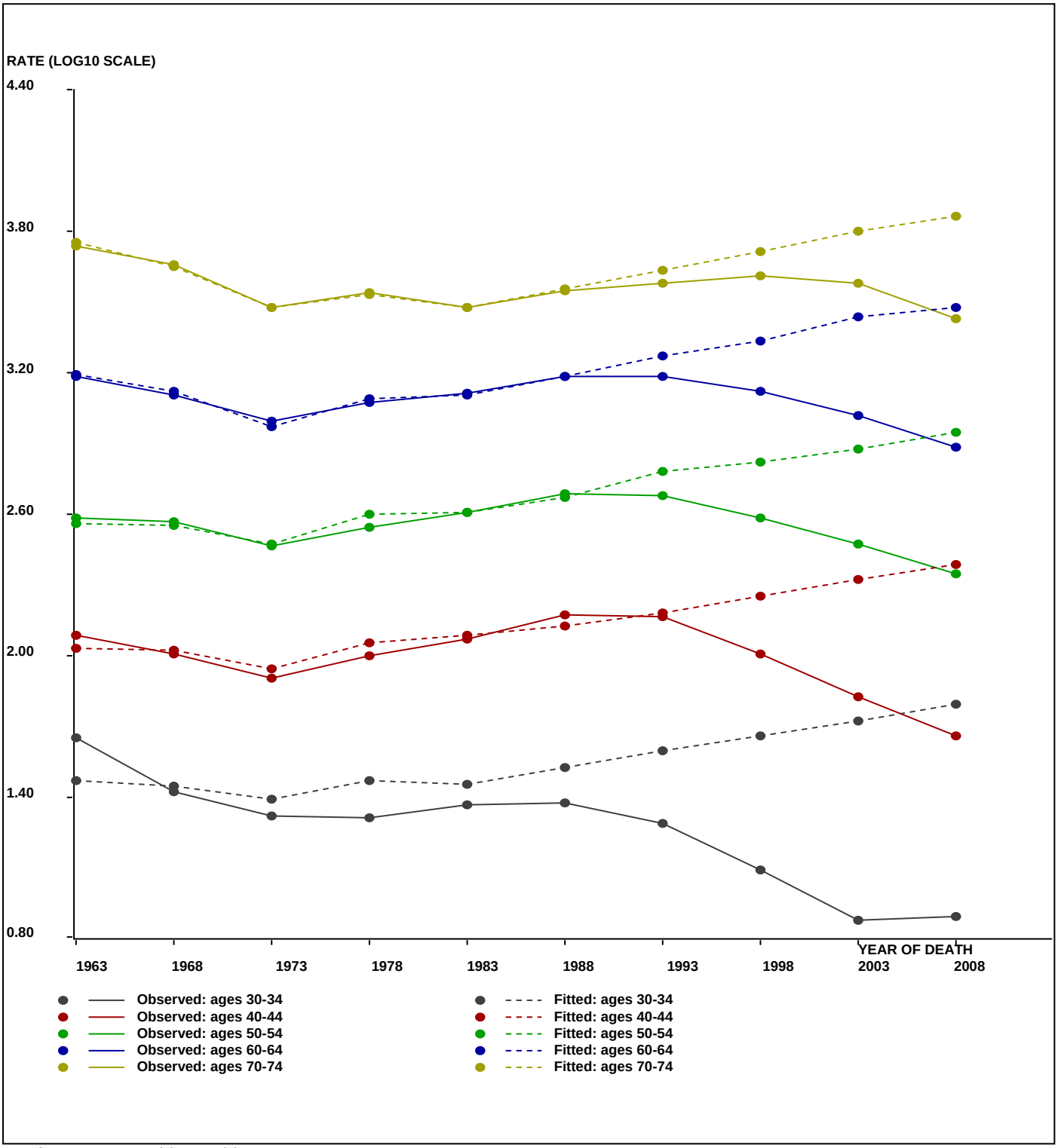


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	19.4	59.6	146.2	269.0	470.5	834.8	1513.6	2513.2	3766.8	5341.0
	PRE	39.0	77.2	150.8	288.5	598.4	983.3	1836.2	2943.3	4285.0	5496.7
	RES	-19.606	-17.586	-4.592	-19.504	-127.977	-148.548	-322.638	-430.097	-518.227	-155.727
1996-	OBS	12.2	40.8	100.8	201.6	383.3	733.2	1320.6	2393.0	4014.1	7161.5
	PRE	45.4	89.8	177.9	328.2	653.3	1259.6	2120.8	3580.2	5155.4	6651.0
	RES	-33.228	-49.070	-77.092	-126.642	-269.982	-526.459	-800.213	-1187.174	-1141.241	510.467
2001-	OBS	7.5	22.7	66.6	146.3	295.8	539.2	1033.1	1908.8	3753.9	6883.5
	PRE	52.8	104.5	206.9	387.1	743.2	1375.1	2716.7	4135.1	6271.0	8002.0
	RES	-45.298	-81.777	-140.344	-240.737	-447.439	-835.906	-1683.586	-2226.289	-2517.061	-1118.445
2006-	OBS	7.7	17.5	45.2	117.4	220.2	421.7	758.2	1476.6	2680.5	5484.6
	PRE	61.4	121.6	240.7	450.3	876.5	1564.4	2965.8	5297.0	7242.9	9733.6
	RES	-53.674	-104.045	-195.530	-332.896	-656.269	-1142.672	-2207.595	-3820.377	-4562.339	-4249.013

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	139.0	492.0	1116.0	1513.0	2137.0	4263.0	7642.0	11762.0	12140.0	10920.0
	PRE	279.5	637.1	1151.0	1622.7	2718.3	5021.6	9271.0	13774.9	13810.2	11238.4
	CHI	70.598	33.043	1.067	7.415	124.312	114.600	286.233	294.146	201.995	9.021
1996-	OBS	72.2	287.4	817.2	1506.6	2102.6	3224.4	6434.0	11193.0	16507.8	18821.8
	PRE	269.6	633.4	1442.4	2453.0	3583.4	5539.7	10332.8	16745.8	21201.1	17480.2
	CHI	144.566	188.992	270.958	365.160	611.943	967.699	1471.107	1841.282	1038.952	102.969
2001-	OBS	47.0	134.0	464.0	1169.0	2162.0	2871.0	4359.0	8732.0	15804.0	23506.0
	PRE	331.1	616.2	1442.1	3092.0	5432.3	7321.7	11462.7	18916.5	26400.8	27325.3
	CHI	243.776	377.327	663.434	1196.008	1968.751	2705.496	4402.339	5483.292	4253.344	533.827
2006-	OBS	56.0	109.0	264.0	808.0	1727.0	2999.0	3883.0	5878.0	11174.0	19626.0
	PRE	444.3	756.1	1406.4	3099.0	6873.9	11125.2	15189.1	21086.3	30192.4	34830.5
	CHI	339.371	553.786	927.950	1693.701	3853.772	5935.592	8415.771	10968.803	11979.838	6637.217

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	531.81	10.43	51	P, C	96.51	2830.37	0.0000
AGE-PERIOD	86.06	1.91	45	Cohort	78.42	456.86	0.0000
AGE-COHORT	367.58	10.21	36	Period	94.95	1952.91	0.0000
PERIOD-COHORT	30.27	0.76	40	Age	38.64	160.68	0.0000
FULL AGE-PERIOD-COHORT	18.58	0.58	32			98.52	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.518439	32.994336
35	1.763213	57.971351
40	2.015844	103.715524
45	2.301986	200.440866
50	2.557895	361.322837
55	2.784162	608.361598
60	3.026679	1063.357320
65	3.278718	1899.842626
70	3.532913	3411.248488
75	3.751665	5645.008730

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.007606	0.982639
1966	-0.121119	0.756625
1971	-0.044941	0.901693
1976	0.053807	1.131898
1981	0.011856	1.027675
1986	0.035515	1.085212

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.031770	0.929458
1891	0.019713	1.046438
1896	0.041355	1.099904
1901	0.019989	1.047101
1906	0.004368	1.010108
1911	-0.018721	0.957809
1916	-0.009114	0.979232
1921	-0.013604	0.969161
1926	-0.031263	0.930544
1931	-0.026873	0.939998
1936	-0.032162	0.928621
1941	0.030215	1.072050
1946	0.080236	1.202919
1951	0.070103	1.175175
1956	0.061313	1.151630

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	209.0	124.0	161.0	220.0	319.0	344.0
	EXP	179.9	130.7	155.0	262.0	311.4	344.0
	CHI	4.7	0.3	0.2	6.7	0.2	0.0
35 -	OBS	319.0	271.0	250.0	320.0	420.0	564.0
	EXP	311.5	240.6	271.0	338.7	414.0	571.7
	CHI	0.2	3.8	1.6	1.0	0.1	0.1
40 -	OBS	454.0	411.0	483.0	577.0	558.0	806.0
	EXP	443.6	424.1	504.8	600.9	543.4	774.3
	CHI	0.2	0.4	0.9	1.0	0.4	1.3
45 -	OBS	762.0	615.0	932.0	1168.0	1081.0	1083.0
	EXP	711.6	651.0	958.0	1202.6	1036.6	1085.7
	CHI	3.6	2.0	0.7	1.0	1.9	0.0
50 -	OBS	1652.0	957.0	1335.0	2002.0	1973.0	1927.0
	EXP	1567.6	962.4	1362.9	2115.3	1921.9	1922.2
	CHI	4.5	0.0	0.6	6.1	1.4	0.0
55 -	OBS	2608.0	1959.0	1790.0	2651.0	3262.0	3237.0
	EXP	2497.3	1961.3	1860.2	2779.3	3121.8	3297.5
	CHI	4.9	0.0	2.7	5.9	6.3	1.1
60 -	OBS	3712.0	3089.0	3920.0	3876.0	4292.0	5458.0
	EXP	3760.6	3185.3	3879.0	3876.0	4189.3	5460.0
	CHI	0.6	2.9	0.4	0.0	2.5	0.0
65 -	OBS	4922.0	4725.0	6240.0	8033.0	5838.0	7386.0
	EXP	5067.4	4727.3	6213.9	8038.8	5786.5	7312.9
	CHI	4.2	0.0	0.1	0.0	0.5	0.7
70 -	OBS	5785.0	6033.0	8658.0	12422.0	11356.0	9435.0
	EXP	5895.8	6015.8	8693.9	12155.8	11467.7	9464.7
	CHI	2.1	0.0	0.1	5.8	1.1	0.1
75 -	OBS	5592.0	5848.0	9248.0	14234.0	14054.0	15725.0
	EXP	5592.0	5739.3	9122.8	14147.8	14371.1	15733.6
	CHI	0.0	2.1	1.7	0.5	7.0	0.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	7569.11	189.23	40	P, C	-187.54	0.0000
AGE-PERIOD	12393.83	309.85	40	Cohort	-75.61	0.0000
AGE-COHORT	19531.43	488.29	40	Period	-11.43	0.0000
PERIOD-COHORT	16662.99	416.57	40	Age	-30.62	0.0000
FULL AGE-PERIOD-COHORT	21764.45	544.11	40			0.0000

AGE	EFFECT
30	32.994336
35	57.971351
40	103.715524
45	200.440866
50	361.322837
55	608.361598
60	1063.357320
65	1899.842626
70	3411.248488
75	5645.008730

PERIOD	EFFECT	LOWER	UPPER
% Period Change	105.5988	102.5988	108.5988
1961	0.982639		
1966	0.756625		
1971	0.901693		
1976	1.131898		
1981	1.027675		
1986	1.085212		
1991	1.145971	1.113415	1.178527
1996	1.210131	1.142350	1.279866
2001	1.277884	1.172037	1.389919
2006	1.349430	1.202496	1.509435

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.929458	1.000000	
1891	1.046438	2.000000	
1896	1.099904	4.000000	
1901	1.047101	8.000000	
1906	1.010108	16.000000	
1911	0.957809	32.000000	
1916	0.979232	64.000000	
1921	0.969161	128.000000	
1926	0.930544	256.000000	
1931	0.939998	512.000000	
1936	0.928621	1024.000000	
1941	1.072050	2048.000000	
1946	1.202919	4096.000000	
1951	1.175175	8192.000000	
1956	1.247736	EXTRAPOLATION	1.151630
1961	1.307656	EXTRAPOLATION	
1966	1.370453	EXTRAPOLATION	
1971	1.436266	EXTRAPOLATION	
1976	1.505240	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	35.4	22.0	33.1	37.7	40.8	41.2	35.7	30.8	26.9	22.0
	EXP	30.5	23.2	31.9	44.9	39.8	44.7	49.4*	54.7*	60.6*	67.0*
	Elow							48.0	51.7	55.5	59.7
	Eup							50.8	57.9	65.9	75.0
35	OBS	54.3	46.4	44.8	66.5	72.7	72.9	69.5	66.4	59.9	36.3
	EXP	53.0	41.2	48.5	70.3	71.7	73.9	82.9*	91.7*	101.5*	112.4*
	Elow							80.5	86.6	93.1	100.1
	Eup							85.2	97.0	110.4	125.7
40	OBS	101.1	70.8	84.1	104.7	117.3	140.9	138.8	123.1	111.1	84.2
	EXP	98.8	73.0	87.9	109.0	114.3	135.4	139.7*	156.6*	173.3*	191.8*
	Elow							135.7	147.8	159.0	170.9
	Eup							143.6	165.6	188.5	214.5
45	OBS	206.5	138.9	163.6	207.1	199.5	232.6	234.4	228.9	202.5	156.3
	EXP	192.9	147.0	168.2	213.3	191.3	233.2	276.3*	285.1*	319.6*	353.7*
	Elow							268.5	269.1	293.1	315.2
	Eup							284.2	301.5	347.6	395.6
50	OBS	358.4	266.2	309.3	360.2	358.3	365.0	343.0	384.6	330.1	257.2
	EXP	340.1	267.7	315.8	380.6	349.0	364.1	443.9*	526.0*	542.6*	608.4*
	Elow							431.3	496.5	497.7	542.1
	Eup							456.5	556.3	590.2	680.5
55	OBS	630.6	440.4	516.9	636.6	607.9	609.2	554.2	602.3	520.1	406.1
	EXP	603.8	440.9	537.2	667.4	581.8	620.6	647.4*	789.2*	935.2*	964.7*
	Elow							629.0	745.0	857.7	859.7
	Eup							665.8	834.7	1017.2	1079.1
60	OBS	1080.0	788.1	928.1	1178.6	1085.1	1073.4	1002.4	1003.7	899.9	681.8
	EXP	1094.1	812.7	918.4	1178.6	1059.1	1073.8	1145.5*	1195.0*	1456.8*	1726.1*
	Elow							1112.9	1128.0	1336.1	1538.2
	Eup							1178.0	1263.8	1584.5	1930.8
65	OBS	1994.5	1504.4	1737.7	2058.2	1928.9	2018.1	1903.4	2044.0	1734.1	1327.1
	EXP	2053.4	1505.2	1730.4	2059.7	1911.9	1998.1	2025.9*	2161.1*	2254.5*	2748.4*
	Elow							1968.4	2040.1	2067.7	2449.2
	Eup							2083.5	2285.6	2452.1	3074.3
70	OBS	3441.8	2847.0	3207.5	3985.6	3325.0	3613.7	3624.7	3974.8	3686.2	2597.5
	EXP	3507.7	2838.9	3220.8	3900.2	3357.7	3625.0	3788.6*	3841.3*	4097.6*	4274.7*
	Elow							3681.0	3626.2	3758.2	3809.2
	Eup							3896.3	4062.7	4456.9	4781.5
75	OBS	5155.7	4554.2	5675.4	6731.3	5730.6	5864.3	6625.3	7963.3	7306.4	5600.6
	EXP	5155.7	4469.5	5598.6	6690.5	5859.9	5867.6	6334.7*	6620.5*	6712.6*	7160.5*
	Elow							6154.7	6249.7	6156.6	6380.8
	Eup							6514.6	7002.0	7301.1	8009.5
30-79	OBS	783.4	619.3	729.3	887.2	795.4	829.7	833.2	918.1	824.4	618.9
	EXP	784.5	619.1	730.2	889.9	792.5	830.1	885.4*	944.0*	1018.4*	1125.3*
	Elow							860.2	891.1	934.1	1002.8
	Eup							910.5	998.4	1107.7	1258.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	209.0	124.0	161.0	220.0	319.0	344.0	256.0	182.8	169.0	159.0
	EXP	179.9	130.7	155.0	262.0	311.4	372.7	354.2*	325.1*	379.8*	484.9*
	CHI	4.694	0.348	0.230	6.744	0.184	2.211	27.235	62.303	117.009	219.001
35 -	OBS	319.0	271.0	250.0	320.0	420.0	564.0	573.0	468.4	353.0	226.0
	EXP	311.5	240.6	271.0	338.7	414.0	571.7	683.9*	646.8*	598.6*	698.8*
	CHI	0.181	3.844	1.622	1.030	0.088	0.104	17.983	49.215	100.782	319.858
40 -	OBS	454.0	411.0	483.0	577.0	558.0	806.0	1059.0	998.0	774.0	492.0
	EXP	443.6	424.1	504.8	600.9	543.4	774.3	1065.9*	1269.9*	1207.9*	1120.6*
	CHI	0.242	0.406	0.939	0.954	0.393	1.301	0.045	58.223	155.876	352.635
45 -	OBS	762.0	615.0	932.0	1168.0	1081.0	1083.0	1318.0	1710.6	1618.0	1076.0
	EXP	711.6	651.0	958.0	1202.6	1036.6	1085.7	1554.0*	2130.3*	2553.0*	2434.2*
	CHI	3.572	1.987	0.707	0.998	1.902	0.007	35.834	82.681	342.419	757.814
50 -	OBS	1652.0	957.0	1335.0	2002.0	1973.0	1927.0	1558.0	2109.6	2413.0	2017.0
	EXP	1567.6	962.4	1362.9	2115.3	1921.9	1922.2	2016.3*	2884.9*	3965.9*	4771.2*
	CHI	4.546	0.030	0.573	6.073	1.360	0.012	104.171	208.370	608.064	1589.899
55 -	OBS	2608.0	1959.0	1790.0	2651.0	3262.0	3237.0	2830.0	2648.8	2769.0	2888.0
	EXP	2497.3	1961.3	1860.2	2779.3	3121.8	3297.5	3306.1*	3471.0*	4979.2*	6860.9*
	CHI	4.909	0.003	2.652	5.924	6.294	1.109	68.572	194.776	981.095	2300.525
60 -	OBS	3712.0	3089.0	3920.0	3876.0	4292.0	5458.0	5061.0	4890.0	3797.0	3492.0
	EXP	3760.6	3185.3	3879.0	3876.0	4189.3	5460.0	5783.5*	5822.0*	6146.6*	8840.1*
	CHI	0.629	2.912	0.433	0.000	2.519	0.001	90.250	149.210	898.167	3235.545
65 -	OBS	4922.0	4725.0	6240.0	8033.0	5838.0	7386.0	8908.0	9560.4	7933.0	5283.0
	EXP	5067.4	4727.3	6213.9	8038.8	5786.5	7312.9	9481.7*	10108.2*	10313.5*	10941.0*
	CHI	4.171	0.001	0.109	0.004	0.459	0.730	34.716	29.692	549.467	2925.949
70 -	OBS	5785.0	6033.0	8658.0	12422.0	11356.0	9435.0	11682.0	16346.2	15519.0	10828.0
	EXP	5895.8	6015.8	8693.9	12155.8	11467.7	9464.7	12210.5*	15797.3*	17250.9*	17819.2*
	CHI	2.082	0.049	0.148	5.831	1.088	0.093	22.873	19.074	173.871	2742.955
75 -	OBS	5592.0	5848.0	9248.0	14234.0	14054.0	15725.0	13546.0	20929.0	24950.0	20041.0
	EXP	5592.0	5739.3	9122.8	14147.8	14371.1	15733.6	12951.7*	17400.1*	22922.4*	25622.8*
	CHI	0.000	2.060	1.717	0.525	6.996	0.005	27.269	715.710	179.345	1215.972
30-79	OBS	26015.0	24032.0	33017.0	45503.0	43153.0	45965.0	46791.0	59843.8	60295.0	46502.0
	EXP	26027.3	24037.8	33021.6	45517.3	43163.6	45995.4	49407.9*	59855.7*	70317.9*	79593.7*
	O/E	1.000	1.000	1.000	1.000	1.000	0.999	0.947	1.000	0.857	0.584

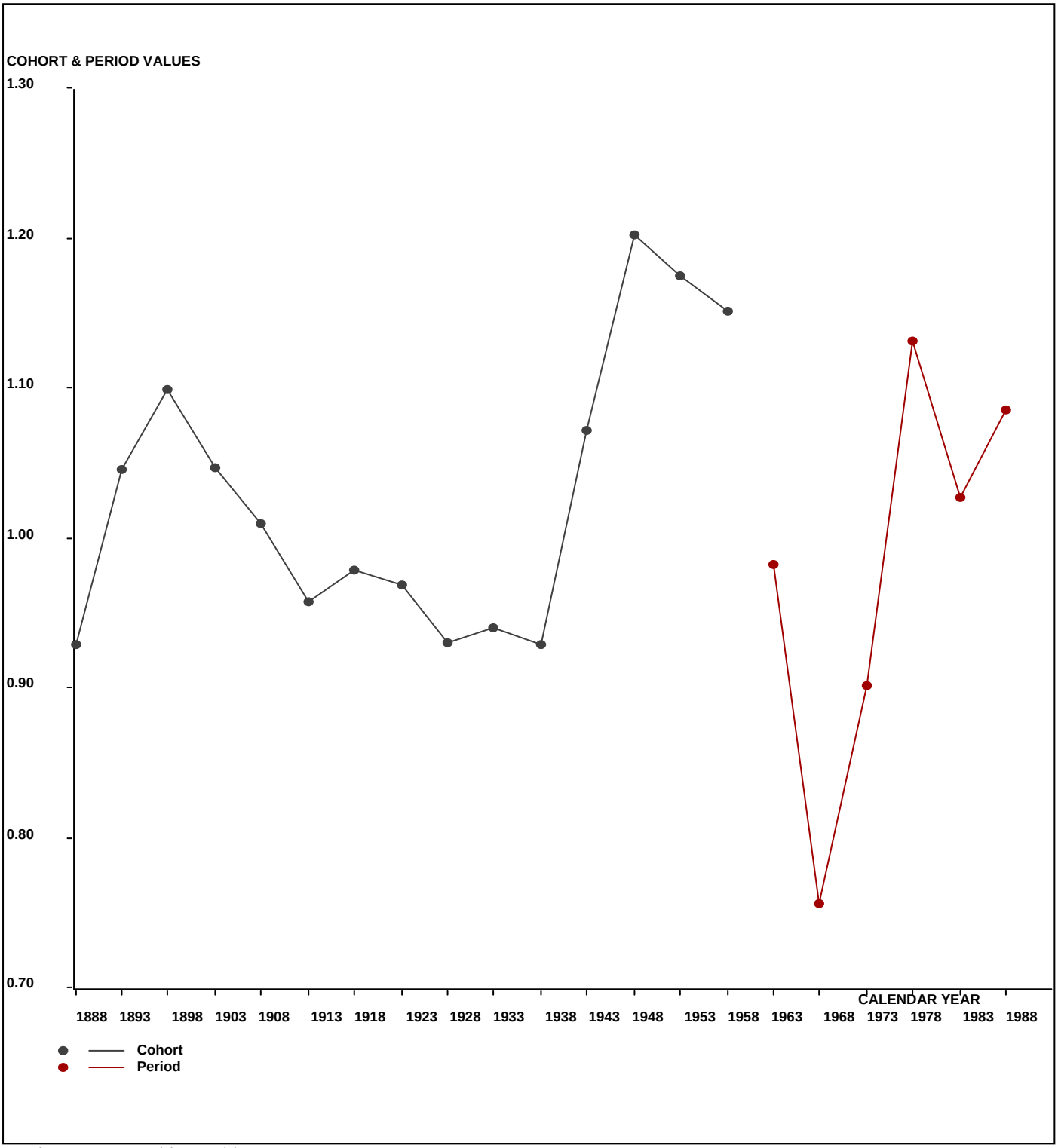
CHI SQUARE (LOG)= 21764.4523 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

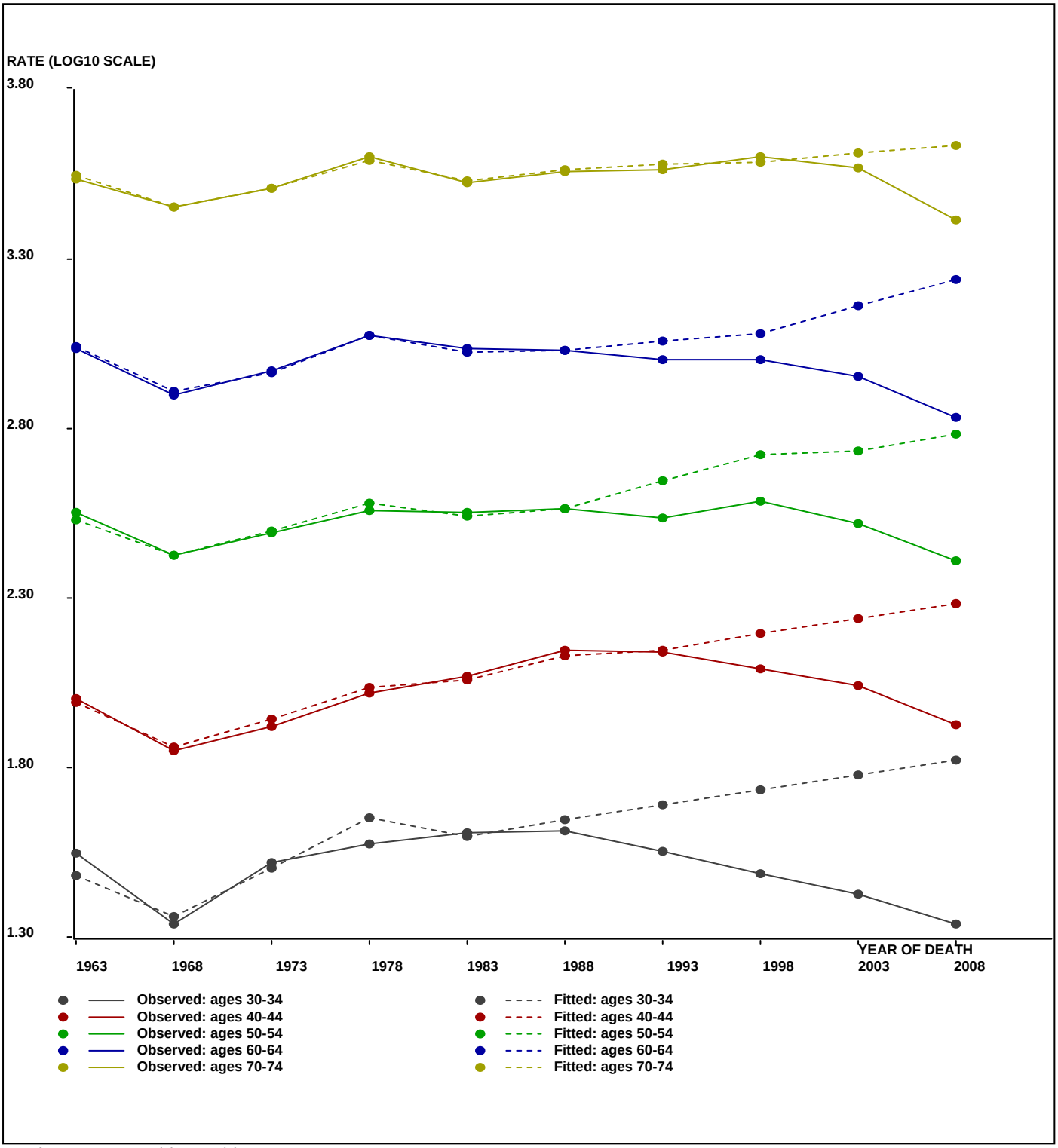


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	35.7	69.5	138.8	234.4	343.0	554.2	1002.4	1903.4	3624.7	6625.3
	PRE	49.4	82.9	139.7	276.3	443.9	647.4	1145.5	2025.9	3788.6	6334.7
	RES	-13.710	-13.441	-0.908	-41.959	-100.897	-93.237	-143.090	-122.589	-163.977	290.665
1996-	OBS	30.8	66.4	123.1	228.9	384.6	602.3	1003.7	2044.0	3974.8	7963.3
	PRE	54.7	91.7	156.6	285.1	526.0	789.2	1195.0	2161.1	3841.3	6620.5
	RES	-23.953	-25.304	-33.532	-56.157	-141.356	-186.960	-191.298	-117.128	133.479	1342.722
2001-	OBS	26.9	59.9	111.1	202.5	330.1	520.1	899.9	1734.1	3686.2	7306.4
	PRE	60.6	101.5	173.3	319.6	542.6	935.2	1456.8	2254.5	4097.6	6712.6
	RES	-33.612	-41.657	-62.259	-117.046	-212.468	-415.111	-556.861	-520.373	-411.377	593.755
2006-	OBS	22.0	36.3	84.2	156.3	257.2	406.1	681.8	1327.1	2597.5	5600.6
	PRE	67.0	112.4	191.8	353.7	608.4	964.7	1726.1	2748.4	4274.7	7160.5
	RES	-45.041	-76.017	-107.595	-197.349	-351.187	-558.649	-1044.263	-1421.309	-1677.131	-1559.877

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	256.0	573.0	1059.0	1318.0	1558.0	2830.0	5061.0	8908.0	11682.0	13546.0
	PRE	354.2	683.9	1065.9	1554.0	2016.3	3306.1	5783.5	9481.7	12210.5	12951.7
	CHI	27.235	17.983	0.045	35.834	104.171	68.572	90.250	34.716	22.873	27.269
1996-	OBS	182.8	468.4	998.0	1710.6	2109.6	2648.8	4890.0	9560.4	16346.2	20929.0
	PRE	325.1	646.8	1269.9	2130.3	2884.9	3471.0	5822.0	10108.2	15797.3	17400.1
	CHI	62.303	49.215	58.223	82.681	208.370	194.776	149.210	29.692	19.074	715.710
2001-	OBS	169.0	353.0	774.0	1618.0	2413.0	2769.0	3797.0	7933.0	15519.0	24950.0
	PRE	379.8	598.6	1207.9	2553.0	3965.9	4979.2	6146.6	10313.5	17250.9	22922.4
	CHI	117.009	100.782	155.876	342.419	608.064	981.095	898.167	549.467	173.871	179.345
2006-	OBS	159.0	226.0	492.0	1076.0	2017.0	2888.0	3492.0	5283.0	10828.0	20041.0
	PRE	484.9	698.8	1120.6	2434.2	4771.2	6860.9	8840.1	10941.0	17819.2	25622.8
	CHI	219.001	319.858	352.635	757.814	1589.899	2300.525	3235.545	2925.949	2742.955	1215.972

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	551.87	10.82	51	P, C	96.20	2964.94	0.0000
AGE-PERIOD	41.18	0.92	45	Cohort	49.05	219.49	0.0000
AGE-COHORT	23.59	0.66	36	Period	11.04	125.64	0.0000
PERIOD-COHORT	25.28	0.63	40	Age	16.99	135.20	0.0000
FULL AGE-PERIOD-COHORT	20.98	0.66	32			111.67	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.738129	5.471785
35	1.128192	13.433587
40	1.466637	29.284474
45	1.765447	58.270303
50	2.059092	114.575663
55	2.275884	188.748834
60	2.464389	291.332279
65	2.621833	418.632109
70	2.730788	538.006974
75	2.792272	619.829713

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.121362	0.756202
1966	-0.078388	0.834857
1971	-0.062212	0.866539
1976	-0.016031	0.963761
1981	0.034565	1.082841
1986	0.081399	1.206142

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.212034	0.613714
1891	-0.146871	0.713064
1896	-0.084457	0.823272
1901	-0.069399	0.852317
1906	-0.058629	0.873718
1911	-0.061414	0.868132
1916	-0.003754	0.991393
1921	0.057131	1.140593
1926	0.085739	1.218257
1931	0.096101	1.247674
1936	0.092893	1.238492
1941	0.155886	1.431811
1946	0.167685	1.471246
1951	0.118987	1.315185
1956	0.044511	1.107926

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	50.0	27.0	27.0	37.0	53.0	61.0
	EXP	30.5	31.9	33.0	45.3	60.9	61.0
	CHI	12.5	0.8	1.1	1.5	1.0	0.0
35 -	OBS	86.0	89.0	75.0	65.0	120.0	172.0
	EXP	72.7	81.7	80.5	89.2	123.6	164.8
	CHI	2.4	0.7	0.4	6.6	0.1	0.3
40 -	OBS	122.0	158.0	201.0	156.0	223.0	308.0
	EXP	113.4	173.0	181.8	192.7	215.9	297.2
	CHI	0.6	1.3	2.0	7.0	0.2	0.4
45 -	OBS	202.0	235.0	361.0	358.0	393.0	487.0
	EXP	161.2	245.7	350.4	395.1	423.5	468.5
	CHI	10.3	0.5	0.3	3.5	2.2	0.7
50 -	OBS	359.0	338.0	438.0	703.0	862.0	973.0
	EXP	346.7	340.9	488.8	747.7	852.3	903.5
	CHI	0.4	0.0	5.3	2.7	0.1	5.3
55 -	OBS	479.0	619.0	516.0	930.0	1363.0	1482.0
	EXP	515.7	608.6	561.5	864.1	1336.1	1509.3
	CHI	2.6	0.2	3.7	5.0	0.5	0.5
60 -	OBS	582.0	823.0	880.0	982.0	1463.0	2182.0
	EXP	645.4	832.9	925.7	915.4	1423.3	2176.7
	CHI	6.2	0.1	2.3	4.8	1.1	0.0
65 -	OBS	647.0	977.0	1169.0	1387.0	1321.0	2048.0
	EXP	643.2	935.6	1138.2	1367.0	1360.2	2107.8
	CHI	0.0	1.8	0.8	0.3	1.1	1.7
70 -	OBS	473.0	750.0	1127.0	1432.0	1728.0	1650.0
	EXP	487.6	783.6	1072.6	1412.0	1727.3	1679.7
	CHI	0.4	1.4	2.8	0.3	0.0	0.5
75 -	OBS	312.0	488.0	749.0	1038.0	1432.0	1741.0
	EXP	312.0	473.8	720.5	1076.6	1438.2	1740.3
	CHI	0.0	0.4	1.1	1.4	0.0	0.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	40745.32	1018.63	40	P, C	91.59	0.0000
AGE-PERIOD	2700.93	67.52	40	Cohort	-26.93	0.0000
AGE-COHORT	3090.83	77.27	40	Period	-10.91	0.0000
PERIOD-COHORT	2543.00	63.57	40	Age	-34.81	0.0000
FULL AGE-PERIOD-COHORT	3428.18	85.70	40			0.0000

AGE	EFFECT
30	5.471785
35	13.433587
40	29.284474
45	58.270303
50	114.575663
55	188.748834
60	291.332279
65	418.632109
70	538.006974
75	619.829713

PERIOD	EFFECT	LOWER	UPPER
% Period Change	111.3868	108.3868	114.3868
1961	0.756202		
1966	0.834857		
1971	0.866539		
1976	0.963761		
1981	1.082841		
1986	1.206142		
1991	1.343484	1.307299	1.379668
1996	1.496464	1.416941	1.578159
2001	1.666864	1.535777	1.805206
2006	1.856667	1.664580	2.064918

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.613714	1.000000	
1891	0.713064	2.000000	
1896	0.823272	4.000000	
1901	0.852317	8.000000	
1906	0.873718	16.000000	
1911	0.868132	32.000000	
1916	0.991393	64.000000	
1921	1.140593	128.000000	
1926	1.218257	256.000000	
1931	1.247674	512.000000	
1936	1.238492	1024.000000	
1941	1.431811	2048.000000	
1946	1.471246	4096.000000	
1951	1.315185	8192.000000	
1956	1.397135	EXTRAPOLATION	1.107926
1961	1.419867	EXTRAPOLATION	
1966	1.442968	EXTRAPOLATION	
1971	1.466445	EXTRAPOLATION	
1976	1.490304	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	8.5	4.8	5.6	6.3	6.8	7.3	8.0	5.9	4.0	3.0
	EXP	5.2	5.7	6.8	7.8	7.8	9.2	10.4*	11.8*	13.4*	15.1*
	Elow							10.2	11.2	12.3	13.6
	Eup							10.7	12.5	14.5	16.8
35	OBS	14.6	15.3	13.4	13.5	20.8	22.2	22.7	23.1	15.8	12.7
	EXP	12.4	14.0	14.4	18.5	21.4	21.3	25.2*	28.5*	32.3*	36.6*
	Elow							24.5	27.0	29.8	32.8
	Eup							25.9	30.1	35.0	40.7
40	OBS	27.2	27.2	35.0	28.3	46.9	53.9	73.8	69.8	67.9	50.1
	EXP	25.3	29.8	31.7	35.0	45.4	52.0	51.7*	61.2*	69.3*	78.5*
	Elow							50.3	58.0	63.9	70.3
	Eup							53.1	64.6	75.1	87.3
45	OBS	54.8	53.1	63.4	63.5	72.5	104.6	144.7	170.8	171.6	153.2
	EXP	43.7	55.5	61.5	70.1	78.1	100.6	115.2*	114.7*	135.7*	153.6*
	Elow							112.1	108.6	125.0	137.7
	Eup							118.3	120.9	147.0	170.8
50	OBS	77.9	94.0	101.5	126.5	156.6	184.3	223.2	297.4	347.8	348.7
	EXP	75.2	94.8	113.2	134.5	154.8	171.2	220.4*	252.3*	251.2*	297.2*
	Elow							214.5	238.9	231.4	266.5
	Eup							226.3	266.0	272.0	330.5
55	OBS	115.8	139.1	149.0	223.3	254.0	278.9	309.2	413.6	505.4	612.4
	EXP	124.7	136.8	162.2	207.5	249.0	284.0	314.1*	404.4*	462.9*	460.9*
	Elow							305.6	382.9	426.5	413.2
	Eup							322.5	426.5	501.3	512.6
60	OBS	169.3	210.0	208.3	298.6	369.9	429.1	491.6	484.5	627.6	835.9
	EXP	187.8	212.5	219.2	278.4	359.8	428.1	488.3*	539.9*	695.3*	795.8*
	Elow							475.2	511.3	640.6	713.5
	Eup							501.5	569.4	753.0	885.1
65	OBS	262.2	311.1	325.5	355.4	436.5	559.6	622.6	652.6	704.7	942.8
	EXP	260.6	297.9	317.0	350.3	449.4	575.9	685.2*	781.6*	864.2*	1112.9*
	Elow							666.7	740.1	796.3	997.8
	Eup							703.6	824.3	935.9	1237.7
70	OBS	281.4	353.9	417.5	459.5	506.0	632.0	727.3	762.0	871.0	942.5
	EXP	290.1	369.8	397.4	453.0	505.8	643.3	824.4*	980.8*	1118.9*	1237.1*
	Elow							802.2	928.7	1030.9	1109.1
	Eup							846.6	1034.4	1211.8	1375.9
75	OBS	287.7	380.0	459.7	490.9	583.9	649.3	757.1	878.9	974.3	1030.9
	EXP	287.7	369.0	442.2	509.1	586.4	649.0	825.6*	1058.0*	1258.7*	1435.8*
	Elow							803.3	1001.7	1159.7	1287.3
	Eup							847.8	1115.7	1363.1	1596.9
30-79	OBS	96.2	114.7	126.2	150.6	180.5	215.6	251.0	282.3	323.6	372.5
	EXP	96.5	114.9	127.4	150.5	180.6	215.6	257.3*	301.7*	347.2*	397.2*
	Elow							250.4	285.6	319.9	356.1
	Eup							264.2	318.1	376.1	441.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	50.0	27.0	27.0	37.0	53.0	61.0	57.0	34.8	25.0	22.0
	EXP	30.5	31.9	33.0	45.3	60.9	76.9	74.8*	70.2*	83.9*	109.5*
	CHI	12.499	0.755	1.091	1.506	1.025	3.296	4.227	17.855	41.338	69.955
35 -	OBS	86.0	89.0	75.0	65.0	120.0	172.0	187.0	163.0	93.0	79.0
	EXP	72.7	81.7	80.5	89.2	123.6	164.8	208.0*	201.3*	190.5*	227.5*
	CHI	2.424	0.662	0.373	6.588	0.106	0.316	2.128	7.272	49.914	96.906
40 -	OBS	122.0	158.0	201.0	156.0	223.0	308.0	563.0	565.8	473.0	293.0
	EXP	113.4	173.0	181.8	192.7	215.9	297.2	394.9*	496.5*	483.1*	458.4*
	CHI	0.644	1.299	2.028	6.983	0.233	0.394	71.578	9.673	0.209	59.671
45 -	OBS	202.0	235.0	361.0	358.0	393.0	487.0	814.0	1276.6	1371.0	1054.0
	EXP	161.2	245.7	350.4	395.1	423.5	468.5	647.8*	857.1*	1084.0*	1057.2*
	CHI	10.342	0.470	0.320	3.488	2.194	0.728	42.664	205.357	75.981	0.010
50 -	OBS	359.0	338.0	438.0	703.0	862.0	973.0	1014.0	1631.2	2542.0	2735.0
	EXP	346.7	340.9	488.8	747.7	852.3	903.5	1001.1*	1383.6*	1835.8*	2330.9*
	CHI	0.435	0.025	5.281	2.675	0.110	5.345	0.166	44.304	271.634	70.051
55 -	OBS	479.0	619.0	516.0	930.0	1363.0	1482.0	1579.0	1818.8	2691.0	4355.0
	EXP	515.7	608.6	561.5	864.1	1336.1	1509.3	1603.8*	1778.6*	2464.6*	3277.7*
	CHI	2.618	0.179	3.693	5.028	0.541	0.492	0.384	0.907	20.802	354.085
60 -	OBS	582.0	823.0	880.0	982.0	1463.0	2182.0	2482.0	2360.8	2648.0	4281.0
	EXP	645.4	832.9	925.7	915.4	1423.3	2176.7	2465.6*	2630.7*	2933.8*	4075.7*
	CHI	6.227	0.118	2.255	4.844	1.108	0.013	0.108	27.693	27.834	10.342
65 -	OBS	647.0	977.0	1169.0	1387.0	1321.0	2048.0	2914.0	3052.2	3224.0	3753.0
	EXP	643.2	935.6	1138.2	1367.0	1360.2	2107.8	3206.7*	3655.9*	3953.5*	4430.2*
	CHI	0.023	1.835	0.834	0.292	1.129	1.695	26.724	99.700	134.621	103.523
70 -	OBS	473.0	750.0	1127.0	1432.0	1728.0	1650.0	2344.0	3133.8	3667.0	3929.0
	EXP	487.6	783.6	1072.6	1412.0	1727.3	1679.7	2657.1*	4033.6*	4710.5*	5157.1*
	CHI	0.438	1.439	2.761	0.284	0.000	0.524	36.885	200.723	231.171	292.440
75 -	OBS	312.0	488.0	749.0	1038.0	1432.0	1741.0	1548.0	2309.8	3327.0	3689.0
	EXP	312.0	473.8	720.5	1076.6	1438.2	1740.3	1687.9*	2780.5*	4298.1*	5138.0*
	CHI	0.000	0.424	1.124	1.387	0.026	0.000	11.600	79.692	219.418	408.632
30-79	OBS	3312.0	4504.0	5543.0	7088.0	8958.0	11104.0	13502.0	16346.8	20061.0	24190.0
	EXP	3328.5	4507.6	5553.0	7105.2	8961.3	11124.6	13947.8*	17888.1*	22037.8*	26262.1*
	O/E	0.995	0.999	0.998	0.998	1.000	0.998	0.968	0.914	0.910	0.921

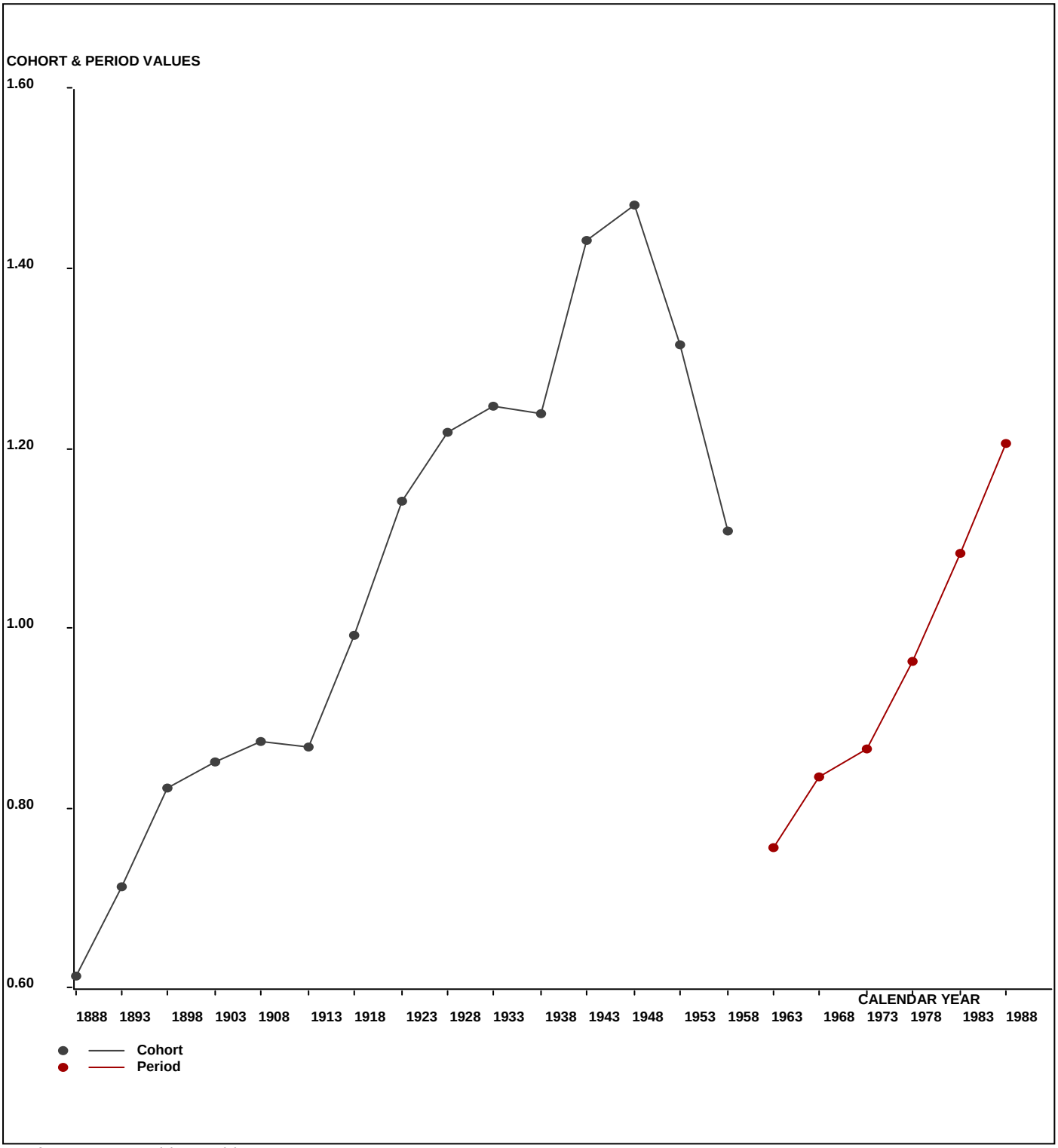
CHI SQUARE (LOG)= 3428.1762 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

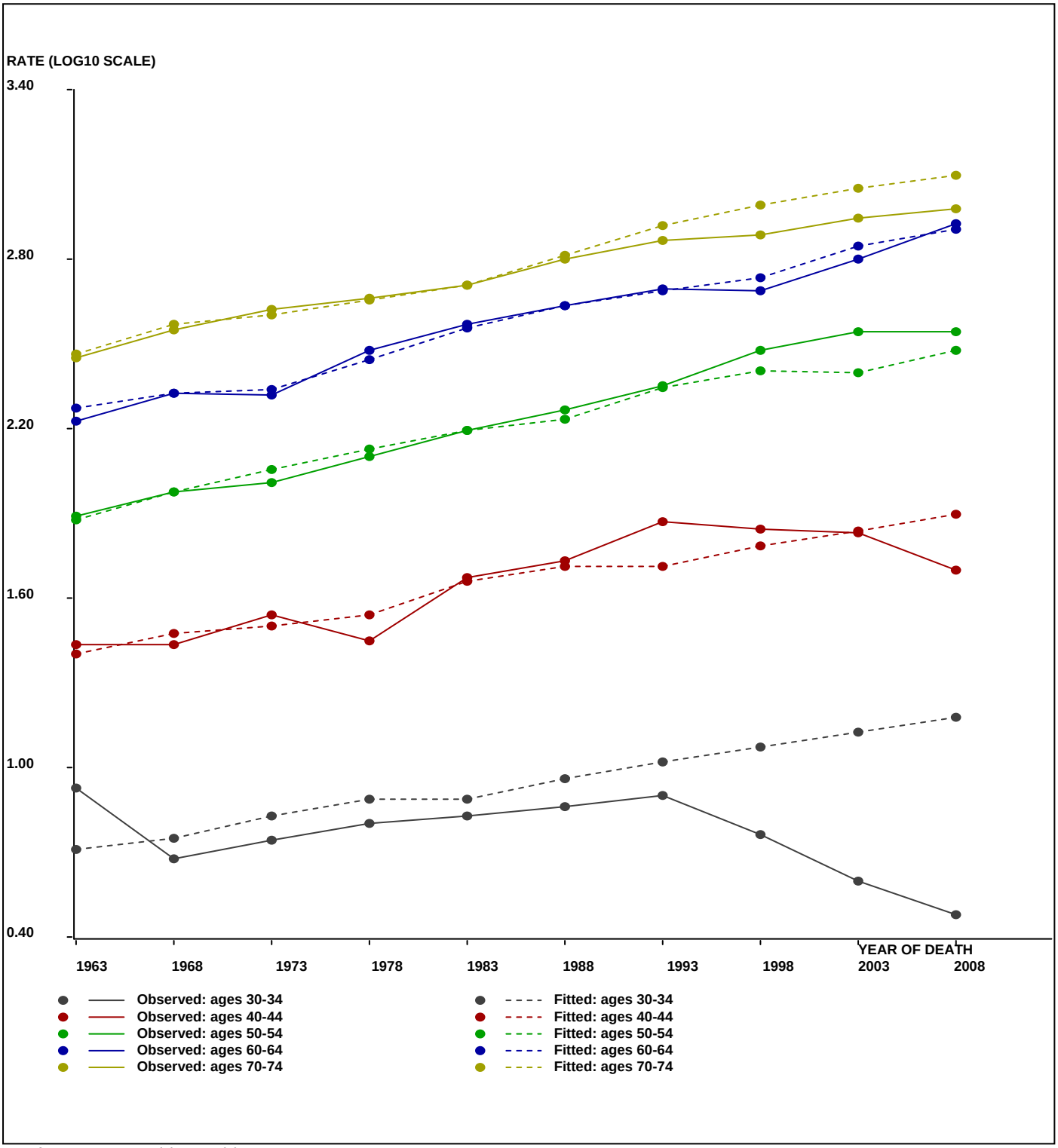


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	8.0	22.7	73.8	144.7	223.2	309.2	491.6	622.6	727.3	757.1
	PRE	10.4	25.2	51.7	115.2	220.4	314.1	488.3	685.2	824.4	825.6
	RES	-2.482	-2.550	22.030	29.559	2.838	-4.861	3.239	-62.549	-97.135	-68.439
1996-	OBS	5.9	23.1	69.8	170.8	297.4	413.6	484.5	652.6	762.0	878.9
	PRE	11.8	28.5	61.2	114.7	252.3	404.4	539.9	781.6	980.8	1058.0
	RES	-5.959	-5.426	8.546	56.137	45.140	9.133	-55.399	-129.077	-218.799	-179.107
2001-	OBS	4.0	15.8	67.9	171.6	347.8	505.4	627.6	704.7	871.0	974.3
	PRE	13.4	32.3	69.3	135.7	251.2	462.9	695.3	864.2	1118.9	1258.7
	RES	-9.389	-16.538	-1.442	35.927	96.617	42.526	-67.725	-159.474	-247.868	-284.386
2006-	OBS	3.0	12.7	50.1	153.2	348.7	612.4	835.9	942.8	942.5	1030.9
	PRE	15.1	36.6	78.5	153.6	297.2	460.9	795.8	1112.9	1237.1	1435.8
	RES	-12.100	-23.873	-28.307	-0.463	51.524	151.487	40.087	-170.121	-294.600	-404.928

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	57.0	187.0	563.0	814.0	1014.0	1579.0	2482.0	2914.0	2344.0	1548.0
	PRE	74.8	208.0	394.9	647.8	1001.1	1603.8	2465.6	3206.7	2657.1	1687.9
	CHI	4.227	2.128	71.578	42.664	0.166	0.384	0.108	26.724	36.885	11.600
1996-	OBS	34.8	163.0	565.8	1276.6	1631.2	1818.8	2360.8	3052.2	3133.8	2309.8
	PRE	70.2	201.3	496.5	857.1	1383.6	1778.6	2630.7	3655.9	4033.6	2780.5
	CHI	17.855	7.272	9.673	205.357	44.304	0.907	27.693	99.700	200.723	79.692
2001-	OBS	25.0	93.0	473.0	1371.0	2542.0	2691.0	2648.0	3224.0	3667.0	3327.0
	PRE	83.9	190.5	483.1	1084.0	1835.8	2464.6	2933.8	3953.5	4710.5	4298.1
	CHI	41.338	49.914	0.209	75.981	271.634	20.802	27.834	134.621	231.171	219.418
2006-	OBS	22.0	79.0	293.0	1054.0	2735.0	4355.0	4281.0	3753.0	3929.0	3689.0
	PRE	109.5	227.5	458.4	1057.2	2330.9	3277.7	4075.7	4430.2	5157.1	5138.0
	CHI	69.955	96.906	59.671	0.010	70.051	354.085	10.342	103.523	292.440	408.632

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	423.76	8.31	51	P, C	96.32	2272.76	0.0000
AGE-PERIOD	118.53	2.63	45	Cohort	86.85	630.93	0.0000
AGE-COHORT	262.58	7.29	36	Period	94.06	1414.83	0.0000
PERIOD-COHORT	30.71	0.77	40	Age	49.22	163.65	0.0000
FULL AGE-PERIOD-COHORT	15.59	0.49	32			83.43	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.895027	7.852853
35	1.076839	11.935460
40	1.293891	19.673901
45	1.563162	36.573139
50	1.858875	72.256115
55	2.149993	141.251491
60	2.428587	268.278987
65	2.704194	506.051160
70	2.947122	885.364485
75	3.143400	1391.232647

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.246399	0.567023
1966	0.017970	1.042245
1971	0.070933	1.177425
1976	0.026655	1.063299
1981	0.028558	1.067966
1986	-0.049893	0.891471

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.106341	1.277442
1891	0.090240	1.230950
1896	0.083560	1.212160
1901	0.027947	1.066466
1906	-0.042399	0.906987
1911	-0.076293	0.838894
1916	-0.048851	0.893613
1921	-0.022033	0.950532
1926	0.005643	1.013077
1931	0.053769	1.131797
1936	0.035266	1.084591
1941	0.103151	1.268094
1946	0.058701	1.144724
1951	-0.002406	0.994475
1956	0.120065	1.318453

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	41.0	44.0	55.0	49.0	66.0	77.0
	EXP	29.8	50.1	57.0	55.8	65.2	77.0
	CHI	4.2	0.7	0.1	0.8	0.0	0.0
35 -	OBS	70.0	77.0	64.0	65.0	81.0	81.0
	EXP	40.3	82.2	85.1	77.5	84.3	81.8
	CHI	21.9	0.3	5.2	2.0	0.1	0.0
40 -	OBS	66.0	91.0	131.0	125.0	139.0	124.0
	EXP	47.6	120.7	150.5	125.1	126.7	114.8
	CHI	7.1	7.3	2.5	0.0	1.2	0.7
45 -	OBS	79.0	148.0	217.0	243.0	262.0	193.0
	EXP	68.4	160.5	248.5	248.2	229.6	192.5
	CHI	1.7	1.0	4.0	0.1	4.6	0.0
50 -	OBS	148.0	236.0	347.0	427.0	514.0	358.0
	EXP	158.4	241.9	349.1	432.6	480.9	368.8
	CHI	0.7	0.1	0.0	0.1	2.3	0.3
55 -	OBS	292.0	541.0	508.0	597.0	859.0	738.0
	EXP	300.4	549.4	514.7	594.5	820.1	757.3
	CHI	0.2	0.1	0.1	0.0	1.8	0.5
60 -	OBS	528.0	1000.0	1118.0	855.0	1102.0	1214.0
	EXP	557.6	994.0	1119.3	838.3	1077.3	1232.0
	CHI	1.6	0.0	0.0	0.3	0.6	0.3
65 -	OBS	851.0	1773.0	1987.0	1782.0	1430.0	1534.0
	EXP	858.4	1766.6	1940.7	1761.7	1461.7	1569.4
	CHI	0.1	0.0	1.1	0.2	0.7	0.8
70 -	OBS	1008.0	2390.0	3044.0	2671.0	2650.0	1857.0
	EXP	1038.7	2370.2	3000.9	2661.2	2709.0	1841.5
	CHI	0.9	0.2	0.6	0.0	1.3	0.1
75 -	OBS	1093.0	2322.0	3223.0	3315.0	3250.0	2847.0
	EXP	1093.0	2292.0	3235.5	3336.0	3304.9	2789.9
	CHI	0.0	0.4	0.0	0.1	0.9	1.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	10176.80	254.42	40	P, C	92.72	0.0000
AGE-PERIOD	905.71	22.64	40	Cohort	18.17	0.0000
AGE-COHORT	13108.48	327.71	40	Period	94.35	0.0000
PERIOD-COHORT	1002.63	25.07	40	Age	26.08	0.0000
FULL AGE-PERIOD-COHORT	741.13	18.53	40			0.0000

AGE	EFFECT
30	7.852853
35	11.935460
40	19.673901
45	36.573139
50	72.256115
55	141.251491
60	268.278987
65	506.051160
70	885.364485
75	1391.232647

PERIOD	EFFECT	LOWER	UPPER
% Period Change	83.4737	80.4737	86.4737
1961	0.567023		
1966	1.042245		
1971	1.177425		
1976	1.063299		
1981	1.067966		
1986	0.891471		
1991	0.744144	0.717400	0.770888
1996	0.621164	0.577318	0.666615
2001	0.518509	0.464589	0.576447
2006	0.432819	0.373872	0.498475

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.277442	1.000000	
1891	1.230950	2.000000	
1896	1.212160	4.000000	
1901	1.066466	8.000000	
1906	0.906987	16.000000	
1911	0.838894	32.000000	
1916	0.893613	64.000000	
1921	0.950532	128.000000	
1926	1.013077	256.000000	
1931	1.131797	512.000000	
1936	1.084591	1024.000000	
1941	1.268094	2048.000000	
1946	1.144724	4096.000000	
1951	0.994475	8192.000000	
1956	1.020116	EXTRAPOLATION	1.318453
1961	0.995521	EXTRAPOLATION	
1966	0.971519	EXTRAPOLATION	
1971	0.948096	EXTRAPOLATION	
1976	0.925238	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	6.9	7.8	11.3	8.4	8.4	9.2	4.6	3.1	1.6	0.8
	EXP	5.0	8.9	11.7	9.6	8.3	7.1	5.8*	4.7*	3.9*	3.1*
	Elow							5.6	4.4	3.5	2.7
	Eup							6.0	5.1	4.3	3.6
35	OBS	11.9	13.2	11.5	13.5	14.0	10.5	9.0	6.3	3.9	2.4
	EXP	6.9	14.1	15.2	16.1	14.6	10.6	9.1*	7.4*	6.0*	4.9*
	Elow							8.7	6.9	5.4	4.2
	Eup							9.4	7.9	6.7	5.6
40	OBS	14.7	15.7	22.8	22.7	29.2	21.7	18.7	13.3	7.2	7.2
	EXP	10.6	20.8	26.2	22.7	26.6	20.1	14.6*	12.5*	10.2*	8.3*
	Elow							14.0	11.6	9.1	7.1
	Eup							15.1	13.4	11.3	9.5
45	OBS	21.4	33.4	38.1	43.1	48.3	41.5	30.4	23.6	18.0	14.8
	EXP	18.5	36.2	43.6	44.0	42.4	41.3	31.2*	22.6*	19.3*	15.8*
	Elow							30.0	21.0	17.3	13.6
	Eup							32.3	24.2	21.5	18.1
50	OBS	32.1	65.6	80.4	76.8	93.4	67.8	56.4	49.0	41.2	39.9
	EXP	34.4	67.3	80.9	77.8	87.3	69.9	68.2*	51.4*	37.3*	31.9*
	Elow							65.7	47.8	33.4	27.6
	Eup							70.6	55.1	41.4	36.7
55	OBS	70.6	121.6	146.7	143.4	160.1	138.9	97.1	104.5	82.8	103.9
	EXP	72.6	123.5	148.6	142.8	152.8	142.5	114.0*	111.3*	83.8*	60.8*
	Elow							109.9	103.4	75.1	52.5
	Eup							118.1	119.4	93.2	70.0
60	OBS	153.6	255.1	264.7	260.0	278.6	238.8	179.4	157.7	146.0	167.3
	EXP	162.2	253.6	265.0	254.9	272.3	242.3	225.9*	180.7*	176.4*	132.9*
	Elow							217.8	168.0	158.1	114.8
	Eup							234.1	194.0	196.1	153.1
65	OBS	344.8	564.5	553.3	456.6	472.5	419.1	319.4	309.7	250.3	281.6
	EXP	347.8	562.5	540.4	451.4	482.9	428.8	381.5*	355.8*	284.6*	277.7*
	Elow							367.8	330.7	255.0	239.9
	Eup							395.2	381.8	316.4	319.9
70	OBS	599.7	1127.9	1127.7	857.0	775.9	711.2	529.6	479.2	454.4	446.4
	EXP	618.0	1118.5	1111.7	853.8	793.2	705.3	626.2*	557.1*	519.6*	415.6*
	Elow							603.7	517.8	465.5	359.0
	Eup							648.8	597.9	577.6	478.7
75	OBS	1007.7	1808.3	1977.9	1567.7	1325.2	1061.7	809.9	751.5	750.8	734.7
	EXP	1007.7	1784.9	1985.6	1577.6	1347.6	1040.4	925.1*	821.4*	730.8*	681.5*
	Elow							891.9	763.5	654.8	588.7
	Eup							958.4	881.5	812.5	784.9
30-79	OBS	127.2	222.1	234.6	197.2	192.3	163.9	123.6	113.9	101.7	106.4
	EXP	127.9	222.1	235.1	197.2	191.6	164.0	144.9*	127.2*	110.5*	94.5*
	Elow							139.7	118.3	99.1	81.6
	Eup							150.1	136.6	122.9	108.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	41.0	44.0	55.0	49.0	66.0	77.0	33.0	18.6	10.0	6.0
	EXP	29.8	50.1	57.0	55.8	65.2	59.6	41.7*	28.2*	24.2*	22.8*
	CHI	4.250	0.735	0.070	0.818	0.010	5.096	1.807	3.244	8.342	12.334
35 -	OBS	70.0	77.0	64.0	65.0	81.0	81.0	74.0	44.4	23.0	15.0
	EXP	40.3	82.2	85.1	77.5	84.3	81.8	74.8*	52.0*	35.5*	30.5*
	CHI	21.911	0.323	5.224	2.011	0.128	0.008	0.008	1.122	4.373	7.847
40 -	OBS	66.0	91.0	131.0	125.0	139.0	124.0	143.0	108.2	50.0	42.0
	EXP	47.6	120.7	150.5	125.1	126.7	114.8	111.1*	101.1*	70.8*	48.3*
	CHI	7.087	7.287	2.537	0.000	1.193	0.735	9.154	0.500	6.100	0.830
45 -	OBS	79.0	148.0	217.0	243.0	262.0	193.0	171.0	176.6	144.0	102.0
	EXP	68.4	160.5	248.5	248.2	229.6	192.5	175.2*	168.8*	154.5*	108.5*
	CHI	1.652	0.969	3.994	0.109	4.581	0.001	0.101	0.357	0.718	0.384
50 -	OBS	148.0	236.0	347.0	427.0	514.0	358.0	256.0	268.8	301.0	313.0
	EXP	158.4	241.9	349.1	432.6	480.9	368.8	309.7*	281.8*	272.3*	250.2*
	CHI	0.687	0.145	0.012	0.073	2.279	0.317	9.314	0.600	3.021	15.761
55 -	OBS	292.0	541.0	508.0	597.0	859.0	738.0	496.0	459.6	441.0	739.0
	EXP	300.4	549.4	514.7	594.5	820.1	757.3	582.2*	489.3*	446.4*	432.4*
	CHI	0.236	0.129	0.087	0.010	1.849	0.490	12.759	1.806	0.065	217.455
60 -	OBS	528.0	1000.0	1118.0	855.0	1102.0	1214.0	906.0	768.2	616.0	857.0
	EXP	557.6	994.0	1119.3	838.3	1077.3	1232.0	1140.8*	880.6*	744.3*	680.7*
	CHI	1.573	0.036	0.001	0.332	0.568	0.262	48.337	14.350	22.114	45.633
65 -	OBS	851.0	1773.0	1987.0	1782.0	1430.0	1534.0	1495.0	1448.8	1145.0	1121.0
	EXP	858.4	1766.6	1940.7	1761.7	1461.7	1569.4	1785.5*	1664.1*	1301.9*	1105.7*
	CHI	0.063	0.023	1.106	0.233	0.687	0.798	47.257	27.845	18.908	0.213
70 -	OBS	1008.0	2390.0	3044.0	2671.0	2650.0	1857.0	1707.0	1970.8	1913.0	1861.0
	EXP	1038.7	2370.2	3000.9	2661.2	2709.0	1841.5	2018.3*	2291.2*	2187.4*	1732.5*
	CHI	0.907	0.165	0.618	0.036	1.287	0.130	48.028	44.815	34.421	9.526
75 -	OBS	1093.0	2322.0	3223.0	3315.0	3250.0	2847.0	1656.0	1975.2	2564.0	2629.0
	EXP	1093.0	2292.0	3235.5	3336.0	3304.9	2789.9	1891.5*	2158.9*	2495.6*	2438.7*
	CHI	0.000	0.394	0.048	0.133	0.912	1.170	29.324	15.630	1.877	14.849
30-79	OBS	4176.0	8622.0	10694.0	10129.0	10353.0	9023.0	6937.0	7239.2	7207.0	7685.0
	EXP	4192.6	8627.5	10701.2	10131.0	10359.6	9007.5	8130.8*	8116.1*	7732.8*	6850.2*
	O/E	0.996	0.999	0.999	1.000	0.999	1.002	0.853	0.892	0.932	1.122

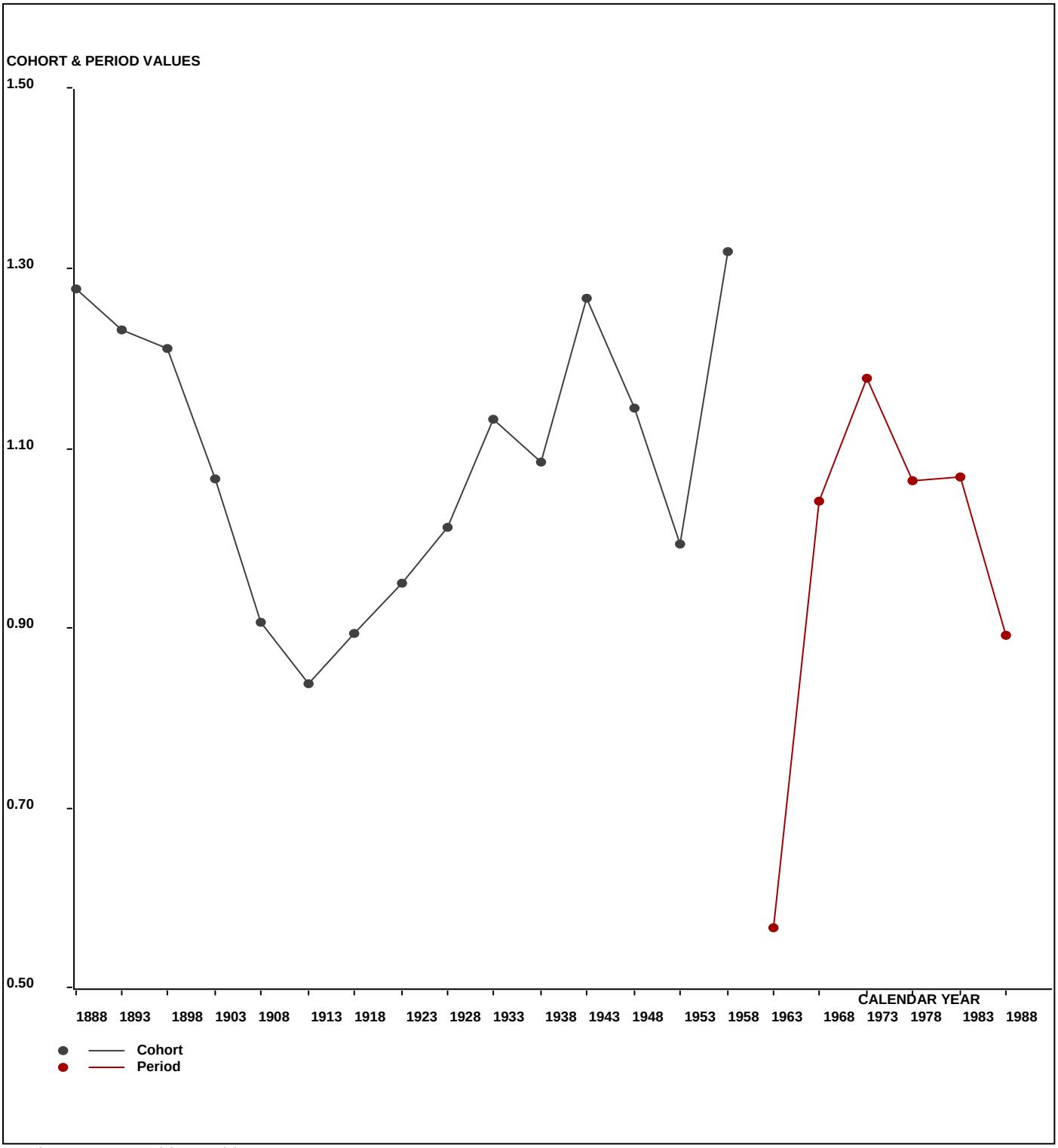
CHI SQUARE (LOG)= 741.1287 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

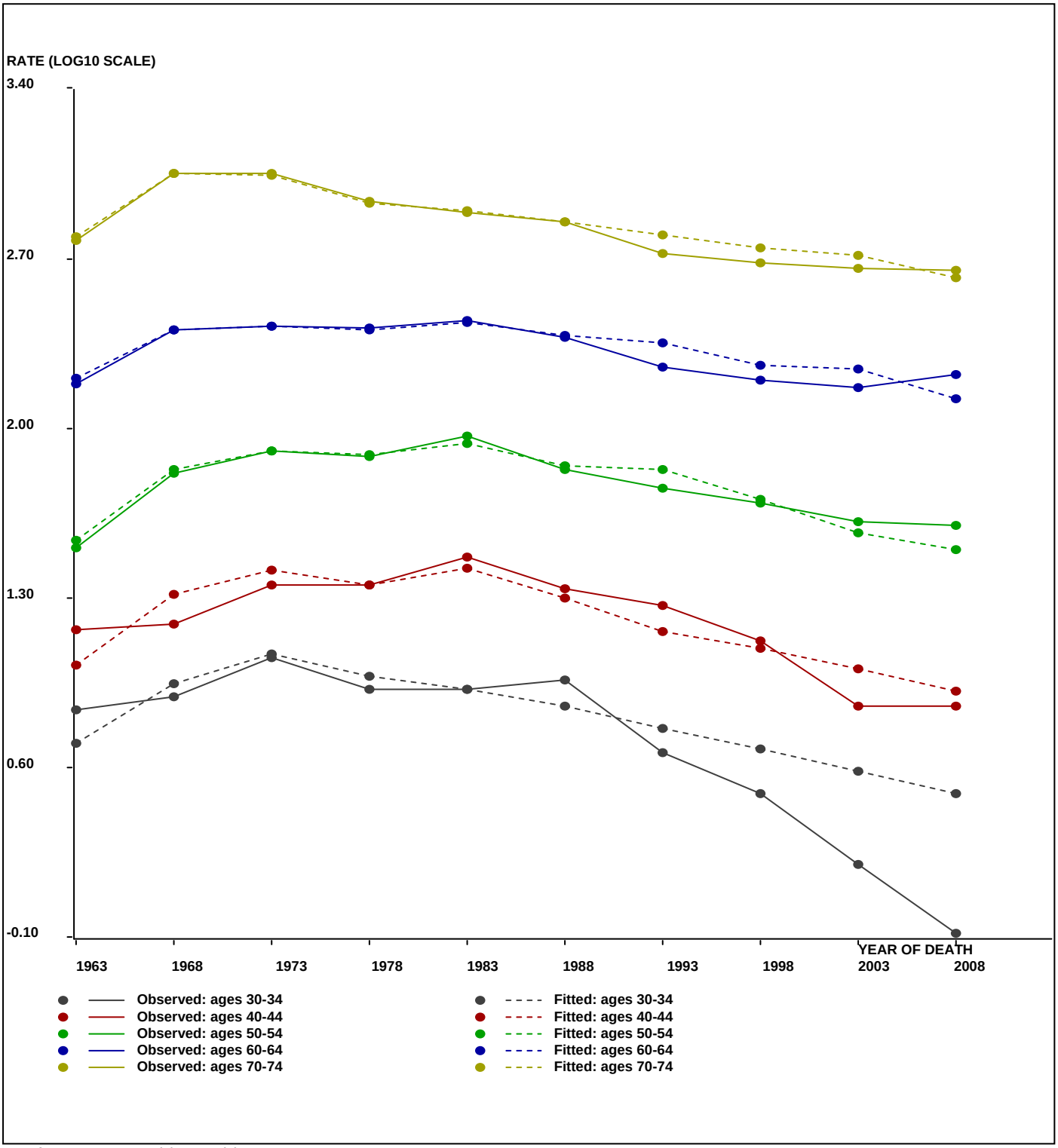


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Poland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	4.6	9.0	18.7	30.4	56.4	97.1	179.4	319.4	529.6	809.9
	PRE	5.8	9.1	14.6	31.2	68.2	114.0	225.9	381.5	626.2	925.1
	RES	-1.211	-0.091	4.179	-0.749	-11.824	-16.877	-46.510	-62.065	-96.604	-115.189
1996-	OBS	3.1	6.3	13.3	23.6	49.0	104.5	157.7	309.7	479.2	751.5
	PRE	4.7	7.4	12.5	22.6	51.4	111.3	180.7	355.8	557.1	821.4
	RES	-1.609	-1.084	0.876	1.038	-2.371	-6.760	-23.072	-46.021	-77.920	-69.893
2001-	OBS	1.6	3.9	7.2	18.0	41.2	82.8	146.0	250.3	454.4	750.8
	PRE	3.9	6.0	10.2	19.3	37.3	83.8	176.4	284.6	519.6	730.8
	RES	-2.266	-2.112	-2.981	-1.318	3.924	-1.014	-30.406	-34.297	-65.177	20.045
2006-	OBS	0.8	2.4	7.2	14.8	39.9	103.9	167.3	281.6	446.4	734.7
	PRE	3.1	4.9	8.3	15.8	31.9	60.8	132.9	277.7	415.6	681.5
	RES	-2.315	-2.486	-1.084	-0.938	8.007	43.117	34.414	3.851	30.819	53.179

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	33.0	74.0	143.0	171.0	256.0	496.0	906.0	1495.0	1707.0	1656.0
	PRE	41.7	74.8	111.1	175.2	309.7	582.2	1140.8	1785.5	2018.3	1891.5
	CHI	1.807	0.008	9.154	0.101	9.314	12.759	48.337	47.257	48.028	29.324
1996-	OBS	18.6	44.4	108.2	176.6	268.8	459.6	768.2	1448.8	1970.8	1975.2
	PRE	28.2	52.0	101.1	168.8	281.8	489.3	880.6	1664.1	2291.2	2158.9
	CHI	3.244	1.122	0.500	0.357	0.600	1.806	14.350	27.845	44.815	15.630
2001-	OBS	10.0	23.0	50.0	144.0	301.0	441.0	616.0	1145.0	1913.0	2564.0
	PRE	24.2	35.5	70.8	154.5	272.3	446.4	744.3	1301.9	2187.4	2495.6
	CHI	8.342	4.373	6.100	0.718	3.021	0.065	22.114	18.908	34.421	1.877
2006-	OBS	6.0	15.0	42.0	102.0	313.0	739.0	857.0	1121.0	1861.0	2629.0
	PRE	22.8	30.5	48.3	108.5	250.2	432.4	680.7	1105.7	1732.5	2438.7
	CHI	12.334	7.847	0.830	0.384	15.761	217.455	45.633	0.213	9.526	14.849

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	566.82	11.11	51	P, C	97.59	3011.58	0.0000
AGE-PERIOD	29.74	0.66	45	Cohort	53.98	157.73	0.0000
AGE-COHORT	425.86	11.83	36	Period	96.79	2260.27	0.0000
PERIOD-COHORT	14.45	0.36	40	Age	5.31	76.67	0.0004
FULL AGE-PERIOD-COHORT	13.68	0.43	32			72.59	0.0001

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.580180	38.034666
35	2.114382	130.131446
40	2.549587	354.475729
45	2.939393	869.747866
50	3.274323	1880.712905
55	3.564262	3666.583691
60	3.827363	6719.897240
65	4.062577	11549.874700
70	4.275121	18841.746018
75	4.473387	29743.168751

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.020867	0.953088
1966	-0.002453	0.994368
1971	0.035262	1.084580
1976	0.043059	1.104228
1981	0.005604	1.012988
1986	-0.080413	0.830973

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.015947	1.037401
1891	0.003564	1.008239
1896	0.009263	1.021558
1901	0.001261	1.002909
1906	-0.009821	0.977640
1911	-0.004815	0.988974
1916	-0.002990	0.993139
1921	0.008288	1.019266
1926	0.004383	1.010144
1931	0.011424	1.026653
1936	-0.002205	0.994937
1941	-0.035144	0.922265
1946	-0.012195	0.972310
1951	0.029713	1.070812
1956	-0.002001	0.995404

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	51.0	44.0	52.0	66.0	61.0	46.0
	EXP	42.2	44.2	54.7	68.7	65.3	46.0
	CHI	1.8	0.0	0.1	0.1	0.3	0.0
35 -	OBS	189.0	128.0	144.0	194.0	212.0	187.0
	EXP	159.4	152.1	163.9	188.2	213.5	182.9
	CHI	5.5	3.8	2.4	0.2	0.0	0.1
40 -	OBS	449.0	438.0	439.0	472.0	475.0	477.0
	EXP	466.7	452.3	447.2	447.9	464.5	472.9
	CHI	0.7	0.5	0.2	1.3	0.2	0.0
45 -	OBS	1045.0	1196.0	1190.0	1106.0	1021.0	908.0
	EXP	1088.3	1182.3	1189.5	1095.4	990.2	921.9
	CHI	1.7	0.2	0.0	0.1	1.0	0.2
50 -	OBS	2279.0	2318.0	2785.0	2587.0	2169.0	1678.0
	EXP	2331.2	2402.8	2713.6	2542.4	2114.8	1715.6
	CHI	1.2	3.0	1.9	0.8	1.4	0.8
55 -	OBS	4183.0	4489.0	4731.0	5263.0	4406.0	3208.0
	EXP	4076.3	4561.5	4892.7	5149.6	4353.1	3253.3
	CHI	2.8	1.2	5.3	2.5	0.6	0.6
60 -	OBS	6643.0	7266.0	8452.0	8500.0	8020.0	6017.0
	EXP	6415.8	7282.5	8494.7	8496.3	8079.2	6135.0
	CHI	8.0	0.0	0.2	0.0	0.4	2.3
65 -	OBS	8785.0	10315.0	12186.0	13287.0	12080.0	10145.0
	EXP	8965.2	10245.2	12137.4	13217.8	11965.9	10270.1
	CHI	3.6	0.5	0.2	0.4	1.1	1.5
70 -	OBS	10679.0	12639.0	14985.0	16654.0	16423.0	13665.0
	EXP	10770.7	12606.2	15021.1	16660.1	16488.8	13499.6
	CHI	0.8	0.1	0.1	0.0	0.3	2.0
75 -	OBS	11803.0	13074.0	16013.0	17439.0	17823.0	16339.0
	EXP	11803.0	12983.0	15868.1	17706.2	17957.7	16177.3
	CHI	0.0	0.6	1.3	4.0	1.0	1.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	85851.18	2146.28	40	P, C	96.06	0.0000
AGE-PERIOD	4109.65	102.74	40	Cohort	17.65	0.0000
AGE-COHORT	53812.75	1345.32	40	Period	93.71	0.0000
PERIOD-COHORT	3605.36	90.13	40	Age	6.13	0.0000
FULL AGE-PERIOD-COHORT	3384.29	84.61	40			0.0000

AGE	EFFECT
30	38.034666
35	130.131446
40	354.475729
45	869.747866
50	1880.712905
55	3666.583691
60	6719.897240
65	11549.874700
70	18841.746018
75	29743.168751

PERIOD	EFFECT	LOWER	UPPER
% Period Change	82.0318	79.0318	85.0318
1961	0.953088		
1966	0.994368		
1971	1.084580		
1976	1.104228		
1981	1.012988		
1986	0.830973		
1991	0.681663	0.656733	0.706592
1996	0.559180	0.519029	0.600828
2001	0.458706	0.410198	0.510895
2006	0.376285	0.324187	0.434424

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.037401	1.000000	
1891	1.008239	2.000000	
1896	1.021558	4.000000	
1901	1.002909	8.000000	
1906	0.977640	16.000000	
1911	0.988974	32.000000	
1916	0.993139	64.000000	
1921	1.019266	128.000000	
1926	1.010144	256.000000	
1931	1.026653	512.000000	
1936	0.994937	1024.000000	
1941	0.922265	2048.000000	
1946	0.972310	4096.000000	
1951	1.070812	8192.000000	
1956	1.061356	EXTRAPOLATION	0.995404
1961	1.083739	EXTRAPOLATION	
1966	1.106595	EXTRAPOLATION	
1971	1.129932	EXTRAPOLATION	
1976	1.153762	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	45.0	37.4	36.2	39.3	38.5	31.5	29.1	22.8	18.9	14.7
	EXP	37.2	37.6	38.0	40.8	41.3	33.5	28.1*	23.5*	19.7*	16.5*
	Elow							27.1	21.8	17.6	14.2
	Eup							29.1	25.3	22.0	19.1
35	OBS	148.6	111.8	123.4	136.6	127.2	118.4	82.9	59.8	55.2	36.1
	EXP	125.3	132.8	140.4	132.5	128.2	115.8	94.1*	78.9*	66.1*	55.3*
	Elow							90.7	73.2	59.1	47.7
	Eup							97.6	84.7	73.6	63.9
40	OBS	331.3	344.8	387.5	410.4	338.7	288.9	207.5	186.5	152.8	106.8
	EXP	344.4	356.1	394.7	389.4	331.2	286.4	258.7*	210.4*	176.2*	147.6*
	Elow							249.3	195.3	157.6	127.2
	Eup							268.2	226.0	196.3	170.4
45	OBS	790.5	891.7	953.3	995.5	903.9	656.5	523.4	422.7	342.7	256.3
	EXP	823.3	881.5	952.9	986.0	876.6	666.6	576.5*	520.8*	423.4*	354.7*
	Elow							555.4	483.4	378.7	305.6
	Eup							597.5	559.6	471.6	409.5
50	OBS	1733.0	1791.7	2133.7	2134.6	2006.0	1520.8	1053.8	882.3	673.4	557.9
	EXP	1772.7	1857.3	2079.1	2097.8	1955.9	1554.9	1182.4*	1022.5*	923.8*	751.1*
	Elow							1139.1	949.1	826.1	647.1
	Eup							1225.6	1098.7	1028.9	867.2
55	OBS	3505.8	3548.4	3818.9	4217.6	3797.5	3084.5	2285.0	1563.4	1306.0	1015.8
	EXP	3416.4	3605.7	3949.4	4126.7	3751.9	3128.0	2486.7*	1890.9*	1635.3*	1477.4*
	Elow							2395.8	1755.1	1462.4	1272.8
	Eup							2577.7	2031.7	1821.4	1705.6
60	OBS	6650.8	6517.8	7171.7	7372.6	6887.5	5532.2	4242.5	3067.0	2255.1	1845.1
	EXP	6423.3	6532.6	7207.9	7369.4	6938.3	5640.7	4702.8*	3738.6*	2842.8*	2458.6*
	Elow							4530.8	3470.2	2542.2	2118.2
	Eup							4874.8	4017.1	3166.3	2838.4
65	OBS	11019.3	11596.7	12295.7	12679.1	11730.4	9663.4	7313.6	5752.4	4210.6	2941.9
	EXP	11245.4	11518.2	12246.7	12613.1	11619.6	9782.5	7953.0*	6630.6*	5271.2*	4008.2*
	Elow							7662.1	6154.5	4713.7	3453.3
	Eup							8243.8	7124.4	5870.9	4627.5
70	OBS	17951.7	19189.3	20445.5	20332.9	18800.7	15740.1	12672.5	9680.6	7067.1	5048.0
	EXP	18105.8	19139.5	20494.8	20340.4	18876.0	15549.6	13091.2*	10642.8*	8873.2*	7054.0*
	Elow							12612.4	9878.6	7934.8	6077.3
	Eup							13569.9	11435.5	9882.7	8143.9
75	OBS	29408.1	30028.3	33255.2	32441.6	29234.9	24687.6	20252.4	15849.4	12217.0	9295.6
	EXP	29408.1	29819.3	32954.3	32938.7	29455.8	24443.3	20135.7*	16952.2*	13781.8*	11490.2*
	Elow							19399.3	15735.0	12324.3	9899.3
	Eup							20872.1	18214.8	15349.8	13265.5
30-79	OBS	4225.0	4366.1	4749.8	4814.2	4416.6	3631.4	2835.9	2172.5	1641.6	1229.5
	EXP	4226.4	4368.8	4751.8	4808.8	4410.0	3640.7	2995.8*	2461.6*	2010.2*	1647.4*
	Elow							2886.3	2284.8	1797.6	1419.3
	Eup							3105.4	2644.9	2238.9	1902.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	51.0	44.0	52.0	66.0	61.0	46.0	45.0	37.0	30.0	22.0
	EXP	42.2	44.2	54.7	68.7	65.3	49.0	43.5*	38.1*	31.3*	24.7*
	CHI	1.824	0.001	0.134	0.103	0.285	0.189	0.055	0.033	0.054	0.294
35 -	OBS	189.0	128.0	144.0	194.0	212.0	187.0	123.0	93.0	90.0	59.0
	EXP	159.4	152.1	163.9	188.2	213.5	182.9	139.7*	122.6*	107.7*	90.3*
	CHI	5.509	3.811	2.418	0.176	0.011	0.093	2.006	7.149	2.906	10.864
40 -	OBS	449.0	438.0	439.0	472.0	475.0	477.0	328.0	276.0	237.0	177.0
	EXP	466.7	452.3	447.2	447.9	464.5	472.9	409.0*	311.3*	273.4*	244.7*
	CHI	0.670	0.452	0.150	1.300	0.237	0.036	16.056	3.995	4.844	18.739
45 -	OBS	1045.0	1196.0	1190.0	1106.0	1021.0	908.0	857.0	661.0	503.0	396.0
	EXP	1088.3	1182.3	1189.5	1095.4	990.2	921.9	943.8*	814.3*	621.4*	548.0*
	CHI	1.724	0.159	0.000	0.103	0.959	0.210	7.991	28.860	22.570	42.174
50 -	OBS	2279.0	2318.0	2785.0	2587.0	2169.0	1678.0	1433.0	1417.0	1036.0	811.0
	EXP	2331.2	2402.8	2713.6	2542.4	2114.8	1715.6	1607.9*	1642.2*	1421.3*	1091.9*
	CHI	1.170	2.993	1.876	0.781	1.389	0.824	19.020	30.886	104.428	72.285
55 -	OBS	4183.0	4489.0	4731.0	5263.0	4406.0	3208.0	2447.0	2064.0	2043.0	1531.0
	EXP	4076.3	4561.5	4892.7	5149.6	4353.1	3253.3	2663.0*	2496.4*	2558.1*	2226.7*
	CHI	2.791	1.152	5.343	2.497	0.642	0.631	17.528	74.890	103.733	217.364
60 -	OBS	6643.0	7266.0	8452.0	8500.0	8020.0	6017.0	4185.0	3129.0	2855.0	2812.0
	EXP	6415.8	7282.5	8494.7	8496.3	8079.2	6135.0	4639.0*	3814.2*	3599.1*	3747.0*
	CHI	8.048	0.037	0.215	0.002	0.434	2.269	44.432	123.079	153.845	233.321
65 -	OBS	8785.0	10315.0	12186.0	13287.0	12080.0	10145.0	7264.0	5223.0	3995.0	3487.0
	EXP	8965.2	10245.2	12137.4	13217.8	11965.9	10270.1	7899.1*	6020.3*	5001.2*	4750.9*
	CHI	3.622	0.476	0.195	0.362	1.087	1.525	51.056	105.599	202.452	336.260
70 -	OBS	10679.0	12639.0	14985.0	16654.0	16423.0	13665.0	11448.0	8364.0	5675.0	4303.0
	EXP	10770.7	12606.2	15021.1	16660.1	16488.8	13499.6	11826.2*	9195.3*	7125.3*	6013.0*
	CHI	0.781	0.085	0.087	0.002	0.263	2.026	12.095	75.158	295.199	486.276
75 -	OBS	11803.0	13074.0	16013.0	17439.0	17823.0	16339.0	13629.0	11375.0	8562.0	6217.0
	EXP	11803.0	12983.0	15868.1	17706.2	17957.7	16177.3	13550.4*	12166.5*	9658.7*	7684.7*
	CHI	0.000	0.638	1.323	4.033	1.010	1.616	0.455	51.489	124.517	280.330
30-79	OBS	46106.0	51907.0	60977.0	65568.0	62690.0	52670.0	41759.0	32639.0	25026.0	19815.0
	EXP	46118.8	51912.0	60982.9	65572.7	62693.1	52677.7	43721.7*	36621.2*	30397.5*	26422.1*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.955	0.891	0.823	0.750

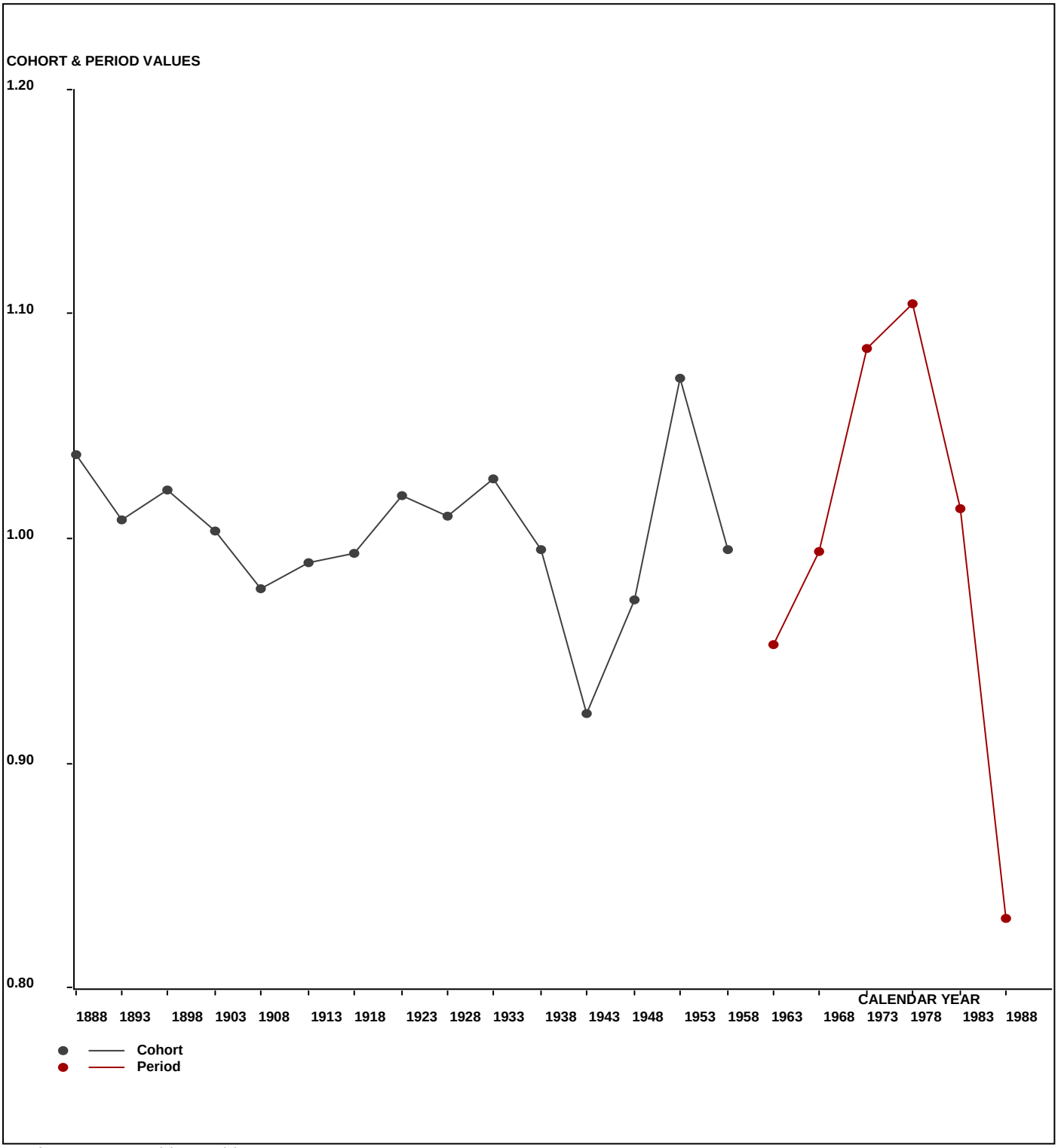
CHI SQUARE (LOG)= 3384.2863 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

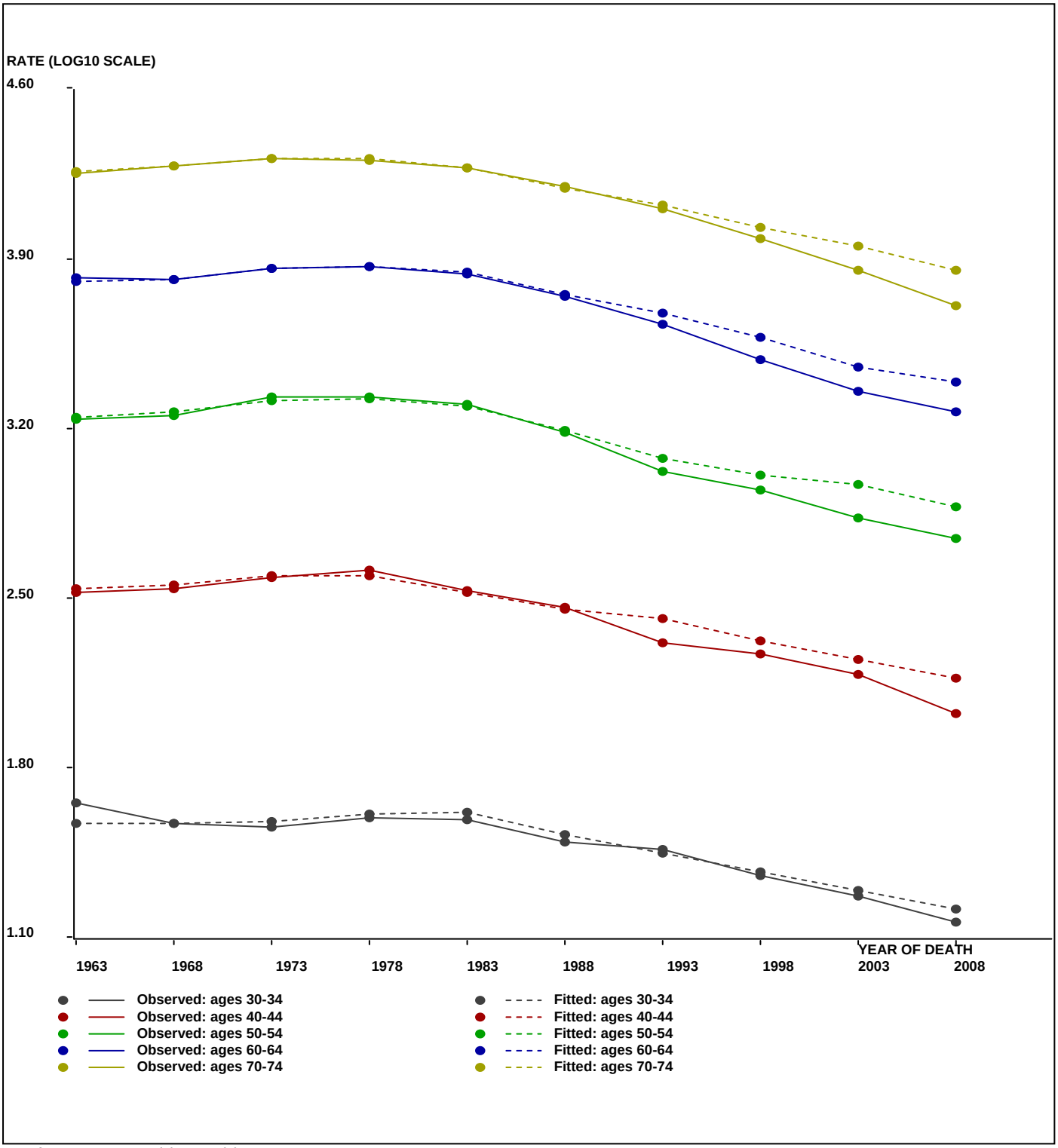


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	29.1	82.9	207.5	523.4	1053.8	2285.0	4242.5	7313.6	12672.5	20252.4
	PRE	28.1	94.1	258.7	576.5	1182.4	2486.7	4702.8	7953.0	13091.2	20135.7
	RES	1.001	-11.279	-51.264	-53.043	-128.596	-201.743	-460.245	-639.388	-418.658	116.731
1996-	OBS	22.8	59.8	186.5	422.7	882.3	1563.4	3067.0	5752.4	9680.6	15849.4
	PRE	23.5	78.9	210.4	520.8	1022.5	1890.9	3738.6	6630.6	10642.8	16952.2
	RES	-0.693	-19.042	-23.834	-98.043	-140.232	-327.510	-671.587	-878.157	-962.187	-1102.813
2001-	OBS	18.9	55.2	152.8	342.7	673.4	1306.0	2255.1	4210.6	7067.1	12217.0
	PRE	19.7	66.1	176.2	423.4	923.8	1635.3	2842.8	5271.2	8873.2	13781.8
	RES	-0.821	-10.851	-23.456	-80.698	-250.405	-329.304	-587.756	-1060.546	-1806.071	-1564.806
2006-	OBS	14.7	36.1	106.8	256.3	557.9	1015.8	1845.1	2941.9	5048.0	9295.6
	PRE	16.5	55.3	147.6	354.7	751.1	1477.4	2458.6	4008.2	7054.0	11490.2
	RES	-1.800	-19.189	-40.845	-98.391	-193.251	-461.588	-613.505	-1066.345	-2006.000	-2194.563

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	45.0	123.0	328.0	857.0	1433.0	2447.0	4185.0	7264.0	11448.0	13629.0
	PRE	43.5	139.7	409.0	943.8	1607.9	2663.0	4639.0	7899.1	11826.2	13550.4
	CHI	0.055	2.006	16.056	7.991	19.020	17.528	44.432	51.056	12.095	0.455
1996-	OBS	37.0	93.0	276.0	661.0	1417.0	2064.0	3129.0	5223.0	8364.0	11375.0
	PRE	38.1	122.6	311.3	814.3	1642.2	2496.4	3814.2	6020.3	9195.3	12166.5
	CHI	0.033	7.149	3.995	28.860	30.886	74.890	123.079	105.599	75.158	51.489
2001-	OBS	30.0	90.0	237.0	503.0	1036.0	2043.0	2855.0	3995.0	5675.0	8562.0
	PRE	31.3	107.7	273.4	621.4	1421.3	2558.1	3599.1	5001.2	7125.3	9658.7
	CHI	0.054	2.906	4.844	22.570	104.428	103.733	153.845	202.452	295.199	124.517
2006-	OBS	22.0	59.0	177.0	396.0	811.0	1531.0	2812.0	3487.0	4303.0	6217.0
	PRE	24.7	90.3	244.7	548.0	1091.9	2226.7	3747.0	4750.9	6013.0	7684.7
	CHI	0.294	10.864	18.739	42.174	72.285	217.364	233.321	336.260	486.276	280.330

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	498.12	9.77	51	P, C	96.30	2657.94	0.0000
AGE-PERIOD	25.25	0.56	45	Cohort	27.06	134.20	0.0000
AGE-COHORT	25.88	0.72	36	Period	28.82	137.44	0.0000
PERIOD-COHORT	19.50	0.49	40	Age	5.51	103.53	0.0000
FULL AGE-PERIOD-COHORT	18.42	0.58	32			97.88	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.644069	44.062459
35	1.837816	68.836085
40	2.102330	126.569832
45	2.351446	224.618683
50	2.555769	359.557763
55	2.802374	634.415938
60	3.064872	1161.105297
65	3.352317	2250.698486
70	3.650071	4467.566990
75	3.922730	8370.086856

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.088602	1.226315
1966	0.030789	1.073467
1971	0.025314	1.060021
1976	-0.011760	0.973285
1981	-0.063547	0.863880
1986	-0.095568	0.802476

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.058348	1.143794
1891	0.027415	1.065161
1896	0.017162	1.040309
1901	0.002249	1.005192
1906	0.000004	1.000009
1911	0.001965	1.004535
1916	-0.028865	0.935697
1921	-0.041183	0.909530
1926	-0.054242	0.882589
1931	-0.024358	0.945456
1936	-0.082434	0.827114
1941	-0.095482	0.802635
1946	-0.104558	0.786036
1951	-0.127326	0.745889
1956	-0.266334	0.541584

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	44.0	52.0	59.0	56.0	46.0	28.0
	EXP	58.0	46.0	53.9	56.7	44.9	28.0
	CHI	3.4	0.8	0.5	0.0	0.0	0.0
35 -	OBS	91.0	75.0	71.0	79.0	84.0	64.0
	EXP	94.8	80.0	70.4	76.4	77.9	65.1
	CHI	0.2	0.3	0.0	0.1	0.5	0.0
40 -	OBS	150.0	155.0	160.0	137.0	124.0	126.0
	EXP	191.3	152.3	143.7	117.2	123.1	131.8
	CHI	8.9	0.0	1.8	3.4	0.0	0.3
45 -	OBS	260.0	309.0	298.0	259.0	176.0	191.0
	EXP	340.7	294.1	262.3	229.6	181.3	200.1
	CHI	19.1	0.8	4.9	3.8	0.2	0.4
50 -	OBS	546.0	462.0	500.0	394.0	311.0	239.0
	EXP	582.5	467.2	452.5	374.3	317.5	263.3
	CHI	2.3	0.1	5.0	1.0	0.1	2.2
55 -	OBS	913.0	820.0	836.0	735.0	552.0	475.0
	EXP	928.3	865.4	779.5	700.8	561.2	500.6
	CHI	0.3	2.4	4.1	1.7	0.2	1.3
60 -	OBS	1439.0	1465.0	1415.0	1222.0	1062.0	845.0
	EXP	1429.6	1389.5	1457.1	1219.1	1062.3	894.4
	CHI	0.1	4.1	1.2	0.0	0.0	2.7
65 -	OBS	2357.0	2201.0	2330.0	2286.0	1881.0	1660.0
	EXP	2289.1	2160.2	2364.5	2306.0	1873.5	1724.6
	CHI	2.0	0.8	0.5	0.2	0.0	2.4
70 -	OBS	3565.0	3292.0	3470.0	3500.0	3359.0	2919.0
	EXP	3471.5	3286.1	3488.9	3561.5	3386.6	2912.3
	CHI	2.5	0.0	0.1	1.1	0.2	0.0
75 -	OBS	4712.0	4071.0	4369.0	4370.0	4441.0	4631.0
	EXP	4712.0	4166.9	4444.5	4401.9	4408.3	4465.5
	CHI	0.0	2.2	1.3	0.2	0.2	6.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	12924.38	323.11	40	P, C	94.59	0.0000
AGE-PERIOD	682.24	17.06	40	Cohort	-2.56	0.0000
AGE-COHORT	602.14	15.05	40	Period	-16.20	0.0000
PERIOD-COHORT	836.97	20.92	40	Age	16.40	0.0000
FULL AGE-PERIOD-COHORT	699.67	17.49	40			0.0000

AGE	EFFECT
30	44.062459
35	68.836085
40	126.569832
45	224.618683
50	359.557763
55	634.415938
60	1161.105297
65	2250.698486
70	4467.566990
75	8370.086856

PERIOD	EFFECT	LOWER	UPPER
% Period Change	92.8920	89.8920	95.8920
1961	1.226315		
1966	1.073467		
1971	1.060021		
1976	0.973285		
1981	0.863880		
1986	0.802476		
1991	0.745436	0.721361	0.769510
1996	0.692450	0.648446	0.737899
2001	0.643231	0.582901	0.707586
2006	0.597510	0.523982	0.678518

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.143794	1.000000	
1891	1.065161	2.000000	
1896	1.040309	4.000000	
1901	1.005192	8.000000	
1906	1.000009	16.000000	
1911	1.004535	32.000000	
1916	0.935697	64.000000	
1921	0.909530	128.000000	
1926	0.882589	256.000000	
1931	0.945456	512.000000	
1936	0.827114	1024.000000	
1941	0.802635	2048.000000	
1946	0.786036	4096.000000	
1951	0.745889	8192.000000	
1956	0.720041	EXTRAPOLATION	0.541584
1961	0.692613	EXTRAPOLATION	
1966	0.666230	EXTRAPOLATION	
1971	0.640851	EXTRAPOLATION	
1976	0.616440	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	38.8	44.3	41.0	33.3	29.1	19.1	16.8	12.3	6.3	4.7
	EXP	51.1	39.1	37.5	33.7	28.4	25.5	22.7*	20.3*	18.2*	16.2*
	Elow							22.0	19.0	16.5	14.2
	Eup							23.5	21.7	20.0	18.4
35	OBS	71.5	65.5	60.8	55.6	50.4	40.5	36.4	29.6	17.2	17.2
	EXP	74.5	69.9	60.4	53.8	46.7	41.2	36.9*	33.0*	29.5*	26.4*
	Elow							35.8	30.9	26.7	23.1
	Eup							38.1	35.2	32.5	29.9
40	OBS	110.7	122.0	141.2	119.1	88.4	76.3	75.3	58.8	45.8	47.6
	EXP	141.2	119.9	126.8	101.9	87.8	79.8	70.4*	63.1*	56.4*	50.4*
	Elow							68.1	59.1	51.1	44.2
	Eup							72.6	67.2	62.0	57.2
45	OBS	196.7	230.4	238.7	233.1	155.8	138.1	127.6	117.7	96.1	74.4
	EXP	257.7	219.3	210.1	206.7	160.5	144.7	131.6*	116.0*	104.0*	93.0*
	Elow							127.4	108.6	94.3	81.5
	Eup							135.9	123.6	114.4	105.6
50	OBS	415.2	357.1	383.1	325.1	287.6	216.6	189.7	205.5	170.9	138.9
	EXP	442.9	361.2	346.7	308.9	293.7	238.7	215.1*	195.7*	172.5*	154.7*
	Elow							208.2	183.3	156.3	135.7
	Eup							222.1	208.5	189.8	175.7
55	OBS	765.2	648.2	674.8	589.0	475.8	456.7	421.1	327.2	317.1	227.6
	EXP	778.0	684.1	629.3	561.6	483.7	481.3	391.2*	352.6*	320.8*	282.7*
	Elow							378.5	330.2	290.7	248.0
	Eup							403.8	375.7	352.9	321.1
60	OBS	1440.7	1314.2	1200.7	1059.9	912.0	776.9	828.2	709.7	496.8	414.7
	EXP	1431.3	1246.4	1236.4	1057.4	912.3	822.4	818.3*	665.0*	599.5*	545.3*
	Elow							791.9	622.7	543.2	478.2
	Eup							844.7	708.7	659.4	619.3
65	OBS	2956.5	2474.5	2351.0	2181.4	1826.6	1581.2	1559.6	1430.7	1108.8	758.5
	EXP	2871.3	2428.6	2385.8	2200.5	1819.3	1642.7	1480.8*	1473.5*	1197.4*	1079.4*
	Elow							1432.9	1379.9	1085.1	946.6
	Eup							1528.6	1570.2	1317.2	1225.7
70	OBS	5992.9	4998.1	4734.5	4273.1	3845.3	3362.3	3229.0	2818.3	2249.0	1755.0
	EXP	5835.6	4989.1	4760.3	4348.3	3876.9	3354.6	3029.0*	2730.3*	2716.9*	2207.9*
	Elow							2931.2	2556.8	2462.1	1936.2
	Eup							3126.8	2909.6	2988.8	2507.3
75	OBS	11740.3	9350.3	9073.4	8129.5	7284.5	6997.3	6471.4	5859.1	4761.5	3649.8
	EXP	11740.3	9570.5	9230.1	8188.8	7230.8	6747.3	5838.2*	5271.5*	4751.8*	4728.4*
	Elow							5649.6	4936.5	4306.1	4146.6
	Eup							6026.7	5617.5	5227.2	5369.5
30-79	OBS	1289.3	1087.1	1052.0	945.5	820.1	735.7	702.9	625.0	499.0	382.1
	EXP	1292.2	1087.7	1049.3	942.1	821.0	742.5	663.0*	601.2*	546.0*	494.6*
	Elow							641.5	563.0	494.8	433.8
	Eup							684.4	640.7	600.6	561.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	44.0	52.0	59.0	56.0	46.0	28.0	26.0	20.0	10.0	7.0
	EXP	58.0	46.0	53.9	56.7	44.9	37.2	35.2*	32.9*	28.8*	24.3*
	CHI	3.363	0.791	0.481	0.008	0.025	2.287	2.396	5.075	12.309	12.288
35 -	OBS	91.0	75.0	71.0	79.0	84.0	64.0	54.0	46.0	28.0	28.0
	EXP	94.8	80.0	70.4	76.4	77.9	65.1	54.8*	51.3*	48.1*	43.0*
	CHI	0.150	0.309	0.004	0.090	0.482	0.018	0.013	0.553	8.395	5.250
40 -	OBS	150.0	155.0	160.0	137.0	124.0	126.0	119.0	87.0	71.0	79.0
	EXP	191.3	152.3	143.7	117.2	123.1	131.8	111.3*	93.4*	87.5*	83.5*
	CHI	8.925	0.047	1.845	3.353	0.007	0.257	0.539	0.435	3.106	0.246
45 -	OBS	260.0	309.0	298.0	259.0	176.0	191.0	209.0	184.0	141.0	115.0
	EXP	340.7	294.1	262.3	229.6	181.3	200.1	215.5*	181.4*	152.7*	143.6*
	CHI	19.125	0.752	4.853	3.757	0.155	0.414	0.196	0.037	0.893	5.707
50 -	OBS	546.0	462.0	500.0	394.0	311.0	239.0	258.0	330.0	263.0	202.0
	EXP	582.5	467.2	452.5	374.3	317.5	263.3	292.6*	314.3*	265.4*	224.9*
	CHI	2.285	0.059	4.995	1.034	0.134	2.246	4.081	0.784	0.022	2.330
55 -	OBS	913.0	820.0	836.0	735.0	552.0	475.0	451.0	432.0	496.0	343.0
	EXP	928.3	865.4	779.5	700.8	561.2	500.6	418.9*	465.5*	501.8*	426.2*
	CHI	0.251	2.387	4.089	1.669	0.152	1.310	2.461	2.411	0.066	16.225
60 -	OBS	1439.0	1465.0	1415.0	1222.0	1062.0	845.0	817.0	724.0	629.0	632.0
	EXP	1429.6	1389.5	1457.1	1219.1	1062.3	894.4	807.2*	678.4*	758.9*	831.1*
	CHI	0.062	4.103	1.217	0.007	0.000	2.731	0.118	3.059	22.243	47.703
65 -	OBS	2357.0	2201.0	2330.0	2286.0	1881.0	1660.0	1549.0	1299.0	1052.0	899.0
	EXP	2289.1	2160.2	2364.5	2306.0	1873.5	1724.6	1470.7*	1337.9*	1136.1*	1279.4*
	CHI	2.013	0.772	0.504	0.174	0.030	2.420	4.166	1.130	6.227	113.109
70 -	OBS	3565.0	3292.0	3470.0	3500.0	3359.0	2919.0	2917.0	2435.0	1806.0	1496.0
	EXP	3471.5	3286.1	3488.9	3561.5	3386.6	2912.3	2736.3*	2359.0*	2181.7*	1882.1*
	CHI	2.520	0.011	0.103	1.062	0.226	0.015	11.932	2.448	64.711	79.196
75 -	OBS	4712.0	4071.0	4369.0	4370.0	4441.0	4631.0	4355.0	4205.0	3337.0	2441.0
	EXP	4712.0	4166.9	4444.5	4401.9	4408.3	4465.5	3928.8*	3783.3*	3330.2*	3162.4*
	CHI	0.000	2.206	1.282	0.231	0.243	6.131	46.230	46.998	0.014	164.569
30-79	OBS	14077.0	12902.0	13508.0	13038.0	12036.0	11178.0	10755.0	9762.0	7833.0	6242.0
	EXP	14097.7	12907.7	13517.4	13043.5	12036.7	11195.1	10071.3*	9297.5*	8491.2*	8100.5*
	O/E	0.999	1.000	0.999	1.000	1.000	0.998	1.068	1.050	0.922	0.771

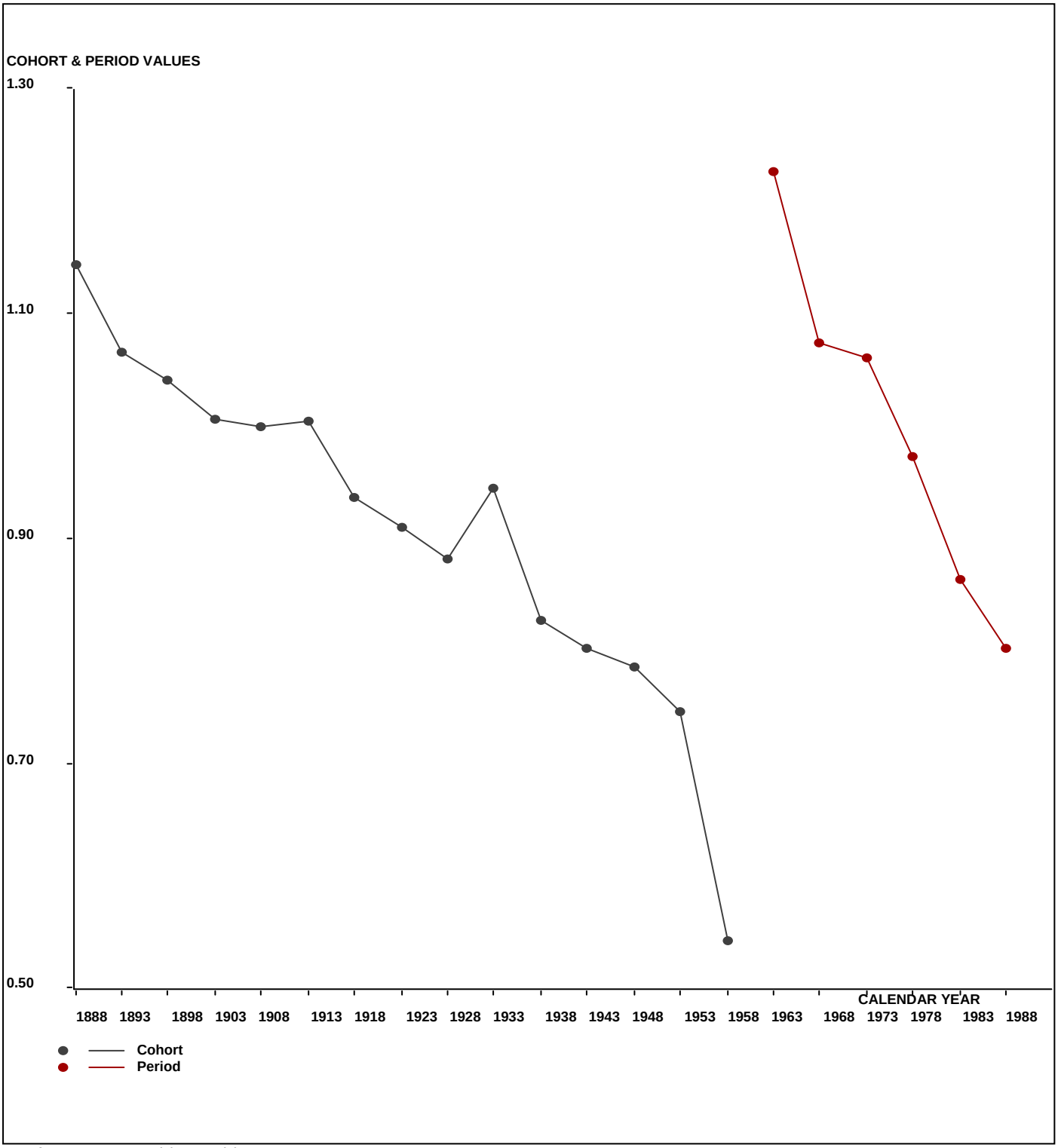
CHI SQUARE (LOG)= 699.6690 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

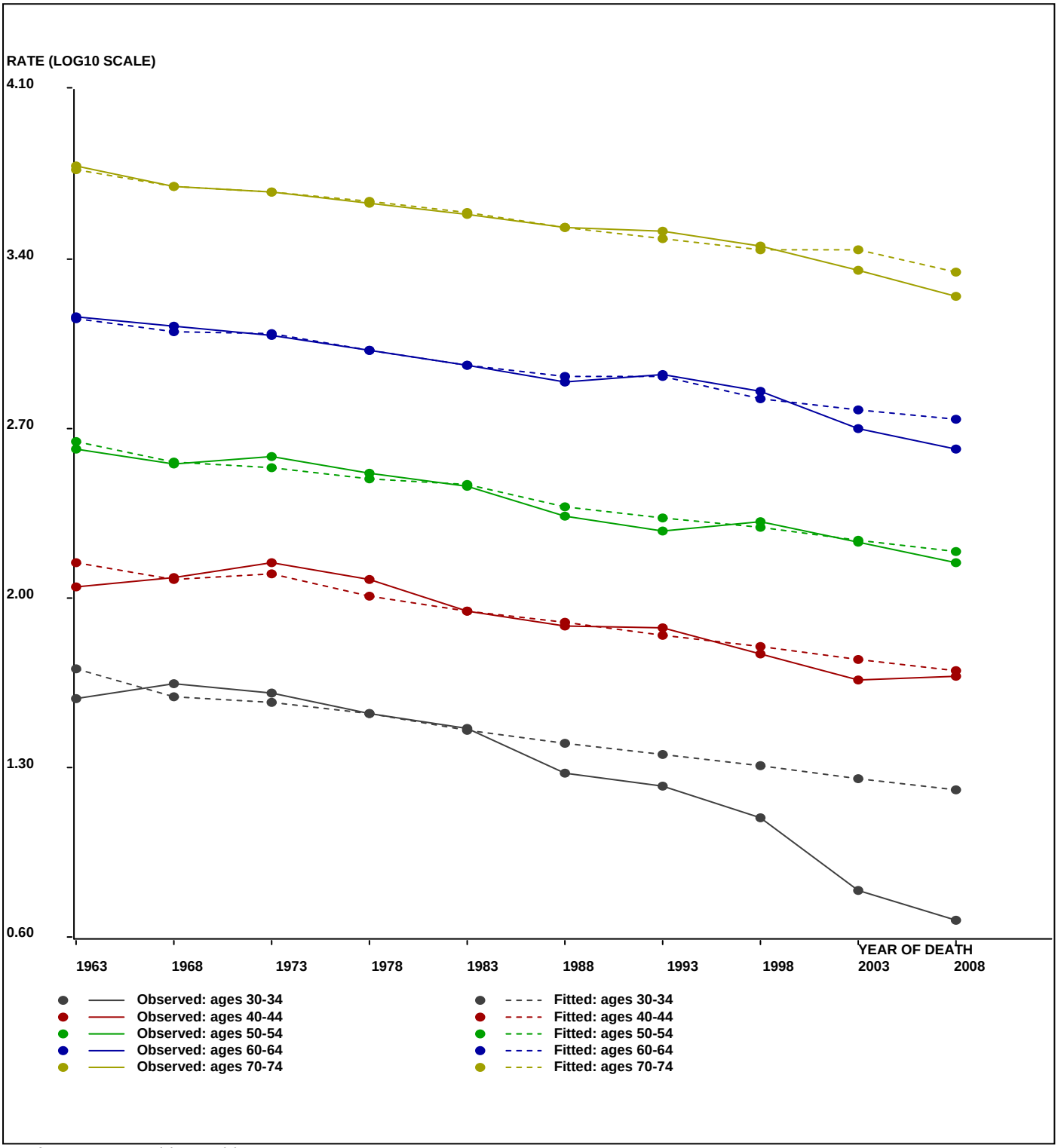


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	16.8	36.4	75.3	127.6	189.7	421.1	828.2	1559.6	3229.0	6471.4
	PRE	22.7	36.9	70.4	131.6	215.1	391.2	818.3	1480.8	3029.0	5838.2
	RES	-5.937	-0.566	4.900	-3.966	-25.407	29.982	9.914	78.811	200.015	633.294
1996-	OBS	12.3	29.6	58.8	117.7	205.5	327.2	709.7	1430.7	2818.3	5859.1
	PRE	20.3	33.0	63.1	116.0	195.7	352.6	665.0	1473.5	2730.3	5271.5
	RES	-7.980	-3.426	-4.305	1.664	9.773	-25.377	44.653	-42.814	87.958	587.541
2001-	OBS	6.3	17.2	45.8	96.1	170.9	317.1	496.8	1108.8	2249.0	4761.5
	PRE	18.2	29.5	56.4	104.0	172.5	320.8	599.5	1197.4	2716.9	4751.8
	RES	-11.866	-12.324	-10.625	-7.957	-1.564	-3.689	-102.624	-88.648	-467.916	9.734
2006-	OBS	4.7	17.2	47.6	74.4	138.9	227.6	414.7	758.5	1755.0	3649.8
	PRE	16.2	26.4	50.4	93.0	154.7	282.7	545.3	1079.4	2207.9	4728.4
	RES	-11.548	-9.207	-2.736	-18.530	-15.746	-55.170	-130.648	-320.940	-452.913	-1078.651

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	26.0	54.0	119.0	209.0	258.0	451.0	817.0	1549.0	2917.0	4355.0
	PRE	35.2	54.8	111.3	215.5	292.6	418.9	807.2	1470.7	2736.3	3928.8
	CHI	2.396	0.013	0.539	0.196	4.081	2.461	0.118	4.166	11.932	46.230
1996-	OBS	20.0	46.0	87.0	184.0	330.0	432.0	724.0	1299.0	2435.0	4205.0
	PRE	32.9	51.3	93.4	181.4	314.3	465.5	678.4	1337.9	2359.0	3783.3
	CHI	5.075	0.553	0.435	0.037	0.784	2.411	3.059	1.130	2.448	46.998
2001-	OBS	10.0	28.0	71.0	141.0	263.0	496.0	629.0	1052.0	1806.0	3337.0
	PRE	28.8	48.1	87.5	152.7	265.4	501.8	758.9	1136.1	2181.7	3330.2
	CHI	12.309	8.395	3.106	0.893	0.022	0.066	22.243	6.227	64.711	0.014
2006-	OBS	7.0	28.0	79.0	115.0	202.0	343.0	632.0	899.0	1496.0	2441.0
	PRE	24.3	43.0	83.5	143.6	224.9	426.2	831.1	1279.4	1882.1	3162.4
	CHI	12.288	5.250	0.246	5.707	2.330	16.225	47.703	113.109	79.196	164.569

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	184.59	3.62	51	P, C	96.90	994.64	0.0000
AGE-PERIOD	60.18	1.34	45	Cohort	90.50	320.40	0.0000
AGE-COHORT	31.42	0.87	36	Period	81.81	166.81	0.0000
PERIOD-COHORT	6.14	0.15	40	Age	6.89	32.59	0.7911
FULL AGE-PERIOD-COHORT	5.71	0.18	32			30.36	0.5499

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.880417	7.593058
35	1.353853	22.586725
40	1.781167	60.418094
45	2.124878	133.314837
50	2.456674	286.203149
55	2.752698	565.845521
60	2.985421	966.988596
65	3.176686	1502.054845
70	3.310268	2042.996285
75	3.414003	2594.194899

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.083335	0.825400
1966	-0.055274	0.880493
1971	0.006580	1.015266
1976	0.043321	1.104896
1981	0.023468	1.055524
1986	0.010071	1.023461

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.232625	0.585296
1891	-0.124674	0.750458
1896	-0.002957	0.993214
1901	0.042517	1.102852
1906	0.011537	1.026921
1911	-0.016657	0.962373
1916	-0.011928	0.972908
1921	0.019325	1.045503
1926	0.003796	1.008779
1931	0.048220	1.117429
1936	0.038909	1.093727
1941	0.041072	1.099187
1946	-0.052113	0.886924
1951	-0.026823	0.940106
1956	-0.101237	0.792068

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	6.0	7.0	15.0	10.0	14.0	9.0
	EXP	7.9	8.6	12.2	12.5	11.9	9.0
	CHI	0.5	0.3	0.7	0.5	0.4	0.0
35 -	OBS	25.0	17.0	30.0	45.0	36.0	32.0
	EXP	23.9	25.4	29.3	39.0	35.2	34.3
	CHI	0.0	2.8	0.0	0.9	0.0	0.2
40 -	OBS	68.0	76.0	68.0	89.0	95.0	92.0
	EXP	70.7	68.2	77.7	84.0	98.3	90.6
	CHI	0.1	0.9	1.2	0.3	0.1	0.0
45 -	OBS	147.0	162.0	178.0	165.0	186.0	201.0
	EXP	141.5	164.6	170.4	182.9	173.9	207.4
	CHI	0.2	0.0	0.3	1.7	0.8	0.2
50 -	OBS	313.0	297.0	404.0	387.0	379.0	336.0
	EXP	299.0	317.2	396.5	386.6	365.0	353.5
	CHI	0.7	1.3	0.1	0.0	0.5	0.9
55 -	OBS	569.0	611.0	647.0	828.0	709.0	693.0
	EXP	572.3	606.6	692.4	815.7	699.1	673.0
	CHI	0.0	0.0	3.0	0.2	0.1	0.6
60 -	OBS	864.0	1013.0	1146.0	1162.0	1249.0	1058.0
	EXP	879.2	974.7	1113.5	1198.4	1242.6	1085.8
	CHI	0.3	1.5	0.9	1.1	0.0	0.7
65 -	OBS	973.0	1288.0	1547.0	1678.0	1628.0	1666.0
	EXP	981.7	1297.4	1552.1	1673.7	1588.5	1687.4
	CHI	0.1	0.1	0.0	0.0	1.0	0.3
70 -	OBS	763.0	1175.0	1672.0	1896.0	1757.0	1819.0
	EXP	752.8	1176.8	1676.6	1898.7	1812.8	1766.1
	CHI	0.1	0.0	0.0	0.0	1.7	1.6
75 -	OBS	503.0	736.0	1270.0	1728.0	1686.0	1690.0
	EXP	503.0	746.3	1259.6	1699.3	1714.3	1691.1
	CHI	0.0	0.1	0.1	0.5	0.5	0.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	689.19	17.23	40	P, C	49.84	0.0000
AGE-PERIOD	565.37	14.13	40	Cohort	38.86	0.0000
AGE-COHORT	2468.95	61.72	40	Period	86.00	0.0000
PERIOD-COHORT	396.78	9.92	40	Age	12.88	0.0000
FULL AGE-PERIOD-COHORT	345.68	8.64	40			0.0000

AGE	EFFECT
30	7.593058
35	22.586725
40	60.418094
45	133.314837
50	286.203149
55	565.845521
60	966.988596
65	1502.054845
70	2042.996285
75	2594.194899

PERIOD	EFFECT	LOWER	UPPER
% Period Change	96.9623	93.9623	99.9623
1961	0.825400		
1966	0.880493		
1971	1.015266		
1976	1.104896		
1981	1.055524		
1986	1.023461		
1991	0.992371	0.961667	1.023075
1996	0.962226	0.903604	1.022689
2001	0.932996	0.849047	1.022303
2006	0.904654	0.797784	1.021918

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.585296	1.000000	
1891	0.750458	2.000000	
1896	0.993214	4.000000	
1901	1.102852	8.000000	
1906	1.026921	16.000000	
1911	0.962373	32.000000	
1916	0.972908	64.000000	
1921	1.045503	128.000000	
1926	1.008779	256.000000	
1931	1.117429	512.000000	
1936	1.093727	1024.000000	
1941	1.099187	2048.000000	
1946	0.886924	4096.000000	
1951	0.940106	8192.000000	
1956	0.900063	EXTRAPOLATION	0.792068
1961	0.871006	EXTRAPOLATION	
1966	0.842886	EXTRAPOLATION	
1971	0.815675	EXTRAPOLATION	
1976	0.789341	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	5.3	6.0	10.4	5.9	8.8	6.2	2.6	1.9	2.5	5.3
	EXP	7.0	7.3	8.5	7.4	7.5	7.0	6.6*	6.2*	5.8*	5.4*
	Elow							6.4	5.8	5.3	4.8
	Eup							6.8	6.5	6.3	6.1
35	OBS	19.7	14.9	25.7	31.7	21.6	20.3	18.2	5.8	8.6	5.5
	EXP	18.8	22.2	25.1	27.4	21.1	21.7	20.2*	18.9*	17.8*	16.7*
	Elow							19.6	17.8	16.2	14.7
	Eup							20.8	20.1	19.5	18.8
40	OBS	50.2	59.8	60.0	77.4	67.7	55.7	48.1	33.8	32.9	23.5
	EXP	52.1	53.7	68.5	73.0	70.1	54.8	56.4*	52.3*	49.1*	46.1*
	Elow							54.6	49.1	44.7	40.6
	Eup							58.1	55.6	53.8	52.0
45	OBS	111.2	120.8	142.6	148.5	164.7	145.3	142.3	110.0	95.4	64.1
	EXP	107.1	122.7	136.5	164.6	153.9	150.0	117.3*	120.6*	112.0*	105.0*
	Elow							113.7	113.2	101.9	92.6
	Eup							121.0	128.2	122.7	118.7
50	OBS	238.0	229.6	309.5	319.3	350.5	304.5	289.0	267.7	217.7	185.7
	EXP	227.3	245.2	303.8	319.0	337.6	320.4	312.2*	244.3*	251.0*	233.0*
	Elow							302.5	229.4	228.4	205.5
	Eup							321.8	259.6	275.1	263.2
55	OBS	476.9	483.0	522.3	663.5	611.1	666.3	549.1	490.1	451.3	381.5
	EXP	479.6	479.5	558.9	653.6	602.5	647.1	614.2*	598.5*	468.2*	481.2*
	Elow							595.2	562.0	426.1	424.4
	Eup							633.2	636.1	513.1	543.6
60	OBS	865.0	908.7	972.4	1007.9	1072.6	972.8	1071.5	936.1	848.3	792.6
	EXP	880.2	874.3	944.8	1039.5	1067.1	998.4	1072.3*	1017.7*	991.7*	775.9*
	Elow							1039.1	955.7	902.5	684.2
	Eup							1105.5	1081.6	1086.6	876.4
65	OBS	1220.5	1448.0	1560.9	1601.2	1580.9	1586.9	1637.1	1554.0	1431.3	1230.1
	EXP	1231.4	1458.6	1566.0	1597.2	1542.5	1607.2	1503.7*	1615.0*	1532.8*	1493.6*
	Elow							1457.2	1516.6	1394.8	1317.2
	Eup							1550.2	1716.5	1679.5	1687.2
70	OBS	1282.6	1784.0	2281.3	2314.8	2011.4	2095.2	2072.2	2059.0	2166.8	1857.1
	EXP	1265.5	1786.6	2287.5	2318.1	2075.3	2034.3	2119.7*	1983.1*	2129.9*	2021.4*
	Elow							2054.1	1862.3	1938.3	1782.6
	Eup							2185.2	2107.7	2333.8	2283.5
75	OBS	1253.3	1690.4	2637.5	3214.6	2765.5	2553.5	2382.0	2540.1	2400.0	2564.3
	EXP	1253.3	1714.2	2615.9	3161.1	2812.0	2555.2	2504.7*	2609.8*	2441.6*	2622.4*
	Elow							2427.2	2450.8	2221.9	2312.6
	Eup							2582.2	2773.8	2675.3	2962.4
30-79	OBS	389.0	454.2	549.0	597.8	567.5	551.4	539.7	509.6	481.4	433.8
	EXP	389.0	455.1	549.7	598.6	565.5	552.6	545.8*	534.6*	513.1*	489.0*
	Elow							528.9	502.0	466.9	431.2
	Eup							562.7	568.2	562.2	552.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	6.0	7.0	15.0	10.0	14.0	9.0	4.0	3.0	4.0	8.0
	EXP	7.9	8.6	12.2	12.5	11.9	10.2	10.1*	10.0*	9.2*	8.1*
	CHI	0.476	0.295	0.650	0.504	0.360	0.147	3.726	4.878	2.919	0.001
35 -	OBS	25.0	17.0	30.0	45.0	36.0	32.0	27.0	9.0	14.0	9.0
	EXP	23.9	25.4	29.3	39.0	35.2	34.3	29.9*	29.4*	29.0*	27.2*
	CHI	0.048	2.800	0.018	0.935	0.017	0.157	0.289	14.183	7.727	12.186
40 -	OBS	68.0	76.0	68.0	89.0	95.0	92.0	76.0	50.0	51.0	39.0
	EXP	70.7	68.2	77.7	84.0	98.3	90.6	89.1*	77.4*	76.2*	76.4*
	CHI	0.100	0.899	1.201	0.302	0.112	0.023	1.928	9.711	8.319	18.295
45 -	OBS	147.0	162.0	178.0	165.0	186.0	201.0	233.0	172.0	140.0	99.0
	EXP	141.5	164.6	170.4	182.9	173.9	207.4	192.1*	188.6*	164.3*	162.3*
	CHI	0.212	0.041	0.335	1.744	0.849	0.200	8.698	1.455	3.594	24.696
50 -	OBS	313.0	297.0	404.0	387.0	379.0	336.0	393.0	430.0	335.0	270.0
	EXP	299.0	317.2	396.5	386.6	365.0	353.5	424.5*	392.3*	386.2*	338.8*
	CHI	0.658	1.284	0.141	0.000	0.538	0.865	2.344	3.628	6.792	13.968
55 -	OBS	569.0	611.0	647.0	828.0	709.0	693.0	588.0	647.0	706.0	575.0
	EXP	572.3	606.6	692.4	815.7	699.1	673.0	657.7*	790.1*	732.5*	725.3*
	CHI	0.019	0.032	2.978	0.187	0.141	0.592	7.388	25.921	0.956	31.153
60 -	OBS	864.0	1013.0	1146.0	1162.0	1249.0	1058.0	1057.0	955.0	1074.0	1208.0
	EXP	879.2	974.7	1113.5	1198.4	1242.6	1085.8	1057.8*	1038.2*	1255.5*	1182.5*
	CHI	0.263	1.504	0.950	1.107	0.033	0.714	0.001	6.673	26.237	0.551
65 -	OBS	973.0	1288.0	1547.0	1678.0	1628.0	1666.0	1626.0	1411.0	1358.0	1458.0
	EXP	981.7	1297.4	1552.1	1673.7	1588.5	1687.4	1493.5*	1466.4*	1454.3*	1770.4*
	CHI	0.077	0.068	0.017	0.011	0.983	0.270	11.758	2.092	6.373	55.123
70 -	OBS	763.0	1175.0	1672.0	1896.0	1757.0	1819.0	1872.0	1779.0	1740.0	1583.0
	EXP	752.8	1176.8	1676.6	1898.7	1812.8	1766.1	1914.8*	1713.4*	1710.4*	1723.1*
	CHI	0.138	0.003	0.012	0.004	1.720	1.585	0.959	2.514	0.513	11.393
75 -	OBS	503.0	736.0	1270.0	1728.0	1686.0	1690.0	1603.0	1823.0	1682.0	1715.0
	EXP	503.0	746.3	1259.6	1699.3	1714.3	1691.1	1685.5*	1873.0*	1711.2*	1753.9*
	CHI	0.000	0.143	0.086	0.486	0.467	0.001	4.040	1.336	0.497	0.863
30-79	OBS	4231.0	5382.0	6977.0	7988.0	7739.0	7596.0	7479.0	7279.0	7104.0	6964.0
	EXP	4232.0	5385.7	6980.2	7990.7	7741.6	7599.4	7555.2*	7578.8*	7528.6*	7768.0*
	O/E	1.000	0.999	1.000	1.000	1.000	1.000	0.990	0.960	0.944	0.896

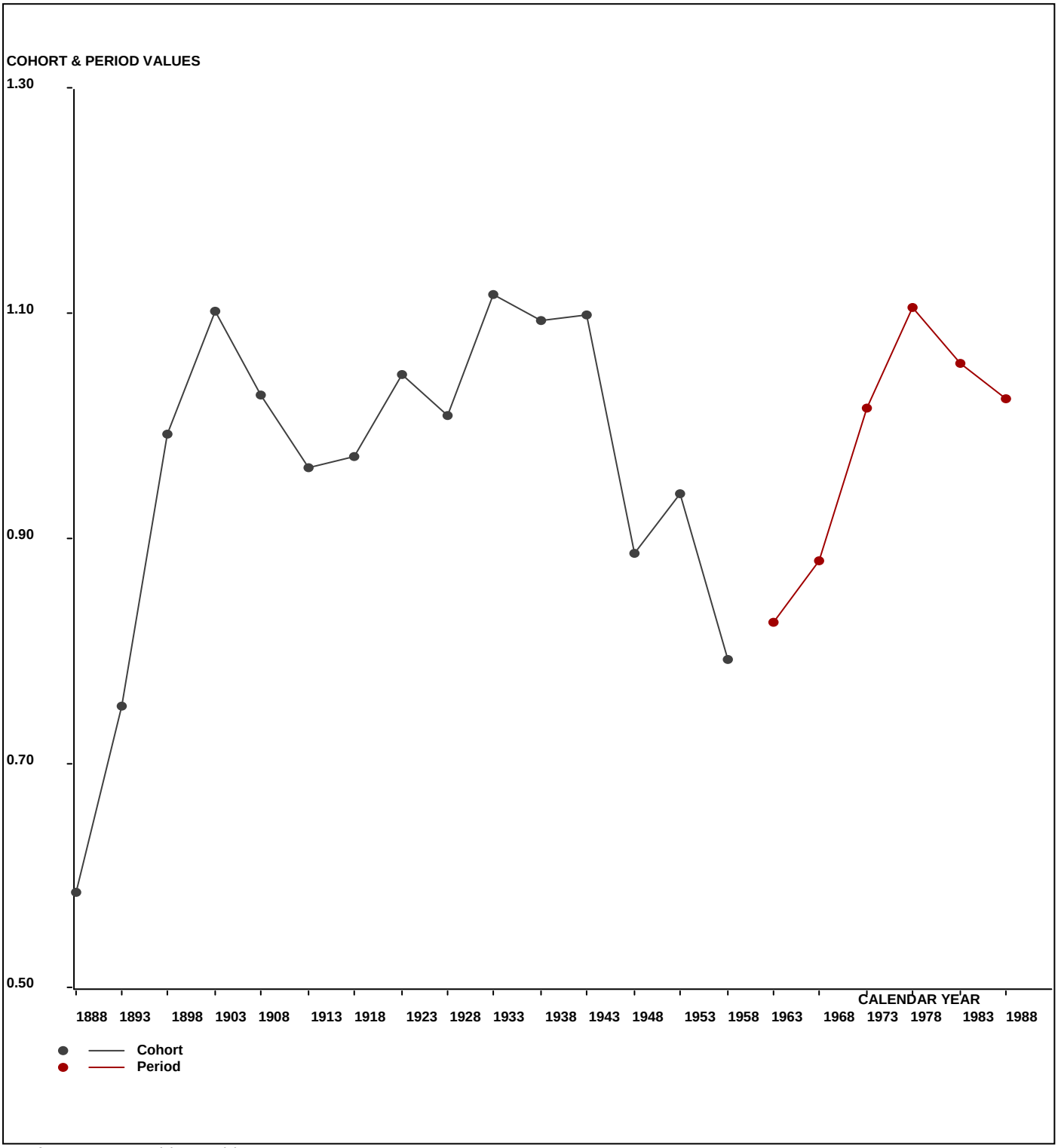
CHI SQUARE (LOG)= 345.6795 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

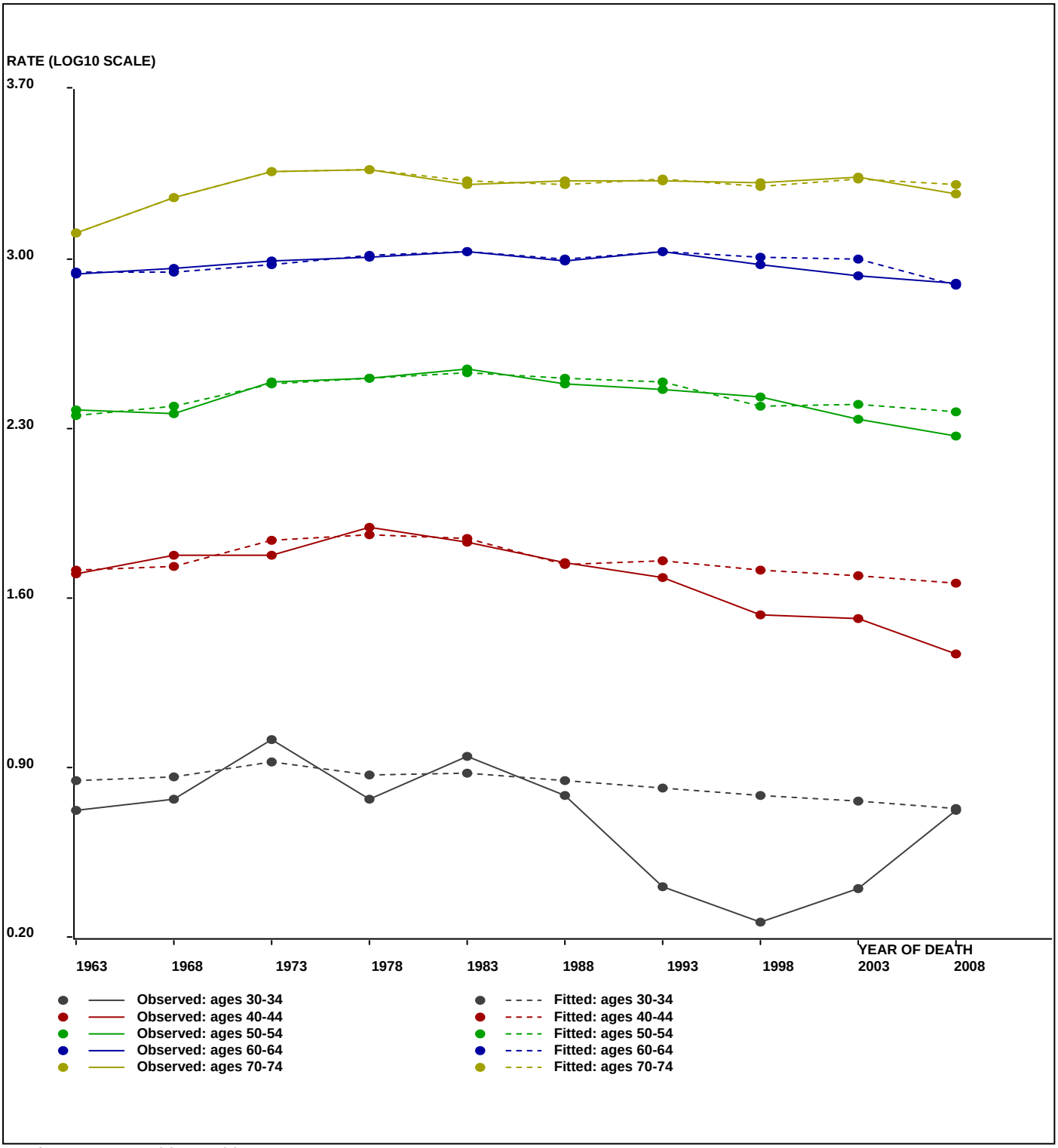


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	2.6	18.2	48.1	142.3	289.0	549.1	1071.5	1637.1	2072.2	2382.0
	PRE	6.6	20.2	56.4	117.3	312.2	614.2	1072.3	1503.7	2119.7	2504.7
	RES	-3.977	-1.984	-8.292	24.967	-23.197	-65.093	-0.764	133.420	-47.430	-122.630
1996-	OBS	1.9	5.8	33.8	110.0	267.7	490.1	936.1	1554.0	2059.0	2540.1
	PRE	6.2	18.9	52.3	120.6	244.3	598.5	1017.7	1615.0	1983.1	2609.8
	RES	-4.306	-13.141	-18.532	-10.593	23.491	-108.400	-81.587	-61.008	75.961	-69.699
2001-	OBS	2.5	8.6	32.9	95.4	217.7	451.3	848.3	1431.3	2166.8	2400.0
	PRE	5.8	17.8	49.1	112.0	251.0	468.2	991.7	1532.8	2129.9	2441.6
	RES	-3.259	-9.175	-16.226	-16.557	-33.290	-16.918	-143.359	-101.464	36.891	-41.607
2006-	OBS	5.3	5.5	23.5	64.1	185.7	381.5	792.6	1230.1	1857.1	2564.3
	PRE	5.4	16.7	46.1	105.0	233.0	481.2	775.9	1493.6	2021.4	2622.4
	RES	-0.072	-11.154	-22.547	-40.975	-47.318	-99.733	16.748	-263.556	-164.370	-58.175

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	4.0	27.0	76.0	233.0	393.0	588.0	1057.0	1626.0	1872.0	1603.0
	PRE	10.1	29.9	89.1	192.1	424.5	657.7	1057.8	1493.5	1914.8	1685.5
	CHI	3.726	0.289	1.928	8.698	2.344	7.388	0.001	11.758	0.959	4.040
1996-	OBS	3.0	9.0	50.0	172.0	430.0	647.0	955.0	1411.0	1779.0	1823.0
	PRE	10.0	29.4	77.4	188.6	392.3	790.1	1038.2	1466.4	1713.4	1873.0
	CHI	4.878	14.183	9.711	1.455	3.628	25.921	6.673	2.092	2.514	1.336
2001-	OBS	4.0	14.0	51.0	140.0	335.0	706.0	1074.0	1358.0	1740.0	1682.0
	PRE	9.2	29.0	76.2	164.3	386.2	732.5	1255.5	1454.3	1710.4	1711.2
	CHI	2.919	7.727	8.319	3.594	6.792	0.956	26.237	6.373	0.513	0.497
2006-	OBS	8.0	9.0	39.0	99.0	270.0	575.0	1208.0	1458.0	1583.0	1715.0
	PRE	8.1	27.2	76.4	162.3	338.8	725.3	1182.5	1770.4	1723.1	1753.9
	CHI	0.001	12.186	18.295	24.696	13.968	31.153	0.551	55.123	11.393	0.863

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	219.33	4.30	51	P, C	94.99	1192.32	0.0000
AGE-PERIOD	20.74	0.46	45	Cohort	47.06	111.00	0.0000
AGE-COHORT	94.72	2.63	36	Period	88.41	507.91	0.0000
PERIOD-COHORT	13.47	0.34	40	Age	18.50	71.77	0.0015
FULL AGE-PERIOD-COHORT	10.98	0.34	32			58.51	0.0029

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.016995	10.399088
35	1.212421	16.308780
40	1.438687	27.459134
45	1.665501	46.291514
50	1.943146	87.729625
55	2.237983	172.974958
60	2.518913	330.303187
65	2.815197	653.426353
70	3.065326	1162.319449
75	3.323010	2103.826291

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.203641	0.625690
1966	-0.068269	0.854536
1971	0.054380	1.133393
1976	0.075070	1.188693
1981	0.030941	1.073844
1986	-0.053306	0.884493

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.146553	0.713587
1891	-0.116660	0.764434
1896	-0.061794	0.867373
1901	-0.004760	0.989099
1906	-0.005402	0.987639
1911	0.017428	1.040945
1916	0.037519	1.090231
1921	0.050351	1.122925
1926	0.054084	1.132620
1931	0.052368	1.128152
1936	0.027387	1.065092
1941	-0.029066	0.935263
1946	-0.093617	0.806089
1951	-0.243810	0.570414
1956	-0.087289	0.817921

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	5.0	14.0	11.0	19.0	11.0	11.0
	EXP	8.3	11.1	15.9	16.8	10.1	11.0
	CHI	1.3	0.7	1.5	0.3	0.1	0.0
35 -	OBS	8.0	15.0	22.0	29.0	29.0	12.0
	EXP	14.7	18.0	23.0	25.8	23.5	13.0
	CHI	3.1	0.5	0.0	0.4	1.3	0.1
40 -	OBS	17.0	40.0	40.0	45.0	42.0	22.0
	EXP	26.1	33.8	39.8	40.0	38.7	32.3
	CHI	3.2	1.2	0.0	0.6	0.3	3.3
45 -	OBS	31.0	59.0	87.0	74.0	53.0	50.0
	EXP	41.7	59.6	74.2	69.0	59.8	53.0
	CHI	2.8	0.0	2.2	0.4	0.8	0.2
50 -	OBS	68.0	87.0	153.0	154.0	121.0	90.0
	EXP	75.1	105.7	145.7	143.1	114.9	91.2
	CHI	0.7	3.3	0.4	0.8	0.3	0.0
55 -	OBS	137.0	188.0	261.0	288.0	251.0	173.0
	EXP	127.5	194.6	264.8	288.1	244.1	179.5
	CHI	0.7	0.2	0.1	0.0	0.2	0.2
60 -	OBS	228.0	284.0	456.0	500.0	494.0	324.0
	EXP	204.2	310.8	459.3	493.5	463.8	359.9
	CHI	2.8	2.3	0.0	0.1	2.0	3.6
65 -	OBS	273.0	498.0	780.0	845.0	766.0	650.0
	EXP	282.7	491.2	724.9	847.3	787.8	681.3
	CHI	0.3	0.1	4.2	0.0	0.6	1.4
70 -	OBS	336.0	607.0	919.0	1082.0	1114.0	1017.0
	EXP	330.7	567.4	955.0	1117.7	1134.9	973.1
	CHI	0.1	2.8	1.4	1.1	0.4	2.0
75 -	OBS	377.0	593.0	964.0	1333.0	1354.0	1321.0
	EXP	377.0	598.4	995.9	1329.7	1360.3	1282.0
	CHI	0.0	0.0	1.0	0.0	0.0	1.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	1265.86	31.65	40	P, C	-81.65	0.0000
AGE-PERIOD	1934.52	48.36	40	Cohort	-18.86	0.0000
AGE-COHORT	1359.94	34.00	40	Period	-69.08	0.0000
PERIOD-COHORT	1983.94	49.60	40	Age	-15.90	0.0000
FULL AGE-PERIOD-COHORT	2299.38	57.48	40			0.0000

AGE	EFFECT
30	10.399088
35	16.308780
40	27.459134
45	46.291514
50	87.729625
55	172.974958
60	330.303187
65	653.426353
70	1162.319449
75	2103.826291

PERIOD	EFFECT	LOWER	UPPER
% Period Change	82.3670	79.3670	85.3670
1961	0.625690		
1966	0.854536		
1971	1.133393		
1976	1.188693		
1981	1.073844		
1986	0.884493		
1991	0.728530	0.701996	0.755065
1996	0.600069	0.557153	0.644576
2001	0.494258	0.442195	0.550255
2006	0.407106	0.350957	0.469737

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.713587	1.000000	
1891	0.764434	2.000000	
1896	0.867373	4.000000	
1901	0.989099	8.000000	
1906	0.987639	16.000000	
1911	1.040945	32.000000	
1916	1.090231	64.000000	
1921	1.122925	128.000000	
1926	1.132620	256.000000	
1931	1.128152	512.000000	
1936	1.065092	1024.000000	
1941	0.935263	2048.000000	
1946	0.806089	4096.000000	
1951	0.570414	8192.000000	
1956	0.527903	EXTRAPOLATION	0.817921
1961	0.452811	EXTRAPOLATION	
1966	0.388401	EXTRAPOLATION	
1971	0.333153	EXTRAPOLATION	
1976	0.285764	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	4.4	11.9	7.6	11.3	6.9	7.5	3.2	4.3	2.5	0.7
	EXP	7.3	9.5	11.0	10.0	6.4	4.9	3.4*	2.4*	1.7*	1.2*
	Elow							3.3	2.3	1.5	1.0
	Eup							3.6	2.6	1.9	1.4
35	OBS	6.3	13.1	18.8	20.4	17.4	7.6	10.8	3.9	8.0	2.5
	EXP	11.6	15.7	19.7	18.1	14.1	8.2	6.3*	4.4*	3.1*	2.2*
	Elow							6.0	4.1	2.8	1.9
	Eup							6.5	4.8	3.5	2.6
40	OBS	12.5	31.5	35.3	39.1	29.9	13.3	12.7	5.4	4.5	7.2
	EXP	19.3	26.6	35.1	34.8	27.6	19.6	11.4*	8.7*	6.1*	4.3*
	Elow							11.0	8.1	5.5	3.7
	Eup							11.8	9.3	6.8	5.0
45	OBS	23.4	44.0	69.7	66.6	46.9	36.2	29.3	17.3	10.2	11.0
	EXP	31.6	44.4	59.4	62.1	52.9	38.3	27.2*	15.8*	12.1*	8.5*
	Elow							26.2	14.7	10.8	7.4
	Eup							28.2	17.0	13.4	9.8
50	OBS	51.7	67.2	117.2	127.1	111.9	81.6	54.4	41.7	38.3	37.1
	EXP	57.1	81.7	111.7	118.1	106.3	82.6	59.8*	42.4*	24.7*	18.9*
	Elow							57.6	39.4	22.1	16.3
	Eup							62.0	45.6	27.5	21.8
55	OBS	114.8	148.6	210.7	230.8	216.3	166.3	113.0	95.4	77.4	81.6
	EXP	106.9	153.9	213.7	230.9	210.4	172.6	134.2*	97.1*	68.9*	40.2*
	Elow							129.3	90.1	61.7	34.6
	Eup							139.1	104.3	76.7	46.3
60	OBS	228.3	254.8	386.9	433.7	424.2	297.9	293.0	254.8	205.4	196.2
	EXP	204.4	278.8	389.7	428.1	398.3	330.9	271.5*	211.1*	152.7*	108.4*
	Elow							261.6	196.0	136.6	93.4
	Eup							281.4	226.8	170.0	125.1
65	OBS	342.4	559.9	787.0	806.3	743.8	619.1	591.0	559.5	497.5	398.2
	EXP	354.6	552.3	731.4	808.5	765.0	649.0	539.2*	442.3*	344.0*	248.8*
	Elow							519.5	410.7	307.7	214.5
	Eup							558.8	475.2	383.0	287.1
70	OBS	564.8	921.6	1253.9	1321.0	1275.3	1171.4	1222.1	1213.0	1135.7	901.0
	EXP	555.9	861.5	1303.0	1364.6	1299.3	1120.8	950.9*	790.0*	648.1*	504.0*
	Elow							916.2	733.5	579.8	434.5
	Eup							985.5	848.6	721.5	581.5
75	OBS	939.3	1362.0	2002.0	2479.8	2221.0	1996.0	1897.6	2052.4	1912.0	1767.3
	EXP	939.3	1374.3	2068.2	2473.5	2231.3	1937.0	1671.0*	1417.6*	1177.7*	966.2*
	Elow							1610.1	1316.2	1053.7	833.0
	Eup							1731.9	1522.8	1311.2	1114.9
30-79	OBS	135.7	201.2	288.2	319.1	293.7	245.3	231.7	224.3	202.9	176.6
	EXP	136.7	201.9	288.4	318.2	293.2	247.2	204.9*	166.0*	130.7*	99.4*
	Elow							197.5	154.1	116.9	85.7
	Eup							212.4	178.3	145.5	114.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	5.0	14.0	11.0	19.0	11.0	11.0	5.0	7.0	4.0	1.0
	EXP	8.3	11.1	15.9	16.8	10.1	7.1	5.3*	3.9*	2.7*	1.8*
	CHI	1.330	0.745	1.485	0.301	0.083	2.143	0.018	2.407	0.603	0.362
35 -	OBS	8.0	15.0	22.0	29.0	29.0	12.0	16.0	6.0	13.0	4.0
	EXP	14.7	18.0	23.0	25.8	23.5	13.0	9.3*	6.9*	5.1*	3.6*
	CHI	3.055	0.499	0.042	0.409	1.277	0.076	4.808	0.115	12.214	0.042
40 -	OBS	17.0	40.0	40.0	45.0	42.0	22.0	20.0	8.0	7.0	12.0
	EXP	26.1	33.8	39.8	40.0	38.7	32.3	18.0*	12.9*	9.5*	7.2*
	CHI	3.200	1.153	0.001	0.630	0.285	3.298	0.213	1.843	0.674	3.202
45 -	OBS	31.0	59.0	87.0	74.0	53.0	50.0	48.0	27.0	15.0	17.0
	EXP	41.7	59.6	74.2	69.0	59.8	53.0	44.5*	24.8*	17.7*	13.2*
	CHI	2.766	0.006	2.216	0.367	0.775	0.166	0.273	0.200	0.419	1.104
50 -	OBS	68.0	87.0	153.0	154.0	121.0	90.0	74.0	67.0	59.0	54.0
	EXP	75.1	105.7	145.7	143.1	114.9	91.2	81.3*	68.2*	38.1*	27.4*
	CHI	0.679	3.321	0.362	0.823	0.322	0.015	0.654	0.019	11.530	25.795
55 -	OBS	137.0	188.0	261.0	288.0	251.0	173.0	121.0	126.0	121.0	123.0
	EXP	127.5	194.6	264.8	288.1	244.1	179.5	143.7*	128.2*	107.8*	60.5*
	CHI	0.702	0.227	0.054	0.000	0.195	0.236	3.597	0.036	1.615	64.437
60 -	OBS	228.0	284.0	456.0	500.0	494.0	324.0	289.0	260.0	260.0	299.0
	EXP	204.2	310.8	459.3	493.5	463.8	359.9	267.8*	215.4*	193.3*	165.2*
	CHI	2.780	2.305	0.023	0.085	1.968	3.579	1.680	9.247	23.011	108.373
65 -	OBS	273.0	498.0	780.0	845.0	766.0	650.0	587.0	508.0	472.0	472.0
	EXP	282.7	491.2	724.9	847.3	787.8	681.3	535.5*	401.6*	326.4*	294.9*
	CHI	0.334	0.093	4.187	0.006	0.603	1.442	4.949	28.168	64.984	106.364
70 -	OBS	336.0	607.0	919.0	1082.0	1114.0	1017.0	1104.0	1048.0	912.0	768.0
	EXP	330.7	567.4	955.0	1117.7	1134.9	973.1	859.0*	682.5*	520.4*	429.6*
	CHI	0.085	2.759	1.357	1.138	0.386	1.984	69.881	195.697	294.593	266.539
75 -	OBS	377.0	593.0	964.0	1333.0	1354.0	1321.0	1277.0	1473.0	1340.0	1182.0
	EXP	377.0	598.4	995.9	1329.7	1360.3	1282.0	1124.5*	1017.4*	825.4*	646.2*
	CHI	0.000	0.048	1.021	0.008	0.029	1.188	20.679	204.002	320.843	444.194
30-79	OBS	1480.0	2385.0	3693.0	4369.0	4235.0	3670.0	3541.0	3530.0	3203.0	2932.0
	EXP	1488.2	2390.6	3698.4	4370.8	4237.9	3672.4	3089.0*	2561.7*	2046.4*	1649.7*
	O/E	0.994	0.998	0.999	1.000	0.999	0.999	1.146	1.378	1.565	1.777

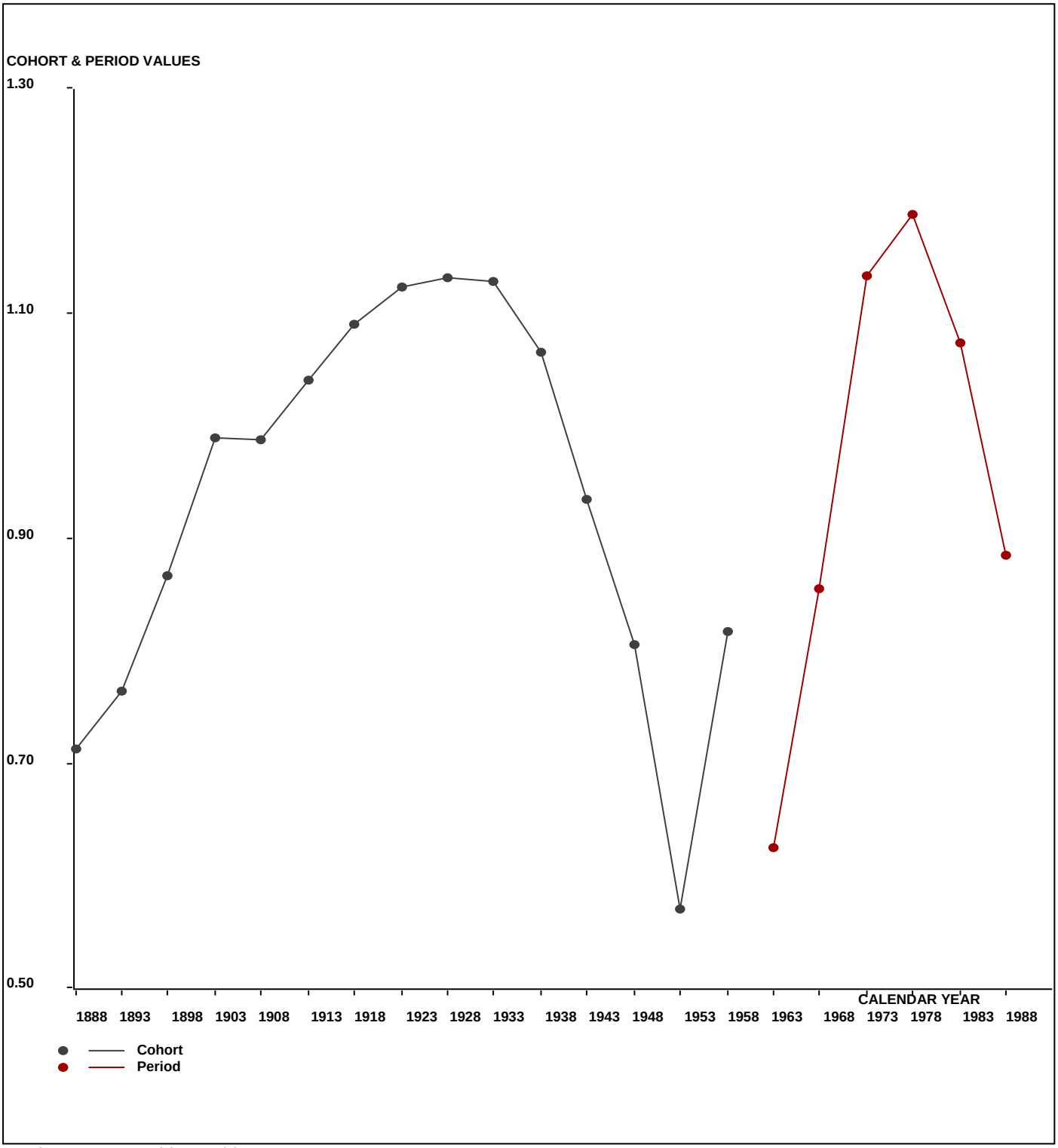
CHI SQUARE (LOG)= 2299.3825 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

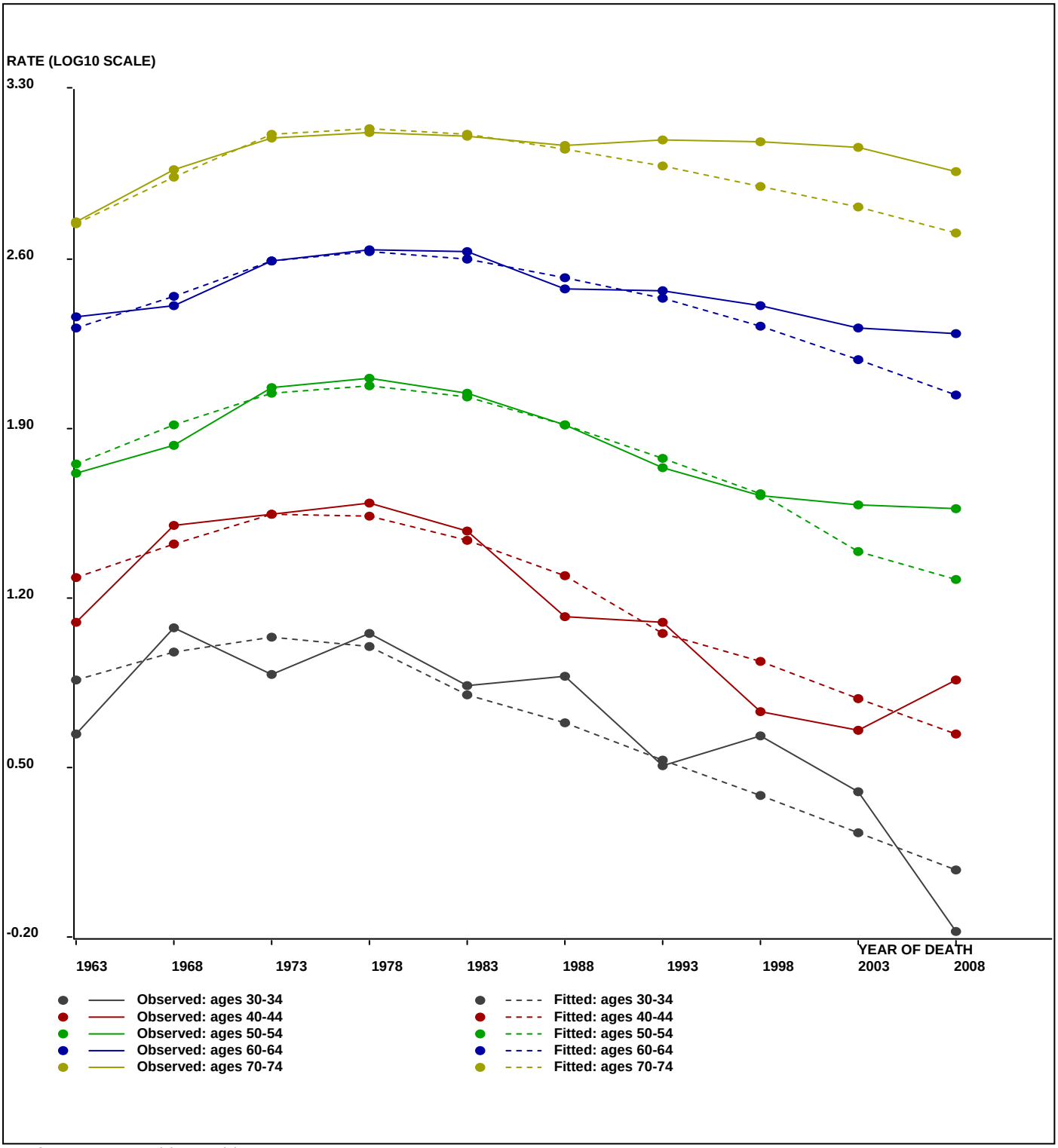


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	3.2	10.8	12.7	29.3	54.4	113.0	293.0	591.0	1222.1	1897.6
	PRE	3.4	6.3	11.4	27.2	59.8	134.2	271.5	539.2	950.9	1671.0
	RES	-0.197	4.507	1.240	2.131	-5.360	-21.232	21.500	51.834	271.211	226.599
1996-	OBS	4.3	3.9	5.4	17.3	41.7	95.4	254.8	559.5	1213.0	2052.4
	PRE	2.4	4.4	8.7	15.8	42.4	97.1	211.1	442.3	790.0	1417.6
	RES	1.898	-0.572	-3.291	1.423	-0.718	-1.638	43.744	117.146	423.001	634.788
2001-	OBS	2.5	8.0	4.5	10.2	38.3	77.4	205.4	497.5	1135.7	1912.0
	PRE	1.7	3.1	6.1	12.1	24.7	68.9	152.7	344.0	648.1	1177.7
	RES	0.807	4.843	-1.634	-1.858	13.615	8.434	52.681	153.492	487.611	734.284
2006-	OBS	0.7	2.5	7.2	11.0	37.1	81.6	196.2	398.2	901.0	1767.3
	PRE	1.2	2.2	4.3	8.5	18.9	40.2	108.4	248.8	504.0	966.2
	RES	-0.541	0.238	2.896	2.469	18.290	41.440	87.793	149.417	396.975	801.084

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	5.0	16.0	20.0	48.0	74.0	121.0	289.0	587.0	1104.0	1277.0
	PRE	5.3	9.3	18.0	44.5	81.3	143.7	267.8	535.5	859.0	1124.5
	CHI	0.018	4.808	0.213	0.273	0.654	3.597	1.680	4.949	69.881	20.679
1996-	OBS	7.0	6.0	8.0	27.0	67.0	126.0	260.0	508.0	1048.0	1473.0
	PRE	3.9	6.9	12.9	24.8	68.2	128.2	215.4	401.6	682.5	1017.4
	CHI	2.407	0.115	1.843	0.200	0.019	0.036	9.247	28.168	195.697	204.002
2001-	OBS	4.0	13.0	7.0	15.0	59.0	121.0	260.0	472.0	912.0	1340.0
	PRE	2.7	5.1	9.5	17.7	38.1	107.8	193.3	326.4	520.4	825.4
	CHI	0.603	12.214	0.674	0.419	11.530	1.615	23.011	64.984	294.593	320.843
2006-	OBS	1.0	4.0	12.0	17.0	54.0	123.0	299.0	472.0	768.0	1182.0
	PRE	1.8	3.6	7.2	13.2	27.4	60.5	165.2	294.9	429.6	646.2
	CHI	0.362	0.042	3.202	1.104	25.795	64.437	108.373	106.364	266.539	444.194

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1146.69	22.48	51	P, C	99.62	6124.66	0.0000
AGE-PERIOD	24.00	0.53	45	Cohort	82.05	127.44	0.0000
AGE-COHORT	80.80	2.24	36	Period	94.67	428.61	0.0000
PERIOD-COHORT	5.77	0.14	40	Age	25.30	30.64	0.8567
FULL AGE-PERIOD-COHORT	4.31	0.13	32			22.86	0.8827

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.968380	9.297799
35	1.380914	24.038880
40	1.803837	63.655725
45	2.214860	164.006056
50	2.555506	359.340528
55	2.926259	843.838109
60	3.286112	1932.468752
65	3.627932	4245.533024
70	3.936854	8646.771960
75	4.224297	16760.883168

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.051405	1.125653
1966	0.036258	1.087072
1971	0.040581	1.097946
1976	0.011817	1.027583
1981	-0.043149	0.905422
1986	-0.123764	0.752032

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.052616	1.128797
1891	0.035975	1.086364
1896	0.029934	1.071357
1901	0.015543	1.036438
1906	-0.018032	0.959330
1911	-0.032991	0.926850
1916	-0.042132	0.907545
1921	-0.039192	0.913709
1926	-0.033701	0.925334
1931	-0.037385	0.917519
1936	-0.026363	0.941102
1941	-0.028216	0.937096
1946	0.070749	1.176925
1951	0.095193	1.245068
1956	0.089732	1.229509

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	9.0	14.0	11.0	16.0	17.0	12.0
	EXP	10.7	10.7	12.8	17.8	15.9	12.0
	CHI	0.3	1.0	0.3	0.2	0.1	0.0
35 -	OBS	31.0	26.0	23.0	33.0	45.0	33.0
	EXP	31.4	26.9	27.8	30.9	40.6	34.2
	CHI	0.0	0.0	0.8	0.1	0.5	0.0
40 -	OBS	83.0	89.0	70.0	78.0	61.0	86.0
	EXP	87.4	80.5	71.7	68.6	71.8	89.0
	CHI	0.2	0.9	0.0	1.3	1.6	0.1
45 -	OBS	230.0	195.0	210.0	172.0	151.0	162.0
	EXP	218.1	216.5	207.8	171.7	154.8	152.8
	CHI	0.6	2.1	0.0	0.0	0.1	0.6
50 -	OBS	500.0	456.0	483.0	405.0	328.0	273.0
	EXP	490.8	456.0	472.2	420.3	327.5	278.8
	CHI	0.2	0.0	0.2	0.6	0.0	0.1
55 -	OBS	1152.0	1061.0	1055.0	1032.0	827.0	631.0
	EXP	1118.9	1089.1	1056.9	1014.8	852.1	627.6
	CHI	1.0	0.7	0.0	0.3	0.7	0.0
60 -	OBS	2446.0	2425.0	2382.0	2141.0	1978.0	1602.0
	EXP	2422.7	2382.7	2427.7	2187.1	1982.3	1573.2
	CHI	0.2	0.8	0.9	1.0	0.0	0.5
65 -	OBS	4621.0	4754.0	4992.0	4701.0	4054.0	3443.0
	EXP	4627.1	4808.0	4964.7	4710.6	4012.9	3442.3
	CHI	0.0	0.6	0.2	0.0	0.4	0.0
70 -	OBS	7513.0	8028.0	8829.0	8553.0	7807.0	6226.0
	EXP	7579.3	8046.8	8839.5	8551.7	7707.6	6232.0
	CHI	0.6	0.0	0.0	0.0	1.3	0.0
75 -	OBS	10671.0	11367.0	12853.0	13362.0	12265.0	10624.0
	EXP	10671.0	11301.2	12828.1	13321.2	12370.4	10650.9
	CHI	0.0	0.4	0.0	0.1	0.9	0.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	50781.09	1269.53	40	P, C	96.77	0.0000
AGE-PERIOD	992.97	24.82	40	Cohort	-65.01	0.0000
AGE-COHORT	11775.01	294.38	40	Period	86.08	0.0000
PERIOD-COHORT	1300.65	32.52	40	Age	-25.98	0.0000
FULL AGE-PERIOD-COHORT	1638.54	40.96	40			0.0000

AGE	EFFECT
30	9.297799
35	24.038880
40	63.655725
45	164.006056
50	359.340528
55	843.838109
60	1932.468752
65	4245.533024
70	8646.771960
75	16760.883168

PERIOD	EFFECT	LOWER	UPPER
% Period Change	83.0587	80.0587	86.0587
1961	1.125653		
1966	1.087072		
1971	1.097946		
1976	1.027583		
1981	0.905422		
1986	0.752032		
1991	0.624628	0.602067	0.647189
1996	0.518808	0.482007	0.556963
2001	0.430915	0.385889	0.479315
2006	0.357913	0.308938	0.412492

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.128797	1.000000	
1891	1.086364	2.000000	
1896	1.071357	4.000000	
1901	1.036438	8.000000	
1906	0.959330	16.000000	
1911	0.926850	32.000000	
1916	0.907545	64.000000	
1921	0.913709	128.000000	
1926	0.925334	256.000000	
1931	0.917519	512.000000	
1936	0.941102	1024.000000	
1941	0.937096	2048.000000	
1946	1.176925	4096.000000	
1951	1.245068	8192.000000	
1956	1.321616	EXTRAPOLATION	1.229509
1961	1.421437	EXTRAPOLATION	
1966	1.528798	EXTRAPOLATION	
1971	1.644268	EXTRAPOLATION	
1976	1.768459	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	8.1	12.5	8.2	10.1	11.2	8.6	10.2	5.2	3.3	6.2
	EXP	9.6	9.5	9.6	11.2	10.5	9.2	8.3*	7.4*	6.6*	5.9*
	Elow							8.0	6.9	5.9	5.1
	Eup							8.6	7.9	7.3	6.8
35	OBS	24.7	23.2	20.5	24.7	28.4	21.7	17.6	15.5	9.0	13.9
	EXP	25.0	24.0	24.8	23.1	25.6	22.5	19.8*	17.7*	15.8*	14.1*
	Elow							19.1	16.5	14.2	12.2
	Eup							20.6	19.0	17.6	16.3
40	OBS	62.2	70.8	62.6	70.0	45.9	54.4	49.7	42.0	28.8	30.1
	EXP	65.5	64.0	64.1	61.6	54.0	56.3	49.5*	43.6*	39.0*	34.8*
	Elow							47.7	40.6	34.9	30.1
	Eup							51.3	46.9	43.4	40.1
45	OBS	176.6	146.7	168.4	154.9	136.3	122.5	110.3	85.3	92.5	65.5
	EXP	167.5	162.9	166.6	154.6	139.7	115.6	120.6*	105.9*	93.4*	83.4*
	Elow							116.2	98.4	83.6	72.0
	Eup							124.9	113.7	103.9	96.2
50	OBS	382.0	354.5	368.8	329.2	299.0	249.1	213.8	177.9	155.3	144.6
	EXP	374.9	354.5	360.5	341.7	298.5	254.3	210.3*	219.4*	192.8*	170.0*
	Elow							202.7	203.8	172.6	146.7
	Eup							217.9	235.5	214.4	195.9
55	OBS	938.2	828.3	839.3	805.7	686.1	585.4	476.9	358.3	322.9	275.3
	EXP	911.2	850.2	840.8	792.3	707.0	582.3	496.0*	410.3*	428.0*	376.0*
	Elow							478.1	381.2	383.2	324.6
	Eup							514.0	440.4	476.0	433.4
60	OBS	2276.2	2051.1	1929.5	1764.2	1595.2	1369.4	1171.4	849.0	650.0	526.8
	EXP	2254.6	2015.3	1966.5	1802.2	1598.7	1344.8	1107.5*	943.5*	780.3*	814.0*
	Elow							1067.5	876.6	698.8	702.6
	Eup							1147.5	1012.9	868.0	938.2
65	OBS	5113.2	4729.6	4496.4	4035.3	3524.3	2917.9	2253.5	1794.1	1391.2	979.6
	EXP	5120.0	4783.4	4471.8	4043.5	3488.6	2917.3	2453.9*	2020.9*	1721.7*	1423.9*
	Elow							2365.2	1877.6	1541.8	1229.1
	Eup							2542.5	2169.6	1915.1	1641.1
70	OBS	10481.3	10046.9	9827.9	8525.2	7349.9	5895.8	4706.5	3622.1	2708.5	1956.6
	EXP	10573.9	10070.4	9839.6	8523.9	7256.3	5901.4	4935.0*	4151.1*	3418.7*	2912.5*
	Elow							4756.7	3856.6	3061.5	2514.0
	Eup							5113.2	4456.3	3802.7	3356.7
75	OBS	21296.9	19909.2	19753.9	17905.4	14434.5	11653.2	9208.6	7337.6	5470.9	4243.7
	EXP	21296.9	19793.8	19715.7	17850.8	14558.5	11682.7	9501.4*	7945.3*	6683.2*	5504.1*
	Elow							9158.2	7381.7	5984.9	4751.0
	Eup							9844.6	8529.6	7433.9	6343.5
30-79	OBS	2110.5	1970.1	1928.4	1732.8	1468.3	1204.0	965.1	752.6	578.9	443.4
	EXP	2109.7	1971.2	1929.0	1733.8	1468.6	1202.9	999.9*	843.0*	716.6*	616.8*
	Elow							963.8	783.2	641.7	532.4
	Eup							1036.1	905.0	797.1	710.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	9.0	14.0	11.0	16.0	17.0	12.0	15.0	8.0	5.0	9.0
	EXP	10.7	10.7	12.8	17.8	15.9	12.9	12.1*	11.4*	10.1*	8.5*
	CHI	0.272	1.049	0.256	0.190	0.079	0.063	0.692	1.000	2.561	0.031
35 -	OBS	31.0	26.0	23.0	33.0	45.0	33.0	25.0	23.0	14.0	22.0
	EXP	31.4	26.9	27.8	30.9	40.6	34.2	28.2*	26.3*	24.7*	22.3*
	CHI	0.006	0.030	0.832	0.143	0.487	0.041	0.364	0.411	4.636	0.005
40 -	OBS	83.0	89.0	70.0	78.0	61.0	86.0	76.0	60.0	43.0	48.0
	EXP	87.4	80.5	71.7	68.6	71.8	89.0	75.7*	62.3*	58.1*	55.5*
	CHI	0.224	0.902	0.042	1.278	1.629	0.100	0.001	0.087	3.933	1.013
45 -	OBS	230.0	195.0	210.0	172.0	151.0	162.0	174.0	130.0	132.0	98.0
	EXP	218.1	216.5	207.8	171.7	154.8	152.8	190.2*	161.5*	133.4*	124.8*
	CHI	0.644	2.131	0.023	0.001	0.092	0.553	1.376	6.141	0.014	5.736
50 -	OBS	500.0	456.0	483.0	405.0	328.0	273.0	281.0	278.0	235.0	206.0
	EXP	490.8	456.0	472.2	420.3	327.5	278.8	276.4*	342.9*	291.7*	242.2*
	CHI	0.173	0.000	0.249	0.558	0.001	0.119	0.075	12.288	11.024	5.401
55 -	OBS	1152.0	1061.0	1055.0	1032.0	827.0	631.0	517.0	464.0	497.0	412.0
	EXP	1118.9	1089.1	1056.9	1014.8	852.1	627.6	537.7*	531.2*	658.6*	562.7*
	CHI	0.978	0.723	0.003	0.293	0.741	0.018	0.800	8.502	39.665	40.355
60 -	OBS	2446.0	2425.0	2382.0	2141.0	1978.0	1602.0	1236.0	899.0	821.0	801.0
	EXP	2422.7	2382.7	2427.7	2187.1	1982.3	1573.2	1168.6*	999.1*	985.7*	1237.7*
	CHI	0.224	0.751	0.861	0.970	0.010	0.529	3.889	10.030	27.520	154.079
65 -	OBS	4621.0	4754.0	4992.0	4701.0	4054.0	3443.0	2528.0	1818.0	1414.0	1184.0
	EXP	4627.1	4808.0	4964.7	4710.6	4012.9	3442.3	2752.7*	2047.9*	1750.0*	1721.1*
	CHI	0.008	0.607	0.150	0.019	0.421	0.000	18.349	25.808	64.505	167.608
70 -	OBS	7513.0	8028.0	8829.0	8553.0	7807.0	6226.0	5152.0	3780.0	2561.0	1863.0
	EXP	7579.3	8046.8	8839.5	8551.7	7707.6	6232.0	5402.1*	4332.0*	3232.6*	2773.2*
	CHI	0.580	0.044	0.013	0.000	1.283	0.006	11.579	70.334	139.514	298.764
75 -	OBS	10671.0	11367.0	12853.0	13362.0	12265.0	10624.0	8475.0	7064.0	5054.0	3591.0
	EXP	10671.0	11301.2	12828.1	13321.2	12370.4	10650.9	8744.4*	7649.0*	6174.0*	4657.5*
	CHI	0.000	0.384	0.048	0.125	0.897	0.068	8.301	44.745	203.177	244.224
30-79	OBS	27256.0	28415.0	30908.0	30493.0	27533.0	23092.0	18479.0	14524.0	10776.0	8234.0
	EXP	27257.6	28418.3	30909.3	30494.8	27535.9	23093.6	19188.2*	16163.6*	13318.8*	11405.5*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.963	0.899	0.809	0.722

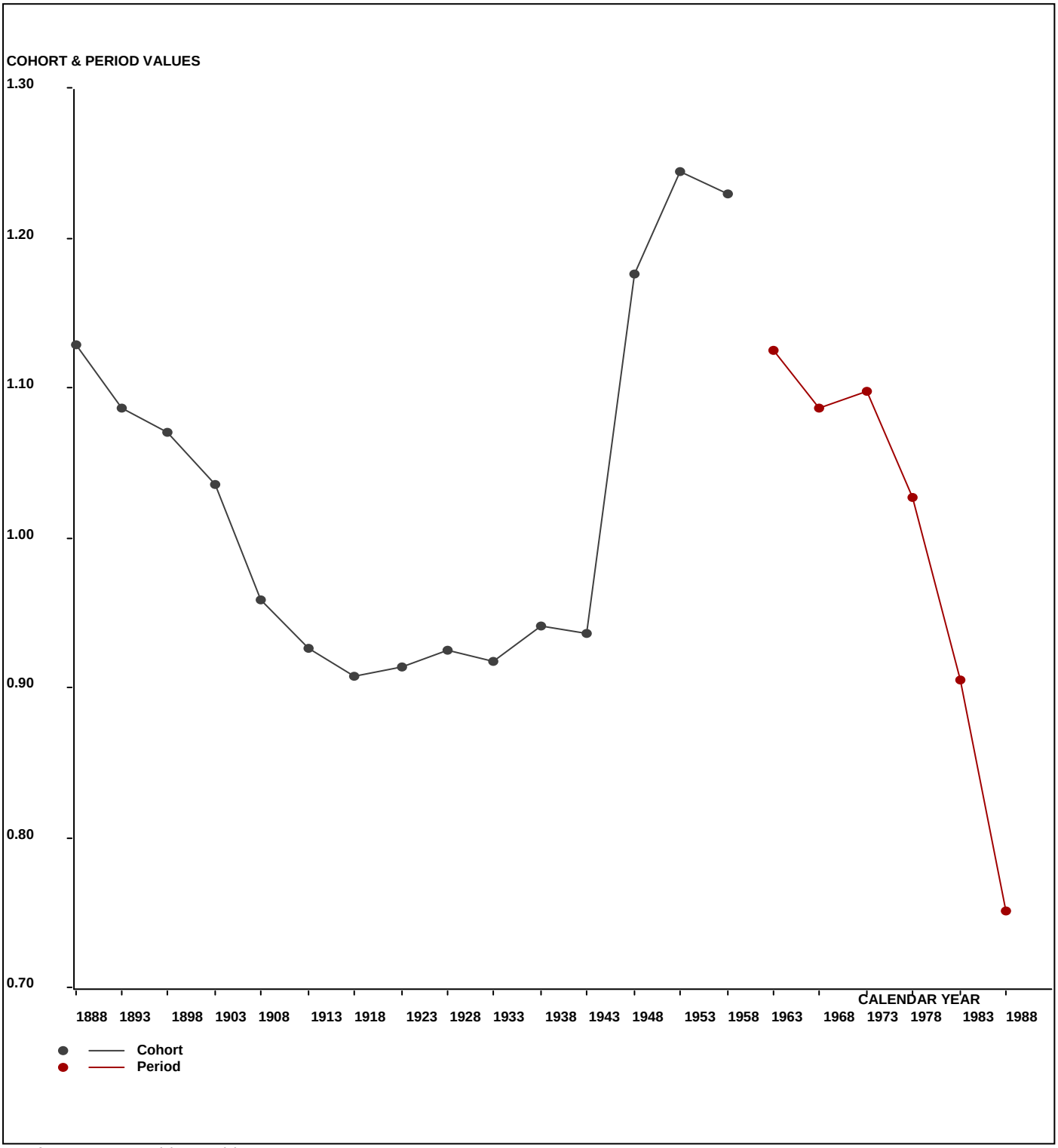
CHI SQUARE (LOG)= 1638.5382 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

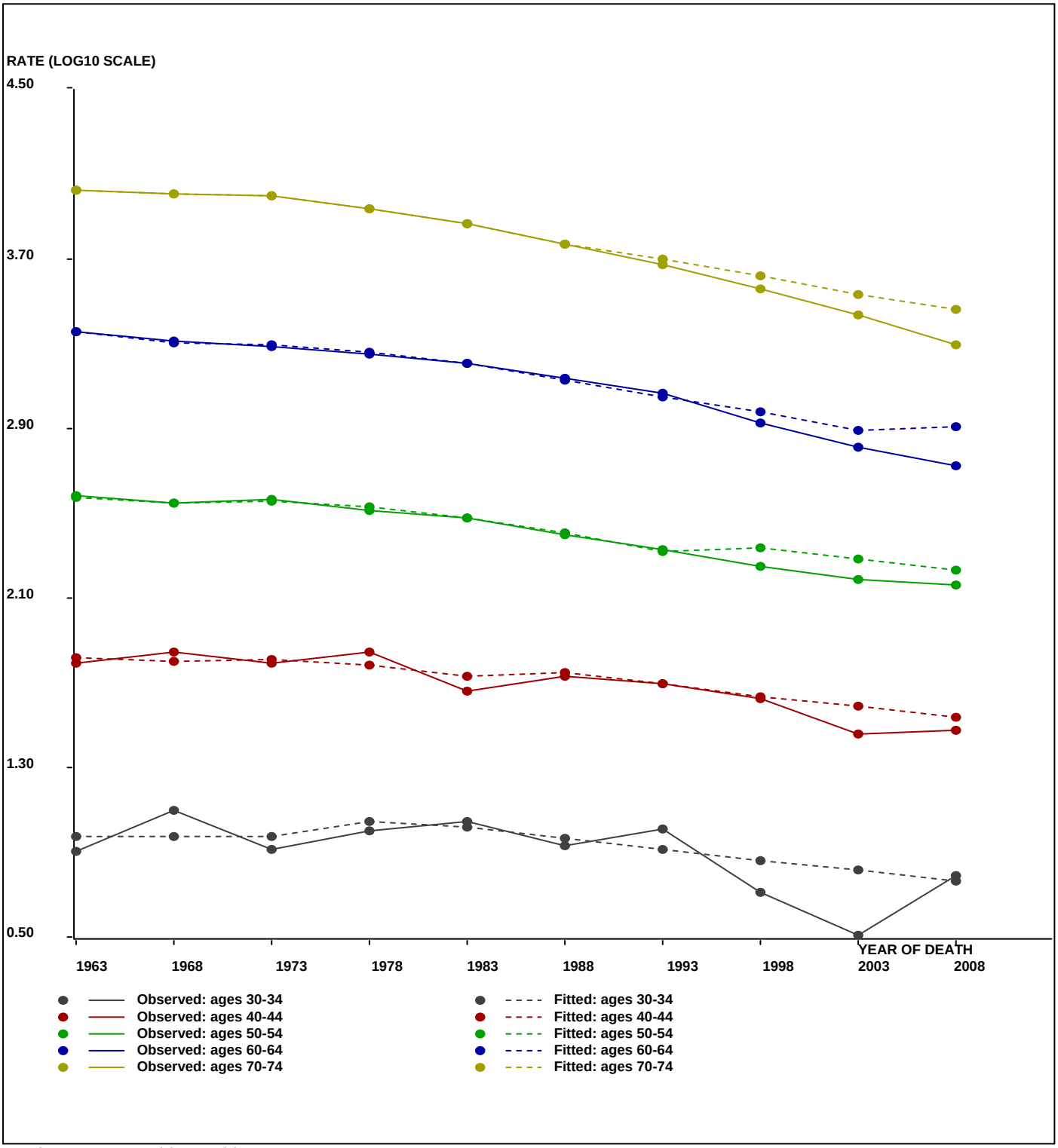


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	10.2	17.6	49.7	110.3	213.8	476.9	1171.4	2253.5	4706.5	9208.6
	PRE	8.3	19.8	49.5	120.6	210.3	496.0	1107.5	2453.9	4935.0	9501.4
	RES	1.974	-2.256	0.218	-10.257	3.470	-19.138	63.890	-200.343	-228.478	-292.743
1996-	OBS	5.2	15.5	42.0	85.3	177.9	358.3	849.0	1794.1	3622.1	7337.6
	PRE	7.4	17.7	43.6	105.9	219.4	410.3	943.5	2020.9	4151.1	7945.3
	RES	-2.187	-2.217	-1.630	-20.658	-41.535	-51.902	-94.538	-226.870	-528.930	-607.687
2001-	OBS	3.3	9.0	28.8	92.5	155.3	322.9	650.0	1391.2	2708.5	5470.9
	PRE	6.6	15.8	39.0	93.4	192.8	428.0	780.3	1721.7	3418.7	6683.2
	RES	-3.320	-6.861	-10.142	-0.952	-37.479	-105.023	-130.389	-330.554	-710.226	-1212.387
2006-	OBS	6.2	13.9	30.1	65.5	144.6	275.3	526.8	979.6	1956.6	4243.7
	PRE	5.9	14.1	34.8	83.4	170.0	376.0	814.0	1423.9	2912.5	5504.1
	RES	0.357	-0.202	-4.706	-17.892	-25.385	-100.703	-287.212	-444.363	-955.956	-1260.392

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	15.0	25.0	76.0	174.0	281.0	517.0	1236.0	2528.0	5152.0	8475.0
	PRE	12.1	28.2	75.7	190.2	276.4	537.7	1168.6	2752.7	5402.1	8744.4
	CHI	0.692	0.364	0.001	1.376	0.075	0.800	3.889	18.349	11.579	8.301
1996-	OBS	8.0	23.0	60.0	130.0	278.0	464.0	899.0	1818.0	3780.0	7064.0
	PRE	11.4	26.3	62.3	161.5	342.9	531.2	999.1	2047.9	4332.0	7649.0
	CHI	1.000	0.411	0.087	6.141	12.288	8.502	10.030	25.808	70.334	44.745
2001-	OBS	5.0	14.0	43.0	132.0	235.0	497.0	821.0	1414.0	2561.0	5054.0
	PRE	10.1	24.7	58.1	133.4	291.7	658.6	985.7	1750.0	3232.6	6174.0
	CHI	2.561	4.636	3.933	0.014	11.024	39.665	27.520	64.505	139.514	203.177
2006-	OBS	9.0	22.0	48.0	98.0	206.0	412.0	801.0	1184.0	1863.0	3591.0
	PRE	8.5	22.3	55.5	124.8	242.2	562.7	1237.7	1721.1	2773.2	4657.5
	CHI	0.031	0.005	1.013	5.736	5.401	40.355	154.079	167.608	298.764	244.224

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1180.49	23.15	51	P, C	97.84	6345.90	0.0000
AGE-PERIOD	36.69	0.82	45	Cohort	30.43	195.17	0.0000
AGE-COHORT	36.25	1.01	36	Period	29.58	192.42	0.0000
PERIOD-COHORT	27.81	0.70	40	Age	8.20	147.73	0.0000
FULL AGE-PERIOD-COHORT	25.53	0.80	32			135.65	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.668688	46.632433
35	1.873795	74.781580
40	2.098540	125.470164
45	2.325175	211.434064
50	2.522623	333.137393
55	2.695689	496.236850
60	2.943596	878.205938
65	3.237896	1729.402853
70	3.562506	3651.787631
75	3.867748	7374.755315

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.135005	1.364600
1966	0.044336	1.107479
1971	0.009843	1.022923
1976	-0.046205	0.899073
1981	-0.092887	0.807445
1986	-0.126800	0.746793

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.056800	1.139726
1891	0.058671	1.144645
1896	0.035384	1.084885
1901	0.020245	1.047720
1906	-0.001521	0.996504
1911	-0.026791	0.940176
1916	-0.066302	0.858417
1921	-0.110219	0.775855
1926	-0.114226	0.768731
1931	-0.127138	0.746212
1936	-0.106112	0.783228
1941	-0.079312	0.833082
1946	-0.154148	0.701216
1951	-0.210400	0.616028
1956	-0.209600	0.617164

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	51.0	37.0	54.0	51.0	39.0	30.0
	EXP	52.9	45.3	53.2	46.6	35.1	30.0
	CHI	0.1	1.5	0.0	0.4	0.4	0.0
35 -	OBS	69.0	66.0	75.0	94.0	69.0	48.0
	EXP	98.5	69.3	67.1	74.8	67.0	52.2
	CHI	8.8	0.2	0.9	4.9	0.1	0.3
40 -	OBS	145.0	121.0	119.0	126.0	117.0	97.0
	EXP	177.4	134.3	107.2	98.5	112.2	103.8
	CHI	5.9	1.3	1.3	7.7	0.2	0.4
45 -	OBS	272.0	243.0	249.0	183.0	147.0	144.0
	EXP	322.5	241.4	207.4	157.5	148.1	173.9
	CHI	7.9	0.0	8.4	4.1	0.0	5.1
50 -	OBS	519.0	399.0	403.0	299.0	221.0	180.0
	EXP	559.5	407.4	346.3	283.2	220.2	213.6
	CHI	2.9	0.2	9.3	0.9	0.0	5.3
55 -	OBS	768.0	666.0	622.0	456.0	369.0	260.0
	EXP	828.6	661.8	547.7	443.3	371.3	298.1
	CHI	4.4	0.0	10.1	0.4	0.0	4.9
60 -	OBS	1345.0	1159.0	1072.0	800.0	688.0	567.0
	EXP	1349.2	1145.9	1042.7	822.5	682.2	589.8
	CHI	0.0	0.2	0.8	0.6	0.0	0.9
65 -	OBS	2438.0	2054.0	1974.0	1606.0	1343.0	1129.0
	EXP	2313.8	2017.0	1957.2	1703.0	1378.8	1182.4
	CHI	6.7	0.7	0.1	5.5	0.9	2.4
70 -	OBS	4164.0	3557.0	3440.0	3243.0	2898.0	2505.0
	EXP	4088.6	3505.9	3516.0	3282.4	2944.6	2472.1
	CHI	1.4	0.7	1.6	0.5	0.7	0.4
75 -	OBS	5747.0	5261.0	5143.0	5226.0	5109.0	4864.0
	EXP	5747.0	5337.6	5325.1	5184.1	5042.0	4720.6
	CHI	0.0	1.1	6.2	0.3	0.9	4.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	18558.74	463.97	40	P, C	96.44	0.0000
AGE-PERIOD	261.95	6.55	40	Cohort	-152.39	0.0000
AGE-COHORT	732.08	18.30	40	Period	9.69	0.0000
PERIOD-COHORT	884.22	22.11	40	Age	25.23	0.0000
FULL AGE-PERIOD-COHORT	661.13	16.53	40			0.0000

AGE	EFFECT
30	46.632433
35	74.781580
40	125.470164
45	211.434064
50	333.137393
55	496.236850
60	878.205938
65	1729.402853
70	3651.787631
75	7374.755315

PERIOD	EFFECT	LOWER	UPPER
% Period Change	92.4884	89.4884	95.4884
1961	1.364600		
1966	1.107479		
1971	1.022923		
1976	0.899073		
1981	0.807445		
1986	0.746793		
1991	0.690696	0.668293	0.713100
1996	0.638814	0.598044	0.680928
2001	0.590828	0.535180	0.650207
2006	0.546448	0.478924	0.620872

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.139726	1.000000	
1891	1.144645	2.000000	
1896	1.084885	4.000000	
1901	1.047720	8.000000	
1906	0.996504	16.000000	
1911	0.940176	32.000000	
1916	0.858417	64.000000	
1921	0.775855	128.000000	
1926	0.768731	256.000000	
1931	0.746212	512.000000	
1936	0.783228	1024.000000	
1941	0.833082	2048.000000	
1946	0.701216	4096.000000	
1951	0.616028	8192.000000	
1956	0.596491	EXTRAPOLATION	0.617164
1961	0.558459	EXTRAPOLATION	
1966	0.522853	EXTRAPOLATION	
1971	0.489516	EXTRAPOLATION	
1976	0.458305	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	45.7	33.0	40.3	32.1	25.7	21.5	16.4	11.7	6.5	7.6
	EXP	47.5	40.4	39.7	29.4	23.2	20.8	18.0*	15.6*	13.5*	11.7*
	Elow							17.4	14.6	12.2	10.2
	Eup							18.6	16.6	14.8	13.3
35	OBS	55.0	58.8	67.0	70.4	43.6	31.6	28.8	22.9	16.7	8.2
	EXP	78.4	61.8	59.9	56.0	42.3	34.4	30.8*	26.7*	23.1*	20.0*
	Elow							29.8	25.0	20.9	17.5
	Eup							31.8	28.4	25.4	22.7
40	OBS	108.6	96.3	106.4	113.0	88.0	61.4	49.7	46.9	32.9	33.3
	EXP	132.8	106.8	95.8	88.4	84.4	65.7	53.4*	47.8*	41.4*	35.8*
	Elow							51.7	44.8	37.5	31.4
	Eup							55.1	51.0	45.6	40.7
45	OBS	208.9	182.9	199.6	164.8	132.7	108.9	91.9	93.8	77.0	51.5
	EXP	247.7	181.7	166.3	141.9	133.7	131.5	102.4*	83.2*	74.5*	64.5*
	Elow							99.1	77.9	67.5	56.6
	Eup							105.7	88.7	82.0	73.3
50	OBS	396.5	310.2	307.7	243.1	201.4	164.2	146.1	145.2	144.1	92.7
	EXP	427.4	316.7	264.4	230.2	200.7	194.9	191.7*	149.2*	121.3*	108.6*
	Elow							185.5	139.7	109.8	95.2
	Eup							197.9	159.1	133.4	123.4
55	OBS	625.5	519.9	494.8	356.0	306.1	241.2	235.2	207.0	191.7	165.1
	EXP	674.8	516.7	435.7	346.2	308.0	276.5	268.5*	264.1*	205.6*	167.0*
	Elow							259.7	247.2	186.2	146.4
	Eup							277.2	281.5	226.3	189.8
60	OBS	1251.7	980.3	868.4	659.2	554.9	484.7	461.5	398.5	299.3	267.0
	EXP	1255.6	969.2	844.6	677.8	550.2	504.2	452.6*	439.4*	432.3*	336.5*
	Elow							438.0	411.4	391.5	294.9
	Eup							467.3	468.4	475.7	382.3
65	OBS	2697.7	2043.5	1778.0	1378.6	1167.5	956.8	877.2	774.7	688.7	470.8
	EXP	2560.3	2006.7	1762.9	1461.8	1198.7	1002.0	918.2*	824.4*	800.3*	787.3*
	Elow							888.5	771.8	724.9	690.0
	Eup							948.0	878.7	880.7	894.5
70	OBS	5809.2	4451.5	3829.2	3232.4	2728.3	2372.1	2105.7	1757.4	1491.2	1045.0
	EXP	5704.0	4387.6	3913.8	3271.7	2772.2	2341.0	1956.9*	1793.3*	1610.0*	1562.9*
	Elow							1893.4	1678.9	1458.4	1369.8
	Eup							2020.4	1911.5	1771.8	1775.8
75	OBS	11469.7	9214.6	7904.3	7003.0	6012.7	5335.2	4849.3	4182.0	3350.3	2729.9
	EXP	11469.7	9348.8	8184.2	6946.9	5933.9	5177.9	4372.5*	3655.1*	3349.5*	3007.2*
	Elow							4230.7	3421.9	3034.0	2635.6
	Eup							4514.4	3896.1	3686.2	3416.7
30-79	OBS	1215.8	959.0	850.3	709.3	598.8	512.7	465.0	403.9	336.6	257.4
	EXP	1221.0	959.7	843.3	706.2	599.4	521.8	453.4*	400.5*	364.4*	331.3*
	Elow							438.7	374.9	330.1	290.4
	Eup							468.1	426.9	401.0	376.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	51.0	37.0	54.0	51.0	39.0	30.0	24.0	18.0	10.0	11.0
	EXP	52.9	45.3	53.2	46.6	35.1	29.0	26.4*	24.0*	20.6*	16.8*
	CHI	0.071	1.527	0.011	0.408	0.425	0.035	0.214	1.508	5.484	2.025
35 -	OBS	69.0	66.0	75.0	94.0	69.0	48.0	41.0	34.0	26.0	13.0
	EXP	98.5	69.3	67.1	74.8	67.0	52.2	43.8*	39.6*	36.0*	31.6*
	CHI	8.832	0.161	0.935	4.949	0.058	0.345	0.178	0.782	2.793	10.914
40 -	OBS	145.0	121.0	119.0	126.0	117.0	97.0	76.0	67.0	49.0	53.0
	EXP	177.4	134.3	107.2	98.5	112.2	103.8	81.6*	68.3*	61.7*	57.1*
	CHI	5.913	1.309	1.310	7.671	0.203	0.443	0.384	0.024	2.617	0.297
45 -	OBS	272.0	243.0	249.0	183.0	147.0	144.0	145.0	143.0	110.0	77.0
	EXP	322.5	241.4	207.4	157.5	148.1	173.9	161.5*	126.8*	106.4*	96.5*
	CHI	7.900	0.010	8.352	4.124	0.008	5.144	1.691	2.060	0.122	3.930
50 -	OBS	519.0	399.0	403.0	299.0	221.0	180.0	192.0	227.0	218.0	132.0
	EXP	559.5	407.4	346.3	283.2	220.2	213.6	251.9*	233.2*	183.5*	154.7*
	CHI	2.932	0.173	9.285	0.877	0.003	5.279	14.258	0.166	6.503	3.332
55 -	OBS	768.0	666.0	622.0	456.0	369.0	260.0	255.0	268.0	295.0	247.0
	EXP	828.6	661.8	547.7	443.3	371.3	298.1	291.0*	341.9*	316.4*	250.0*
	CHI	4.430	0.026	10.075	0.361	0.014	4.865	4.458	15.992	1.448	0.035
60 -	OBS	1345.0	1159.0	1072.0	800.0	688.0	567.0	487.0	422.0	378.0	406.0
	EXP	1349.2	1145.9	1042.7	822.5	682.2	589.8	477.6*	465.3*	546.0*	511.6*
	CHI	0.013	0.150	0.826	0.617	0.050	0.881	0.185	4.026	51.699	21.815
65 -	OBS	2438.0	2054.0	1974.0	1606.0	1343.0	1129.0	984.0	785.0	700.0	569.0
	EXP	2313.8	2017.0	1957.2	1703.0	1378.8	1182.4	1030.1*	835.4*	813.4*	951.6*
	CHI	6.666	0.678	0.145	5.525	0.932	2.408	2.061	3.039	15.816	153.812
70 -	OBS	4164.0	3557.0	3440.0	3243.0	2898.0	2505.0	2305.0	1834.0	1410.0	995.0
	EXP	4088.6	3505.9	3516.0	3282.4	2944.6	2472.1	2142.2*	1871.5*	1522.3*	1488.2*
	CHI	1.389	0.744	1.641	0.474	0.738	0.437	12.378	0.750	8.291	163.452
75 -	OBS	5747.0	5261.0	5143.0	5226.0	5109.0	4864.0	4463.0	4026.0	3095.0	2310.0
	EXP	5747.0	5337.6	5325.1	5184.1	5042.0	4720.6	4024.2*	3518.8*	3094.3*	2544.6*
	CHI	0.000	1.100	6.225	0.338	0.889	4.354	47.851	73.101	0.000	21.635
30-79	OBS	15518.0	13563.0	13151.0	12084.0	11000.0	9824.0	8972.0	7824.0	6291.0	4813.0
	EXP	15538.0	13566.0	13169.7	12096.1	11001.7	9835.5	8530.3*	7524.8*	6700.7*	6102.7*
	O/E	0.999	1.000	0.999	0.999	1.000	0.999	1.052	1.040	0.939	0.789

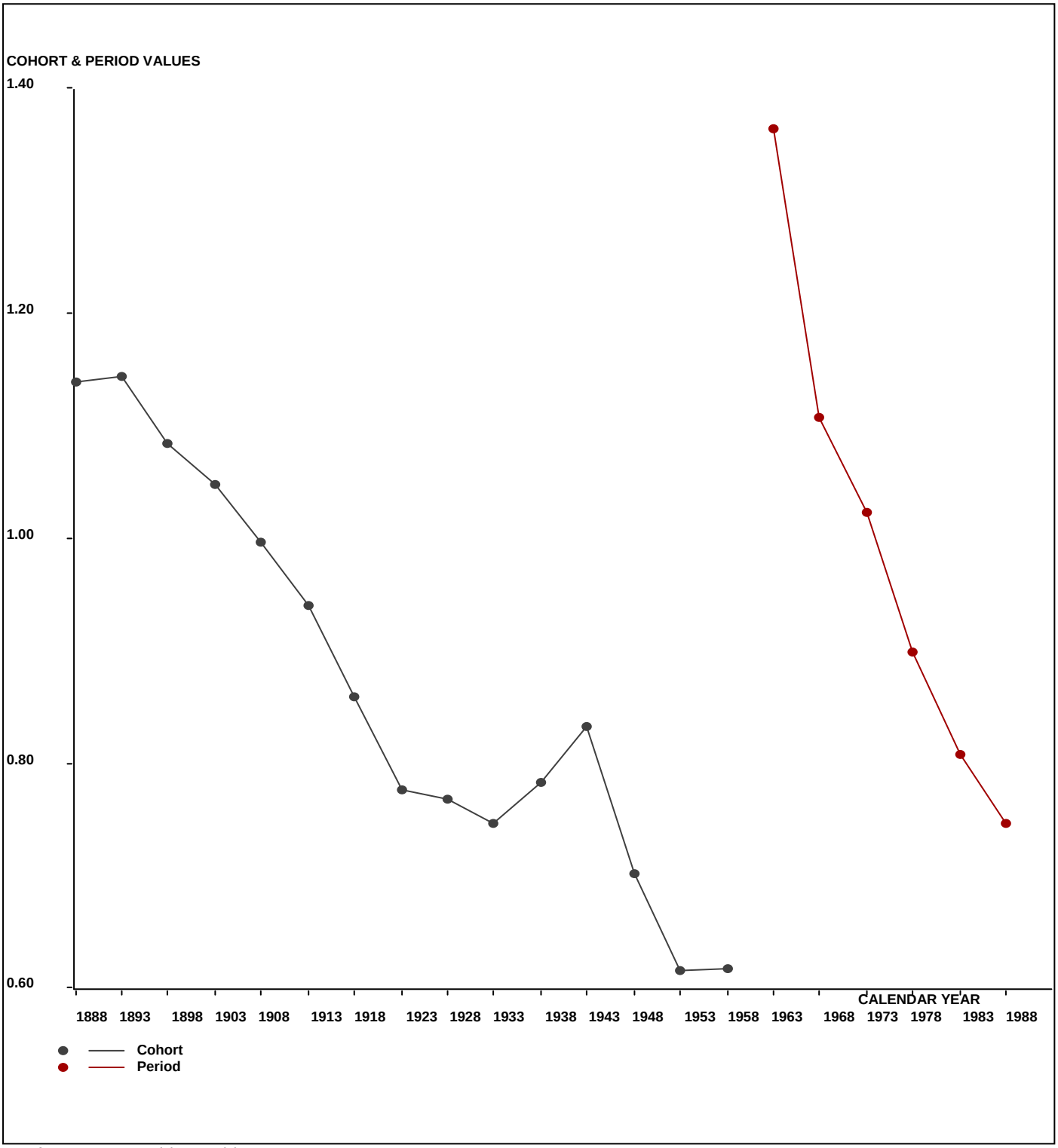
CHI SQUARE (LOG)= 661.1292 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

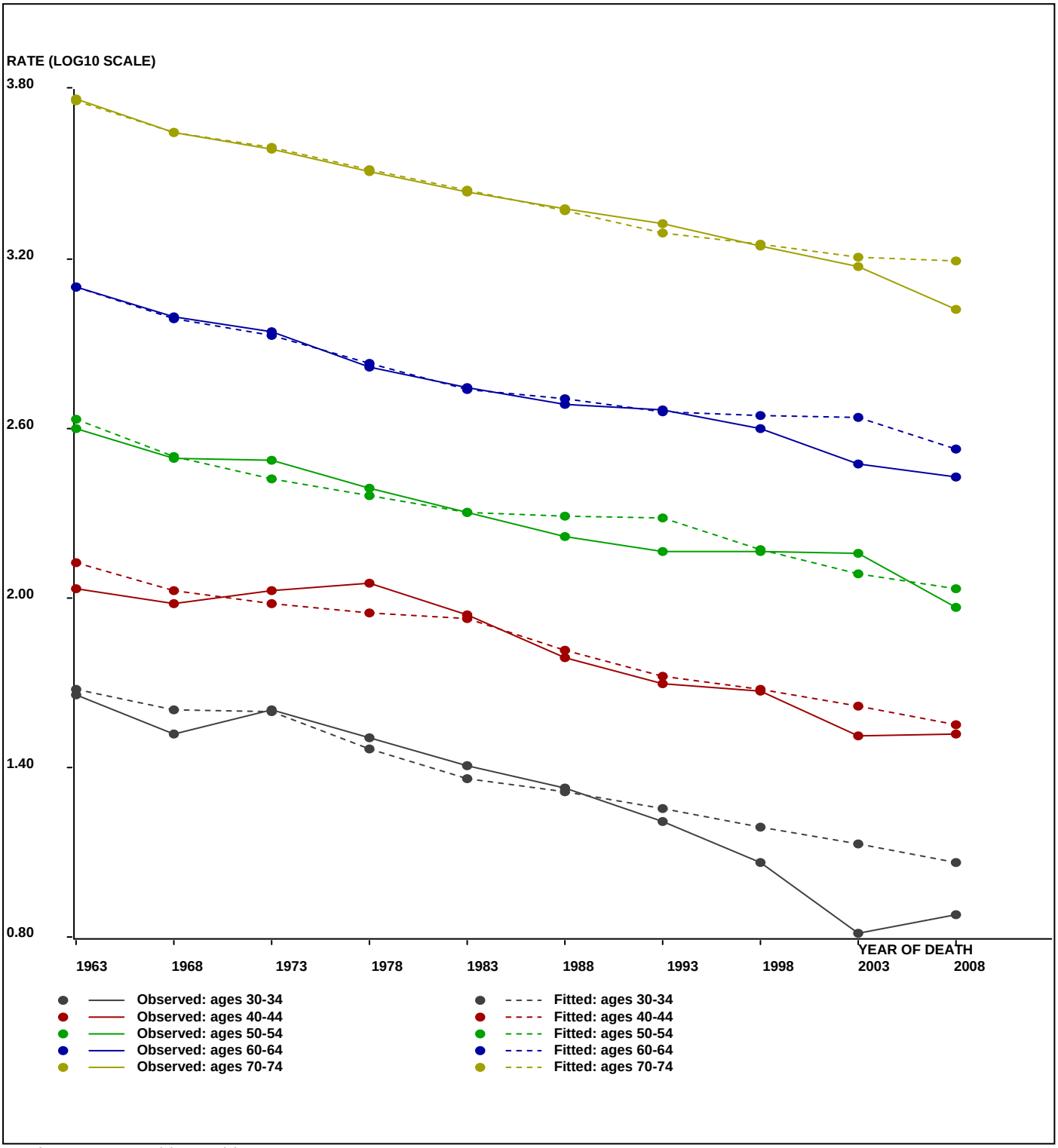


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	16.4	28.8	49.7	91.9	146.1	235.2	461.5	877.2	2105.7	4849.3
	PRE	18.0	30.8	53.4	102.4	191.7	268.5	452.6	918.2	1956.9	4372.5
	RES	-1.621	-1.964	-3.663	-10.478	-45.602	-33.227	8.916	-41.077	148.754	476.805
1996-	OBS	11.7	22.9	46.9	93.8	145.2	207.0	398.5	774.7	1757.4	4182.0
	PRE	15.6	26.7	47.8	83.2	149.2	264.1	439.4	824.4	1793.3	3655.1
	RES	-3.903	-3.750	-0.892	10.605	-3.982	-57.112	-40.873	-49.722	-35.899	526.826
2001-	OBS	6.5	16.7	32.9	77.0	144.1	191.7	299.3	688.7	1491.2	3350.3
	PRE	13.5	23.1	41.4	74.5	121.3	205.6	432.3	800.3	1610.0	3349.5
	RES	-6.952	-6.432	-8.526	2.527	22.828	-13.909	-133.010	-111.594	-118.819	0.753
2006-	OBS	7.6	8.2	33.3	51.5	92.7	165.1	267.0	470.8	1045.0	2729.9
	PRE	11.7	20.0	35.8	64.5	108.6	167.0	336.5	787.3	1562.9	3007.2
	RES	-4.050	-11.764	-2.585	-13.022	-15.935	-1.981	-69.485	-316.524	-517.972	-277.281

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	24.0	41.0	76.0	145.0	192.0	255.0	487.0	984.0	2305.0	4463.0
	PRE	26.4	43.8	81.6	161.5	251.9	291.0	477.6	1030.1	2142.2	4024.2
	CHI	0.214	0.178	0.384	1.691	14.258	4.458	0.185	2.061	12.378	47.851
1996-	OBS	18.0	34.0	67.0	143.0	227.0	268.0	422.0	785.0	1834.0	4026.0
	PRE	24.0	39.6	68.3	126.8	233.2	341.9	465.3	835.4	1871.5	3518.8
	CHI	1.508	0.782	0.024	2.060	0.166	15.992	4.026	3.039	0.750	73.101
2001-	OBS	10.0	26.0	49.0	110.0	218.0	295.0	378.0	700.0	1410.0	3095.0
	PRE	20.6	36.0	61.7	106.4	183.5	316.4	546.0	813.4	1522.3	3094.3
	CHI	5.484	2.793	2.617	0.122	6.503	1.448	51.699	15.816	8.291	0.000
2006-	OBS	11.0	13.0	53.0	77.0	132.0	247.0	406.0	569.0	995.0	2310.0
	PRE	16.8	31.6	57.1	96.5	154.7	250.0	511.6	951.6	1488.2	2544.6
	CHI	2.025	10.914	0.297	3.930	3.332	0.035	21.815	153.812	163.452	21.635

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	223.73	4.39	51	P, C	97.72	1207.17	0.0000
AGE-PERIOD	20.93	0.47	45	Cohort	75.62	111.22	0.0000
AGE-COHORT	5.85	0.16	36	Period	12.75	31.09	0.7010
PERIOD-COHORT	6.40	0.16	40	Age	20.30	34.06	0.7337
FULL AGE-PERIOD-COHORT	5.10	0.16	32			27.15	0.7106

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.568229	3.700229
35	0.903598	8.009355
40	1.408175	25.596183
45	1.761188	57.701622
50	2.025108	105.951633
55	2.226427	168.432893
60	2.450254	282.003456
65	2.612522	409.753296
70	2.736542	545.183043
75	2.816808	655.854647

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.165090	0.683770
1966	-0.113907	0.769295
1971	-0.040660	0.910626
1976	-0.006040	0.986188
1981	0.048230	1.117455
1986	0.086125	1.219341

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.068304	0.854467
1891	-0.105073	0.785104
1896	-0.056865	0.877274
1901	-0.070168	0.850810
1906	-0.103988	0.787068
1911	-0.058194	0.874593
1916	-0.003744	0.991415
1921	0.071962	1.180217
1926	0.074470	1.187054
1931	0.163125	1.455877
1936	0.183407	1.525482
1941	0.250419	1.779994
1946	0.287282	1.937681
1951	0.220206	1.660374
1956	0.279995	1.905438

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	7.0	3.0	6.0	10.0	11.0	12.0
	EXP	4.1	4.9	8.0	11.2	10.4	12.0
	CHI	2.0	0.7	0.5	0.1	0.0	0.0
35 -	OBS	11.0	11.0	10.0	14.0	30.0	24.0
	EXP	8.2	10.1	12.5	18.8	27.5	24.6
	CHI	1.0	0.1	0.5	1.2	0.2	0.0
40 -	OBS	26.0	32.0	32.0	49.0	67.0	94.0
	EXP	27.6	29.4	38.0	42.9	67.7	95.5
	CHI	0.1	0.2	0.9	0.9	0.0	0.0
45 -	OBS	58.0	68.0	65.0	88.0	112.0	172.0
	EXP	50.9	69.6	77.8	92.0	108.9	165.6
	CHI	1.0	0.0	2.1	0.2	0.1	0.2
50 -	OBS	93.0	106.0	146.0	151.0	187.0	210.0
	EXP	82.9	103.9	149.1	152.6	189.1	216.0
	CHI	1.2	0.0	0.1	0.0	0.0	0.2
55 -	OBS	114.0	145.0	186.0	244.0	272.0	329.0
	EXP	111.3	145.2	191.1	251.1	269.3	322.3
	CHI	0.1	0.0	0.1	0.2	0.0	0.1
60 -	OBS	175.0	216.0	272.0	325.0	458.0	482.0
	EXP	176.3	201.9	277.3	334.6	461.2	477.5
	CHI	0.0	1.0	0.1	0.3	0.0	0.0
65 -	OBS	211.0	247.0	311.0	434.0	530.0	712.0
	EXP	222.1	269.6	326.0	411.7	522.2	695.8
	CHI	0.6	1.9	0.7	1.2	0.1	0.4
70 -	OBS	195.0	284.0	407.0	428.0	561.0	693.0
	EXP	209.8	294.0	379.5	424.6	566.0	696.0
	CHI	1.0	0.3	2.0	0.0	0.0	0.0
75 -	OBS	192.0	240.0	361.0	405.0	484.0	614.0
	EXP	192.0	226.2	340.9	410.7	490.1	637.6
	CHI	0.0	0.8	1.2	0.1	0.1	0.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	14094.43	352.36	40	P, C	96.45	0.0000
AGE-PERIOD	1049.43	26.24	40	Cohort	52.34	0.0000
AGE-COHORT	960.14	24.00	40	Period	47.91	0.0000
PERIOD-COHORT	455.54	11.39	40	Age	-9.79	0.0000
FULL AGE-PERIOD-COHORT	500.12	12.50	40			0.0000

AGE	EFFECT
30	3.700229
35	8.009355
40	25.596183
45	57.701622
50	105.951633
55	168.432893
60	282.003456
65	409.753296
70	545.183043
75	655.854647

PERIOD	EFFECT	LOWER	UPPER
% Period Change	109.1176	106.1176	112.1176
1961	0.683770		
1966	0.769295		
1971	0.910626		
1976	0.986188		
1981	1.117455		
1986	1.219341		
1991	1.330516	1.293935	1.367096
1996	1.451827	1.373094	1.532756
2001	1.584200	1.457095	1.718489
2006	1.728641	1.546234	1.926730

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.854467	1.000000	
1891	0.785104	2.000000	
1896	0.877274	4.000000	
1901	0.850810	8.000000	
1906	0.787068	16.000000	
1911	0.874593	32.000000	
1916	0.991415	64.000000	
1921	1.180217	128.000000	
1926	1.187054	256.000000	
1931	1.455877	512.000000	
1936	1.525482	1024.000000	
1941	1.779994	2048.000000	
1946	1.937681	4096.000000	
1951	1.660374	8192.000000	
1956	1.847922	EXTRAPOLATION	1.905438
1961	1.924940	EXTRAPOLATION	
1966	2.005168	EXTRAPOLATION	
1971	2.088740	EXTRAPOLATION	
1976	2.175796	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	6.3	2.7	4.5	6.3	7.3	8.6	6.1	5.8	3.9	2.1
	EXP	3.7	4.3	6.0	7.1	6.9	8.3	9.5*	10.8*	12.2*	13.9*
	Elow							9.2	10.2	11.3	12.4
	Eup							9.7	11.4	13.3	15.5
35	OBS	8.8	9.8	8.9	10.5	18.9	15.8	19.0	17.5	9.0	10.1
	EXP	6.5	9.0	11.1	14.1	17.3	16.2	19.7*	22.4*	25.4*	28.9*
	Elow							19.2	21.2	23.4	25.9
	Eup							20.2	23.6	27.6	32.2
40	OBS	19.5	25.5	28.6	43.9	50.4	59.5	55.6	49.0	36.9	33.9
	EXP	20.7	23.4	33.9	38.5	50.9	60.5	56.5*	68.7*	78.1*	88.7*
	Elow							55.0	64.9	71.8	79.4
	Eup							58.1	72.5	84.7	98.9
45	OBS	44.5	51.2	52.1	79.2	101.1	130.1	142.0	121.4	107.9	85.6
	EXP	39.1	52.4	62.4	82.8	98.4	125.2	148.8*	139.1*	168.9*	192.0*
	Elow							144.7	131.6	155.4	171.7
	Eup							152.9	146.8	183.2	214.0
50	OBS	71.0	82.4	111.5	122.7	170.4	191.6	239.7	268.7	255.1	212.7
	EXP	63.4	80.8	113.9	124.0	172.4	197.1	250.9*	298.1*	278.7*	338.5*
	Elow							244.0	281.9	256.3	302.7
	Eup							257.8	314.7	302.3	377.2
55	OBS	92.8	113.2	148.0	190.5	225.7	305.2	364.4	410.1	541.9	411.7
	EXP	90.6	113.3	152.1	196.0	223.4	299.0	341.9*	435.3*	517.0*	483.4*
	Elow							332.5	411.7	475.6	432.4
	Eup							351.3	459.5	560.9	538.8
60	OBS	162.9	182.7	220.3	267.8	369.4	412.0	519.4	625.2	705.4	782.7
	EXP	164.1	170.7	224.6	275.7	371.9	408.2	546.3*	624.6*	795.2*	944.6*
	Elow							531.2	590.7	731.4	844.9
	Eup							561.3	659.4	862.6	1052.8
65	OBS	233.5	245.7	280.1	372.5	460.8	603.4	648.1	793.4	953.3	1124.4
	EXP	245.8	268.2	293.7	353.4	454.0	589.7	647.2*	866.1*	990.2*	1260.8*
	Elow							629.4	819.1	910.8	1127.8
	Eup							665.0	914.4	1074.2	1405.3
70	OBS	272.0	355.4	453.0	426.6	528.2	656.2	839.5	928.5	1163.3	1283.4
	EXP	292.7	367.9	422.4	423.2	532.8	659.1	856.1*	939.6*	1257.4*	1437.7*
	Elow							832.6	888.6	1156.5	1286.0
	Eup							879.6	991.9	1364.0	1602.4
75	OBS	383.2	420.4	554.8	542.7	569.6	673.5	825.8	1021.1	1247.0	1555.2
	EXP	383.2	396.1	523.9	550.3	576.8	699.4	865.1*	1123.8*	1233.4*	1650.6*
	Elow							841.3	1062.8	1134.4	1476.4
	Eup							888.9	1186.4	1337.9	1839.7
30-79	OBS	89.8	103.3	127.6	148.7	185.5	226.5	268.8	305.9	353.9	368.2
	EXP	89.5	103.5	129.4	149.2	185.3	225.8	274.0*	328.0*	385.8*	453.0*
	Elow							266.4	310.2	354.9	405.2
	Eup							281.5	346.2	418.6	504.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	7.0	3.0	6.0	10.0	11.0	12.0	9.0	9.0	6.0	3.0
	EXP	4.1	4.9	8.0	11.2	10.4	11.6	13.9*	16.6*	18.7*	20.1*
	CHI	2.038	0.715	0.514	0.132	0.035	0.011	1.725	3.488	8.658	14.516
35 -	OBS	11.0	11.0	10.0	14.0	30.0	24.0	27.0	26.0	14.0	16.0
	EXP	8.2	10.1	12.5	18.8	27.5	24.6	28.0*	33.2*	39.7*	45.6*
	CHI	0.986	0.087	0.485	1.211	0.236	0.016	0.035	1.558	16.623	19.235
40 -	OBS	26.0	32.0	32.0	49.0	67.0	94.0	85.0	70.0	55.0	54.0
	EXP	27.6	29.4	38.0	42.9	67.7	95.5	86.4*	98.1*	116.3*	141.4*
	CHI	0.091	0.234	0.937	0.857	0.007	0.024	0.024	8.031	32.347	53.993
45 -	OBS	58.0	68.0	65.0	88.0	112.0	172.0	224.0	185.0	154.0	128.0
	EXP	50.9	69.6	77.8	92.0	108.9	165.6	234.7*	212.0*	241.2*	287.1*
	CHI	0.982	0.038	2.106	0.173	0.086	0.249	0.484	3.446	31.515	88.143
50 -	OBS	93.0	106.0	146.0	151.0	187.0	210.0	315.0	420.0	386.0	303.0
	EXP	82.9	103.9	149.1	152.6	189.1	216.0	329.8*	465.8*	421.7*	482.2*
	CHI	1.219	0.041	0.066	0.016	0.024	0.167	0.663	4.509	3.019	66.591
55 -	OBS	114.0	145.0	186.0	244.0	272.0	329.0	395.0	531.0	834.0	616.0
	EXP	111.3	145.2	191.1	251.1	269.3	322.3	370.6*	563.6*	795.7*	723.4*
	CHI	0.065	0.000	0.138	0.200	0.027	0.139	1.605	1.886	1.841	15.944
60 -	OBS	175.0	216.0	272.0	325.0	458.0	482.0	548.0	662.0	891.0	1190.0
	EXP	176.3	201.9	277.3	334.6	461.2	477.5	576.4*	661.4*	1004.5*	1436.2*
	CHI	0.009	0.988	0.100	0.276	0.022	0.042	1.398	0.001	12.820	42.207
65 -	OBS	211.0	247.0	311.0	434.0	530.0	712.0	727.0	804.0	969.0	1359.0
	EXP	222.1	269.6	326.0	411.7	522.2	695.8	726.0*	877.6*	1006.5*	1523.9*
	CHI	0.558	1.891	0.695	1.206	0.117	0.377	0.001	6.179	1.397	17.844
70 -	OBS	195.0	284.0	407.0	428.0	561.0	693.0	919.0	969.0	1100.0	1222.0
	EXP	209.8	294.0	379.5	424.6	566.0	696.0	937.1*	980.5*	1188.9*	1368.9*
	CHI	1.042	0.340	1.999	0.028	0.043	0.013	0.351	0.135	6.654	15.766
75 -	OBS	192.0	240.0	361.0	405.0	484.0	614.0	760.0	983.0	1152.0	1316.0
	EXP	192.0	226.2	340.9	410.7	490.1	637.6	796.2*	1081.9*	1139.4*	1396.7*
	CHI	0.000	0.847	1.185	0.078	0.077	0.877	1.647	9.037	0.140	4.663
30-79	OBS	1082.0	1352.0	1796.0	2148.0	2712.0	3342.0	4009.0	4659.0	5561.0	6207.0
	EXP	1085.2	1354.7	1800.2	2150.1	2712.3	3342.6	4099.1*	4990.7*	5972.6*	7425.4*
	O/E	0.997	0.998	0.998	0.999	1.000	1.000	0.978	0.934	0.931	0.836

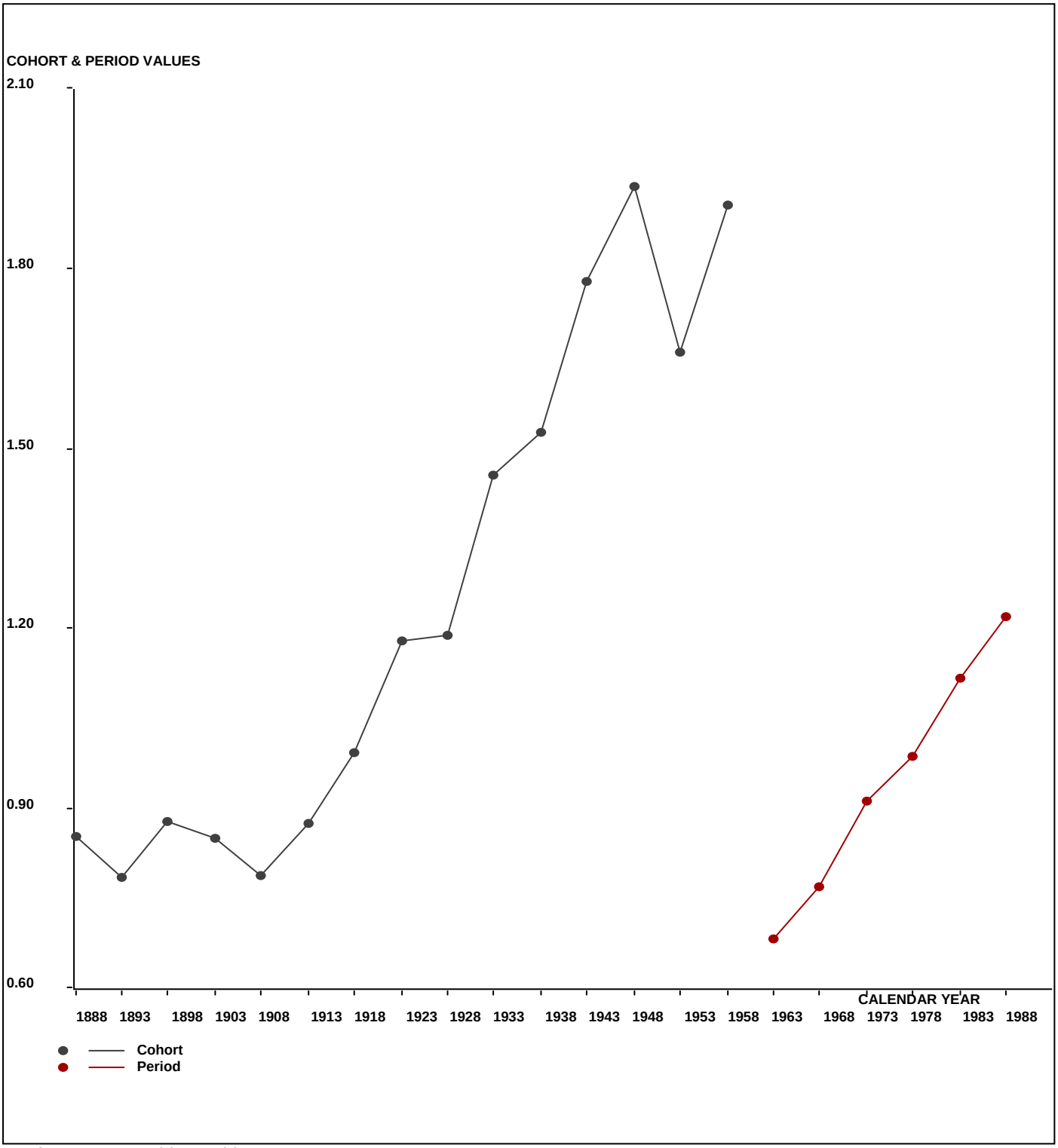
CHI SQUARE (LOG)= 500.1182 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

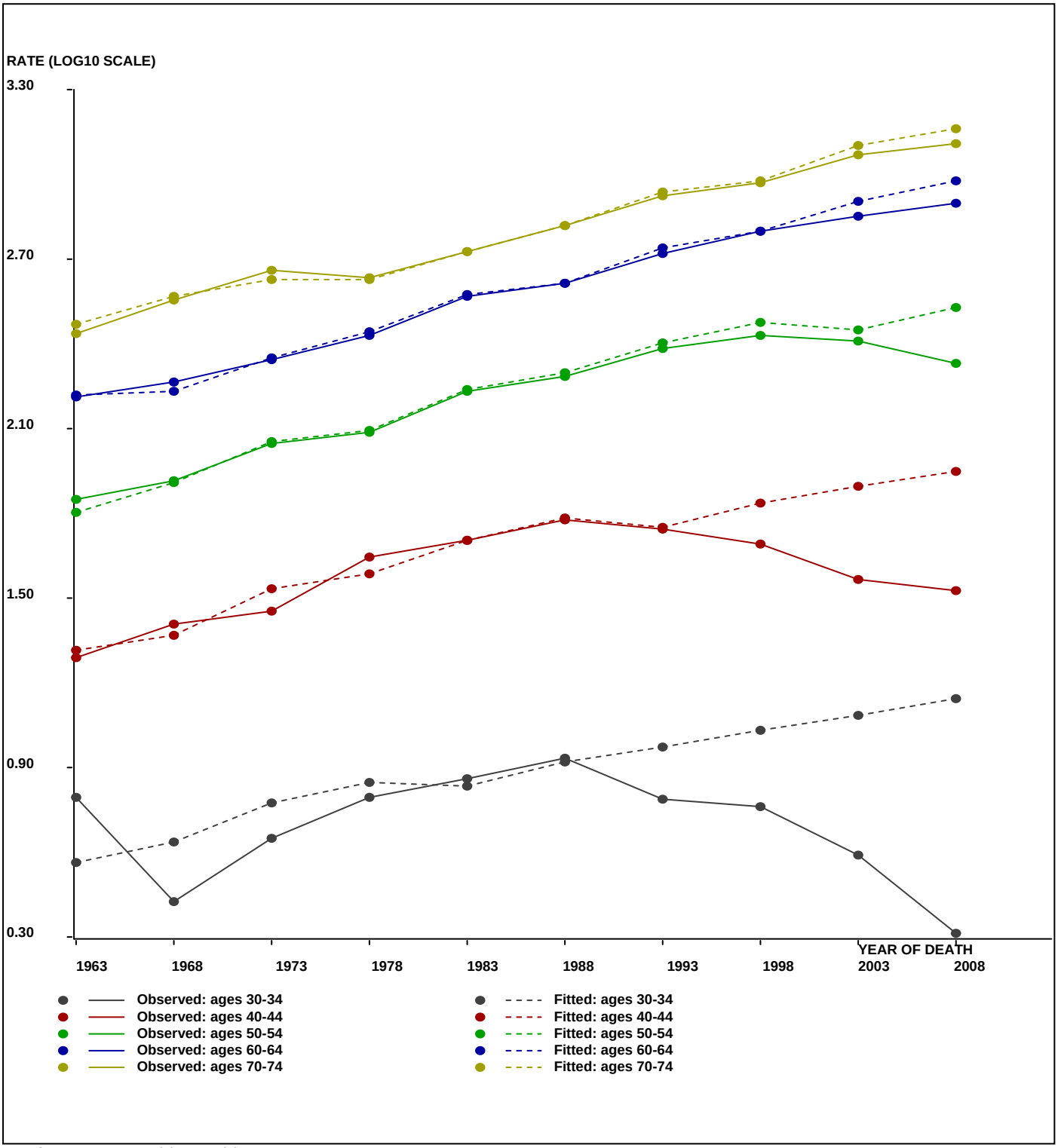


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	6.1	19.0	55.6	142.0	239.7	364.4	519.4	648.1	839.5	825.8
	PRE	9.5	19.7	56.5	148.8	250.9	341.9	546.3	647.2	856.1	865.1
	RES	-3.339	-0.697	-0.934	-6.753	-11.252	22.501	-26.899	0.907	-16.570	-39.345
1996-	OBS	5.8	17.5	49.0	121.4	268.7	410.1	625.2	793.4	928.5	1021.1
	PRE	10.8	22.4	68.7	139.1	298.1	435.3	624.6	866.1	939.6	1123.8
	RES	-4.936	-4.850	-19.652	-17.732	-29.324	-25.178	0.613	-72.670	-11.036	-102.710
2001-	OBS	3.9	9.0	36.9	107.9	255.1	541.9	705.4	953.3	1163.3	1247.0
	PRE	12.2	25.4	78.1	168.9	278.7	517.0	795.2	990.2	1257.4	1233.4
	RES	-8.323	-16.467	-41.157	-61.062	-23.579	24.871	-89.836	-36.890	-94.067	13.664
2006-	OBS	2.1	10.1	33.9	85.6	212.7	411.7	782.7	1124.4	1283.4	1555.2
	PRE	13.9	28.9	88.7	192.0	338.5	483.4	944.6	1260.8	1437.7	1650.6
	RES	-11.837	-18.777	-54.831	-106.392	-125.775	-71.772	-161.929	-136.431	-154.287	-95.371

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	9.0	27.0	85.0	224.0	315.0	395.0	548.0	727.0	919.0	760.0
	PRE	13.9	28.0	86.4	234.7	329.8	370.6	576.4	726.0	937.1	796.2
	CHI	1.725	0.035	0.024	0.484	0.663	1.605	1.398	0.001	0.351	1.647
1996-	OBS	9.0	26.0	70.0	185.0	420.0	531.0	662.0	804.0	969.0	983.0
	PRE	16.6	33.2	98.1	212.0	465.8	563.6	661.4	877.6	980.5	1081.9
	CHI	3.488	1.558	8.031	3.446	4.509	1.886	0.001	6.179	0.135	9.037
2001-	OBS	6.0	14.0	55.0	154.0	386.0	834.0	891.0	969.0	1100.0	1152.0
	PRE	18.7	39.7	116.3	241.2	421.7	795.7	1004.5	1006.5	1188.9	1139.4
	CHI	8.658	16.623	32.347	31.515	3.019	1.841	12.820	1.397	6.654	0.140
2006-	OBS	3.0	16.0	54.0	128.0	303.0	616.0	1190.0	1359.0	1222.0	1316.0
	PRE	20.1	45.6	141.4	287.1	482.2	723.4	1436.2	1523.9	1368.9	1396.7
	CHI	14.516	19.235	53.993	88.143	66.591	15.944	42.207	17.844	15.766	4.663

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	137.92	2.70	51	P, C	95.35	762.69	0.0000
AGE-PERIOD	28.52	0.63	45	Cohort	77.51	152.37	0.0000
AGE-COHORT	51.59	1.43	36	Period	87.56	277.58	0.0000
PERIOD-COHORT	8.77	0.22	40	Age	26.85	46.74	0.2152
FULL AGE-PERIOD-COHORT	6.42	0.20	32			34.24	0.3605

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.937662	8.662867
35	1.087903	12.243428
40	1.284079	19.234435
45	1.483901	30.472030
50	1.786694	61.191929
55	2.042558	110.295615
60	2.264951	184.056640
65	2.486658	306.660394
70	2.689594	489.321226
75	2.873961	748.102718

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.332986	0.464530
1966	-0.118967	0.760384
1971	0.025465	1.060388
1976	0.078327	1.197643
1981	0.056156	1.138037
1986	0.019899	1.046886

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.150072	1.412773
1891	0.027031	1.064219
1896	-0.044453	0.902706
1901	-0.071077	0.849029
1906	-0.068167	0.854739
1911	-0.019067	0.957047
1916	0.021263	1.050179
1921	0.079047	1.199630
1926	0.074671	1.187602
1931	0.122603	1.326182
1936	0.104023	1.270640
1941	-0.020065	0.954849
1946	-0.069965	0.851206
1951	-0.058497	0.873983
1956	-0.148151	0.710966

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	6.0	5.0	9.0	18.0	14.0	9.0
	EXP	5.9	9.4	11.7	14.0	13.1	9.0
	CHI	0.0	2.0	0.6	1.1	0.1	0.0
35 -	OBS	10.0	14.0	17.0	20.0	18.0	16.0
	EXP	8.5	13.9	18.5	18.7	18.8	17.0
	CHI	0.3	0.0	0.1	0.1	0.0	0.1
40 -	OBS	15.0	13.0	34.0	36.0	30.0	23.0
	EXP	14.3	21.8	30.3	32.6	27.8	27.1
	CHI	0.0	3.6	0.5	0.3	0.2	0.6
45 -	OBS	12.0	32.0	53.0	51.0	57.0	39.0
	EXP	19.4	36.9	47.9	53.7	48.8	40.3
	CHI	2.8	0.7	0.6	0.1	1.4	0.0
50 -	OBS	32.0	63.0	102.0	108.0	111.0	81.0
	EXP	35.6	62.9	102.0	107.1	101.3	89.2
	CHI	0.4	0.0	0.0	0.0	0.9	0.8
55 -	OBS	57.0	115.0	147.0	211.0	174.0	153.0
	EXP	53.8	102.8	154.4	203.0	179.7	165.1
	CHI	0.2	1.4	0.4	0.3	0.2	0.9
60 -	OBS	80.0	131.0	216.0	285.0	325.0	272.0
	EXP	78.0	141.4	230.6	280.9	311.6	267.7
	CHI	0.1	0.8	0.9	0.1	0.6	0.1
65 -	OBS	115.0	199.0	349.0	395.0	412.0	436.0
	EXP	116.2	199.0	308.6	409.5	421.6	454.4
	CHI	0.0	0.0	5.3	0.5	0.2	0.7
70 -	OBS	176.0	282.0	381.0	484.0	564.0	586.0
	EXP	173.4	268.4	395.8	502.5	566.1	568.1
	CHI	0.0	0.7	0.6	0.7	0.0	0.6
75 -	OBS	246.0	343.0	453.0	580.0	600.0	704.0
	EXP	246.0	345.6	465.9	567.7	618.3	683.3
	CHI	0.0	0.0	0.4	0.3	0.5	0.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	3658.65	91.47	40	P, C	13.98	0.0000
AGE-PERIOD	2643.55	66.09	40	Cohort	-19.05	0.0000
AGE-COHORT	417.63	10.44	40	Period	-653.55	0.0000
PERIOD-COHORT	3045.31	76.13	40	Age	-3.34	0.0000
FULL AGE-PERIOD-COHORT	3147.07	78.68	40			0.0000

AGE	EFFECT
30	8.662867
35	12.243428
40	19.234435
45	30.472030
50	61.191929
55	110.295615
60	184.056640
65	306.660394
70	489.321226
75	748.102718

PERIOD	EFFECT	LOWER	UPPER
% Period Change	91.9905	88.9905	94.9905
1961	0.464530		
1966	0.760384		
1971	1.060388		
1976	1.197643		
1981	1.138037		
1986	1.046886		
1991	0.963036	0.931630	0.994443
1996	0.885902	0.829062	0.944627
2001	0.814946	0.737787	0.897306
2006	0.749674	0.656561	0.852356

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.412773	1.000000	
1891	1.064219	2.000000	
1896	0.902706	4.000000	
1901	0.849029	8.000000	
1906	0.854739	16.000000	
1911	0.957047	32.000000	
1916	1.050179	64.000000	
1921	1.199630	128.000000	
1926	1.187602	256.000000	
1931	1.326182	512.000000	
1936	1.270640	1024.000000	
1941	0.954849	2048.000000	
1946	0.851206	4096.000000	
1951	0.873983	8192.000000	
1956	0.801849	EXTRAPOLATION	0.710966
1961	0.749410	EXTRAPOLATION	
1966	0.700401	EXTRAPOLATION	
1971	0.654597	EXTRAPOLATION	
1976	0.611788	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	5.4	4.5	6.7	11.3	9.2	6.4	3.4	3.2	2.6	1.4
	EXP	5.3	8.4	8.8	8.8	8.6	7.3	6.3*	5.4*	4.6*	4.0*
	Elow							6.0	5.0	4.2	3.5
	Eup							6.5	5.7	5.1	4.5
35	OBS	8.0	12.5	15.2	15.0	11.4	10.5	5.6	4.0	5.8	1.9
	EXP	6.8	12.3	16.5	14.0	11.9	11.2	9.5*	8.1*	7.0*	6.0*
	Elow							9.1	7.6	6.3	5.3
	Eup							9.8	8.7	7.7	6.8
40	OBS	11.2	10.3	30.4	32.3	22.6	14.6	11.8	7.7	6.0	3.8
	EXP	10.7	17.4	27.0	29.3	20.9	17.1	16.2*	13.7*	11.7*	10.1*
	Elow							15.7	12.8	10.6	8.8
	Eup							16.7	14.6	12.9	11.5
45	OBS	9.2	24.1	42.5	45.9	51.5	29.5	26.6	14.4	21.7	5.4
	EXP	14.9	27.8	38.4	48.4	44.1	30.5	25.0*	23.6*	19.9*	17.1*
	Elow							24.2	22.1	18.0	15.0
	Eup							25.8	25.2	21.9	19.5
50	OBS	24.4	49.0	77.9	87.8	101.2	73.9	53.3	59.5	39.7	37.9
	EXP	27.2	48.9	77.8	87.0	92.4	81.4	56.3*	46.1*	43.6*	36.8*
	Elow							54.4	43.2	39.5	32.2
	Eup							58.1	49.2	48.0	41.8
55	OBS	46.4	89.8	116.9	164.7	144.4	141.9	114.4	111.2	131.9	89.6
	EXP	43.8	80.3	122.8	158.5	149.1	153.1	135.0*	93.3*	76.5*	72.3*
	Elow							130.6	87.3	69.3	63.3
	Eup							139.4	99.5	84.2	82.2
60	OBS	74.4	110.8	175.0	234.8	262.1	232.5	264.4	263.5	249.4	238.7
	EXP	72.6	119.6	186.8	231.5	251.3	228.8	235.1*	207.2*	143.2*	117.5*
	Elow							227.4	193.9	129.7	102.9
	Eup							242.7	220.9	157.7	133.5
65	OBS	127.2	198.0	314.4	339.1	358.2	369.5	429.7	500.3	519.5	473.2
	EXP	128.6	198.0	277.9	351.5	366.5	385.1	350.7*	360.3*	317.5*	219.5*
	Elow							339.3	337.2	287.5	192.3
	Eup							362.2	384.2	349.6	249.6
70	OBS	245.5	352.9	424.1	482.4	531.0	554.9	665.0	804.9	965.6	888.5
	EXP	241.9	335.9	440.5	500.9	532.9	538.0	565.3*	514.8*	528.8*	466.1*
	Elow							546.9	481.8	478.8	408.2
	Eup							583.7	548.9	582.3	530.0
75	OBS	491.0	600.8	696.2	777.2	706.1	772.2	921.4	1201.8	1291.4	1472.5
	EXP	491.0	605.4	716.1	760.7	727.7	749.5	756.6*	795.0*	724.0*	743.8*
	Elow							731.9	744.0	655.5	651.4
	Eup							781.3	847.8	797.2	845.6
30-79	OBS	59.7	88.1	122.0	143.0	145.2	139.0	150.4	171.4	184.1	174.3
	EXP	60.0	89.0	122.1	142.7	143.9	140.9	134.3*	124.5*	110.7*	96.4*
	Elow							130.0	116.6	100.2	84.4
	Eup							138.7	132.8	121.9	109.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	6.0	5.0	9.0	18.0	14.0	9.0	5.0	5.0	4.0	2.0
	EXP	5.9	9.4	11.7	14.0	13.1	10.2	9.2*	8.3*	7.1*	5.7*
	CHI	0.000	2.043	0.643	1.136	0.069	0.130	1.895	1.305	1.334	2.427
35 -	OBS	10.0	14.0	17.0	20.0	18.0	16.0	8.0	6.0	9.0	3.0
	EXP	8.5	13.9	18.5	18.7	18.8	17.0	13.4*	12.1*	10.9*	9.5*
	CHI	0.272	0.002	0.117	0.092	0.032	0.060	2.201	3.040	0.331	4.428
40 -	OBS	15.0	13.0	34.0	36.0	30.0	23.0	18.0	11.0	9.0	6.0
	EXP	14.3	21.8	30.3	32.6	27.8	27.1	24.7*	19.5*	17.5*	16.1*
	CHI	0.033	3.572	0.462	0.347	0.175	0.613	1.838	3.713	4.136	6.329
45 -	OBS	12.0	32.0	53.0	51.0	57.0	39.0	42.0	22.0	31.0	8.0
	EXP	19.4	36.9	47.9	53.7	48.8	40.3	39.4*	36.0*	28.4*	25.6*
	CHI	2.795	0.660	0.551	0.140	1.377	0.040	0.171	5.422	0.232	12.096
50 -	OBS	32.0	63.0	102.0	108.0	111.0	81.0	70.0	93.0	60.0	54.0
	EXP	35.6	62.9	102.0	107.1	101.3	89.2	74.0*	72.1*	65.9*	52.4*
	CHI	0.366	0.000	0.000	0.008	0.924	0.757	0.211	6.047	0.536	0.048
55 -	OBS	57.0	115.0	147.0	211.0	174.0	153.0	124.0	144.0	203.0	134.0
	EXP	53.8	102.8	154.4	203.0	179.7	165.1	146.3*	120.8*	117.8*	108.1*
	CHI	0.194	1.445	0.353	0.318	0.179	0.881	3.403	4.453	61.718	6.186
60 -	OBS	80.0	131.0	216.0	285.0	325.0	272.0	279.0	279.0	315.0	363.0
	EXP	78.0	141.4	230.6	280.9	311.6	267.7	248.0*	219.4*	180.9*	178.6*
	CHI	0.051	0.769	0.923	0.059	0.578	0.069	3.866	16.197	99.379	190.450
65 -	OBS	115.0	199.0	349.0	395.0	412.0	436.0	482.0	507.0	528.0	572.0
	EXP	116.2	199.0	308.6	409.5	421.6	454.4	393.4*	365.1*	322.8*	265.3*
	CHI	0.013	0.000	5.295	0.512	0.218	0.748	19.931	55.160	130.508	354.475
70 -	OBS	176.0	282.0	381.0	484.0	564.0	586.0	728.0	840.0	913.0	846.0
	EXP	173.4	268.4	395.8	502.5	566.1	568.1	618.8*	537.3*	500.0*	443.8*
	CHI	0.039	0.691	0.550	0.684	0.008	0.564	19.263	170.602	341.028	364.440
75 -	OBS	246.0	343.0	453.0	580.0	600.0	704.0	848.0	1157.0	1193.0	1246.0
	EXP	246.0	345.6	465.9	567.7	618.3	683.3	696.3*	765.4*	668.9*	629.4*
	CHI	0.000	0.020	0.359	0.268	0.543	0.625	33.039	200.353	410.713	604.161
30-79	OBS	749.0	1197.0	1761.0	2188.0	2305.0	2319.0	2604.0	3064.0	3265.0	3234.0
	EXP	751.1	1202.1	1765.5	2189.7	2307.0	2322.4	2263.6*	2155.9*	1920.2*	1734.5*
	O/E	0.997	0.996	0.997	0.999	0.999	0.999	1.150	1.421	1.700	1.864

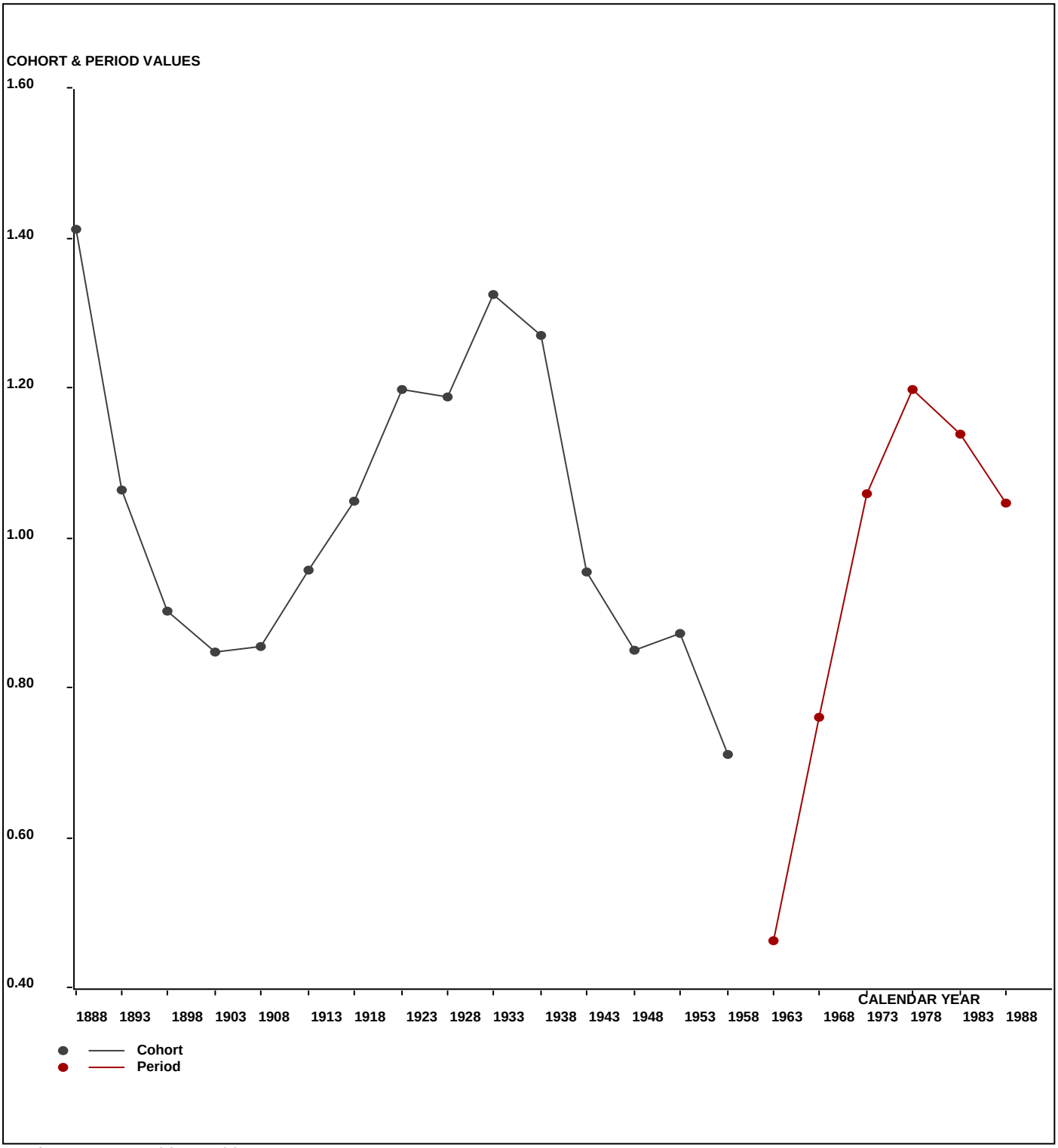
CHI SQUARE (LOG)= 3147.0680 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

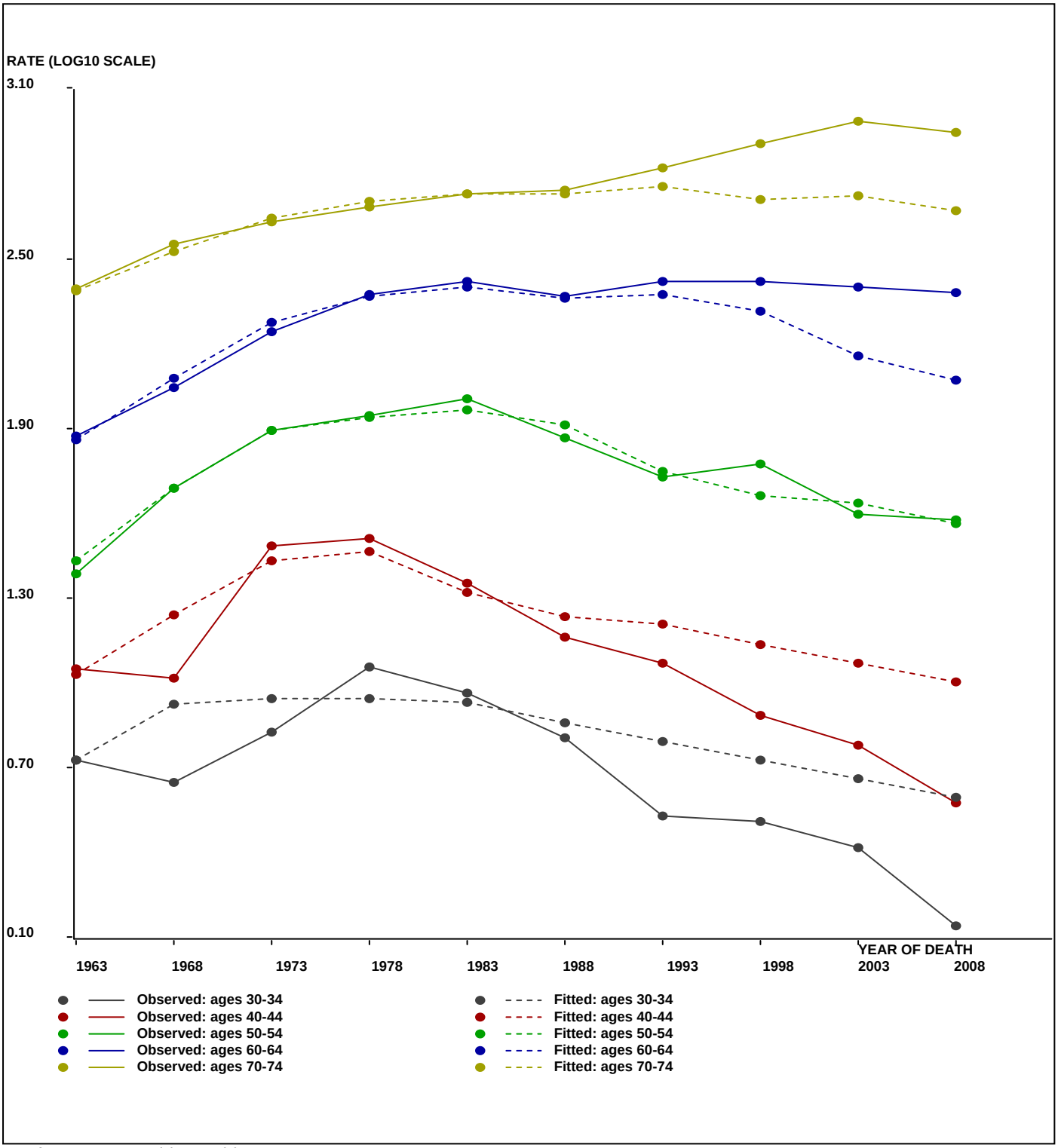


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Sweden COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	3.4	5.6	11.8	26.6	53.3	114.4	264.4	429.7	665.0	921.4
	PRE	6.3	9.5	16.2	25.0	56.3	135.0	235.1	350.7	565.3	756.6
	RES	-2.842	-3.826	-4.413	1.647	-3.008	-20.583	29.349	78.940	99.740	164.805
1996-	OBS	3.2	4.0	7.7	14.4	59.5	111.2	263.5	500.3	804.9	1201.8
	PRE	5.4	8.1	13.7	23.6	46.1	93.3	207.2	360.3	514.8	795.0
	RES	-2.133	-4.082	-5.960	-9.161	13.362	17.912	56.295	140.042	290.104	406.768
2001-	OBS	2.6	5.8	6.0	21.7	39.7	131.9	249.4	519.5	965.6	1291.4
	PRE	4.6	7.0	11.7	19.9	43.6	76.5	143.2	317.5	528.8	724.0
	RES	-2.007	-1.218	-5.709	1.799	-3.929	55.392	106.151	201.923	436.732	567.362
2006-	OBS	1.4	1.9	3.8	5.4	37.9	89.6	238.7	473.2	888.5	1472.5
	PRE	4.0	6.0	10.1	17.1	36.8	72.3	117.5	219.5	466.1	743.8
	RES	-2.586	-4.107	-6.334	-11.769	1.119	17.284	121.292	253.729	422.374	728.721

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	5.0	8.0	18.0	42.0	70.0	124.0	279.0	482.0	728.0	848.0
	PRE	9.2	13.4	24.7	39.4	74.0	146.3	248.0	393.4	618.8	696.3
	CHI	1.895	2.201	1.838	0.171	0.211	3.403	3.866	19.931	19.263	33.039
1996-	OBS	5.0	6.0	11.0	22.0	93.0	144.0	279.0	507.0	840.0	1157.0
	PRE	8.3	12.1	19.5	36.0	72.1	120.8	219.4	365.1	537.3	765.4
	CHI	1.305	3.040	3.713	5.422	6.047	4.453	16.197	55.160	170.602	200.353
2001-	OBS	4.0	9.0	9.0	31.0	60.0	203.0	315.0	528.0	913.0	1193.0
	PRE	7.1	10.9	17.5	28.4	65.9	117.8	180.9	322.8	500.0	668.9
	CHI	1.334	0.331	4.136	0.232	0.536	61.718	99.379	130.508	341.028	410.713
2006-	OBS	2.0	3.0	6.0	8.0	54.0	134.0	363.0	572.0	846.0	1246.0
	PRE	5.7	9.5	16.1	25.6	52.4	108.1	178.6	265.3	443.8	629.4
	CHI	2.427	4.428	6.329	12.096	0.048	6.186	190.450	354.475	364.440	604.161

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1064.12	20.87	51	P, C	97.26	5691.54	0.0000
AGE-PERIOD	90.66	2.01	45	Cohort	67.85	481.38	0.0000
AGE-COHORT	120.57	3.35	36	Period	75.82	640.44	0.0000
PERIOD-COHORT	34.72	0.87	40	Age	16.03	184.21	0.0000
FULL AGE-PERIOD-COHORT	29.15	0.91	32			154.64	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.799539	63.028755
35	2.250571	178.062054
40	2.615080	412.173602
45	2.897371	789.534812
50	3.153748	1424.779409
55	3.400264	2513.415617
60	3.624012	4207.377746
65	3.849795	7076.114184
70	4.036449	10875.495430
75	4.199162	15818.366103

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.125111	1.333862
1966	0.062939	1.155949
1971	-0.049383	0.892518
1976	-0.025365	0.943268
1981	-0.051126	0.888943
1986	-0.100703	0.793043

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.087097	1.222071
1891	0.028292	1.067314
1896	-0.004916	0.988745
1901	-0.017729	0.959999
1906	-0.015180	0.965650
1911	-0.003352	0.992310
1916	0.003591	1.008302
1921	0.018856	1.044374
1926	0.005588	1.012950
1931	-0.008991	0.979511
1936	-0.055757	0.879514
1941	-0.105980	0.783465
1946	-0.110152	0.775975
1951	-0.126899	0.746622
1956	-0.051095	0.889006

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	78.0	74.0	48.0	66.0	43.0	56.0
	EXP	79.4	68.2	52.8	58.9	51.4	56.0
	CHI	0.0	0.5	0.4	0.9	1.4	0.0
35 -	OBS	213.0	186.0	150.0	162.0	151.0	141.0
	EXP	219.9	198.3	148.3	150.1	154.1	133.5
	CHI	0.2	0.8	0.0	0.9	0.1	0.4
40 -	OBS	437.0	424.0	397.0	354.0	335.0	314.0
	EXP	481.9	448.7	353.4	347.1	317.4	318.5
	CHI	4.2	1.4	5.4	0.1	1.0	0.1
45 -	OBS	748.0	761.0	747.0	719.0	627.0	509.0
	EXP	833.5	803.1	657.8	689.1	605.0	535.6
	CHI	8.8	2.2	12.1	1.3	0.8	1.3
50 -	OBS	1422.0	1255.0	1212.0	1255.0	1145.0	908.0
	EXP	1575.1	1277.3	1092.5	1199.1	1123.7	945.8
	CHI	14.9	0.4	13.1	2.6	0.4	1.5
55 -	OBS	2464.0	2271.0	1740.0	1959.0	1827.0	1589.0
	EXP	2437.4	2291.3	1661.7	1916.2	1872.5	1676.3
	CHI	0.3	0.2	3.7	1.0	1.1	4.5
60 -	OBS	3403.0	3214.0	2755.0	2714.0	2747.0	2481.0
	EXP	3350.1	3238.8	2723.9	2684.8	2759.9	2558.6
	CHI	0.8	0.2	0.4	0.3	0.1	2.4
65 -	OBS	4564.0	4268.0	3636.0	4169.0	3703.0	3581.0
	EXP	4401.2	4244.3	3675.2	4222.3	3728.1	3654.3
	CHI	6.0	0.1	0.4	0.7	0.2	1.5
70 -	OBS	5210.0	4841.0	4048.0	4784.0	4966.0	4303.0
	EXP	5178.8	4697.7	4073.3	4867.1	5054.5	4284.5
	CHI	0.2	4.4	0.2	1.4	1.5	0.1
75 -	OBS	5667.0	4583.0	3450.0	4509.0	5078.0	5266.0
	EXP	5667.0	4614.4	3775.7	4561.2	4960.0	4998.0
	CHI	0.0	0.2	28.1	0.6	2.8	14.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	34779.77	869.49	40	P, C	94.36	0.0000
AGE-PERIOD	4588.79	114.72	40	Cohort	57.28	0.0000
AGE-COHORT	3105.46	77.64	40	Period	36.87	0.0000
PERIOD-COHORT	2148.19	53.70	40	Age	8.74	0.0000
FULL AGE-PERIOD-COHORT	1960.53	49.01	40			0.0000

AGE	EFFECT
30	63.028755
35	178.062054
40	412.173602
45	789.534812
50	1424.779409
55	2513.415617
60	4207.377746
65	7076.114184
70	10875.495430
75	15818.366103

PERIOD	EFFECT	LOWER	UPPER
% Period Change	89.2119	86.2119	92.2119
1961	1.333862		
1966	1.155949		
1971	0.892518		
1976	0.943268		
1981	0.888943		
1986	0.793043		
1991	0.707489	0.683698	0.731280
1996	0.631164	0.589429	0.674327
2001	0.563074	0.508158	0.621810
2006	0.502329	0.438093	0.573383

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.222071	1.000000	
1891	1.067314	2.000000	
1896	0.988745	4.000000	
1901	0.959999	8.000000	
1906	0.965650	16.000000	
1911	0.992310	32.000000	
1916	1.008302	64.000000	
1921	1.044374	128.000000	
1926	1.012950	256.000000	
1931	0.979511	512.000000	
1936	0.879514	1024.000000	
1941	0.783465	2048.000000	
1946	0.775975	4096.000000	
1951	0.746622	8192.000000	
1956	0.705763	EXTRAPOLATION	0.889006
1961	0.671227	EXTRAPOLATION	
1966	0.638382	EXTRAPOLATION	
1971	0.607143	EXTRAPOLATION	
1976	0.577434	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	80.9	69.5	40.1	51.7	35.0	44.4	32.5	33.3	27.6	22.4
	EXP	82.3	64.1	44.1	46.1	41.8	35.3	29.9*	25.4*	21.5*	18.3*
	Elow							28.9	23.7	19.4	15.9
	Eup							30.9	27.1	23.8	20.9
35	OBS	233.0	189.1	141.4	142.0	120.4	111.3	91.6	75.6	61.3	36.7
	EXP	240.6	201.6	139.8	131.6	122.8	105.4	88.9*	75.4*	64.0*	54.3*
	Elow							85.9	70.4	57.8	47.4
	Eup							91.9	80.6	70.7	62.0
40	OBS	520.7	456.0	404.8	348.7	303.0	250.0	253.2	198.8	155.9	100.8
	EXP	574.2	482.6	360.3	341.9	287.1	253.6	217.7*	183.6*	155.8*	132.2*
	Elow							210.4	171.5	140.6	115.3
	Eup							225.0	196.2	172.0	150.9
45	OBS	953.0	903.2	810.5	761.1	639.7	466.2	423.8	380.8	277.4	237.7
	EXP	1061.9	953.2	713.8	729.5	617.3	490.6	433.4*	372.1*	313.8*	266.2*
	Elow							418.9	347.5	283.2	232.2
	Eup							448.0	397.5	346.5	303.9
50	OBS	1702.5	1631.7	1473.4	1424.9	1264.1	954.1	752.7	639.0	519.5	418.2
	EXP	1885.8	1660.6	1328.1	1361.4	1240.6	993.8	789.7*	697.8*	599.0*	505.1*
	Elow							763.2	651.7	540.6	440.5
	Eup							816.3	745.5	661.5	576.6
55	OBS	3272.7	2857.5	2368.4	2531.3	2208.2	1850.8	1442.9	1096.4	897.5	778.5
	EXP	3237.4	2883.0	2261.9	2476.0	2263.2	1952.4	1564.0*	1242.9*	1098.2*	942.7*
	Elow							1511.4	1160.7	991.1	822.1
	Eup							1616.6	1327.9	1212.7	1076.0
60	OBS	5472.7	4660.5	3768.8	4045.2	3887.8	3277.4	2562.3	1979.4	1361.4	1213.1
	EXP	5387.6	4696.5	3726.3	4001.6	3906.1	3379.8	2915.7*	2335.6*	1856.1*	1640.0*
	Elow							2817.6	2181.2	1675.1	1430.3
	Eup							3013.7	2495.3	2049.7	1872.0
65	OBS	9677.5	7896.2	6033.5	6539.7	6299.9	5743.2	4731.8	3614.1	2443.5	1869.2
	EXP	9332.3	7852.4	6098.6	6623.3	6342.5	5860.7	5071.1*	4374.7*	3504.3*	2784.9*
	Elow							4900.6	4085.4	3162.5	2428.7
	Eup							5241.6	4673.9	3869.9	3178.8
70	OBS	15576.3	12809.2	9260.3	9737.0	9425.4	8733.9	8023.7	6237.3	4419.2	3365.4
	EXP	15482.9	12430.0	9318.3	9906.1	9593.4	8696.3	8035.7*	6953.1*	5998.2*	4804.9*
	Elow							7765.5	6493.3	5413.2	4190.4
	Eup							8305.9	7428.6	6623.9	5484.5
75	OBS	25785.1	19383.1	12755.1	14160.3	13901.6	13115.7	12576.0	11318.7	8107.0	6404.4
	EXP	25785.1	19516.1	13959.3	14324.1	13578.6	12448.2	11284.2*	10427.0*	9022.3*	7783.2*
	Elow							10904.8	9737.5	8142.3	6787.9
	Eup							11663.7	11140.1	9963.4	8884.1
30-79	OBS	3789.8	3126.8	2374.0	2512.8	2372.8	2103.3	1827.2	1483.2	1067.8	851.4
	EXP	3793.2	3128.1	2374.1	2509.1	2374.3	2112.6	1851.6*	1596.9*	1345.5*	1123.8*
	Elow							1789.4	1491.3	1214.3	980.1
	Eup							1913.9	1706.1	1485.9	1282.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	78.0	74.0	48.0	66.0	43.0	56.0	47.0	50.0	38.0	29.0
	EXP	79.4	68.2	52.8	58.9	51.4	44.5	43.3*	38.2*	29.6*	23.7*
	CHI	0.023	0.490	0.430	0.865	1.377	2.997	0.307	3.675	2.375	1.202
35 -	OBS	213.0	186.0	150.0	162.0	151.0	141.0	122.0	113.0	95.0	54.0
	EXP	219.9	198.3	148.3	150.1	154.1	133.5	118.4*	112.7*	99.3*	80.0*
	CHI	0.217	0.760	0.019	0.944	0.062	0.419	0.106	0.001	0.183	8.432
40 -	OBS	437.0	424.0	397.0	354.0	335.0	314.0	325.0	265.0	233.0	163.0
	EXP	481.9	448.7	353.4	347.1	317.4	318.5	279.5*	244.7*	232.8*	213.8*
	CHI	4.177	1.362	5.381	0.137	0.976	0.065	7.406	1.683	0.000	12.053
45 -	OBS	748.0	761.0	747.0	719.0	627.0	509.0	527.0	480.0	365.0	365.0
	EXP	833.5	803.1	657.8	689.1	605.0	535.6	539.1*	469.0*	412.8*	408.8*
	CHI	8.768	2.206	12.082	1.295	0.797	1.318	0.269	0.260	5.528	4.693
50 -	OBS	1422.0	1255.0	1212.0	1255.0	1145.0	908.0	798.0	767.0	636.0	552.0
	EXP	1575.1	1277.3	1092.5	1199.1	1123.7	945.8	837.2*	837.6*	733.3*	666.8*
	CHI	14.883	0.389	13.078	2.610	0.403	1.510	1.839	5.956	12.922	19.749
55 -	OBS	2464.0	2271.0	1740.0	1959.0	1827.0	1589.0	1296.0	1095.0	1025.0	930.0
	EXP	2437.4	2291.3	1661.7	1916.2	1872.5	1676.3	1404.7*	1241.3*	1254.3*	1126.2*
	CHI	0.291	0.180	3.688	0.955	1.106	4.542	8.414	17.251	41.903	34.170
60 -	OBS	3403.0	3214.0	2755.0	2714.0	2747.0	2481.0	2012.0	1625.0	1258.0	1327.0
	EXP	3350.1	3238.8	2723.9	2684.8	2759.9	2558.6	2289.5*	1917.4*	1715.1*	1794.0*
	CHI	0.837	0.190	0.355	0.318	0.061	2.352	33.642	44.588	121.843	121.545
65 -	OBS	4564.0	4268.0	3636.0	4169.0	3703.0	3581.0	3163.0	2527.0	1804.0	1611.0
	EXP	4401.2	4244.3	3675.2	4222.3	3728.1	3654.3	3389.8*	3058.8*	2587.1*	2400.2*
	CHI	6.020	0.132	0.419	0.673	0.168	1.469	15.173	92.460	237.057	259.474
70 -	OBS	5210.0	4841.0	4048.0	4784.0	4966.0	4303.0	4254.0	3586.0	2716.0	2235.0
	EXP	5178.8	4697.7	4073.3	4867.1	5054.5	4284.5	4260.4*	3997.6*	3686.5*	3191.0*
	CHI	0.188	4.372	0.158	1.419	1.549	0.080	0.010	42.372	255.491	286.396
75 -	OBS	5667.0	4583.0	3450.0	4509.0	5078.0	5266.0	4799.0	4776.0	3816.0	3351.0
	EXP	5667.0	4614.4	3775.7	4561.2	4960.0	4998.0	4306.1*	4399.7*	4246.8*	4072.4*
	CHI	0.000	0.214	28.094	0.596	2.805	14.370	56.426	32.177	43.705	127.800
30-79	OBS	24206.0	21877.0	18183.0	20691.0	20622.0	19148.0	17343.0	15284.0	11986.0	10617.0
	EXP	24224.1	21882.2	18214.7	20695.9	20626.7	19149.5	17468.1*	16317.0*	14997.7*	13976.6*
	O/E	0.999	1.000	0.998	1.000	1.000	1.000	0.993	0.937	0.799	0.760

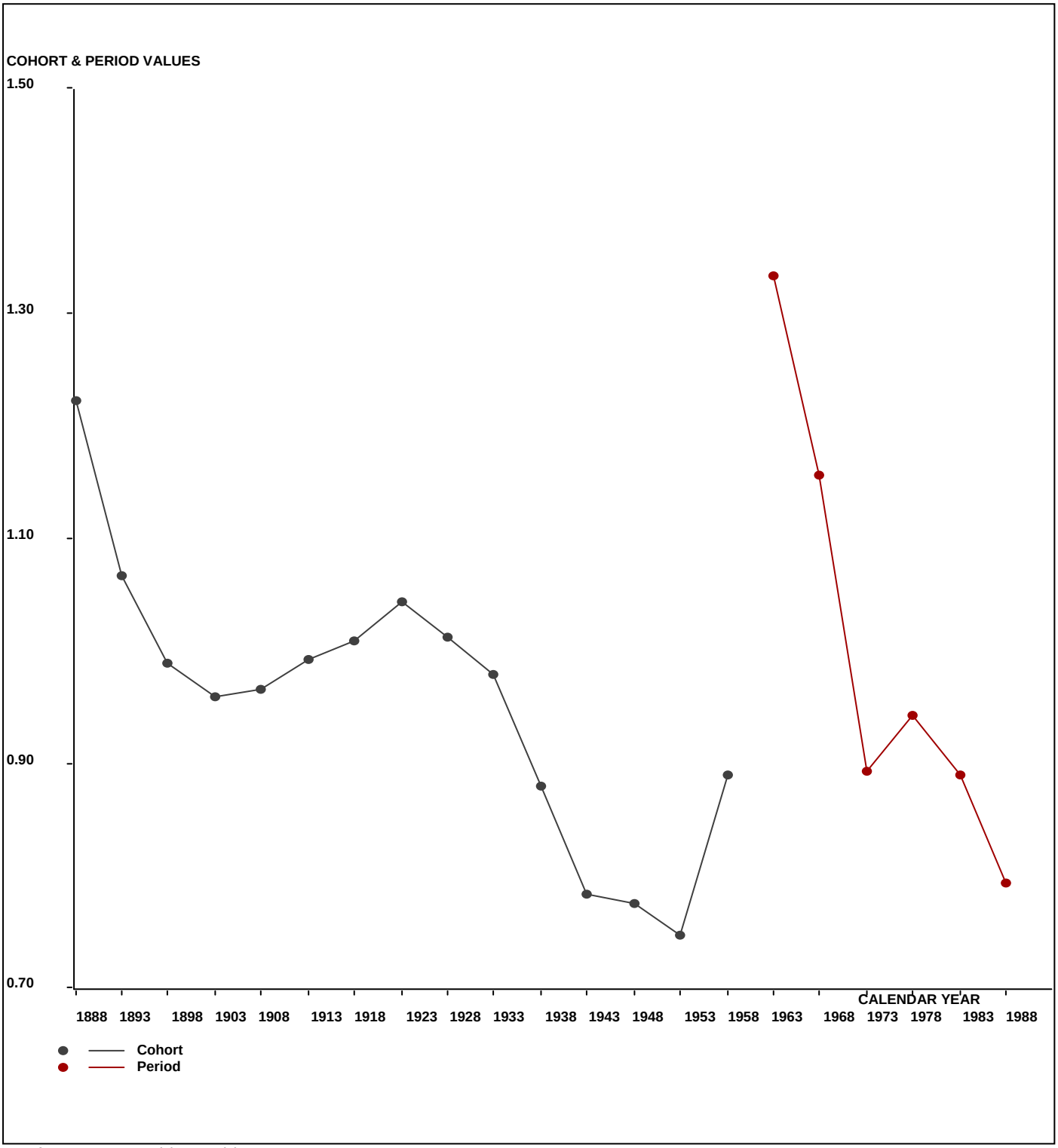
CHI SQUARE (LOG)= 1960.5347 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

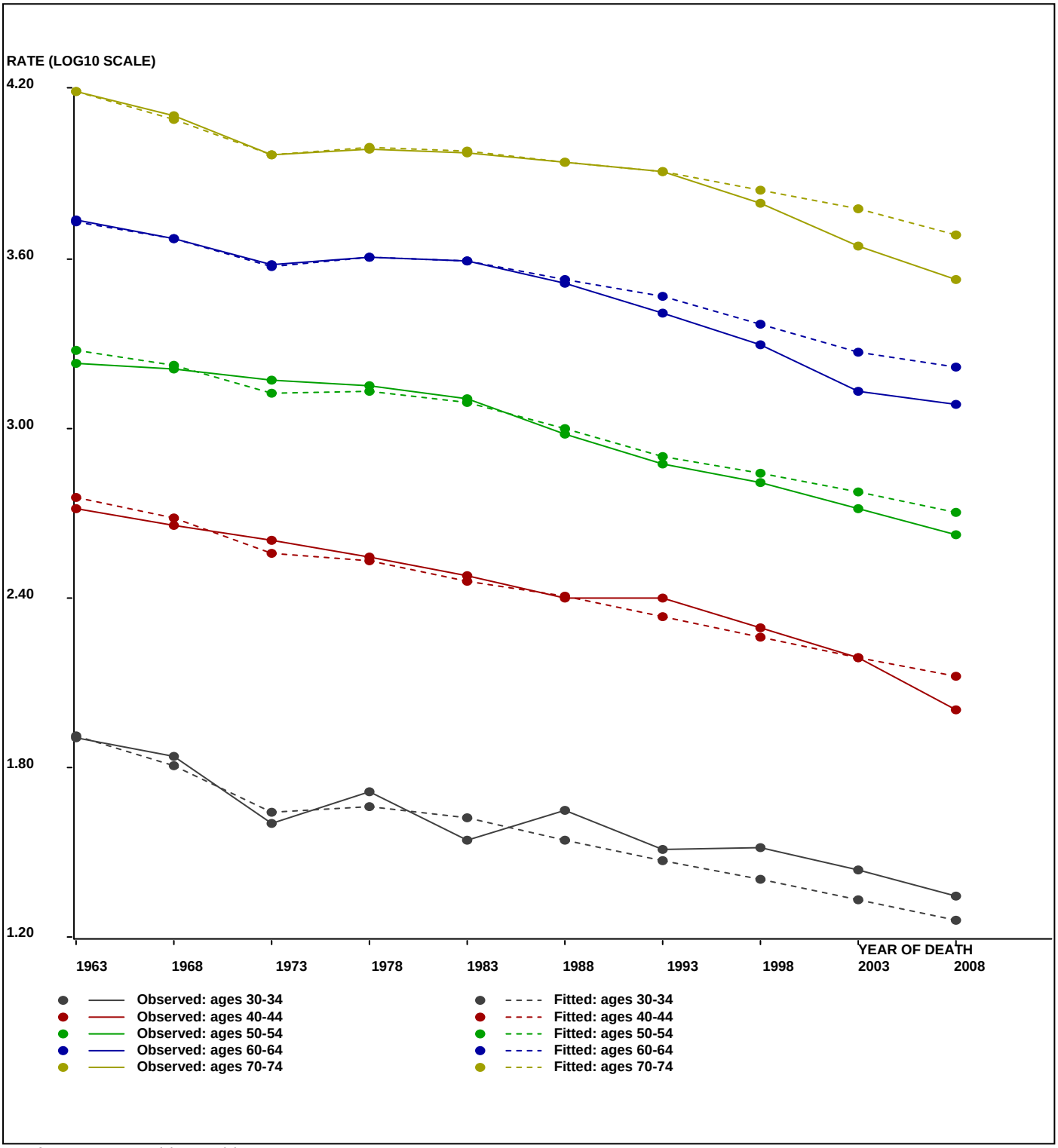


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	32.5	91.6	253.2	423.8	752.7	1442.9	2562.3	4731.8	8023.7	12576.0
	PRE	29.9	88.9	217.7	433.4	789.7	1564.0	2915.7	5071.1	8035.7	11284.2
	RES	2.520	2.665	35.440	-9.692	-37.012	-121.042	-353.433	-339.270	-12.013	1291.731
1996-	OBS	33.3	75.6	198.8	380.8	639.0	1096.4	1979.4	3614.1	6237.3	11318.7
	PRE	25.4	75.4	183.6	372.1	697.8	1242.9	2335.6	4374.7	6953.1	10427.0
	RES	7.881	0.198	15.228	8.754	-58.841	-146.517	-356.163	-760.584	-715.850	891.698
2001-	OBS	27.6	61.3	155.9	277.4	519.5	897.5	1361.4	2443.5	4419.2	8107.0
	PRE	21.5	64.0	155.8	313.8	599.0	1098.2	1856.1	3504.3	5998.2	9022.3
	RES	6.102	-2.746	0.113	-36.310	-79.511	-200.727	-494.706	-1060.768	-1579.082	-915.267
2006-	OBS	22.4	36.7	100.8	237.7	418.2	778.5	1213.1	1869.2	3365.4	6404.4
	PRE	18.3	54.3	132.2	266.2	505.1	942.7	1640.0	2784.9	4804.9	7783.2
	RES	4.119	-17.635	-31.386	-28.522	-86.933	-164.200	-426.884	-915.649	-1439.468	-1378.791

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	47.0	122.0	325.0	527.0	798.0	1296.0	2012.0	3163.0	4254.0	4799.0
	PRE	43.3	118.4	279.5	539.1	837.2	1404.7	2289.5	3389.8	4260.4	4306.1
	CHI	0.307	0.106	7.406	0.269	1.839	8.414	33.642	15.173	0.010	56.426
1996-	OBS	50.0	113.0	265.0	480.0	767.0	1095.0	1625.0	2527.0	3586.0	4776.0
	PRE	38.2	112.7	244.7	469.0	837.6	1241.3	1917.4	3058.8	3997.6	4399.7
	CHI	3.675	0.001	1.683	0.260	5.956	17.251	44.588	92.460	42.372	32.177
2001-	OBS	38.0	95.0	233.0	365.0	636.0	1025.0	1258.0	1804.0	2716.0	3816.0
	PRE	29.6	99.3	232.8	412.8	733.3	1254.3	1715.1	2587.1	3686.5	4246.8
	CHI	2.375	0.183	0.000	5.528	12.922	41.903	121.843	237.057	255.491	43.705
2006-	OBS	29.0	54.0	163.0	365.0	552.0	930.0	1327.0	1611.0	2235.0	3351.0
	PRE	23.7	80.0	213.8	408.8	666.8	1126.2	1794.0	2400.2	3191.0	4072.4
	CHI	1.202	8.432	12.053	4.693	19.749	34.170	121.545	259.474	286.396	127.800

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	910.55	17.85	51	P, C	99.27	4923.91	0.0000
AGE-PERIOD	17.82	0.40	45	Cohort	62.82	94.70	0.0000
AGE-COHORT	16.35	0.45	36	Period	59.47	86.79	0.0000
PERIOD-COHORT	9.38	0.23	40	Age	29.34	49.79	0.1380
FULL AGE-PERIOD-COHORT	6.63	0.21	32			35.17	0.3202

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.557354	36.087305
35	1.741705	55.170198
40	1.986759	96.997115
45	2.266197	184.585376
50	2.522891	333.342951
55	2.790711	617.605178
60	3.084778	1215.565536
65	3.417882	2617.468923
70	3.713069	5164.986740
75	3.995532	9897.643199

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.114917	1.302918
1966	0.056575	1.139134
1971	0.024290	1.057525
1976	-0.021137	0.952496
1981	-0.094173	0.805058
1986	-0.183299	0.655693

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.069620	1.173869
1891	0.064627	1.160452
1896	0.044267	1.107305
1901	0.030738	1.073343
1906	0.001513	1.003489
1911	-0.043286	0.905136
1916	-0.074275	0.842802
1921	-0.116919	0.763978
1926	-0.116684	0.764392
1931	-0.128456	0.743950
1936	-0.134430	0.733788
1941	-0.117367	0.763191
1946	-0.032985	0.926863
1951	-0.186793	0.650439
1956	-0.244054	0.570093

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	34.0	28.0	33.0	45.0	24.0	17.0
	EXP	33.7	32.1	34.9	40.7	23.2	17.0
	CHI	0.0	0.5	0.1	0.5	0.0	0.0
35 -	OBS	46.0	52.0	43.0	49.0	49.0	29.0
	EXP	50.2	46.0	45.4	45.7	51.6	29.8
	CHI	0.4	0.8	0.1	0.2	0.1	0.0
40 -	OBS	72.0	82.0	82.0	65.0	69.0	72.0
	EXP	81.0	78.5	74.8	68.8	65.9	74.0
	CHI	1.0	0.2	0.7	0.2	0.1	0.1
45 -	OBS	143.0	150.0	133.0	134.0	105.0	96.0
	EXP	159.1	135.3	137.5	123.6	106.9	100.8
	CHI	1.6	1.6	0.1	0.9	0.0	0.2
50 -	OBS	291.0	245.0	228.0	217.0	195.0	164.0
	EXP	328.3	246.2	221.5	213.8	180.8	152.6
	CHI	4.2	0.0	0.2	0.0	1.1	0.8
55 -	OBS	610.0	495.0	425.0	352.0	337.0	215.0
	EXP	608.0	506.1	404.4	347.8	314.4	258.7
	CHI	0.0	0.2	1.0	0.1	1.6	7.4
60 -	OBS	1082.0	966.0	843.0	660.0	519.0	439.0
	EXP	1057.0	958.3	850.5	654.7	528.3	461.2
	CHI	0.6	0.1	0.1	0.0	0.2	1.1
65 -	OBS	1773.0	1746.0	1700.0	1407.0	1049.0	809.0
	EXP	1780.9	1729.8	1673.9	1438.6	1043.9	817.6
	CHI	0.0	0.2	0.4	0.7	0.0	0.1
70 -	OBS	2655.0	2472.0	2519.0	2427.0	1987.0	1391.0
	EXP	2612.1	2462.2	2562.8	2425.6	1983.0	1406.2
	CHI	0.7	0.0	0.7	0.0	0.0	0.2
75 -	OBS	3327.0	3050.0	3133.0	3224.0	2883.0	2438.0
	EXP	3327.0	3093.6	3134.9	3222.1	2920.8	2358.5
	CHI	0.0	0.6	0.0	0.0	0.5	2.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	23642.28	591.06	40	P, C	98.69	0.0000
AGE-PERIOD	457.97	11.45	40	Cohort	32.40	0.0000
AGE-COHORT	987.07	24.68	40	Period	68.63	0.0000
PERIOD-COHORT	404.83	10.12	40	Age	23.52	0.0000
FULL AGE-PERIOD-COHORT	309.61	7.74	40			0.0000

AGE	EFFECT
30	36.087305
35	55.170198
40	96.997115
45	184.585376
50	333.342951
55	617.605178
60	1215.565536
65	2617.468923
70	5164.986740
75	9897.643199

PERIOD	EFFECT	LOWER	UPPER
% Period Change	81.4467	78.4467	84.4467
1961	1.302918		
1966	1.139134		
1971	1.057525		
1976	0.952496		
1981	0.805058		
1986	0.655693		
1991	0.534041	0.514370	0.553712
1996	0.434959	0.403507	0.467591
2001	0.354260	0.316538	0.394866
2006	0.288533	0.248314	0.333451

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.173869	1.000000	
1891	1.160452	2.000000	
1896	1.107305	4.000000	
1901	1.073343	8.000000	
1906	1.003489	16.000000	
1911	0.905136	32.000000	
1916	0.842802	64.000000	
1921	0.763978	128.000000	
1926	0.764392	256.000000	
1931	0.743950	512.000000	
1936	0.733788	1024.000000	
1941	0.763191	2048.000000	
1946	0.926863	4096.000000	
1951	0.650439	8192.000000	
1956	0.679235	EXTRAPOLATION	0.570093
1961	0.651520	EXTRAPOLATION	
1966	0.624935	EXTRAPOLATION	
1971	0.599435	EXTRAPOLATION	
1976	0.574975	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	35.3	26.3	27.6	35.3	19.5	13.5	10.4	10.0	13.8	6.2
	EXP	35.0	30.2	29.1	31.9	18.9	16.1	12.6*	9.8*	7.7*	6.0*
	Elow							12.1	9.1	6.8	5.2
	Eup							13.0	10.5	8.5	6.9
35	OBS	50.3	52.9	40.5	43.0	39.1	22.9	31.5	14.1	20.6	12.2
	EXP	54.9	46.8	42.8	40.1	41.2	23.5	20.0*	15.6*	12.2*	9.5*
	Elow							19.3	14.5	10.9	8.2
	Eup							20.7	16.8	13.6	11.0
40	OBS	85.8	88.2	83.6	64.0	62.4	57.3	44.4	45.0	27.4	28.4
	EXP	96.6	84.5	76.3	67.8	59.6	58.9	33.7*	28.7*	22.4*	17.5*
	Elow							32.5	26.6	20.0	15.1
	Eup							34.9	30.8	25.0	20.2
45	OBS	182.2	178.0	144.3	141.8	107.1	87.9	89.3	68.2	55.5	50.1
	EXP	202.7	160.6	149.2	130.8	109.0	92.4	91.4*	52.2*	44.4*	34.7*
	Elow							88.0	48.4	39.7	29.9
	Eup							94.7	56.1	49.5	40.1
50	OBS	348.4	318.5	277.2	246.4	215.3	172.3	120.7	111.6	95.6	72.0
	EXP	393.1	320.0	269.3	242.7	199.6	160.4	135.9*	134.4*	76.8*	65.3*
	Elow							130.9	124.7	68.6	56.2
	Eup							140.9	144.5	85.6	75.5
55	OBS	810.2	622.8	578.5	454.8	407.3	250.4	204.9	206.3	151.5	130.6
	EXP	807.5	636.8	550.5	449.4	380.1	301.3	242.0*	205.0*	202.8*	115.9*
	Elow							233.1	190.2	181.2	99.8
	Eup							250.9	220.4	226.0	134.0
60	OBS	1740.1	1400.8	1153.2	983.7	734.5	579.9	435.5	442.2	298.7	214.8
	EXP	1699.9	1389.5	1163.5	975.8	747.6	609.2	482.9*	388.0*	328.7*	325.1*
	Elow							465.2	359.9	293.7	279.8
	Eup							500.7	417.1	366.3	375.7
65	OBS	3759.5	3230.3	2821.0	2207.1	1784.6	1297.5	1003.8	780.9	610.9	449.0
	EXP	3776.3	3200.3	2777.7	2256.6	1776.0	1311.2	1068.5*	847.0*	680.4*	576.4*
	Elow							1029.1	785.7	608.0	496.0
	Eup							1107.9	910.5	758.4	666.1
70	OBS	7937.6	6540.9	5762.5	4939.7	3771.3	2823.4	2284.1	1732.4	1355.4	966.7
	EXP	7809.3	6514.9	5862.7	4936.8	3763.7	2854.3	2107.3*	1717.3*	1361.2*	1093.5*
	Elow							2029.7	1593.1	1216.3	941.1
	Eup							2184.9	1846.1	1517.3	1263.8
75	OBS	15138.0	12899.5	11583.2	10124.8	7892.5	6072.2	5180.8	3810.8	2885.0	2247.6
	EXP	15138.0	13083.8	11590.2	10118.9	7996.0	5874.2	4454.8*	3289.0*	2680.2*	2124.6*
	Elow							4290.7	3051.1	2394.8	1828.4
	Eup							4618.9	3535.7	2987.4	2455.3
30-79	OBS	1592.8	1340.6	1181.6	1004.7	790.1	594.3	485.6	384.2	294.0	222.4
	EXP	1593.3	1341.4	1181.2	1004.4	789.2	597.6	462.3*	363.1*	294.0*	238.0*
	Elow							445.3	336.9	262.7	204.8
	Eup							479.3	390.4	327.7	275.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	34.0	28.0	33.0	45.0	24.0	17.0	15.0	15.0	19.0	8.0
	EXP	33.7	32.1	34.9	40.7	23.2	20.3	18.2*	14.7*	10.5*	7.8*
	CHI	0.002	0.527	0.100	0.465	0.026	0.523	0.558	0.005	6.808	0.008
35 -	OBS	46.0	52.0	43.0	49.0	49.0	29.0	42.0	21.0	32.0	18.0
	EXP	50.2	46.0	45.4	45.7	51.6	29.8	26.7*	23.4*	18.9*	14.1*
	CHI	0.355	0.788	0.130	0.232	0.135	0.021	8.825	0.238	9.003	1.110
40 -	OBS	72.0	82.0	82.0	65.0	69.0	72.0	57.0	60.0	41.0	46.0
	EXP	81.0	78.5	74.8	68.8	65.9	74.0	43.3*	38.2*	33.5*	28.3*
	CHI	1.006	0.154	0.685	0.212	0.146	0.056	4.368	12.451	1.699	11.094
45 -	OBS	143.0	150.0	133.0	134.0	105.0	96.0	111.0	86.0	73.0	77.0
	EXP	159.1	135.3	137.5	123.6	106.9	100.8	113.6*	65.8*	58.4*	53.3*
	CHI	1.629	1.586	0.148	0.882	0.033	0.233	0.061	6.185	3.632	10.555
50 -	OBS	291.0	245.0	228.0	217.0	195.0	164.0	128.0	134.0	117.0	95.0
	EXP	328.3	246.2	221.5	213.8	180.8	152.6	144.0*	161.3*	94.0*	86.2*
	CHI	4.247	0.005	0.188	0.049	1.109	0.845	1.785	4.625	5.605	0.891
55 -	OBS	610.0	495.0	425.0	352.0	337.0	215.0	184.0	206.0	173.0	156.0
	EXP	608.0	506.1	404.4	347.8	314.4	258.7	217.4*	204.8*	231.6*	138.5*
	CHI	0.007	0.243	1.049	0.050	1.617	7.369	5.125	0.007	14.831	2.219
60 -	OBS	1082.0	966.0	843.0	660.0	519.0	439.0	342.0	363.0	276.0	235.0
	EXP	1057.0	958.3	850.5	654.7	528.3	461.2	379.2*	318.5*	303.7*	355.6*
	CHI	0.589	0.063	0.067	0.043	0.162	1.069	3.655	6.217	2.526	40.897
65 -	OBS	1773.0	1746.0	1700.0	1407.0	1049.0	809.0	671.0	546.0	451.0	387.0
	EXP	1780.9	1729.8	1673.9	1438.6	1043.9	817.6	714.2*	592.2*	502.3*	496.8*
	CHI	0.035	0.152	0.406	0.693	0.025	0.089	2.617	3.606	5.245	24.253
70 -	OBS	2655.0	2472.0	2519.0	2427.0	1987.0	1391.0	1211.0	996.0	833.0	642.0
	EXP	2612.1	2462.2	2562.8	2425.6	1983.0	1406.2	1117.2*	987.3*	836.6*	726.2*
	CHI	0.705	0.039	0.748	0.001	0.008	0.165	7.868	0.077	0.016	9.771
75 -	OBS	3327.0	3050.0	3133.0	3224.0	2883.0	2438.0	1977.0	1608.0	1358.0	1176.0
	EXP	3327.0	3093.6	3134.9	3222.1	2920.8	2358.5	1700.0*	1387.8*	1261.6*	1111.6*
	CHI	0.000	0.614	0.001	0.001	0.489	2.679	45.145	34.937	7.367	3.726
30-79	OBS	10033.0	9286.0	9139.0	8580.0	7217.0	5670.0	4738.0	4035.0	3373.0	2840.0
	EXP	10037.4	9288.1	9140.7	8581.3	7218.8	5679.7	4473.8*	3794.0*	3351.2*	3018.3*
	O/E	1.000	1.000	1.000	1.000	1.000	0.998	1.059	1.064	1.006	0.941

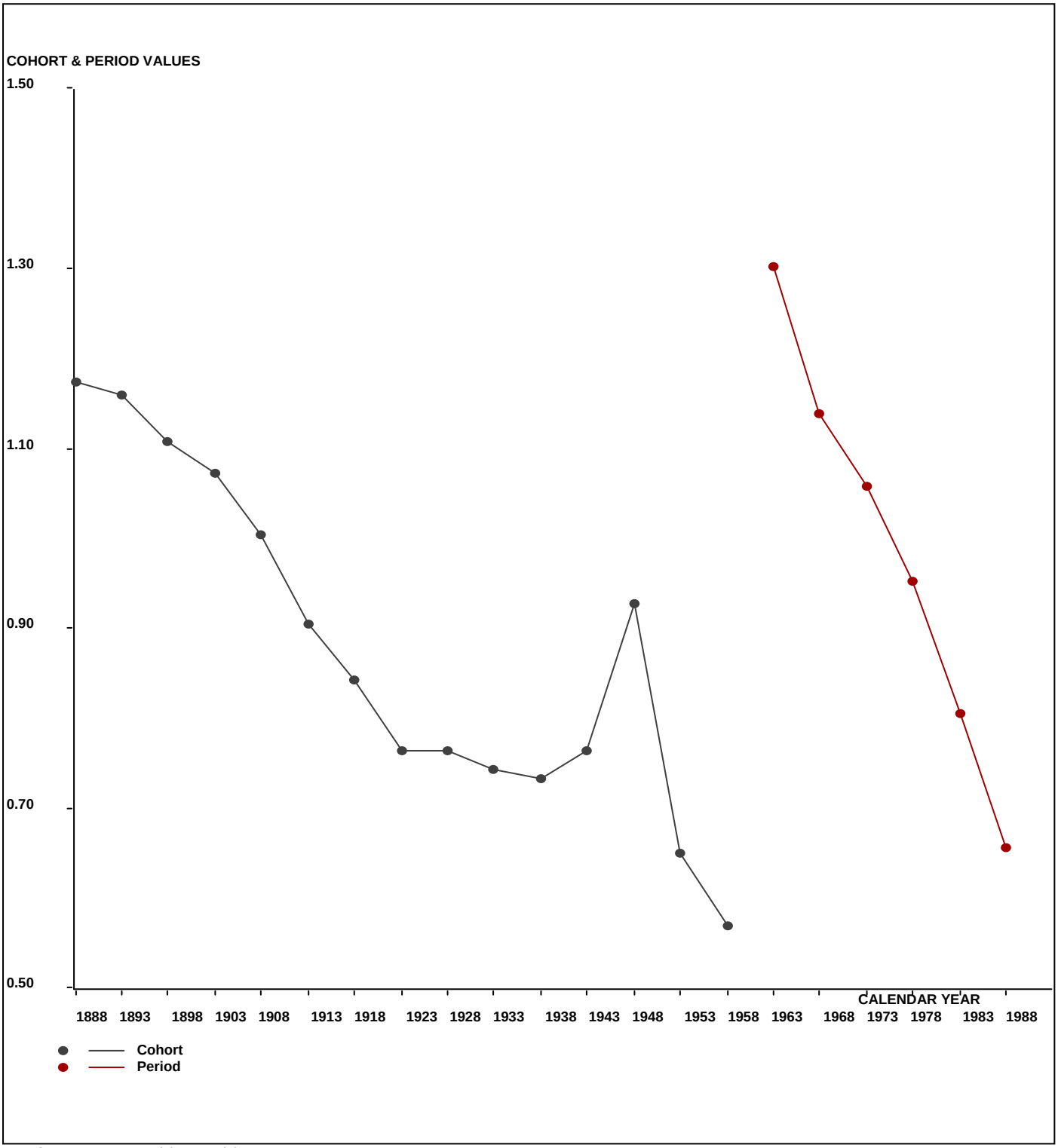
CHI SQUARE (LOG)= 309.6105 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

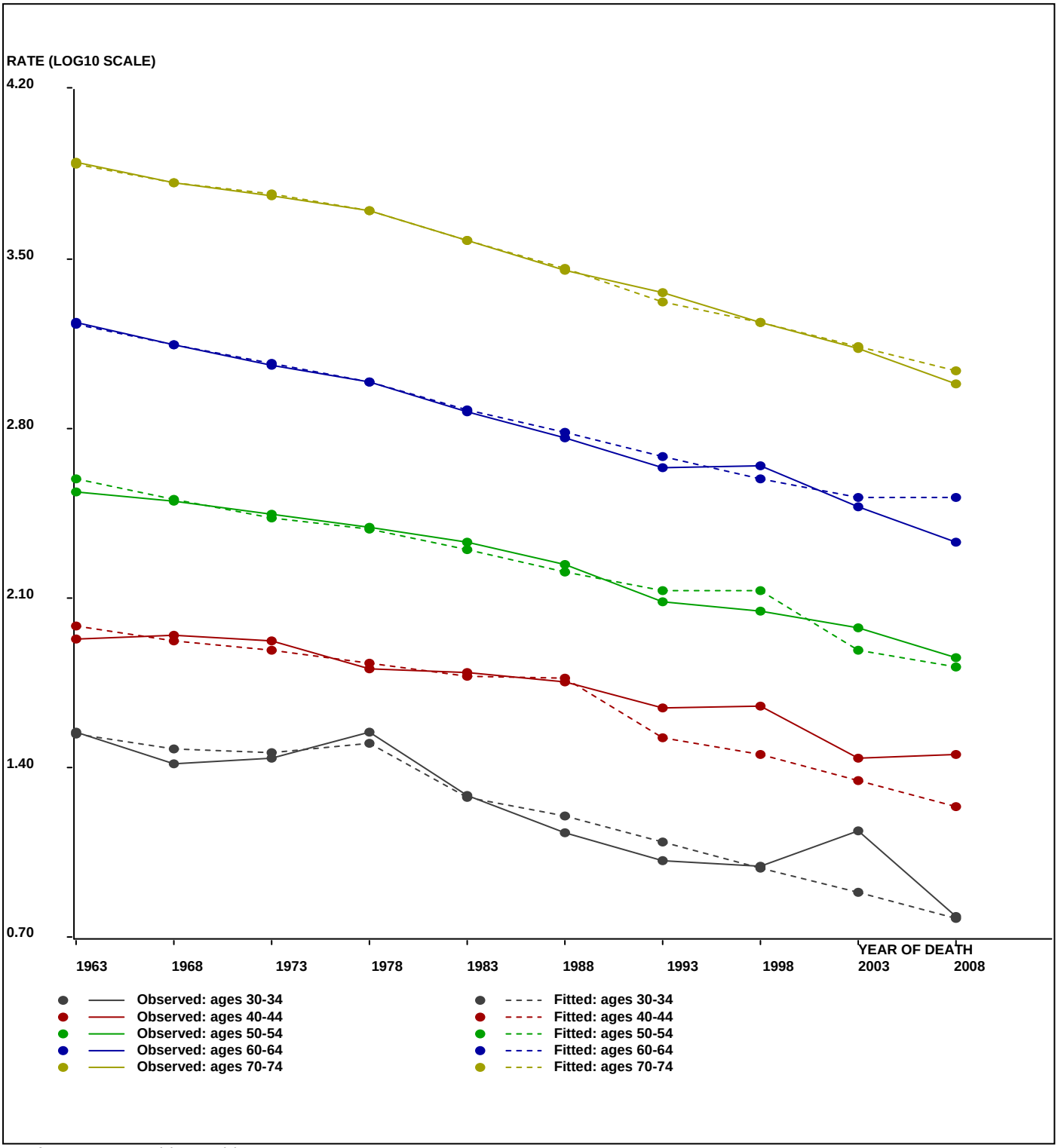


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	10.4	31.5	44.4	89.3	120.7	204.9	435.5	1003.8	2284.1	5180.8
	PRE	12.6	20.0	33.7	91.4	135.9	242.0	482.9	1068.5	2107.3	4454.8
	RES	-2.199	11.513	10.707	-2.112	-15.123	-37.163	-47.412	-64.681	176.843	725.969
1996-	OBS	10.0	14.1	45.0	68.2	111.6	206.3	442.2	780.9	1732.4	3810.8
	PRE	9.8	15.6	28.7	52.2	134.4	205.0	388.0	847.0	1717.3	3289.0
	RES	0.174	-1.578	16.362	16.008	-22.754	1.237	54.205	-66.095	15.132	521.846
2001-	OBS	13.8	20.6	27.4	55.5	95.6	151.5	298.7	610.9	1355.4	2885.0
	PRE	7.7	12.2	22.4	44.4	76.8	202.8	328.7	680.4	1361.2	2680.2
	RES	6.161	8.421	5.044	11.074	18.753	-51.317	-29.970	-69.528	-5.881	204.818
2006-	OBS	6.2	12.2	28.4	50.1	72.0	130.6	214.8	449.0	966.7	2247.6
	PRE	6.0	9.5	17.5	34.7	65.3	115.9	325.1	576.4	1093.5	2124.6
	RES	0.193	2.682	10.953	15.444	6.641	14.672	-110.245	-127.355	-126.840	122.997

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	15.0	42.0	57.0	111.0	128.0	184.0	342.0	671.0	1211.0	1977.0
	PRE	18.2	26.7	43.3	113.6	144.0	217.4	379.2	714.2	1117.2	1700.0
	CHI	0.558	8.825	4.368	0.061	1.785	5.125	3.655	2.617	7.868	45.145
1996-	OBS	15.0	21.0	60.0	86.0	134.0	206.0	363.0	546.0	996.0	1608.0
	PRE	14.7	23.4	38.2	65.8	161.3	204.8	318.5	592.2	987.3	1387.8
	CHI	0.005	0.238	12.451	6.185	4.625	0.007	6.217	3.606	0.077	34.937
2001-	OBS	19.0	32.0	41.0	73.0	117.0	173.0	276.0	451.0	833.0	1358.0
	PRE	10.5	18.9	33.5	58.4	94.0	231.6	303.7	502.3	836.6	1261.6
	CHI	6.808	9.003	1.699	3.632	5.605	14.831	2.526	5.245	0.016	7.367
2006-	OBS	8.0	18.0	46.0	77.0	95.0	156.0	235.0	387.0	642.0	1176.0
	PRE	7.8	14.1	28.3	53.3	86.2	138.5	355.6	496.8	726.2	1111.6
	CHI	0.008	1.110	11.094	10.555	0.891	2.219	40.897	24.253	9.771	3.726

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	185.24	3.63	51	P, C	94.80	994.40	0.0000
AGE-PERIOD	86.47	1.92	45	Cohort	88.86	460.24	0.0000
AGE-COHORT	19.47	0.54	36	Period	50.51	103.41	0.0000
PERIOD-COHORT	18.78	0.47	40	Age	48.70	99.75	0.0000
FULL AGE-PERIOD-COHORT	9.63	0.30	32			51.17	0.0172

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.003313	10.076576
35	1.595422	39.393275
40	2.144604	139.509447
45	2.523828	334.062937
50	2.852531	712.084184
55	3.124177	1330.995883
60	3.329919	2137.562476
65	3.486109	3062.730334
70	3.589308	3884.259046
75	3.638868	4353.795244

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.033203	0.926397
1966	-0.013572	0.969232
1971	0.007548	1.017531
1976	0.016814	1.039474
1981	0.015350	1.035977
1986	-0.010499	0.976114

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.275552	0.530211
1891	-0.190683	0.644640
1896	-0.087619	0.817299
1901	-0.022743	0.948981
1906	0.021132	1.049861
1911	0.025053	1.059382
1916	0.015777	1.036996
1921	0.035023	1.083983
1926	0.040391	1.097467
1931	-0.002672	0.993866
1936	-0.031344	0.930372
1941	-0.089955	0.812915
1946	-0.023639	0.947023
1951	-0.068834	0.853426
1956	-0.190171	0.645399

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	6.0	10.0	8.0	18.0	8.0	8.0
	EXP	8.9	9.7	10.0	12.7	10.9	8.0
	CHI	1.0	0.0	0.4	2.3	0.8	0.0
35 -	OBS	36.0	35.0	47.0	31.0	47.0	44.0
	EXP	36.6	37.3	39.6	38.0	48.5	41.6
	CHI	0.0	0.1	1.4	1.3	0.0	0.1
40 -	OBS	105.0	136.0	137.0	160.0	125.0	157.0
	EXP	117.6	138.0	138.4	137.0	129.9	162.0
	CHI	1.3	0.0	0.0	3.9	0.2	0.2
45 -	OBS	213.0	293.0	348.0	351.0	311.0	302.0
	EXP	251.9	295.7	343.8	326.0	315.6	289.4
	CHI	6.0	0.0	0.1	1.9	0.1	0.5
50 -	OBS	562.0	542.0	624.0	777.0	680.0	586.0
	EXP	583.7	550.5	646.1	715.5	664.1	615.5
	CHI	0.8	0.1	0.8	5.3	0.4	1.4
55 -	OBS	1019.0	1123.0	1037.0	1140.0	1220.0	1072.0
	EXP	974.6	1086.1	1031.8	1160.7	1252.0	1108.6
	CHI	2.0	1.3	0.0	0.4	0.8	1.2
60 -	OBS	1218.0	1504.0	1695.0	1496.0	1714.0	1699.0
	EXP	1168.5	1500.0	1684.4	1545.9	1696.1	1733.5
	CHI	2.1	0.0	0.1	1.6	0.2	0.7
65 -	OBS	1062.0	1499.0	1919.0	2157.0	1994.0	2059.0
	EXP	1093.6	1522.6	1971.7	2150.1	1934.0	2020.6
	CHI	0.9	0.4	1.4	0.0	1.9	0.7
70 -	OBS	783.0	1167.0	1661.0	2079.0	2189.0	1964.0
	EXP	775.9	1162.9	1639.6	2082.7	2246.0	1937.1
	CHI	0.1	0.0	0.3	0.0	1.4	0.4
75 -	OBS	470.0	636.0	1006.0	1318.0	1736.0	1830.0
	EXP	470.0	643.2	979.3	1367.6	1729.7	1807.6
	CHI	0.0	0.1	0.7	1.8	0.0	0.3

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	4387.17	109.68	40	P, C	89.31	0.0000
AGE-PERIOD	1801.14	45.03	40	Cohort	73.96	0.0000
AGE-COHORT	3225.29	80.63	40	Period	85.46	0.0000
PERIOD-COHORT	1153.13	28.83	40	Age	59.33	0.0000
FULL AGE-PERIOD-COHORT	468.94	11.72	40			0.0000

AGE	EFFECT
30	10.076576
35	39.393275
40	139.509447
45	334.062937
50	712.084184
55	1330.995883
60	2137.562476
65	3062.730334
70	3884.259046
75	4353.795244

PERIOD	EFFECT	LOWER	UPPER
% Period Change	94.2216	91.2216	97.2216
1961	0.926397		
1966	0.969232		
1971	1.017531		
1976	1.039474		
1981	1.035977		
1986	0.976114		
1991	0.919710	0.890427	0.948994
1996	0.866566	0.812262	0.922627
2001	0.816492	0.740958	0.896993
2006	0.769312	0.675914	0.872070

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.530211	1.000000	
1891	0.644640	2.000000	
1896	0.817299	4.000000	
1901	0.948981	8.000000	
1906	1.049861	16.000000	
1911	1.059382	32.000000	
1916	1.036996	64.000000	
1921	1.083983	128.000000	
1926	1.097467	256.000000	
1931	0.993866	512.000000	
1936	0.930372	1024.000000	
1941	0.812915	2048.000000	
1946	0.947023	4096.000000	
1951	0.853426	8192.000000	
1956	0.839961	EXTRAPOLATION	0.645399
1961	0.817920	EXTRAPOLATION	
1966	0.796457	EXTRAPOLATION	
1971	0.775557	EXTRAPOLATION	
1976	0.755206	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	6.2	9.4	6.7	14.1	6.5	6.3	9.7	7.3	6.5	3.9
	EXP	9.3	9.1	8.3	9.9	8.9	8.3	7.6*	7.0*	6.4*	5.9*
	Elow							7.3	6.5	5.8	5.1
	Eup							7.8	7.4	7.0	6.6
35	OBS	39.4	35.6	44.3	27.2	37.5	34.7	32.3	19.4	20.0	9.5
	EXP	40.1	37.9	37.3	33.3	38.6	32.8	30.4*	27.9*	25.6*	23.5*
	Elow							29.5	26.2	23.2	20.7
	Eup							31.4	29.7	28.1	26.6
40	OBS	125.1	146.3	139.7	157.6	113.1	125.0	101.3	97.5	64.2	55.7
	EXP	140.1	148.4	141.1	134.9	117.5	129.0	109.5*	101.5*	93.2*	85.5*
	Elow							106.0	95.2	84.5	75.1
	Eup							113.0	108.1	102.4	96.9
45	OBS	271.4	347.7	377.6	371.6	317.3	276.6	279.8	222.1	206.8	156.3
	EXP	320.9	351.0	373.1	345.1	322.0	265.1	291.0*	247.1*	229.1*	210.2*
	Elow							281.7	231.6	207.9	184.7
	Eup							300.2	263.0	251.7	238.3
50	OBS	672.9	704.7	758.6	882.2	750.7	615.7	561.2	520.7	422.3	376.5
	EXP	698.8	715.7	785.4	812.3	733.2	646.7	532.4*	584.4*	496.2*	460.1*
	Elow							515.4	547.8	450.3	404.3
	Eup							549.3	622.2	545.1	521.6
55	OBS	1353.5	1413.0	1411.5	1473.0	1474.6	1248.6	1062.2	877.1	815.2	710.7
	EXP	1294.5	1366.6	1404.4	1499.7	1513.3	1291.2	1138.9*	937.6*	1029.2*	873.9*
	Elow							1102.6	878.9	934.0	767.8
	Eup							1175.2	998.3	1130.6	990.6
60	OBS	1958.8	2180.9	2318.8	2229.8	2425.8	2244.4	1840.2	1553.1	1308.3	1197.6
	EXP	1879.2	2175.1	2304.2	2304.1	2400.4	2289.9	1953.9*	1723.4*	1418.8*	1557.3*
	Elow							1891.7	1615.4	1287.5	1368.3
	Eup							2016.1	1834.9	1558.7	1765.4
65	OBS	2251.9	2773.3	3184.4	3383.6	3392.4	3302.2	2878.3	2264.0	2187.5	1834.4
	EXP	2318.9	2817.0	3271.8	3372.7	3290.3	3240.6	3091.4*	2637.8*	2326.6*	1915.4*
	Elow							2992.9	2472.5	2111.3	1682.8
	Eup							3189.8	2808.4	2556.0	2171.2
70	OBS	2340.9	3087.9	3799.8	4231.4	4154.7	3986.4	3793.1	3271.7	2920.6	2507.1
	EXP	2319.6	3076.9	3750.7	4238.9	4263.0	3931.8	3872.4*	3694.0*	3152.0*	2780.1*
	Elow							3749.1	3462.5	2860.4	2442.6
	Eup							3995.7	3933.0	3462.8	3151.5
75	OBS	2138.5	2689.9	3719.3	4139.1	4752.5	4557.9	4174.5	3803.7	3615.9	3228.0
	EXP	2138.5	2720.3	3620.7	4294.8	4735.3	4502.2	4152.4*	4089.7*	3901.3*	3328.9*
	Elow							4020.2	3833.4	3540.4	2924.7
	Eup							4284.6	4354.3	4286.0	3773.5
30-79	OBS	836.8	978.6	1107.8	1175.7	1183.5	1098.3	976.5	828.7	749.4	650.5
	EXP	838.9	979.1	1108.1	1175.7	1182.6	1100.6	1012.5*	924.2*	832.5*	748.8*
	Elow							980.2	866.3	755.5	657.9
	Eup							1044.7	984.0	914.6	848.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	6.0	10.0	8.0	18.0	8.0	8.0	14.0	11.0	9.0	5.0
	EXP	8.9	9.7	10.0	12.7	10.9	10.4	11.0*	10.4*	8.8*	7.6*
	CHI	0.967	0.011	0.392	2.256	0.795	0.559	0.832	0.029	0.006	0.877
35 -	OBS	36.0	35.0	47.0	31.0	47.0	44.0	43.0	29.0	31.0	14.0
	EXP	36.6	37.3	39.6	38.0	48.5	41.6	40.5*	41.7*	39.7*	34.6*
	CHI	0.010	0.144	1.393	1.279	0.045	0.143	0.149	3.876	1.917	12.273
40 -	OBS	105.0	136.0	137.0	160.0	125.0	157.0	130.0	130.0	96.0	90.0
	EXP	117.6	138.0	138.4	137.0	129.9	162.0	140.6*	135.3*	139.2*	138.2*
	CHI	1.344	0.028	0.013	3.878	0.185	0.152	0.796	0.211	13.432	16.836
45 -	OBS	213.0	293.0	348.0	351.0	311.0	302.0	348.0	280.0	272.0	240.0
	EXP	251.9	295.7	343.8	326.0	315.6	289.4	361.9*	311.4*	301.4*	322.8*
	CHI	6.007	0.025	0.051	1.913	0.067	0.548	0.530	3.167	2.869	21.235
50 -	OBS	562.0	542.0	624.0	777.0	680.0	586.0	595.0	625.0	517.0	497.0
	EXP	583.7	550.5	646.1	715.5	664.1	615.5	564.4*	701.5*	607.5*	607.4*
	CHI	0.806	0.131	0.755	5.287	0.380	1.410	1.659	8.336	13.482	20.060
55 -	OBS	1019.0	1123.0	1037.0	1140.0	1220.0	1072.0	954.0	876.0	931.0	849.0
	EXP	974.6	1086.1	1031.8	1160.7	1252.0	1108.6	1022.9*	936.5*	1175.4*	1044.0*
	CHI	2.021	1.250	0.026	0.368	0.820	1.208	4.645	3.903	50.829	36.418
60 -	OBS	1218.0	1504.0	1695.0	1496.0	1714.0	1699.0	1445.0	1275.0	1209.0	1310.0
	EXP	1168.5	1500.0	1684.4	1545.9	1696.1	1733.5	1534.3*	1414.8*	1311.1*	1703.5*
	CHI	2.096	0.011	0.067	1.611	0.189	0.685	5.195	13.811	7.943	90.902
65 -	OBS	1062.0	1499.0	1919.0	2157.0	1994.0	2059.0	1924.0	1583.0	1615.0	1581.0
	EXP	1093.6	1522.6	1971.7	2150.1	1934.0	2020.6	2066.4*	1844.3*	1717.6*	1650.8*
	CHI	0.915	0.367	1.409	0.022	1.861	0.729	9.817	37.034	6.134	2.951
70 -	OBS	783.0	1167.0	1661.0	2079.0	2189.0	1964.0	2011.0	1881.0	1795.0	1665.0
	EXP	775.9	1162.9	1639.6	2082.7	2246.0	1937.1	2053.1*	2123.8*	1937.2*	1846.3*
	CHI	0.065	0.015	0.280	0.006	1.449	0.374	0.862	27.761	10.441	17.809
75 -	OBS	470.0	636.0	1006.0	1318.0	1736.0	1830.0	1593.0	1605.0	1702.0	1689.0
	EXP	470.0	643.2	979.3	1367.6	1729.7	1807.6	1584.5*	1725.7*	1836.4*	1741.8*
	CHI	0.000	0.080	0.726	1.796	0.023	0.277	0.045	8.439	9.832	1.599
30-79	OBS	5474.0	6945.0	8482.0	9527.0	10024.0	9721.0	9057.0	8295.0	8177.0	7940.0
	EXP	5481.4	6946.0	8484.5	9535.9	10026.9	9726.2	9379.6*	9245.5*	9074.4*	9097.0*
	O/E	0.999	1.000	1.000	0.999	1.000	0.999	0.966	0.897	0.901	0.873

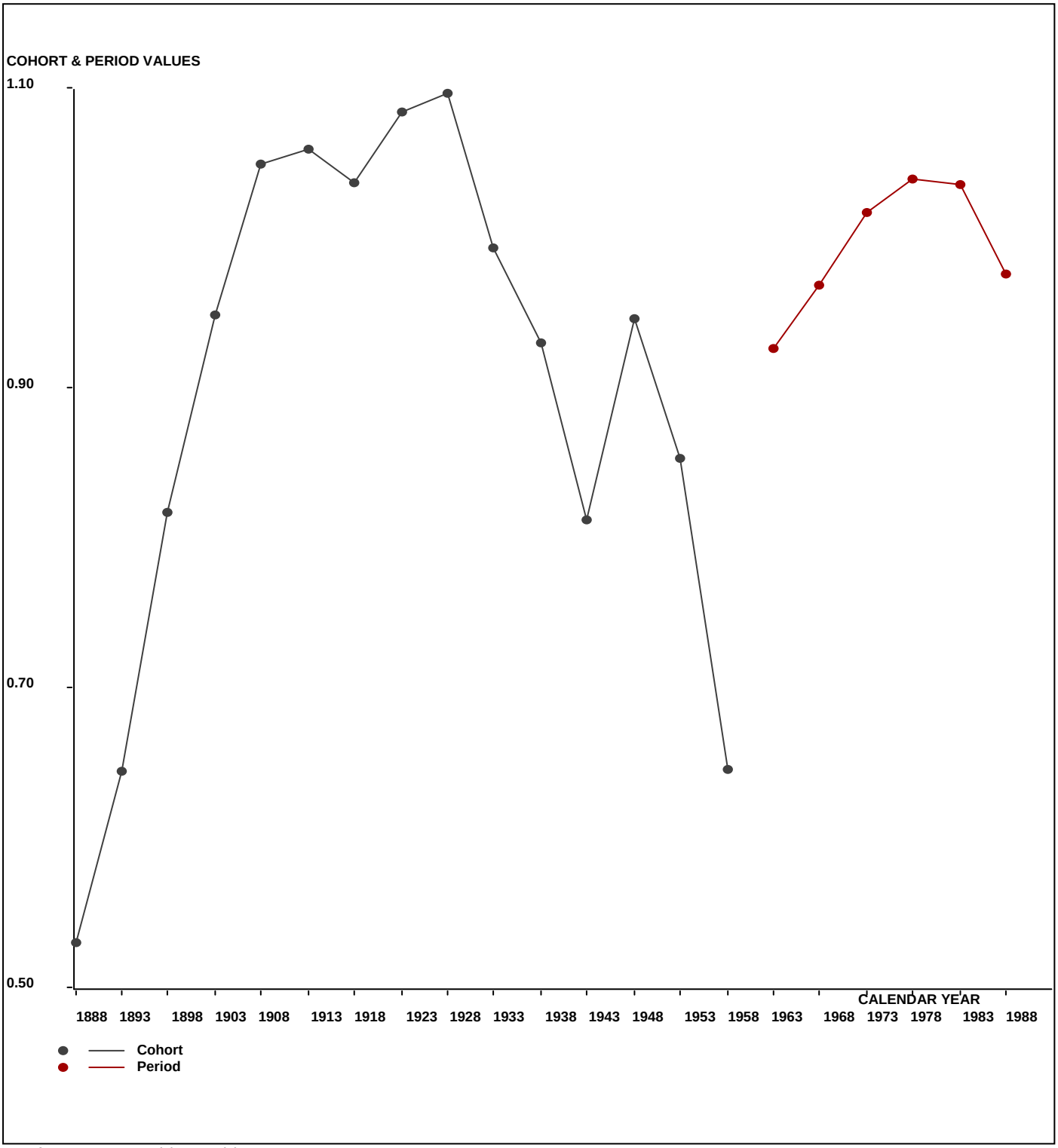
CHI SQUARE (LOG)= 468.9401 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

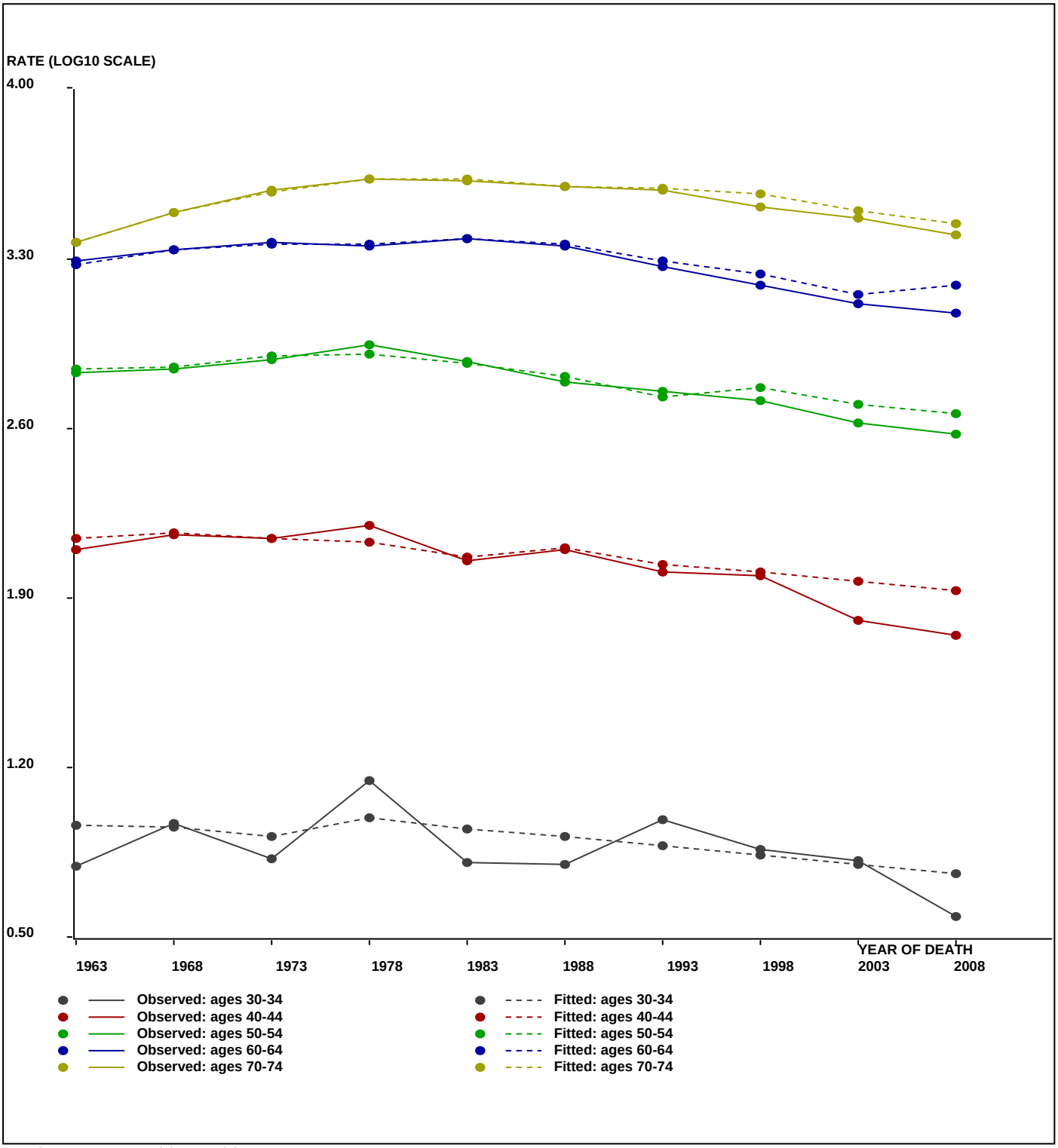


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	9.7	32.3	101.3	279.8	561.2	1062.2	1840.2	2878.3	3793.1	4174.5
	PRE	7.6	30.4	109.5	291.0	532.4	1138.9	1953.9	3091.4	3872.4	4152.4
	RES	2.086	1.844	-8.237	-11.139	28.861	-76.745	-113.693	-213.076	-79.356	22.145
1996-	OBS	7.3	19.4	97.5	222.1	520.7	877.1	1553.1	2264.0	3271.7	3803.7
	PRE	7.0	27.9	101.5	247.1	584.4	937.6	1723.4	2637.8	3694.0	4089.7
	RES	0.366	-8.511	-4.006	-24.914	-63.704	-60.528	-170.273	-373.780	-422.339	-285.992
2001-	OBS	6.5	20.0	64.2	206.8	422.3	815.2	1308.3	2187.5	2920.6	3615.9
	PRE	6.4	25.6	93.2	229.1	496.2	1029.2	1418.8	2326.6	3152.0	3901.3
	RES	0.168	-5.627	-28.937	-22.351	-73.918	-214.016	-110.436	-139.032	-231.399	-285.465
2006-	OBS	3.9	9.5	55.7	156.3	376.5	710.7	1197.6	1834.4	2507.1	3228.0
	PRE	5.9	23.5	85.5	210.2	460.1	873.9	1557.3	1915.4	2780.1	3328.9
	RES	-1.992	-13.996	-29.831	-53.914	-83.624	-163.212	-359.746	-80.988	-273.043	-100.866

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	14.0	43.0	130.0	348.0	595.0	954.0	1445.0	1924.0	2011.0	1593.0
	PRE	11.0	40.5	140.6	361.9	564.4	1022.9	1534.3	2066.4	2053.1	1584.5
	CHI	0.832	0.149	0.796	0.530	1.659	4.645	5.195	9.817	0.862	0.045
1996-	OBS	11.0	29.0	130.0	280.0	625.0	876.0	1275.0	1583.0	1881.0	1605.0
	PRE	10.4	41.7	135.3	311.4	701.5	936.5	1414.8	1844.3	2123.8	1725.7
	CHI	0.029	3.876	0.211	3.167	8.336	3.903	13.811	37.034	27.761	8.439
2001-	OBS	9.0	31.0	96.0	272.0	517.0	931.0	1209.0	1615.0	1795.0	1702.0
	PRE	8.8	39.7	139.2	301.4	607.5	1175.4	1311.1	1717.6	1937.2	1836.4
	CHI	0.006	1.917	13.432	2.869	13.482	50.829	7.943	6.134	10.441	9.832
2006-	OBS	5.0	14.0	90.0	240.0	497.0	849.0	1310.0	1581.0	1665.0	1689.0
	PRE	7.6	34.6	138.2	322.8	607.4	1044.0	1703.5	1650.8	1846.3	1741.8
	CHI	0.877	12.273	16.836	21.235	20.060	36.418	90.902	2.951	17.809	1.599

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	106.33	2.08	51	P, C	92.26	572.31	0.0000
AGE-PERIOD	56.17	1.25	45	Cohort	85.36	301.88	0.0000
AGE-COHORT	33.12	0.92	36	Period	75.16	176.54	0.0000
PERIOD-COHORT	20.49	0.51	40	Age	59.86	109.83	0.0000
FULL AGE-PERIOD-COHORT	8.23	0.26	32			44.01	0.0768

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.132427	13.565215
35	1.282895	19.182047
40	1.635503	43.201880
45	1.930486	85.209045
50	2.235599	172.027816
55	2.538831	345.804434
60	2.857311	719.964880
65	3.111697	1293.293945
70	3.356511	2272.535488
75	3.563725	3662.053339

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.040142	0.911712
1966	0.058632	1.144542
1971	0.052589	1.128728
1976	0.006175	1.014320
1981	-0.040706	0.910529
1986	-0.044773	0.902042

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.196250	0.636429
1891	-0.158216	0.694679
1896	-0.074254	0.842841
1901	-0.004581	0.989508
1906	0.026094	1.061926
1911	0.024181	1.057259
1916	0.061362	1.151759
1921	0.070338	1.175813
1926	0.003770	1.008719
1931	-0.073773	0.843776
1936	-0.134680	0.733364
1941	-0.182863	0.656352
1946	-0.157142	0.696398
1951	-0.246747	0.566569
1956	-0.108920	0.778180

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	7.0	13.0	10.0	15.0	9.0	12.0
	EXP	10.1	12.1	12.0	12.2	8.6	12.0
	CHI	0.9	0.1	0.3	0.6	0.0	0.0
35 -	OBS	10.0	13.0	11.0	25.0	16.0	12.0
	EXP	16.1	18.2	16.8	14.6	15.3	12.4
	CHI	2.3	1.5	2.0	7.5	0.0	0.0
40 -	OBS	41.0	46.0	36.0	35.0	32.0	30.0
	EXP	38.9	46.4	40.4	32.6	28.5	34.1
	CHI	0.1	0.0	0.5	0.2	0.4	0.5
45 -	OBS	74.0	99.0	92.0	64.0	66.0	36.0
	EXP	70.2	96.6	89.4	68.9	55.8	55.1
	CHI	0.2	0.1	0.1	0.3	1.9	6.6
50 -	OBS	140.0	177.0	184.0	163.0	121.0	98.0
	EXP	138.5	174.4	187.8	155.0	119.7	108.3
	CHI	0.0	0.0	0.1	0.4	0.0	1.0
55 -	OBS	284.0	319.0	316.0	296.0	264.0	240.0
	EXP	252.1	332.6	330.3	319.2	262.8	226.0
	CHI	4.0	0.6	0.6	1.7	0.0	0.9
60 -	OBS	408.0	576.0	652.0	574.0	540.0	489.0
	EXP	403.9	603.5	628.1	564.3	544.6	495.9
	CHI	0.0	1.3	0.9	0.2	0.0	0.1
65 -	OBS	452.0	812.0	934.0	867.0	784.0	881.0
	EXP	468.7	791.7	934.2	884.2	797.2	855.3
	CHI	0.6	0.5	0.0	0.3	0.2	0.8
70 -	OBS	459.0	825.0	1091.0	1216.0	1172.0	1174.0
	EXP	481.4	828.5	1109.5	1202.7	1152.6	1163.2
	CHI	1.0	0.0	0.3	0.1	0.3	0.1
75 -	OBS	467.0	710.0	962.0	1164.0	1273.0	1387.0
	EXP	467.0	688.4	942.3	1170.4	1293.4	1402.2
	CHI	0.0	0.7	0.4	0.0	0.3	0.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	4867.65	121.69	40	P, C	76.49	0.0000
AGE-PERIOD	4297.35	107.43	40	Cohort	73.37	0.0000
AGE-COHORT	688.65	17.22	40	Period	-66.20	0.0000
PERIOD-COHORT	2362.98	59.07	40	Age	51.56	0.0000
FULL AGE-PERIOD-COHORT	1144.53	28.61	40			0.0000

AGE	EFFECT
30	13.565215
35	19.182047
40	43.201880
45	85.209045
50	172.027816
55	345.804434
60	719.964880
65	1293.293945
70	2272.535488
75	3662.053339

PERIOD	EFFECT	LOWER	UPPER
% Period Change	99.0680	96.0680	102.0680
1961	0.911712		
1966	1.144542		
1971	1.128728		
1976	1.014320		
1981	0.910529		
1986	0.902042		
1991	0.893635	0.866574	0.920696
1996	0.885306	0.832500	0.939736
2001	0.877055	0.799766	0.959170
2006	0.868880	0.768319	0.979005

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.636429	1.000000	
1891	0.694679	2.000000	
1896	0.842841	4.000000	
1901	0.989508	8.000000	
1906	1.061926	16.000000	
1911	1.057259	32.000000	
1916	1.151759	64.000000	
1921	1.175813	128.000000	
1926	1.008719	256.000000	
1931	0.843776	512.000000	
1936	0.733364	1024.000000	
1941	0.656352	2048.000000	
1946	0.696398	4096.000000	
1951	0.566569	8192.000000	
1956	0.528644	EXTRAPOLATION	0.778180
1961	0.481304	EXTRAPOLATION	
1966	0.438203	EXTRAPOLATION	
1971	0.398962	EXTRAPOLATION	
1976	0.363235	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	7.3	12.2	8.4	11.8	7.3	9.5	4.1	4.0	0.7	0.8
	EXP	10.4	11.4	10.0	9.6	7.0	6.5	5.8*	5.3*	4.7*	4.3*
	Elow							5.7	4.9	4.3	3.8
	Eup							6.0	5.6	5.2	4.8
35	OBS	10.9	13.2	10.4	21.9	12.8	9.5	7.5	4.7	5.2	3.4
	EXP	17.6	18.5	15.9	12.8	12.2	9.8	9.1*	8.2*	7.4*	6.6*
	Elow							8.8	7.7	6.7	5.9
	Eup							9.3	8.7	8.1	7.5
40	OBS	48.9	49.5	36.7	34.5	28.9	23.9	17.9	10.5	5.4	3.1
	EXP	46.3	49.9	41.1	32.1	25.8	27.1	21.9*	20.2*	18.2*	16.4*
	Elow							21.2	19.0	16.6	14.5
	Eup							22.5	21.5	19.9	18.5
45	OBS	94.3	117.5	99.8	67.7	67.3	33.0	32.2	21.4	15.2	12.4
	EXP	89.5	114.7	97.0	72.9	56.9	50.4	53.0*	42.7*	39.5*	35.6*
	Elow							51.4	40.2	36.0	31.5
	Eup							54.6	45.4	43.2	40.2
50	OBS	167.6	230.1	223.7	185.1	133.6	103.0	81.1	75.8	46.6	34.8
	EXP	165.8	226.8	228.3	176.0	132.2	113.8	100.9*	106.1*	85.5*	79.0*
	Elow							97.8	99.7	77.9	69.9
	Eup							104.0	112.6	93.5	89.0
55	OBS	377.2	401.4	430.1	382.5	319.1	279.5	188.2	142.2	109.4	86.2
	EXP	334.8	418.5	449.6	412.4	317.6	263.2	226.6*	200.9*	211.2*	170.2*
	Elow							219.8	189.0	192.6	150.5
	Eup							233.5	213.3	231.0	191.8
60	OBS	656.1	835.2	891.9	855.5	764.3	646.0	503.0	387.4	271.6	264.2
	EXP	649.5	875.1	859.2	841.1	770.8	655.1	542.9*	467.4*	414.5*	435.6*
	Elow							526.4	439.6	377.9	385.2
	Eup							559.3	496.2	453.3	490.9
65	OBS	958.4	1502.3	1549.9	1360.0	1333.8	1412.9	1099.6	825.2	598.7	482.7
	EXP	993.8	1464.7	1550.2	1386.9	1356.3	1371.7	1165.8*	966.1*	831.8*	737.6*
	Elow							1130.5	908.5	758.5	652.2
	Eup							1201.1	1025.5	909.7	831.0
70	OBS	1372.3	2182.9	2495.8	2475.0	2224.4	2382.9	2142.7	1735.9	1207.3	960.7
	EXP	1439.3	2192.2	2538.2	2447.8	2187.7	2361.0	2387.9*	2029.4*	1681.8*	1448.1*
	Elow							2315.6	1908.4	1533.6	1280.5
	Eup							2460.2	2154.2	1839.2	1631.6
75	OBS	2124.9	3002.8	3556.7	3655.5	3485.0	3454.5	3519.4	3225.5	2358.2	1760.2
	EXP	2124.9	2911.7	3483.9	3675.5	3540.9	3492.5	3769.2*	3812.0*	3239.8*	2684.8*
	Elow							3655.0	3584.7	2954.3	2374.1
	Eup							3883.3	4046.4	3543.2	3025.1
30-79	OBS	364.5	511.0	554.4	527.2	481.2	470.3	409.3	337.5	241.1	191.9
	EXP	365.6	510.8	555.0	528.1	481.2	470.2	450.4*	407.2*	350.5*	306.5*
	Elow							436.8	382.9	319.6	271.0
	Eup							464.1	432.2	383.4	345.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	7.0	13.0	10.0	15.0	9.0	12.0	6.0	6.0	1.0	1.0
	EXP	10.1	12.1	12.0	12.2	8.6	8.2	8.5*	7.9*	6.5*	5.5*
	CHI	0.929	0.064	0.343	0.629	0.019	1.816	0.710	0.460	4.677	3.723
35 -	OBS	10.0	13.0	11.0	25.0	16.0	12.0	10.0	7.0	8.0	5.0
	EXP	16.1	18.2	16.8	14.6	15.3	12.4	12.1*	12.2*	11.4*	9.8*
	CHI	2.326	1.495	2.031	7.473	0.036	0.014	0.356	2.224	1.031	2.345
40 -	OBS	41.0	46.0	36.0	35.0	32.0	30.0	23.0	14.0	8.0	5.0
	EXP	38.9	46.4	40.4	32.6	28.5	34.1	28.1*	26.9*	27.3*	26.6*
	CHI	0.117	0.003	0.469	0.173	0.418	0.489	0.919	6.221	13.605	17.542
45 -	OBS	74.0	99.0	92.0	64.0	66.0	36.0	40.0	27.0	20.0	19.0
	EXP	70.2	96.6	89.4	68.9	55.8	55.1	65.9*	53.9*	52.0*	54.7*
	CHI	0.202	0.059	0.075	0.347	1.877	6.608	10.209	13.404	19.670	23.317
50 -	OBS	140.0	177.0	184.0	163.0	121.0	98.0	86.0	91.0	57.0	46.0
	EXP	138.5	174.4	187.8	155.0	119.7	108.3	107.0*	127.3*	104.7*	104.3*
	CHI	0.016	0.038	0.077	0.410	0.014	0.981	4.111	10.356	21.702	32.589
55 -	OBS	284.0	319.0	316.0	296.0	264.0	240.0	169.0	142.0	125.0	103.0
	EXP	252.1	332.6	330.3	319.2	262.8	226.0	203.6*	200.7*	241.2*	203.4*
	CHI	4.046	0.553	0.616	1.683	0.006	0.871	5.865	17.163	55.999	49.538
60 -	OBS	408.0	576.0	652.0	574.0	540.0	489.0	395.0	318.0	251.0	289.0
	EXP	403.9	603.5	628.1	564.3	544.6	495.9	426.3*	383.7*	383.0*	476.5*
	CHI	0.042	1.250	0.913	0.166	0.039	0.097	2.297	11.262	45.483	73.801
65 -	OBS	452.0	812.0	934.0	867.0	784.0	881.0	735.0	577.0	442.0	416.0
	EXP	468.7	791.7	934.2	884.2	797.2	855.3	779.3*	675.5*	614.1*	635.7*
	CHI	0.594	0.521	0.000	0.333	0.219	0.773	2.517	14.362	48.244	75.912
70 -	OBS	459.0	825.0	1091.0	1216.0	1172.0	1174.0	1136.0	998.0	742.0	638.0
	EXP	481.4	828.5	1109.5	1202.7	1152.6	1163.2	1266.0*	1166.8*	1033.6*	961.7*
	CHI	1.044	0.015	0.309	0.148	0.325	0.100	13.348	24.416	82.269	108.946
75 -	OBS	467.0	710.0	962.0	1164.0	1273.0	1387.0	1343.0	1361.0	1110.0	921.0
	EXP	467.0	688.4	942.3	1170.4	1293.4	1402.2	1438.3*	1608.5*	1525.0*	1404.8*
	CHI	0.000	0.675	0.411	0.035	0.323	0.166	6.317	38.086	112.935	166.600
30-79	OBS	2342.0	3590.0	4288.0	4419.0	4277.0	4359.0	3943.0	3541.0	2764.0	2443.0
	EXP	2346.8	3592.4	4290.8	4424.0	4278.6	4360.7	4335.0*	4263.5*	3998.8*	3883.0*
	O/E	0.998	0.999	0.999	0.999	1.000	1.000	0.910	0.831	0.691	0.629

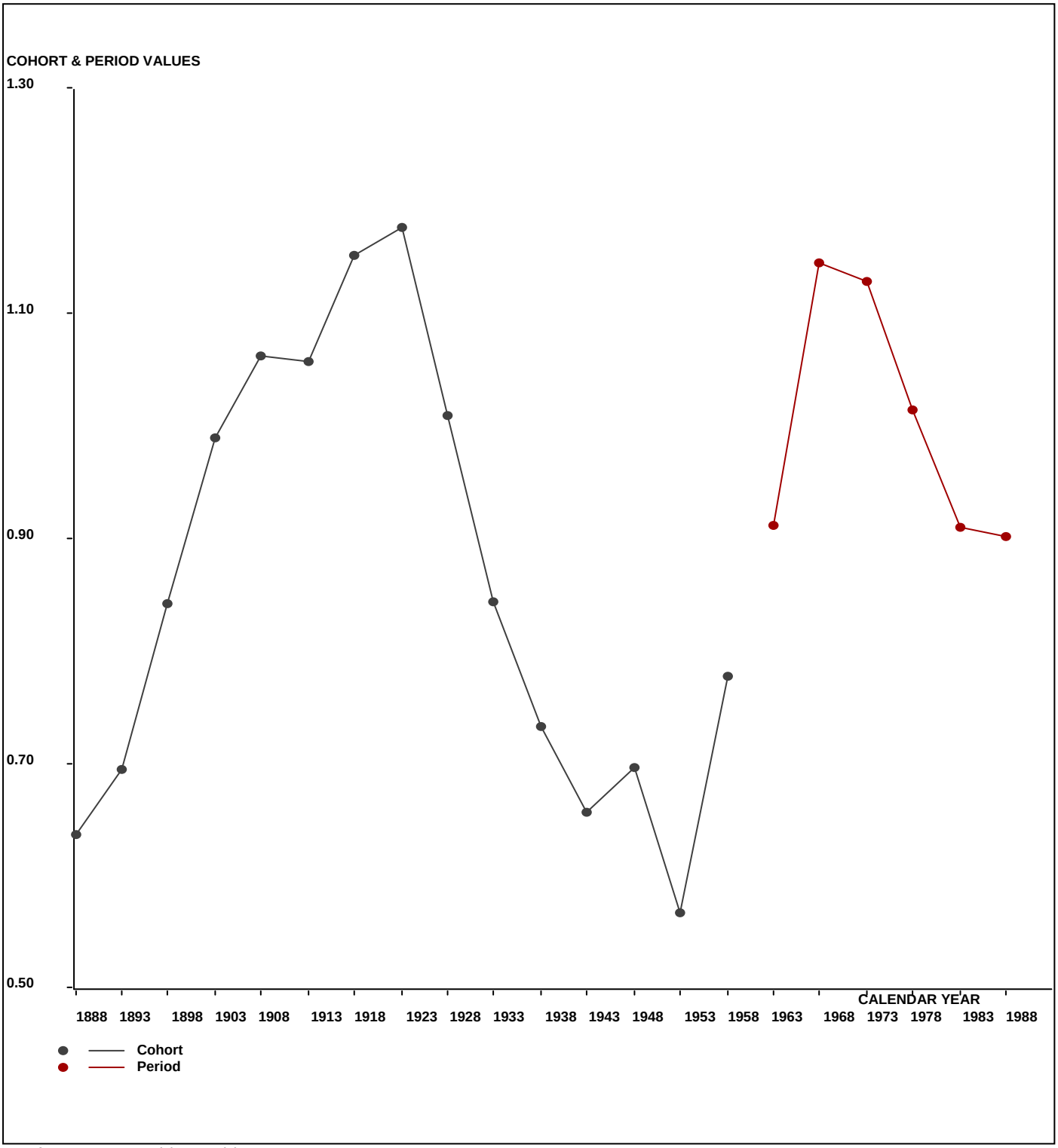
CHI SQUARE (LOG)= 1144.5307 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

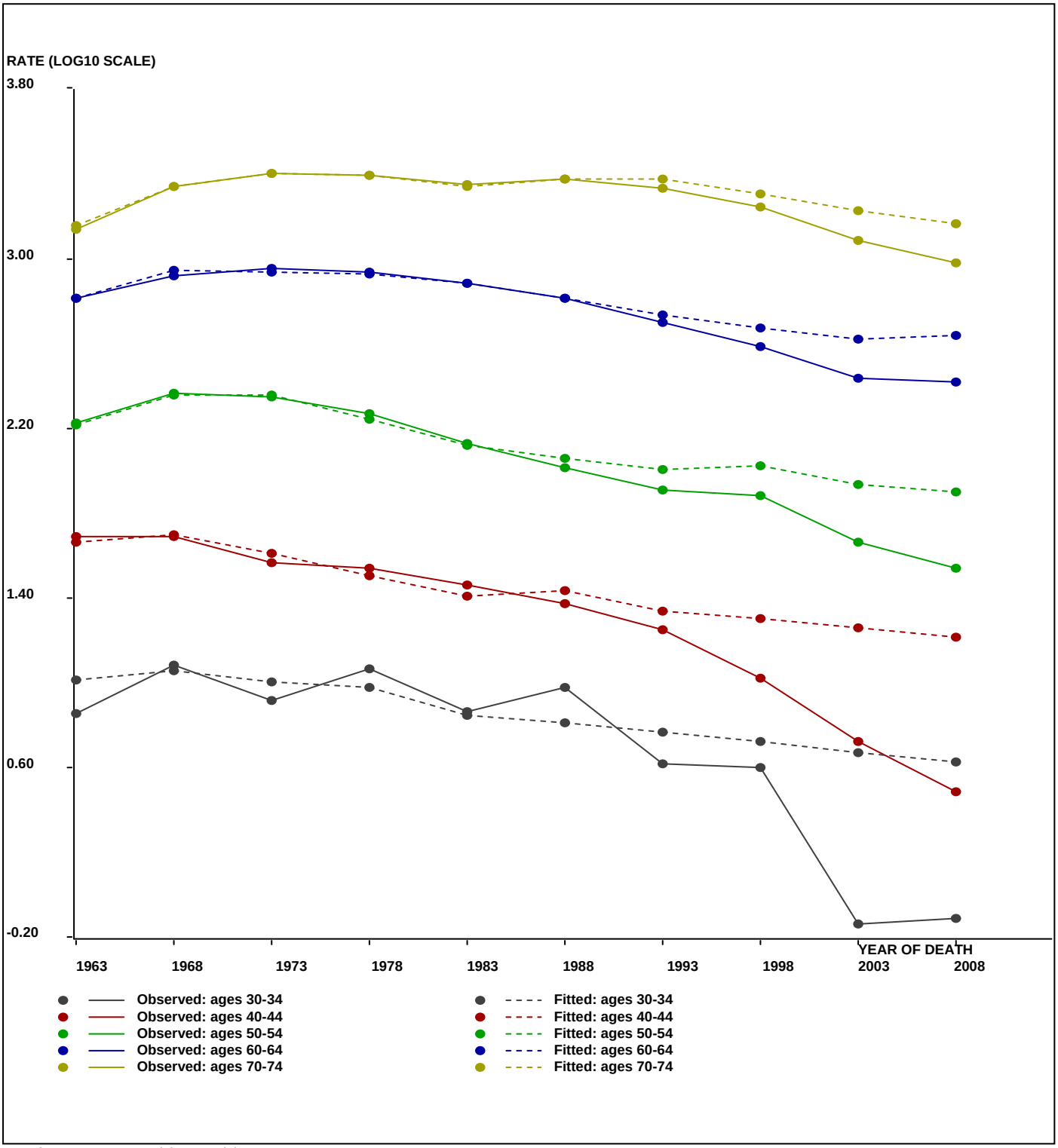


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	4.1	7.5	17.9	32.2	81.1	188.2	503.0	1099.6	2142.7	3519.4
	PRE	5.8	9.1	21.9	53.0	100.9	226.6	542.9	1165.8	2387.9	3769.2
	RES	-1.692	-1.556	-3.957	-20.864	-19.779	-38.467	-39.847	-66.253	-245.189	-249.795
1996-	OBS	4.0	4.7	10.5	21.4	75.8	142.2	387.4	825.2	1735.9	3225.5
	PRE	5.3	8.2	20.2	42.7	106.1	200.9	467.4	966.1	2029.4	3812.0
	RES	-1.269	-3.488	-9.715	-21.319	-30.250	-58.762	-80.079	-140.869	-293.571	-586.576
2001-	OBS	0.7	5.2	5.4	15.2	46.6	109.4	271.6	598.7	1207.3	2358.2
	PRE	4.7	7.4	18.2	39.5	85.5	211.2	414.5	831.8	1681.8	3239.8
	RES	-4.019	-2.213	-12.884	-24.305	-38.926	-101.764	-142.827	-233.151	-474.466	-881.661
2006-	OBS	0.8	3.4	3.1	12.4	34.8	86.2	264.2	482.7	960.7	1760.2
	PRE	4.3	6.6	16.4	35.6	79.0	170.2	435.6	737.6	1448.1	2684.8
	RES	-3.509	-3.254	-13.357	-23.261	-44.168	-84.017	-171.441	-254.879	-487.394	-924.585

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	6.0	10.0	23.0	40.0	86.0	169.0	395.0	735.0	1136.0	1343.0
	PRE	8.5	12.1	28.1	65.9	107.0	203.6	426.3	779.3	1266.0	1438.3
	CHI	0.710	0.356	0.919	10.209	4.111	5.865	2.297	2.517	13.348	6.317
1996-	OBS	6.0	7.0	14.0	27.0	91.0	142.0	318.0	577.0	998.0	1361.0
	PRE	7.9	12.2	26.9	53.9	127.3	200.7	383.7	675.5	1166.8	1608.5
	CHI	0.460	2.224	6.221	13.404	10.356	17.163	11.262	14.362	24.416	38.086
2001-	OBS	1.0	8.0	8.0	20.0	57.0	125.0	251.0	442.0	742.0	1110.0
	PRE	6.5	11.4	27.3	52.0	104.7	241.2	383.0	614.1	1033.6	1525.0
	CHI	4.677	1.031	13.605	19.670	21.702	55.999	45.483	48.244	82.269	112.935
2006-	OBS	1.0	5.0	5.0	19.0	46.0	103.0	289.0	416.0	638.0	921.0
	PRE	5.5	9.8	26.6	54.7	104.3	203.4	476.5	635.7	961.7	1404.8
	CHI	3.723	2.345	17.542	23.317	32.589	49.538	73.801	75.912	108.946	166.600

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	2702.70	52.99	51	P, C	99.35	14708.05	0.0000
AGE-PERIOD	26.79	0.60	45	Cohort	34.55	142.50	0.0000
AGE-COHORT	268.61	7.46	36	Period	93.47	1432.53	0.0000
PERIOD-COHORT	20.51	0.51	40	Age	14.50	109.19	0.0000
FULL AGE-PERIOD-COHORT	17.53	0.55	32			93.27	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.144111	13.935132
35	1.496459	31.365984
40	1.798560	62.886941
45	2.138581	137.587983
50	2.438962	274.765401
55	2.782341	605.815748
60	3.105792	1275.828570
65	3.431379	2700.095667
70	3.732177	5397.299933
75	4.013787	10322.550707

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.263202	1.833168
1966	0.108411	1.283545
1971	-0.150020	0.707914
1976	-0.143453	0.718698
1981	-0.183886	0.654808
1986	-0.226264	0.593931

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.035441	1.085028
1891	0.001942	1.004482
1896	-0.008565	0.980470
1901	-0.008501	0.980616
1906	-0.001778	0.995914
1911	0.003797	1.008782
1916	-0.003379	0.992249
1921	0.007888	1.018329
1926	-0.031725	0.929555
1931	-0.055960	0.879103
1936	-0.064733	0.861522
1941	-0.060830	0.869300
1946	-0.014125	0.968000
1951	-0.232387	0.585616
1956	0.068700	1.171387

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	25.0	18.0	8.0	6.0	7.0	12.0
	EXP	22.1	16.0	9.8	12.0	6.5	12.0
	CHI	0.4	0.3	0.3	3.0	0.0	0.0
35 -	OBS	39.0	38.0	27.0	24.0	22.0	13.0
	EXP	51.7	35.4	19.8	21.6	24.2	13.5
	CHI	3.1	0.2	2.6	0.3	0.2	0.0
40 -	OBS	120.0	67.0	39.0	30.0	27.0	50.0
	EXP	103.5	73.4	39.1	39.2	38.8	44.1
	CHI	2.6	0.6	0.0	2.1	3.6	0.8
45 -	OBS	183.0	157.0	81.0	85.0	95.0	85.0
	EXP	205.7	158.5	88.2	84.9	76.4	76.5
	CHI	2.5	0.0	0.6	0.0	4.5	0.9
50 -	OBS	398.0	309.0	181.0	212.0	154.0	110.0
	EXP	458.1	285.0	172.4	174.0	150.4	135.9
	CHI	7.9	2.0	0.4	8.3	0.1	4.9
55 -	OBS	905.0	655.0	381.0	387.0	367.0	282.0
	EXP	948.8	692.9	338.8	373.2	337.9	291.6
	CHI	2.0	2.1	5.2	0.5	2.5	0.3
60 -	OBS	1763.0	1317.0	794.0	736.0	677.0	568.0
	EXP	1742.0	1344.9	774.9	693.5	685.5	618.3
	CHI	0.3	0.6	0.5	2.6	0.1	4.1
65 -	OBS	3100.0	2418.0	1493.0	1557.0	1170.0	1215.0
	EXP	3017.7	2400.8	1470.7	1562.3	1260.4	1246.1
	CHI	2.2	0.1	0.3	0.0	6.5	0.8
70 -	OBS	4686.0	3732.0	2371.0	2657.0	2570.0	2100.0
	EXP	4680.4	3701.4	2352.1	2684.5	2593.2	2104.9
	CHI	0.0	0.3	0.2	0.3	0.2	0.0
75 -	OBS	6706.0	4937.0	3030.0	3724.0	4032.0	3999.0
	EXP	6706.0	4942.6	3146.3	3781.9	3957.4	3898.4
	CHI	0.0	0.0	4.3	0.9	1.4	2.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	26282.55	657.06	40	P, C	94.76	0.0000
AGE-PERIOD	2105.12	52.63	40	Cohort	34.62	0.0000
AGE-COHORT	2176.29	54.41	40	Period	36.75	0.0000
PERIOD-COHORT	1608.63	40.22	40	Age	14.44	0.0000
FULL AGE-PERIOD-COHORT	1376.41	34.41	40			0.0000

AGE	EFFECT
30	13.935132
35	31.365984
40	62.886941
45	137.587983
50	274.765401
55	605.815748
60	1275.828570
65	2700.095667
70	5397.299933
75	10322.550707

PERIOD	EFFECT	LOWER	UPPER
% Period Change	90.7031	87.7031	93.7031
1961	1.833168		
1966	1.283545		
1971	0.707914		
1976	0.718698		
1981	0.654808		
1986	0.593931		
1991	0.538714	0.520896	0.556532
1996	0.488630	0.456842	0.521487
2001	0.443203	0.400664	0.488650
2006	0.401998	0.351395	0.457880

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.085028	1.000000	
1891	1.004482	2.000000	
1896	0.980470	4.000000	
1901	0.980616	8.000000	
1906	0.995914	16.000000	
1911	1.008782	32.000000	
1916	0.992249	64.000000	
1921	1.018329	128.000000	
1926	0.929555	256.000000	
1931	0.879103	512.000000	
1936	0.861522	1024.000000	
1941	0.869300	2048.000000	
1946	0.968000	4096.000000	
1951	0.585616	8192.000000	
1956	0.592248	EXTRAPOLATION	1.171387
1961	0.531525	EXTRAPOLATION	
1966	0.477028	EXTRAPOLATION	
1971	0.428119	EXTRAPOLATION	
1976	0.384224	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	25.4	17.4	7.0	4.8	5.7	9.7	6.4	7.3	3.6	1.5
	EXP	22.5	15.4	8.6	9.7	5.3	4.9	4.0*	3.2*	2.6*	2.2*
	Elow							3.9	3.0	2.4	1.9
	Eup							4.1	3.5	2.9	2.5
35	OBS	40.3	38.0	26.1	21.7	18.1	10.5	17.8	3.4	7.1	7.5
	EXP	53.4	35.4	19.1	19.6	19.9	10.9	10.0*	8.1*	6.6*	5.4*
	Elow							9.7	7.6	6.0	4.7
	Eup							10.3	8.7	7.3	6.1
40	OBS	136.2	68.5	39.0	29.8	24.9	41.0	30.3	30.0	28.7	16.9
	EXP	117.4	75.0	39.1	38.9	35.8	36.2	19.8*	18.2*	14.8*	12.1*
	Elow							19.2	17.0	13.4	10.5
	Eup							20.5	19.4	16.3	13.7
45	OBS	222.6	178.1	83.2	87.1	96.5	78.9	74.8	82.7	47.9	42.0
	EXP	250.3	179.8	90.5	86.9	77.6	71.0	71.7*	39.4*	36.1*	29.4*
	Elow							69.4	36.8	32.6	25.7
	Eup							74.1	42.0	39.8	33.5
50	OBS	441.4	379.4	208.0	223.6	161.9	113.8	115.3	127.0	93.3	76.2
	EXP	508.1	349.9	198.1	183.6	158.2	140.6	128.7*	130.0*	71.3*	65.4*
	Elow							124.4	121.5	64.5	57.2
	Eup							132.9	138.7	78.6	74.5
55	OBS	1055.0	741.5	478.5	459.8	400.5	305.9	239.8	221.0	160.1	123.2
	EXP	1106.0	784.4	425.5	443.4	368.7	316.3	281.2*	257.3*	259.9*	142.6*
	Elow							271.9	240.6	235.0	124.7
	Eup							290.5	274.6	286.6	162.4
60	OBS	2321.2	1597.0	933.6	965.6	840.2	647.0	573.5	478.8	326.4	256.3
	EXP	2293.5	1630.9	911.1	909.8	850.7	704.4	604.2*	537.1*	491.5*	496.5*
	Elow							584.2	502.1	444.4	434.0
	Eup							624.2	573.2	542.0	565.5
65	OBS	4985.4	3422.8	1932.5	1950.9	1628.5	1592.3	1262.4	989.2	667.9	529.7
	EXP	4853.1	3398.5	1903.6	1957.6	1754.3	1633.1	1352.1*	1159.8*	1031.0*	943.6*
	Elow							1307.4	1084.4	932.0	824.8
	Eup							1396.8	1237.8	1136.7	1074.7
70	OBS	9950.5	6848.5	3776.9	3823.6	3533.3	3173.3	2809.9	2325.9	1583.2	1102.3
	EXP	9938.5	6792.4	3746.8	3863.2	3565.2	3180.8	2960.9*	2451.5*	2102.9*	1869.2*
	Elow							2863.0	2292.0	1901.1	1633.9
	Eup							3058.8	2616.3	2318.5	2129.1
75	OBS	20531.9	13293.6	6899.9	7163.7	6858.6	6344.3	5903.4	5027.2	3556.9	2599.8
	EXP	20531.9	13308.8	7164.8	7275.0	6731.7	6184.7	5517.8*	5136.4*	4252.7*	3648.0*
	Elow							5335.3	4802.2	3844.5	3188.8
	Eup							5700.3	5481.7	4688.8	4155.1
30-79	OBS	2088.3	1418.7	780.8	795.6	719.7	644.1	569.2	481.1	334.4	248.3
	EXP	2091.9	1418.9	777.8	791.8	722.2	649.3	575.9*	507.1*	434.1*	378.5*
	Elow							556.9	474.1	392.4	330.8
	Eup							594.9	541.2	478.6	431.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	25.0	18.0	8.0	6.0	7.0	12.0	9.0	11.0	5.0	2.0
	EXP	22.1	16.0	9.8	12.0	6.5	6.1	5.6*	4.9*	3.7*	2.8*
	CHI	0.390	0.262	0.334	3.004	0.036	5.802	2.036	7.666	0.468	0.232
35 -	OBS	39.0	38.0	27.0	24.0	22.0	13.0	23.0	5.0	11.0	11.0
	EXP	51.7	35.4	19.8	21.6	24.2	13.5	12.9*	11.8*	10.2*	7.9*
	CHI	3.113	0.191	2.637	0.256	0.199	0.019	7.908	3.931	0.057	1.197
40 -	OBS	120.0	67.0	39.0	30.0	27.0	50.0	38.0	39.0	42.0	27.0
	EXP	103.5	73.4	39.1	39.2	38.8	44.1	24.9*	23.6*	21.7*	19.3*
	CHI	2.641	0.559	0.000	2.148	3.589	0.784	6.878	9.986	19.087	3.119
45 -	OBS	183.0	157.0	81.0	85.0	95.0	85.0	91.0	103.0	62.0	63.0
	EXP	205.7	158.5	88.2	84.9	76.4	76.5	87.3*	49.0*	46.8*	44.1*
	CHI	2.507	0.015	0.580	0.000	4.532	0.942	0.158	59.399	4.963	8.127
50 -	OBS	398.0	309.0	181.0	212.0	154.0	110.0	122.0	151.0	114.0	99.0
	EXP	458.1	285.0	172.4	174.0	150.4	135.9	136.2*	154.5*	87.1*	84.9*
	CHI	7.888	2.020	0.432	8.282	0.085	4.946	1.482	0.079	8.287	2.325
55 -	OBS	905.0	655.0	381.0	387.0	367.0	282.0	224.0	225.0	184.0	148.0
	EXP	948.8	692.9	338.8	373.2	337.9	291.6	262.7*	262.0*	298.7*	171.3*
	CHI	2.021	2.076	5.243	0.510	2.510	0.315	5.699	5.233	44.060	3.173
60 -	OBS	1763.0	1317.0	794.0	736.0	677.0	568.0	506.0	426.0	317.0	288.0
	EXP	1742.0	1344.9	774.9	693.5	685.5	618.3	533.1*	477.8*	477.4*	557.9*
	CHI	0.254	0.581	0.473	2.602	0.105	4.096	1.378	5.617	53.890	130.582
65 -	OBS	3100.0	2418.0	1493.0	1557.0	1170.0	1215.0	1050.0	827.0	563.0	498.0
	EXP	3017.7	2400.8	1470.7	1562.3	1260.4	1246.1	1124.7*	969.6*	869.0*	887.1*
	CHI	2.245	0.123	0.338	0.018	6.482	0.778	4.956	20.985	107.770	170.646
70 -	OBS	4686.0	3732.0	2371.0	2657.0	2570.0	2100.0	1996.0	1801.0	1240.0	879.0
	EXP	4680.4	3701.4	2352.1	2684.5	2593.2	2104.9	2103.2*	1898.2*	1647.0*	1490.6*
	CHI	0.007	0.253	0.152	0.282	0.208	0.012	5.466	4.980	100.590	250.930
75 -	OBS	6706.0	4937.0	3030.0	3724.0	4032.0	3999.0	3441.0	3178.0	2470.0	1872.0
	EXP	6706.0	4942.6	3146.3	3781.9	3957.4	3898.4	3216.2*	3247.0*	2953.2*	2626.7*
	CHI	0.000	0.006	4.301	0.885	1.407	2.597	15.711	1.467	79.051	216.837
30-79	OBS	17925.0	13648.0	8405.0	9418.0	9121.0	8434.0	7500.0	6766.0	5008.0	3887.0
	EXP	17935.8	13651.0	8412.0	9427.1	9130.7	8435.5	7506.8*	7098.6*	6414.8*	5892.6*
	O/E	0.999	1.000	0.999	0.999	0.999	1.000	0.999	0.953	0.781	0.660

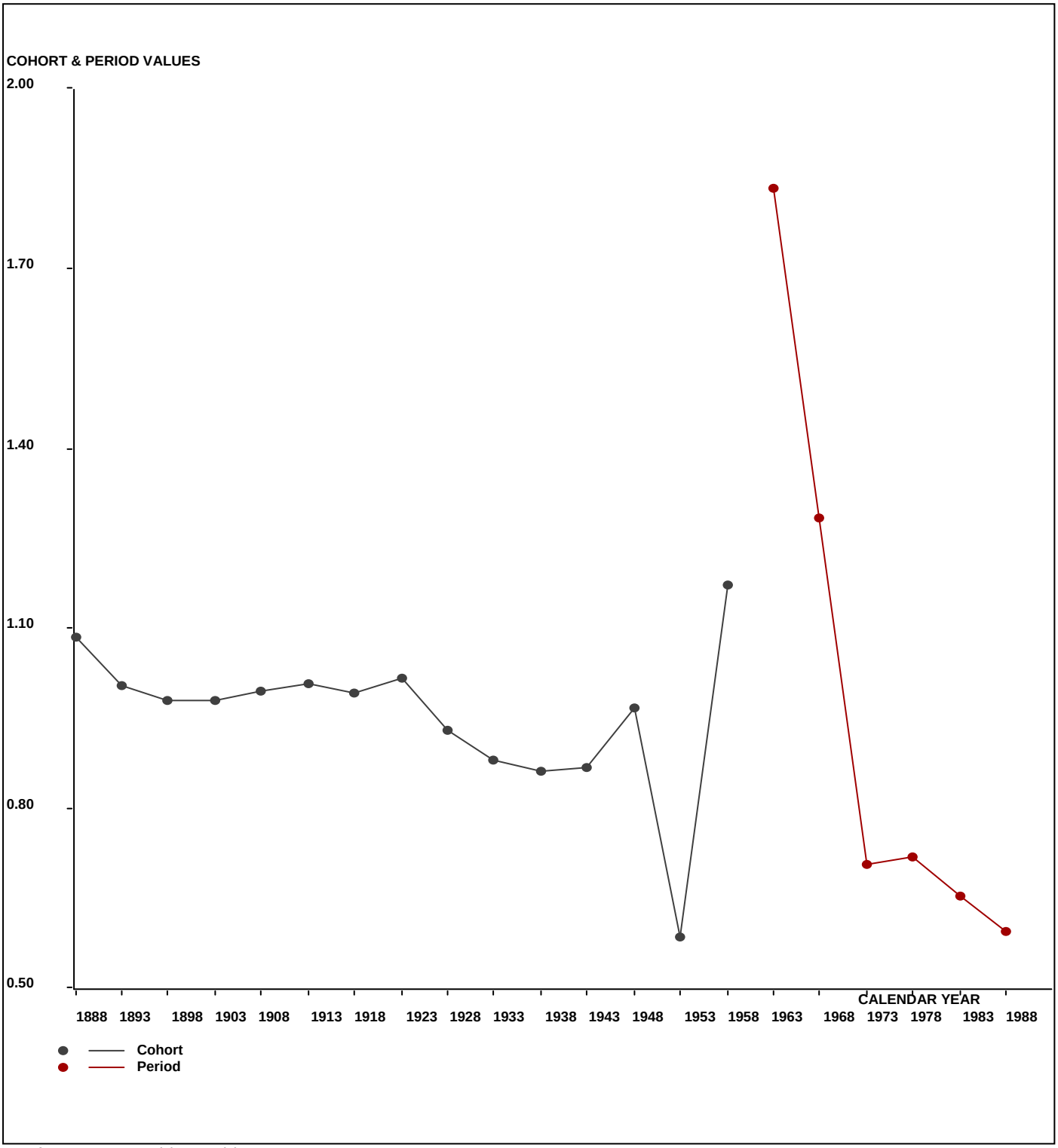
CHI SQUARE (LOG)= 1376.4052 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

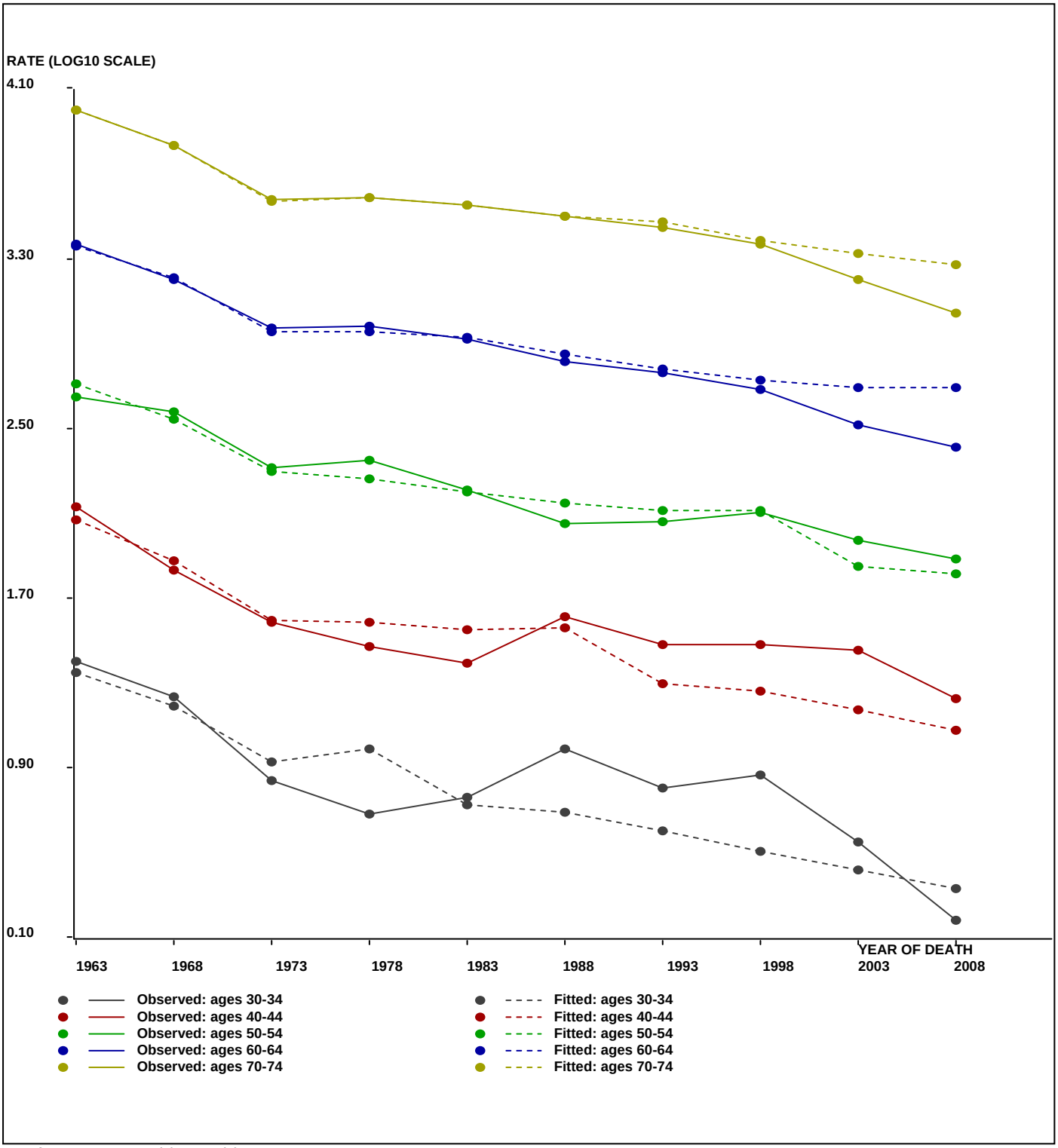


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	6.4	17.8	30.3	74.8	115.3	239.8	573.5	1262.4	2809.9	5903.4
PRE	4.0	10.0	19.8	71.7	128.7	281.2	604.2	1352.1	2960.9	5517.8
RES	2.402	7.836	10.425	3.057	-13.420	-41.414	-30.718	-89.753	-150.944	385.648
1996- OBS	7.3	3.4	30.0	82.7	127.0	221.0	478.8	989.2	2325.9	5027.2
PRE	3.2	8.1	18.2	39.4	130.0	257.3	537.1	1159.8	2451.5	5136.4
RES	4.070	-4.699	11.829	43.333	-2.931	-36.364	-58.233	-170.628	-125.566	-109.174
2001- OBS	3.6	7.1	28.7	47.9	93.3	160.1	326.4	667.9	1583.2	3556.9
PRE	2.6	6.6	14.8	36.1	71.3	259.9	491.5	1031.0	2102.9	4252.7
RES	0.942	0.494	13.905	11.765	21.993	-99.817	-165.151	-363.061	-519.691	-695.784
2006- OBS	1.5	7.5	16.9	42.0	76.2	123.2	256.3	529.7	1102.3	2599.8
PRE	2.2	5.4	12.1	29.4	65.4	142.6	496.5	943.6	1869.2	3648.0
RES	-0.618	2.099	4.854	12.624	10.822	-19.408	-240.187	-413.850	-766.948	-1048.125

Observed and predicted deaths (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	9.0	23.0	38.0	91.0	122.0	224.0	506.0	1050.0	1996.0	3441.0
PRE	5.6	12.9	24.9	87.3	136.2	262.7	533.1	1124.7	2103.2	3216.2
CHI	2.036	7.908	6.878	0.158	1.482	5.699	1.378	4.956	5.466	15.711
1996- OBS	11.0	5.0	39.0	103.0	151.0	225.0	426.0	827.0	1801.0	3178.0
PRE	4.9	11.8	23.6	49.0	154.5	262.0	477.8	969.6	1898.2	3247.0
CHI	7.666	3.931	9.986	59.399	0.079	5.233	5.617	20.985	4.980	1.467
2001- OBS	5.0	11.0	42.0	62.0	114.0	184.0	317.0	563.0	1240.0	2470.0
PRE	3.7	10.2	21.7	46.8	87.1	298.7	477.4	869.0	1647.0	2953.2
CHI	0.468	0.057	19.087	4.963	8.287	44.060	53.890	107.770	100.590	79.051
2006- OBS	2.0	11.0	27.0	63.0	99.0	148.0	288.0	498.0	879.0	1872.0
PRE	2.8	7.9	19.3	44.1	84.9	171.3	557.9	887.1	1490.6	2626.7
CHI	0.232	1.197	3.119	8.127	2.325	3.173	130.582	170.646	250.930	216.837

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	1370.60	26.87	51	P, C	99.19	7493.38	0.0000
AGE-PERIOD	49.61	1.10	45	Cohort	77.73	267.10	0.0000
AGE-COHORT	16.90	0.47	36	Period	34.65	89.88	0.0000
PERIOD-COHORT	22.77	0.57	40	Age	51.48	121.45	0.0000
FULL AGE-PERIOD-COHORT	11.05	0.35	32			58.71	0.0027

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.590014	38.905768
35	1.826209	67.020648
40	2.099494	125.745881
45	2.354372	226.137027
50	2.541227	347.717833
55	2.687045	486.457931
60	2.948317	887.803807
65	3.254039	1794.896426
70	3.573650	3746.711195
75	3.884459	7664.054057

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.089439	1.228680
1966	0.041460	1.100171
1971	0.011529	1.026901
1976	-0.023846	0.946574
1981	-0.073441	0.844420
1986	-0.156126	0.698029

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.135938	1.367535
1891	0.127779	1.342082
1896	0.082667	1.209670
1901	0.041993	1.101522
1906	-0.035349	0.921830
1911	-0.115836	0.765886
1916	-0.190680	0.644645
1921	-0.249780	0.562627
1926	-0.292522	0.509891
1931	-0.343166	0.453769
1936	-0.336976	0.460282
1941	-0.265685	0.542394
1946	-0.199103	0.632262
1951	-0.104690	0.785796
1956	-0.204302	0.624738

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	17.0	13.0	31.0	31.0	32.0	21.0
	EXP	21.3	20.4	24.8	28.8	31.5	21.0
	CHI	0.9	2.7	1.6	0.2	0.0	0.0
35 -	OBS	31.0	28.0	38.0	46.0	43.0	45.0
	EXP	40.6	33.5	32.8	38.0	43.5	45.5
	CHI	2.3	0.9	0.8	1.7	0.0	0.0
40 -	OBS	75.0	64.0	56.0	70.0	56.0	66.0
	EXP	76.6	69.0	58.6	55.1	62.4	67.7
	CHI	0.0	0.4	0.1	4.0	0.7	0.0
45 -	OBS	127.0	112.0	138.0	107.0	88.0	82.0
	EXP	147.2	123.4	115.3	94.8	86.5	92.2
	CHI	2.8	1.1	4.5	1.6	0.0	1.1
50 -	OBS	265.0	206.0	190.0	179.0	131.0	88.0
	EXP	295.0	200.8	174.8	159.1	126.7	108.0
	CHI	3.1	0.1	1.3	2.5	0.1	3.7
55 -	OBS	470.0	340.0	272.0	237.0	186.0	136.0
	EXP	472.7	362.1	256.4	218.1	191.9	142.0
	CHI	0.0	1.3	0.9	1.6	0.2	0.3
60 -	OBS	910.0	755.0	617.0	404.0	342.0	249.0
	EXP	912.6	742.5	593.8	412.9	339.9	277.4
	CHI	0.0	0.2	0.9	0.2	0.0	2.9
65 -	OBS	1662.0	1579.0	1315.0	1015.0	702.0	512.0
	EXP	1658.8	1536.6	1312.7	1038.5	702.0	537.9
	CHI	0.0	1.2	0.0	0.5	0.0	1.2
70 -	OBS	2972.0	2767.0	2621.0	2223.0	1730.0	1122.0
	EXP	2909.6	2717.2	2660.5	2271.8	1762.5	1115.7
	CHI	1.3	0.9	0.6	1.0	0.6	0.0
75 -	OBS	4206.0	4139.0	4127.0	4153.0	3543.0	2663.0
	EXP	4206.0	4202.6	4180.8	4154.1	3507.1	2582.6
	CHI	0.0	1.0	0.7	0.0	0.4	2.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	24871.35	621.78	40	P, C	96.77	0.0000
AGE-PERIOD	1864.90	46.62	40	Cohort	56.96	0.0000
AGE-COHORT	662.50	16.56	40	Period	-21.16	0.0000
PERIOD-COHORT	573.32	14.33	40	Age	-40.01	0.0000
FULL AGE-PERIOD-COHORT	802.68	20.07	40			0.0000

AGE	EFFECT
30	38.905768
35	67.020648
40	125.745881
45	226.137027
50	347.717833
55	486.457931
60	887.803807
65	1794.896426
70	3746.711195
75	7664.054057

PERIOD	EFFECT	LOWER	UPPER
% Period Change	82.6637	79.6637	85.6637
1961	1.228680		
1966	1.100171		
1971	1.026901		
1976	0.946574		
1981	0.844420		
1986	0.698029		
1991	0.577017	0.556076	0.597958
1996	0.476984	0.442991	0.512233
2001	0.394293	0.352903	0.438798
2006	0.325937	0.281136	0.375891

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.367535	1.000000	
1891	1.342082	2.000000	
1896	1.209670	4.000000	
1901	1.101522	8.000000	
1906	0.921830	16.000000	
1911	0.765886	32.000000	
1916	0.644645	64.000000	
1921	0.562627	128.000000	
1926	0.509891	256.000000	
1931	0.453769	512.000000	
1936	0.460282	1024.000000	
1941	0.542394	2048.000000	
1946	0.632262	4096.000000	
1951	0.785796	8192.000000	
1956	0.822115	EXTRAPOLATION	0.624738
1961	0.911408	EXTRAPOLATION	
1966	1.010400	EXTRAPOLATION	
1971	1.120143	EXTRAPOLATION	
1976	1.241806	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	17.3	12.6	27.1	25.0	26.2	17.0	20.6	13.3	10.0	11.5
	EXP	21.7	19.7	21.7	23.3	25.8	22.3	20.5*	18.8*	17.2*	15.7*
	Elow							19.7	17.4	15.4	13.6
	Eup							21.2	20.1	19.1	18.2
35	OBS	32.1	28.0	36.8	41.6	35.3	36.3	23.3	22.1	12.3	8.9
	EXP	42.0	33.5	31.7	34.4	35.8	36.8	31.8*	29.1*	26.7*	24.5*
	Elow							30.6	27.1	23.9	21.1
	Eup							32.9	31.3	29.7	28.2
40	OBS	85.1	65.4	56.0	69.6	51.7	54.1	41.4	38.5	28.0	20.0
	EXP	86.9	70.5	58.6	54.8	57.6	55.5	57.0*	49.3*	45.2*	41.4*
	Elow							54.9	45.8	40.4	35.7
	Eup							59.1	53.0	50.3	47.8
45	OBS	154.5	127.1	141.7	109.6	89.4	76.1	53.4	63.4	53.3	39.4
	EXP	179.1	140.0	118.4	97.1	87.9	85.6	82.5*	84.8*	73.3*	67.2*
	Elow							79.5	78.7	65.6	57.9
	Eup							85.5	91.0	81.6	77.5
50	OBS	293.9	252.9	218.3	188.8	137.7	91.0	85.0	96.7	73.7	79.3
	EXP	327.2	246.6	200.9	167.8	133.2	111.7	108.8*	104.9*	107.7*	93.2*
	Elow							104.9	97.4	96.4	80.4
	Eup							112.8	112.6	119.9	107.5
55	OBS	547.9	384.9	341.6	281.6	203.0	147.5	141.3	115.9	105.3	100.7
	EXP	551.0	409.9	322.0	259.1	209.5	154.1	129.2*	125.9*	121.3*	124.6*
	Elow							124.5	116.9	108.5	107.5
	Eup							133.9	135.2	135.0	143.7
60	OBS	1198.1	915.5	725.5	530.0	424.5	283.7	257.3	212.4	162.7	145.9
	EXP	1201.6	900.4	698.2	541.7	421.8	316.0	232.5*	194.9*	189.9*	183.0*
	Elow							224.0	181.0	169.9	157.8
	Eup							240.9	209.3	211.3	211.0
65	OBS	2672.8	2235.2	1702.1	1271.8	977.1	671.0	509.8	476.1	345.2	287.2
	EXP	2667.8	2175.2	1699.1	1301.2	977.1	704.9	528.1*	388.5*	325.7*	317.3*
	Elow							508.9	360.8	291.6	273.7
	Eup							547.3	417.2	362.5	365.9
70	OBS	6310.9	5077.7	4175.2	3199.1	2378.5	1695.5	1395.1	1031.9	858.0	694.7
	EXP	6178.3	4986.3	4238.1	3269.3	2423.1	1685.9	1216.4*	911.2*	670.4*	562.1*
	Elow							1172.2	846.3	600.0	484.8
	Eup							1260.5	978.6	746.0	648.2
75	OBS	12877.6	11144.9	9397.9	7988.9	6026.8	4224.8	3290.6	2831.5	2000.2	1693.0
	EXP	12877.6	11316.1	9520.4	7991.1	5965.8	4097.3	2850.8*	2056.8*	1540.8*	1133.5*
	Elow							2747.3	1910.2	1379.1	977.7
	Eup							2954.3	2208.8	1714.8	1307.2
30-79	OBS	1249.8	1031.9	857.6	691.7	524.0	371.7	300.1	255.6	193.5	164.8
	EXP	1252.2	1033.2	854.4	689.1	524.7	377.5	281.9*	220.7*	181.2*	156.0*
	Elow							271.7	205.0	162.1	134.5
	Eup							292.1	237.0	201.6	179.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	17.0	13.0	31.0	31.0	32.0	21.0	29.0	20.0	14.0	15.0
	EXP	21.3	20.4	24.8	28.8	31.5	27.6	28.8*	28.2*	24.0*	20.5*
	CHI	0.873	2.683	1.556	0.163	0.009	1.593	0.001	2.376	4.137	1.489
35 -	OBS	31.0	28.0	38.0	46.0	43.0	45.0	30.0	32.0	19.0	13.0
	EXP	40.6	33.5	32.8	38.0	43.5	45.5	41.0*	42.3*	41.2*	35.9*
	CHI	2.271	0.892	0.841	1.681	0.007	0.006	2.943	2.489	11.976	14.610
40 -	OBS	75.0	64.0	56.0	70.0	56.0	66.0	52.0	50.0	41.0	32.0
	EXP	76.6	69.0	58.6	55.1	62.4	67.7	71.6*	64.0*	66.1*	66.1*
	CHI	0.034	0.364	0.114	4.019	0.662	0.044	5.360	3.079	9.521	17.596
45 -	OBS	127.0	112.0	138.0	107.0	88.0	82.0	65.0	79.0	69.0	59.0
	EXP	147.2	123.4	115.3	94.8	86.5	92.2	100.4*	105.6*	94.9*	100.7*
	CHI	2.778	1.051	4.475	1.561	0.026	1.131	12.459	6.682	7.078	17.274
50 -	OBS	265.0	206.0	190.0	179.0	131.0	88.0	90.0	115.0	90.0	103.0
	EXP	295.0	200.8	174.8	159.1	126.7	108.0	115.2*	124.7*	131.6*	121.0*
	CHI	3.053	0.132	1.317	2.485	0.145	3.708	5.511	0.747	13.165	2.675
55 -	OBS	470.0	340.0	272.0	237.0	186.0	136.0	132.0	118.0	121.0	121.0
	EXP	472.7	362.1	256.4	218.1	191.9	142.0	120.7*	128.2*	139.4*	149.7*
	CHI	0.015	1.347	0.946	1.644	0.182	0.257	1.056	0.804	2.425	5.488
60 -	OBS	910.0	755.0	617.0	404.0	342.0	249.0	227.0	189.0	158.0	164.0
	EXP	912.6	742.5	593.8	412.9	339.9	277.4	205.1*	173.4*	184.4*	205.6*
	CHI	0.008	0.210	0.904	0.194	0.014	2.905	2.339	1.403	3.780	8.417
65 -	OBS	1662.0	1579.0	1315.0	1015.0	702.0	512.0	424.0	398.0	291.0	270.0
	EXP	1658.8	1536.6	1312.7	1038.5	702.0	537.9	439.3*	324.8*	274.6*	298.3*
	CHI	0.006	1.169	0.004	0.532	0.000	1.246	0.530	16.506	0.982	2.687
70 -	OBS	2972.0	2767.0	2621.0	2223.0	1730.0	1122.0	991.0	799.0	672.0	554.0
	EXP	2909.6	2717.2	2660.5	2271.8	1762.5	1115.7	864.0*	705.6*	525.0*	448.2*
	CHI	1.340	0.913	0.587	1.049	0.598	0.036	18.663	12.368	41.138	24.961
75 -	OBS	4206.0	4139.0	4127.0	4153.0	3543.0	2663.0	1918.0	1790.0	1389.0	1219.0
	EXP	4206.0	4202.6	4180.8	4154.1	3507.1	2582.6	1661.7*	1300.2*	1070.0*	816.2*
	CHI	0.000	0.962	0.692	0.000	0.367	2.502	39.539	184.509	95.111	198.809
30-79	OBS	10735.0	10003.0	9405.0	8465.0	6853.0	4984.0	3958.0	3590.0	2864.0	2550.0
	EXP	10740.4	10008.1	9410.5	8471.4	6854.0	4996.8	3647.7*	2996.8*	2551.2*	2262.2*
	O/E	0.999	0.999	0.999	0.999	1.000	0.997	1.085	1.198	1.123	1.127

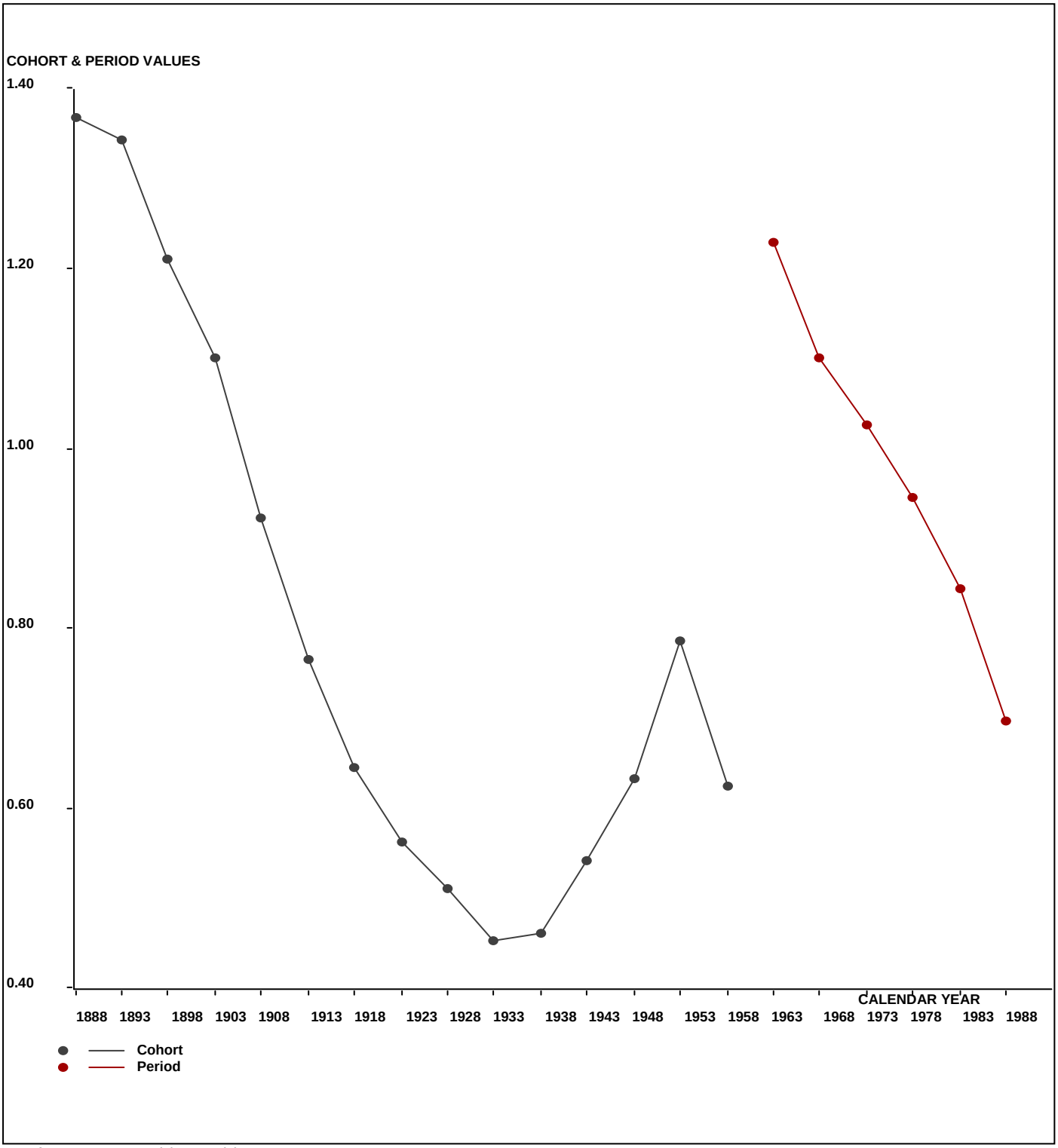
CHI SQUARE (LOG)= 802.6842 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

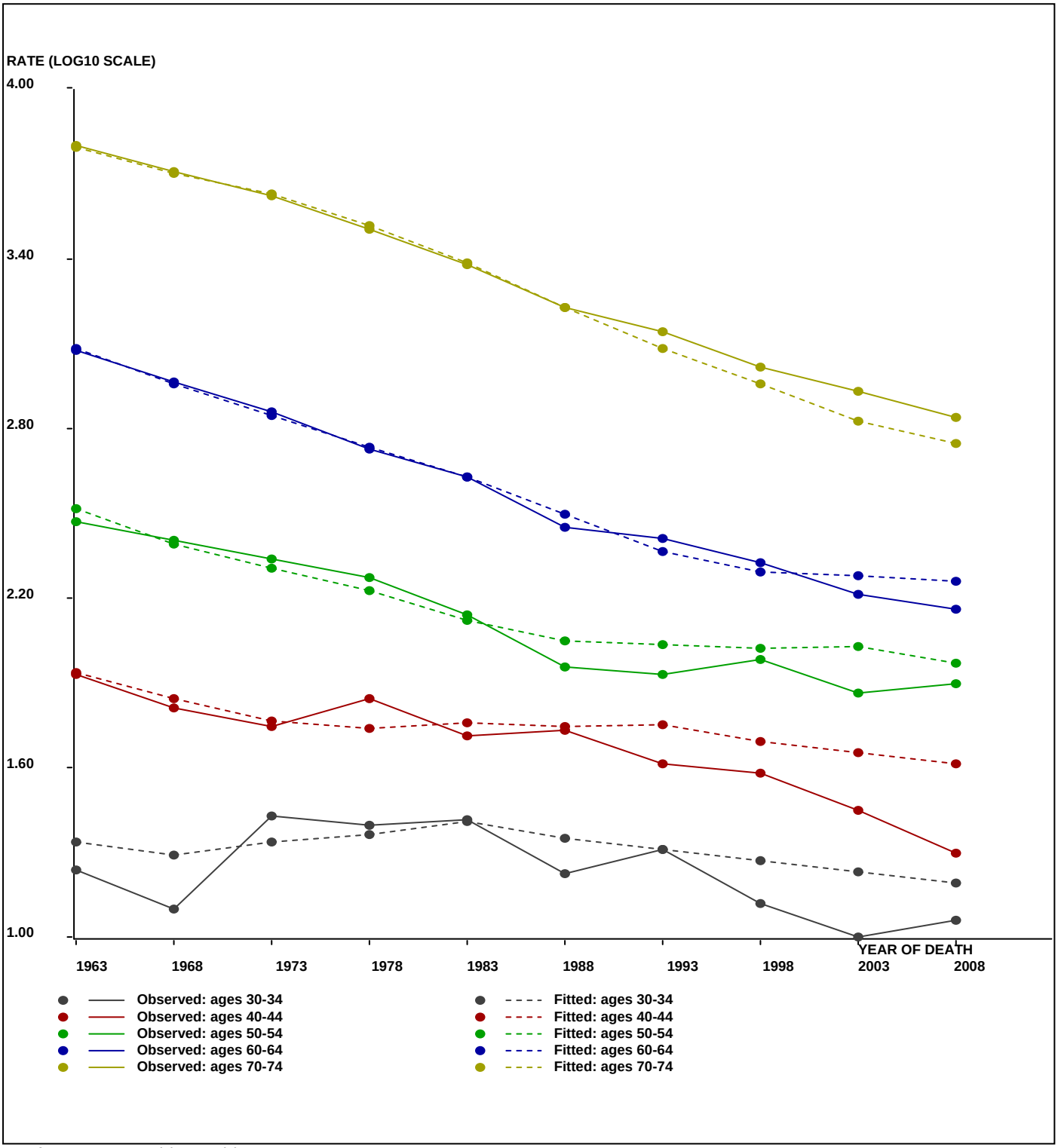


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	20.6	23.3	41.4	53.4	85.0	141.3	257.3	509.8	1395.1	3290.6
	PRE	20.5	31.8	57.0	82.5	108.8	129.2	232.5	528.1	1216.4	2850.8
	RES	0.137	-8.519	-15.601	-29.068	-23.802	12.085	24.824	-18.335	178.768	439.751
1996-	OBS	13.3	22.1	38.5	63.4	96.7	115.9	212.4	476.1	1031.9	2831.5
	PRE	18.8	29.1	49.3	84.8	104.9	125.9	194.9	388.5	911.2	2056.8
	RES	-5.445	-7.071	-10.812	-21.326	-8.118	-9.969	17.531	87.579	120.644	774.793
2001-	OBS	10.0	12.3	28.0	53.3	73.7	105.3	162.7	345.2	858.0	2000.2
	PRE	17.2	26.7	45.2	73.3	107.7	121.3	189.9	325.7	670.4	1540.8
	RES	-7.141	-14.392	-17.152	-20.017	-34.071	-15.995	-27.185	19.479	187.644	459.390
2006-	OBS	11.5	8.9	20.0	39.4	79.3	100.7	145.9	287.2	694.7	1693.0
	PRE	15.7	24.5	41.4	67.2	93.2	124.6	183.0	317.3	562.1	1133.5
	RES	-4.241	-15.609	-21.365	-27.822	-13.854	-23.858	-37.018	-30.117	132.645	559.438

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	29.0	30.0	52.0	65.0	90.0	132.0	227.0	424.0	991.0	1918.0
	PRE	28.8	41.0	71.6	100.4	115.2	120.7	205.1	439.3	864.0	1661.7
	CHI	0.001	2.943	5.360	12.459	5.511	1.056	2.339	0.530	18.663	39.539
1996-	OBS	20.0	32.0	50.0	79.0	115.0	118.0	189.0	398.0	799.0	1790.0
	PRE	28.2	42.3	64.0	105.6	124.7	128.2	173.4	324.8	705.6	1300.2
	CHI	2.376	2.489	3.079	6.682	0.747	0.804	1.403	16.506	12.368	184.509
2001-	OBS	14.0	19.0	41.0	69.0	90.0	121.0	158.0	291.0	672.0	1389.0
	PRE	24.0	41.2	66.1	94.9	131.6	139.4	184.4	274.6	525.0	1070.0
	CHI	4.137	11.976	9.521	7.078	13.165	2.425	3.780	0.982	41.138	95.111
2006-	OBS	15.0	13.0	32.0	59.0	103.0	121.0	164.0	270.0	554.0	1219.0
	PRE	20.5	35.9	66.1	100.7	121.0	149.7	205.6	298.3	448.2	816.2
	CHI	1.489	14.610	17.596	17.274	2.675	5.488	8.417	2.687	24.961	198.809

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	109.77	2.15	51	P, C	94.74	592.90	0.0000
AGE-PERIOD	8.40	0.19	45	Cohort	31.25	45.42	0.4543
AGE-COHORT	6.63	0.18	36	Period	12.95	35.91	0.4728
PERIOD-COHORT	6.55	0.16	40	Age	11.82	35.71	0.6639
FULL AGE-PERIOD-COHORT	5.77	0.18	32			31.37	0.4983

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.657973	4.549602
35	1.081620	12.067571
40	1.363713	23.105384
45	1.697682	49.851911
50	1.900898	79.597293
55	2.139457	137.866038
60	2.344798	221.206500
65	2.486661	306.662451
70	2.595557	394.055374
75	2.672770	470.728212

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.144003	0.717789
1966	-0.135105	0.732647
1971	-0.060446	0.870070
1976	-0.016203	0.963379
1981	0.056830	1.139802
1986	0.095336	1.245477

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.118521	0.761165
1891	-0.074212	0.842923
1896	-0.054239	0.882594
1901	-0.067691	0.855675
1906	-0.080493	0.830821
1911	-0.019024	0.957142
1916	0.012735	1.029758
1921	0.013680	1.032001
1926	0.059803	1.147633
1931	0.097613	1.252025
1936	0.112502	1.295693
1941	0.184620	1.529750
1946	0.190148	1.549343
1951	0.173000	1.489363
1956	0.154057	1.425796

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	8.0	2.0	4.0	8.0	8.0	10.0
	EXP	4.0	4.5	6.9	8.4	9.4	10.0
	CHI	3.9	1.4	1.2	0.0	0.2	0.0
35 -	OBS	3.0	12.0	13.0	16.0	31.0	29.0
	EXP	9.6	11.1	14.1	19.6	25.9	27.7
	CHI	4.5	0.1	0.1	0.7	1.0	0.1
40 -	OBS	14.0	25.0	20.0	26.0	50.0	49.0
	EXP	15.1	19.0	25.2	29.0	43.7	54.4
	CHI	0.1	1.9	1.1	0.3	0.9	0.5
45 -	OBS	33.0	29.0	50.0	60.0	72.0	101.0
	EXP	30.3	33.2	48.5	58.7	72.5	102.3
	CHI	0.2	0.5	0.0	0.0	0.0	0.0
50 -	OBS	47.0	41.0	62.0	89.0	106.0	130.0
	EXP	49.3	48.9	62.2	83.4	108.0	124.2
	CHI	0.1	1.3	0.0	0.4	0.0	0.3
55 -	OBS	71.0	85.0	100.0	118.0	162.0	197.0
	EXP	70.5	85.4	98.4	115.4	165.2	198.2
	CHI	0.0	0.0	0.0	0.1	0.1	0.0
60 -	OBS	108.0	123.0	159.0	169.0	195.0	270.0
	EXP	103.2	111.0	156.7	167.3	209.7	277.6
	CHI	0.2	1.3	0.0	0.0	1.0	0.2
65 -	OBS	119.0	130.0	176.0	215.0	255.0	317.0
	EXP	120.8	135.8	171.3	225.7	258.6	300.8
	CHI	0.0	0.2	0.1	0.5	0.0	0.9
70 -	OBS	107.0	132.0	173.0	213.0	336.0	339.0
	EXP	112.3	138.9	184.2	219.2	312.7	334.5
	CHI	0.2	0.3	0.7	0.2	1.7	0.1
75 -	OBS	84.0	113.0	167.0	213.0	250.0	340.0
	EXP	84.0	108.0	158.7	201.7	262.1	353.7
	CHI	0.0	0.2	0.4	0.6	0.6	0.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	8302.54	207.56	40	P, C	97.14	0.0000
AGE-PERIOD	286.64	7.17	40	Cohort	17.06	0.0000
AGE-COHORT	365.32	9.13	40	Period	34.92	0.0000
PERIOD-COHORT	279.83	7.00	40	Age	15.04	0.0000
FULL AGE-PERIOD-COHORT	237.74	5.94	40			0.0000

AGE	EFFECT
30	4.549602
35	12.067571
40	23.105384
45	49.851911
50	79.597293
55	137.866038
60	221.206500
65	306.662451
70	394.055374
75	470.728212

PERIOD	EFFECT	LOWER	UPPER
% Period Change	109.2713	106.2713	112.2713
1961	0.717789		
1966	0.732647		
1971	0.870070		
1976	0.963379		
1981	1.139802		
1986	1.245477		
1991	1.360949	1.323584	1.398313
1996	1.487126	1.406590	1.569904
2001	1.625002	1.494802	1.762552
2006	1.775661	1.588545	1.978840

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.761165	1.000000	
1891	0.842923	2.000000	
1896	0.882594	4.000000	
1901	0.855675	8.000000	
1906	0.830821	16.000000	
1911	0.957142	32.000000	
1916	1.029758	64.000000	
1921	1.032001	128.000000	
1926	1.147633	256.000000	
1931	1.252025	512.000000	
1936	1.295693	1024.000000	
1941	1.529750	2048.000000	
1946	1.549343	4096.000000	
1951	1.489363	8192.000000	
1956	1.604458	EXTRAPOLATION	1.425796
1961	1.674714	EXTRAPOLATION	
1966	1.748047	EXTRAPOLATION	
1971	1.824590	EXTRAPOLATION	
1976	1.904486	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	8.1	1.9	3.5	6.5	6.6	8.1	5.7	4.0	4.3	1.5
	EXP	4.1	4.3	6.1	6.8	7.7	9.1	10.4*	11.8*	13.5*	15.4*
	Elow							10.1	11.2	12.4	13.8
	Eup							10.7	12.5	14.6	17.1
35	OBS	3.1	12.0	12.6	14.5	25.5	23.4	19.4	18.6	9.7	12.3
	EXP	9.9	11.1	13.6	17.8	21.3	22.4	26.4*	30.1*	34.3*	39.1*
	Elow							25.6	28.4	31.5	35.0
	Eup							27.1	31.7	37.2	43.6
40	OBS	15.9	25.6	20.0	25.8	46.1	40.2	60.5	70.1	56.1	42.6
	EXP	17.1	19.4	25.2	28.8	40.3	44.6	46.8*	55.1*	62.9*	71.7*
	Elow							45.5	52.1	57.8	64.2
	Eup							48.1	58.2	68.2	79.9
45	OBS	40.1	32.9	51.4	61.5	73.2	93.8	124.1	122.9	146.7	118.1
	EXP	36.8	37.7	49.8	60.1	73.6	95.0	105.1*	110.4*	130.0*	148.2*
	Elow							102.2	104.4	119.6	132.6
	Eup							108.0	116.6	141.0	165.2
50	OBS	52.1	50.3	71.2	93.9	111.5	134.5	189.9	228.8	243.9	238.7
	EXP	54.7	60.1	71.5	88.0	113.6	128.5	165.7*	183.4*	192.6*	226.8*
	Elow							161.2	173.5	177.2	202.9
	Eup							170.3	193.6	208.9	252.7
55	OBS	82.8	96.2	125.6	140.2	176.8	213.7	287.9	289.7	395.0	432.9
	EXP	82.2	96.7	123.5	137.1	180.3	215.0	243.1*	313.6*	347.1*	364.6*
	Elow							236.4	296.7	319.3	326.2
	Eup							249.8	331.1	376.5	406.3
60	OBS	142.2	149.2	187.0	221.7	242.0	307.6	414.8	403.5	508.6	623.8
	EXP	135.9	134.6	184.2	219.4	260.2	316.2	376.9*	426.2*	549.9*	608.6*
	Elow							366.6	403.2	505.8	544.4
	Eup							387.3	450.0	596.4	678.2
65	OBS	191.4	184.0	227.8	269.4	354.9	415.4	490.5	583.7	646.6	756.3
	EXP	194.3	192.2	221.7	282.8	359.9	394.2	479.0*	571.0*	645.7*	833.0*
	Elow							465.8	540.1	593.9	745.2
	Eup							492.1	602.8	700.3	928.3
70	OBS	227.2	242.2	275.6	306.5	461.9	512.3	580.0	632.8	755.9	907.9
	EXP	238.4	254.8	293.4	315.4	429.9	505.4	553.5*	672.5*	801.7*	906.6*
	Elow							538.3	636.1	737.5	811.1
	Eup							568.6	710.0	869.6	1010.3
75	OBS	257.2	304.3	380.3	409.7	425.3	539.4	705.1	746.6	835.2	1066.6
	EXP	257.2	290.7	361.5	388.0	445.8	561.2	659.7*	722.4*	877.9*	1046.5*
	Elow							641.6	683.3	807.5	936.2
	Eup							677.8	762.6	952.2	1166.3
30-79	OBS	72.8	77.3	96.3	112.4	141.2	167.2	212.9	229.0	266.6	299.8
	EXP	73.4	78.1	96.6	112.4	141.8	167.0	194.9*	227.2*	265.6*	307.0*
	Elow							189.6	214.9	244.3	274.6
	Eup							200.3	239.8	288.1	342.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	8.0	2.0	4.0	8.0	8.0	10.0	8.0	6.0	6.0	2.0
	EXP	4.0	4.5	6.9	8.4	9.4	11.3	14.6*	17.8*	18.8*	20.1*
	CHI	3.948	1.366	1.237	0.020	0.213	0.140	2.983	7.802	8.720	16.258
35 -	OBS	3.0	12.0	13.0	16.0	31.0	29.0	25.0	27.0	15.0	18.0
	EXP	9.6	11.1	14.1	19.6	25.9	27.7	34.0*	43.6*	52.9*	57.4*
	CHI	4.549	0.078	0.081	0.676	0.989	0.059	2.367	6.313	27.168	27.014
40 -	OBS	14.0	25.0	20.0	26.0	50.0	49.0	76.0	91.0	82.0	68.0
	EXP	15.1	19.0	25.2	29.0	43.7	54.4	58.8*	71.6*	92.0*	114.5*
	CHI	0.078	1.890	1.060	0.313	0.918	0.537	5.028	5.255	1.078	18.874
45 -	OBS	33.0	29.0	50.0	60.0	72.0	101.0	151.0	153.0	190.0	177.0
	EXP	30.3	33.2	48.5	58.7	72.5	102.3	127.9*	137.5*	168.3*	222.2*
	CHI	0.243	0.538	0.049	0.028	0.003	0.016	4.183	1.744	2.796	9.212
50 -	OBS	47.0	41.0	62.0	89.0	106.0	130.0	201.0	272.0	298.0	310.0
	EXP	49.3	48.9	62.2	83.4	108.0	124.2	175.4*	218.0*	235.4*	294.5*
	CHI	0.108	1.279	0.001	0.371	0.038	0.272	3.732	13.375	16.668	0.819
55 -	OBS	71.0	85.0	100.0	118.0	162.0	197.0	269.0	295.0	454.0	520.0
	EXP	70.5	85.4	98.4	115.4	165.2	198.2	227.1*	319.4*	398.9*	438.0*
	CHI	0.003	0.002	0.027	0.060	0.064	0.007	7.716	1.858	7.598	15.370
60 -	OBS	108.0	123.0	159.0	169.0	195.0	270.0	366.0	359.0	494.0	701.0
	EXP	103.2	111.0	156.7	167.3	209.7	277.6	332.6*	379.2*	534.1*	683.9*
	CHI	0.224	1.288	0.035	0.018	1.024	0.206	3.362	1.075	3.004	0.429
65 -	OBS	119.0	130.0	176.0	215.0	255.0	317.0	408.0	488.0	545.0	711.0
	EXP	120.8	135.8	171.3	225.7	258.6	300.8	398.4*	477.3*	544.3*	783.1*
	CHI	0.027	0.249	0.131	0.505	0.050	0.876	0.232	0.238	0.001	6.641
70 -	OBS	107.0	132.0	173.0	213.0	336.0	339.0	412.0	490.0	592.0	724.0
	EXP	112.3	138.9	184.2	219.2	312.7	334.5	393.1*	520.7*	627.9*	722.9*
	CHI	0.248	0.338	0.677	0.174	1.738	0.062	0.905	1.815	2.055	0.002
75 -	OBS	84.0	113.0	167.0	213.0	250.0	340.0	411.0	472.0	580.0	768.0
	EXP	84.0	108.0	158.7	201.7	262.1	353.7	384.5*	456.7*	609.6*	753.5*
	CHI	0.000	0.235	0.430	0.631	0.555	0.531	1.823	0.513	1.438	0.278
30-79	OBS	594.0	692.0	924.0	1127.0	1465.0	1782.0	2327.0	2653.0	3256.0	3999.0
	EXP	599.1	695.8	926.0	1128.4	1467.7	1784.5	2146.4*	2641.8*	3282.1*	4090.1*
	O/E	0.991	0.995	0.998	0.999	0.998	0.999	1.084	1.004	0.992	0.978

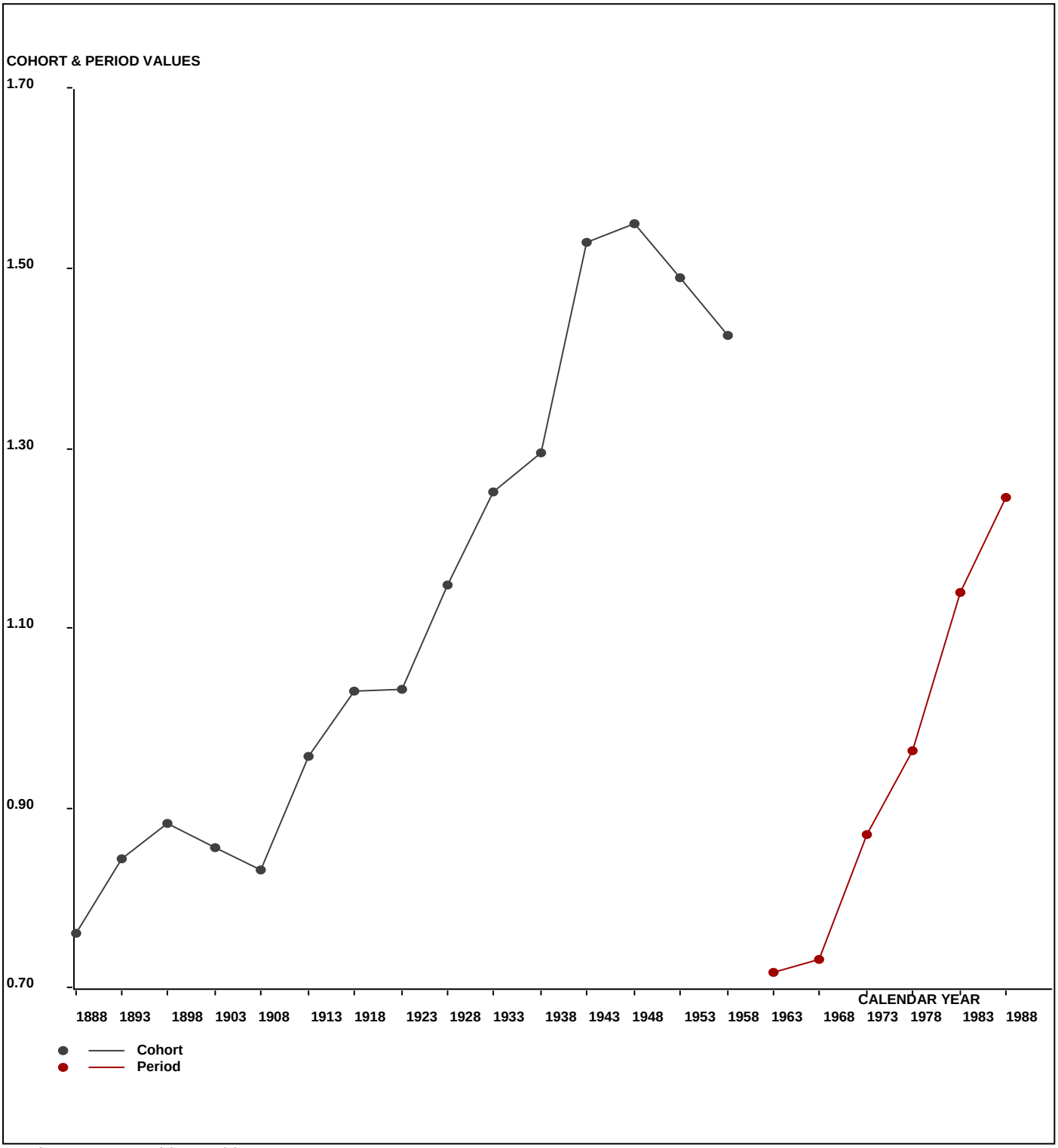
CHI SQUARE (LOG)= 237.7426 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

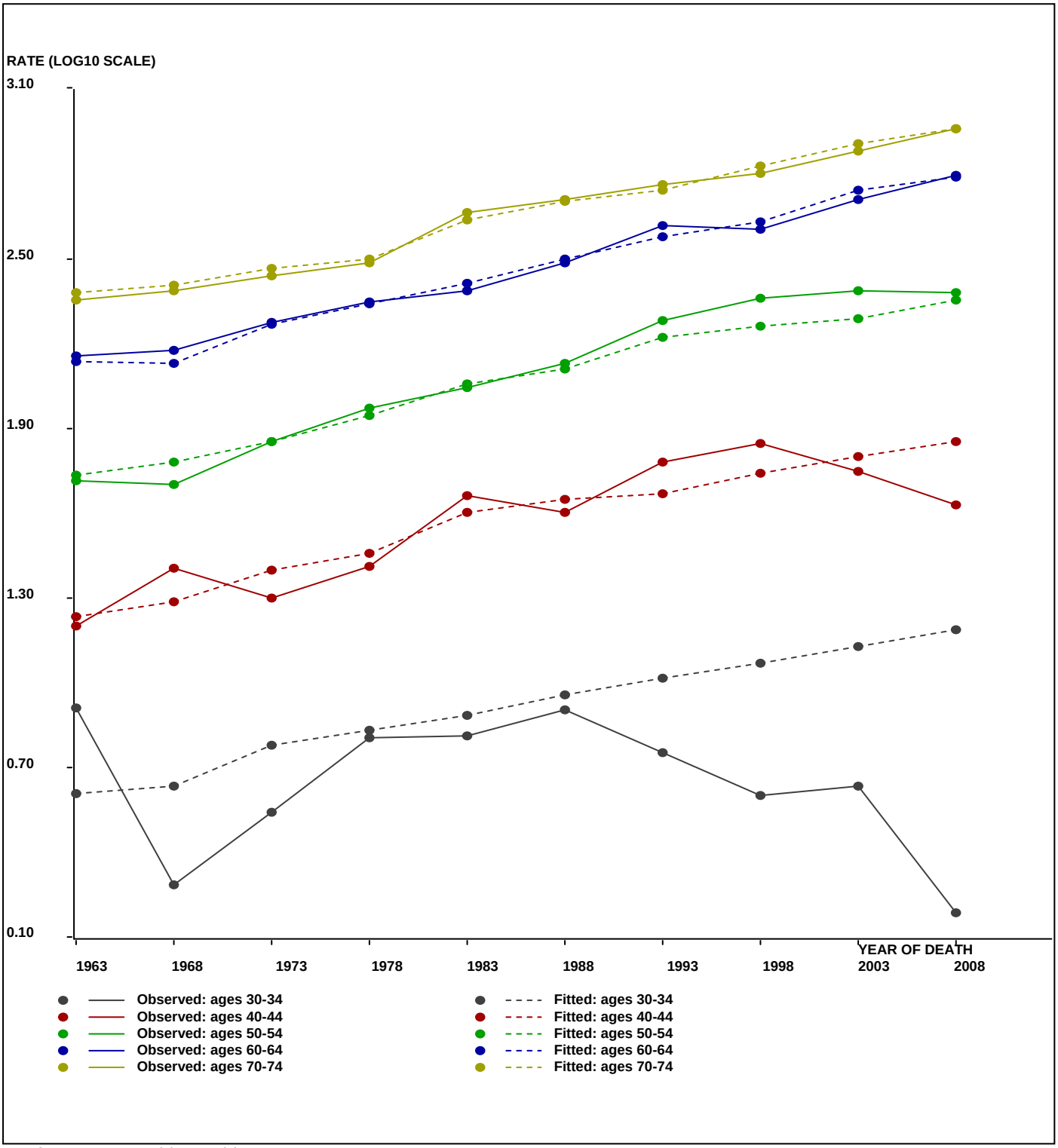


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	5.7	19.4	60.5	124.1	189.9	287.9	414.8	490.5	580.0	705.1
	PRE	10.4	26.4	46.8	105.1	165.7	243.1	376.9	479.0	553.5	659.7
	RES	-4.687	-6.956	13.695	19.012	24.171	44.809	37.898	11.549	26.559	45.419
1996-	OBS	4.0	18.6	70.1	122.9	228.8	289.7	403.5	583.7	632.8	746.6
	PRE	11.8	30.1	55.1	110.4	183.4	313.6	426.2	571.0	672.5	722.4
	RES	-7.835	-11.438	14.935	12.436	45.427	-23.925	-22.698	12.739	-39.705	24.209
2001-	OBS	4.3	9.7	56.1	146.7	243.9	395.0	508.6	646.6	755.9	835.2
	PRE	13.5	34.3	62.9	130.0	192.6	347.1	549.9	645.7	801.7	877.9
	RES	-9.186	-24.562	-6.808	16.753	51.266	47.902	-41.244	0.881	-45.869	-42.638
2006-	OBS	1.5	12.3	42.6	118.1	238.7	432.9	623.8	756.3	907.9	1066.6
	PRE	15.4	39.1	71.7	148.2	226.8	364.6	608.6	833.0	906.6	1046.5
	RES	-13.851	-26.829	-29.120	-30.181	11.959	68.303	15.234	-76.708	1.318	20.092

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	8.0	25.0	76.0	151.0	201.0	269.0	366.0	408.0	412.0	411.0
	PRE	14.6	34.0	58.8	127.9	175.4	227.1	332.6	398.4	393.1	384.5
	CHI	2.983	2.367	5.028	4.183	3.732	7.716	3.362	0.232	0.905	1.823
1996-	OBS	6.0	27.0	91.0	153.0	272.0	295.0	359.0	488.0	490.0	472.0
	PRE	17.8	43.6	71.6	137.5	218.0	319.4	379.2	477.3	520.7	456.7
	CHI	7.802	6.313	5.255	1.744	13.375	1.858	1.075	0.238	1.815	0.513
2001-	OBS	6.0	15.0	82.0	190.0	298.0	454.0	494.0	545.0	592.0	580.0
	PRE	18.8	52.9	92.0	168.3	235.4	398.9	534.1	544.3	627.9	609.6
	CHI	8.720	27.168	1.078	2.796	16.668	7.598	3.004	0.001	2.055	1.438
2006-	OBS	2.0	18.0	68.0	177.0	310.0	520.0	701.0	711.0	724.0	768.0
	PRE	20.1	57.4	114.5	222.2	294.5	438.0	683.9	783.1	722.9	753.5
	CHI	16.258	27.014	18.874	9.212	0.819	15.370	0.429	6.641	0.002	0.278

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	30.04	0.59	51	P, C	72.25	161.56	0.0000
AGE-PERIOD	17.06	0.38	45	Cohort	51.15	92.00	0.0000
AGE-COHORT	20.76	0.58	36	Period	59.86	111.77	0.0000
PERIOD-COHORT	8.75	0.22	40	Age	4.78	47.25	0.2006
FULL AGE-PERIOD-COHORT	8.33	0.26	32			45.03	0.0630

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.908152	8.093794
35	1.065976	11.640620
40	1.224490	16.768327
45	1.492894	31.109566
50	1.644783	44.134992
55	1.927579	84.640741
60	2.177890	150.622525
65	2.447647	280.315196
70	2.689900	489.665757
75	2.897986	790.652525

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.124870	0.750119
1966	0.005183	1.012005
1971	0.068541	1.170956
1976	-0.005618	0.987147
1981	-0.012993	0.970525
1986	0.014761	1.034573

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.105547	1.275109
1891	0.014995	1.035130
1896	0.008192	1.019042
1901	-0.044937	0.901703
1906	-0.039906	0.912208
1911	-0.017414	0.960696
1916	0.022206	1.052461
1921	0.047211	1.114837
1926	0.028304	1.067344
1931	0.090654	1.232124
1936	0.010479	1.024423
1941	-0.081089	0.829681
1946	-0.033592	0.925568
1951	-0.094563	0.804334
1956	0.130581	1.350769

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	4.0	16.0	3.0	7.0	5.0	14.0
	EXP	7.4	8.7	9.0	9.2	7.7	14.0
	CHI	1.5	6.2	4.0	0.5	0.9	0.0
35 -	OBS	4.0	13.0	15.0	10.0	15.0	14.0
	EXP	9.0	14.5	14.4	10.5	12.7	12.0
	CHI	2.8	0.2	0.0	0.0	0.4	0.3
40 -	OBS	10.0	16.0	25.0	18.0	17.0	19.0
	EXP	12.4	17.7	24.2	17.1	14.6	19.6
	CHI	0.5	0.2	0.0	0.1	0.4	0.0
45 -	OBS	16.0	29.0	38.0	43.0	28.0	30.0
	EXP	20.2	30.9	37.9	36.9	30.4	28.8
	CHI	0.9	0.1	0.0	1.0	0.2	0.1
50 -	OBS	23.0	29.0	57.0	48.0	60.0	35.0
	EXP	28.7	38.3	50.1	44.1	50.2	45.2
	CHI	1.1	2.3	0.9	0.3	1.9	2.3
55 -	OBS	55.0	89.0	76.0	75.0	81.0	84.0
	EXP	49.7	72.7	83.1	78.4	80.3	99.5
	CHI	0.6	3.7	0.6	0.1	0.0	2.4
60 -	OBS	82.0	106.0	142.0	127.0	129.0	146.0
	EXP	77.4	114.7	144.1	119.3	131.3	146.0
	CHI	0.3	0.7	0.0	0.5	0.0	0.0
65 -	OBS	127.0	170.0	244.0	211.0	208.0	249.0
	EXP	133.2	180.7	231.3	212.2	205.7	246.7
	CHI	0.3	0.6	0.7	0.0	0.0	0.0
70 -	OBS	191.0	291.0	325.0	288.0	312.0	361.0
	EXP	179.1	275.2	324.6	306.4	332.1	352.8
	CHI	0.8	0.9	0.0	1.1	1.2	0.2
75 -	OBS	247.0	295.0	404.0	371.0	419.0	505.0
	EXP	247.0	307.6	414.3	365.9	411.5	495.3
	CHI	0.0	0.5	0.3	0.1	0.1	0.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	297.02	7.43	40	P, C	-108.19	0.0000
AGE-PERIOD	1176.42	29.41	40	Cohort	47.44	0.0000
AGE-COHORT	289.53	7.24	40	Period	-113.58	0.0000
PERIOD-COHORT	657.18	16.43	40	Age	5.90	0.0000
FULL AGE-PERIOD-COHORT	618.38	15.46	40			0.0000

AGE	EFFECT
30	8.093794
35	11.640620
40	16.768327
45	31.109566
50	44.134992
55	84.640741
60	150.622525
65	280.315196
70	489.665757
75	790.652525

PERIOD	EFFECT	LOWER	UPPER
% Period Change	106.5993	103.5993	109.5993
1961	0.750119		
1966	1.012005		
1971	1.170956		
1976	0.987147		
1981	0.970525		
1986	1.034573		
1991	1.102848	1.071811	1.133886
1996	1.175629	1.110389	1.242731
2001	1.253213	1.150356	1.362025
2006	1.335917	1.191761	1.492771

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.275109	1.000000	
1891	1.035130	2.000000	
1896	1.019042	4.000000	
1901	0.901703	8.000000	
1906	0.912208	16.000000	
1911	0.960696	32.000000	
1916	1.052461	64.000000	
1921	1.114837	128.000000	
1926	1.067344	256.000000	
1931	1.232124	512.000000	
1936	1.024423	1024.000000	
1941	0.829681	2048.000000	
1946	0.925568	4096.000000	
1951	0.804334	8192.000000	
1956	0.772309	EXTRAPOLATION	1.350769
1961	0.728510	EXTRAPOLATION	
1966	0.687194	EXTRAPOLATION	
1971	0.648221	EXTRAPOLATION	
1976	0.611459	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	4.1	15.5	2.6	5.7	4.1	11.3	3.6	2.7	1.4	0.1
	EXP	7.5	8.4	7.9	7.4	6.3	6.5	6.5*	6.5*	6.6*	6.6*
	Elow							6.3	6.2	6.0	5.9
	Eup							6.7	6.9	7.1	7.4
35	OBS	4.1	13.0	14.5	9.1	12.3	11.3	4.7	2.1	1.9	2.0
	EXP	9.3	14.5	14.0	9.5	10.5	9.7	9.9*	10.0*	10.0*	10.1*
	Elow							9.6	9.4	9.2	9.0
	Eup							10.2	10.5	10.9	11.3
40	OBS	11.3	16.4	25.0	17.9	15.7	15.6	10.4	6.9	4.8	2.5
	EXP	14.0	18.1	24.2	17.0	13.5	16.1	14.9*	15.2*	15.3*	15.4*
	Elow							14.5	14.4	14.1	13.7
	Eup							15.3	16.1	16.6	17.2
45	OBS	19.5	32.9	39.0	44.0	28.4	27.9	16.4	10.4	12.4	10.7
	EXP	24.6	35.1	38.9	37.8	30.9	26.7	31.8*	29.4*	30.1*	30.3*
	Elow							30.9	27.8	27.6	27.0
	Eup							32.6	31.1	32.7	33.8
50	OBS	25.5	35.6	65.5	50.6	63.1	36.2	41.6	37.0	30.3	24.6
	EXP	31.8	47.0	57.6	46.5	52.8	46.8	40.4*	48.0*	44.5*	45.5*
	Elow							39.2	45.4	40.8	40.6
	Eup							41.5	50.8	48.4	50.9
55	OBS	64.1	100.8	95.4	89.1	88.4	91.1	74.9	73.7	73.1	81.6
	EXP	57.9	82.3	104.3	93.1	87.7	107.9	95.6*	82.6*	98.2*	90.9*
	Elow							92.9	78.0	90.1	81.1
	Eup							98.3	87.3	106.7	101.6
60	OBS	108.0	128.5	167.0	166.6	160.1	166.3	185.9	161.9	143.1	150.4
	EXP	101.9	139.0	169.4	156.5	163.0	166.3	204.7*	181.4*	156.6*	186.2*
	Elow							198.9	171.3	143.8	166.1
	Eup							210.4	191.8	170.2	208.1
65	OBS	204.2	240.6	315.8	264.4	289.5	326.3	341.4	266.7	257.4	267.0
	EXP	214.3	255.8	299.4	265.8	286.3	323.3	330.0*	406.0*	359.9*	310.7*
	Elow							320.7	383.5	330.3	277.2
	Eup							339.3	429.2	391.1	347.2
70	OBS	405.6	534.0	517.7	414.5	428.9	545.5	502.6	559.2	431.6	504.1
	EXP	380.2	505.0	517.0	440.9	456.6	533.2	602.0*	614.4*	756.1*	670.1*
	Elow							585.1	580.3	694.0	597.8
	Eup							619.0	649.5	821.7	748.8
75	OBS	756.2	794.3	920.0	713.7	712.7	801.2	875.0	950.7	869.8	745.8
	EXP	756.2	828.3	943.4	703.8	700.0	785.8	917.7*	1036.3*	1057.6*	1301.4*
	Elow							891.9	978.8	970.8	1161.0
	Eup							943.5	1095.4	1149.4	1454.2
30-79	OBS	89.5	112.6	128.9	108.9	110.3	120.7	118.9	114.7	101.3	101.7
	EXP	90.5	113.6	129.2	108.4	110.1	121.5	132.4*	140.1*	144.4*	147.1*
	Elow							128.7	132.3	132.5	131.2
	Eup							136.1	148.1	156.9	164.3

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	4.0	16.0	3.0	7.0	5.0	14.0	5.0	4.0	2.0	0.1
	EXP	7.4	8.7	9.0	9.2	7.7	8.0	9.2*	9.8*	9.2*	8.6*
	CHI	1.527	6.154	3.996	0.508	0.949	4.491	1.886	3.456	5.603	8.421
35 -	OBS	4.0	13.0	15.0	10.0	15.0	14.0	6.0	3.0	3.0	3.0
	EXP	9.0	14.5	14.4	10.5	12.7	12.0	12.8*	14.5*	15.5*	14.8*
	CHI	2.788	0.159	0.022	0.027	0.406	0.334	3.597	9.081	10.057	9.399
40 -	OBS	10.0	16.0	25.0	18.0	17.0	19.0	13.0	9.0	7.0	4.0
	EXP	12.4	17.7	24.2	17.1	14.6	19.6	18.7*	19.8*	22.4*	24.6*
	CHI	0.450	0.167	0.027	0.052	0.382	0.018	1.725	5.870	10.577	17.225
45 -	OBS	16.0	29.0	38.0	43.0	28.0	30.0	20.0	13.0	16.0	16.0
	EXP	20.2	30.9	37.9	36.9	30.4	28.8	38.6*	36.6*	39.0*	45.4*
	CHI	0.869	0.122	0.001	0.993	0.196	0.053	8.984	15.249	13.555	19.030
50 -	OBS	23.0	29.0	57.0	48.0	60.0	35.0	44.0	44.0	37.0	32.0
	EXP	28.7	38.3	50.1	44.1	50.2	45.2	42.7*	57.1*	54.4*	59.1*
	CHI	1.123	2.252	0.939	0.347	1.915	2.311	0.037	3.000	5.541	12.448
55 -	OBS	55.0	89.0	76.0	75.0	81.0	84.0	70.0	75.0	84.0	98.0
	EXP	49.7	72.7	83.1	78.4	80.3	99.5	89.3*	84.1*	112.8*	109.2*
	CHI	0.569	3.658	0.600	0.148	0.005	2.403	4.188	0.978	7.371	1.158
60 -	OBS	82.0	106.0	142.0	127.0	129.0	146.0	164.0	144.0	139.0	169.0
	EXP	77.4	114.7	144.1	119.3	131.3	146.0	180.6*	161.4*	152.1*	209.3*
	CHI	0.276	0.655	0.031	0.499	0.041	0.000	1.523	1.872	1.129	7.757
65 -	OBS	127.0	170.0	244.0	211.0	208.0	249.0	284.0	223.0	217.0	251.0
	EXP	133.2	180.7	231.3	212.2	205.7	246.7	274.5*	339.5*	303.3*	292.1*
	CHI	0.292	0.634	0.694	0.006	0.026	0.021	0.332	39.954	24.578	5.781
70 -	OBS	191.0	291.0	325.0	288.0	312.0	361.0	357.0	433.0	338.0	402.0
	EXP	179.1	275.2	324.6	306.4	332.1	352.8	427.7*	475.8*	592.2*	534.4*
	CHI	0.797	0.909	0.001	1.105	1.214	0.189	11.672	3.844	109.109	32.792
75 -	OBS	247.0	295.0	404.0	371.0	419.0	505.0	510.0	601.0	604.0	537.0
	EXP	247.0	307.6	414.3	365.9	411.5	495.3	534.9*	655.1*	734.4*	937.1*
	CHI	0.000	0.516	0.256	0.072	0.137	0.189	1.161	4.465	23.157	170.814
30-79	OBS	759.0	1054.0	1329.0	1198.0	1274.0	1457.0	1473.0	1549.0	1447.0	1512.1
	EXP	763.9	1061.0	1333.0	1199.9	1276.6	1453.9	1628.9*	1853.5*	2035.3*	2234.6*
	O/E	0.994	0.993	0.997	0.998	0.998	1.002	0.904	0.836	0.711	0.677

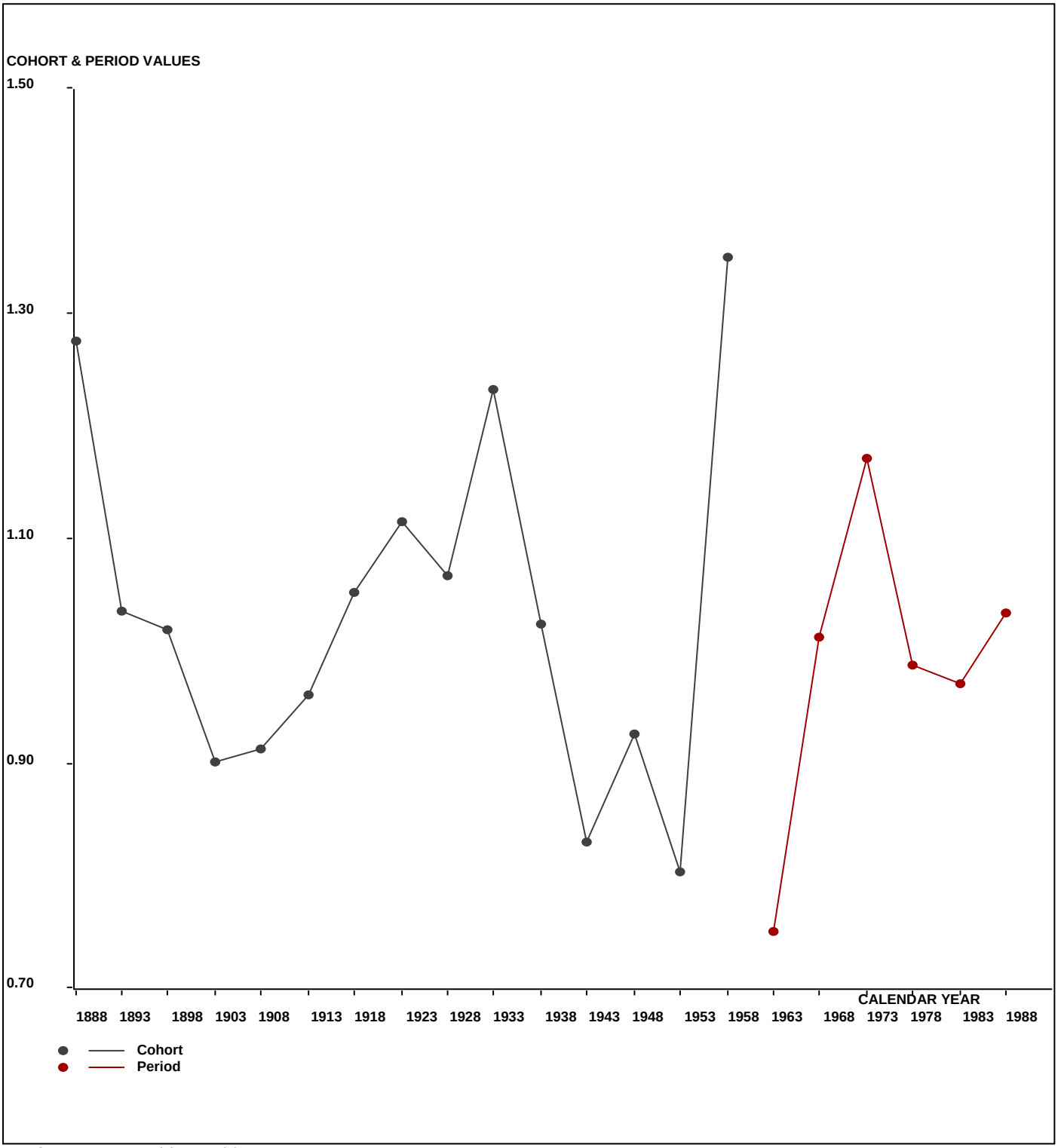
CHI SQUARE (LOG)= 618.3761 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

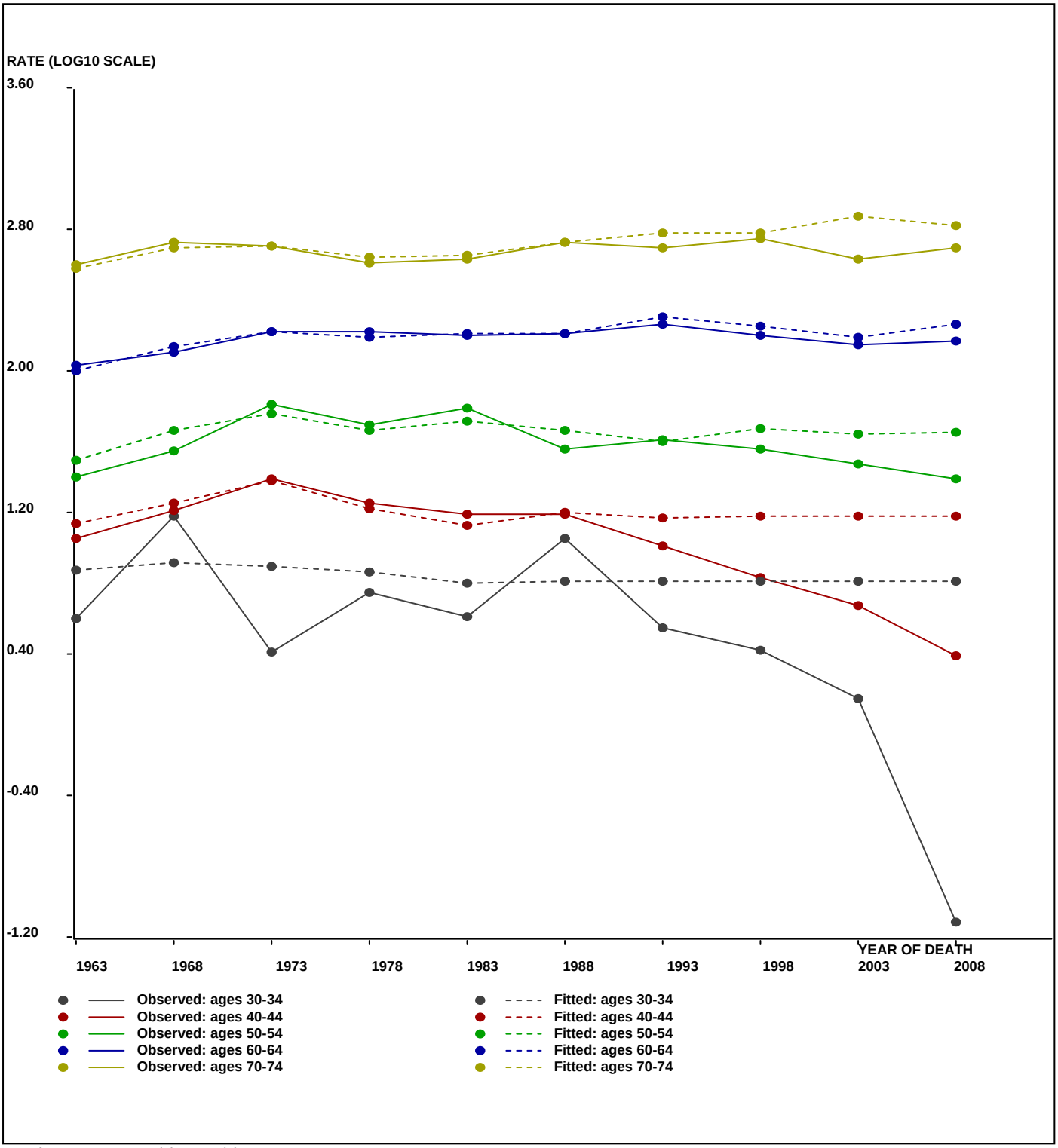


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

Switzerland COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	3.6	4.7	10.4	16.4	41.6	74.9	185.9	341.4	502.6	875.0
	PRE	6.5	9.9	14.9	31.8	40.4	95.6	204.7	330.0	602.0	917.7
	RES	-2.952	-5.260	-4.521	-15.315	1.183	-20.703	-18.797	11.474	-99.461	-42.748
1996-	OBS	2.7	2.1	6.9	10.4	37.0	73.7	161.9	266.7	559.2	950.7
	PRE	6.5	10.0	15.2	29.4	48.0	82.6	181.4	406.0	614.4	1036.3
	RES	-3.878	-7.901	-8.295	-18.979	-11.009	-8.903	-19.537	-139.301	-55.227	-85.552
2001-	OBS	1.4	1.9	4.8	12.4	30.3	73.1	143.1	257.4	431.6	869.8
	PRE	6.6	10.0	15.3	30.1	44.5	98.2	156.6	359.9	756.1	1057.6
	RES	-5.140	-8.082	-10.523	-17.754	-14.204	-25.093	-13.493	-102.437	-324.548	-187.797
2006-	OBS	0.1	2.0	2.5	10.7	24.6	81.6	150.4	267.0	504.1	745.8
	PRE	6.6	10.1	15.4	30.3	45.5	90.9	186.2	310.7	670.1	1301.4
	RES	-6.535	-8.036	-12.888	-19.604	-20.893	-9.363	-35.855	-43.711	-166.004	-555.639

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	5.0	6.0	13.0	20.0	44.0	70.0	164.0	284.0	357.0	510.0
	PRE	9.2	12.8	18.7	38.6	42.7	89.3	180.6	274.5	427.7	534.9
	CHI	1.886	3.597	1.725	8.984	0.037	4.188	1.523	0.332	11.672	1.161
1996-	OBS	4.0	3.0	9.0	13.0	44.0	75.0	144.0	223.0	433.0	601.0
	PRE	9.8	14.5	19.8	36.6	57.1	84.1	161.4	339.5	475.8	655.1
	CHI	3.456	9.081	5.870	15.249	3.000	0.978	1.872	39.954	3.844	4.465
2001-	OBS	2.0	3.0	7.0	16.0	37.0	84.0	139.0	217.0	338.0	604.0
	PRE	9.2	15.5	22.4	39.0	54.4	112.8	152.1	303.3	592.2	734.4
	CHI	5.603	10.057	10.577	13.555	5.541	7.371	1.129	24.578	109.109	23.157
2006-	OBS	0.1	3.0	4.0	16.0	32.0	98.0	169.0	251.0	402.0	537.0
	PRE	8.6	14.8	24.6	45.4	59.1	109.2	209.3	292.1	534.4	937.1
	CHI	8.421	9.399	17.225	19.030	12.448	1.158	7.757	5.781	32.792	170.814

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	2892.58	56.72	51	P, C	92.71	15391.30	0.0000
AGE-PERIOD	804.89	17.89	45	Cohort	73.79	4273.31	0.0000
AGE-COHORT	926.62	25.74	36	Period	77.23	4916.11	0.0000
PERIOD-COHORT	333.76	8.34	40	Age	36.79	1770.47	0.0000
FULL AGE-PERIOD-COHORT	210.97	6.59	32			1118.79	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	2.063921	115.856755
35	2.543379	349.444969
40	2.933985	858.984740
45	3.248340	1771.495152
50	3.505668	3203.818840
55	3.728277	5349.052665
60	3.935735	8624.525322
65	4.128419	13440.621252
70	4.304217	20147.327878
75	4.452523	28348.004558

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.022953	1.054274
1966	0.018802	1.044244
1971	0.026837	1.063744
1976	0.014648	1.034303
1981	-0.017433	0.960654
1986	-0.069259	0.852591

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.018082	1.042514
1891	-0.011591	0.973663
1896	-0.019411	0.956288
1901	-0.008301	0.981068
1906	-0.006963	0.984096
1911	-0.000580	0.998666
1916	0.006294	1.014597
1921	0.031909	1.076240
1926	0.020488	1.048305
1931	0.011034	1.025732
1936	-0.024755	0.944593
1941	-0.071004	0.849172
1946	-0.117167	0.763542
1951	-0.133278	0.735735
1956	-0.154569	0.700537

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	1003.0	932.0	934.0	922.0	825.0	676.0
	EXP	1044.2	948.1	899.0	910.6	815.9	676.0
	CHI	1.6	0.3	1.4	0.1	0.1	0.0
35 -	OBS	3422.0	3010.0	2869.0	2698.0	2504.0	2148.0
	EXP	3449.1	3082.6	2859.3	2595.0	2510.7	2157.2
	CHI	0.2	1.7	0.0	4.1	0.0	0.0
40 -	OBS	7850.0	8286.0	8014.0	6970.0	5847.0	5409.0
	EXP	8630.3	8276.0	7569.5	6717.3	5823.1	5413.8
	CHI	70.5	0.0	26.1	9.5	0.1	0.0
45 -	OBS	14447.0	17026.0	17906.0	15310.0	12865.0	10284.0
	EXP	15920.1	17174.3	16960.9	14859.7	12581.1	10450.0
	CHI	136.3	1.3	52.7	13.6	6.4	2.6
50 -	OBS	27896.0	27075.0	31883.0	29756.0	24332.0	19078.0
	EXP	29733.2	27395.9	30424.5	28783.6	24177.6	19623.9
	CHI	113.5	3.8	69.9	32.9	1.0	15.2
55 -	OBS	45079.0	46496.0	43967.0	47620.0	41962.0	33225.0
	EXP	45371.1	46332.7	43695.4	46555.6	42227.1	34195.9
	CHI	1.9	0.6	1.7	24.3	1.7	27.6
60 -	OBS	61016.0	65588.0	67988.0	62768.0	63293.0	53950.0
	EXP	59355.0	65155.1	68710.7	62109.0	63678.0	55654.7
	CHI	46.5	2.9	7.6	7.0	2.3	52.2
65 -	OBS	66316.0	77590.0	87654.0	87842.0	77107.0	75789.0
	EXP	65049.4	76533.4	87176.9	88999.7	77484.8	77094.1
	CHI	24.7	14.6	2.6	15.1	1.8	22.1
70 -	OBS	72516.0	73430.0	87606.0	97468.0	97986.0	84054.0
	EXP	71206.4	73226.1	89134.7	98651.2	97983.9	82898.4
	CHI	24.1	0.6	26.2	14.2	0.0	16.1
75 -	OBS	69921.0	64928.0	68090.0	80981.0	89352.0	90432.0
	EXP	69921.0	66263.1	69589.3	82222.8	88799.3	87015.7
	CHI	0.0	26.9	32.3	18.8	3.4	134.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	575293.22	14382.33	40	P, C	88.29	0.0000
AGE-PERIOD	127335.85	3183.40	40	Cohort	47.10	0.0000
AGE-COHORT	228085.13	5702.13	40	Period	70.47	0.0000
PERIOD-COHORT	80748.10	2018.70	40	Age	16.58	0.0000
FULL AGE-PERIOD-COHORT	67361.99	1684.05	40			0.0000

AGE	EFFECT
30	115.856755
35	349.444969
40	858.984740
45	1771.495152
50	3203.818840
55	5349.052665
60	8624.525322
65	13440.621252
70	20147.327878
75	28348.004558

PERIOD	EFFECT	LOWER	UPPER
% Period Change	88.7510	85.7510	91.7510
1961	1.054274		
1966	1.044244		
1971	1.063744		
1976	1.034303		
1981	0.960654		
1986	0.852591		
1991	0.756683	0.731105	0.782260
1996	0.671564	0.626930	0.717732
2001	0.596020	0.537599	0.658526
2006	0.528973	0.460997	0.604205

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.042514	1.000000	
1891	0.973663	2.000000	
1896	0.956288	4.000000	
1901	0.981068	8.000000	
1906	0.984096	16.000000	
1911	0.998666	32.000000	
1916	1.014597	64.000000	
1921	1.076240	128.000000	
1926	1.048305	256.000000	
1931	1.025732	512.000000	
1936	0.944593	1024.000000	
1941	0.849172	2048.000000	
1946	0.763542	4096.000000	
1951	0.735735	8192.000000	
1956	0.685636	EXTRAPOLATION	0.700537
1961	0.640984	EXTRAPOLATION	
1966	0.599240	EXTRAPOLATION	
1971	0.560214	EXTRAPOLATION	
1976	0.523730	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	120.3	112.3	108.7	92.6	82.8	69.2	49.9	40.9	41.6	37.7
	EXP	125.3	114.3	104.7	91.5	81.9	67.7	56.2*	46.6*	38.7*	32.1*
	Elow							54.3	43.5	34.9	28.0
	Eup							58.1	49.8	42.7	36.7
35	OBS	383.2	365.5	352.3	319.1	255.6	218.3	172.6	131.1	114.7	101.7
	EXP	386.2	374.3	351.1	306.9	256.3	219.2	181.3*	150.4*	124.8*	103.6*
	Elow							175.2	140.4	112.6	90.2
	Eup							187.4	160.8	137.9	118.3
40	OBS	886.5	941.4	992.3	870.8	703.6	558.7	427.8	351.8	290.4	233.1
	EXP	974.6	940.3	937.3	839.2	700.7	559.2	478.2*	395.5*	328.2*	272.3*
	Elow							462.0	369.2	296.0	237.3
	Eup							494.4	422.7	362.6	311.0
45	OBS	1719.6	1973.7	2085.5	1936.4	1643.8	1262.2	927.5	713.3	621.6	479.3
	EXP	1894.9	1990.9	1975.4	1879.4	1607.5	1282.6	1023.5*	875.3*	723.9*	600.6*
	Elow							988.9	817.1	653.0	523.5
	Eup							1058.1	935.5	799.8	686.1
50	OBS	3164.8	3354.6	3843.7	3591.1	3177.1	2508.4	1822.8	1375.3	1071.3	875.1
	EXP	3373.2	3394.4	3667.9	3473.8	3157.0	2580.2	2058.6*	1642.8*	1404.9*	1162.0*
	Elow							1989.0	1533.6	1267.2	1012.6
	Eup							2128.2	1755.8	1552.3	1327.2
55	OBS	5513.9	5597.9	5809.0	6090.5	5353.0	4545.1	3380.6	2496.7	1794.7	1389.9
	EXP	5549.7	5578.3	5773.1	5954.3	5386.8	4677.9	3823.3*	3050.4*	2434.3*	2081.8*
	Elow							3694.0	2847.7	2195.7	1814.2
	Eup							3952.5	3260.1	2689.6	2377.8
60	OBS	9170.1	8921.8	9065.7	9146.6	8862.9	7472.3	6000.0	4332.4	3101.0	2204.3
	EXP	8920.5	8862.9	9162.1	9050.6	8916.8	7708.4	6694.0*	5471.0*	4365.1*	3483.4*
	Elow							6467.7	5107.4	3937.2	3035.7
	Eup							6920.2	5847.1	4822.9	3978.8
65	OBS	13814.5	13959.7	14147.0	13702.5	13036.4	12124.2	9747.4	7388.0	5082.9	3441.9
	EXP	13550.7	13769.6	14070.0	13883.1	13100.3	12333.0	10661.6*	9258.5*	7567.0*	6037.4*
	Elow							10301.2	8643.2	6825.3	5261.5
	Eup							11021.9	9895.0	8360.6	6896.0
70	OBS	21061.7	20175.1	20665.3	20261.1	19329.2	17671.1	15633.2	11813.3	8481.4	5539.0
	EXP	20681.4	20119.1	21025.9	20507.0	19328.8	17428.2	16407.4*	14183.8*	12317.2*	10066.9*
	Elow							15852.8	13241.1	11109.9	8773.2
	Eup							16962.0	15158.9	13609.0	11498.6
75	OBS	31157.1	28241.9	28215.6	28330.9	26966.3	25084.6	22532.3	18596.4	13584.5	9372.5
	EXP	31157.1	28822.6	28836.9	28765.3	26799.5	24137.0	21763.6*	20488.9*	17712.1*	15381.2*
	Elow							21027.9	19127.2	15976.0	13404.6
	Eup							22499.2	21897.5	19569.7	17568.7
30-79	OBS	5520.2	5423.2	5579.5	5494.6	5118.9	4520.5	3728.0	2856.6	2076.3	1465.1
	EXP	5522.6	5428.4	5577.0	5485.4	5118.5	4535.7	3970.7*	3418.1*	2862.2*	2367.5*
	Elow							3836.5	3190.9	2581.6	2063.3
	Eup							4104.9	3653.1	3162.3	2704.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	1003.0	932.0	934.0	922.0	825.0	676.0	548.0	471.0	451.0	371.0
	EXP	1044.2	948.1	899.0	910.6	815.9	661.6	617.4*	536.7*	419.1*	316.2*
	CHI	1.628	0.274	1.364	0.143	0.102	0.312	7.805	8.052	2.432	9.492
35 -	OBS	3422.0	3010.0	2869.0	2698.0	2504.0	2148.0	1675.0	1429.0	1328.0	1112.0
	EXP	3449.1	3082.6	2859.3	2595.0	2510.7	2157.2	1759.0*	1640.1*	1444.4*	1131.9*
	CHI	0.213	1.712	0.033	4.086	0.018	0.039	4.013	27.182	9.386	0.348
40 -	OBS	7850.0	8286.0	8014.0	6970.0	5847.0	5409.0	4180.0	3403.0	3158.0	2696.0
	EXP	8630.3	8276.0	7569.5	6717.3	5823.1	5413.8	4672.7*	3825.6*	3568.7*	3149.0*
	CHI	70.542	0.012	26.103	9.508	0.098	0.004	51.958	46.677	47.256	65.174
45 -	OBS	14447.0	17026.0	17906.0	15310.0	12865.0	10284.0	8860.0	6893.0	5966.0	5162.0
	EXP	15920.1	17174.3	16960.9	14859.7	12581.1	10450.0	9776.9*	8458.9*	6948.7*	6468.4*
	CHI	136.309	1.281	52.659	13.644	6.407	2.636	85.986	289.884	138.964	263.837
50 -	OBS	27896.0	27075.0	31883.0	29756.0	24332.0	19078.0	14527.0	12881.0	10150.0	8233.0
	EXP	29733.2	27395.9	30424.5	28783.6	24177.6	19623.9	16406.5*	15386.7*	13310.5*	10931.4*
	CHI	113.525	3.758	69.920	32.851	0.986	15.185	215.320	408.056	750.453	666.089
55 -	OBS	45079.0	46496.0	43967.0	47620.0	41962.0	33225.0	24763.0	19284.0	16284.0	12746.0
	EXP	45371.1	46332.7	43695.4	46555.6	42227.1	34195.9	28005.9*	23560.7*	22086.7*	19090.7*
	CHI	1.880	0.576	1.688	24.334	1.664	27.568	375.496	776.303	1524.515	2108.637
60 -	OBS	61016.0	65588.0	67988.0	62768.0	63293.0	53950.0	40935.0	30006.0	22717.0	19083.0
	EXP	59355.0	65155.1	68710.7	62109.0	63678.0	55654.7	45669.3*	37891.8*	31977.4*	30155.8*
	CHI	46.482	2.877	7.600	6.993	2.327	52.213	490.788	1641.131	2681.735	4065.774
65 -	OBS	66316.0	77590.0	87654.0	87842.0	77107.0	75789.0	62281.0	45499.0	32261.0	23247.0
	EXP	65049.4	76533.4	87176.9	88999.7	77484.8	77094.1	68122.2*	57018.1*	48027.6*	40777.6*
	CHI	24.662	14.586	2.611	15.059	1.842	22.095	500.853	2327.162	5175.877	7536.568
70 -	OBS	72516.0	73430.0	87606.0	97468.0	97986.0	84054.0	80423.0	63154.0	45088.0	31149.0
	EXP	71206.4	73226.1	89134.7	98651.2	97983.9	82898.4	84406.0*	75826.5*	65479.2*	56611.9*
	CHI	24.085	0.568	26.217	14.190	0.000	16.110	187.951	2117.882	6350.145	11452.729
75 -	OBS	69921.0	64928.0	68090.0	80981.0	89352.0	90432.0	78432.0	72409.0	56635.0	40586.0
	EXP	69921.0	66263.1	69589.3	82222.8	88799.3	87015.7	75756.0*	79777.7*	73843.6*	66605.6*
	CHI	0.000	26.900	32.302	18.754	3.440	134.128	94.529	680.614	4010.318	10164.621
30-79	OBS	369466.0	384361.0	416911.0	432335.0	416073.0	375045.0	316624.0	255429.0	194038.0	144385.0
	EXP	369679.8	384387.3	417020.2	432404.5	416081.4	375165.3	335191.9*	303922.9*	267105.9*	235238.6*
	O/E	0.999	1.000	1.000	1.000	1.000	1.000	0.945	0.840	0.726	0.614

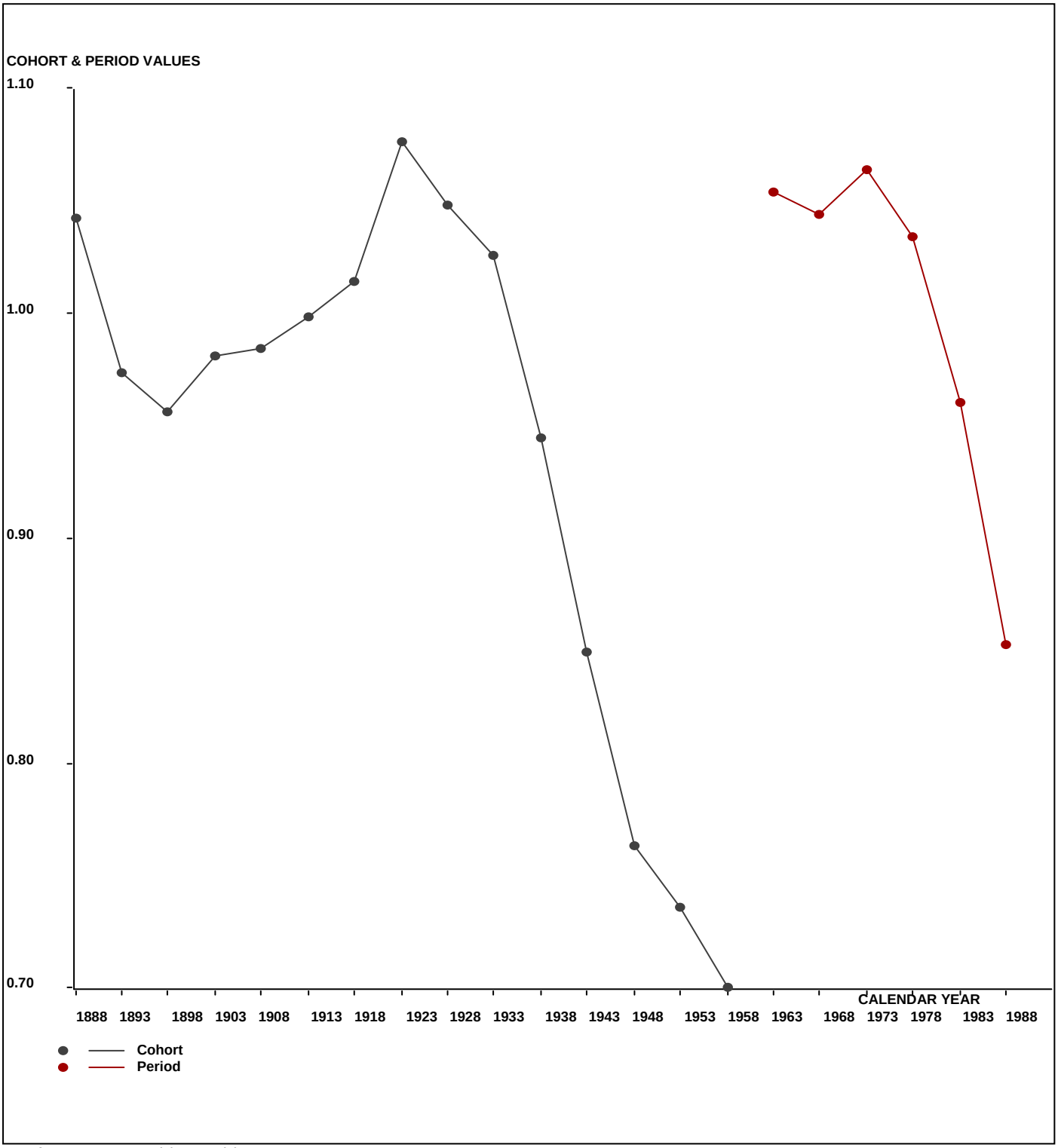
CHI SQUARE (LOG)= 67361.9929 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

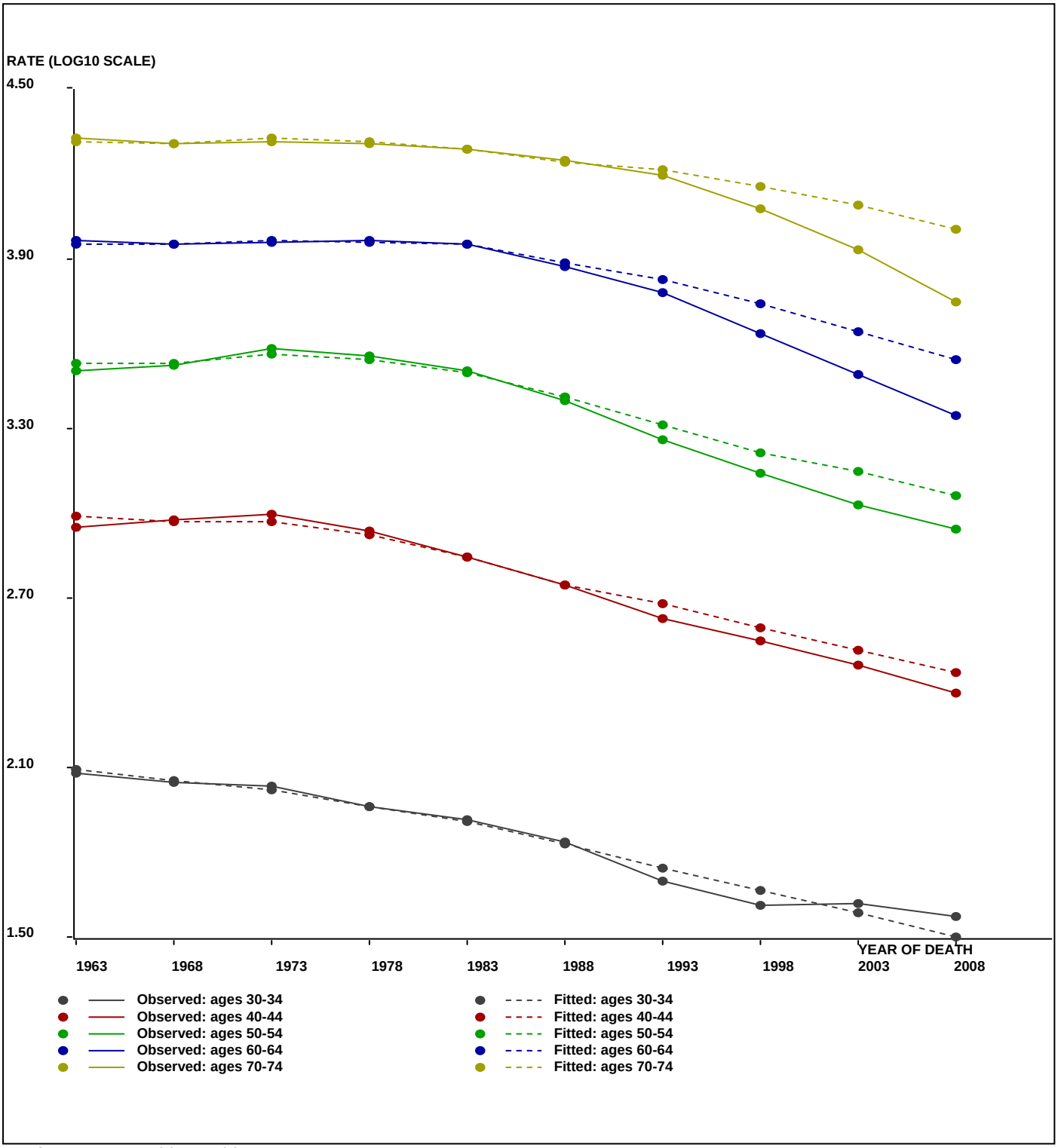


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	49.9	172.6	427.8	927.5	1822.8	3380.6	6000.0	9747.4	15633.2	22532.3
	PRE	56.2	181.3	478.2	1023.5	2058.6	3823.3	6694.0	10661.6	16407.4	21763.6
	RES	-6.318	-8.659	-50.427	-95.984	-235.837	-442.704	-693.934	-914.180	-774.242	768.785
1996-	OBS	40.9	131.1	351.8	713.3	1375.3	2496.7	4332.4	7388.0	11813.3	18596.4
	PRE	46.6	150.4	395.5	875.3	1642.8	3050.4	5471.0	9258.5	14183.8	20488.9
	RES	-5.711	-19.365	-43.689	-162.033	-267.532	-553.708	-1138.587	-1870.456	-2370.460	-1892.468
2001-	OBS	41.6	114.7	290.4	621.6	1071.3	1794.7	3101.0	5082.9	8481.4	13584.5
	PRE	38.7	124.8	328.2	723.9	1404.9	2434.3	4365.1	7567.0	12317.2	17712.1
	RES	2.947	-10.061	-37.763	-102.375	-333.591	-639.544	-1264.089	-2484.112	-3835.766	-4127.655
2006-	OBS	37.7	101.7	233.1	479.3	875.1	1389.9	2204.3	3441.9	5539.0	9372.5
	PRE	32.1	103.6	272.3	600.6	1162.0	2081.8	3483.4	6037.4	10066.9	15381.2
	RES	5.561	-1.817	-39.171	-121.309	-286.830	-691.866	-1279.053	-2595.521	-4527.896	-6008.701

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	548.0	1675.0	4180.0	8860.0	14527.0	24763.0	40935.0	62281.0	80423.0	78432.0
	PRE	617.4	1759.0	4672.7	9776.9	16406.5	28005.9	45669.3	68122.2	84406.0	75756.0
	CHI	7.805	4.013	51.958	85.986	215.320	375.496	490.788	500.853	187.951	94.529
1996-	OBS	471.0	1429.0	3403.0	6893.0	12881.0	19284.0	30006.0	45499.0	63154.0	72409.0
	PRE	536.7	1640.1	3825.6	8458.9	15386.7	23560.7	37891.8	57018.1	75826.5	79777.7
	CHI	8.052	27.182	46.677	289.884	408.056	776.303	1641.131	2327.162	2117.882	680.614
2001-	OBS	451.0	1328.0	3158.0	5966.0	10150.0	16284.0	22717.0	32261.0	45088.0	56635.0
	PRE	419.1	1444.4	3568.7	6948.7	13310.5	22086.7	31977.4	48027.6	65479.2	73843.6
	CHI	2.432	9.386	47.256	138.964	750.453	1524.515	2681.735	5175.877	6350.145	4010.318
2006-	OBS	371.0	1112.0	2696.0	5162.0	8233.0	12746.0	19083.0	23247.0	31149.0	40586.0
	PRE	316.2	1131.9	3149.0	6468.4	10931.4	19090.7	30155.8	40777.6	56611.9	66605.6
	CHI	9.492	0.348	65.174	263.837	666.089	2108.637	4065.774	7536.568	11452.729	10164.621

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	5891.05	115.51	51	P, C	98.75	31488.39	0.0000
AGE-PERIOD	119.32	2.65	45	Cohort	38.15	632.83	0.0000
AGE-COHORT	141.53	3.93	36	Period	47.86	750.92	0.0000
PERIOD-COHORT	94.02	2.35	40	Age	21.51	498.66	0.0000
FULL AGE-PERIOD-COHORT	73.80	2.31	32			391.43	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.723338	52.885655
35	1.963665	91.974003
40	2.213973	163.671504
45	2.489410	308.609841
50	2.748561	560.480492
55	3.012999	1030.382993
60	3.290947	1954.102237
65	3.573612	3746.385327
70	3.840481	6925.975335
75	4.079219	12001.037025

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.079169	1.199966
1966	0.054908	1.134769
1971	0.031498	1.075222
1976	-0.023105	0.948189
1981	-0.072688	0.845886
1986	-0.119088	0.760172

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.038927	1.093773
1891	0.035729	1.085748
1896	0.028737	1.068409
1901	0.024761	1.058672
1906	0.008224	1.019117
1911	-0.009685	0.977947
1916	-0.036466	0.919463
1921	-0.053122	0.884866
1926	-0.076819	0.837878
1931	-0.082883	0.826261
1936	-0.105901	0.783608
1941	-0.113047	0.770820
1946	-0.112509	0.771776
1951	-0.128606	0.743693
1956	-0.061349	0.868262

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	412.0	403.0	388.0	376.0	340.0	341.0
	EXP	437.0	390.2	376.5	385.2	331.5	341.0
	CHI	1.4	0.4	0.4	0.2	0.2	0.0
35 -	OBS	718.0	721.0	654.0	593.0	636.0	503.0
	EXP	825.8	710.2	631.1	568.4	588.2	511.7
	CHI	14.1	0.2	0.8	1.1	3.9	0.1
40 -	OBS	1451.0	1359.0	1237.0	1024.0	907.0	888.0
	EXP	1538.8	1369.6	1174.4	973.4	886.8	929.6
	CHI	5.0	0.1	3.3	2.6	0.5	1.9
45 -	OBS	2556.0	2642.0	2537.0	2066.0	1661.0	1415.0
	EXP	2860.7	2673.1	2387.1	1911.7	1601.0	1473.4
	CHI	32.5	0.4	9.4	12.5	2.2	2.3
50 -	OBS	5248.0	4722.0	4658.0	4024.0	3079.0	2385.0
	EXP	5797.6	4719.8	4423.3	3689.6	3000.1	2539.2
	CHI	52.1	0.0	12.5	30.3	2.1	9.4
55 -	OBS	10155.0	9415.0	7818.0	7135.0	5749.0	4430.0
	EXP	10301.6	9497.5	7710.1	6759.4	5724.7	4731.0
	CHI	2.1	0.7	1.5	20.9	0.1	19.1
60 -	OBS	16952.0	16665.0	15220.0	11810.0	10439.0	8559.0
	EXP	16517.6	16613.2	15409.6	11691.1	10445.2	8986.2
	CHI	11.4	0.2	2.3	1.2	0.0	20.3
65 -	OBS	23483.0	25291.0	25607.0	22110.0	17018.0	15240.0
	EXP	23056.9	25015.7	25435.6	22270.2	17234.3	15752.7
	CHI	7.9	3.0	1.2	1.2	2.7	16.7
70 -	OBS	31363.0	30627.0	33330.0	31896.0	28800.0	23297.0
	EXP	31068.4	30562.2	33422.0	32195.8	29044.1	23026.2
	CHI	2.8	0.1	0.3	2.8	2.1	3.2
75 -	OBS	35348.0	33696.0	32771.0	33804.0	34499.0	33338.0
	EXP	35348.0	33993.3	33269.7	34434.8	34279.7	32163.3
	CHI	0.0	2.6	7.5	11.6	1.4	42.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	206625.25	5165.63	40	P, C	95.11	0.0000
AGE-PERIOD	9468.33	236.71	40	Cohort	-6.74	0.0000
AGE-COHORT	13712.10	342.80	40	Period	26.30	0.0000
PERIOD-COHORT	12599.89	315.00	40	Age	19.79	0.0000
FULL AGE-PERIOD-COHORT	10106.29	252.66	40			0.0000

AGE	EFFECT
30	52.885655
35	91.974003
40	163.671504
45	308.609841
50	560.480492
55	1030.382993
60	1954.102237
65	3746.385327
70	6925.975335
75	12001.037025

PERIOD	EFFECT	LOWER	UPPER
% Period Change	89.8669	86.8669	92.8669
1961	1.199966		
1966	1.134769		
1971	1.075222		
1976	0.948189		
1981	0.845886		
1986	0.760172		
1991	0.683143	0.660338	0.705949
1996	0.613920	0.573616	0.655593
2001	0.551711	0.498282	0.608829
2006	0.495806	0.432843	0.565401

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.093773	1.000000	
1891	1.085748	2.000000	
1896	1.068409	4.000000	
1901	1.058672	8.000000	
1906	1.019117	16.000000	
1911	0.977947	32.000000	
1916	0.919463	64.000000	
1921	0.884866	128.000000	
1926	0.837878	256.000000	
1931	0.826261	512.000000	
1936	0.783608	1024.000000	
1941	0.770820	2048.000000	
1946	0.771776	4096.000000	
1951	0.743693	8192.000000	
1956	0.725835	EXTRAPOLATION	0.868262
1961	0.707966	EXTRAPOLATION	
1966	0.690537	EXTRAPOLATION	
1971	0.673537	EXTRAPOLATION	
1976	0.656956	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	49.4	48.6	45.2	37.8	34.1	34.9	27.8	25.2	21.5	21.6
	EXP	52.4	47.0	43.8	38.7	33.3	29.2	25.6*	22.4*	19.7*	17.2*
	Elow							24.7	20.9	17.7	15.0
	Eup							26.4	23.9	21.7	19.6
35	OBS	80.4	87.5	80.3	70.1	64.9	51.1	50.3	42.3	41.1	34.5
	EXP	92.5	86.2	77.5	67.2	60.0	52.0	45.6*	40.0*	35.0*	30.7*
	Elow							44.1	37.4	31.6	26.8
	Eup							47.1	42.7	38.7	35.0
40	OBS	163.9	154.4	153.2	127.9	109.1	91.7	84.4	82.9	75.5	62.4
	EXP	173.8	155.6	145.4	121.6	106.7	96.0	83.2*	72.9*	63.9*	56.0*
	Elow							80.4	68.1	57.7	48.9
	Eup							85.9	77.9	70.5	63.9
45	OBS	304.2	306.3	295.5	261.3	212.2	173.7	148.1	140.0	131.9	102.5
	EXP	340.5	309.9	278.0	241.8	204.6	180.8	162.7*	140.9*	123.6*	108.3*
	Elow							157.3	131.7	111.6	94.6
	Eup							168.1	150.5	136.4	123.5
50	OBS	595.4	585.1	561.6	485.6	402.0	313.6	265.6	235.9	209.5	172.1
	EXP	657.7	584.8	533.3	445.3	391.7	333.9	295.1*	265.6*	230.0*	201.7*
	Elow							285.3	248.1	207.7	176.1
	Eup							305.0	283.6	253.8	230.0
55	OBS	1242.1	1133.5	1032.9	912.5	733.4	606.0	490.2	403.8	337.0	249.9
	EXP	1260.1	1143.5	1018.7	864.5	730.3	647.2	551.6*	487.6*	438.7*	379.9*
	Elow							533.2	455.6	396.2	331.7
	Eup							570.0	520.7	484.2	433.3
60	OBS	2547.7	2266.9	2029.5	1721.0	1461.8	1185.5	979.3	787.6	611.8	430.1
	EXP	2482.4	2259.8	2054.8	1703.6	1462.6	1244.6	1103.0*	940.1*	831.0*	747.7*
	Elow							1066.2	878.3	750.5	652.8
	Eup							1139.8	1003.9	917.1	852.7
65	OBS	4891.8	4550.2	4132.9	3449.0	2877.2	2438.0	1887.8	1541.9	1214.3	817.3
	EXP	4803.1	4500.7	4105.2	3473.9	2913.8	2520.0	2144.4*	1900.4*	1619.7*	1431.8*
	Elow							2072.8	1775.6	1462.8	1250.0
	Eup							2216.0	2029.4	1787.3	1632.8
70	OBS	9109.2	8414.8	7862.2	6630.4	5681.2	4897.9	3965.9	3124.4	2565.8	1714.7
	EXP	9023.6	8397.0	7883.9	6692.7	5729.4	4840.9	4186.7*	3562.7*	3157.3*	2690.9*
	Elow							4046.9	3328.8	2851.5	2349.1
	Eup							4326.4	3804.5	3484.1	3068.6
75	OBS	15751.2	14656.8	13579.9	11826.2	10411.8	9247.5	7674.8	6269.6	5334.0	3750.3
	EXP	15751.2	14786.2	13786.5	12046.9	10345.6	8921.7	7538.2*	6519.4*	5547.7*	4916.4*
	Elow							7286.5	6091.4	5010.4	4292.1
	Eup							7789.8	6961.9	6122.0	5606.5
30-79	OBS	1944.4	1803.1	1665.0	1423.6	1215.3	1039.3	848.6	693.2	575.6	405.7
	EXP	1945.0	1803.8	1665.0	1421.4	1214.6	1043.6	896.8*	777.2*	675.2*	591.8*
	Elow							866.9	726.2	609.9	516.6
	Eup							926.7	830.0	745.2	674.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	412.0	403.0	388.0	376.0	340.0	341.0	306.0	290.0	233.0	213.0
	EXP	437.0	390.2	376.5	385.2	331.5	285.1	281.0*	258.1*	212.9*	169.7*
	CHI	1.434	0.423	0.350	0.218	0.219	10.976	2.218	3.942	1.898	11.043
35 -	OBS	718.0	721.0	654.0	593.0	636.0	503.0	488.0	461.0	476.0	377.0
	EXP	825.8	710.2	631.1	568.4	588.2	511.7	442.5*	435.9*	405.5*	335.7*
	CHI	14.083	0.163	0.834	1.067	3.893	0.148	4.682	1.449	12.246	5.079
40 -	OBS	1451.0	1359.0	1237.0	1024.0	907.0	888.0	825.0	802.0	821.0	722.0
	EXP	1538.8	1369.6	1174.4	973.4	886.8	929.6	812.5*	705.4*	695.2*	648.1*
	CHI	5.015	0.083	3.342	2.632	0.459	1.866	0.192	13.220	22.764	8.431
45 -	OBS	2556.0	2642.0	2537.0	2066.0	1661.0	1415.0	1415.0	1353.0	1266.0	1104.0
	EXP	2860.7	2673.1	2387.1	1911.7	1601.0	1473.4	1554.3*	1361.7*	1186.2*	1166.6*
	CHI	32.454	0.363	9.411	12.461	2.250	2.313	12.479	0.056	5.365	3.355
50 -	OBS	5248.0	4722.0	4658.0	4024.0	3079.0	2385.0	2117.0	2209.0	1985.0	1619.0
	EXP	5797.6	4719.8	4423.3	3689.6	3000.1	2539.2	2352.1*	2487.3*	2178.8*	1897.5*
	CHI	52.094	0.001	12.455	30.311	2.076	9.369	23.508	31.130	17.233	40.886
55 -	OBS	10155.0	9415.0	7818.0	7135.0	5749.0	4430.0	3591.0	3119.0	3058.0	2292.0
	EXP	10301.6	9497.5	7710.1	6759.4	5724.7	4731.0	4040.4*	3766.1*	3980.7*	3484.1*
	CHI	2.085	0.717	1.510	20.869	0.103	19.148	49.983	111.187	213.886	407.899
60 -	OBS	16952.0	16665.0	15220.0	11810.0	10439.0	8559.0	6681.0	5455.0	4482.0	3723.0
	EXP	16517.6	16613.2	15409.6	11691.1	10445.2	8986.2	7525.2*	6510.8*	6087.8*	6473.2*
	CHI	11.424	0.162	2.333	1.210	0.004	20.313	94.704	171.218	423.588	1168.443
65 -	OBS	23483.0	25291.0	25607.0	22110.0	17018.0	15240.0	12062.0	9496.0	7707.0	5520.0
	EXP	23056.9	25015.7	25435.6	22270.2	17234.3	15752.7	13701.6*	11703.4*	10279.9*	9670.5*
	CHI	7.874	3.030	1.155	1.152	2.716	16.686	196.212	416.358	643.963	1781.382
70 -	OBS	31363.0	30627.0	33330.0	31896.0	28800.0	23297.0	20402.0	16703.0	13640.0	9643.0
	EXP	31068.4	30562.2	33422.0	32195.8	29044.1	23026.2	21537.9*	19045.9*	16784.2*	15132.3*
	CHI	2.794	0.138	0.254	2.791	2.051	3.186	59.907	288.213	589.016	1991.242
75 -	OBS	35348.0	33696.0	32771.0	33804.0	34499.0	33338.0	26715.0	24412.0	22238.0	16240.0
	EXP	35348.0	33993.3	33269.7	34434.8	34279.7	32163.3	26239.3*	25384.6*	23128.8*	21289.6*
	CHI	0.000	2.601	7.474	11.555	1.403	42.905	8.625	37.268	34.311	1197.708
30-79	OBS	127686.0	125541.0	124220.0	114838.0	103128.0	90396.0	74602.0	64300.0	55906.0	41453.0
	EXP	127752.4	125544.8	124239.3	114879.4	103135.5	90398.4	78486.8*	71659.3*	64940.2*	60267.3*
	O/E	0.999	1.000	1.000	1.000	1.000	1.000	0.951	0.897	0.861	0.688

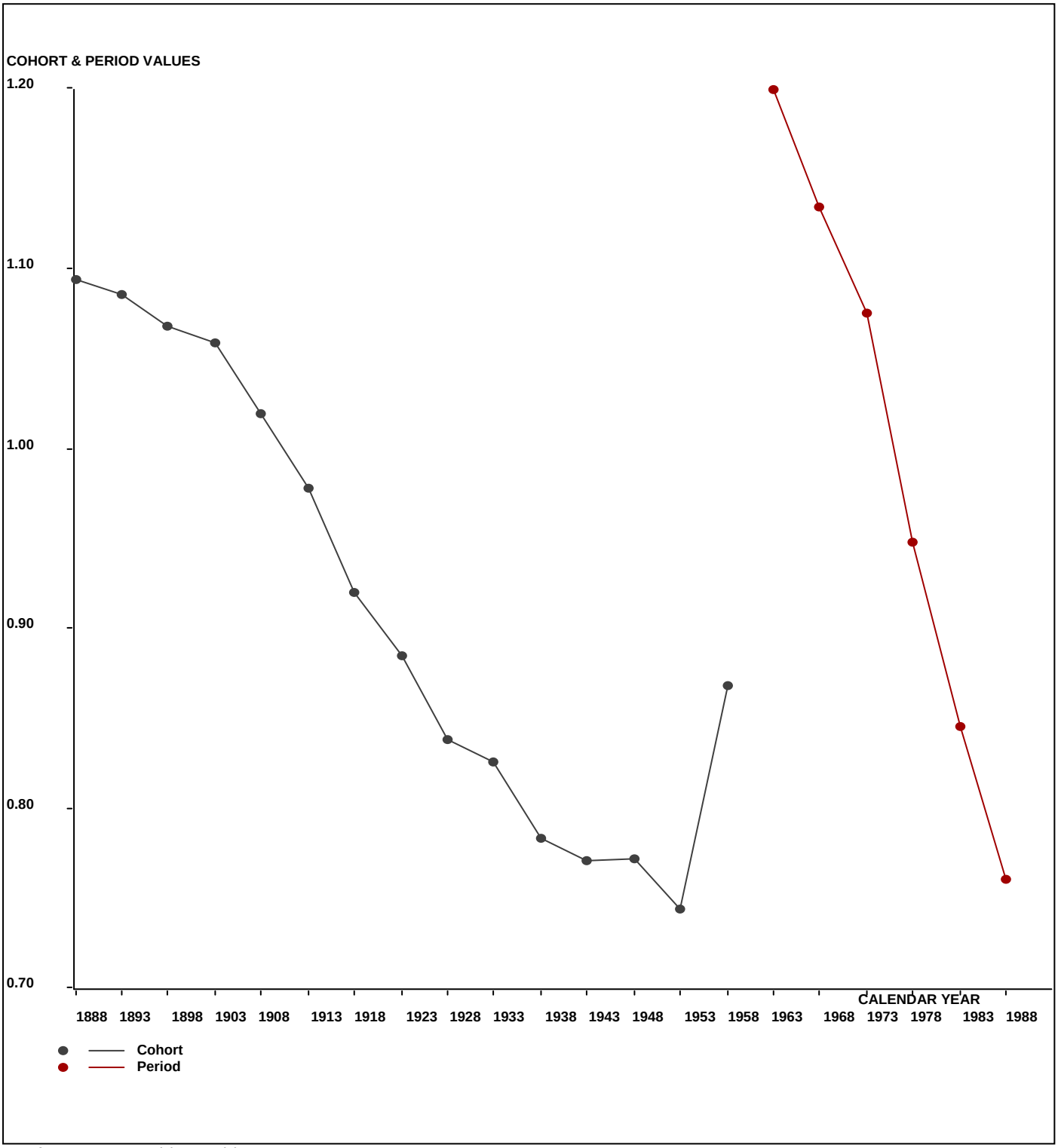
CHI SQUARE (LOG)= 10106.2889 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

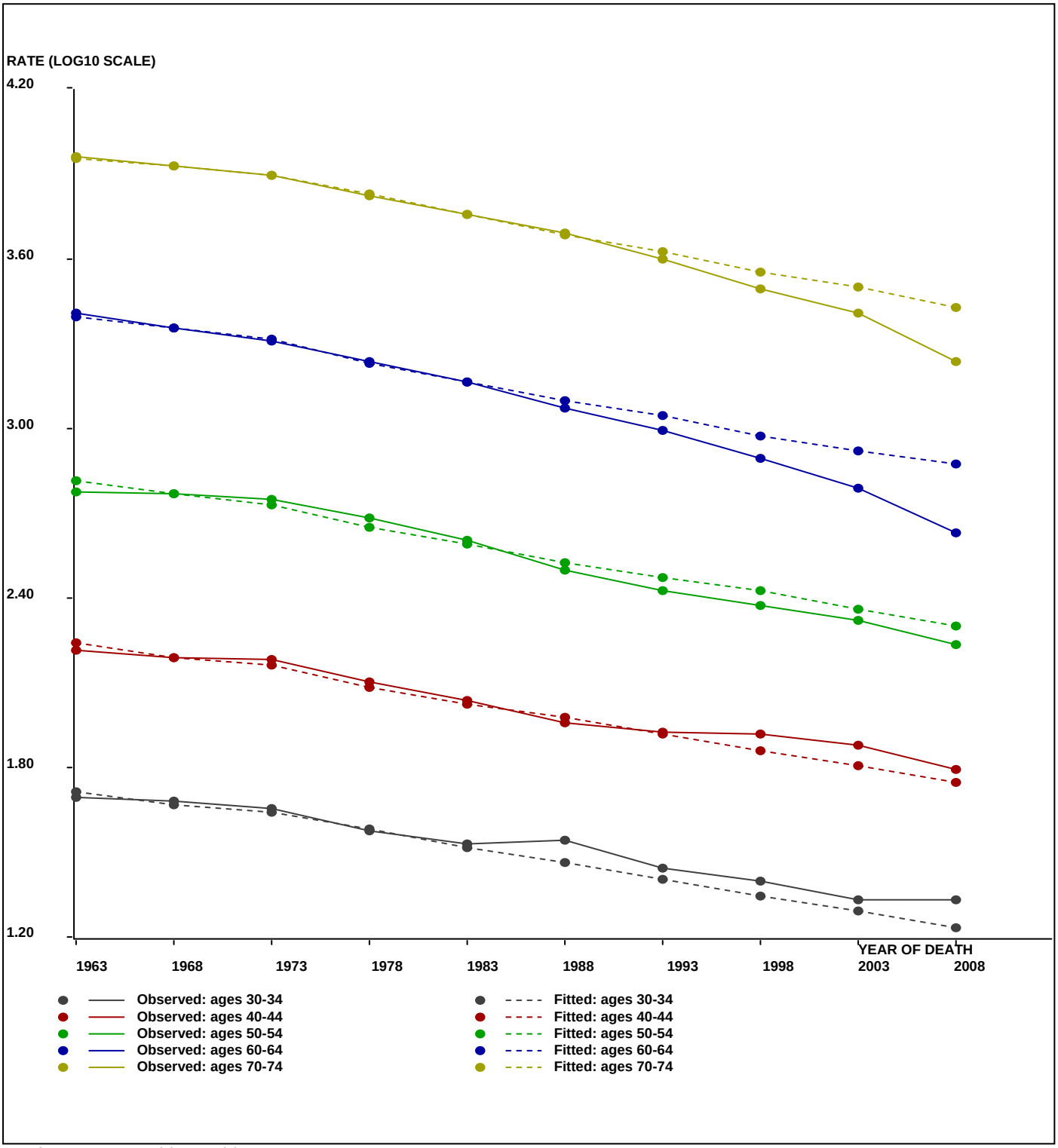


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	27.8	50.3	84.4	148.1	265.6	490.2	979.3	1887.8	3965.9	7674.8
	PRE	25.6	45.6	83.2	162.7	295.1	551.6	1103.0	2144.4	4186.7	7538.2
	RES	2.272	4.691	1.278	-14.579	-29.505	-61.349	-123.738	-256.615	-220.805	136.671
1996-	OBS	25.2	42.3	82.9	140.0	235.9	403.8	787.6	1541.9	3124.4	6269.6
	PRE	22.4	40.0	72.9	140.9	265.6	487.6	940.1	1900.4	3562.7	6519.4
	RES	2.771	2.305	9.984	-0.900	-29.709	-83.781	-152.445	-358.441	-438.258	-249.800
2001-	OBS	21.5	41.1	75.5	131.9	209.5	337.0	611.8	1214.3	2565.8	5334.0
	PRE	19.7	35.0	63.9	123.6	230.0	438.7	831.0	1619.7	3157.3	5547.7
	RES	1.856	6.089	11.568	8.311	-20.452	-101.698	-219.206	-405.377	-591.456	-213.673
2006-	OBS	21.6	34.5	62.4	102.5	172.1	249.9	430.1	817.3	1714.7	3750.3
	PRE	17.2	30.7	56.0	108.3	201.7	379.9	747.7	1431.8	2690.9	4916.4
	RES	4.394	3.778	6.392	-5.809	-29.608	-129.997	-317.683	-614.512	-976.117	-1166.109

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	306.0	488.0	825.0	1415.0	2117.0	3591.0	6681.0	12062.0	20402.0	26715.0
	PRE	281.0	442.5	812.5	1554.3	2352.1	4040.4	7525.2	13701.6	21537.9	26239.3
	CHI	2.218	4.682	0.192	12.479	23.508	49.983	94.704	196.212	59.907	8.625
1996-	OBS	290.0	461.0	802.0	1353.0	2209.0	3119.0	5455.0	9496.0	16703.0	24412.0
	PRE	258.1	435.9	705.4	1361.7	2487.3	3766.1	6510.8	11703.4	19045.9	25384.6
	CHI	3.942	1.449	13.220	0.056	31.130	111.187	171.218	416.358	288.213	37.268
2001-	OBS	233.0	476.0	821.0	1266.0	1985.0	3058.0	4482.0	7707.0	13640.0	22238.0
	PRE	212.9	405.5	695.2	1186.2	2178.8	3980.7	6087.8	10279.9	16784.2	23128.8
	CHI	1.898	12.246	22.764	5.365	17.233	213.886	423.588	643.963	589.016	34.311
2006-	OBS	213.0	377.0	722.0	1104.0	1619.0	2292.0	3723.0	5520.0	9643.0	16240.0
	PRE	169.7	335.7	648.1	1166.6	1897.5	3484.1	6473.2	9670.5	15132.3	21289.6
	CHI	11.043	5.079	8.431	3.355	40.886	407.899	1168.443	1781.382	1991.242	1197.708

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	2768.06	54.28	51	P, C	99.76	14811.11	0.0000
AGE-PERIOD	1992.75	44.28	45	Cohort	99.67	10648.75	0.0000
AGE-COHORT	20.45	0.57	36	Period	68.15	108.44	0.0000
PERIOD-COHORT	390.77	9.77	40	Age	98.33	2078.84	0.0000
FULL AGE-PERIOD-COHORT	6.51	0.20	32			34.54	0.3473

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.665656	46.308046
35	2.045924	111.153669
40	2.410009	257.044728
45	2.766323	583.878735
50	3.063226	1156.715162
55	3.312176	2051.993502
60	3.514657	3270.825861
65	3.661433	4585.991549
70	3.770098	5889.762658
75	3.834245	6827.234866

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.001127	0.997409
1966	0.002790	1.006446
1971	0.004229	1.009785
1976	0.004621	1.010697
1981	-0.000724	0.998335
1986	-0.011536	0.973786

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.187876	0.648820
1891	-0.073828	0.843669
1896	0.017194	1.040386
1901	0.058229	1.143480
1906	0.050050	1.122147
1911	0.027857	1.066246
1916	-0.001572	0.996386
1921	-0.023313	0.947734
1926	-0.079366	0.832979
1931	-0.165473	0.683167
1936	-0.267801	0.539758
1941	-0.320364	0.478229
1946	-0.389965	0.407413
1951	-0.518950	0.302726
1956	-0.730160	0.186140

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	282.0	211.0	197.0	175.0	126.0	82.0
	EXP	263.0	208.7	192.1	189.8	139.4	82.0
	CHI	1.4	0.0	0.1	1.1	1.3	0.0
35 -	OBS	835.0	637.0	484.0	456.0	419.0	335.0
	EXP	824.7	629.4	493.4	454.3	442.8	322.5
	CHI	0.1	0.1	0.2	0.0	1.3	0.5
40 -	OBS	2083.0	1931.0	1458.0	1121.0	990.0	1024.0
	EXP	2151.5	1896.6	1432.1	1122.4	1019.8	987.3
	CHI	2.2	0.6	0.5	0.0	0.9	1.4
45 -	OBS	4762.0	4799.0	4276.0	3168.0	2516.0	2238.0
	EXP	4875.1	4804.3	4216.7	3187.6	2462.4	2215.4
	CHI	2.6	0.0	0.8	0.1	1.2	0.2
50 -	OBS	10857.0	9277.0	9212.0	8178.0	6019.0	4578.0
	EXP	10843.2	9361.9	9182.3	8069.1	6041.9	4624.0
	CHI	0.0	0.8	0.1	1.5	0.1	0.5
55 -	OBS	18834.0	18343.0	15661.0	15328.0	13282.0	9968.0
	EXP	18776.3	18289.9	15626.5	15368.2	13376.6	9979.1
	CHI	0.2	0.2	0.1	0.1	0.7	0.0
60 -	OBS	24725.0	27135.0	26476.0	22728.0	22148.0	19035.0
	EXP	24821.6	27156.4	26410.4	22603.9	22100.3	19155.5
	CHI	0.4	0.0	0.2	0.7	0.1	0.8
65 -	OBS	23102.0	29401.0	32092.0	31605.0	26803.0	26492.0
	EXP	22844.6	29334.8	32197.3	31682.0	26982.0	26456.7
	CHI	2.9	0.1	0.3	0.2	1.2	0.0
70 -	OBS	16979.0	22308.0	28845.0	32035.0	31873.0	27397.0
	EXP	17064.1	22446.1	28830.2	32134.2	31782.0	27182.1
	CHI	0.4	0.8	0.0	0.3	0.3	1.7
75 -	OBS	9915.0	13412.0	17187.0	22569.0	25510.0	25408.0
	EXP	9915.0	13327.4	17308.6	22553.7	25342.7	25555.3
	CHI	0.0	0.5	0.9	0.0	1.1	0.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	130004.31	3250.11	40	P, C	98.96	0.0000
AGE-PERIOD	20803.28	520.08	40	Cohort	93.52	0.0000
AGE-COHORT	2350.07	58.75	40	Period	42.65	0.0000
PERIOD-COHORT	4327.36	108.18	40	Age	68.85	0.0000
FULL AGE-PERIOD-COHORT	1347.78	33.69	40			0.0000

AGE	EFFECT
30	46.308046
35	111.153669
40	257.044728
45	583.878735
50	1156.715162
55	2051.993502
60	3270.825861
65	4585.991549
70	5889.762658
75	6827.234866

PERIOD	EFFECT	LOWER	UPPER
% Period Change	97.5411	94.5411	100.5411
1961	0.997409		
1966	1.006446		
1971	1.009785		
1976	1.010697		
1981	0.998335		
1986	0.973786		
1991	0.949842	0.920628	0.979055
1996	0.926486	0.870372	0.984353
2001	0.903704	0.822859	0.989679
2006	0.881483	0.777939	0.995033

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.648820	1.000000	
1891	0.843669	2.000000	
1896	1.040386	4.000000	
1901	1.143480	8.000000	
1906	1.122147	16.000000	
1911	1.066246	32.000000	
1916	0.996386	64.000000	
1921	0.947734	128.000000	
1926	0.832979	256.000000	
1931	0.683167	512.000000	
1936	0.539758	1024.000000	
1941	0.478229	2048.000000	
1946	0.407413	4096.000000	
1951	0.302726	8192.000000	
1956	0.259299	EXTRAPOLATION	0.186140
1961	0.214188	EXTRAPOLATION	
1966	0.176926	EXTRAPOLATION	
1971	0.146146	EXTRAPOLATION	
1976	0.120720	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	33.8	25.4	22.9	17.6	12.6	8.4	7.7	5.5	4.7	4.7
	EXP	31.6	25.2	22.4	19.1	14.0	11.7	9.4*	7.6*	6.1*	4.9*
	Elow							9.1	7.1	5.6	4.3
	Eup							9.7	8.1	6.7	5.6
35	OBS	93.5	77.3	59.4	53.9	42.8	34.0	27.5	19.0	15.2	15.2
	EXP	92.3	76.4	60.6	53.7	45.2	32.8	27.4*	22.1*	17.8*	14.3*
	Elow							26.5	20.7	16.2	12.6
	Eup							28.2	23.4	19.5	16.2
40	OBS	235.2	219.4	180.5	140.1	119.1	105.8	86.5	68.0	52.0	50.0
	EXP	243.0	215.5	177.3	140.2	122.7	102.0	73.9*	61.8*	49.8*	40.1*
	Elow							71.6	58.0	45.3	35.4
	Eup							76.2	65.6	54.5	45.3
45	OBS	566.8	556.3	498.0	400.7	321.5	274.7	232.1	180.1	152.5	119.2
	EXP	580.3	556.9	491.1	403.2	314.6	271.9	225.9*	163.8*	136.8*	110.2*
	Elow							219.0	153.8	124.6	97.3
	Eup							232.9	174.0	149.8	124.4
50	OBS	1231.7	1149.4	1110.6	987.0	785.9	601.9	556.7	432.3	365.4	315.9
	EXP	1230.1	1160.0	1107.0	973.8	788.9	608.0	525.4*	436.6*	316.4*	264.4*
	Elow							509.3	410.2	288.1	233.3
	Eup							541.6	463.9	346.6	298.4
55	OBS	2303.7	2208.4	2069.1	1960.4	1694.4	1363.6	1082.3	917.3	756.4	683.2
	EXP	2296.7	2202.0	2064.6	1965.5	1706.4	1365.1	1052.0*	909.2*	755.5*	547.6*
	Elow							1019.7	854.1	687.9	483.2
	Eup							1084.4	966.0	827.4	618.1
60	OBS	3715.9	3691.1	3530.4	3312.0	3101.4	2636.4	2085.5	1615.8	1458.4	1257.0
	EXP	3730.4	3694.0	3521.6	3293.9	3094.7	2653.1	2122.4*	1635.7*	1413.6*	1174.6*
	Elow							2057.2	1536.6	1287.1	1036.7
	Eup							2187.7	1737.8	1548.1	1326.0
65	OBS	4812.5	5289.7	5179.5	4930.1	4531.6	4238.0	3606.7	2800.4	2289.3	2107.7
	EXP	4758.8	5277.8	5196.5	4942.1	4561.8	4232.4	3628.4*	2902.7*	2237.0*	1933.2*
	Elow							3516.8	2726.9	2036.8	1706.1
	Eup							3740.0	3084.0	2449.8	2182.3
70	OBS	4931.4	6129.2	6804.2	6659.3	6287.4	5759.8	5186.6	4236.4	3450.1	2999.7
	EXP	4956.1	6167.1	6800.7	6679.9	6269.5	5714.6	5301.9*	4545.4*	3636.2*	2802.3*
	Elow							5138.9	4270.1	3310.9	2473.1
	Eup							5465.0	4829.3	3982.2	3163.3
75	OBS	4418.2	5833.8	7122.1	7895.7	7698.9	7047.8	6231.2	5580.5	4772.5	4256.7
	EXP	4418.2	5797.1	7172.5	7890.3	7648.4	7088.7	6461.4*	5994.7*	5139.3*	4111.4*
	Elow							6262.6	5631.7	4679.6	3628.4
	Eup							6660.1	6369.2	5628.2	4641.0
30-79	OBS	1643.8	1765.7	1791.7	1727.4	1582.4	1397.5	1195.3	974.4	818.4	724.8
	EXP	1643.9	1765.9	1791.6	1726.9	1583.0	1398.0	1205.5*	1012.9*	825.9*	664.7*
	Elow							1168.4	951.6	752.0	586.6
	Eup							1242.6	1076.2	904.5	750.3

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	282.0	211.0	197.0	175.0	126.0	82.0	85.0	63.0	51.0	46.0
	EXP	263.0	208.7	192.1	189.8	139.4	114.2	103.5*	87.4*	66.3*	48.5*
	CHI	1.373	0.025	0.125	1.149	1.296	9.093	3.312	6.805	3.513	0.134
35 -	OBS	835.0	637.0	484.0	456.0	419.0	335.0	267.0	207.0	176.0	166.0
	EXP	824.7	629.4	493.4	454.3	442.8	322.5	265.6*	240.5*	205.7*	156.5*
	CHI	0.128	0.091	0.177	0.007	1.284	0.487	0.007	4.668	4.284	0.575
40 -	OBS	2083.0	1931.0	1458.0	1121.0	990.0	1024.0	845.0	658.0	565.0	578.0
	EXP	2151.5	1896.6	1432.1	1122.4	1019.8	987.3	722.2*	597.3*	541.1*	463.6*
	CHI	2.182	0.623	0.468	0.002	0.872	1.364	20.879	6.173	1.060	28.214
45 -	OBS	4762.0	4799.0	4276.0	3168.0	2516.0	2238.0	2217.0	1741.0	1464.0	1284.0
	EXP	4875.1	4804.3	4216.7	3187.6	2462.4	2215.4	2158.4*	1582.6*	1313.3*	1187.2*
	CHI	2.624	0.006	0.834	0.120	1.165	0.230	1.594	15.849	17.298	7.901
50 -	OBS	10857.0	9277.0	9212.0	8178.0	6019.0	4578.0	4437.0	4049.0	3462.0	2972.0
	EXP	10843.2	9361.9	9182.3	8069.1	6041.9	4624.0	4187.5*	4089.4*	2998.1*	2487.3*
	CHI	0.018	0.771	0.096	1.471	0.087	0.458	14.868	0.399	71.777	94.471
55 -	OBS	18834.0	18343.0	15661.0	15328.0	13282.0	9968.0	7928.0	7085.0	6863.0	6265.0
	EXP	18776.3	18289.9	15626.5	15368.2	13376.6	9979.1	7706.2*	7022.3*	6854.9*	5021.5*
	CHI	0.177	0.154	0.076	0.105	0.669	0.012	6.385	0.560	0.010	307.961
60 -	OBS	24725.0	27135.0	26476.0	22728.0	22148.0	19035.0	14228.0	11191.0	10684.0	10882.0
	EXP	24821.6	27156.4	26410.4	22603.9	22100.3	19155.5	14480.3*	11328.5*	10355.5*	10168.9*
	CHI	0.376	0.017	0.163	0.681	0.103	0.758	4.395	1.669	10.421	50.004
65 -	OBS	23102.0	29401.0	32092.0	31605.0	26803.0	26492.0	23045.0	17246.0	14530.0	14236.0
	EXP	22844.6	29334.8	32197.3	31682.0	26982.0	26456.7	23183.9*	17876.0*	14197.9*	13057.4*
	CHI	2.901	0.149	0.344	0.187	1.187	0.047	0.832	22.205	7.768	106.388
70 -	OBS	16979.0	22308.0	28845.0	32035.0	31873.0	27397.0	26682.0	22648.0	18341.0	16869.0
	EXP	17064.1	22446.1	28830.2	32134.2	31782.0	27182.1	27275.2*	24299.6*	19330.5*	15758.8*
	CHI	0.424	0.850	0.008	0.306	0.261	1.698	12.903	112.259	50.648	78.217
75 -	OBS	9915.0	13412.0	17187.0	22569.0	25510.0	25408.0	21690.0	21729.0	19897.0	18433.0
	EXP	9915.0	13327.4	17308.6	22553.7	25342.7	25555.3	22491.1*	23341.7*	21426.3*	17803.5*
	CHI	0.000	0.537	0.855	0.010	1.104	0.849	28.534	111.427	109.157	22.257
30-79	OBS	112374.0	127454.0	135888.0	137363.0	129686.0	116557.0	101424.0	86617.0	76033.0	71731.0
	EXP	112379.1	127455.6	135889.6	137365.0	129690.0	116592.2	102573.9*	90465.4*	77289.4*	66153.1*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.989	0.957	0.984	1.084

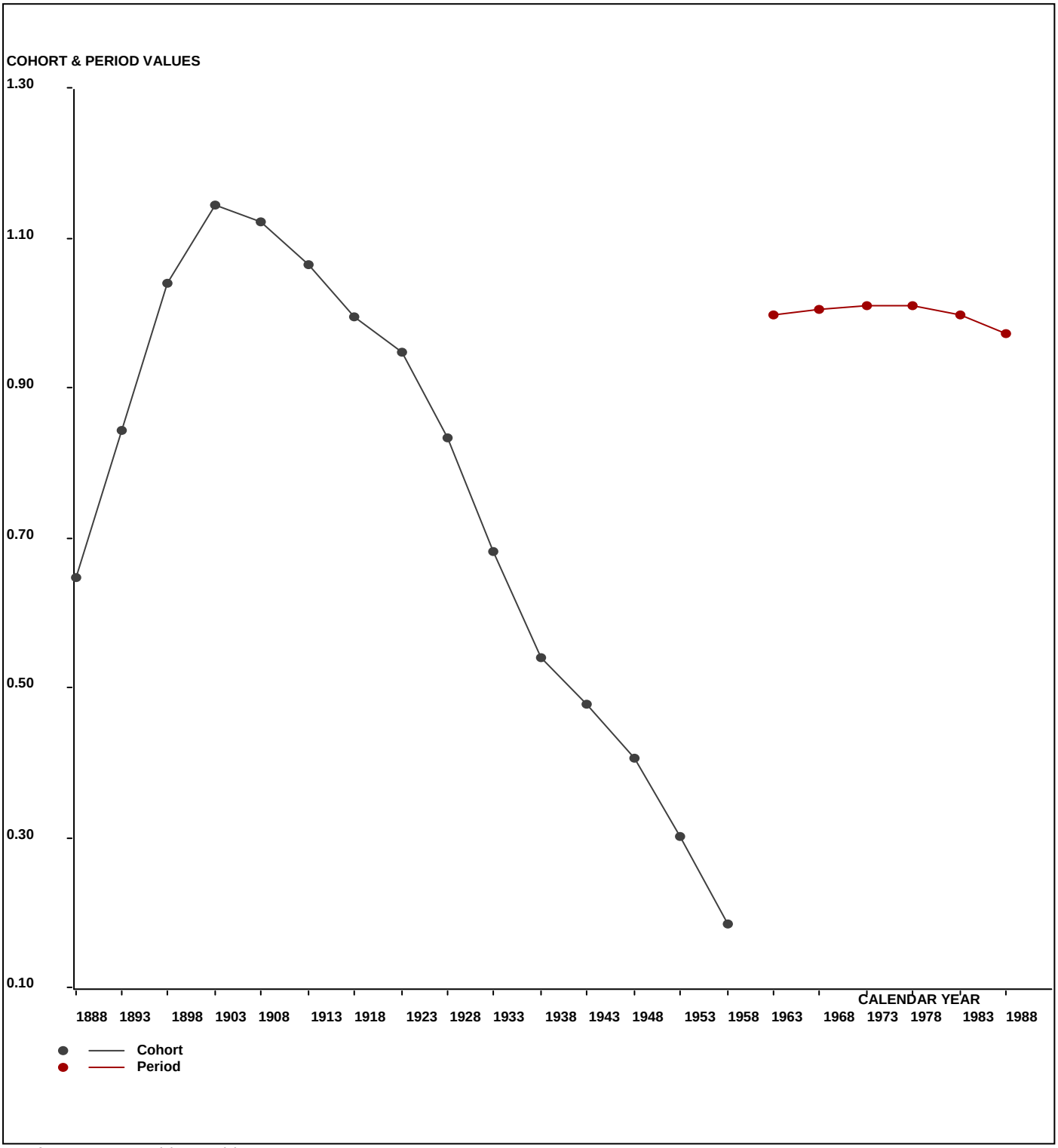
CHI SQUARE (LOG)= 1347.7791 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

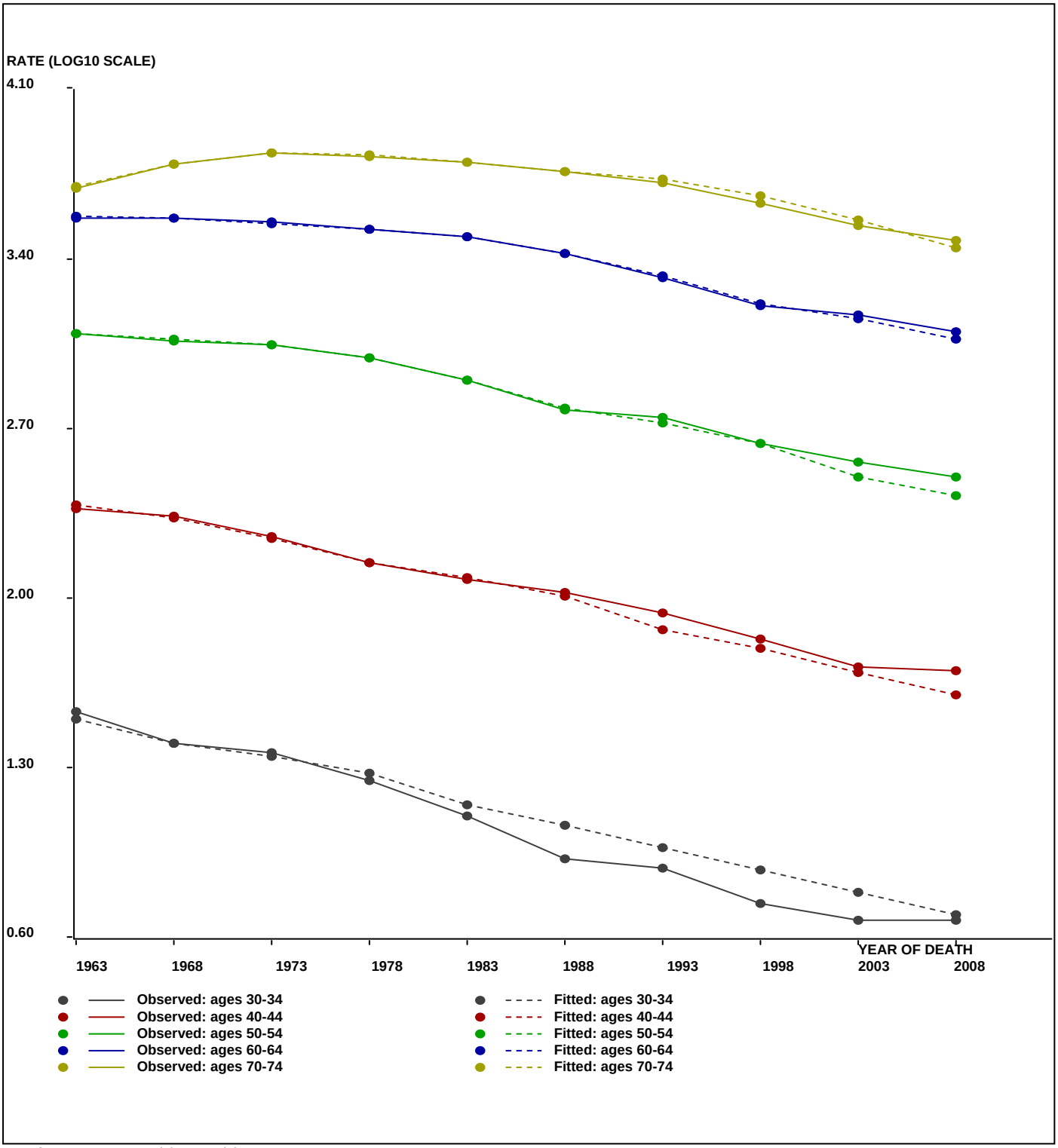


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	7.7	27.5	86.5	232.1	556.7	1082.3	2085.5	3606.7	5186.6	6231.2
	PRE	9.4	27.4	73.9	225.9	525.4	1052.0	2122.4	3628.4	5301.9	6461.4
	RES	-1.685	0.142	12.567	6.140	31.309	30.281	-36.978	-21.738	-115.319	-230.144
1996-	OBS	5.5	19.0	68.0	180.1	432.3	917.3	1615.8	2800.4	4236.4	5580.5
	PRE	7.6	22.1	61.8	163.8	436.6	909.2	1635.7	2902.7	4545.4	5994.7
	RES	-2.118	-3.073	6.278	16.388	-4.312	8.119	-19.855	-102.304	-308.945	-414.190
2001-	OBS	4.7	15.2	52.0	152.5	365.4	756.4	1458.4	2289.3	3450.1	4772.5
	PRE	6.1	17.8	49.8	136.8	316.4	755.5	1413.6	2237.0	3636.2	5139.3
	RES	-1.408	-2.565	2.202	15.702	48.963	0.898	44.842	52.323	-186.127	-366.824
2006-	OBS	4.7	15.2	50.0	119.2	315.9	683.2	1257.0	2107.7	2999.7	4256.7
	PRE	4.9	14.3	40.1	110.2	264.4	547.6	1174.6	1933.2	2802.3	4111.4
	RES	-0.259	0.868	9.889	8.993	51.526	135.604	82.370	174.503	197.424	145.366

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	85.0	267.0	845.0	2217.0	4437.0	7928.0	14228.0	23045.0	26682.0	21690.0
	PRE	103.5	265.6	722.2	2158.4	4187.5	7706.2	14480.3	23183.9	27275.2	22491.1
	CHI	3.312	0.007	20.879	1.594	14.868	6.385	4.395	0.832	12.903	28.534
1996-	OBS	63.0	207.0	658.0	1741.0	4049.0	7085.0	11191.0	17246.0	22648.0	21729.0
	PRE	87.4	240.5	597.3	1582.6	4089.4	7022.3	11328.5	17876.0	24299.6	23341.7
	CHI	6.805	4.668	6.173	15.849	0.399	0.560	1.669	22.205	112.259	111.427
2001-	OBS	51.0	176.0	565.0	1464.0	3462.0	6863.0	10684.0	14530.0	18341.0	19897.0
	PRE	66.3	205.7	541.1	1313.3	2998.1	6854.9	10355.5	14197.9	19330.5	21426.3
	CHI	3.513	4.284	1.060	17.298	71.777	0.010	10.421	7.768	50.648	109.157
2006-	OBS	46.0	166.0	578.0	1284.0	2972.0	6265.0	10882.0	14236.0	16869.0	18433.0
	PRE	48.5	156.5	463.6	1187.2	2487.3	5021.5	10168.9	13057.4	15758.8	17803.5
	CHI	0.134	0.575	28.214	7.901	94.471	307.961	50.004	106.388	78.217	22.257

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	9390.62	184.13	51	P, C	99.24	50777.22	0.0000
AGE-PERIOD	1300.92	28.91	45	Cohort	94.51	6924.65	0.0000
AGE-COHORT	371.99	10.33	36	Period	80.79	1974.02	0.0000
PERIOD-COHORT	453.58	11.34	40	Age	84.25	2415.72	0.0000
FULL AGE-PERIOD-COHORT	71.46	2.23	32			379.98	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.673334	47.133978
35	1.858742	72.234033
40	2.099364	125.708362
45	2.407463	255.542601
50	2.721821	527.013163
55	3.023708	1056.106308
60	3.302400	2006.317986
65	3.527049	3365.495834
70	3.737932	5469.307387
75	3.924788	8409.842487

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.115790	1.305539
1966	0.077084	1.194219
1971	-0.005018	0.988512
1976	-0.077738	0.836107
1981	-0.109058	0.777932
1986	-0.096791	0.800220

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.056712	0.877583
1891	-0.001722	0.996043
1896	0.056238	1.138251
1901	0.077557	1.195521
1906	0.039366	1.094879
1911	-0.012222	0.972251
1916	-0.050171	0.890901
1921	-0.102900	0.789041
1926	-0.177859	0.663959
1931	-0.271436	0.535259
1936	-0.349061	0.447650
1941	-0.412111	0.387158
1946	-0.456676	0.349401
1951	-0.446890	0.357363
1956	-0.420269	0.379954

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	198.0	202.0	177.0	165.0	147.0	140.0
	EXP	274.5	209.0	155.0	137.0	130.6	140.0
	CHI	21.3	0.2	3.1	5.7	2.1	0.0
35 -	OBS	399.0	402.0	341.0	241.0	182.0	185.0
	EXP	559.2	380.3	260.3	197.7	192.3	203.3
	CHI	45.9	1.2	25.0	9.5	0.6	1.6
40 -	OBS	977.0	867.0	618.0	445.0	340.0	319.0
	EXP	1146.6	877.3	537.2	376.6	314.6	340.3
	CHI	25.1	0.1	12.2	12.4	2.0	1.3
45 -	OBS	2290.0	2072.0	1558.0	1047.0	721.0	538.0
	EXP	2497.1	2077.2	1440.0	904.2	696.5	645.1
	CHI	17.2	0.0	9.7	22.5	0.9	17.8
50 -	OBS	5685.0	4563.0	3617.0	2573.0	1668.0	1237.0
	EXP	5896.4	4525.4	3409.7	2424.2	1680.6	1435.8
	CHI	7.6	0.3	12.6	9.1	0.1	27.5
55 -	OBS	12232.0	10254.0	7180.0	5436.0	4370.0	3116.0
	EXP	12341.7	10184.9	7039.6	5447.6	4276.1	3306.8
	CHI	1.0	0.5	2.8	0.0	2.1	11.0
60 -	OBS	21127.0	19496.0	14432.0	10192.0	8606.0	7467.0
	EXP	20836.1	19285.2	14460.8	10255.8	8794.7	7696.4
	CHI	4.1	2.3	0.1	0.4	4.0	6.8
65 -	OBS	24270.0	27009.0	22238.0	17424.0	13522.0	13429.0
	EXP	24008.2	26706.8	22568.6	17538.4	13796.1	13283.5
	CHI	2.9	3.4	4.8	0.7	5.4	1.6
70 -	OBS	24800.0	26749.0	27030.0	24044.0	21020.0	18897.0
	EXP	24487.3	27059.0	27400.9	24085.7	20970.2	18546.6
	CHI	4.0	3.6	5.0	0.1	0.1	6.6
75 -	OBS	21623.0	22681.0	22880.0	23799.0	24000.0	23818.0
	EXP	21623.0	22997.9	22835.0	24028.6	23734.4	23587.9
	CHI	0.0	4.4	0.1	2.2	3.0	2.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	169082.70	4227.07	40	P, C	97.03	0.0000
AGE-PERIOD	18286.73	457.17	40	Cohort	72.53	0.0000
AGE-COHORT	16848.99	421.22	40	Period	70.18	0.0000
PERIOD-COHORT	20669.04	516.73	40	Age	75.69	0.0000
FULL AGE-PERIOD-COHORT	5023.73	125.59	40			0.0000

AGE	EFFECT
30	47.133978
35	72.234033
40	125.708362
45	255.542601
50	527.013163
55	1056.106308
60	2006.317986
65	3365.495834
70	5469.307387
75	8409.842487

PERIOD	EFFECT	LOWER	UPPER
% Period Change	102.8650	99.8650	105.8650
1961	1.305539		
1966	1.194219		
1971	0.988512		
1976	0.836107		
1981	0.777932		
1986	0.800220		
1991	0.823146	0.799140	0.847153
1996	0.846729	0.798061	0.896838
2001	0.870988	0.796983	0.949438
2006	0.895941	0.795907	1.005122

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.877583	1.000000	
1891	0.996043	2.000000	
1896	1.138251	4.000000	
1901	1.195521	8.000000	
1906	1.094879	16.000000	
1911	0.972251	32.000000	
1916	0.890901	64.000000	
1921	0.789041	128.000000	
1926	0.663959	256.000000	
1931	0.535259	512.000000	
1936	0.447650	1024.000000	
1941	0.387158	2048.000000	
1946	0.349401	4096.000000	
1951	0.357363	8192.000000	
1956	0.308737	EXTRAPOLATION	0.379954
1961	0.279221	EXTRAPOLATION	
1966	0.252527	EXTRAPOLATION	
1971	0.228385	EXTRAPOLATION	
1976	0.206551	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	23.8	24.3	20.6	16.6	14.8	14.3	10.8	8.2	7.2	3.9
	EXP	32.9	25.2	18.0	13.8	13.1	11.6	10.8*	10.1*	9.4*	8.7*
	Elow							10.5	9.5	8.6	7.7
	Eup							11.1	10.7	10.2	9.8
35	OBS	44.7	48.8	41.9	28.5	18.6	18.8	14.1	11.4	11.9	9.1
	EXP	62.6	46.2	32.0	23.4	19.6	20.7	18.4*	17.1*	15.9*	14.8*
	Elow							17.8	16.1	14.5	13.1
	Eup							18.9	18.1	17.3	16.6
40	OBS	110.3	98.5	76.5	55.6	40.9	32.9	20.9	19.6	19.3	17.5
	EXP	129.5	99.7	66.5	47.1	37.9	35.1	37.0*	32.9*	30.6*	28.4*
	Elow							35.9	31.0	28.0	25.3
	Eup							38.1	34.8	33.3	31.9
45	OBS	272.6	240.2	181.5	132.4	92.1	66.0	51.5	45.2	43.0	36.0
	EXP	297.2	240.8	167.7	114.4	89.0	79.2	73.5*	77.3*	68.7*	63.9*
	Elow							71.4	72.9	62.9	56.8
	Eup							75.6	81.9	74.9	71.7
50	OBS	645.0	565.4	436.1	310.5	217.8	162.6	135.6	113.4	105.9	95.2
	EXP	668.9	560.7	411.1	292.6	219.4	188.8	168.0*	155.9*	164.0*	145.8*
	Elow							163.1	147.0	150.1	129.5
	Eup							172.9	165.1	178.8	163.5
55	OBS	1496.2	1234.5	948.6	695.2	557.5	426.3	315.2	287.3	250.5	239.8
	EXP	1509.6	1226.2	930.1	696.7	545.5	452.4	389.2*	346.2*	321.4*	338.1*
	Elow							377.8	326.3	294.1	300.4
	Eup							400.5	366.7	350.3	379.3
60	OBS	3175.2	2652.0	1924.4	1485.2	1205.1	1034.2	809.2	665.2	569.9	493.1
	EXP	3131.5	2623.3	1928.2	1494.5	1231.5	1066.0	884.0*	760.5*	676.6*	628.1*
	Elow							858.2	716.8	619.1	557.9
	Eup							909.8	805.5	737.5	704.6
65	OBS	5055.8	4859.3	3589.1	2718.0	2286.1	2148.3	1756.3	1396.3	1115.8	986.6
	EXP	5001.2	4805.0	3642.5	2735.8	2332.5	2125.0	1839.4*	1525.3*	1312.2*	1167.4*
	Elow							1785.7	1437.6	1200.7	1037.1
	Eup							1893.0	1615.6	1430.4	1309.7
70	OBS	7203.0	7349.4	6376.1	4998.1	4146.5	3972.8	3382.5	2867.9	2221.0	1794.2
	EXP	7112.1	7434.5	6463.6	5006.8	4136.7	3899.2	3552.3*	3074.8*	2549.8*	2193.6*
	Elow							3448.7	2898.1	2333.2	1948.6
	Eup							3655.9	3256.8	2779.5	2460.9
75	OBS	9635.3	9865.6	9481.2	8326.0	7243.2	6606.8	5730.2	4964.4	4103.5	3302.5
	EXP	9635.3	10003.5	9462.5	8406.3	7163.0	6543.0	6167.3*	5618.7*	4863.4*	4033.0*
	Elow							5987.4	5295.7	4450.2	3582.7
	Eup							6347.2	5951.2	5301.5	4524.5
30-79	OBS	1702.4	1613.2	1328.3	1053.1	875.1	791.2	658.2	555.5	454.5	381.3
	EXP	1703.0	1614.8	1326.8	1052.1	875.5	794.1	713.8*	627.2*	544.7*	478.5*
	Elow							692.9	591.1	498.4	425.1
	Eup							734.6	664.3	593.7	536.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	198.0	202.0	177.0	165.0	147.0	140.0	119.0	94.0	78.0	38.0
	EXP	274.5	209.0	155.0	137.0	130.6	113.8	119.0*	116.0*	101.6*	85.9*
	CHI	21.330	0.238	3.137	5.707	2.071	6.053	0.000	4.180	5.470	26.737
35 -	OBS	399.0	402.0	341.0	241.0	182.0	185.0	137.0	124.0	138.0	99.0
	EXP	559.2	380.3	260.3	197.7	192.3	203.3	178.1*	186.2*	183.9*	161.6*
	CHI	45.888	1.241	25.022	9.482	0.554	1.645	9.489	20.783	11.445	24.220
40 -	OBS	977.0	867.0	618.0	445.0	340.0	319.0	204.0	190.0	210.0	202.0
	EXP	1146.6	877.3	537.2	376.6	314.6	340.3	361.3*	317.9*	332.5*	328.9*
	CHI	25.099	0.120	12.159	12.423	2.046	1.331	68.503	51.428	45.106	48.983
45 -	OBS	2290.0	2072.0	1558.0	1047.0	721.0	538.0	492.0	437.0	413.0	388.0
	EXP	2497.1	2077.2	1440.0	904.2	696.5	645.1	702.1*	747.3*	659.6*	688.4*
	CHI	17.181	0.013	9.664	22.543	0.863	17.769	62.854	128.833	92.185	131.112
50 -	OBS	5685.0	4563.0	3617.0	2573.0	1668.0	1237.0	1081.0	1062.0	1003.0	896.0
	EXP	5896.4	4525.4	3409.7	2424.2	1680.6	1435.8	1338.5*	1460.3*	1554.1*	1371.4*
	CHI	7.582	0.313	12.607	9.135	0.095	27.532	49.546	108.646	195.446	164.807
55 -	OBS	12232.0	10254.0	7180.0	5436.0	4370.0	3116.0	2309.0	2219.0	2273.0	2199.0
	EXP	12341.7	10184.9	7039.6	5447.6	4276.1	3306.8	2850.6*	2674.0*	2916.1*	3100.9*
	CHI	0.975	0.468	2.801	0.025	2.061	11.006	102.902	77.437	141.830	262.316
60 -	OBS	21127.0	19496.0	14432.0	10192.0	8606.0	7467.0	5521.0	4607.0	4175.0	4269.0
	EXP	20836.1	19285.2	14460.8	10255.8	8794.7	7696.4	6030.9*	5267.0*	4956.2*	5437.2*
	CHI	4.061	2.305	0.057	0.396	4.047	6.839	43.112	82.696	123.144	250.974
65 -	OBS	24270.0	27009.0	22238.0	17424.0	13522.0	13429.0	11222.0	8599.0	7082.0	6664.0
	EXP	24008.2	26706.8	22568.6	17538.4	13796.1	13283.5	11752.6*	9393.6*	8328.5*	7884.8*
	CHI	2.856	3.421	4.843	0.746	5.446	1.595	23.958	67.208	186.555	189.015
70 -	OBS	24800.0	26749.0	27030.0	24044.0	21020.0	18897.0	17401.0	15332.0	11807.0	10090.0
	EXP	24487.3	27059.0	27400.9	24085.7	20970.2	18546.6	18274.4*	16437.9*	13555.0*	12335.7*
	CHI	3.994	3.552	5.019	0.072	0.118	6.619	41.739	74.405	225.420	408.816
75 -	OBS	21623.0	22681.0	22880.0	23799.0	24000.0	23818.0	19946.0	19330.0	17108.0	14301.0
	EXP	21623.0	22997.9	22835.0	24028.6	23734.4	23587.9	21467.5*	21877.4*	20276.1*	17464.3*
	CHI	0.000	4.368	0.089	2.195	2.972	2.244	107.831	296.613	495.001	572.980
30-79	OBS	113601.0	114295.0	100071.0	85366.0	74576.0	69146.0	58432.0	51994.0	44287.0	39146.0
	EXP	113670.2	114303.0	100107.0	85395.9	74586.1	69159.4	63075.0*	58477.6*	52863.5*	48859.1*
	O/E	0.999	1.000	1.000	1.000	1.000	1.000	0.926	0.889	0.838	0.801

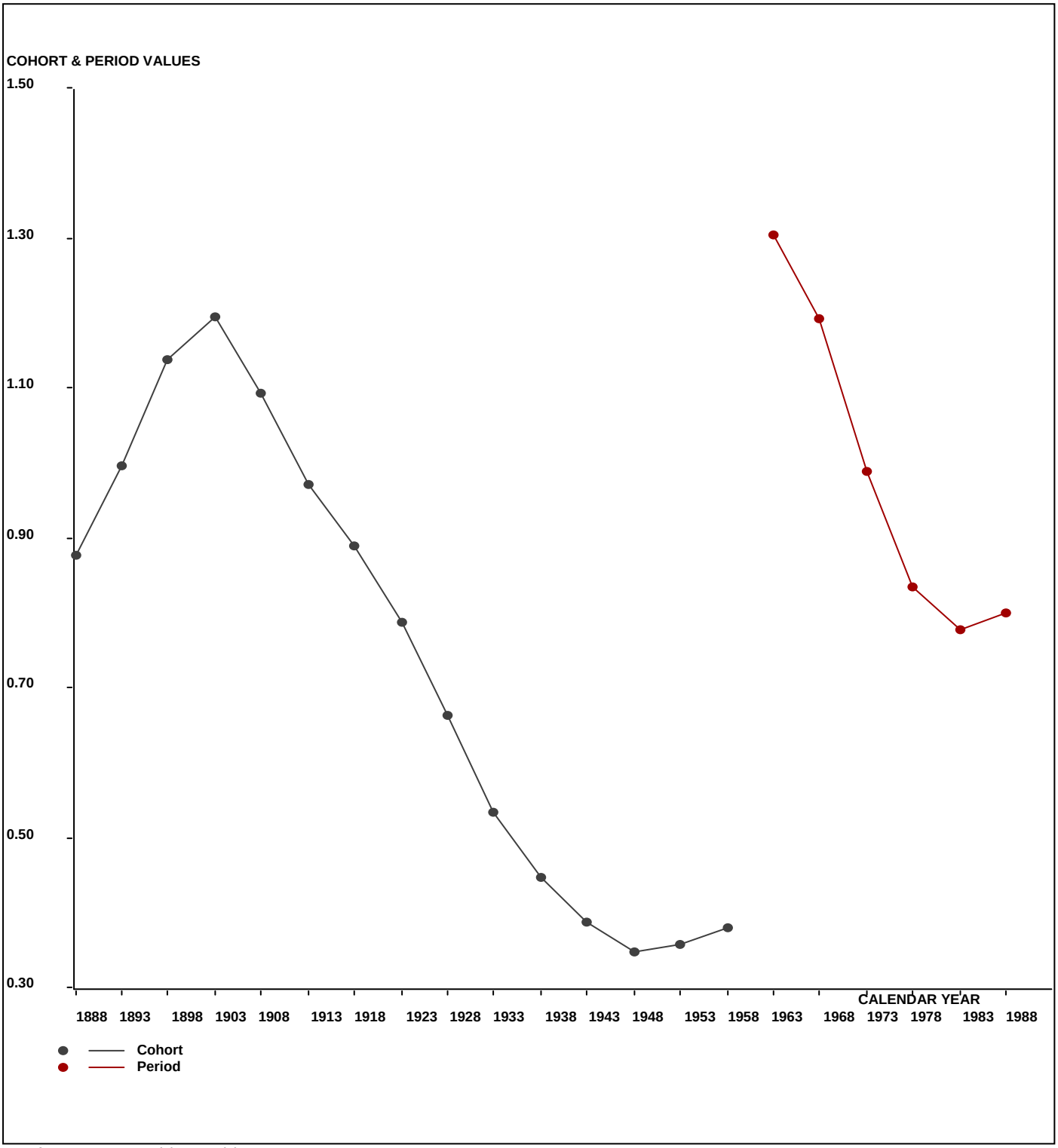
CHI SQUARE (LOG)= 5023.7278 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

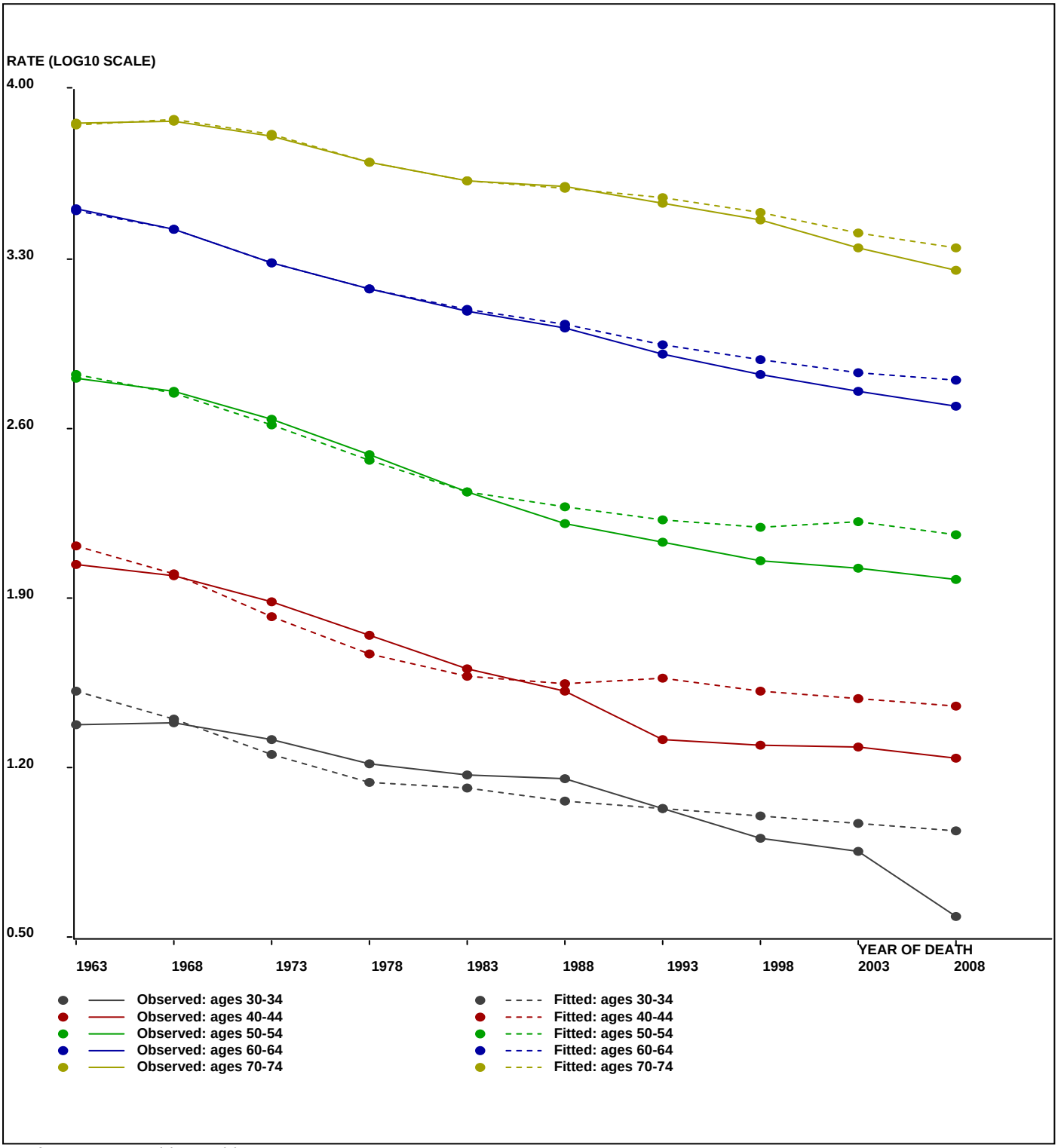


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	10.8	14.1	20.9	51.5	135.6	315.2	809.2	1756.3	3382.5	5730.2
	PRE	10.8	18.4	37.0	73.5	168.0	389.2	884.0	1839.4	3552.3	6167.3
	RES	-0.003	-4.237	-16.101	-21.991	-32.313	-73.938	-74.739	-83.048	-169.770	-437.096
1996-	OBS	8.2	11.4	19.6	45.2	113.4	287.3	665.2	1396.3	2867.9	4964.4
	PRE	10.1	17.1	32.9	77.3	155.9	346.2	760.5	1525.3	3074.8	5618.7
	RES	-1.913	-5.705	-13.218	-32.106	-42.528	-58.916	-95.290	-129.019	-206.870	-654.228
2001-	OBS	7.2	11.9	19.3	43.0	105.9	250.5	569.9	1115.8	2221.0	4103.5
	PRE	9.4	15.9	30.6	68.7	164.0	321.4	676.6	1312.2	2549.8	4863.4
	RES	-2.176	-3.964	-11.261	-25.690	-58.172	-70.880	-106.643	-196.390	-328.818	-759.893
2006-	OBS	3.9	9.1	17.5	36.0	95.2	239.8	493.1	986.6	1794.2	3302.5
	PRE	8.7	14.8	28.4	63.9	145.8	338.1	628.1	1167.4	2193.6	4033.0
	RES	-4.865	-5.723	-10.975	-27.898	-50.535	-98.348	-134.937	-180.747	-399.331	-730.509

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	119.0	137.0	204.0	492.0	1081.0	2309.0	5521.0	11222.0	17401.0	19946.0
	PRE	119.0	178.1	361.3	702.1	1338.5	2850.6	6030.9	11752.6	18274.4	21467.5
	CHI	0.000	9.489	68.503	62.854	49.546	102.902	43.112	23.958	41.739	107.831
1996-	OBS	94.0	124.0	190.0	437.0	1062.0	2219.0	4607.0	8599.0	15332.0	19330.0
	PRE	116.0	186.2	317.9	747.3	1460.3	2674.0	5267.0	9393.6	16437.9	21877.4
	CHI	4.180	20.783	51.428	128.833	108.646	77.437	82.696	67.208	74.405	296.613
2001-	OBS	78.0	138.0	210.0	413.0	1003.0	2273.0	4175.0	7082.0	11807.0	17108.0
	PRE	101.6	183.9	332.5	659.6	1554.1	2916.1	4956.2	8328.5	13555.0	20276.1
	CHI	5.470	11.445	45.106	92.185	195.446	141.830	123.144	186.555	225.420	495.001
2006-	OBS	38.0	99.0	202.0	388.0	896.0	2199.0	4269.0	6664.0	10090.0	14301.0
	PRE	85.9	161.6	328.9	688.4	1371.4	3100.9	5437.2	7884.8	12335.7	17464.3
	CHI	26.737	24.220	48.983	131.112	164.807	262.316	250.974	189.015	408.816	572.980

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	2404.79	47.15	51	P, C	96.63	12787.61	0.0000
AGE-PERIOD	555.16	12.34	45	Cohort	85.39	2947.42	0.0000
AGE-COHORT	221.71	6.16	36	Period	63.41	1176.02	0.0000
PERIOD-COHORT	120.10	3.00	40	Age	32.45	637.21	0.0000
FULL AGE-PERIOD-COHORT	81.13	2.54	32			430.30	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.381509	24.071813
35	1.760927	57.666898
40	2.158563	144.066396
45	2.478221	300.760674
50	2.808714	643.744775
55	3.134212	1362.109641
60	3.452754	2836.312833
65	3.730598	5377.716373
70	3.981386	9580.448856
75	4.188596	15438.167824

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.033840	1.081036
1966	0.009952	1.023181
1971	0.013422	1.031389
1976	0.007480	1.017373
1981	-0.014627	0.966881
1986	-0.055126	0.880794

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.074234	1.186408
1891	0.027388	1.065094
1896	0.001403	1.003236
1901	-0.013510	0.969371
1906	-0.019813	0.955403
1911	-0.016509	0.962701
1916	-0.006754	0.984568
1921	0.018430	1.043351
1926	0.019409	1.045704
1931	0.020137	1.047459
1936	-0.025896	0.942115
1941	-0.086442	0.819517
1946	-0.136853	0.729704
1951	-0.124675	0.750456
1956	-0.172289	0.672530

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	199.0	182.0	165.0	207.0	170.0	139.0
	EXP	223.6	187.3	170.2	174.5	171.9	139.0
	CHI	2.7	0.1	0.2	6.1	0.0	0.0
35 -	OBS	504.0	501.0	457.0	438.0	416.0	377.0
	EXP	584.9	502.7	445.5	398.1	395.1	375.1
	CHI	11.2	0.0	0.3	4.0	1.1	0.0
40 -	OBS	1318.0	1350.0	1326.0	1237.0	921.0	836.0
	EXP	1470.7	1372.3	1249.4	1087.1	936.4	894.8
	CHI	15.9	0.4	4.7	20.7	0.3	3.9
45 -	OBS	2569.0	2765.0	3045.0	2690.0	2101.0	1741.0
	EXP	2804.7	2858.5	2839.4	2537.6	2132.2	1762.6
	CHI	19.8	3.1	14.9	9.2	0.5	0.3
50 -	OBS	5707.0	5494.0	6340.0	6104.0	5153.0	3948.0
	EXP	6236.7	5530.7	6016.0	5854.0	5063.2	4085.6
	CHI	45.0	0.2	17.4	10.7	1.6	4.6
55 -	OBS	11984.0	11804.0	11743.0	12662.0	11524.0	9180.0
	EXP	12470.0	12071.9	11381.4	12130.6	11392.1	9486.5
	CHI	18.9	5.9	11.5	23.3	1.5	9.9
60 -	OBS	23544.0	23652.0	24162.0	22519.0	22743.0	20123.0
	EXP	23630.4	23375.9	24048.1	22218.2	22848.1	20633.0
	CHI	0.3	3.3	0.5	4.1	0.5	12.6
65 -	OBS	39687.0	39751.0	41108.0	41138.0	36560.0	36165.0
	EXP	39185.5	38957.9	41077.5	41501.3	37003.3	36703.0
	CHI	6.4	16.1	0.0	3.2	5.3	7.9
70 -	OBS	60729.0	57401.0	60613.0	62560.0	61504.0	53363.0
	EXP	59705.2	57026.0	60875.5	63243.8	62005.3	53330.4
	CHI	17.6	2.5	1.1	7.4	4.1	0.0
75 -	OBS	78484.0	70010.0	72224.0	76891.0	79493.0	76574.0
	EXP	78484.0	71050.2	73110.2	77345.3	78649.3	75070.7
	CHI	0.0	15.2	10.7	2.7	9.1	30.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	273221.22	6830.53	40	P, C	73.78	0.0000
AGE-PERIOD	94261.21	2356.53	40	Cohort	23.99	0.0000
AGE-COHORT	139860.27	3496.51	40	Period	48.77	0.0000
PERIOD-COHORT	71365.19	1784.13	40	Age	-0.40	0.0000
FULL AGE-PERIOD-COHORT	71648.51	1791.21	40			0.0000

AGE	EFFECT
30	24.071813
35	57.666898
40	144.066396
45	300.760674
50	643.744775
55	1362.109641
60	2836.312833
65	5377.716373
70	9580.448856
75	15438.167824

PERIOD	EFFECT	LOWER	UPPER
% Period Change	91.0964	88.0964	94.0964
1961	1.081036		
1966	1.023181		
1971	1.031389		
1976	1.017373		
1981	0.966881		
1986	0.880794		
1991	0.802372	0.775948	0.828796
1996	0.730932	0.683583	0.779867
2001	0.665853	0.602212	0.733827
2006	0.606569	0.530527	0.690505

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.186408	1.000000	
1891	1.065094	2.000000	
1896	1.003236	4.000000	
1901	0.969371	8.000000	
1906	0.955403	16.000000	
1911	0.962701	32.000000	
1916	0.984568	64.000000	
1921	1.043351	128.000000	
1926	1.045704	256.000000	
1931	1.047459	512.000000	
1936	0.942115	1024.000000	
1941	0.819517	2048.000000	
1946	0.729704	4096.000000	
1951	0.750456	8192.000000	
1956	0.692163	EXTRAPOLATION	0.672530
1961	0.652066	EXTRAPOLATION	
1966	0.614292	EXTRAPOLATION	
1971	0.578707	EXTRAPOLATION	
1976	0.545182	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	24.3	22.6	19.7	21.2	17.3	14.3	13.9	9.7	10.0	9.9
	EXP	27.3	23.2	20.3	17.9	17.5	14.7	12.6*	10.8*	9.3*	8.0*
	Elow							12.2	10.1	8.4	7.0
	Eup							13.0	11.5	10.2	9.1
35	OBS	56.2	61.6	57.5	52.9	42.8	38.3	31.0	27.6	26.8	24.3
	EXP	65.2	61.8	56.0	48.1	40.7	38.1	32.0*	27.5*	23.6*	20.2*
	Elow							31.0	25.7	21.3	17.7
	Eup							33.1	29.3	26.0	23.0
40	OBS	145.6	151.6	165.2	157.1	112.3	86.5	78.9	71.4	60.0	51.8
	EXP	162.5	154.1	155.6	138.1	114.2	92.6	86.7*	72.9*	62.6*	53.7*
	Elow							83.9	68.2	56.6	47.0
	Eup							89.6	77.8	68.9	61.1
45	OBS	293.2	310.6	347.9	339.8	270.0	214.4	166.0	146.5	134.1	99.5
	EXP	320.1	321.1	324.4	320.5	274.0	217.1	176.1*	165.0*	138.6*	119.0*
	Elow							170.3	154.3	125.4	104.0
	Eup							181.9	176.0	152.8	135.4
50	OBS	613.1	644.2	730.0	714.1	663.5	516.2	382.9	279.8	219.4	192.0
	EXP	670.0	648.5	692.7	684.9	652.0	534.2	423.3*	343.4*	321.7*	270.3*
	Elow							409.4	321.1	290.9	236.4
	Eup							437.2	366.3	354.5	307.7
55	OBS	1352.0	1311.9	1427.1	1509.2	1393.1	1216.1	898.7	637.2	430.3	321.0
	EXP	1406.8	1341.7	1383.2	1445.8	1377.2	1256.7	1029.7*	815.9*	661.8*	620.0*
	Elow							995.7	763.1	598.6	542.3
	Eup							1063.6	870.5	729.4	705.8
60	OBS	2961.4	2805.4	2829.6	2879.5	2848.1	2547.8	2028.7	1414.0	940.6	600.0
	EXP	2972.2	2772.6	2816.2	2841.1	2861.3	2612.4	2383.8*	1953.1*	1547.7*	1255.4*
	Elow							2305.3	1826.6	1399.8	1098.0
	Eup							2462.3	2083.9	1705.7	1429.1
65	OBS	5907.0	5442.4	5303.1	5221.0	5058.0	4869.6	3898.4	2866.4	1885.8	1182.9
	EXP	5832.3	5333.8	5299.2	5267.1	5119.4	4942.0	4512.1*	4117.3*	3373.5*	2673.2*
	Elow							4363.5	3850.6	3051.1	2338.1
	Eup							4660.7	4392.9	3717.9	3043.1
70	OBS	11220.1	9898.9	9537.2	9211.5	8845.6	8313.3	7308.8	5332.4	3768.9	2352.8
	EXP	11031.0	9834.3	9578.5	9312.2	8917.6	8308.2	8020.3*	7322.7*	6681.9*	5474.8*
	Elow							7756.2	6848.3	6043.3	4788.5
	Eup							8284.5	7813.0	7364.1	6232.4
75	OBS	19800.2	16578.0	15780.6	15135.9	14414.2	13352.8	12100.8	9758.9	6962.6	4601.0
	EXP	19800.2	16824.3	15974.3	15225.3	14261.2	13090.7	12196.0*	11773.4*	10749.4*	9808.7*
	Elow							11794.4	11010.8	9722.0	8579.1
	Eup							12597.6	12561.7	11846.7	11166.1
30-79	OBS	2322.4	2088.3	2060.7	2022.5	1926.1	1768.1	1490.3	1120.3	785.7	519.3
	EXP	2328.0	2088.4	2054.6	2014.6	1927.5	1777.3	1631.2*	1472.4*	1284.3*	1091.5*
	Elow							1577.4	1377.0	1161.6	954.6
	Eup							1684.9	1571.0	1415.4	1242.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	199.0	182.0	165.0	207.0	170.0	139.0	154.0	114.0	110.0	98.0
	EXP	223.6	187.3	170.2	174.5	171.9	143.1	139.9*	126.5*	102.1*	78.8*
	CHI	2.700	0.149	0.159	6.054	0.021	0.115	1.423	1.235	0.611	4.666
35 -	OBS	504.0	501.0	457.0	438.0	416.0	377.0	304.0	307.0	316.0	270.0
	EXP	584.9	502.7	445.5	398.1	395.1	375.1	313.9*	305.4*	278.2*	225.1*
	CHI	11.180	0.006	0.295	3.992	1.105	0.009	0.315	0.009	5.135	8.957
40 -	OBS	1318.0	1350.0	1326.0	1237.0	921.0	836.0	777.0	701.0	667.0	612.0
	EXP	1470.7	1372.3	1249.4	1087.1	936.4	894.8	853.8*	715.5*	694.8*	633.9*
	CHI	15.851	0.364	4.696	20.666	0.253	3.860	6.909	0.293	1.114	0.757
45 -	OBS	2569.0	2765.0	3045.0	2690.0	2101.0	1741.0	1594.0	1435.0	1310.0	1101.0
	EXP	2804.7	2858.5	2839.4	2537.6	2132.2	1762.6	1690.6*	1616.0*	1354.2*	1316.5*
	CHI	19.801	3.060	14.891	9.157	0.456	0.264	5.515	20.277	1.440	35.279
50 -	OBS	5707.0	5494.0	6340.0	6104.0	5153.0	3948.0	3074.0	2657.0	2121.0	1849.0
	EXP	6236.7	5530.7	6016.0	5854.0	5063.2	4085.6	3398.0*	3260.4*	3110.4*	2603.3*
	CHI	44.991	0.243	17.444	10.675	1.592	4.633	30.894	111.662	314.733	218.544
55 -	OBS	11984.0	11804.0	11743.0	12662.0	11524.0	9180.0	6724.0	5027.0	4005.0	3037.0
	EXP	12470.0	12071.9	11381.4	12130.6	11392.1	9486.5	7703.9*	6437.3*	6159.7*	5866.1*
	CHI	18.938	5.947	11.487	23.281	1.526	9.903	124.639	308.967	753.747	1364.430
60 -	OBS	23544.0	23652.0	24162.0	22519.0	22743.0	20123.0	14728.0	10257.0	7200.0	5431.0
	EXP	23630.4	23375.9	24048.1	22218.2	22848.1	20633.0	17306.2*	14168.2*	11847.2*	11364.3*
	CHI	0.316	3.262	0.540	4.071	0.484	12.605	384.083	1079.684	1822.921	3097.760
65 -	OBS	39687.0	39751.0	41108.0	41138.0	36560.0	36165.0	28766.0	19657.0	13027.0	8616.0
	EXP	39185.5	38957.9	41077.5	41501.3	37003.3	36703.0	33294.9*	28235.3*	23303.8*	19470.8*
	CHI	6.418	16.147	0.023	3.179	5.310	7.887	616.042	2606.207	4531.978	6051.489
70 -	OBS	60729.0	57401.0	60613.0	62560.0	61504.0	53363.0	48720.0	35471.0	23694.0	15075.0
	EXP	59705.2	57026.0	60875.5	63243.8	62005.3	53330.4	53462.8*	48710.2*	42007.5*	35078.2*
	CHI	17.557	2.465	1.132	7.394	4.053	0.020	420.752	3598.348	7983.906	11406.710
75 -	OBS	78484.0	70010.0	72224.0	76891.0	79493.0	76574.0	64825.0	55035.0	39588.0	25284.0
	EXP	78484.0	71050.2	73110.2	77345.3	78649.3	75070.7	65334.9*	66396.1*	61118.8*	53902.2*
	CHI	0.000	15.229	10.743	2.669	9.051	30.102	3.980	1944.001	7584.849	15194.247
30-79	OBS	224725.0	212910.0	221183.0	226446.0	220585.0	202446.0	169666.0	130661.0	92038.0	61373.0
	EXP	224795.5	212933.5	221213.3	226490.6	220596.9	202484.8	183499.0*	169970.7*	149976.8*	130539.3*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.925	0.769	0.614	0.470

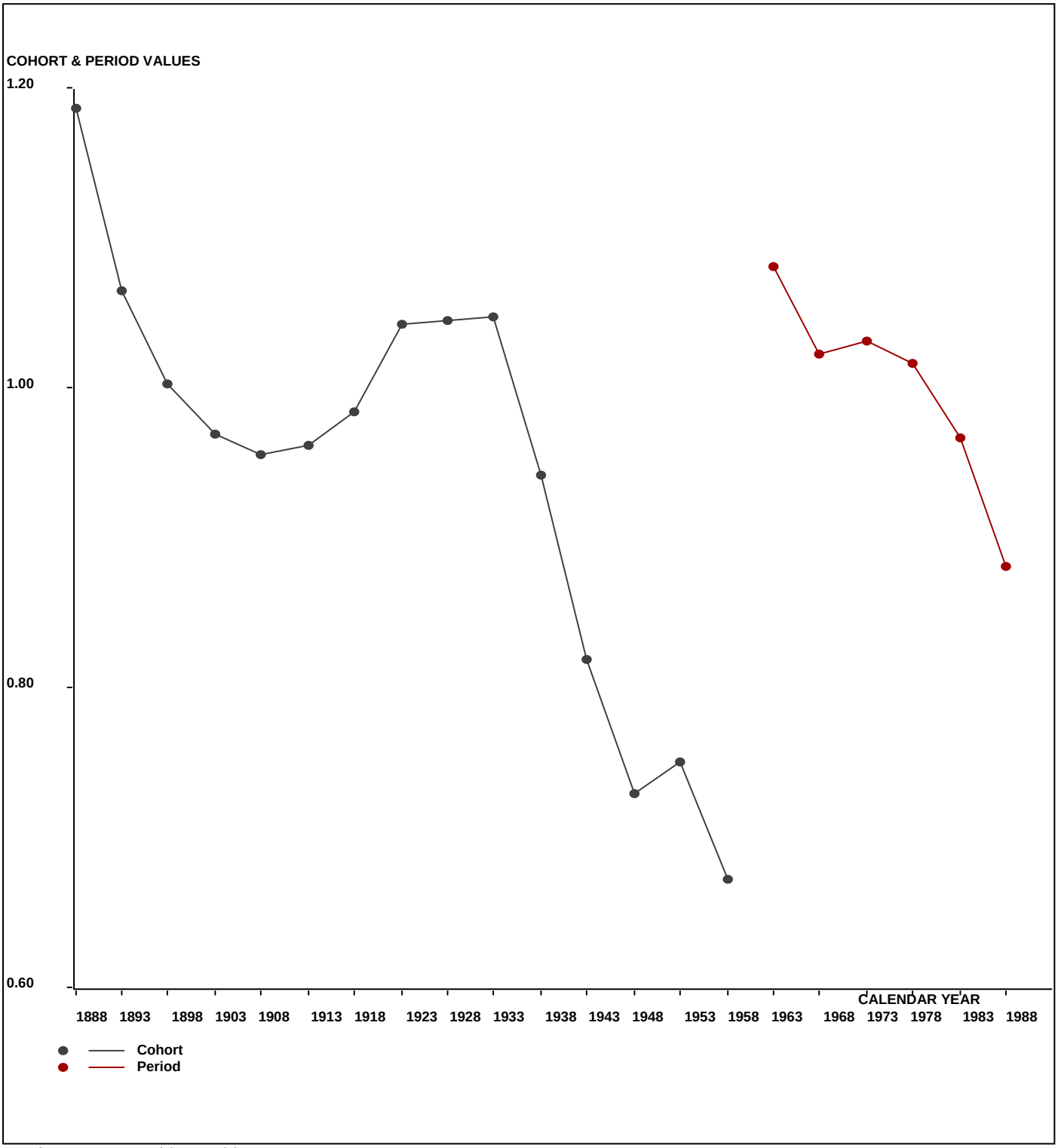
CHI SQUARE (LOG)= 71648.5123 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

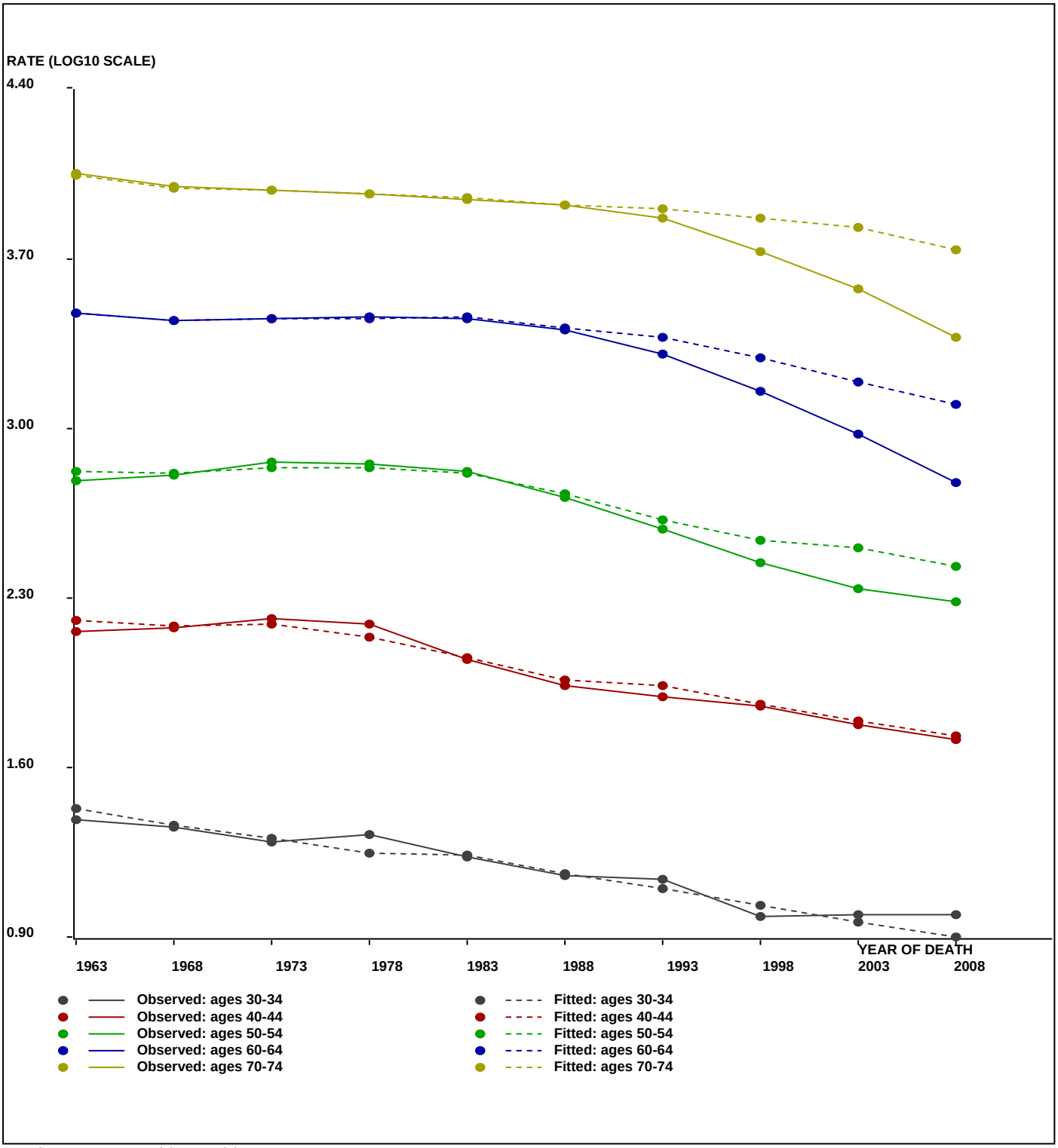


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	13.9	31.0	78.9	166.0	382.9	898.7	2028.7	3898.4	7308.8	12100.8
PRE	12.6	32.0	86.7	176.1	423.3	1029.7	2383.8	4512.1	8020.3	12196.0
RES	1.270	-1.015	-7.803	-10.057	-40.362	-130.968	-355.123	-613.761	-711.507	-95.187
1996- OBS	9.7	27.6	71.4	146.5	279.8	637.2	1414.0	2866.4	5332.4	9758.9
PRE	10.8	27.5	72.9	165.0	343.4	815.9	1953.1	4117.3	7322.7	11773.4
RES	-1.068	0.146	-1.475	-18.480	-63.541	-178.752	-539.172	-1250.894	-1990.278	-2014.561
2001- OBS	10.0	26.8	60.0	134.1	219.4	430.3	940.6	1885.8	3768.9	6962.6
PRE	9.3	23.6	62.6	138.6	321.7	661.8	1547.7	3373.5	6681.9	10749.4
RES	0.718	3.205	-2.505	-4.521	-102.324	-231.510	-607.109	-1487.686	-2913.036	-3786.773
2006- OBS	9.9	24.3	51.8	99.5	192.0	321.0	600.0	1182.9	2352.8	4601.0
PRE	8.0	20.2	53.7	119.0	270.3	620.0	1255.4	2673.2	5474.8	9808.7
RES	1.937	4.038	-1.855	-19.473	-78.309	-299.032	-655.442	-1490.303	-3121.992	-5207.736

Observed and predicted deaths (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	154.0	304.0	777.0	1594.0	3074.0	6724.0	14728.0	28766.0	48720.0	64825.0
PRE	139.9	313.9	853.8	1690.6	3398.0	7703.9	17306.2	33294.9	53462.8	65334.9
CHI	1.423	0.315	6.909	5.515	30.894	124.639	384.083	616.042	420.752	3.980
1996- OBS	114.0	307.0	701.0	1435.0	2657.0	5027.0	10257.0	19657.0	35471.0	55035.0
PRE	126.5	305.4	715.5	1616.0	3260.4	6437.3	14168.2	28235.3	48710.2	66396.1
CHI	1.235	0.009	0.293	20.277	111.662	308.967	1079.684	2606.207	3598.348	1944.001
2001- OBS	110.0	316.0	667.0	1310.0	2121.0	4005.0	7200.0	13027.0	23694.0	39588.0
PRE	102.1	278.2	694.8	1354.2	3110.4	6159.7	11847.2	23303.8	42007.5	61118.8
CHI	0.611	5.135	1.114	1.440	314.733	753.747	1822.921	4531.978	7983.906	7584.849
2006- OBS	98.0	270.0	612.0	1101.0	1849.0	3037.0	5431.0	8616.0	15075.0	25284.0
PRE	78.8	225.1	633.9	1316.5	2603.3	5866.1	11364.3	19470.8	35078.2	53902.2
CHI	4.666	8.957	0.757	35.279	218.544	1364.430	3097.760	6051.489	11406.710	15194.247

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	8119.80	159.21	51	P, C	99.05	43462.34	0.0000
AGE-PERIOD	137.32	3.05	45	Cohort	43.65	728.50	0.0000
AGE-COHORT	97.49	2.71	36	Period	20.63	517.47	0.0000
PERIOD-COHORT	110.15	2.75	40	Age	29.76	584.49	0.0000
FULL AGE-PERIOD-COHORT	77.38	2.42	32			410.62	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.785336	61.000803
35	2.023002	105.439130
40	2.278760	190.002591
45	2.519755	330.944267
50	2.733222	541.030853
55	2.932158	855.378405
60	3.184052	1527.749945
65	3.450232	2819.888424
70	3.743907	5545.067572
75	4.015136	10354.665168

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.081271	1.205789
1966	0.047606	1.115852
1971	0.019241	1.045299
1976	-0.027653	0.938311
1981	-0.072805	0.845658
1986	-0.115086	0.767209

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.048576	1.118345
1891	0.054265	1.133091
1896	0.044064	1.106788
1901	0.021747	1.051350
1906	-0.003551	0.991856
1911	-0.029490	0.934351
1916	-0.057859	0.875267
1921	-0.074607	0.842157
1926	-0.115000	0.767361
1931	-0.136346	0.730557
1936	-0.165534	0.683072
1941	-0.181751	0.658034
1946	-0.188970	0.647188
1951	-0.184624	0.653697
1956	-0.183498	0.655393

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	382.0	377.0	372.0	370.0	354.0	299.0
	EXP	440.7	375.2	351.0	361.7	331.8	299.0
	CHI	7.8	0.0	1.3	0.2	1.5	0.0
35 -	OBS	711.0	725.0	657.0	601.0	578.0	497.0
	EXP	875.3	699.2	598.6	539.1	560.4	520.4
	CHI	30.8	1.0	5.7	7.1	0.6	1.1
40 -	OBS	1502.0	1382.0	1276.0	1098.0	918.0	885.0
	EXP	1746.3	1448.4	1164.8	958.7	867.3	911.7
	CHI	34.2	3.0	10.6	20.2	3.0	0.8
45 -	OBS	2794.0	2806.0	2451.0	1956.0	1545.0	1209.0
	EXP	3060.1	2768.8	2323.6	1796.1	1487.8	1356.5
	CHI	23.1	0.5	7.0	14.2	2.2	16.0
50 -	OBS	5406.0	4621.0	4340.0	3571.0	2553.0	1878.0
	EXP	5674.3	4506.4	4136.2	3329.8	2595.8	2168.5
	CHI	12.7	2.9	10.0	17.5	0.7	38.9
55 -	OBS	8968.0	7903.0	6497.0	5908.0	4722.0	3400.0
	EXP	9067.8	8024.1	6439.6	5671.0	4591.6	3619.2
	CHI	1.1	1.8	0.5	9.9	3.7	13.3
60 -	OBS	15604.0	14405.0	12494.0	9991.0	8695.0	6797.0
	EXP	15397.8	14255.5	12741.3	9812.3	8688.3	7103.8
	CHI	2.8	1.6	4.8	3.3	0.0	13.2
65 -	OBS	25630.0	24371.0	22674.0	19302.0	14963.0	13260.0
	EXP	25284.4	24162.4	22663.1	19479.6	15086.6	13531.3
	CHI	4.7	1.8	0.0	1.6	1.0	5.4
70 -	OBS	41491.0	39843.0	38847.0	34697.0	30049.0	23925.0
	EXP	41005.3	39710.9	38729.3	35048.4	30464.2	23901.8
	CHI	5.8	0.4	0.4	3.5	5.7	0.0
75 -	OBS	55347.0	54798.0	54345.0	51354.0	48185.0	43766.0
	EXP	55347.0	55288.7	54827.5	51891.8	47898.2	42566.6
	CHI	0.0	4.4	4.2	5.6	1.7	33.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	214542.73	5363.57	40	P, C	96.76	0.0000
AGE-PERIOD	7432.30	185.81	40	Cohort	6.48	0.0000
AGE-COHORT	8325.53	208.14	40	Period	16.51	0.0000
PERIOD-COHORT	9881.67	247.04	40	Age	29.66	0.0000
FULL AGE-PERIOD-COHORT	6950.93	173.77	40			0.0000

AGE	EFFECT
30	61.000803
35	105.439130
40	190.002591
45	330.944267
50	541.030853
55	855.378405
60	1527.749945
65	2819.888424
70	5545.067572
75	10354.665168

PERIOD	EFFECT	LOWER	UPPER
% Period Change	90.7233	87.7233	93.7233
1961	1.205789		
1966	1.115852		
1971	1.045299		
1976	0.938311		
1981	0.845658		
1986	0.767209		
1991	0.696038	0.673021	0.719054
1996	0.631469	0.590397	0.673921
2001	0.572889	0.517916	0.631622
2006	0.519744	0.454333	0.591977

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.118345	1.000000	
1891	1.133091	2.000000	
1896	1.106788	4.000000	
1901	1.051350	8.000000	
1906	0.991856	16.000000	
1911	0.934351	32.000000	
1916	0.875267	64.000000	
1921	0.842157	128.000000	
1926	0.767361	256.000000	
1931	0.730557	512.000000	
1936	0.683072	1024.000000	
1941	0.658034	2048.000000	
1946	0.647188	4096.000000	
1951	0.653697	8192.000000	
1956	0.625097	EXTRAPOLATION	0.655393
1961	0.607686	EXTRAPOLATION	
1966	0.590760	EXTRAPOLATION	
1971	0.574305	EXTRAPOLATION	
1976	0.558309	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	46.6	46.7	44.5	37.9	36.0	30.7	25.9	20.2	19.2	15.0
	EXP	53.7	46.5	42.0	37.0	33.7	29.3	25.8*	22.8*	20.1*	17.7*
	Elow							24.9	21.3	18.1	15.5
	Eup							26.7	24.3	22.1	20.2
35	OBS	79.2	89.1	82.6	72.6	59.5	50.5	48.5	39.7	37.6	27.3
	EXP	97.6	86.0	75.3	65.1	57.7	52.9	45.9*	40.5*	35.7*	31.5*
	Elow							44.4	37.8	32.3	27.5
	Eup							47.4	43.2	39.3	35.8
40	OBS	166.0	155.2	159.0	139.5	111.9	91.6	84.1	75.2	65.3	49.8
	EXP	192.9	162.7	145.1	121.8	105.7	94.3	86.5*	75.0*	66.1*	58.3*
	Elow							83.6	70.1	59.8	51.0
	Eup							89.3	80.0	72.9	66.4
45	OBS	318.9	315.2	280.0	247.1	198.5	148.9	128.2	122.7	118.6	86.1
	EXP	349.3	311.0	265.5	226.9	191.2	167.1	149.1*	136.6*	118.5*	104.5*
	Elow							144.1	127.7	107.1	91.4
	Eup							154.0	145.8	130.7	119.1
50	OBS	580.7	541.8	499.7	417.8	328.7	245.5	212.5	188.9	169.4	135.0
	EXP	609.5	528.4	476.3	389.6	334.2	283.5	247.8*	221.1*	202.6*	175.8*
	Elow							239.6	206.7	183.2	153.7
	Eup							256.0	236.0	223.4	200.2
55	OBS	1011.7	878.4	789.6	704.2	570.8	450.4	348.8	309.9	253.6	185.4
	EXP	1023.0	891.8	782.6	675.9	555.1	479.4	406.7*	355.4*	317.1*	290.6*
	Elow							393.2	332.3	286.7	254.0
	Eup							420.1	379.3	349.7	331.0
60	OBS	1962.7	1708.6	1463.2	1277.6	1088.9	860.6	701.4	557.6	428.4	307.2
	EXP	1936.7	1690.9	1492.1	1254.7	1088.0	899.4	776.9*	659.0*	575.9*	513.9*
	Elow							751.2	616.1	520.7	449.2
	Eup							802.5	703.3	635.0	585.3
65	OBS	3814.7	3336.7	2925.0	2449.7	2070.1	1785.4	1385.6	1115.2	857.3	575.8
	EXP	3763.3	3308.2	2923.6	2472.2	2087.2	1822.0	1506.1*	1300.9*	1103.5*	964.4*
	Elow							1456.3	1216.3	997.6	843.1
	Eup							1555.9	1388.3	1216.6	1098.5
70	OBS	7665.8	6871.0	6112.4	5108.9	4321.7	3727.2	3072.3	2396.4	1933.3	1302.1
	EXP	7576.0	6848.2	6093.9	5160.6	4381.4	3723.6	3250.4*	2686.9*	2320.8*	1968.6*
	Elow							3142.9	2512.2	2098.1	1720.9
	Eup							3357.9	2867.6	2558.7	2242.2
75	OBS	13963.1	12975.8	11874.2	10109.0	8737.2	7631.8	6379.8	5268.9	4407.3	3161.2
	EXP	13963.1	13092.0	11979.6	10214.8	8685.2	7422.7	6308.3*	5506.6*	4552.0*	3931.7*
	Elow							6099.7	5148.4	4115.2	3436.9
	Eup							6516.9	5876.8	5018.7	4478.1
30-79	OBS	1643.7	1486.6	1332.7	1133.8	958.8	810.2	665.7	544.8	446.9	315.9
	EXP	1648.2	1485.6	1329.5	1127.5	958.0	819.4	701.8*	603.2*	515.7*	448.3*
	Elow							678.6	564.0	466.2	391.9
	Eup							725.1	643.8	568.6	510.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	382.0	377.0	372.0	370.0	354.0	299.0	288.0	236.0	211.0	149.0
	EXP	440.7	375.2	351.0	361.7	331.8	285.2	286.6*	266.3*	220.9*	175.3*
	CHI	7.829	0.008	1.258	0.190	1.479	0.670	0.007	3.454	0.445	3.939
35 -	OBS	711.0	725.0	657.0	601.0	578.0	497.0	475.0	441.0	443.0	304.0
	EXP	875.3	699.2	598.6	539.1	560.4	520.4	449.7*	449.5*	420.9*	350.0*
	CHI	30.836	0.955	5.696	7.111	0.553	1.053	1.423	0.162	1.162	6.041
40 -	OBS	1502.0	1382.0	1276.0	1098.0	918.0	885.0	828.0	738.0	725.0	588.0
	EXP	1746.3	1448.4	1164.8	958.7	867.3	911.7	850.9*	736.2*	734.8*	688.9*
	CHI	34.167	3.048	10.624	20.228	2.966	0.779	0.615	0.004	0.130	14.785
45 -	OBS	2794.0	2806.0	2451.0	1956.0	1545.0	1209.0	1231.0	1202.0	1159.0	953.0
	EXP	3060.1	2768.8	2323.6	1796.1	1487.8	1356.5	1431.2*	1338.2*	1157.8*	1156.8*
	CHI	23.145	0.500	6.983	14.232	2.200	16.031	28.007	13.853	0.001	35.903
50 -	OBS	5406.0	4621.0	4340.0	3571.0	2553.0	1878.0	1706.0	1794.0	1638.0	1300.0
	EXP	5674.3	4506.4	4136.2	3329.8	2595.8	2168.5	1989.2*	2099.6*	1959.2*	1693.1*
	CHI	12.688	2.912	10.042	17.470	0.706	38.922	40.320	44.477	52.648	91.261
55 -	OBS	8968.0	7903.0	6497.0	5908.0	4722.0	3400.0	2610.0	2445.0	2360.0	1754.0
	EXP	9067.8	8024.1	6439.6	5671.0	4591.6	3619.2	3042.8*	2804.2*	2951.8*	2749.5*
	CHI	1.099	1.827	0.512	9.907	3.704	13.272	61.565	46.019	118.641	360.451
60 -	OBS	15604.0	14405.0	12494.0	9991.0	8695.0	6797.0	5092.0	4045.0	3279.0	2781.0
	EXP	15397.8	14255.5	12741.3	9812.3	8688.3	7103.8	5639.9*	4780.2*	4408.6*	4651.9*
	CHI	2.763	1.568	4.802	3.255	0.005	13.249	53.232	113.081	289.416	752.459
65 -	OBS	25630.0	24371.0	22674.0	19302.0	14963.0	13260.0	10224.0	7648.0	5922.0	4194.0
	EXP	25284.4	24162.4	22663.1	19479.6	15086.6	13531.3	11113.7*	8921.1*	7622.8*	7024.6*
	CHI	4.725	1.800	0.005	1.620	1.012	5.438	71.228	181.677	379.484	1140.580
70 -	OBS	41491.0	39843.0	38847.0	34697.0	30049.0	23925.0	20480.0	15941.0	12154.0	8343.0
	EXP	41005.3	39710.9	38729.3	35048.4	30464.2	23901.8	21666.7*	17873.4*	14590.1*	12613.3*
	CHI	5.752	0.440	0.358	3.523	5.659	0.023	64.996	208.914	406.742	1445.750
75 -	OBS	55347.0	54798.0	54345.0	51354.0	48185.0	43766.0	34177.0	29714.0	25059.0	17372.0
	EXP	55347.0	55288.7	54827.5	51891.8	47898.2	42566.6	33793.8*	31054.2*	25882.0*	21606.0*
	CHI	0.000	4.355	4.246	5.573	1.718	33.796	4.344	57.837	26.172	829.709
30-79	OBS	157835.0	151231.0	143953.0	128848.0	112562.0	95916.0	77111.0	64204.0	52950.0	37738.0
	EXP	157899.0	151239.7	143974.9	128888.5	112571.9	95964.8	80264.6*	70322.9*	59948.8*	52709.4*
	O/E	1.000	1.000	1.000	1.000	1.000	0.999	0.961	0.913	0.883	0.716

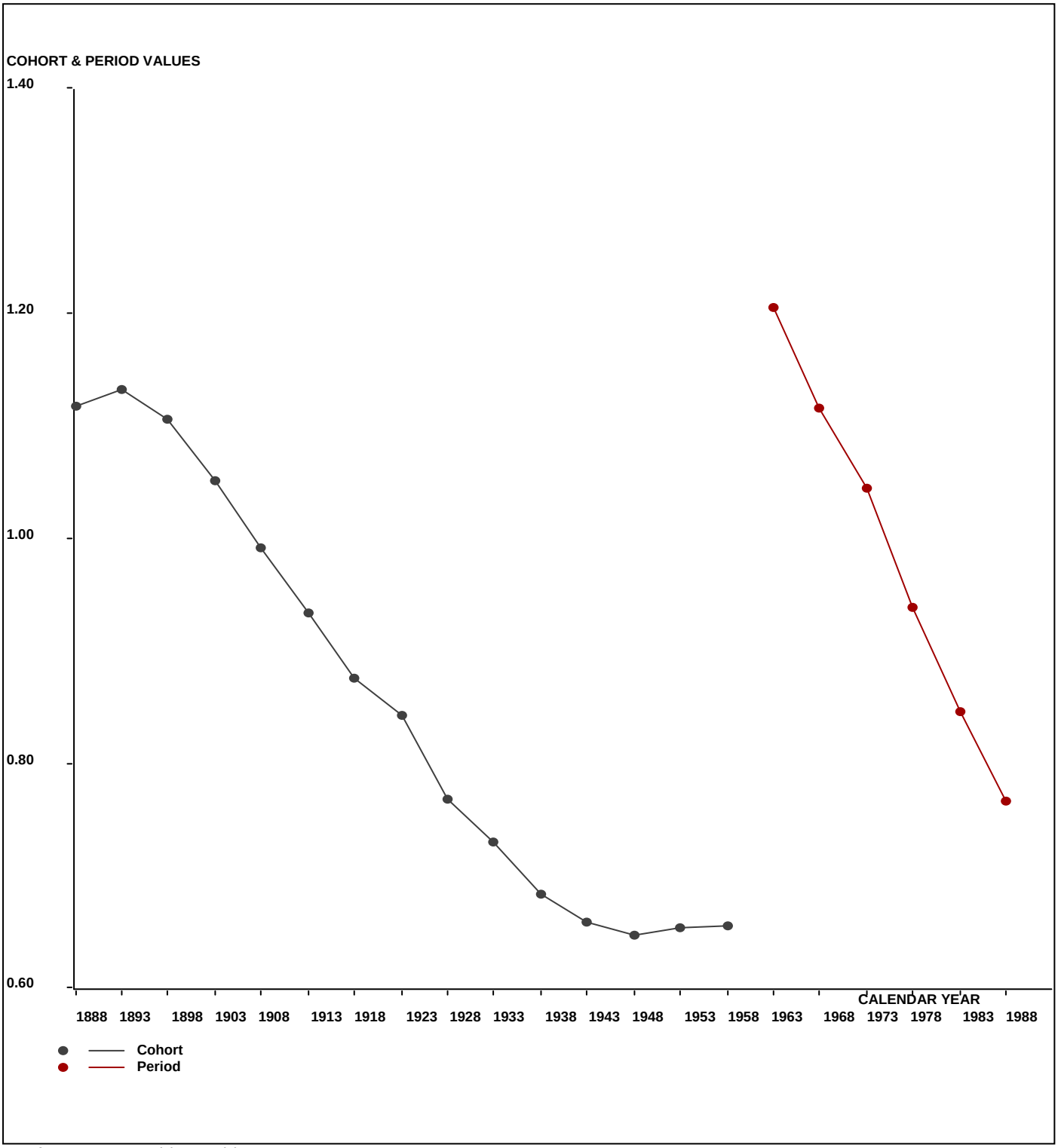
CHI SQUARE (LOG)= 6950.9339 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

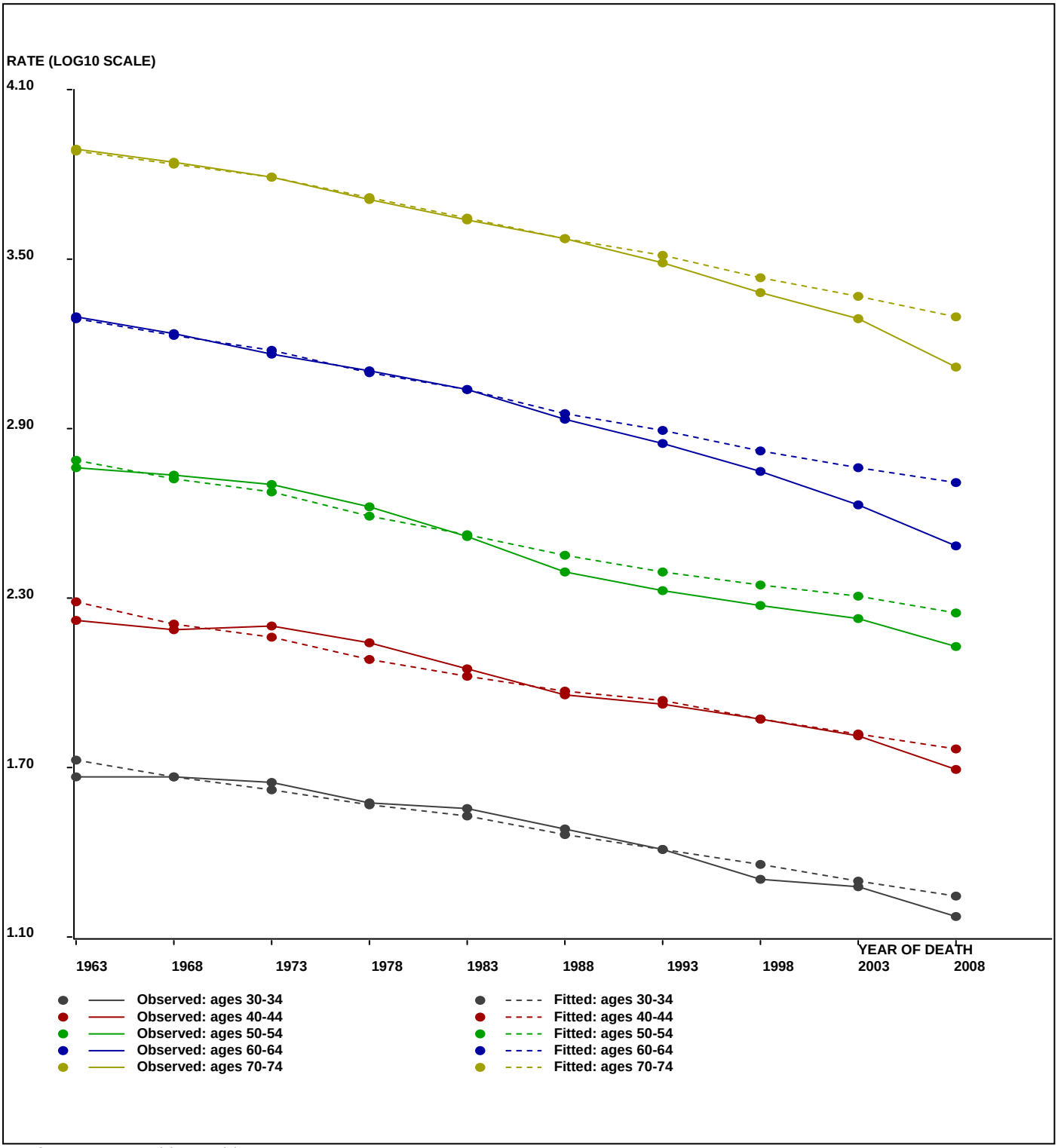


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	25.9	48.5	84.1	128.2	212.5	348.8	701.4	1385.6	3072.3	6379.8
	PRE	25.8	45.9	86.5	149.1	247.8	406.7	776.9	1506.1	3250.4	6308.3
	RES	0.127	2.581	-2.323	-20.855	-35.280	-57.848	-75.472	-120.575	-178.025	71.525
1996-	OBS	20.2	39.7	75.2	122.7	188.9	309.9	557.6	1115.2	2396.4	5268.9
	PRE	22.8	40.5	75.0	136.6	221.1	355.4	659.0	1300.9	2686.9	5506.6
	RES	-2.591	-0.769	0.182	-13.900	-32.181	-45.532	-101.354	-185.643	-290.495	-237.643
2001-	OBS	19.2	37.6	65.3	118.6	169.4	253.6	428.4	857.3	1933.3	4407.3
	PRE	20.1	35.7	66.1	118.5	202.6	317.1	575.9	1103.5	2320.8	4552.0
	RES	-0.901	1.875	-0.879	0.122	-33.214	-63.582	-147.565	-246.212	-387.492	-144.752
2006-	OBS	15.0	27.3	49.8	86.1	135.0	185.4	307.2	575.8	1302.1	3161.2
	PRE	17.7	31.5	58.3	104.5	175.8	290.6	513.9	964.4	1968.6	3931.7
	RES	-2.654	-4.135	-8.546	-18.414	-40.810	-105.225	-206.679	-388.619	-666.492	-770.470

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	288.0	475.0	828.0	1231.0	1706.0	2610.0	5092.0	10224.0	20480.0	34177.0
	PRE	286.6	449.7	850.9	1431.2	1989.2	3042.8	5639.9	11113.7	21666.7	33793.8
	CHI	0.007	1.423	0.615	28.007	40.320	61.565	53.232	71.228	64.996	4.344
1996-	OBS	236.0	441.0	738.0	1202.0	1794.0	2445.0	4045.0	7648.0	15941.0	29714.0
	PRE	266.3	449.5	736.2	1338.2	2099.6	2804.2	4780.2	8921.1	17873.4	31054.2
	CHI	3.454	0.162	0.004	13.853	44.477	46.019	113.081	181.677	208.914	57.837
2001-	OBS	211.0	443.0	725.0	1159.0	1638.0	2360.0	3279.0	5922.0	12154.0	25059.0
	PRE	220.9	420.9	734.8	1157.8	1959.2	2951.8	4408.6	7622.8	14590.1	25882.0
	CHI	0.445	1.162	0.130	0.001	52.648	118.641	289.416	379.484	406.742	26.172
2006-	OBS	149.0	304.0	588.0	953.0	1300.0	1754.0	2781.0	4194.0	8343.0	17372.0
	PRE	175.3	350.0	688.9	1156.8	1693.1	2749.5	4651.9	7024.6	12613.3	21606.0
	CHI	3.939	6.041	14.785	35.903	91.261	360.451	752.459	1140.580	1445.750	829.709

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	3858.13	75.65	51	P, C	99.76	20897.16	0.0000
AGE-PERIOD	742.52	16.50	45	Cohort	98.76	3988.43	0.0000
AGE-COHORT	12.40	0.34	36	Period	25.64	65.77	0.0018
PERIOD-COHORT	223.85	5.60	40	Age	95.88	1195.18	0.0000
FULL AGE-PERIOD-COHORT	9.22	0.29	32			48.91	0.0283

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.887946	7.725851
35	1.334859	21.620170
40	1.713528	51.704486
45	2.065212	116.201579
50	2.359050	228.586396
55	2.606303	403.927467
60	2.835324	684.422444
65	3.014738	1034.518829
70	3.149377	1410.511547
75	3.253185	1791.367363

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.016286	0.963195
1966	-0.004204	0.990366
1971	-0.002554	0.994137
1976	0.002561	1.005914
1981	0.007560	1.017559
1986	0.001091	1.002514

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.474038	0.335708
1891	-0.390139	0.407250
1896	-0.290284	0.512526
1901	-0.199307	0.631965
1906	-0.106631	0.782293
1911	-0.004848	0.988900
1916	0.090930	1.232907
1921	0.168349	1.473496
1926	0.198343	1.578859
1931	0.151850	1.418568
1936	0.088978	1.227377
1941	0.073684	1.184905
1946	0.072348	1.181268
1951	-0.020718	0.953416
1956	-0.114529	0.768194

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	97.0	89.0	70.0	72.0	70.0	58.0
	EXP	86.6	75.8	76.1	89.6	73.8	58.0
	CHI	1.3	2.3	0.5	3.5	0.2	0.0
35 -	OBS	282.0	251.0	220.0	219.0	241.0	207.0
	EXP	295.0	247.1	209.8	213.4	252.4	203.4
	CHI	0.6	0.1	0.5	0.1	0.5	0.1
40 -	OBS	662.0	709.0	577.0	509.0	499.0	618.0
	EXP	664.2	719.8	585.3	502.6	511.4	591.7
	CHI	0.0	0.2	0.1	0.1	0.3	1.2
45 -	OBS	1206.0	1500.0	1599.0	1302.0	1138.0	1133.0
	EXP	1209.0	1509.7	1596.5	1312.8	1129.5	1120.7
	CHI	0.0	0.1	0.0	0.1	0.1	0.1
50 -	OBS	2023.0	2412.0	3006.0	3110.0	2466.0	2111.0
	EXP	2026.9	2380.4	2908.0	3103.2	2562.5	2151.2
	CHI	0.0	0.4	3.3	0.0	3.6	0.8
55 -	OBS	2707.0	3562.0	4086.0	5019.0	5248.0	4434.0
	EXP	2697.8	3559.4	4073.8	5023.1	5368.1	4336.4
	CHI	0.0	0.0	0.0	0.0	2.7	2.2
60 -	OBS	3344.0	4300.0	5745.0	6718.0	8117.0	8688.0
	EXP	3312.2	4470.6	5745.6	6638.1	8194.6	8556.2
	CHI	0.3	6.5	0.0	1.0	0.7	2.0
65 -	OBS	3452.0	4753.0	6226.0	8095.0	9367.0	11343.0
	EXP	3431.3	4729.1	6236.6	8108.5	9381.1	11349.5
	CHI	0.1	0.1	0.0	0.0	0.0	0.0
70 -	OBS	2943.0	4211.0	5613.0	7520.0	10004.0	11083.0
	EXP	2994.7	4151.6	5632.0	7538.3	9868.9	11190.9
	CHI	0.9	0.8	0.1	0.0	1.9	1.0
75 -	OBS	2296.0	3102.0	4096.0	5748.0	8049.0	10063.0
	EXP	2296.0	3051.2	4177.4	5785.0	7864.2	10184.4
	CHI	0.0	0.8	1.6	0.2	4.3	1.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	40404.97	1010.12	40	P, C	94.50	0.0000
AGE-PERIOD	43891.94	1097.30	40	Cohort	94.94	0.0000
AGE-COHORT	2234.20	55.85	40	Period	0.54	0.0000
PERIOD-COHORT	4235.43	105.89	40	Age	47.54	0.0000
FULL AGE-PERIOD-COHORT	2222.07	55.55	40			0.0000

AGE	EFFECT
30	7.725851
35	21.620170
40	51.704486
45	116.201579
50	228.586396
55	403.927467
60	684.422444
65	1034.518829
70	1410.511547
75	1791.367363

PERIOD	EFFECT	LOWER	UPPER
% Period Change	98.5214	95.5214	101.5214
1961	0.963195		
1966	0.990366		
1971	0.994137		
1976	1.005914		
1981	1.017559		
1986	1.002514		
1991	0.987691	0.957616	1.017767
1996	0.973088	0.914728	1.033251
2001	0.958700	0.873762	1.048972
2006	0.944525	0.834630	1.064931

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.335708	1.000000	
1891	0.407250	2.000000	
1896	0.512526	4.000000	
1901	0.631965	8.000000	
1906	0.782293	16.000000	
1911	0.988900	32.000000	
1916	1.232907	64.000000	
1921	1.473496	128.000000	
1926	1.578859	256.000000	
1931	1.418568	512.000000	
1936	1.227377	1024.000000	
1941	1.184905	2048.000000	
1946	1.181268	4096.000000	
1951	0.953416	8192.000000	
1956	0.930252	EXTRAPOLATION	0.768194
1961	0.865084	EXTRAPOLATION	
1966	0.804481	EXTRAPOLATION	
1971	0.748124	EXTRAPOLATION	
1976	0.695715	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	11.8	11.0	8.4	7.4	7.1	5.9	4.2	4.0	5.1	4.3
	EXP	10.6	9.4	9.1	9.2	7.5	7.2	6.6*	6.0*	5.5*	5.1*
	Elow							6.4	5.7	5.1	4.5
	Eup							6.8	6.4	6.1	5.7
35	OBS	31.4	30.9	27.7	26.4	24.8	21.0	18.1	14.6	12.9	13.3
	EXP	32.9	30.4	26.4	25.8	26.0	20.7	19.9*	18.2*	16.7*	15.3*
	Elow							19.3	17.1	15.2	13.5
	Eup							20.5	19.3	18.2	17.2
40	OBS	73.1	79.6	71.9	64.7	60.8	64.0	60.7	57.6	42.5	42.1
	EXP	73.4	80.8	72.9	63.8	62.3	61.2	48.7*	46.8*	42.9*	39.3*
	Elow							47.2	44.0	39.1	34.7
	Eup							50.2	49.7	46.9	44.3
45	OBS	137.6	168.5	182.7	164.4	146.2	139.6	142.9	137.5	126.4	111.0
	EXP	138.0	169.6	182.4	165.8	145.1	138.0	135.6*	107.8*	103.6*	94.9*
	Elow							131.4	101.3	94.5	83.9
	Eup							139.7	114.5	113.4	107.1
50	OBS	217.3	282.8	346.1	363.8	317.5	276.0	284.2	268.4	266.7	258.8
	EXP	217.7	279.1	334.8	363.0	330.0	281.3	267.5*	262.8*	208.9*	200.8*
	Elow							259.4	247.0	190.4	177.5
	Eup							275.7	279.0	228.6	226.5
55	OBS	305.4	395.9	496.6	598.2	634.4	587.4	480.1	485.6	490.5	517.9
	EXP	304.4	395.6	495.1	598.7	648.9	574.4	489.7*	465.7*	457.4*	363.7*
	Elow							474.8	437.8	416.9	321.4
	Eup							504.6	494.5	500.5	410.1
60	OBS	420.6	510.0	672.8	859.0	1016.5	1100.0	962.4	804.8	807.0	865.5
	EXP	416.6	530.3	672.9	848.8	1026.2	1083.3	958.9*	817.4*	777.5*	763.6*
	Elow							929.7	768.4	708.6	674.8
	Eup							988.1	868.0	850.7	861.0
65	OBS	513.8	650.7	803.2	1027.4	1295.9	1527.3	1534.4	1383.0	1223.4	1323.5
	EXP	510.7	647.5	804.6	1029.1	1297.9	1528.2	1613.3*	1428.0*	1217.3*	1157.8*
	Elow							1564.1	1342.4	1109.5	1023.1
	Eup							1662.4	1516.3	1331.9	1305.4
70	OBS	543.7	726.2	883.2	1107.3	1438.8	1726.6	2025.1	2041.2	1881.6	1859.9
	EXP	553.3	716.0	886.2	1110.0	1419.3	1743.4	2052.8*	2167.1*	1918.3*	1635.2*
	Elow							1990.3	2037.1	1748.3	1444.9
	Eup							2115.3	2301.1	2098.9	1843.6
75	OBS	579.2	734.5	895.0	1131.5	1459.5	1754.8	2016.4	2317.6	2428.0	2486.5
	EXP	579.2	722.5	912.7	1138.8	1426.0	1775.9	2181.4*	2568.5*	2711.5*	2400.2*
	Elow							2115.0	2414.5	2471.3	2120.9
	Eup							2247.8	2727.3	2966.8	2706.2
30-79	OBS	219.6	276.1	335.5	399.4	458.2	497.6	500.1	483.7	464.5	478.0
	EXP	219.6	276.2	334.8	399.2	460.4	496.7	510.1*	496.8*	460.4*	415.0*
	Elow							494.6	467.0	419.6	366.7
	Eup							525.6	527.5	503.8	467.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	97.0	89.0	70.0	72.0	70.0	58.0	47.0	47.0	56.0	43.0
	EXP	86.6	75.8	76.1	89.6	73.8	70.2	73.3*	70.8*	61.0*	50.3*
	CHI	1.253	2.301	0.493	3.472	0.192	2.132	9.450	7.992	0.409	1.052
35 -	OBS	282.0	251.0	220.0	219.0	241.0	207.0	177.0	162.0	152.0	148.0
	EXP	295.0	247.1	209.8	213.4	252.4	203.4	194.7*	202.2*	196.7*	169.9*
	CHI	0.571	0.062	0.500	0.148	0.512	0.065	1.614	7.997	10.146	2.819
40 -	OBS	662.0	709.0	577.0	509.0	499.0	618.0	597.0	565.0	472.0	497.0
	EXP	664.2	719.8	585.3	502.6	511.4	591.7	479.2*	459.4*	476.3*	463.9*
	CHI	0.007	0.162	0.119	0.082	0.299	1.170	28.953	24.254	0.039	2.355
45 -	OBS	1206.0	1500.0	1599.0	1302.0	1138.0	1133.0	1372.0	1347.0	1235.0	1228.0
	EXP	1209.0	1509.7	1596.5	1312.8	1129.5	1120.7	1301.6*	1056.0*	1012.4*	1050.8*
	CHI	0.007	0.062	0.004	0.089	0.064	0.136	3.811	80.182	48.936	29.885
50 -	OBS	2023.0	2412.0	3006.0	3110.0	2466.0	2111.0	2281.0	2549.0	2579.0	2493.0
	EXP	2026.9	2380.4	2908.0	3103.2	2562.5	2151.2	2147.5*	2495.1*	2020.3*	1934.6*
	CHI	0.007	0.421	3.304	0.015	3.634	0.751	8.300	1.166	154.502	161.202
55 -	OBS	2707.0	3562.0	4086.0	5019.0	5248.0	4434.0	3592.0	3831.0	4565.0	4900.0
	EXP	2697.8	3559.4	4073.8	5023.1	5368.1	4336.4	3663.7*	3674.5*	4257.5*	3441.4*
	CHI	0.031	0.002	0.037	0.003	2.685	2.198	1.404	6.668	22.203	618.235
60 -	OBS	3344.0	4300.0	5745.0	6718.0	8117.0	8688.0	6987.0	5838.0	6177.0	7835.0
	EXP	3312.2	4470.6	5745.6	6638.1	8194.6	8556.2	6961.9*	5929.7*	5951.4*	6912.7*
	CHI	0.305	6.509	0.000	0.961	0.734	2.029	0.090	1.418	8.556	123.058
65 -	OBS	3452.0	4753.0	6226.0	8095.0	9367.0	11343.0	11322.0	9484.0	8451.0	9640.0
	EXP	3431.3	4729.1	6236.6	8108.5	9381.1	11349.5	11904.1*	9793.1*	8409.0*	8433.0*
	CHI	0.125	0.120	0.018	0.023	0.021	0.004	28.469	9.757	0.210	172.743
70 -	OBS	2943.0	4211.0	5613.0	7520.0	10004.0	11083.0	13499.0	13578.0	11829.0	11917.0
	EXP	2994.7	4151.6	5632.0	7538.3	9868.9	11190.9	13683.8*	14415.2*	12059.6*	10477.0*
	CHI	0.892	0.849	0.064	0.044	1.850	1.041	2.496	48.620	4.411	197.932
75 -	OBS	2296.0	3102.0	4096.0	5748.0	8049.0	10063.0	10802.0	13070.0	13805.0	13664.0
	EXP	2296.0	3051.2	4177.4	5785.0	7864.2	10184.4	11686.0*	14485.2*	15417.1*	13189.9*
	CHI	0.000	0.846	1.585	0.237	4.344	1.448	66.865	138.266	168.570	17.040
30-79	OBS	19012.0	24889.0	31238.0	38312.0	45199.0	49738.0	50676.0	50471.0	49321.0	52365.0
	EXP	19013.6	24894.6	31241.1	38314.7	45206.2	49754.6	52095.9*	52581.2*	49861.4*	46123.4*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.973	0.960	0.989	1.135

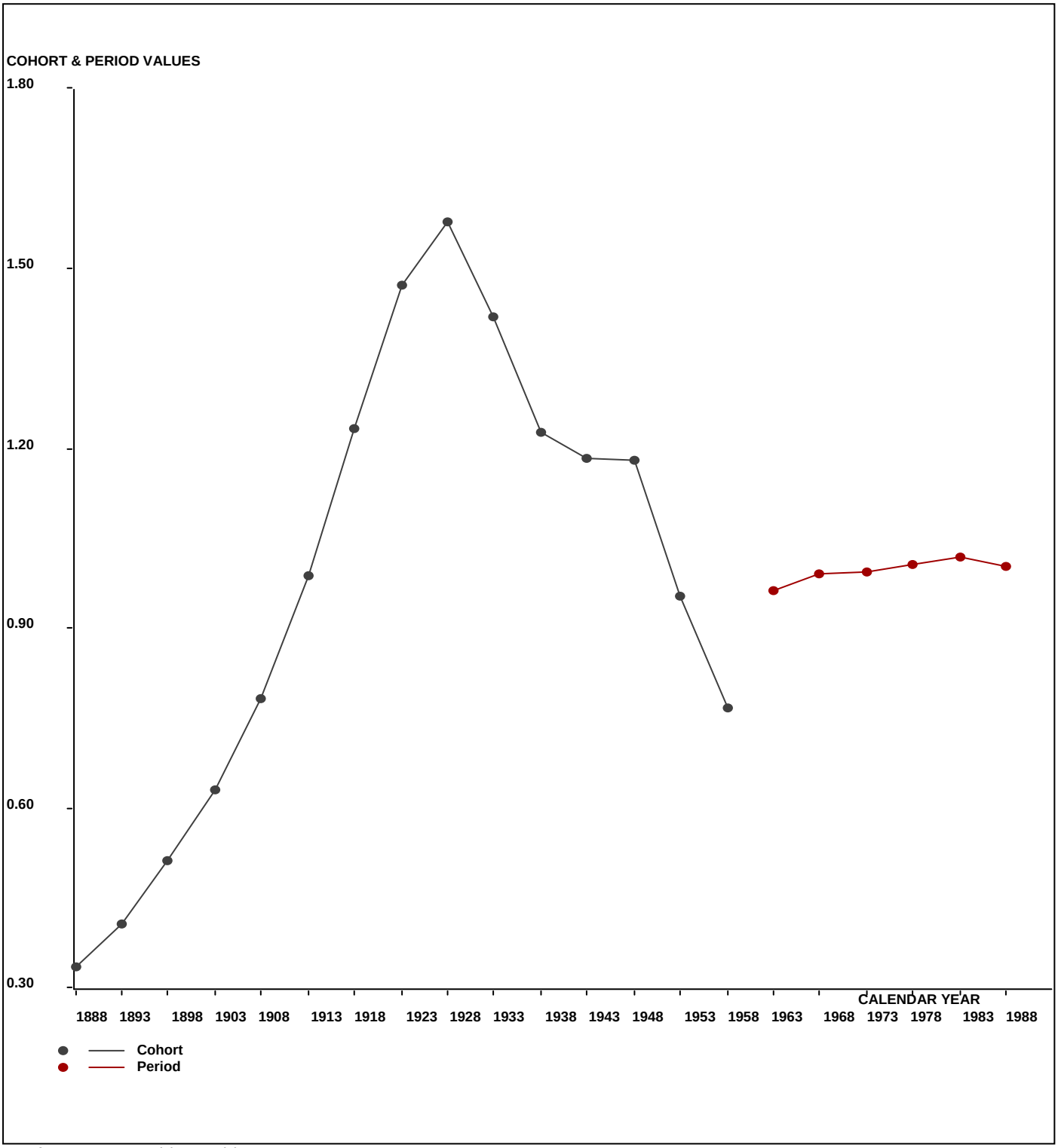
CHI SQUARE (LOG)= 2222.0734 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

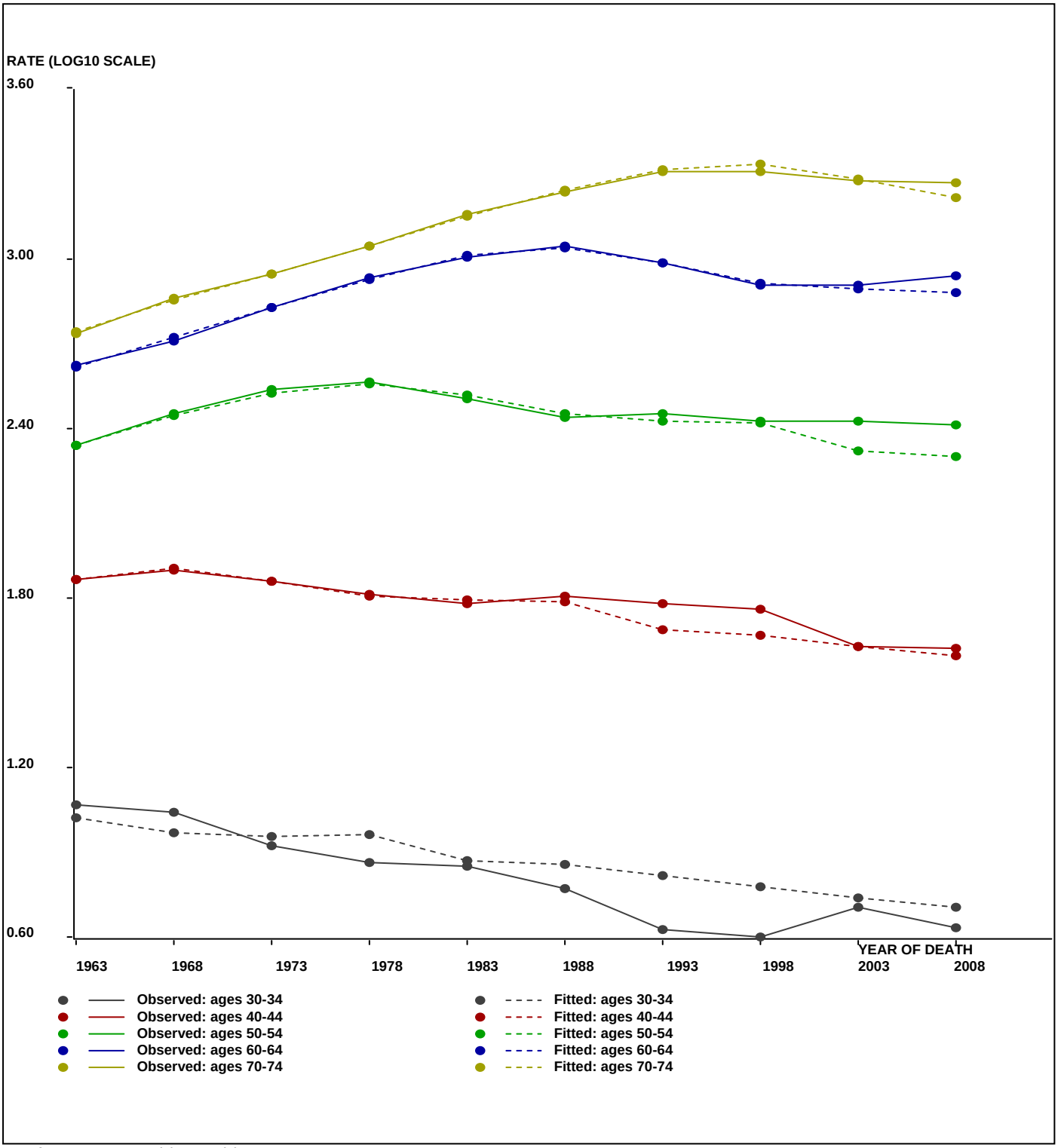


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	4.2	18.1	60.7	142.9	284.2	480.1	962.4	1534.4	2025.1	2016.4
	PRE	6.6	19.9	48.7	135.6	267.5	489.7	958.9	1613.3	2052.8	2181.4
	RES	-2.370	-1.808	11.968	7.336	16.631	-9.585	3.453	-78.893	-27.724	-165.007
1996-	OBS	4.0	14.6	57.6	137.5	268.4	485.6	804.8	1383.0	2041.2	2317.6
	PRE	6.0	18.2	46.8	107.8	262.8	465.7	817.4	1428.0	2167.1	2568.5
	RES	-2.032	-3.619	10.754	29.706	5.681	19.840	-12.640	-45.074	-125.854	-250.946
2001-	OBS	5.1	12.9	42.5	126.4	266.7	490.5	807.0	1223.4	1881.6	2428.0
	PRE	5.5	16.7	42.9	103.6	208.9	457.4	777.5	1217.3	1918.3	2711.5
	RES	-0.454	-3.787	-0.390	22.784	57.780	33.034	29.479	6.078	-36.688	-283.530
2006-	OBS	4.3	13.3	42.1	111.0	258.8	517.9	865.5	1323.5	1859.9	2486.5
	PRE	5.1	15.3	39.3	94.9	200.8	363.7	763.6	1157.8	1635.2	2400.2
	RES	-0.734	-1.968	2.799	16.012	57.977	154.173	101.887	165.708	224.755	86.269

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	47.0	177.0	597.0	1372.0	2281.0	3592.0	6987.0	11322.0	13499.0	10802.0
	PRE	73.3	194.7	479.2	1301.6	2147.5	3663.7	6961.9	11904.1	13683.8	11686.0
	CHI	9.450	1.614	28.953	3.811	8.300	1.404	0.090	28.469	2.496	66.865
1996-	OBS	47.0	162.0	565.0	1347.0	2549.0	3831.0	5838.0	9484.0	13578.0	13070.0
	PRE	70.8	202.2	459.4	1056.0	2495.1	3674.5	5929.7	9793.1	14415.2	14485.2
	CHI	7.992	7.997	24.254	80.182	1.166	6.668	1.418	9.757	48.620	138.266
2001-	OBS	56.0	152.0	472.0	1235.0	2579.0	4565.0	6177.0	8451.0	11829.0	13805.0
	PRE	61.0	196.7	476.3	1012.4	2020.3	4257.5	5951.4	8409.0	12059.6	15417.1
	CHI	0.409	10.146	0.039	48.936	154.502	22.203	8.556	0.210	4.411	168.570
2006-	OBS	43.0	148.0	497.0	1228.0	2493.0	4900.0	7835.0	9640.0	11917.0	13664.0
	PRE	50.3	169.9	463.9	1050.8	1934.6	3441.4	6912.7	8433.0	10477.0	13189.9
	CHI	1.052	2.819	2.355	29.885	161.202	618.235	123.058	172.743	197.932	17.040

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	866.75	17.00	51	P, C	96.12	4626.36	0.0000
AGE-PERIOD	521.12	11.58	45	Cohort	93.55	2786.60	0.0000
AGE-COHORT	144.19	4.01	36	Period	76.67	765.55	0.0000
PERIOD-COHORT	74.64	1.87	40	Age	54.94	399.46	0.0000
FULL AGE-PERIOD-COHORT	33.63	1.05	32			179.13	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.346317	22.198174
35	1.505536	32.028480
40	1.713797	51.736453
45	1.962961	91.824945
50	2.218954	165.559514
55	2.466947	293.053526
60	2.704284	506.156060
65	2.919095	830.032021
70	3.109462	1286.656051
75	3.267972	1853.410114

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.040776	1.098440
1966	0.048015	1.116901
1971	0.005509	1.012766
1976	-0.045442	0.900655
1981	-0.051271	0.888647
1986	-0.007062	0.983870

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.074325	1.186657
1891	0.011246	1.026232
1896	-0.022664	0.949152
1901	-0.049116	0.893066
1906	-0.067244	0.856557
1911	-0.020134	0.954699
1916	0.037025	1.088994
1921	0.088591	1.226283
1926	0.095193	1.245067
1931	0.042043	1.101649
1936	-0.055311	0.880418
1941	-0.139286	0.725628
1946	-0.243738	0.570508
1951	-0.309231	0.490647
1956	-0.294751	0.507281

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	138.0	165.0	176.0	133.0	102.0	108.0
	EXP	220.3	176.2	136.5	111.4	95.2	108.0
	CHI	30.8	0.7	11.5	4.2	0.5	0.0
35 -	OBS	326.0	313.0	290.0	184.0	151.0	145.0
	EXP	393.0	320.6	227.1	173.3	157.7	152.2
	CHI	11.4	0.2	17.4	0.7	0.3	0.3
40 -	OBS	564.0	615.0	503.0	369.0	288.0	263.0
	EXP	630.7	640.5	463.4	323.0	273.7	280.6
	CHI	7.1	1.0	3.4	6.6	0.8	1.1
45 -	OBS	897.0	1107.0	1095.0	796.0	542.0	456.0
	EXP	962.4	1119.7	1013.5	721.3	559.1	532.2
	CHI	4.4	0.1	6.6	7.7	0.5	10.9
50 -	OBS	1572.0	1771.0	1805.0	1635.0	1272.0	1000.0
	EXP	1616.2	1717.4	1785.7	1586.9	1258.7	1096.8
	CHI	1.2	1.7	0.2	1.5	0.1	8.5
55 -	OBS	2445.0	2876.0	2688.0	2654.0	2709.0	2336.0
	EXP	2444.0	2811.6	2659.5	2715.5	2682.1	2397.8
	CHI	0.0	1.5	0.3	1.4	0.3	1.6
60 -	OBS	4003.0	4076.0	4211.0	3883.0	4397.0	4822.0
	EXP	3947.6	4082.5	4179.0	3882.4	4404.5	4897.1
	CHI	0.8	0.0	0.2	0.0	0.0	1.2
65 -	OBS	5835.0	6145.0	5502.0	5508.0	5755.0	7561.0
	EXP	5814.2	6047.1	5581.6	5623.6	5805.9	7437.4
	CHI	0.1	1.6	1.1	2.4	0.4	2.1
70 -	OBS	8065.0	7971.0	7234.0	6699.0	7482.0	8879.0
	EXP	7850.2	7909.4	7396.0	6741.3	7589.9	8849.0
	CHI	5.9	0.5	3.6	0.3	1.5	0.1
75 -	OBS	9576.0	8751.0	8071.0	7579.0	7906.0	10150.0
	EXP	9576.0	8971.4	8154.1	7573.2	7780.3	9983.5
	CHI	0.0	5.4	0.8	0.0	2.0	2.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	16991.83	424.80	40	P, C	85.06	0.0000
AGE-PERIOD	40910.31	1022.76	40	Cohort	93.79	0.0000
AGE-COHORT	15204.43	380.11	40	Period	83.30	0.0000
PERIOD-COHORT	5503.74	137.59	40	Age	53.86	0.0000
FULL AGE-PERIOD-COHORT	2539.16	63.48	40			0.0000

AGE	EFFECT
30	22.198174
35	32.028480
40	51.736453
45	91.824945
50	165.559514
55	293.053526
60	506.156060
65	830.032021
70	1286.656051
75	1853.410114

PERIOD	EFFECT	LOWER	UPPER
% Period Change	110.7155	107.7155	113.7155
1961	1.098440		
1966	1.116901		
1971	1.012766		
1976	0.900655		
1981	0.888647		
1986	0.983870		
1991	1.089296	1.059780	1.118812
1996	1.206020	1.141547	1.272263
2001	1.335250	1.229623	1.446760
2006	1.478328	1.324494	1.645189

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.186657	1.000000	
1891	1.026232	2.000000	
1896	0.949152	4.000000	
1901	0.893066	8.000000	
1906	0.856557	16.000000	
1911	0.954699	32.000000	
1916	1.088994	64.000000	
1921	1.226283	128.000000	
1926	1.245067	256.000000	
1931	1.101649	512.000000	
1936	0.880418	1024.000000	
1941	0.725628	2048.000000	
1946	0.570508	4096.000000	
1951	0.490647	8192.000000	
1956	0.419719	EXTRAPOLATION	0.507281
1961	0.355523	EXTRAPOLATION	
1966	0.301147	EXTRAPOLATION	
1971	0.255087	EXTRAPOLATION	
1976	0.216072	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	16.8	20.4	21.0	13.6	10.4	11.1	6.3	6.8	5.7	5.7
	EXP	26.9	21.8	16.3	11.4	9.7	9.2	8.6*	8.1*	7.6*	7.1*
	Elow							8.4	7.6	7.0	6.4
	Eup							8.8	8.5	8.2	7.9
35	OBS	36.3	38.5	36.5	22.2	15.5	14.7	11.4	9.0	7.0	6.1
	EXP	43.8	39.4	28.6	20.9	16.2	15.5	14.6*	13.7*	12.9*	12.1*
	Elow							14.2	13.0	11.9	10.8
	Eup							15.0	14.5	14.0	13.4
40	OBS	62.3	69.1	62.7	46.9	35.1	27.2	21.3	21.2	16.7	16.2
	EXP	69.7	71.9	57.7	41.0	33.4	29.0	27.7*	26.2*	24.6*	23.0*
	Elow							26.9	24.8	22.6	20.6
	Eup							28.4	27.6	26.6	25.6
45	OBS	102.4	124.3	125.1	100.5	69.6	56.2	41.7	36.4	34.8	34.0
	EXP	109.8	125.8	115.8	91.1	71.8	65.6	57.1*	54.3*	51.5*	48.3*
	Elow							55.5	51.4	47.4	43.2
	Eup							58.6	57.3	55.8	53.7
50	OBS	168.9	207.7	207.8	191.3	163.8	130.7	101.4	100.3	95.8	81.7
	EXP	173.6	201.4	205.6	185.7	162.1	143.4	130.9*	113.9*	108.5*	102.7*
	Elow							127.3	107.8	99.9	92.0
	Eup							134.4	120.2	117.5	114.3
55	OBS	275.8	319.6	326.7	316.3	327.5	309.4	242.8	221.1	209.3	194.5
	EXP	275.7	312.5	323.2	323.7	324.2	317.6	281.0*	256.5*	223.2*	212.6*
	Elow							273.4	242.7	205.6	190.4
	Eup							288.7	270.5	241.9	236.6
60	OBS	503.5	483.5	493.1	496.5	550.6	610.5	541.7	474.5	435.8	412.2
	EXP	496.5	484.2	489.4	496.4	551.6	620.0	607.4*	537.4*	490.4*	426.9*
	Elow							590.9	508.7	451.6	382.5
	Eup							623.9	567.0	531.4	475.1
65	OBS	868.5	841.3	709.8	699.0	796.2	1018.1	1095.5	1019.0	838.6	777.5
	EXP	865.4	827.9	720.0	713.7	803.2	1001.4	1125.7*	1102.8*	975.8*	890.4*
	Elow							1095.2	1043.8	898.6	797.7
	Eup							1156.2	1163.4	1057.3	990.9
70	OBS	1490.1	1374.6	1138.2	986.4	1076.1	1383.2	1702.7	1819.3	1650.9	1390.8
	EXP	1450.4	1364.0	1163.7	992.6	1091.6	1378.6	1718.7*	1932.0*	1892.6*	1674.6*
	Elow							1672.1	1828.7	1742.9	1500.4
	Eup							1765.3	2038.1	2050.7	1863.7
75	OBS	2415.9	2072.2	1763.5	1491.9	1433.6	1769.9	2186.5	2572.0	2638.3	2482.5
	EXP	2415.9	2124.4	1781.6	1490.8	1410.8	1740.9	2198.6*	2741.0*	3081.3*	3018.5*
	Elow							2139.0	2594.5	2837.5	2704.4
	Eup							2258.2	2891.6	3338.6	3359.2
30-79	OBS	357.4	348.9	316.0	286.2	292.0	333.7	351.0	356.2	329.8	299.6
	EXP	359.1	348.6	314.3	285.3	292.1	335.8	371.8*	389.6*	381.3*	352.4*
	Elow							361.8	368.8	351.1	315.8
	Eup							381.9	411.0	413.1	392.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	138.0	165.0	176.0	133.0	102.0	108.0	70.0	79.0	63.0	56.0
	EXP	220.3	176.2	136.5	111.4	95.2	89.4	95.5*	94.4*	83.2*	70.2*
	CHI	30.759	0.708	11.456	4.199	0.479	3.889	6.803	2.499	4.914	2.877
35 -	OBS	326.0	313.0	290.0	184.0	151.0	145.0	112.0	100.0	82.0	68.0
	EXP	393.0	320.6	227.1	173.3	157.7	152.2	143.5*	152.6*	151.9*	134.3*
	CHI	11.420	0.178	17.437	0.657	0.283	0.337	6.932	18.120	32.166	32.737
40 -	OBS	564.0	615.0	503.0	369.0	288.0	263.0	210.0	208.0	185.0	191.0
	EXP	630.7	640.5	463.4	323.0	273.7	280.6	272.1*	257.1*	272.8*	272.0*
	CHI	7.062	1.018	3.389	6.558	0.752	1.107	14.192	9.368	28.266	24.117
45 -	OBS	897.0	1107.0	1095.0	796.0	542.0	456.0	400.0	357.0	340.0	376.0
	EXP	962.4	1119.7	1013.5	721.3	559.1	532.2	547.8*	532.2*	502.7*	534.1*
	CHI	4.438	0.144	6.550	7.727	0.524	10.920	39.896	57.697	52.681	46.805
50 -	OBS	1572.0	1771.0	1805.0	1635.0	1272.0	1000.0	814.0	952.0	926.0	787.0
	EXP	1616.2	1717.4	1785.7	1586.9	1258.7	1096.8	1050.5*	1081.7*	1048.8*	989.5*
	CHI	1.211	1.676	0.209	1.456	0.140	8.550	53.238	15.548	14.375	41.429
55 -	OBS	2445.0	2876.0	2688.0	2654.0	2709.0	2336.0	1817.0	1744.0	1948.0	1840.0
	EXP	2444.0	2811.6	2659.5	2715.5	2682.1	2397.8	2102.8*	2023.3*	2077.8*	2011.0*
	CHI	0.000	1.477	0.306	1.394	0.269	1.592	38.847	38.567	8.104	14.546
60 -	OBS	4003.0	4076.0	4211.0	3883.0	4397.0	4822.0	3933.0	3442.0	3336.0	3731.0
	EXP	3947.6	4082.5	4179.0	3882.4	4404.5	4897.1	4409.7*	3898.6*	3753.9*	3864.4*
	CHI	0.778	0.010	0.245	0.000	0.013	1.152	51.530	53.470	46.529	4.603
65 -	OBS	5835.0	6145.0	5502.0	5508.0	5755.0	7561.0	8084.0	6988.0	5793.0	5663.0
	EXP	5814.2	6047.1	5581.6	5623.6	5805.9	7437.4	8306.7*	7562.6*	6740.5*	6485.3*
	CHI	0.074	1.585	1.135	2.374	0.447	2.053	5.971	43.661	133.188	104.257
70 -	OBS	8065.0	7971.0	7234.0	6699.0	7482.0	8879.0	11350.0	12102.0	10379.0	8911.0
	EXP	7850.2	7909.4	7396.0	6741.3	7589.9	8849.0	11456.7*	12851.6*	11898.5*	10729.7*
	CHI	5.876	0.479	3.550	0.265	1.534	0.102	0.994	43.723	194.057	308.283
75 -	OBS	9576.0	8751.0	8071.0	7579.0	7906.0	10150.0	11713.0	14505.0	15001.0	13642.0
	EXP	9576.0	8971.4	8154.1	7573.2	7780.3	9983.5	11778.0*	15458.1*	17519.4*	16587.5*
	CHI	0.000	5.415	0.846	0.004	2.031	2.775	0.359	58.763	362.013	523.029
30-79	OBS	33421.0	33790.0	31575.0	29440.0	30604.0	35720.0	38503.0	40477.0	38053.0	35265.0
	EXP	33454.7	33796.4	31596.3	29451.9	30607.2	35716.1	40163.4*	43912.2*	44049.6*	41678.0*
	O/E	0.999	1.000	0.999	1.000	1.000	1.000	0.959	0.922	0.864	0.846

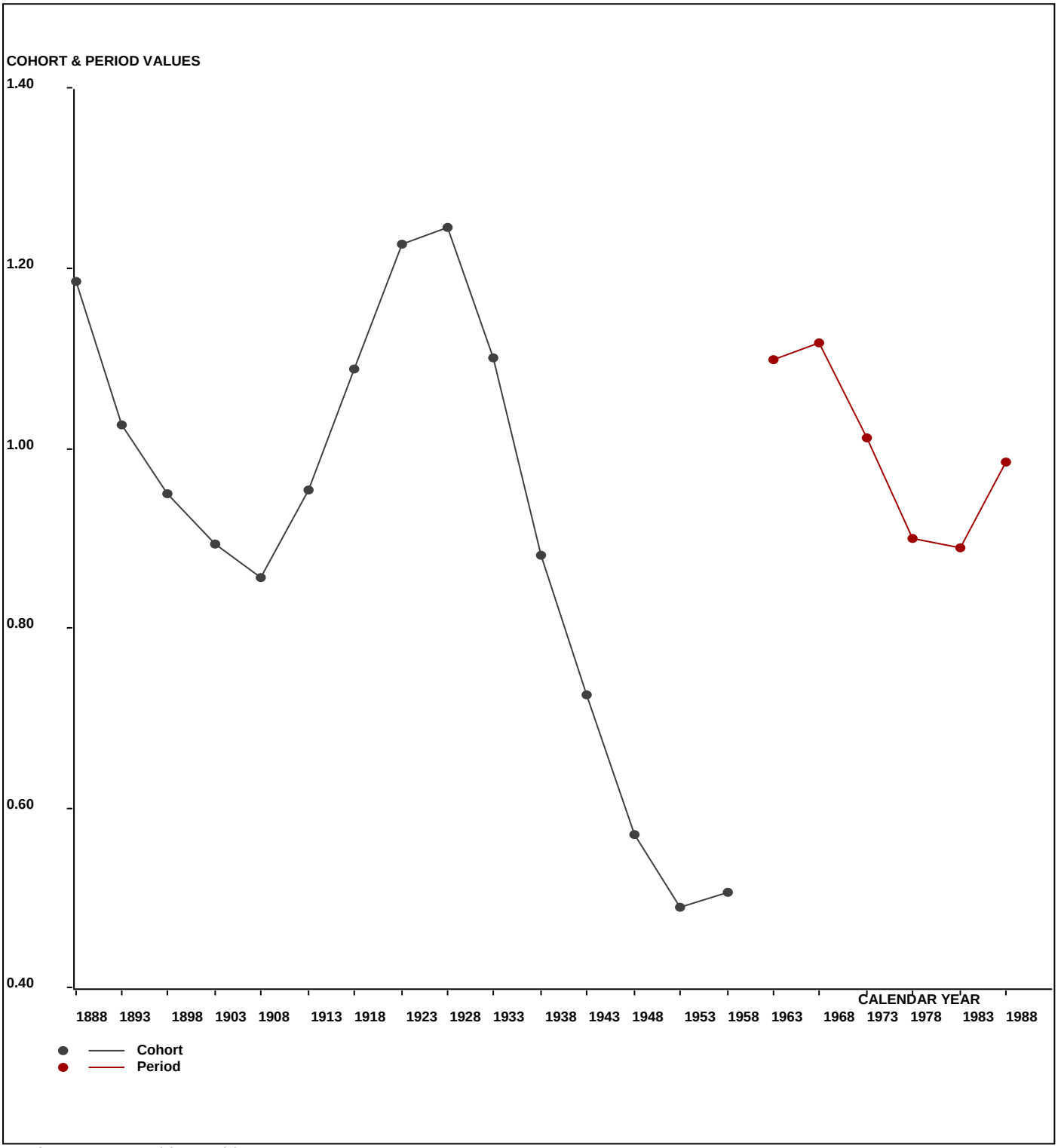
CHI SQUARE (LOG)= 2539.1551 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

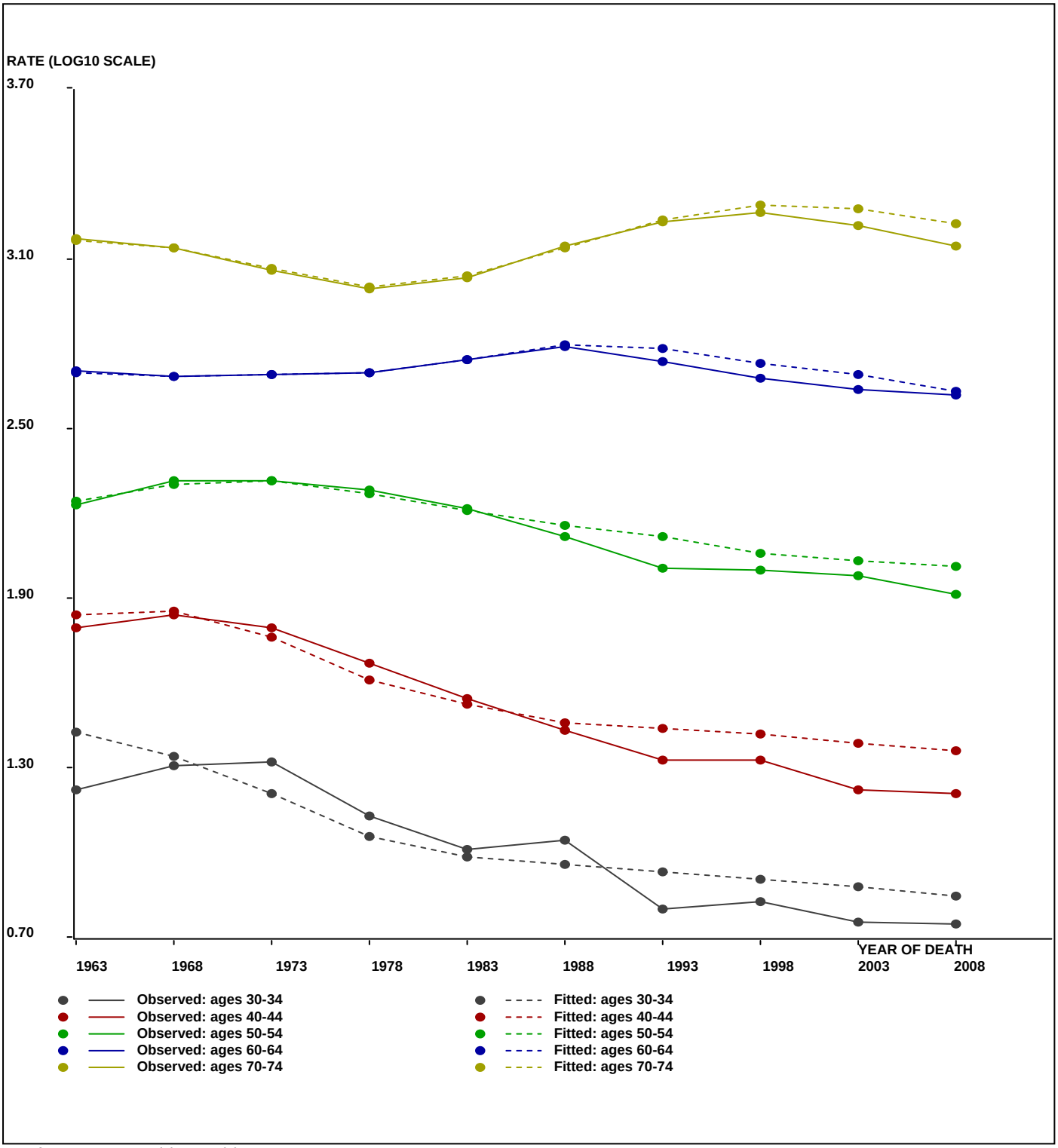


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

UK COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	6.3	11.4	21.3	41.7	101.4	242.8	541.7	1095.5	1702.7	2186.5
	PRE	8.6	14.6	27.7	57.1	130.9	281.0	607.4	1125.7	1718.7	2198.6
	RES	-2.295	-3.218	-6.314	-15.400	-29.460	-38.200	-65.660	-30.181	-16.005	-12.131
1996-	OBS	6.8	9.0	21.2	36.4	100.3	221.1	474.5	1019.0	1819.3	2572.0
	PRE	8.1	13.7	26.2	54.3	113.9	256.5	537.4	1102.8	1932.0	2741.0
	RES	-1.312	-4.732	-4.999	-17.890	-13.657	-35.407	-62.940	-83.792	-112.690	-169.001
2001-	OBS	5.7	7.0	16.7	34.8	95.8	209.3	435.8	838.6	1650.9	2638.3
	PRE	7.6	12.9	24.6	51.5	108.5	223.2	490.4	975.8	1892.6	3081.3
	RES	-1.837	-5.926	-7.905	-16.659	-12.698	-13.942	-54.598	-137.162	-241.705	-442.924
2006-	OBS	5.7	6.1	16.2	34.0	81.7	194.5	412.2	777.5	1390.8	2482.5
	PRE	7.1	12.1	23.0	48.3	102.7	212.6	426.9	890.4	1674.6	3018.5
	RES	-1.435	-5.963	-6.859	-14.287	-21.020	-18.078	-14.733	-112.893	-283.859	-535.993

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	70.0	112.0	210.0	400.0	814.0	1817.0	3933.0	8084.0	11350.0	11713.0
	PRE	95.5	143.5	272.1	547.8	1050.5	2102.8	4409.7	8306.7	11456.7	11778.0
	CHI	6.803	6.932	14.192	39.896	53.238	38.847	51.530	5.971	0.994	0.359
1996-	OBS	79.0	100.0	208.0	357.0	952.0	1744.0	3442.0	6988.0	12102.0	14505.0
	PRE	94.4	152.6	257.1	532.2	1081.7	2023.3	3898.6	7562.6	12851.6	15458.1
	CHI	2.499	18.120	9.368	57.697	15.548	38.567	53.470	43.661	43.723	58.763
2001-	OBS	63.0	82.0	185.0	340.0	926.0	1948.0	3336.0	5793.0	10379.0	15001.0
	PRE	83.2	151.9	272.8	502.7	1048.8	2077.8	3753.9	6740.5	11898.5	17519.4
	CHI	4.914	32.166	28.266	52.681	14.375	8.104	46.529	133.188	194.057	362.013
2006-	OBS	56.0	68.0	191.0	376.0	787.0	1840.0	3731.0	5663.0	8911.0	13642.0
	PRE	70.2	134.3	272.0	534.1	989.5	2011.0	3864.4	6485.3	10729.7	16587.5
	CHI	2.877	32.737	24.117	46.805	41.429	14.546	4.603	104.257	308.283	523.029

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	104639.29	2051.75	51	P, C	99.90	563232.29	0.0000
AGE-PERIOD	1519.61	33.77	45	Cohort	93.20	8060.71	0.0000
AGE-COHORT	6316.21	175.45	36	Period	98.36	33515.75	0.0000
PERIOD-COHORT	698.66	17.47	40	Age	85.21	3707.59	0.0000
FULL AGE-PERIOD-COHORT	103.33	3.23	32			547.85	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	2.128070	134.298068
35	2.607899	405.414211
40	2.990525	978.418851
45	3.286997	1936.406890
50	3.531501	3400.171361
55	3.739709	5491.729955
60	3.935749	8624.807317
65	4.115570	13048.779056
70	4.295876	19764.070980
75	4.466989	29308.155842

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.108880	1.284933
1966	0.099769	1.258255
1971	0.058850	1.145117
1976	-0.032933	0.926972
1981	-0.130790	0.739963
1986	-0.223101	0.598272

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.033398	0.925980
1891	-0.018466	0.958372
1896	-0.003836	0.991207
1901	0.014624	1.034246
1906	0.008845	1.020574
1911	0.012032	1.028092
1916	0.008498	1.019761
1921	0.000361	1.000832
1926	-0.007814	0.982168
1931	-0.022389	0.949753
1936	-0.050978	0.889246
1941	-0.069871	0.851391
1946	-0.094122	0.805152
1951	-0.117698	0.762609
1956	-0.102913	0.789018

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	5080.0	4449.0	4192.0	4030.0	3674.0	3417.0
	EXP	4910.5	4431.4	4357.1	4089.1	3643.5	3417.0
	CHI	5.8	0.1	6.3	0.9	0.3	0.0
35 -	OBS	16268.0	14558.0	11852.0	10371.0	9811.0	8885.0
	EXP	16125.4	14445.2	12122.3	10416.8	9724.3	8915.7
	CHI	1.3	0.9	6.0	0.2	0.8	0.1
40 -	OBS	38582.0	37624.0	31238.0	23792.0	20359.0	19068.0
	EXP	38977.4	37787.4	31579.4	23332.7	19903.5	19096.4
	CHI	4.0	0.7	3.7	9.0	10.4	0.0
45 -	OBS	70994.0	73674.0	66731.0	49705.0	36793.0	31227.0
	EXP	72183.4	73927.1	66591.3	48875.0	36091.3	31481.1
	CHI	19.6	0.9	0.3	14.1	13.6	2.1
50 -	OBS	116296.0	119255.0	113898.0	91385.0	66394.0	49184.0
	EXP	117943.4	119038.0	113258.3	90160.6	65928.7	50115.2
	CHI	23.0	0.4	3.6	16.6	3.3	17.3
55 -	OBS	160167.0	174045.0	163952.0	139855.0	110120.0	80915.0
	EXP	162063.5	173872.8	163205.2	138214.2	109557.4	82174.7
	CHI	22.2	0.2	3.4	19.5	2.9	19.3
60 -	OBS	205910.0	223132.0	222462.0	189612.0	158829.0	127374.0
	EXP	206168.9	221507.0	222327.4	188685.8	159348.3	129305.4
	CHI	0.3	11.9	0.1	4.5	1.7	28.8
65 -	OBS	253002.0	260317.0	261459.0	235475.0	200601.0	172601.0
	EXP	250108.9	259126.3	260514.8	238043.5	201972.7	173732.2
	CHI	33.5	5.5	3.4	27.7	9.3	7.4
70 -	OBS	277370.0	288133.0	277827.0	255120.0	232517.0	204299.0
	EXP	275250.6	288935.6	277560.5	256375.1	233512.2	203647.6
	CHI	16.3	2.2	0.3	6.1	4.2	2.1
75 -	OBS	258962.0	281452.0	275926.0	244221.0	228182.0	215731.0
	EXP	258962.0	283587.6	278042.3	245425.4	227622.1	210909.1
	CHI	0.0	16.1	16.1	5.9	1.4	110.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	2899890.45	72497.26	40	P, C	94.09	0.0000
AGE-PERIOD	94243.78	2356.09	40	Cohort	-81.80	0.0000
AGE-COHORT	50351.08	1258.78	40	Period	-240.28	0.0000
PERIOD-COHORT	114031.90	2850.80	40	Age	-50.25	0.0000
FULL AGE-PERIOD-COHORT	171334.63	4283.37	40			0.0000

AGE	EFFECT
30	134.298068
35	405.414211
40	978.418851
45	1936.406890
50	3400.171361
55	5491.729955
60	8624.807317
65	13048.779056
70	19764.070980
75	29308.155842

PERIOD	EFFECT	LOWER	UPPER
% Period Change	80.8517	77.8517	83.8517
1961	1.284933		
1966	1.258255		
1971	1.145117		
1976	0.926972		
1981	0.739963		
1986	0.598272		
1991	0.483714	0.465765	0.501662
1996	0.391091	0.362606	0.420652
2001	0.316204	0.282295	0.352724
2006	0.255656	0.219772	0.295765

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.925980	1.000000	
1891	0.958372	2.000000	
1896	0.991207	4.000000	
1901	1.034246	8.000000	
1906	1.020574	16.000000	
1911	1.028092	32.000000	
1916	1.019761	64.000000	
1921	1.000832	128.000000	
1926	0.982168	256.000000	
1931	0.949753	512.000000	
1936	0.889246	1024.000000	
1941	0.851391	2048.000000	
1946	0.805152	4096.000000	
1951	0.762609	8192.000000	
1956	0.729763	EXTRAPOLATION	0.789018
1961	0.695492	EXTRAPOLATION	
1966	0.662830	EXTRAPOLATION	
1971	0.631703	EXTRAPOLATION	
1976	0.602037	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	169.5	150.9	126.0	98.8	76.4	63.4	54.1	50.9	58.0	54.7
	EXP	163.9	150.3	130.9	100.2	75.8	58.6	45.2*	34.8*	26.8*	20.7*
	Elow							43.5	32.3	23.9	17.8
	Eup							46.9	37.4	29.9	23.9
35	OBS	516.2	488.3	403.6	318.6	243.7	184.3	155.2	145.4	144.7	128.3
	EXP	511.6	484.5	412.8	320.0	241.5	185.0	143.1*	110.3*	85.0*	65.5*
	Elow							137.8	102.2	75.9	56.3
	Eup							148.4	118.6	94.8	75.7
40	OBS	1245.5	1203.9	1052.6	822.4	630.5	470.6	383.3	344.9	349.8	293.5
	EXP	1258.2	1209.1	1064.1	806.5	616.4	471.3	360.9*	279.2*	215.2*	165.8*
	Elow							347.5	258.9	192.1	142.5
	Eup							374.3	300.4	240.0	191.8
45	OBS	2495.5	2430.2	2182.4	1733.8	1298.9	978.4	804.8	720.6	695.0	601.9
	EXP	2537.3	2438.5	2177.9	1704.8	1274.2	986.3	754.2*	577.5*	446.8*	344.3*
	Elow							726.2	535.5	398.9	296.0
	Eup							782.1	621.2	498.4	398.3
50	OBS	4429.0	4370.8	3918.8	3137.7	2406.4	1775.3	1484.2	1311.5	1248.6	1071.4
	EXP	4491.7	4362.8	3896.8	3095.7	2389.6	1808.9	1400.3*	1070.7*	819.9*	634.4*
	Elow							1348.3	992.7	732.0	545.3
	Eup							1452.2	1151.6	914.6	733.9
55	OBS	7117.4	7111.2	6442.3	5155.4	4011.7	3072.6	2479.8	2223.0	1973.4	1670.7
	EXP	7201.7	7104.1	6412.9	5094.9	3991.2	3120.5	2362.2*	1828.6*	1398.2*	1070.7*
	Elow							2274.6	1695.4	1248.2	920.4
	Eup							2449.9	1966.8	1559.6	1238.7
60	OBS	11447.4	11156.7	10160.0	8193.0	6366.5	4992.3	4115.1	3568.5	3135.1	2468.2
	EXP	11461.8	11075.5	10153.9	8152.9	6387.3	5068.0	3962.3*	2999.5*	2321.9*	1775.3*
	Elow							3815.3	2781.0	2072.9	1526.2
	Eup							4109.3	3226.2	2590.1	2053.9
65	OBS	16811.6	17059.0	15305.1	12301.5	9779.5	7762.3	6451.3	5565.0	4574.4	3575.5
	EXP	16619.4	16981.0	15249.8	12435.7	9846.4	7813.2	6199.3*	4846.8*	3669.1*	2840.2*
	Elow							5969.3	4493.8	3275.6	2441.6
	Eup							6429.3	5213.2	4092.9	3285.8
70	OBS	24525.7	24581.1	23429.7	18606.1	14971.4	12096.5	10097.0	8790.9	7193.0	5263.7
	EXP	24338.3	24649.6	23407.2	18697.7	15035.5	12058.0	9568.1*	7591.7*	5935.5*	4493.2*
	Elow							9213.1	7038.8	5299.0	3862.5
	Eup							9923.1	8165.5	6621.0	5198.1
75	OBS	34871.5	35075.8	33012.9	27960.4	22187.6	18439.0	15757.9	14010.0	11764.7	8524.4
	EXP	34871.5	35342.0	33266.2	28098.3	22133.1	18026.8	14456.9*	11471.7*	9102.1*	7116.3*
	Elow							13920.5	10636.2	8126.0	6117.5
	Eup							14993.3	12338.8	10153.3	8232.8
30-79	OBS	6772.7	6747.1	6195.9	5011.3	3943.7	3125.8	2604.3	2288.1	1970.8	1537.4
	EXP	6772.6	6746.8	6196.0	5010.1	3942.3	3129.4	2460.5*	1919.7*	1488.0*	1145.2*
	Elow							2369.2	1779.9	1328.5	984.5
	Eup							2551.8	2064.8	1659.9	1324.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	5080.0	4449.0	4192.0	4030.0	3674.0	3417.0	3045.0	2739.0	2946.0	2752.0
	EXP	4910.5	4431.4	4357.1	4089.1	3643.5	3160.4	2541.1*	1872.9*	1363.3*	1040.8*
	CHI	5.849	0.070	6.257	0.854	0.256	20.837	99.923	400.504	1837.400	2813.564
35 -	OBS	16268.0	14558.0	11852.0	10371.0	9811.0	8885.0	8406.0	8309.0	7873.0	6565.0
	EXP	16125.4	14445.2	12122.3	10416.8	9724.3	8915.7	7751.2*	6299.8*	4623.3*	3351.5*
	CHI	1.262	0.881	6.026	0.201	0.773	0.106	55.320	640.778	2284.295	3081.071
40 -	OBS	38582.0	37624.0	31238.0	23792.0	20359.0	19068.0	18406.0	18694.0	19912.0	15918.0
	EXP	38977.4	37787.4	31579.4	23332.7	19903.5	19096.4	17333.4*	15134.2*	12248.0*	8993.2*
	CHI	4.012	0.706	3.691	9.040	10.423	0.042	66.377	837.294	4795.653	5332.031
45 -	OBS	70994.0	73674.0	66731.0	49705.0	36793.0	31227.0	32009.0	34365.0	37363.0	33930.0
	EXP	72183.4	73927.1	66591.3	48875.0	36091.3	31481.1	29993.8*	27543.8*	24022.9*	19409.1*
	CHI	19.598	0.867	0.293	14.094	13.641	2.051	135.390	1689.259	7407.896	10863.720
50 -	OBS	116296.0	119255.0	113898.0	91385.0	66394.0	49184.0	46344.0	51662.0	59029.0	56803.0
	EXP	117943.4	119038.0	113258.3	90160.6	65928.7	50115.2	43724.6*	42173.9*	38761.2*	33633.3*
	CHI	23.010	0.396	3.613	16.629	3.284	17.304	156.921	2134.586	10597.758	15961.483
55 -	OBS	160167.0	174045.0	163952.0	139855.0	110120.0	80915.0	65757.0	67309.0	75974.0	76897.0
	EXP	162063.5	173872.8	163205.2	138214.2	109557.4	82174.7	62639.7*	55366.5*	53826.3*	49280.7*
	CHI	22.194	0.171	3.417	19.479	2.890	19.310	155.132	2576.005	9113.075	15475.855
60 -	OBS	205910.0	223132.0	222462.0	189612.0	158829.0	127374.0	101463.0	90090.0	90871.0	91070.0
	EXP	206168.9	221507.0	222327.4	188685.8	159348.3	129305.4	97694.6*	75724.3*	67300.9*	65505.0*
	CHI	0.325	11.921	0.081	4.546	1.692	28.847	145.357	2725.310	8254.744	9977.431
65 -	OBS	253002.0	260317.0	261459.0	235475.0	200601.0	172601.0	147790.0	125390.0	107300.0	96712.0
	EXP	250108.9	259126.3	260514.8	238043.5	201972.7	173732.2	142016.6*	109208.6*	86064.2*	76824.5*
	CHI	33.465	5.472	3.422	27.714	9.316	7.366	234.708	2397.586	5239.775	5148.248
70 -	OBS	277370.0	288133.0	277827.0	255120.0	232517.0	204299.0	187996.0	172292.0	141677.0	109155.0
	EXP	275250.6	288935.6	277560.5	256375.1	233512.2	203647.6	178147.6*	148789.7*	116907.8*	93177.3*
	CHI	16.319	2.229	0.256	6.145	4.241	2.084	544.437	3712.358	5247.826	2739.809
75 -	OBS	258962.0	281452.0	275926.0	244221.0	228182.0	215731.0	203687.0	205614.0	184381.0	137446.0
	EXP	258962.0	283587.6	278042.3	245425.4	227622.1	210909.1	186870.4*	168361.5*	142651.2*	114741.7*
	CHI	0.000	16.082	16.109	5.910	1.377	110.238	1513.332	8242.648	12207.199	4492.571
30-79	OBS	1402631.0	1476639.0	1429537.0	1243566.0	1067280.0	912701.0	814903.0	776464.0	727326.0	627248.0
	EXP	1402694.1	1476658.4	1429558.7	1243618.2	1067303.9	912537.8	768713.1*	650475.3*	547769.1*	465957.1*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	1.060	1.194	1.328	1.346

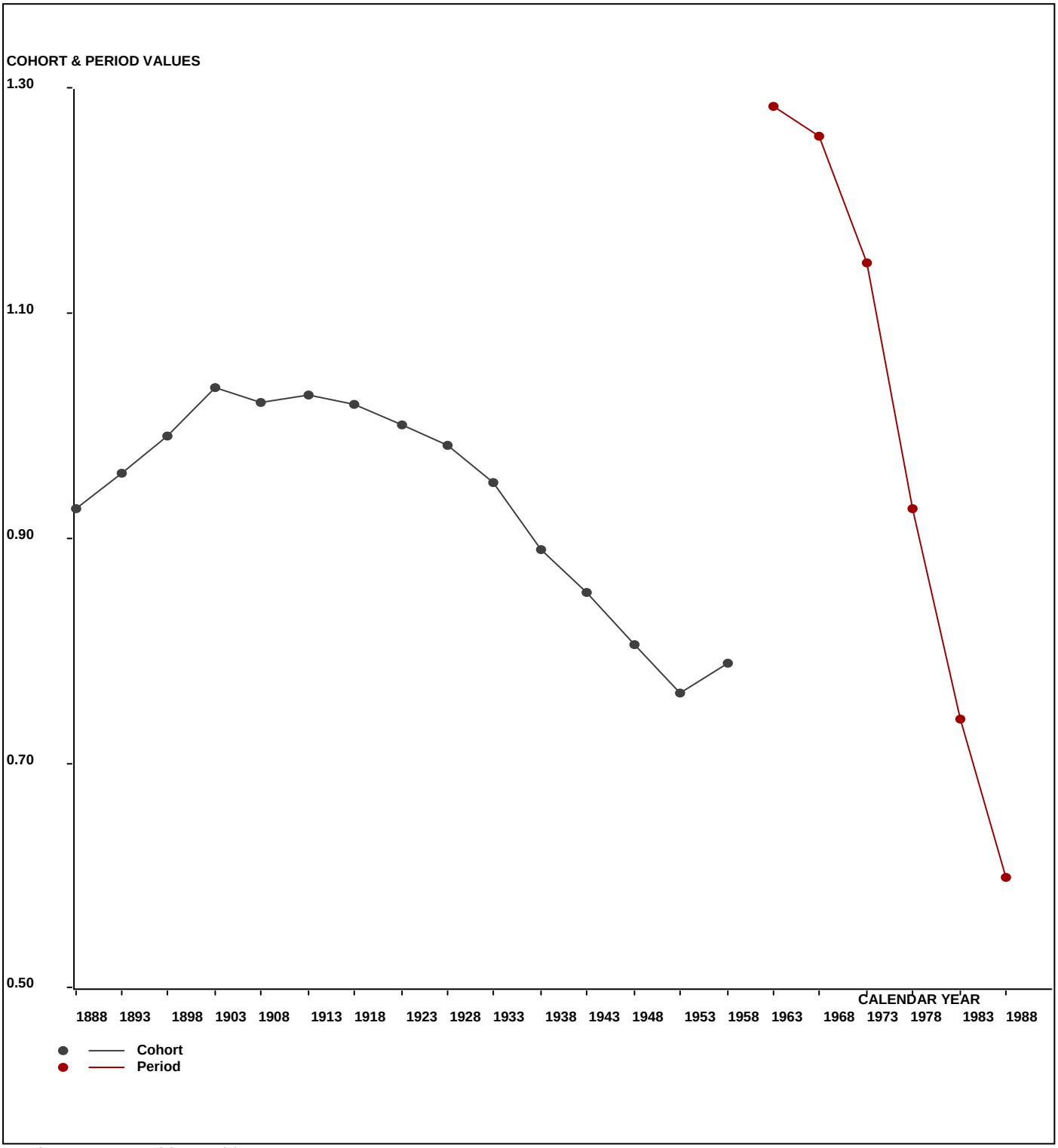
CHI SQUARE (LOG)= 171334.6306 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

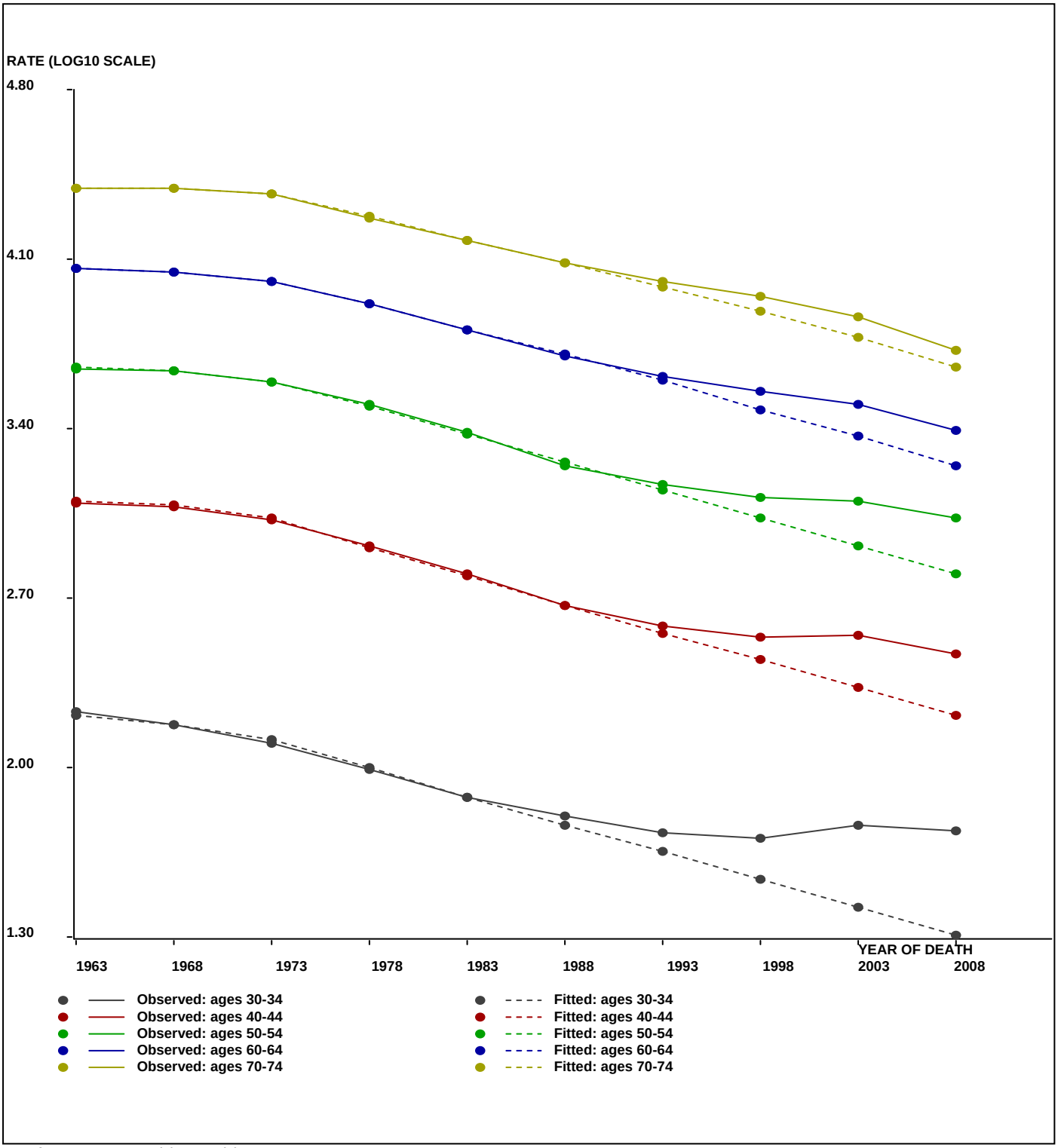


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	54.1	155.2	383.3	804.8	1484.2	2479.8	4115.1	6451.3	10097.0	15757.9
	PRE	45.2	143.1	360.9	754.2	1400.3	2362.2	3962.3	6199.3	9568.1	14456.9
	RES	8.959	12.090	22.335	50.669	83.887	117.556	152.838	252.022	528.944	1300.984
1996-	OBS	50.9	145.4	344.9	720.6	1311.5	2223.0	3568.5	5565.0	8790.9	14010.0
	PRE	34.8	110.3	279.2	577.5	1070.7	1828.6	2999.5	4846.8	7591.7	11471.7
	RES	16.099	35.169	65.681	143.025	240.875	394.426	569.035	718.153	1199.163	2538.277
2001-	OBS	58.0	144.7	349.8	695.0	1248.6	1973.4	3135.1	4574.4	7193.0	11764.7
	PRE	26.8	85.0	215.2	446.8	819.9	1398.2	2321.9	3669.1	5935.5	9102.1
	RES	31.143	59.727	134.640	248.130	428.724	575.293	813.180	905.323	1257.540	2662.633
2006-	OBS	54.7	128.3	293.5	601.9	1071.4	1670.7	2468.2	3575.5	5263.7	8524.4
	PRE	20.7	65.5	165.8	344.3	634.4	1070.7	1775.3	2840.2	4493.2	7116.3
	RES	33.986	62.776	127.665	257.591	437.009	600.007	692.876	735.249	770.477	1408.128

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	3045.0	8406.0	18406.0	32009.0	46344.0	65757.0	101463.0	147790.0	187996.0	203687.0
	PRE	2541.1	7751.2	17333.4	29993.8	43724.6	62639.7	97694.6	142016.6	178147.6	186870.4
	CHI	99.923	55.320	66.377	135.390	156.921	155.132	145.357	234.708	544.437	1513.332
1996-	OBS	2739.0	8309.0	18694.0	34365.0	51662.0	67309.0	90090.0	125390.0	172292.0	205614.0
	PRE	1872.9	6299.8	15134.2	27543.8	42173.9	55366.5	75724.3	109208.6	148789.7	168361.5
	CHI	400.504	640.778	837.294	1689.259	2134.586	2576.005	2725.310	2397.586	3712.358	8242.648
2001-	OBS	2946.0	7873.0	19912.0	37363.0	59029.0	75974.0	90871.0	107300.0	141677.0	184381.0
	PRE	1363.3	4623.3	12248.0	24022.9	38761.2	53826.3	67300.9	86064.2	116907.8	142651.2
	CHI	1837.400	2284.295	4795.653	7407.896	10597.758	9113.075	8254.744	5239.775	5247.826	12207.199
2006-	OBS	2752.0	6565.0	15918.0	33930.0	56803.0	76897.0	91070.0	96712.0	109155.0	137446.0
	PRE	1040.8	3351.5	8993.2	19409.1	33633.3	49280.7	65505.0	76824.5	93177.3	114741.7
	CHI	2813.564	3081.071	5332.031	10863.720	15961.483	15475.855	9977.431	5148.248	2739.809	4492.571

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	34146.68	669.54	51	P, C	99.92	184755.28	0.0000
AGE-PERIOD	412.93	9.18	45	Cohort	93.42	2191.49	0.0000
AGE-COHORT	1255.54	34.88	36	Period	97.83	6663.15	0.0000
PERIOD-COHORT	43.59	1.09	40	Age	37.62	231.12	0.0000
FULL AGE-PERIOD-COHORT	27.19	0.85	32			144.17	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.613358	41.054262
35	1.906599	80.649080
40	2.186777	153.736654
45	2.431519	270.096815
50	2.676640	474.941058
55	2.902991	799.817105
60	3.148452	1407.511816
65	3.404976	2540.830234
70	3.669746	4674.618051
75	3.914116	8205.702591

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.134194	1.362054
1966	0.108615	1.284148
1971	0.061438	1.151962
1976	-0.072153	0.846930
1981	-0.179663	0.661206
1986	-0.252433	0.559200

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.015519	1.036379
1891	0.015211	1.035644
1896	0.017439	1.040973
1901	0.029444	1.070149
1906	0.002695	1.006225
1911	-0.014463	0.967245
1916	-0.034118	0.924447
1921	-0.046017	0.899463
1926	-0.036566	0.919251
1931	-0.022168	0.950238
1936	-0.002894	0.993359
1941	0.012235	1.028572
1946	0.029700	1.070779
1951	0.069798	1.174350
1956	0.103108	1.267968

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	1637.0	1601.0	1619.0	1482.0	1464.0	1569.0
	EXP	1592.0	1544.4	1618.8	1518.9	1532.6	1569.0
	CHI	1.3	2.1	0.0	0.9	3.1	0.0
35 -	OBS	3126.0	3065.0	2624.0	2220.0	2305.0	2619.0
	EXP	3182.5	2934.2	2709.9	2287.3	2298.8	2552.8
	CHI	1.0	5.8	2.7	2.0	0.0	1.7
40 -	OBS	5746.0	5932.0	4898.0	3718.0	3285.0	3760.0
	EXP	5834.5	5671.5	4994.2	3741.8	3376.1	3729.9
	CHI	1.3	12.0	1.9	0.2	2.5	0.2
45 -	OBS	9388.0	9674.0	8625.0	6050.0	5228.0	5112.0
	EXP	9675.2	9457.9	8745.3	6231.8	5025.0	4958.5
	CHI	8.5	4.9	1.7	5.3	8.2	4.8
50 -	OBS	16342.0	15771.0	14283.0	10595.0	8277.0	7151.0
	EXP	16429.8	15383.5	14302.7	10769.2	8233.1	7309.1
	CHI	0.5	9.8	0.0	2.8	0.2	3.4
55 -	OBS	24191.0	24297.0	22013.0	16523.0	13449.0	11243.0
	EXP	24667.9	24314.4	21676.4	16528.6	13344.4	11192.0
	CHI	9.2	0.0	5.2	0.0	0.8	0.2
60 -	OBS	36716.0	36199.0	34445.0	25696.0	20968.0	18437.0
	EXP	36902.9	36373.7	34339.1	25503.9	20883.3	18460.1
	CHI	0.9	0.8	0.3	1.4	0.3	0.0
65 -	OBS	54730.0	53157.0	50572.0	39581.0	31656.0	28226.0
	EXP	54215.5	53282.5	50312.6	39842.6	31857.3	28416.9
	CHI	4.9	0.3	1.3	1.7	1.3	1.3
70 -	OBS	75182.0	73106.0	68323.0	54852.0	46184.0	40370.0
	EXP	74574.2	73247.4	68333.9	54623.2	46431.3	40813.2
	CHI	5.0	0.3	0.0	1.0	1.3	4.8
75 -	OBS	86019.0	86954.0	81867.0	65282.0	56303.0	52431.0
	EXP	86019.0	87566.4	82243.5	64960.2	56146.1	51927.2
	CHI	0.0	4.3	1.7	1.6	0.4	4.9

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	580746.06	14518.65	40	P, C	98.49	0.0000
AGE-PERIOD	30877.17	771.93	40	Cohort	71.63	0.0000
AGE-COHORT	16593.34	414.83	40	Period	47.21	0.0000
PERIOD-COHORT	10090.44	252.26	40	Age	13.18	0.0000
FULL AGE-PERIOD-COHORT	8760.16	219.00	40			0.0000

AGE	EFFECT
30	41.054262
35	80.649080
40	153.736654
45	270.096815
50	474.941058
55	799.817105
60	1407.511816
65	2540.830234
70	4674.618051
75	8205.702591

PERIOD	EFFECT	LOWER	UPPER
% Period Change	84.5726	81.5726	87.5726
1961	1.362054		
1966	1.284148		
1971	1.151962		
1976	0.846930		
1981	0.661206		
1986	0.559200		
1991	0.472930	0.456154	0.489706
1996	0.399969	0.372097	0.428848
2001	0.338265	0.303529	0.375554
2006	0.286079	0.247597	0.328882

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.036379	1.000000	
1891	1.035644	2.000000	
1896	1.040973	4.000000	
1901	1.070149	8.000000	
1906	1.006225	16.000000	
1911	0.967245	32.000000	
1916	0.924447	64.000000	
1921	0.899463	128.000000	
1926	0.919251	256.000000	
1931	0.950238	512.000000	
1936	0.993359	1024.000000	
1941	1.028572	2048.000000	
1946	1.070779	4096.000000	
1951	1.174350	8192.000000	
1956	1.209964	EXTRAPOLATION	1.267968
1961	1.268266	EXTRAPOLATION	
1966	1.329377	EXTRAPOLATION	
1971	1.393434	EXTRAPOLATION	
1976	1.460576	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	54.6	54.3	48.7	36.3	30.5	29.1	23.8	20.3	19.0	18.1
	EXP	53.1	52.4	48.6	37.2	31.9	27.8	24.6*	21.8*	19.4*	17.2*
	Elow							23.8	20.3	17.4	14.8
	Eup							25.5	23.4	21.5	19.7
35	OBS	99.2	102.8	89.4	68.2	57.3	54.3	49.5	41.6	36.4	36.8
	EXP	101.0	98.4	92.3	70.3	57.1	53.0	46.1*	40.9*	36.3*	32.1*
	Elow							44.5	38.1	32.5	27.8
	Eup							47.8	43.9	40.3	37.0
40	OBS	185.5	189.8	165.0	128.5	101.7	92.8	91.1	82.4	72.7	66.0
	EXP	188.3	181.5	168.3	129.3	104.6	92.1	85.4*	74.4*	66.0*	58.5*
	Elow							82.4	69.2	59.2	50.6
	Eup							88.4	79.8	73.2	67.2
45	OBS	330.0	319.1	282.1	211.0	184.6	160.2	155.3	144.3	128.0	118.5
	EXP	340.1	312.0	286.0	217.4	177.4	155.4	136.8*	126.9*	110.5*	98.0*
	Elow							131.9	118.0	99.2	84.8
	Eup							141.6	136.0	122.7	112.7
50	OBS	622.4	578.0	491.4	363.8	300.0	258.1	245.1	223.2	207.4	195.2
	EXP	625.7	563.8	492.1	369.8	298.4	263.8	231.0*	203.4*	188.7*	164.4*
	Elow							222.8	189.2	169.3	142.3
	Eup							239.2	218.1	209.5	189.0
55	OBS	1075.0	992.7	865.0	609.1	490.0	426.9	388.7	369.5	310.4	294.1
	EXP	1096.2	993.4	851.7	609.3	486.1	425.0	375.7*	329.0*	289.7*	268.7*
	Elow							362.4	306.1	260.0	232.6
	Eup							389.1	352.8	321.6	308.9
60	OBS	2041.2	1810.0	1573.1	1110.3	840.5	722.6	649.7	619.2	532.1	441.8
	EXP	2051.6	1818.7	1568.3	1102.0	837.1	723.5	632.5*	559.2*	489.7*	431.2*
	Elow							610.1	520.3	439.4	373.2
	Eup							655.0	599.6	543.7	495.7
65	OBS	3636.7	3483.5	2960.3	2067.8	1543.3	1269.4	1125.9	1045.4	893.7	746.5
	EXP	3602.5	3491.7	2945.2	2081.4	1553.1	1278.0	1104.6*	965.7*	853.8*	747.6*
	Elow							1065.4	898.4	766.1	647.1
	Eup							1143.8	1035.4	947.9	859.5
70	OBS	6647.8	6236.8	5761.8	4000.4	2973.7	2390.3	2089.8	1952.7	1647.8	1271.7
	EXP	6594.0	6248.9	5762.7	3983.7	2989.6	2416.5	1988.5*	1718.7*	1502.6*	1328.4*
	Elow							1918.0	1599.0	1348.3	1149.7
	Eup							2059.0	1842.8	1668.2	1527.2
75	OBS	11583.2	10836.6	9794.9	7474.0	5474.7	4481.4	3965.5	3731.3	3118.7	2326.7
	EXP	11583.2	10912.9	9840.0	7437.2	5459.4	4438.3	3587.5*	2952.1*	2551.6*	2230.7*
	Elow							3460.3	2746.3	2289.5	1930.6
	Eup							3714.8	3165.2	2832.8	2564.4
30-79	OBS	1515.5	1418.8	1260.1	910.6	689.2	573.6	513.4	480.0	409.5	335.8
	EXP	1515.5	1419.1	1260.2	910.6	688.9	573.6	484.4*	417.6*	366.5*	323.6*
	Elow							467.2	388.5	328.9	280.0
	Eup							501.6	447.7	406.9	372.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	1637.0	1601.0	1619.0	1482.0	1464.0	1569.0	1336.0	1090.0	967.0	911.0
	EXP	1592.0	1544.4	1618.8	1518.9	1532.6	1497.2	1385.0*	1174.4*	983.4*	863.7*
	CHI	1.270	2.073	0.000	0.895	3.070	3.441	1.731	6.060	0.275	2.587
35 -	OBS	3126.0	3065.0	2624.0	2220.0	2305.0	2619.0	2681.0	2377.0	1979.0	1886.0
	EXP	3182.5	2934.2	2709.9	2287.3	2298.8	2552.8	2499.6*	2337.2*	1973.3*	1645.7*
	CHI	1.004	5.829	2.725	1.979	0.017	1.716	13.167	0.678	0.017	35.090
40 -	OBS	5746.0	5932.0	4898.0	3718.0	3285.0	3760.0	4377.0	4468.0	4137.0	3580.0
	EXP	5834.5	5671.5	4994.2	3741.8	3376.1	3729.9	4100.5*	4032.3*	3754.3*	3171.4*
	CHI	1.342	11.970	1.853	0.152	2.458	0.243	18.641	47.078	39.018	52.655
45 -	OBS	9388.0	9674.0	8625.0	6050.0	5228.0	5112.0	6176.0	6884.0	6884.0	6678.0
	EXP	9675.2	9457.9	8745.3	6231.8	5025.0	4958.5	5439.8*	6050.5*	5943.3*	5524.3*
	CHI	8.523	4.937	1.656	5.302	8.199	4.755	99.625	114.820	148.891	240.937
50 -	OBS	16342.0	15771.0	14283.0	10595.0	8277.0	7151.0	7652.0	8790.0	9804.0	10348.0
	EXP	16429.8	15383.5	14302.7	10769.2	8233.1	7309.1	7214.0*	8012.2*	8919.1*	8716.2*
	CHI	0.469	9.761	0.027	2.819	0.234	3.418	26.587	75.499	87.792	305.483
55 -	OBS	24191.0	24297.0	22013.0	16523.0	13449.0	11243.0	10306.0	11188.0	11948.0	13537.0
	EXP	24667.9	24314.4	21676.4	16528.6	13344.4	11192.0	9963.8*	9962.8*	11152.9*	12367.6*
	CHI	9.218	0.013	5.226	0.002	0.820	0.232	11.754	150.661	56.685	110.579
60 -	OBS	36716.0	36199.0	34445.0	25696.0	20968.0	18437.0	16018.0	15633.0	15422.0	16302.0
	EXP	36902.9	36373.7	34339.1	25503.9	20883.3	18460.1	15595.6*	14118.0*	14194.5*	15908.5*
	CHI	0.946	0.839	0.327	1.447	0.343	0.029	11.438	162.585	106.158	9.734
65 -	OBS	54730.0	53157.0	50572.0	39581.0	31656.0	28226.0	25793.0	23554.0	20964.0	20193.0
	EXP	54215.5	53282.5	50312.6	39842.6	31857.3	28416.9	25304.7*	21758.7*	20026.4*	20222.8*
	CHI	4.882	0.295	1.337	1.717	1.272	1.282	9.422	148.126	43.897	0.044
70 -	OBS	75182.0	73106.0	68323.0	54852.0	46184.0	40370.0	38910.0	38270.0	32455.0	26371.0
	EXP	74574.2	73247.4	68333.9	54623.2	46431.3	40813.2	37023.8*	33685.2*	29595.4*	27548.3*
	CHI	4.954	0.273	0.002	0.959	1.317	4.813	96.098	624.013	276.299	50.311
75 -	OBS	86019.0	86954.0	81867.0	65282.0	56303.0	52431.0	51258.0	54761.0	48878.0	37515.0
	EXP	86019.0	87566.4	82243.5	64960.2	56146.1	51927.2	46372.5*	43325.3*	39989.0*	35966.7*
	CHI	0.000	4.283	1.723	1.594	0.439	4.888	514.712	3018.458	1975.897	66.653
30-79	OBS	313077.0	309756.0	289269.0	225999.0	189119.0	170918.0	164507.0	167015.0	153438.0	137321.0
	EXP	313093.4	309775.9	289276.4	226007.5	189128.1	170856.9	154899.3*	144456.6*	136531.5*	131935.2*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	1.062	1.156	1.124	1.041

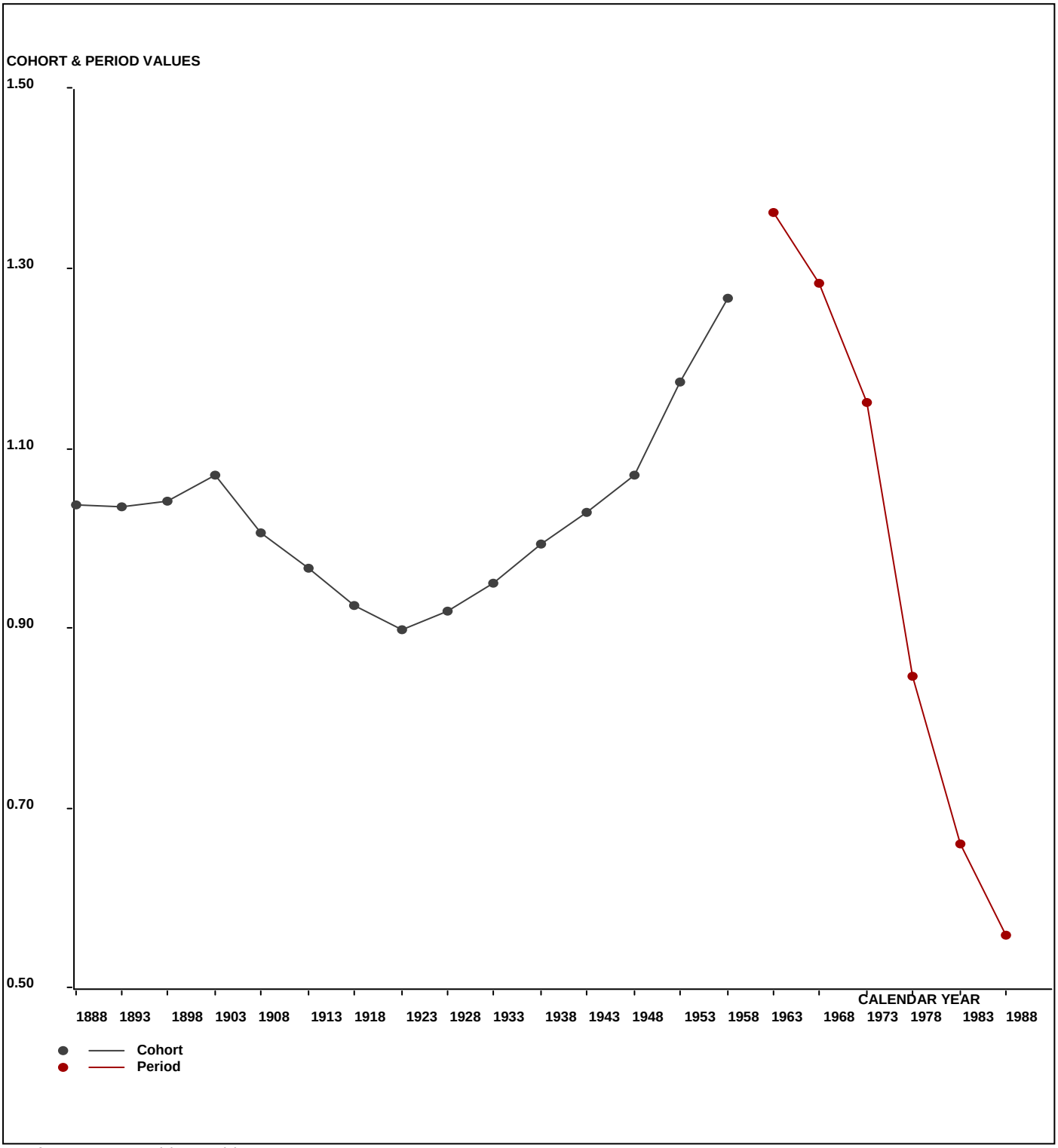
CHI SQUARE (LOG)= 8760.1552 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

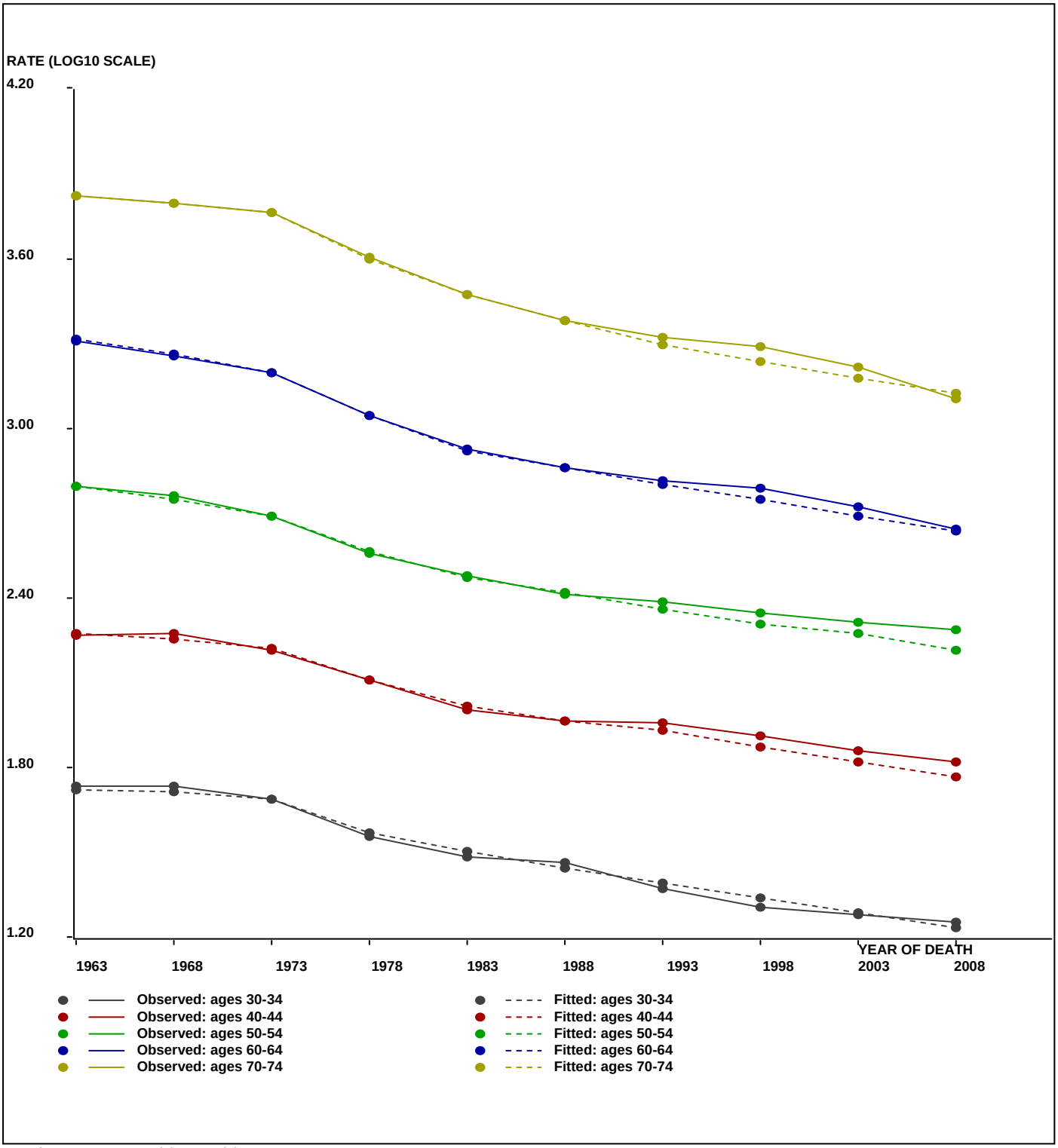


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	23.8	49.5	91.1	155.3	245.1	388.7	649.7	1125.9	2089.8	3965.5
	PRE	24.6	46.1	85.4	136.8	231.0	375.7	632.5	1104.6	1988.5	3587.5
	RES	-0.871	3.350	5.757	18.510	14.026	12.905	17.130	21.315	101.308	377.961
1996-	OBS	20.3	41.6	82.4	144.3	223.2	369.5	619.2	1045.4	1952.7	3731.3
	PRE	21.8	40.9	74.4	126.9	203.4	329.0	559.2	965.7	1718.7	2952.1
	RES	-1.568	0.697	8.039	17.477	19.745	40.463	60.012	79.677	233.929	779.197
2001-	OBS	19.0	36.4	72.7	128.0	207.4	310.4	532.1	893.7	1647.8	3118.7
	PRE	19.4	36.3	66.0	110.5	188.7	289.7	489.7	853.8	1502.6	2551.6
	RES	-0.323	0.106	6.724	17.497	18.718	20.653	42.351	39.972	145.182	567.176
2006-	OBS	18.1	36.8	66.0	118.5	195.2	294.1	441.8	746.5	1271.7	2326.7
	PRE	17.2	32.1	58.5	98.0	164.4	268.7	431.2	747.6	1328.4	2230.7
	RES	0.939	4.695	7.534	20.466	30.777	25.408	10.665	-1.103	-56.771	96.027

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	1336.0	2681.0	4377.0	6176.0	7652.0	10306.0	16018.0	25793.0	38910.0	51258.0
	PRE	1385.0	2499.6	4100.5	5439.8	7214.0	9963.8	15595.6	25304.7	37023.8	46372.5
	CHI	1.731	13.167	18.641	99.625	26.587	11.754	11.438	9.422	96.098	514.712
1996-	OBS	1090.0	2377.0	4468.0	6884.0	8790.0	11188.0	15633.0	23554.0	38270.0	54761.0
	PRE	1174.4	2337.2	4032.3	6050.5	8012.2	9962.8	14118.0	21758.7	33685.2	43325.3
	CHI	6.060	0.678	47.078	114.820	75.499	150.661	162.585	148.126	624.013	3018.458
2001-	OBS	967.0	1979.0	4137.0	6884.0	9804.0	11948.0	15422.0	20964.0	32455.0	48878.0
	PRE	983.4	1973.3	3754.3	5943.3	8919.1	11152.9	14194.5	20026.4	29595.4	39989.0
	CHI	0.275	0.017	39.018	148.891	87.792	56.685	106.158	43.897	276.299	1975.897
2006-	OBS	911.0	1886.0	3580.0	6678.0	10348.0	13537.0	16302.0	20193.0	26371.0	37515.0
	PRE	863.7	1645.7	3171.4	5524.3	8716.2	12367.6	15908.5	20222.8	27548.3	35966.7
	CHI	2.587	35.090	52.655	240.937	305.483	110.579	9.734	0.044	50.311	66.653

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	9050.39	177.46	51	P, C	99.51	48629.29	0.0000
AGE-PERIOD	2296.99	51.04	45	Cohort	98.05	12259.92	0.0000
AGE-COHORT	248.55	6.90	36	Period	81.99	1318.23	0.0000
PERIOD-COHORT	591.08	14.78	40	Age	92.43	3146.13	0.0000
FULL AGE-PERIOD-COHORT	44.77	1.40	32			237.40	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.267104	18.497119
35	1.793693	62.186091
40	2.228675	169.306864
45	2.590830	389.789142
50	2.894641	784.587501
55	3.145190	1396.978571
60	3.357432	2277.360505
65	3.522660	3331.654604
70	3.643640	4401.899416
75	3.717177	5214.075035

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.039995	0.912022
1966	-0.012713	0.971153
1971	0.004872	1.011281
1976	0.013642	1.031911
1981	0.010701	1.024947
1986	0.000921	1.002122

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.342961	0.453983
1891	-0.217362	0.606231
1896	-0.128044	0.744657
1901	-0.056841	0.877323
1906	-0.020947	0.952912
1911	0.007538	1.017509
1916	0.031633	1.075557
1921	0.050450	1.123182
1926	0.078741	1.198784
1931	0.077957	1.196621
1936	0.046601	1.113272
1941	-0.005701	0.986958
1946	-0.092048	0.809006
1951	-0.186739	0.650520
1956	-0.176140	0.666592

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	662.0	633.0	591.0	597.0	541.0	666.0
	EXP	604.8	589.8	614.4	630.0	592.9	666.0
	CHI	5.4	3.2	0.9	1.7	4.5	0.0
35 -	OBS	2069.0	2209.0	2158.0	1954.0	2044.0	2003.0
	EXP	2142.8	2154.7	2055.8	2061.9	2076.0	1954.0
	CHI	2.5	1.4	5.1	5.6	0.5	1.2
40 -	OBS	5168.0	6389.0	6109.0	5569.0	5462.0	5625.0
	EXP	5372.5	6159.9	6080.2	5626.9	5530.2	5561.6
	CHI	7.8	8.5	0.1	0.6	0.8	0.7
45 -	OBS	10322.0	12802.0	14805.0	13951.0	12517.0	12499.0
	EXP	10877.5	12889.8	14448.7	13798.8	12598.2	12304.8
	CHI	28.4	0.6	8.8	1.7	0.5	3.1
50 -	OBS	18540.0	22449.0	26146.0	28624.0	26436.0	24239.0
	EXP	19118.1	22360.4	25901.3	28267.5	26549.3	24250.0
	CHI	17.5	0.4	2.3	4.5	0.5	0.0
55 -	OBS	27005.0	33655.0	38798.0	44322.0	47216.0	43931.0
	EXP	27321.2	33786.0	38669.8	43923.6	47116.1	44115.0
	CHI	3.7	0.5	0.4	3.6	0.2	0.8
60 -	OBS	33087.0	42388.0	51356.0	58759.0	65526.0	68816.0
	EXP	32776.8	42149.9	51310.2	58496.8	65404.9	69803.3
	CHI	2.9	1.3	0.0	1.2	0.2	14.0
65 -	OBS	35058.0	43495.0	54810.0	66392.0	75221.0	82903.0
	EXP	34051.5	43316.8	54847.0	66961.9	75337.2	83383.7
	CHI	29.8	0.7	0.0	4.9	0.2	2.8
70 -	OBS	27828.0	36997.0	46161.0	59279.0	71351.0	80308.0
	EXP	27524.6	37314.3	46310.4	59350.4	71297.0	80130.8
	CHI	3.3	2.7	0.5	0.1	0.0	0.4
75 -	OBS	16032.0	24325.0	32105.0	40888.0	52556.0	63360.0
	EXP	16032.0	24632.0	32818.1	41230.6	52372.5	62203.1
	CHI	0.0	3.8	15.5	2.8	0.6	21.5

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	119298.03	2982.45	40	P, C	76.94	0.0000
AGE-PERIOD	209558.99	5238.97	40	Cohort	86.87	0.0000
AGE-COHORT	85063.79	2126.59	40	Period	67.66	0.0000
PERIOD-COHORT	58285.94	1457.15	40	Age	52.81	0.0000
FULL AGE-PERIOD-COHORT	27505.61	687.64	40			0.0000

AGE	EFFECT
30	18.497119
35	62.186091
40	169.306864
45	389.789142
50	784.587501
55	1396.978571
60	2277.360505
65	3331.654604
70	4401.899416
75	5214.075035

PERIOD	EFFECT	LOWER	UPPER
% Period Change	97.7730	94.7730	100.7730
1961	0.912022		
1966	0.971153		
1971	1.011281		
1976	1.031911		
1981	1.024947		
1986	1.002122		
1991	0.979805	0.949741	1.009869
1996	0.957985	0.900099	1.017675
2001	0.936651	0.853051	1.025542
2006	0.915792	0.808462	1.033470

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.453983	1.000000	
1891	0.606231	2.000000	
1896	0.744657	4.000000	
1901	0.877323	8.000000	
1906	0.952912	16.000000	
1911	1.017509	32.000000	
1916	1.075557	64.000000	
1921	1.123182	128.000000	
1926	1.198784	256.000000	
1931	1.196621	512.000000	
1936	1.113272	1024.000000	
1941	0.986958	2048.000000	
1946	0.809006	4096.000000	
1951	0.650520	8192.000000	
1956	0.598530	EXTRAPOLATION	0.666592
1961	0.525609	EXTRAPOLATION	
1966	0.461573	EXTRAPOLATION	
1971	0.405338	EXTRAPOLATION	
1976	0.355954	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	22.1	21.5	17.8	14.6	11.3	12.4	11.0	8.5	6.2	5.9
	EXP	20.2	20.0	18.5	15.4	12.3	11.1	9.5*	8.2*	7.0*	6.0*
	Elow							9.2	7.7	6.4	5.3
	Eup							9.8	8.7	7.7	6.8
35	OBS	65.6	74.1	73.5	60.0	50.8	41.6	39.3	32.7	24.5	17.9
	EXP	68.0	72.3	70.0	63.3	51.6	40.5	36.5*	31.3*	26.9*	23.1*
	Elow							35.3	29.4	24.5	20.4
	Eup							37.6	33.3	29.4	26.1
40	OBS	166.8	204.4	205.9	192.5	169.2	138.8	116.0	106.9	94.5	60.7
	EXP	173.4	197.1	204.9	194.5	171.3	137.3	107.9*	97.1*	83.4*	71.6*
	Elow							104.6	91.2	75.9	63.2
	Eup							111.2	103.1	91.3	80.8
45	OBS	362.8	422.3	484.2	486.6	441.9	391.6	314.8	254.7	236.6	196.2
	EXP	382.4	425.2	472.5	481.3	444.8	385.5	309.0*	242.9*	218.5*	187.6*
	Elow							299.5	228.2	199.0	165.6
	Eup							318.5	258.0	239.3	211.7
50	OBS	706.1	822.8	899.6	982.8	958.2	874.9	753.0	584.2	499.7	445.6
	EXP	728.1	819.5	891.2	970.6	962.3	875.3	758.7*	608.1*	478.1*	430.1*
	Elow							735.4	571.3	435.4	379.7
	Eup							782.0	646.0	523.4	485.3
55	OBS	1200.0	1375.1	1524.5	1633.8	1720.1	1668.2	1461.0	1221.9	997.0	824.1
	EXP	1214.1	1380.4	1519.5	1619.1	1716.5	1675.2	1523.8*	1320.8*	1058.6*	832.2*
	Elow							1477.1	1241.0	964.1	734.7
	Eup							1570.6	1403.1	1159.0	939.2
60	OBS	1839.5	2119.4	2345.5	2538.9	2626.6	2697.2	2531.6	2124.7	1840.8	1465.8
	EXP	1822.2	2107.5	2343.4	2527.6	2621.7	2735.9	2670.1*	2428.8*	2105.3*	1687.3*
	Elow							2588.2	2282.0	1917.4	1489.5
	Eup							2752.0	2580.1	2305.1	1904.1
65	OBS	2329.6	2850.3	3208.4	3468.4	3667.1	3728.4	3719.9	3328.8	2834.0	2487.7
	EXP	2262.7	2838.6	3210.6	3498.2	3672.8	3750.0	3913.3*	3819.2*	3474.1*	3011.3*
	Elow							3793.2	3588.4	3164.0	2658.4
	Eup							4033.4	4057.2	3803.8	3398.3
70	OBS	2460.6	3156.3	3892.9	4323.3	4594.2	4755.0	4724.6	4504.7	4029.2	3421.4
	EXP	2433.8	3183.3	3905.5	4328.5	4590.7	4744.5	4844.3*	5055.2*	4933.7*	4487.9*
	Elow							4695.6	4749.8	4493.4	3961.9
	Eup							4992.9	5370.2	5401.9	5064.5
75	OBS	2158.8	3031.5	3841.2	4681.2	5110.4	5415.5	5464.6	5234.4	5040.8	4447.5
	EXP	2158.8	3069.7	3926.5	4720.4	5092.5	5316.6	5494.8*	5610.3*	5854.6*	5713.9*
	Elow							5326.2	5271.3	5332.0	5044.2
	Eup							5663.4	5959.9	6410.2	6448.1
30-79	OBS	848.7	1029.0	1178.8	1288.4	1337.2	1340.4	1273.6	1130.2	994.9	844.9
	EXP	848.5	1029.1	1179.0	1288.1	1337.3	1340.8	1313.1*	1248.1*	1145.1*	1007.2*
	Elow							1272.8	1172.7	1042.9	889.1
	Eup							1353.4	1325.9	1253.8	1136.6

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	662.0	633.0	591.0	597.0	541.0	666.0	617.0	459.0	315.0	295.0
	EXP	604.8	589.8	614.4	630.0	592.9	598.0	535.8*	440.0*	356.9*	303.6*
	CHI	5.404	3.170	0.888	1.724	4.547	7.733	12.315	0.819	4.918	0.244
35 -	OBS	2069.0	2209.0	2158.0	1954.0	2044.0	2003.0	2129.0	1870.0	1334.0	915.0
	EXP	2142.8	2154.7	2055.8	2061.9	2076.0	1954.0	1975.2*	1788.9*	1462.8*	1181.6*
	CHI	2.543	1.369	5.081	5.649	0.492	1.227	11.971	3.681	11.344	60.167
40 -	OBS	5168.0	6389.0	6109.0	5569.0	5462.0	5625.0	5569.0	5793.0	5377.0	3293.0
	EXP	5372.5	6159.9	6080.2	5626.9	5530.2	5561.6	5182.5*	5261.3*	4744.6*	3881.9*
	CHI	7.785	8.524	0.136	0.596	0.841	0.723	28.818	53.725	84.301	89.339
45 -	OBS	10322.0	12802.0	14805.0	13951.0	12517.0	12499.0	12521.0	12146.0	12718.0	11058.0
	EXP	10877.5	12889.8	14448.7	13798.8	12598.2	12304.8	12288.3*	11585.0*	11748.3*	10576.7*
	CHI	28.372	0.597	8.788	1.679	0.523	3.065	4.408	27.164	80.046	21.900
50 -	OBS	18540.0	22449.0	26146.0	28624.0	26436.0	24239.0	23512.0	23013.0	23623.0	23626.0
	EXP	19118.1	22360.4	25901.3	28267.5	26549.3	24250.0	23691.2*	23951.9*	22600.0*	22801.0*
	CHI	17.482	0.351	2.312	4.495	0.483	0.005	1.356	36.803	46.309	29.847
55 -	OBS	27005.0	33655.0	38798.0	44322.0	47216.0	43931.0	38743.0	36997.0	38381.0	37931.0
	EXP	27321.2	33786.0	38669.8	43923.6	47116.1	44115.0	40407.4*	39992.5*	40753.0*	38305.1*
	CHI	3.658	0.508	0.425	3.614	0.212	0.767	68.559	224.364	138.062	3.654
60 -	OBS	33087.0	42388.0	51356.0	58759.0	65526.0	68816.0	62420.0	53639.0	53357.0	54084.0
	EXP	32776.8	42149.9	51310.2	58496.8	65404.9	69803.3	65834.0*	61316.7*	61021.6*	62254.6*
	CHI	2.937	1.345	0.041	1.175	0.224	13.963	177.045	961.344	962.716	1072.348
65 -	OBS	35058.0	43495.0	54810.0	66392.0	75221.0	82903.0	85218.0	75004.0	66475.0	67290.0
	EXP	34051.5	43316.8	54847.0	66961.9	75337.2	83383.7	89647.0*	86054.6*	81489.8*	81451.8*
	CHI	29.751	0.733	0.025	4.851	0.179	2.771	218.815	1419.055	2766.536	2462.267
70 -	OBS	27828.0	36997.0	46161.0	59279.0	71351.0	80308.0	87967.0	88287.0	79362.0	70952.0
	EXP	27524.6	37314.3	46310.4	59350.4	71297.0	80130.8	90195.3*	99077.0*	97177.2*	93066.6*
	CHI	3.344	2.698	0.482	0.086	0.041	0.392	55.053	1175.091	3266.002	5254.908
75 -	OBS	16032.0	24325.0	32105.0	40888.0	52556.0	63360.0	70636.0	76821.0	79001.0	71710.0
	EXP	16032.0	24632.0	32818.1	41230.6	52372.5	62203.1	71025.8*	82338.3*	91755.2*	92129.1*
	CHI	0.000	3.826	15.495	2.846	0.643	21.518	2.139	369.701	1772.866	4525.610
30-79	OBS	175771.0	225342.0	273039.0	320335.0	358870.0	384350.0	389332.0	374029.0	359943.0	341154.0
	EXP	175821.8	225353.5	273055.8	320348.4	358874.2	384304.2	400782.6*	411806.2*	413109.3*	405952.1*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	0.971	0.908	0.871	0.840

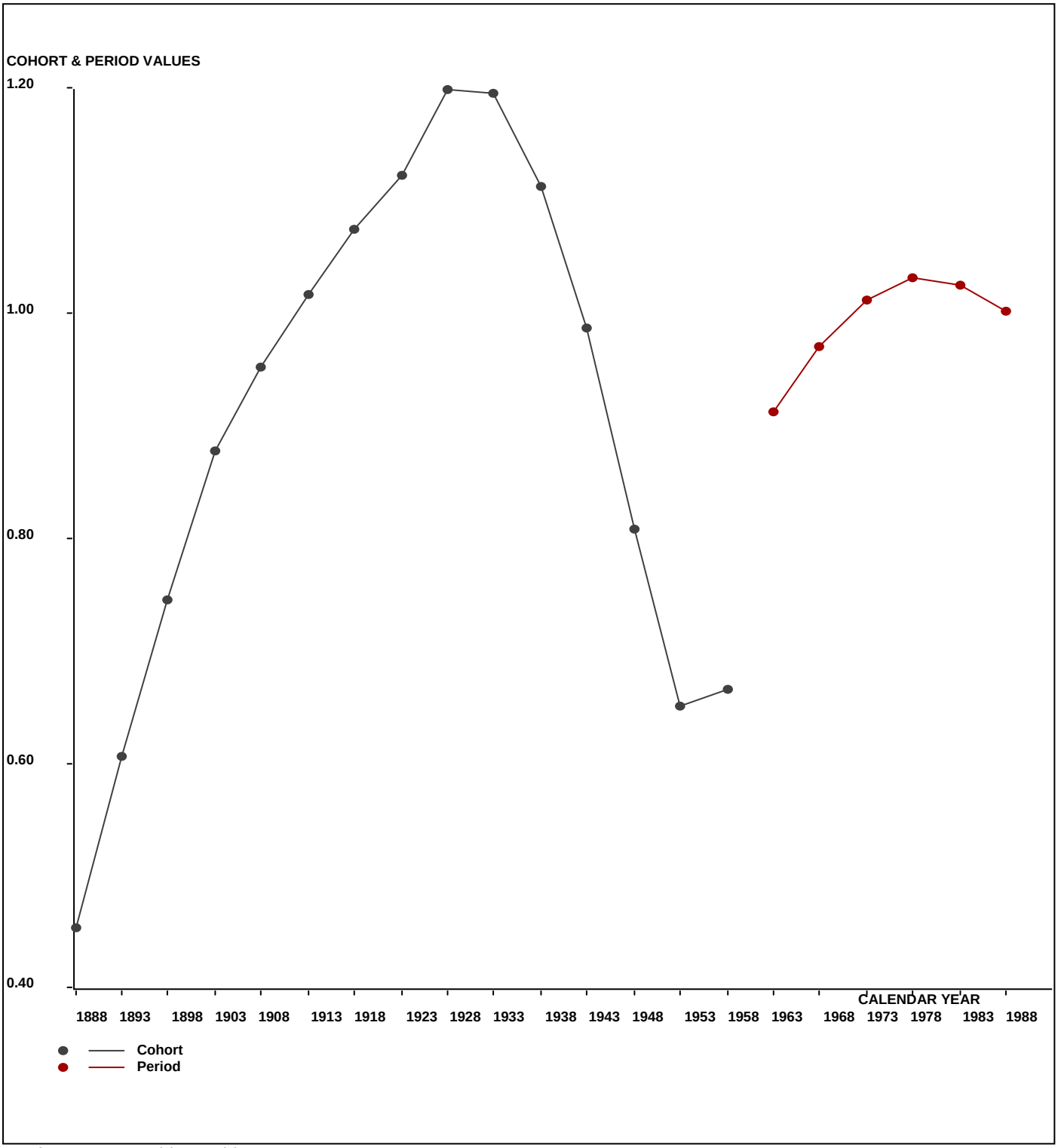
CHI SQUARE (LOG)= 27505.6094 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

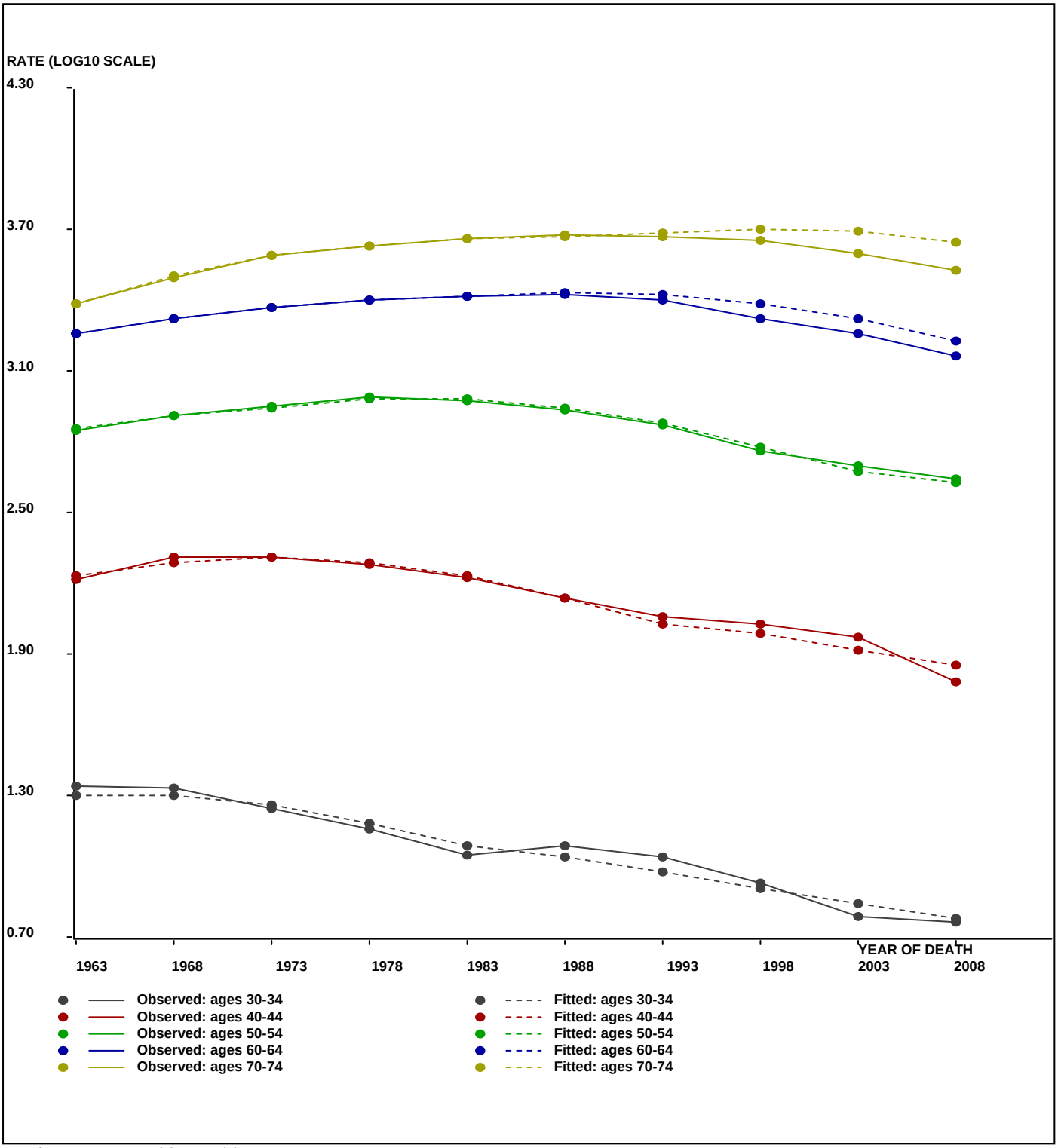


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	11.0	39.3	116.0	314.8	753.0	1461.0	2531.6	3719.9	4724.6	5464.6
	PRE	9.5	36.5	107.9	309.0	758.7	1523.8	2670.1	3913.3	4844.3	5494.8
	RES	1.444	2.839	8.047	5.852	-5.740	-62.767	-138.467	-193.335	-119.682	-30.154
1996-	OBS	8.5	32.7	106.9	254.7	584.2	1221.9	2124.7	3328.8	4504.7	5234.4
	PRE	8.2	31.3	97.1	242.9	608.1	1320.8	2428.8	3819.2	5055.2	5610.3
	RES	0.353	1.420	9.810	11.762	-23.835	-98.931	-304.118	-490.442	-550.540	-375.933
2001-	OBS	6.2	24.5	94.5	236.6	499.7	997.0	1840.8	2834.0	4029.2	5040.8
	PRE	7.0	26.9	83.4	218.5	478.1	1058.6	2105.3	3474.1	4933.7	5854.6
	RES	-0.824	-2.368	11.111	18.038	21.640	-61.614	-264.433	-640.111	-904.484	-813.802
2006-	OBS	5.9	17.9	60.7	196.2	445.6	824.1	1465.8	2487.7	3421.4	4447.5
	PRE	6.0	23.1	71.6	187.6	430.1	832.2	1687.3	3011.3	4487.9	5713.9
	RES	-0.171	-5.209	-10.857	8.538	15.560	-8.128	-221.443	-523.568	-1066.409	-1266.400

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	617.0	2129.0	5569.0	12521.0	23512.0	38743.0	62420.0	85218.0	87967.0	70636.0
	PRE	535.8	1975.2	5182.5	12288.3	23691.2	40407.4	65834.0	89647.0	90195.3	71025.8
	CHI	12.315	11.971	28.818	4.408	1.356	68.559	177.045	218.815	55.053	2.139
1996-	OBS	459.0	1870.0	5793.0	12146.0	23013.0	36997.0	53639.0	75004.0	88287.0	76821.0
	PRE	440.0	1788.9	5261.3	11585.0	23951.9	39992.5	61316.7	86054.6	99077.0	82338.3
	CHI	0.819	3.681	53.725	27.164	36.803	224.364	961.344	1419.055	1175.091	369.701
2001-	OBS	315.0	1334.0	5377.0	12718.0	23623.0	38381.0	53357.0	66475.0	79362.0	79001.0
	PRE	356.9	1462.8	4744.6	11748.3	22600.0	40753.0	61021.6	81489.8	97177.2	91755.2
	CHI	4.918	11.344	84.301	80.046	46.309	138.062	962.716	2766.536	3266.002	1772.866
2006-	OBS	295.0	915.0	3293.0	11058.0	23626.0	37931.0	54084.0	67290.0	70952.0	71710.0
	PRE	303.6	1181.6	3881.9	10576.7	22801.0	38305.1	62254.6	81451.8	93066.6	92129.1
	CHI	0.244	60.167	89.339	21.900	29.847	3.654	1072.348	2462.267	5254.908	4525.610

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	3916.10	76.79	51	P, C	98.43	21016.53	0.0000
AGE-PERIOD	2491.49	55.37	45	Cohort	97.54	13296.14	0.0000
AGE-COHORT	640.49	17.79	36	Period	90.42	3401.18	0.0000
PERIOD-COHORT	509.62	12.74	40	Age	87.96	2718.72	0.0000
FULL AGE-PERIOD-COHORT	61.36	1.92	32			326.00	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.278333	18.981617
35	1.451133	28.257474
40	1.682650	48.156008
45	1.984116	96.408588
50	2.313548	205.848565
55	2.635514	432.029618
60	2.937297	865.559465
65	3.199044	1581.408005
70	3.430384	2693.916655
75	3.619475	4163.654183

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.004575	0.989520
1966	0.061385	1.151820
1971	0.046032	1.111814
1976	-0.013817	0.968686
1981	-0.043733	0.904206
1986	-0.034860	0.922869

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.281545	0.522944
1891	-0.161948	0.688734
1896	-0.070449	0.850259
1901	0.004540	1.010509
1906	0.037746	1.090802
1911	0.051185	1.125083
1916	0.041902	1.101291
1921	0.020564	1.048489
1926	0.001099	1.002533
1931	-0.039707	0.912626
1936	-0.123363	0.752727
1941	-0.201106	0.629353
1946	-0.279410	0.525520
1951	-0.354698	0.441877
1956	-0.364403	0.432113

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	377.0	504.0	558.0	414.0	307.0	408.0
	EXP	513.6	485.3	442.0	394.2	364.6	408.0
	CHI	36.3	0.7	30.5	1.0	9.1	0.0
35 -	OBS	751.0	915.0	804.0	560.0	456.0	606.0
	EXP	883.5	885.6	694.4	560.9	540.6	555.4
	CHI	19.9	1.0	17.3	0.0	13.2	4.6
40 -	OBS	1439.0	1835.0	1537.0	1012.0	733.0	1002.0
	EXP	1547.7	1737.8	1450.1	1015.8	884.9	946.3
	CHI	7.6	5.4	5.2	0.0	26.1	3.3
45 -	OBS	2864.0	3671.0	3433.0	2449.0	1661.0	1796.0
	EXP	2988.9	3529.7	3285.7	2443.5	1858.6	1787.2
	CHI	5.2	5.7	6.6	0.0	21.0	0.0
50 -	OBS	5814.0	7214.0	7320.0	5710.0	4496.0	4015.0
	EXP	6017.5	7124.5	6974.3	5822.3	4686.6	3961.6
	CHI	6.9	1.1	17.1	2.2	7.8	0.7
55 -	OBS	10283.0	13740.0	13684.0	11816.0	10606.0	9759.0
	EXP	10493.9	13702.6	13462.5	11903.5	10750.2	9582.2
	CHI	4.2	0.1	3.6	0.6	1.9	3.3
60 -	OBS	15672.0	21870.0	23643.0	21332.0	20221.0	20558.0
	EXP	15567.9	21749.7	23706.9	21370.1	20471.7	20432.3
	CHI	0.7	0.7	0.2	0.1	3.1	0.8
65 -	OBS	20624.0	27909.0	32315.0	33063.0	32301.0	33968.0
	EXP	20023.2	28087.8	32763.5	32991.3	32301.9	34025.0
	CHI	18.0	1.1	6.1	0.2	0.0	0.1
70 -	OBS	20923.0	30722.0	35740.0	38951.0	42983.0	46089.0
	EXP	20763.4	30925.2	35889.2	39030.2	42562.5	46241.5
	CHI	1.2	1.3	0.6	0.2	4.2	0.5
75 -	OBS	16000.0	26343.0	32488.0	35821.0	42842.0	50311.0
	EXP	16000.0	26503.7	32897.8	35599.0	42233.7	50579.6
	CHI	0.0	1.0	5.1	1.4	8.8	1.4

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	37497.60	937.44	40	P, C	56.64	0.0000
AGE-PERIOD	32382.83	809.57	40	Cohort	49.80	0.0000
AGE-COHORT	61352.01	1533.80	40	Period	73.50	0.0000
PERIOD-COHORT	3926.59	98.16	40	Age	-314.03	0.0000
FULL AGE-PERIOD-COHORT	16257.08	406.43	40			0.0000

AGE	EFFECT
30	18.981617
35	28.257474
40	48.156008
45	96.408588
50	205.848565
55	432.029618
60	865.559465
65	1581.408005
70	2693.916655
75	4163.654183

PERIOD	EFFECT	LOWER	UPPER
% Period Change	102.0641	99.0641	105.0641
1961	0.989520		
1966	1.151820		
1971	1.111814		
1976	0.968686		
1981	0.904206		
1986	0.922869		
1991	0.941918	0.914232	0.969604
1996	0.961360	0.905676	1.018706
2001	0.981204	0.897199	1.070294
2006	1.001457	0.888803	1.124495

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.522944	1.000000	
1891	0.688734	2.000000	
1896	0.850259	4.000000	
1901	1.010509	8.000000	
1906	1.090802	16.000000	
1911	1.125083	32.000000	
1916	1.101291	64.000000	
1921	1.048489	128.000000	
1926	1.002533	256.000000	
1931	0.912626	512.000000	
1936	0.752727	1024.000000	
1941	0.629353	2048.000000	
1946	0.525520	4096.000000	
1951	0.441877	8192.000000	
1956	0.383048	EXTRAPOLATION	0.432113
1961	0.327561	EXTRAPOLATION	
1966	0.280112	EXTRAPOLATION	
1971	0.239536	EXTRAPOLATION	
1976	0.204837	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	12.6	17.1	16.8	10.1	6.4	7.6	8.7	8.6	8.6	7.6
	EXP	17.1	16.5	13.3	9.7	7.6	6.7	5.9*	5.1*	4.5*	3.9*
	Elow							5.7	4.8	4.1	3.5
	Eup							6.0	5.4	4.9	4.4
35	OBS	23.8	30.7	27.4	17.2	11.3	12.6	12.9	13.1	13.4	11.5
	EXP	28.0	29.7	23.6	17.2	13.4	11.5	10.2*	8.9*	7.8*	6.8*
	Elow							9.9	8.4	7.1	6.0
	Eup							10.5	9.4	8.5	7.6
40	OBS	46.5	58.7	51.8	35.0	22.7	24.7	23.1	24.8	26.6	23.6
	EXP	50.0	55.6	48.9	35.1	27.4	23.4	20.0*	17.7*	15.5*	13.5*
	Elow							19.5	16.7	14.2	12.0
	Eup							20.6	18.8	16.9	15.2
45	OBS	100.7	121.1	112.3	85.4	58.6	56.3	53.7	54.7	59.7	57.7
	EXP	105.1	116.4	107.5	85.2	65.6	56.0	47.7*	41.0*	36.2*	31.6*
	Elow							46.3	38.6	33.1	28.1
	Eup							49.1	43.4	39.5	35.5
50	OBS	221.4	264.4	251.9	196.1	163.0	144.9	135.9	122.9	126.1	139.2
	EXP	229.2	261.1	240.0	199.9	169.9	143.0	122.0*	104.0*	89.3*	79.0*
	Elow							118.4	98.0	81.6	70.1
	Eup							125.6	110.2	97.4	88.7
55	OBS	456.9	561.4	537.7	435.6	386.4	370.6	340.3	318.0	288.6	286.1
	EXP	466.3	559.9	529.0	438.8	391.6	363.9	306.3*	261.4*	222.8*	191.2*
	Elow							297.3	246.3	203.7	169.7
	Eup							315.3	277.0	243.0	214.7
60	OBS	871.3	1093.5	1079.8	921.7	810.5	805.7	767.6	705.2	664.3	599.3
	EXP	865.5	1087.5	1082.7	923.4	820.6	800.8	744.1*	626.4*	534.5*	455.5*
	Elow							722.2	590.1	488.7	404.3
	Eup							765.9	663.7	583.0	511.5
65	OBS	1370.4	1828.9	1891.6	1727.2	1574.7	1527.6	1496.5	1439.6	1279.7	1211.5
	EXP	1330.5	1840.6	1917.9	1723.5	1574.8	1530.2	1493.3*	1387.5*	1168.0*	996.7*
	Elow							1449.4	1307.1	1068.0	884.6
	Eup							1537.2	1470.2	1274.0	1119.2
70	OBS	1850.1	2620.9	3014.0	2840.7	2767.6	2728.9	2605.7	2578.4	2360.1	2130.3
	EXP	1835.9	2638.3	3026.6	2846.5	2740.5	2738.0	2660.5*	2596.4*	2412.3*	2030.7*
	Elow							2582.3	2446.0	2205.8	1802.3
	Eup							2738.7	2751.3	2631.4	2280.2
75	OBS	2154.5	3283.0	3887.0	4101.1	4165.8	4300.2	4198.1	4082.4	3904.4	3532.1
	EXP	2154.5	3303.0	3936.0	4075.7	4106.7	4323.1	4319.1*	4196.9*	4095.7*	3805.4*
	Elow							4192.1	3953.8	3745.1	3377.3
	Eup							4446.0	4447.2	4467.6	4272.9
30-79	OBS	459.5	618.6	658.7	604.8	566.2	561.3	540.3	521.1	485.5	448.9
	EXP	459.5	618.8	659.0	604.8	566.8	561.0	538.0*	503.1*	457.9*	401.1*
	Elow							522.2	473.9	418.7	355.9
	Eup							553.9	533.1	499.4	450.3

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	377.0	504.0	558.0	414.0	307.0	408.0	491.0	462.0	435.0	382.0
	EXP	513.6	485.3	442.0	394.2	364.6	361.7	329.4*	275.0*	226.7*	196.1*
	CHI	36.327	0.718	30.451	0.994	9.104	5.934	79.291	127.177	191.318	176.351
35 -	OBS	751.0	915.0	804.0	560.0	456.0	606.0	699.0	750.0	729.0	588.0
	EXP	883.5	885.6	694.4	560.9	540.6	555.4	552.2*	508.4*	422.6*	347.0*
	CHI	19.868	0.973	17.295	0.001	13.234	4.604	39.024	114.859	222.202	167.407
40 -	OBS	1439.0	1835.0	1537.0	1012.0	733.0	1002.0	1110.0	1342.0	1514.0	1281.0
	EXP	1547.7	1737.8	1450.1	1015.8	884.9	946.3	962.6*	961.1*	881.0*	732.7*
	CHI	7.634	5.436	5.209	0.014	26.065	3.278	22.580	150.960	454.783	410.236
45 -	OBS	2864.0	3671.0	3433.0	2449.0	1661.0	1796.0	2134.0	2611.0	3210.0	3251.0
	EXP	2988.9	3529.7	3285.7	2443.5	1858.6	1787.2	1898.0*	1953.2*	1948.1*	1782.8*
	CHI	5.215	5.654	6.601	0.013	21.016	0.043	29.354	221.518	817.428	1209.122
50 -	OBS	5814.0	7214.0	7320.0	5710.0	4496.0	4015.0	4242.0	4841.0	5962.0	7378.0
	EXP	6017.5	7124.5	6974.3	5822.3	4686.6	3961.6	3810.3*	4096.5*	4219.3*	4186.6*
	CHI	6.883	1.125	17.133	2.165	7.754	0.719	48.903	135.313	719.826	2432.714
55 -	OBS	10283.0	13740.0	13684.0	11816.0	10606.0	9759.0	9024.0	9628.0	11109.0	13170.0
	EXP	10493.9	13702.6	13462.5	11903.5	10750.2	9582.2	8122.6*	7914.5*	8576.3*	8799.5*
	CHI	4.237	0.102	3.646	0.644	1.934	3.262	100.034	370.960	747.908	2170.755
60 -	OBS	15672.0	21870.0	23643.0	21332.0	20221.0	20558.0	18927.0	17803.0	19254.0	22114.0
	EXP	15567.9	21749.7	23706.9	21370.1	20471.7	20432.3	18345.3*	15812.7*	15492.7*	16807.7*
	CHI	0.696	0.666	0.172	0.068	3.071	0.773	18.443	250.502	913.187	1675.203
65 -	OBS	20624.0	27909.0	32315.0	33063.0	32301.0	33968.0	34283.0	32438.0	30017.0	32769.0
	EXP	20023.2	28087.8	32763.5	32991.3	32301.9	34025.0	34209.8*	31262.4*	27397.1*	26959.7*
	CHI	18.024	1.138	6.139	0.156	0.000	0.096	0.156	44.210	250.531	1251.782
70 -	OBS	20923.0	30722.0	35740.0	38951.0	42983.0	46089.0	48515.0	50534.0	46485.0	44176.0
	EXP	20763.4	30925.2	35889.2	39030.2	42562.5	46241.5	49535.4*	50886.4*	47514.5*	42112.3*
	CHI	1.227	1.335	0.620	0.161	4.154	0.503	21.018	2.441	22.305	101.127
75 -	OBS	16000.0	26343.0	32488.0	35821.0	42842.0	50311.0	54265.0	59914.0	61191.0	56951.0
	EXP	16000.0	26503.7	32897.8	35599.0	42233.7	50579.6	55828.4*	61594.3*	64190.0*	61357.2*
	CHI	0.000	0.975	5.104	1.384	8.760	1.426	43.783	45.838	140.111	316.424
30-79	OBS	94747.0	134723.0	151522.0	151128.0	156606.0	168512.0	173690.0	180323.0	179906.0	182060.0
	EXP	94799.6	134732.0	151566.4	151130.8	156655.4	168472.9	173594.0*	175264.5*	170868.2*	163281.7*
	O/E	0.999	1.000	1.000	1.000	1.000	1.000	1.001	1.029	1.053	1.115

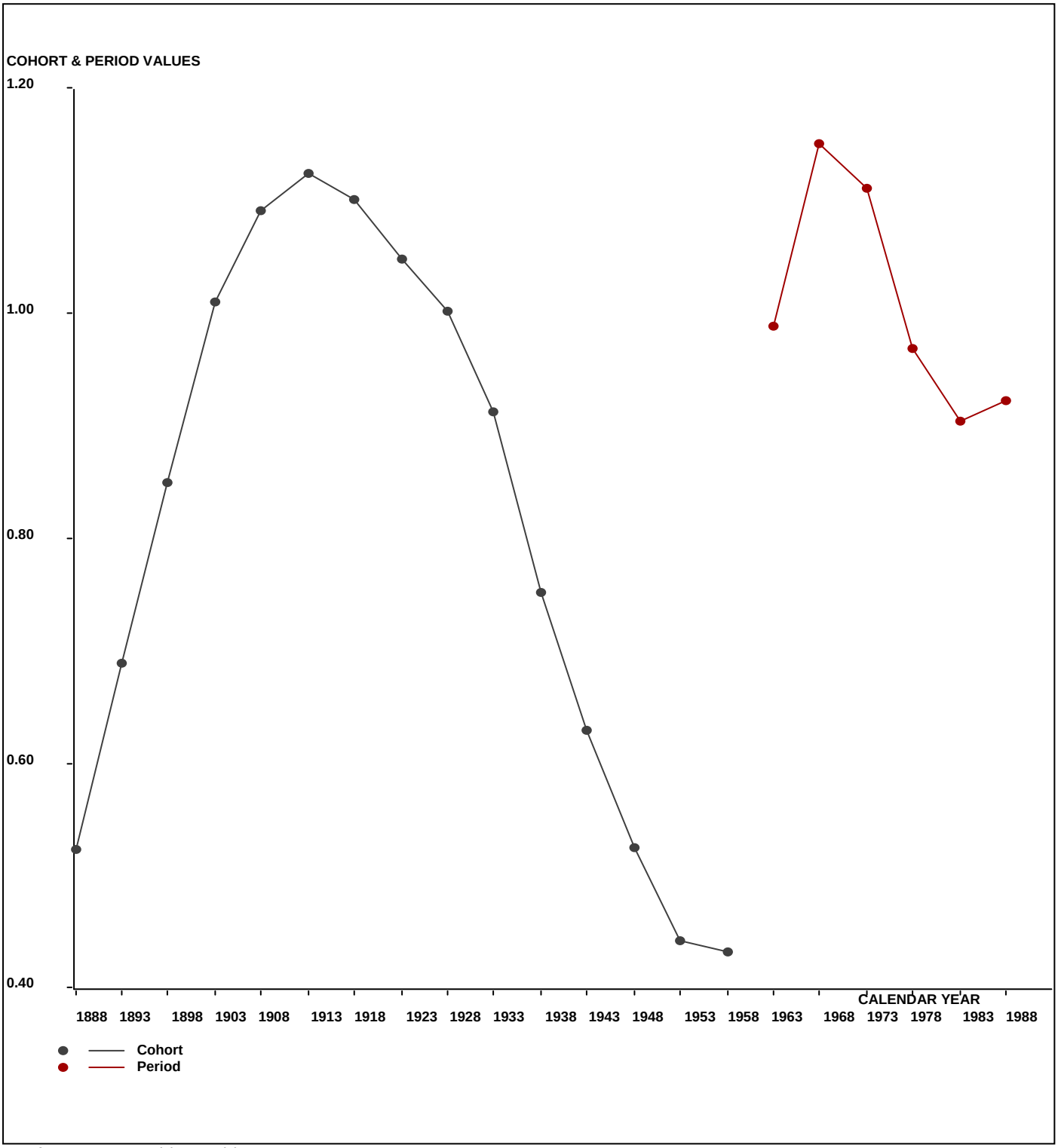
CHI SQUARE (LOG)= 16257.0848 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

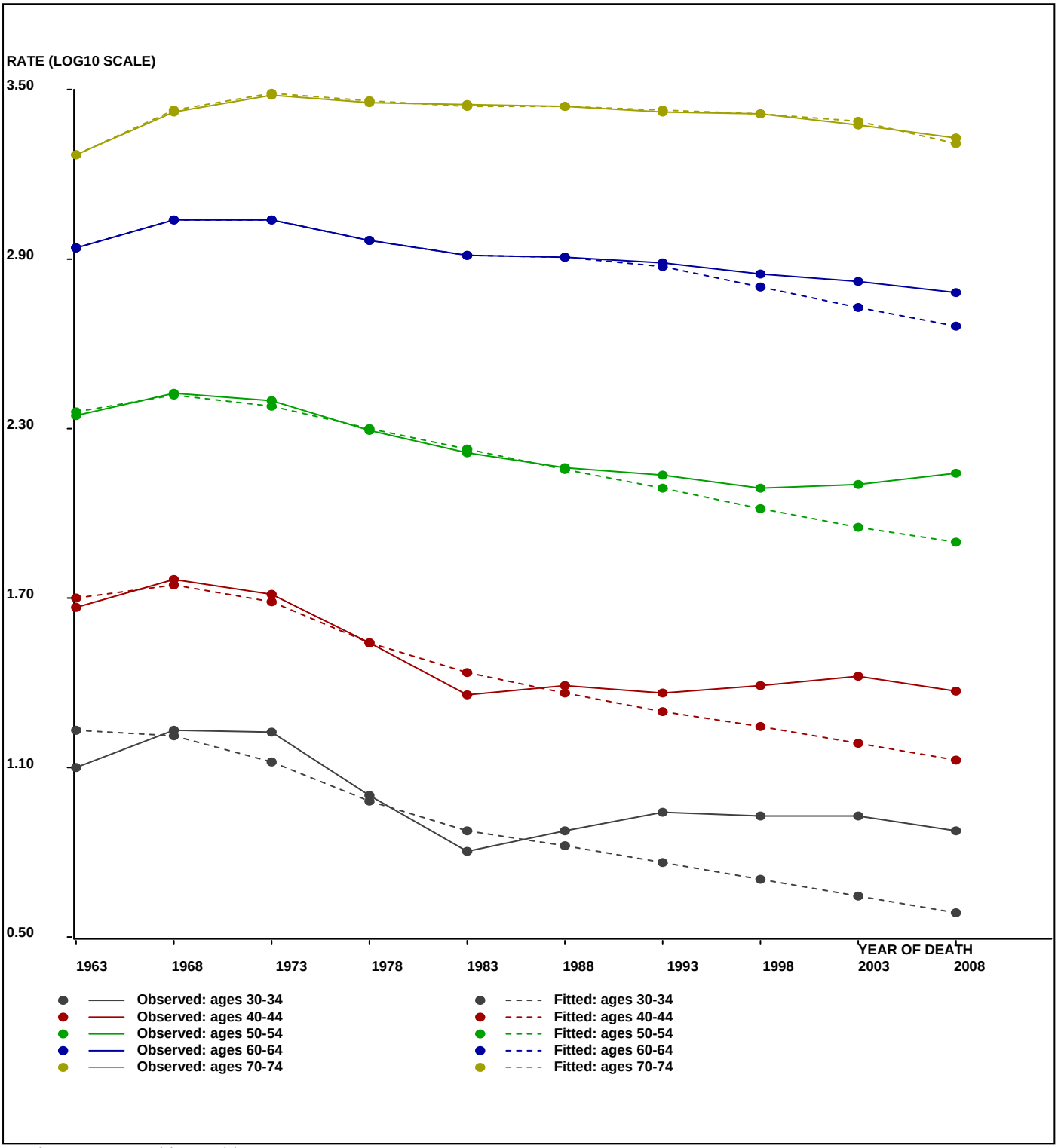


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Males, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	8.7	12.9	23.1	53.7	135.9	340.3	767.6	1496.5	2605.7	4198.1
PRE	5.9	10.2	20.0	47.7	122.0	306.3	744.1	1493.3	2660.5	4319.1
RES	2.873	2.710	3.070	5.935	13.824	33.993	23.592	3.194	-54.803	-120.953
1996- OBS	8.6	13.1	24.8	54.7	122.9	318.0	705.2	1439.6	2578.4	4082.4
PRE	5.1	8.9	17.7	41.0	104.0	261.4	626.4	1387.5	2596.4	4196.9
RES	3.476	4.230	7.028	13.792	18.901	56.591	78.836	52.176	-17.983	-114.490
2001- OBS	8.6	13.4	26.6	59.7	126.1	288.6	664.3	1279.7	2360.1	3904.4
PRE	4.5	7.8	15.5	36.2	89.3	222.8	534.5	1168.0	2412.3	4095.7
RES	4.098	5.632	11.120	23.472	36.864	65.786	129.768	111.691	-52.267	-191.353
2006- OBS	7.6	11.5	23.6	57.7	139.2	286.1	599.3	1211.5	2130.3	3532.1
PRE	3.9	6.8	13.5	31.6	79.0	191.2	455.5	996.7	2030.7	3805.4
RES	3.693	4.708	10.108	26.045	60.193	94.956	143.813	214.772	99.514	-273.276

Observed and predicted deaths (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	491.0	699.0	1110.0	2134.0	4242.0	9024.0	18927.0	34283.0	48515.0	54265.0
PRE	329.4	552.2	962.6	1898.0	3810.3	8122.6	18345.3	34209.8	49535.4	55828.4
CHI	79.291	39.024	22.580	29.354	48.903	100.034	18.443	0.156	21.018	43.783
1996- OBS	462.0	750.0	1342.0	2611.0	4841.0	9628.0	17803.0	32438.0	50534.0	59914.0
PRE	275.0	508.4	961.1	1953.2	4096.5	7914.5	15812.7	31262.4	50886.4	61594.3
CHI	127.177	114.859	150.960	221.518	135.313	370.960	250.502	44.210	2.441	45.838
2001- OBS	435.0	729.0	1514.0	3210.0	5962.0	11109.0	19254.0	30017.0	46485.0	61191.0
PRE	226.7	422.6	881.0	1948.1	4219.3	8576.3	15492.7	27397.1	47514.5	64190.0
CHI	191.318	222.202	454.783	817.428	719.826	747.908	913.187	250.531	22.305	140.111
2006- OBS	382.0	588.0	1281.0	3251.0	7378.0	13170.0	22114.0	32769.0	44176.0	56951.0
PRE	196.1	347.0	732.7	1782.8	4186.6	8799.5	16807.7	26959.7	42112.3	61357.2
CHI	176.351	167.407	410.236	1209.122	2432.714	2170.755	1675.203	1251.782	101.127	316.424

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	60512.10	1186.51	51	P, C	99.88	325012.64	0.0000
AGE-PERIOD	499.55	11.10	45	Cohort	85.04	2650.79	0.0000
AGE-COHORT	3396.41	94.34	36	Period	97.80	18029.02	0.0000
PERIOD-COHORT	127.04	3.18	40	Age	41.16	674.26	0.0000
FULL AGE-PERIOD-COHORT	74.76	2.34	32			396.39	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.552633	35.697078
35	1.952884	89.718937
40	2.324775	211.239382
45	2.630727	427.294414
50	2.928970	849.121725
55	3.206287	1608.003121
60	3.484902	3054.229679
65	3.739685	5491.428539
70	3.991970	9816.796112
75	4.228206	16912.420668

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.111888	1.293863
1966	0.108147	1.282763
1971	0.068422	1.170636
1976	-0.037213	0.917882
1981	-0.133790	0.734869
1986	-0.218791	0.604239

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.005577	0.987241
1891	-0.001135	0.997390
1896	-0.000849	0.998048
1901	0.017805	1.041850
1906	-0.008946	0.979611
1911	-0.006383	0.985411
1916	-0.001918	0.995593
1921	0.004200	1.009717
1926	0.009087	1.021145
1931	0.013790	1.032262
1936	-0.003871	0.991127
1941	-0.041954	0.907916
1946	-0.104313	0.786478
1951	-0.140227	0.724058
1956	-0.088535	0.815577

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	1435.0	1460.0	1244.0	984.0	863.0	957.0
	EXP	1410.1	1322.5	1259.8	1072.9	934.4	957.0
	CHI	0.4	14.3	0.2	7.4	5.5	0.0
35 -	OBS	3636.0	3680.0	3217.0	2322.0	2085.0	2008.0
	EXP	3785.3	3531.5	3038.1	2498.3	2175.0	1940.5
	CHI	5.9	6.2	10.5	12.4	3.7	2.3
40 -	OBS	8224.0	8992.0	7787.0	5593.0	4696.0	4402.0
	EXP	8721.7	8819.0	7552.0	5650.9	4742.0	4232.1
	CHI	28.4	3.4	7.3	0.6	0.4	6.8
45 -	OBS	15441.0	17574.0	16292.0	12003.0	8996.0	8037.0
	EXP	16080.2	17296.6	16051.9	11968.2	9158.9	7808.9
	CHI	25.4	4.4	3.6	0.1	2.9	6.7
50 -	OBS	29252.0	31631.0	30963.0	24657.0	18573.0	14682.0
	EXP	29685.5	30936.7	30591.1	24827.8	18942.8	14791.9
	CHI	6.3	15.6	4.5	1.2	7.2	0.8
55 -	OBS	48519.0	54283.0	52272.0	44862.0	37052.0	28654.0
	EXP	49600.4	54122.3	51621.0	44616.6	36960.7	28738.2
	CHI	23.6	0.5	8.2	1.3	0.2	0.2
60 -	OBS	82954.0	87105.0	88280.0	75123.0	66044.0	55313.0
	EXP	83322.4	87669.8	88408.6	74323.2	65599.1	55504.7
	CHI	1.6	3.6	0.2	8.6	3.0	0.7
65 -	OBS	129276.0	137647.0	134022.0	117588.0	102745.0	90893.0
	EXP	127987.0	137257.5	133800.8	118899.8	102484.7	91760.1
	CHI	13.0	1.1	0.4	14.5	0.7	8.2
70 -	OBS	183229.0	198997.0	194867.0	168269.0	152188.0	133295.0
	EXP	181435.1	198635.0	194980.3	167658.6	153058.3	135102.7
	CHI	17.7	0.7	0.1	2.2	4.9	24.2
75 -	OBS	215013.0	249864.0	255194.0	223091.0	200090.0	187196.0
	EXP	215013.0	251673.2	256857.2	223000.2	199292.1	184643.4
	CHI	0.0	13.0	10.8	0.0	3.2	35.3

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	1397326.16	34933.15	40	P, C	93.31	0.0000
AGE-PERIOD	26577.33	664.43	40	Cohort	-251.91	0.0000
AGE-COHORT	72434.81	1810.87	40	Period	-29.12	0.0000
PERIOD-COHORT	69011.74	1725.29	40	Age	-35.52	0.0000
FULL AGE-PERIOD-COHORT	93527.00	2338.17	40			0.0000

AGE	EFFECT
30	35.697078
35	89.718937
40	211.239382
45	427.294414
50	849.121725
55	1608.003121
60	3054.229679
65	5491.428539
70	9816.796112
75	16912.420668

PERIOD	EFFECT	LOWER	UPPER
% Period Change	82.2241	79.2241	85.2241
1961	1.293863		
1966	1.282763		
1971	1.170636		
1976	0.917882		
1981	0.734869		
1986	0.604239		
1991	0.496831	0.478704	0.514958
1996	0.408515	0.379249	0.438868
2001	0.335898	0.300457	0.374022
2006	0.276189	0.238034	0.318757

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.987241	1.000000	
1891	0.997390	2.000000	
1896	0.998048	4.000000	
1901	1.041850	8.000000	
1906	0.979611	16.000000	
1911	0.985411	32.000000	
1916	0.995593	64.000000	
1921	1.009717	128.000000	
1926	1.021145	256.000000	
1931	1.032262	512.000000	
1936	0.991127	1024.000000	
1941	0.907916	2048.000000	
1946	0.786478	4096.000000	
1951	0.724058	8192.000000	
1956	0.679728	EXTRAPOLATION	0.815577
1961	0.629561	EXTRAPOLATION	
1966	0.583096	EXTRAPOLATION	
1971	0.540061	EXTRAPOLATION	
1976	0.500202	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	48.5	50.1	37.5	23.6	17.5	17.6	18.7	18.5	19.3	17.0
	EXP	47.7	45.4	37.9	25.8	19.0	14.7	11.2*	8.5*	6.5*	4.9*
	Elow							10.8	7.9	5.8	4.3
	Eup							11.6	9.1	7.2	5.7
35	OBS	113.9	123.8	110.2	69.5	49.7	40.6	42.6	46.0	47.5	41.3
	EXP	118.5	118.8	104.1	74.8	51.9	39.3	30.3*	23.1*	17.6*	13.4*
	Elow							29.2	21.4	15.7	11.5
	Eup							31.4	24.8	19.6	15.4
40	OBS	260.2	282.1	263.2	190.2	139.6	104.4	96.1	96.7	110.1	94.0
	EXP	276.0	276.7	255.3	192.2	140.9	100.4	76.0*	58.7*	44.7*	34.0*
	Elow							73.2	54.5	40.0	29.3
	Eup							78.8	63.0	49.7	39.3
45	OBS	528.5	562.3	518.4	406.0	305.7	241.3	202.6	192.3	205.7	191.3
	EXP	550.4	553.4	510.8	404.9	311.2	234.4	167.0*	126.4*	97.6*	74.3*
	Elow							160.9	117.3	87.3	64.0
	Eup							173.1	135.8	108.6	85.7
50	OBS	1066.8	1108.8	1015.9	790.4	631.5	504.7	433.4	393.2	373.2	331.4
	EXP	1082.6	1084.4	1003.7	795.9	644.1	508.5	383.0*	272.8*	206.5*	159.4*
	Elow							369.0	253.3	184.7	137.4
	Eup							397.0	293.1	230.0	184.0
55	OBS	1993.7	2038.6	1897.7	1498.5	1209.6	1000.0	862.5	771.2	669.3	539.9
	EXP	2038.1	2032.6	1874.1	1490.3	1206.7	1003.0	791.8*	596.4*	424.8*	321.6*
	Elow							762.9	553.7	380.0	277.1
	Eup							820.7	640.7	473.0	371.1
60	OBS	4098.9	3813.2	3518.1	2821.1	2281.6	1878.0	1599.3	1456.3	1244.2	927.1
	EXP	4117.1	3838.0	3523.2	2791.1	2266.3	1884.5	1566.4*	1236.6*	931.4*	663.4*
	Elow							1509.2	1148.0	833.2	571.8
	Eup							1623.5	1328.5	1037.2	765.7
65	OBS	7162.7	7359.8	6307.8	4912.1	4027.9	3318.7	2768.2	2516.2	2106.8	1530.5
	EXP	7091.3	7339.0	6297.4	4966.9	4017.7	3350.4	2786.0*	2315.7*	1828.2*	1377.0*
	Elow							2684.4	2149.8	1635.3	1186.8
	Eup							2887.6	2487.8	2035.7	1589.2
70	OBS	12793.7	12590.9	11965.9	8859.1	7068.4	5826.5	4896.7	4338.7	3666.4	2610.1
	EXP	12668.4	12568.0	11972.8	8826.9	7108.8	5905.6	4924.7*	4095.1*	3403.8*	2687.2*
	Elow							4745.0	3801.7	3044.7	2316.0
	Eup							5104.4	4399.4	3790.2	3101.4
75	OBS	21603.1	21482.5	19631.7	16179.9	12223.7	10209.3	8644.7	7741.5	6569.0	4731.4
	EXP	21603.1	21638.0	19759.6	16173.3	12175.0	10070.1	8365.6*	6976.1*	5801.0*	4821.7*
	Elow							8060.4	6476.3	5188.9	4155.6
	Eup							8670.8	7494.5	6459.4	5564.9
30-79	OBS	2851.3	2843.0	2599.7	2037.1	1608.0	1325.9	1123.2	1012.7	874.4	654.8
	EXP	2853.0	2841.3	2597.6	2037.2	1608.9	1326.9	1089.2*	885.2*	708.0*	553.9*
	Elow							1049.4	821.8	633.3	477.3
	Eup							1128.9	951.0	788.4	639.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	1435.0	1460.0	1244.0	984.0	863.0	957.0	1052.0	991.0	975.0	854.0
	EXP	1410.1	1322.5	1259.8	1072.9	934.4	797.6	628.6*	454.4*	326.5*	247.9*
	CHI	0.439	14.290	0.198	7.374	5.462	31.859	285.154	633.631	1287.904	1481.503
35 -	OBS	3636.0	3680.0	3217.0	2322.0	2085.0	2008.0	2336.0	2645.0	2597.0	2130.0
	EXP	3785.3	3531.5	3038.1	2498.3	2175.0	1940.5	1661.3*	1325.5*	961.2*	689.9*
	CHI	5.892	6.247	10.538	12.435	3.723	2.346	274.046	1313.407	2784.009	3005.883
40 -	OBS	8224.0	8992.0	7787.0	5593.0	4696.0	4402.0	4749.0	5333.0	6374.0	5181.0
	EXP	8721.7	8819.0	7552.0	5650.9	4742.0	4232.1	3756.9*	3235.1*	2585.2*	1874.4*
	CHI	28.399	3.394	7.314	0.593	0.447	6.820	261.987	1360.533	5552.974	5833.128
45 -	OBS	15441.0	17574.0	16292.0	12003.0	8996.0	8037.0	8425.0	9504.0	11363.0	11072.0
	EXP	16080.2	17296.6	16051.9	11968.2	9158.9	7808.9	6944.2*	6247.7*	5388.4*	4300.6*
	CHI	25.412	4.449	3.592	0.101	2.897	6.662	315.780	1697.219	6624.600	10661.714
50 -	OBS	29252.0	31631.0	30963.0	24657.0	18573.0	14682.0	14278.0	16345.0	18487.0	18290.0
	EXP	29685.5	30936.7	30591.1	24827.8	18942.8	14791.9	12618.8*	11339.5*	10229.9*	8798.8*
	CHI	6.330	15.583	4.520	1.175	7.220	0.816	218.163	2209.518	6664.671	10237.999
55 -	OBS	48519.0	54283.0	52272.0	44862.0	37052.0	28654.0	24478.0	25051.0	27616.0	26509.0
	EXP	49600.4	54122.3	51621.0	44616.6	36960.7	28738.2	22472.9*	19372.6*	17527.5*	15789.7*
	CHI	23.575	0.477	8.210	1.350	0.225	0.246	178.901	1664.432	5806.768	7277.055
60 -	OBS	82954.0	87105.0	88280.0	75123.0	66044.0	55313.0	44138.0	40313.0	39553.0	37449.0
	EXP	83322.4	87669.8	88408.6	74323.2	65599.1	55504.7	43228.7*	34232.5*	29611.1*	26798.4*
	CHI	1.629	3.638	0.187	8.607	3.017	0.662	19.129	1080.025	3337.970	4232.948
65 -	OBS	129276.0	137647.0	134022.0	117588.0	102745.0	90893.0	76850.0	66043.0	56033.0	46757.0
	EXP	127987.0	137257.5	133800.8	118899.8	102484.7	91760.1	77344.5*	60779.8*	48623.6*	42067.9*
	CHI	12.982	1.105	0.366	14.474	0.661	8.194	3.162	455.762	1129.053	522.661
70 -	OBS	183229.0	198997.0	194867.0	168269.0	152188.0	133295.0	120234.0	109135.0	88423.0	64058.0
	EXP	181435.1	198635.0	194980.3	167658.6	153058.3	135102.7	120920.7*	103006.8*	82089.2*	65951.4*
	CHI	17.737	0.660	0.066	2.223	4.948	24.188	3.900	364.589	488.694	54.359
75 -	OBS	215013.0	249864.0	255194.0	223091.0	200090.0	187196.0	167793.0	164198.0	142524.0	99680.0
	EXP	215013.0	251673.2	256857.2	223000.2	199292.1	184643.4	162374.4*	147963.9*	125860.7*	101583.3*
	CHI	0.000	13.006	10.770	0.037	3.195	35.290	180.822	1781.142	2206.143	35.660
30-79	OBS	716979.0	791233.0	784138.0	674492.0	593332.0	525437.0	464333.0	439558.0	393945.0	311980.0
	EXP	717040.7	791264.1	784160.7	674516.5	593348.0	525320.1	451951.0*	387957.8*	323203.3*	268102.4*
	O/E	1.000	1.000	1.000	1.000	1.000	1.000	1.027	1.133	1.219	1.164

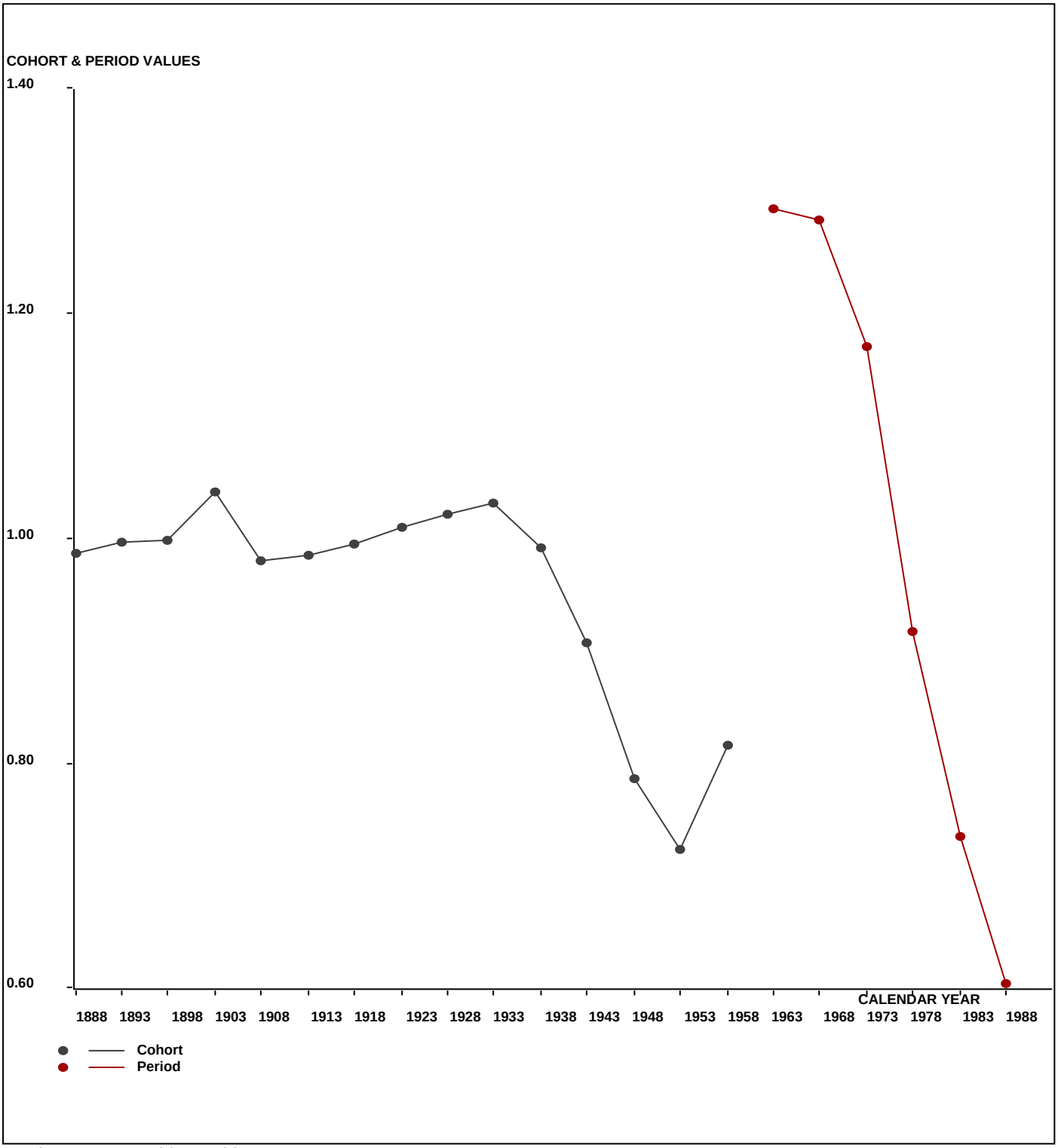
CHI SQUARE (LOG)= 93526.9990 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

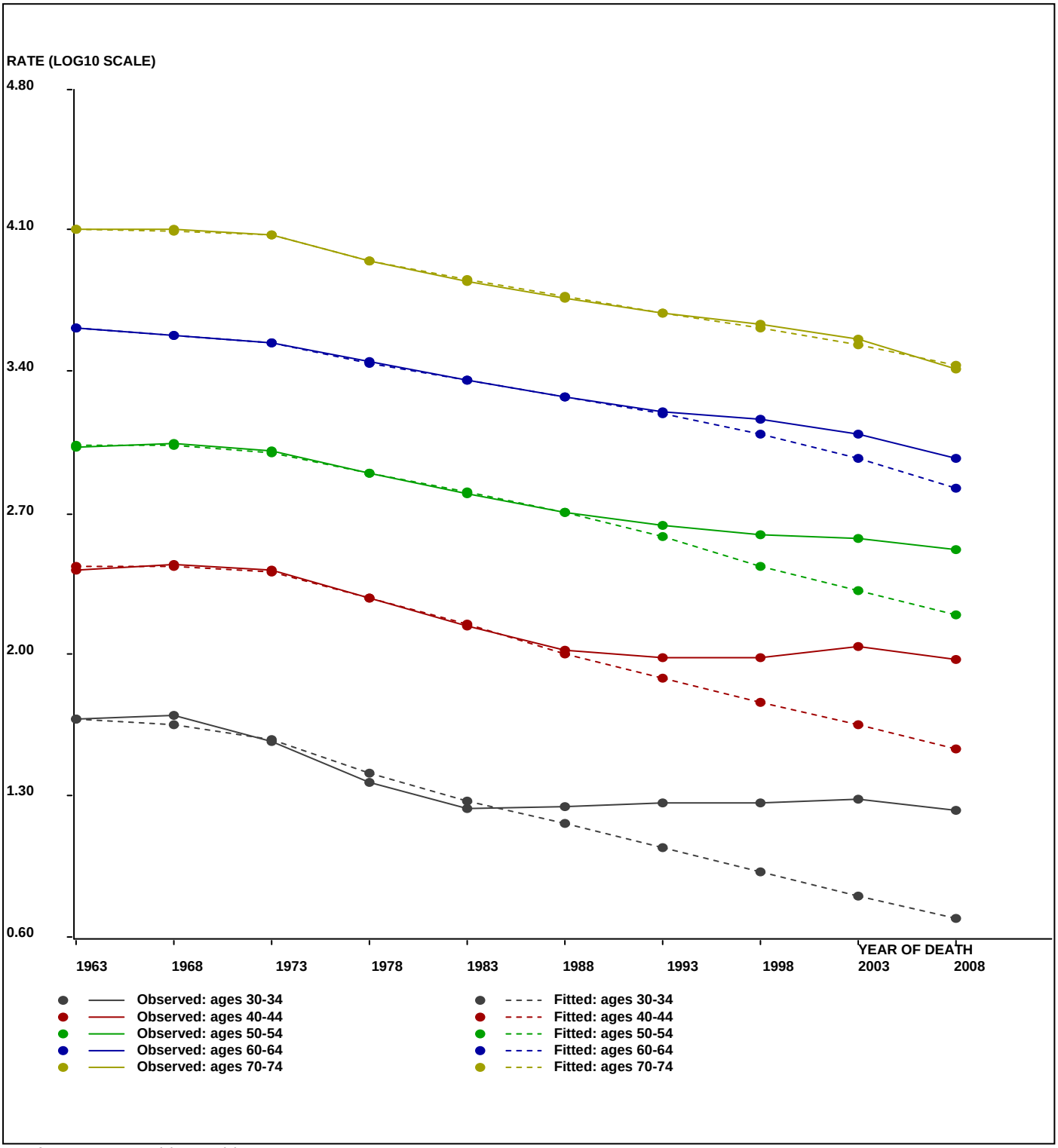


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA IHD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	18.7	42.6	96.1	202.6	433.4	862.5	1599.3	2768.2	4896.7	8644.7
PRE	11.2	30.3	76.0	167.0	383.0	791.8	1566.4	2786.0	4924.7	8365.6
RES	7.520	12.306	20.067	35.604	50.362	70.648	32.950	-17.813	-27.968	279.166
1996- OBS	18.5	46.0	96.7	192.3	393.2	771.2	1456.3	2516.2	4338.7	7741.5
PRE	8.5	23.1	58.7	126.4	272.8	596.4	1236.6	2315.7	4095.1	6976.1
RES	10.041	22.969	38.039	65.875	120.425	174.815	219.652	200.527	243.632	765.393
2001- OBS	19.3	47.5	110.1	205.7	373.2	669.3	1244.2	2106.8	3666.4	6569.0
PRE	6.5	17.6	44.7	97.6	206.5	424.8	931.4	1828.2	3403.8	5801.0
RES	12.861	29.907	65.469	108.173	166.688	244.505	312.729	278.583	262.629	768.019
2006- OBS	17.0	41.3	94.0	191.3	331.4	539.9	927.1	1530.5	2610.1	4731.4
PRE	4.9	13.4	34.0	74.3	159.4	321.6	663.4	1377.0	2687.2	4821.7
RES	12.055	27.933	60.012	116.982	171.952	218.302	263.671	153.487	-77.149	-90.341

Observed and predicted deaths (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	1052.0	2336.0	4749.0	8425.0	14278.0	24478.0	44138.0	76850.0	120234.0	167793.0
PRE	628.6	1661.3	3756.9	6944.2	12618.8	22472.9	43228.7	77344.5	120920.7	162374.4
CHI	285.154	274.046	261.987	315.780	218.163	178.901	19.129	3.162	3.900	180.822
1996- OBS	991.0	2645.0	5333.0	9504.0	16345.0	25051.0	40313.0	66043.0	109135.0	164198.0
PRE	454.4	1325.5	3235.1	6247.7	11339.5	19372.6	34232.5	60779.8	103006.8	147963.9
CHI	633.631	1313.407	1360.533	1697.219	2209.518	1664.432	1080.025	455.762	364.589	1781.142
2001- OBS	975.0	2597.0	6374.0	11363.0	18487.0	27616.0	39553.0	56033.0	88423.0	142524.0
PRE	326.5	961.2	2585.2	5388.4	10229.9	17527.5	29611.1	48623.6	82089.2	125860.7
CHI	1287.904	2784.009	5552.974	6624.600	6664.671	5806.768	3337.970	1129.053	488.694	2206.143
2006- OBS	854.0	2130.0	5181.0	11072.0	18290.0	26509.0	37449.0	46757.0	64058.0	99680.0
PRE	247.9	689.9	1874.4	4300.6	8798.8	15789.7	26798.4	42067.9	65951.4	101583.3
CHI	1481.503	3005.883	5833.128	10661.714	10237.999	7277.055	4232.948	522.661	54.359	35.660

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	34937.35	685.05	51	P, C	99.90	188855.24	0.0000
AGE-PERIOD	291.16	6.47	45	Cohort	88.47	1544.16	0.0000
AGE-COHORT	752.83	20.91	36	Period	95.54	3994.08	0.0000
PERIOD-COHORT	46.68	1.17	40	Age	28.10	247.53	0.0000
FULL AGE-PERIOD-COHORT	33.56	1.05	32			177.96	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.682302	48.117377
35	1.945767	88.260714
40	2.184582	152.961276
45	2.403674	253.322362
50	2.595009	393.557955
55	2.770667	589.749306
60	2.999078	997.878439
65	3.254288	1795.925390
70	3.534850	3426.494570
75	3.814492	6523.667451

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	0.148820	1.408704
1966	0.106997	1.279373
1971	0.055266	1.135707
1976	-0.071231	0.848728
1981	-0.173804	0.670186
1986	-0.244899	0.568985

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	0.019789	1.046620
1891	0.020704	1.048826
1896	0.019090	1.044936
1901	0.028891	1.068788
1906	-0.010918	0.975173
1911	-0.025329	0.943346
1916	-0.028953	0.935507
1921	-0.026802	0.940151
1926	-0.024625	0.944876
1931	-0.007828	0.982137
1936	-0.008601	0.980389
1941	-0.016270	0.963231
1946	-0.049662	0.891946
1951	-0.052461	0.886215
1956	-0.006282	0.985640

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	1807.0	1923.0	1799.0	1463.0	1390.0	1468.0
	EXP	1969.0	1758.7	1747.8	1516.6	1406.0	1468.0
	CHI	13.3	15.3	1.5	1.9	0.2	0.0
35 -	OBS	3536.0	3523.0	2938.0	2332.0	2179.0	2216.0
	EXP	3751.5	3296.6	2868.1	2410.9	2213.0	2200.2
	CHI	12.4	15.5	1.7	2.6	0.5	0.1
40 -	OBS	6081.0	6091.0	5154.0	3645.0	3337.0	3358.0
	EXP	6402.3	5893.4	5047.7	3742.6	3322.3	3272.7
	CHI	16.1	6.6	2.2	2.5	0.1	2.2
45 -	OBS	9657.0	9780.0	8655.0	6034.0	4813.0	4636.0
	EXP	9752.9	9522.6	8542.9	6242.2	4898.3	4625.0
	CHI	0.9	7.0	1.5	6.9	1.5	0.0
50 -	OBS	14289.0	13700.0	12961.0	9607.0	7548.0	6324.0
	EXP	14340.6	13437.8	12807.9	9845.7	7618.2	6385.9
	CHI	0.2	5.1	1.8	5.8	0.6	0.6
55 -	OBS	19455.0	19040.0	17396.0	14020.0	11453.0	9531.0
	EXP	19716.3	18952.3	17259.0	14088.2	11439.2	9443.1
	CHI	3.5	0.4	1.1	0.3	0.0	0.8
60 -	OBS	30367.0	27977.0	26873.0	21281.0	18348.0	15918.0
	EXP	30405.7	28438.4	26826.8	21098.3	18199.4	15801.0
	CHI	0.0	7.5	0.1	1.6	1.2	0.9
65 -	OBS	48274.0	46143.0	42131.0	34259.0	28414.0	26128.0
	EXP	47713.2	45927.9	42260.4	34420.7	28721.9	26311.6
	CHI	6.6	1.0	0.4	0.8	3.3	1.3
70 -	OBS	73062.0	71977.0	67325.0	54347.0	46611.0	41541.0
	EXP	72505.6	72397.8	67733.2	53866.2	46642.0	41725.5
	CHI	4.3	2.4	2.5	4.3	0.0	0.8
75 -	OBS	95730.0	101255.0	100493.0	81824.0	70152.0	64314.0
	EXP	95730.0	101815.1	100637.6	81594.3	69789.5	64204.5
	CHI	0.0	3.1	0.2	0.6	1.9	0.2

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	513428.81	12835.72	40	P, C	96.27	0.0000
AGE-PERIOD	24909.55	622.74	40	Cohort	23.06	0.0000
AGE-COHORT	37644.89	941.12	40	Period	49.09	0.0000
PERIOD-COHORT	18753.72	468.84	40	Age	-2.19	0.0000
FULL AGE-PERIOD-COHORT	19165.16	479.13	40			0.0000

AGE	EFFECT
30	48.117377
35	88.260714
40	152.961276
45	253.322362
50	393.557955
55	589.749306
60	997.878439
65	1795.925390
70	3426.494570
75	6523.667451

PERIOD	EFFECT	LOWER	UPPER
% Period Change	84.8995	81.8995	87.8995
1961	1.408704		
1966	1.279373		
1971	1.135707		
1976	0.848728		
1981	0.670186		
1986	0.568985		
1991	0.483066	0.465996	0.500135
1996	0.410120	0.381649	0.439617
2001	0.348190	0.312568	0.386421
2006	0.295612	0.255992	0.339662

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	1.046620	1.000000	
1891	1.048826	2.000000	
1896	1.044936	4.000000	
1901	1.068788	8.000000	
1906	0.975173	16.000000	
1911	0.943346	32.000000	
1916	0.935507	64.000000	
1921	0.940151	128.000000	
1926	0.944876	256.000000	
1931	0.982137	512.000000	
1936	0.980389	1024.000000	
1941	0.963231	2048.000000	
1946	0.891946	4096.000000	
1951	0.886215	8192.000000	
1956	0.868586	EXTRAPOLATION	0.985640
1961	0.849806	EXTRAPOLATION	
1966	0.831433	EXTRAPOLATION	
1971	0.813456	EXTRAPOLATION	
1976	0.795868	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	61.1	66.0	54.2	35.1	28.3	27.0	24.5	20.5	18.4	15.6
	EXP	66.6	60.4	52.6	36.4	28.6	23.8	19.8*	16.4*	13.6*	11.3*
	Elow							19.1	15.3	12.2	9.8
	Eup							20.5	17.6	15.1	13.0
35	OBS	110.7	118.5	100.7	69.8	51.9	44.8	43.9	41.9	33.5	29.7
	EXP	117.5	110.9	98.3	72.2	52.8	44.5	37.0*	30.8*	25.6*	21.2*
	Elow							35.7	28.6	22.9	18.4
	Eup							38.3	33.0	28.4	24.4
40	OBS	192.4	191.1	174.2	124.0	99.2	79.7	74.1	74.0	70.0	58.3
	EXP	202.6	184.9	170.6	127.3	98.7	77.6	65.5*	54.5*	45.3*	37.6*
	Elow							63.2	50.7	40.6	32.6
	Eup							67.8	58.4	50.2	43.2
45	OBS	330.6	312.9	275.4	204.1	163.5	139.2	121.1	116.5	109.8	99.8
	EXP	333.8	304.7	271.8	211.2	166.4	138.8	109.1*	92.1*	76.6*	63.6*
	Elow							105.3	85.7	68.8	55.1
	Eup							113.0	98.7	85.0	73.1
50	OBS	521.1	480.2	425.2	308.0	256.7	217.4	198.2	176.5	159.5	147.0
	EXP	523.0	471.0	420.2	315.6	259.0	219.5	183.1*	144.0*	121.4*	101.1*
	Elow							176.7	134.0	109.0	87.5
	Eup							189.6	154.3	134.8	116.1
55	OBS	799.4	715.1	631.6	468.3	373.9	332.6	301.4	279.5	234.6	202.6
	EXP	810.2	711.8	626.6	470.6	373.5	329.6	279.3*	233.0*	183.2*	154.5*
	Elow							269.4	216.8	164.4	133.8
	Eup							289.2	249.7	203.3	177.5
60	OBS	1500.5	1224.8	1070.9	799.2	633.9	540.5	489.6	459.2	390.0	319.9
	EXP	1502.4	1245.0	1069.1	792.3	628.7	536.5	473.4*	401.2*	334.7*	263.1*
	Elow							456.7	373.4	300.4	227.8
	Eup							490.2	430.1	371.4	302.3
65	OBS	2674.7	2467.2	1982.9	1431.1	1113.9	954.0	824.0	815.9	687.2	556.5
	EXP	2643.6	2455.7	1989.0	1437.9	1126.0	960.7	819.7*	723.4*	613.1*	511.4*
	Elow							790.8	673.2	550.3	442.8
	Eup							848.7	775.4	680.4	587.6
70	OBS	5101.4	4554.1	4134.1	2861.3	2164.9	1815.8	1602.5	1537.2	1341.1	1054.9
	EXP	5062.6	4580.8	4159.2	2836.0	2166.3	1823.9	1556.2*	1327.8*	1171.8*	993.0*
	Elow							1501.2	1235.6	1051.9	860.0
	Eup							1611.1	1423.3	1300.4	1141.0
75	OBS	9618.3	8705.6	7730.8	5934.4	4285.7	3507.6	3156.2	3106.7	2720.5	2097.5
	EXP	9618.3	8753.7	7741.9	5917.7	4263.5	3501.6	2948.1*	2515.4*	2146.3*	1894.0*
	Elow							2843.9	2340.7	1926.7	1640.2
	Eup							3052.3	2696.3	2381.9	2176.3
30-79	OBS	1200.9	1082.5	948.1	694.0	529.7	446.1	398.3	383.0	332.9	270.1
	EXP	1201.4	1081.7	947.6	694.9	530.1	445.6	378.0*	321.4*	272.9*	230.9*
	Elow							364.6	299.1	245.0	199.9
	Eup							391.3	344.5	302.9	265.3

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	1807.0	1923.0	1799.0	1463.0	1390.0	1468.0	1378.0	1093.0	927.0	783.0
	EXP	1969.0	1758.7	1747.8	1516.6	1406.0	1293.7	1112.1*	876.8*	687.2*	569.1*
	CHI	13.324	15.348	1.499	1.897	0.181	23.494	63.587	53.302	83.683	80.363
35 -	OBS	3536.0	3523.0	2938.0	2332.0	2179.0	2216.0	2406.0	2408.0	1831.0	1533.0
	EXP	3751.5	3296.6	2868.1	2410.9	2213.0	2200.2	2030.5*	1767.1*	1397.6*	1094.2*
	CHI	12.381	15.542	1.703	2.585	0.522	0.114	69.449	232.441	134.400	175.986
40 -	OBS	6081.0	6091.0	5154.0	3645.0	3337.0	3358.0	3665.0	4079.0	4050.0	3215.0
	EXP	6402.3	5893.4	5047.7	3742.6	3322.3	3272.7	3237.4*	3005.2*	2619.3*	2071.4*
	CHI	16.124	6.627	2.238	2.546	0.065	2.223	56.470	383.707	781.465	631.324
45 -	OBS	9657.0	9780.0	8655.0	6034.0	4813.0	4636.0	5038.0	5761.0	6066.0	5779.0
	EXP	9752.9	9522.6	8542.9	6242.2	4898.3	4625.0	4539.6*	4551.3*	4231.5*	3683.6*
	CHI	0.944	6.958	1.472	6.945	1.485	0.026	54.722	321.537	795.331	1191.945
50 -	OBS	14289.0	13700.0	12961.0	9607.0	7548.0	6324.0	6530.0	7335.0	7900.0	8116.0
	EXP	14340.6	13437.8	12807.9	9845.7	7618.2	6385.9	6033.1*	5984.0*	6015.7*	5577.7*
	CHI	0.186	5.116	1.831	5.787	0.647	0.600	40.930	305.035	590.210	1155.102
55 -	OBS	19455.0	19040.0	17396.0	14020.0	11453.0	9531.0	8553.0	9080.0	9678.0	9950.0
	EXP	19716.3	18952.3	17259.0	14088.2	11439.2	9443.1	7927.0*	7567.6*	7557.2*	7586.4*
	CHI	3.462	0.406	1.087	0.330	0.017	0.818	49.442	302.270	595.161	736.385
60 -	OBS	30367.0	27977.0	26873.0	21281.0	18348.0	15918.0	13513.0	12712.0	12397.0	12922.0
	EXP	30405.7	28438.4	26826.8	21098.3	18199.4	15801.0	13065.6*	11106.8*	10639.6*	10628.0*
	CHI	0.049	7.485	0.080	1.582	1.213	0.866	15.323	231.997	290.284	495.152
65 -	OBS	48274.0	46143.0	42131.0	34259.0	28414.0	26128.0	22875.0	21414.0	18276.0	17002.0
	EXP	47713.2	45927.9	42260.4	34420.7	28721.9	26311.6	22757.2*	18986.7*	16305.3*	15622.6*
	CHI	6.592	1.008	0.396	0.760	3.300	1.281	0.610	310.323	238.179	121.789
70 -	OBS	73062.0	71977.0	67325.0	54347.0	46611.0	41541.0	39348.0	38665.0	32343.0	25891.0
	EXP	72505.6	72397.8	67733.2	53866.2	46642.0	41725.5	38210.0*	33399.3*	28259.1*	24371.9*
	CHI	4.270	2.446	2.460	4.292	0.021	0.816	33.895	830.185	590.185	94.686
75 -	OBS	95730.0	101255.0	100493.0	81824.0	70152.0	64314.0	61262.0	65894.0	59026.0	44190.0
	EXP	95730.0	101815.1	100637.6	81594.3	69789.5	64204.5	57222.5*	53351.1*	46566.5*	39903.1*
	CHI	0.000	3.081	0.208	0.647	1.883	0.187	285.165	2948.847	3333.729	460.560
30-79	OBS	302258.0	301409.0	285725.0	228812.0	194245.0	175434.0	164568.0	168441.0	152494.0	129381.0
	EXP	302287.1	301440.5	285731.5	228825.8	194249.7	175263.1	156134.7*	140595.7*	124279.0*	111108.1*
	O/E	1.000	1.000	1.000	1.000	1.000	1.001	1.054	1.198	1.227	1.164

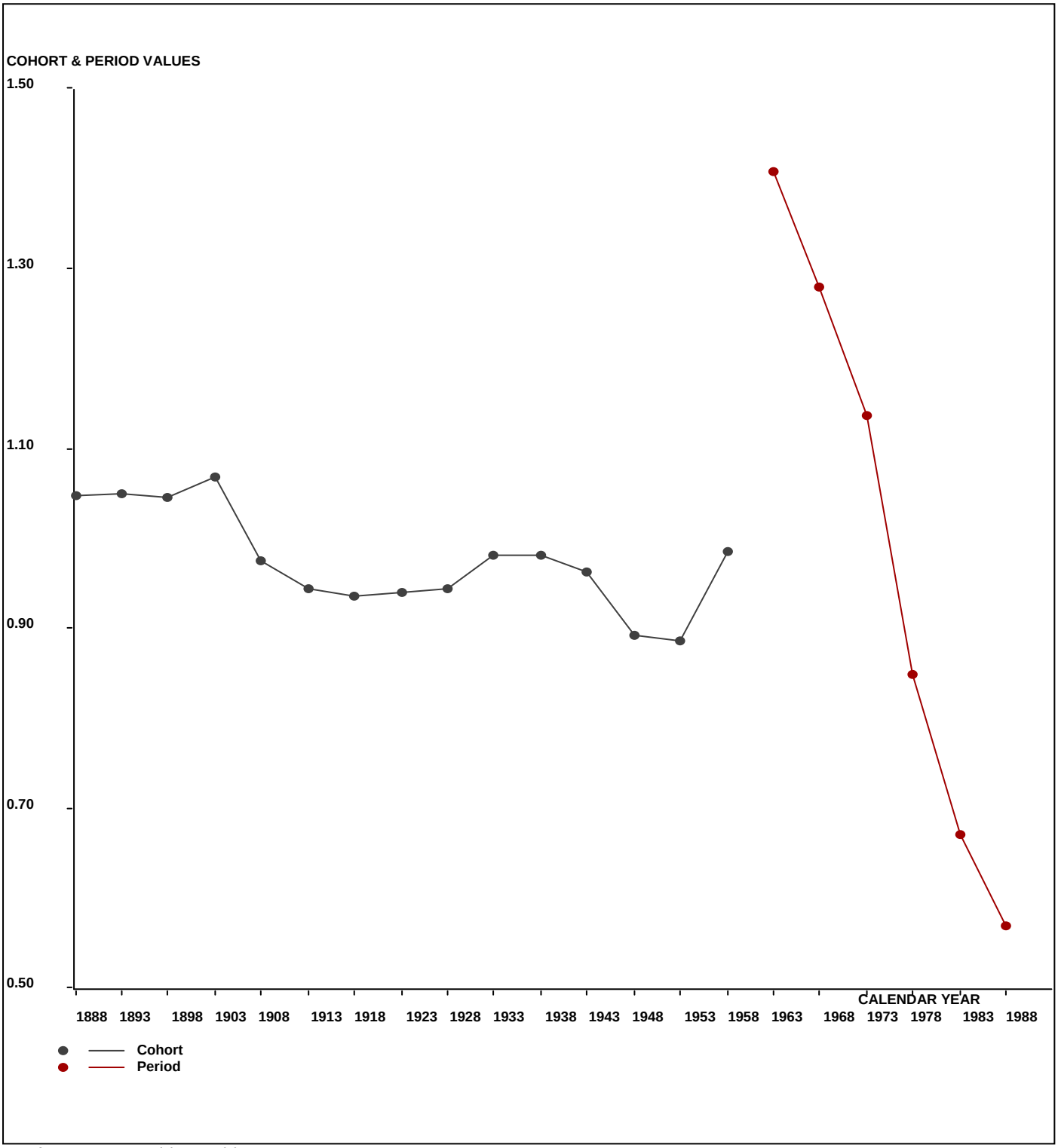
CHI SQUARE (LOG)= 19165.1564 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

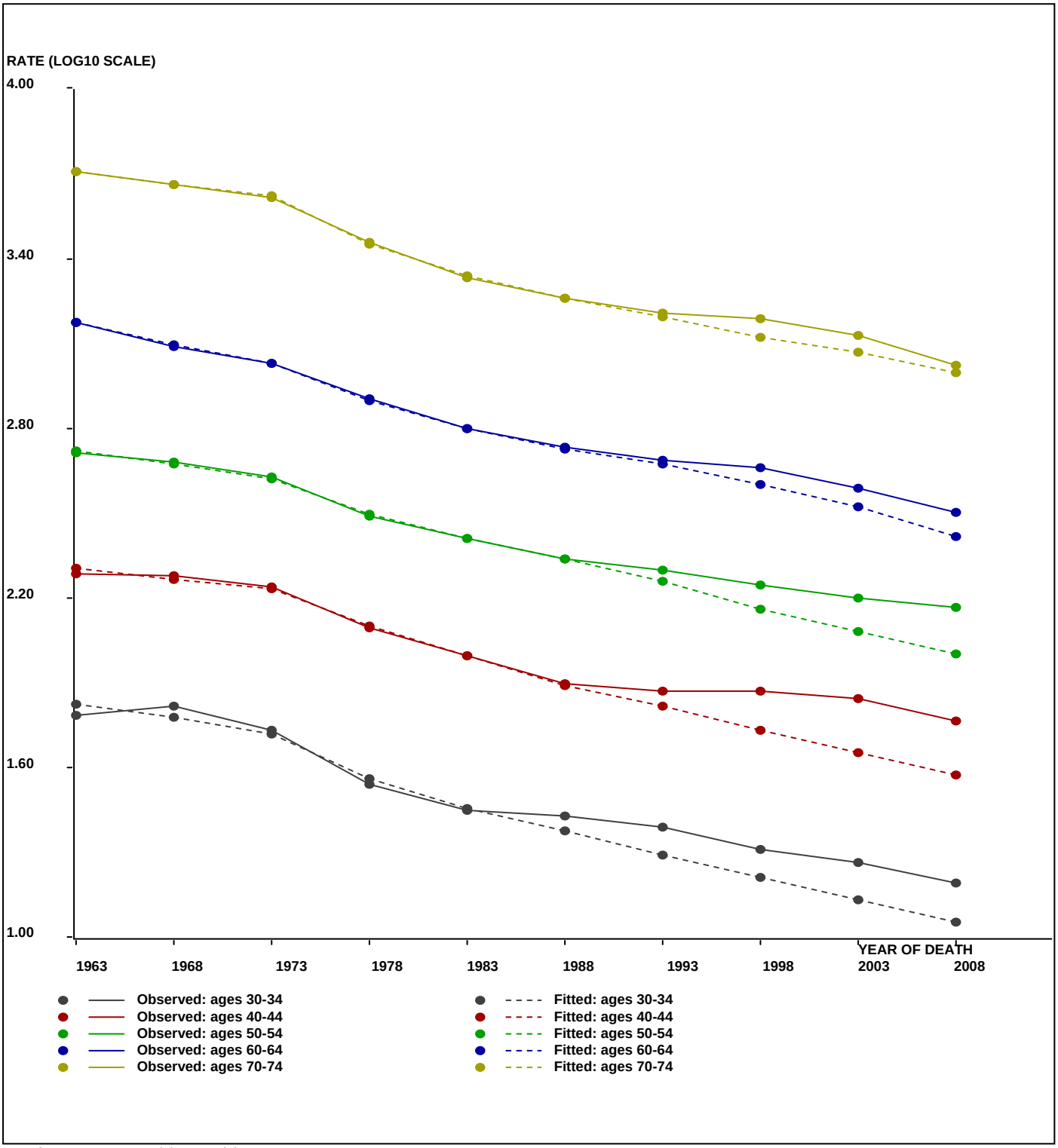


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Stroke, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	24.5	43.9	74.1	121.1	198.2	301.4	489.6	824.0	1602.5	3156.2
PRE	19.8	37.0	65.5	109.1	183.1	279.3	473.4	819.7	1556.2	2948.1
RES	4.723	6.849	8.648	11.984	15.083	22.058	16.213	4.245	46.348	208.118
1996- OBS	20.5	41.9	74.0	116.5	176.5	279.5	459.2	815.9	1537.2	3106.7
PRE	16.4	30.8	54.5	92.1	144.0	233.0	401.2	723.4	1327.8	2515.4
RES	4.045	11.156	19.470	24.472	32.504	46.562	57.988	92.482	209.341	591.364
2001- OBS	18.4	33.5	70.0	109.8	159.5	234.6	390.0	687.2	1341.1	2720.5
PRE	13.6	25.6	45.3	76.6	121.4	183.2	334.7	613.1	1171.8	2146.3
RES	4.756	7.924	24.722	33.215	38.039	51.400	55.281	74.095	169.338	574.264
2006- OBS	15.6	29.7	58.3	99.8	147.0	202.6	319.9	556.5	1054.9	2097.5
PRE	11.3	21.2	37.6	63.6	101.1	154.5	263.1	511.4	993.0	1894.0
RES	4.254	8.512	20.755	36.200	45.986	48.135	56.791	45.151	61.897	203.482

Observed and predicted deaths (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	1378.0	2406.0	3665.0	5038.0	6530.0	8553.0	13513.0	22875.0	39348.0	61262.0
PRE	1112.1	2030.5	3237.4	4539.6	6033.1	7927.0	13065.6	22757.2	38210.0	57222.5
CHI	63.587	69.449	56.470	54.722	40.930	49.442	15.323	0.610	33.895	285.165
1996- OBS	1093.0	2408.0	4079.0	5761.0	7335.0	9080.0	12712.0	21414.0	38665.0	65894.0
PRE	876.8	1767.1	3005.2	4551.3	5984.0	7567.6	11106.8	18986.7	33399.3	53351.1
CHI	53.302	232.441	383.707	321.537	305.035	302.270	231.997	310.323	830.185	2948.847
2001- OBS	927.0	1831.0	4050.0	6066.0	7900.0	9678.0	12397.0	18276.0	32343.0	59026.0
PRE	687.2	1397.6	2619.3	4231.5	6015.7	7557.2	10639.6	16305.3	28259.1	46566.5
CHI	83.683	134.400	781.465	795.331	590.210	595.161	290.284	238.179	590.185	3333.729
2006- OBS	783.0	1533.0	3215.0	5779.0	8116.0	9950.0	12922.0	17002.0	25891.0	44190.0
PRE	569.1	1094.2	2071.4	3683.6	5577.7	7586.4	10628.0	15622.6	24371.9	39903.1
CHI	80.363	175.986	631.324	1191.945	1155.102	736.385	495.152	121.789	94.686	460.560

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	23181.87	454.55	51	P, C	99.93	131326.39	0.0000
AGE-PERIOD	2335.81	51.91	45	Cohort	99.33	12563.20	0.0000
AGE-COHORT	143.34	3.98	36	Period	89.11	760.40	0.0000
PERIOD-COHORT	1012.65	25.32	40	Age	98.46	5409.37	0.0000
FULL AGE-PERIOD-COHORT	15.60	0.49	32			82.73	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	0.725483	5.314746
35	1.259140	18.161001
40	1.694715	49.512491
45	2.056292	113.839185
50	2.349344	223.534370
55	2.602750	400.635961
60	2.828570	673.861206
65	3.030358	1072.402268
70	3.200199	1585.619427
75	3.332308	2149.354878

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.095098	0.803345
1966	-0.053742	0.883605
1971	-0.011467	0.973941
1976	0.010087	1.023498
1981	0.017969	1.042243
1986	0.011739	1.027398

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.709984	0.194992
1891	-0.644709	0.226616
1896	-0.561070	0.274745
1901	-0.416157	0.383568
1906	-0.282418	0.521894
1911	-0.114783	0.767745
1916	0.029772	1.070956
1921	0.135281	1.365465
1926	0.226439	1.684378
1931	0.282483	1.916386
1936	0.303386	2.010879
1941	0.278879	1.900547
1946	0.220958	1.663252
1951	0.161454	1.450289
1956	0.142071	1.386982

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	250.0	258.0	334.0	376.0	397.0	412.0
	EXP	242.0	275.2	326.7	376.7	395.2	412.0
	CHI	0.3	1.1	0.2	0.0	0.0	0.0
35 -	OBS	773.0	955.0	1018.0	1153.0	1339.0	1336.0
	EXP	784.7	914.1	1038.1	1180.4	1320.5	1337.8
	CHI	0.2	1.8	0.4	0.6	0.3	0.0
40 -	OBS	1702.0	2341.0	2828.0	3057.0	3181.0	3549.0
	EXP	1716.5	2348.7	2734.0	2996.5	3299.9	3567.0
	CHI	0.1	0.0	3.2	1.2	4.3	0.1
45 -	OBS	2698.0	4285.0	5921.0	6686.0	6912.0	7540.0
	EXP	2861.3	4292.6	5868.9	6600.6	7021.4	7404.9
	CHI	9.3	0.0	0.5	1.1	1.7	2.5
50 -	OBS	3608.0	6016.0	9202.0	12080.0	13032.0	13517.0
	EXP	3780.3	6034.6	9060.7	12021.7	13130.2	13433.3
	CHI	7.9	0.1	2.2	0.3	0.7	0.5
55 -	OBS	4072.0	7239.0	11731.0	16647.0	21583.0	22468.0
	EXP	4087.8	7236.9	11510.4	16762.6	21543.4	22601.9
	CHI	0.1	0.0	4.2	0.8	0.1	0.8
60 -	OBS	4290.0	7054.0	12523.0	19638.0	27996.0	34215.0
	EXP	4202.3	7098.4	12643.7	19669.0	27759.2	34346.4
	CHI	1.8	0.3	1.2	0.0	2.0	0.5
65 -	OBS	4471.0	6872.0	11615.0	20070.0	30567.0	40960.0
	EXP	4272.0	6797.6	11581.6	20172.2	30533.8	41203.8
	CHI	9.3	0.8	0.1	0.5	0.0	1.4
70 -	OBS	4202.0	6128.0	9479.0	16155.0	27351.0	39865.0
	EXP	4134.2	6083.8	9646.5	16087.3	27317.7	39912.9
	CHI	1.1	0.3	2.9	0.3	0.0	0.1
75 -	OBS	3351.0	4937.0	7224.0	11637.0	19096.0	31439.0
	EXP	3351.0	5005.8	7476.2	11634.4	19137.3	31086.0
	CHI	0.0	0.9	8.5	0.0	0.1	4.0

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	386764.15	9669.10	40	P, C	91.86	0.0000
AGE-PERIOD	431726.22	10793.16	40	Cohort	92.71	0.0000
AGE-COHORT	105668.56	2641.71	40	Period	70.22	0.0000
PERIOD-COHORT	113221.18	2830.53	40	Age	72.20	0.0000
FULL AGE-PERIOD-COHORT	31470.62	786.77	40			0.0000

AGE	EFFECT
30	5.314746
35	18.161001
40	49.512491
45	113.839185
50	223.534370
55	400.635961
60	673.861206
65	1072.402268
70	1585.619427
75	2149.354878

PERIOD	EFFECT	LOWER	UPPER
% Period Change	98.5757	95.5757	101.5757
1961	0.803345		
1966	0.883605		
1971	0.973941		
1976	1.023498		
1981	1.042243		
1986	1.027398		
1991	1.012765	0.981943	1.043587
1996	0.998340	0.938499	1.060031
2001	0.984121	0.896977	1.076733
2006	0.970104	0.857292	1.093700

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.194992	1.000000	
1891	0.226616	2.000000	
1896	0.274745	4.000000	
1901	0.383568	8.000000	
1906	0.521894	16.000000	
1911	0.767745	32.000000	
1916	1.070956	64.000000	
1921	1.365465	128.000000	
1926	1.684378	256.000000	
1931	1.916386	512.000000	
1936	2.010879	1024.000000	
1941	1.900547	2048.000000	
1946	1.663252	4096.000000	
1951	1.450289	8192.000000	
1956	1.484974	EXTRAPOLATION	1.386982
1961	1.433452	EXTRAPOLATION	
1966	1.383717	EXTRAPOLATION	
1971	1.335708	EXTRAPOLATION	
1976	1.289364	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	8.5	8.9	10.1	9.0	8.1	7.6	8.7	7.8	5.1	4.8
	EXP	8.2	9.4	9.8	9.0	8.0	8.1	7.7*	7.3*	7.0*	6.6*
	Elow							7.5	6.9	6.4	5.9
	Eup							8.0	7.8	7.6	7.5
35	OBS	24.2	32.1	34.9	34.5	31.9	27.0	28.5	28.9	24.1	17.0
	EXP	24.6	30.8	35.6	35.3	31.5	27.1	27.3*	26.0*	24.7*	23.5*
	Elow							26.5	24.4	22.5	20.8
	Eup							28.1	27.6	27.1	26.5
40	OBS	53.9	73.4	95.6	104.0	94.5	84.2	72.7	78.4	81.0	59.2
	EXP	54.3	73.7	92.4	101.9	98.1	84.6	72.7*	73.4*	69.8*	66.5*
	Elow							70.5	69.0	63.7	58.7
	Eup							74.9	77.9	76.4	74.9
45	OBS	92.4	137.1	188.4	226.2	234.9	226.3	196.6	162.5	174.8	171.1
	EXP	97.9	137.4	186.8	223.3	238.6	222.3	191.8*	164.8*	166.4*	158.3*
	Elow							185.9	154.9	151.6	139.9
	Eup							197.6	175.0	182.0	178.5
50	OBS	131.6	210.9	301.9	387.2	443.1	464.7	433.8	366.0	315.7	319.2
	EXP	137.9	211.5	297.3	385.4	446.5	461.8	430.3*	371.2*	319.0*	322.0*
	Elow							417.2	348.9	290.8	284.6
	Eup							443.4	394.1	349.1	363.0
55	OBS	167.3	271.9	425.9	556.0	704.6	784.1	797.6	720.5	623.3	516.3
	EXP	168.0	271.8	417.9	559.9	703.3	788.8	815.9*	760.2*	655.8*	563.7*
	Elow							791.1	714.6	597.7	498.1
	Eup							840.7	807.1	717.5	635.5
60	OBS	212.0	308.8	499.1	737.5	967.2	1161.7	1261.2	1219.0	1145.3	942.7
	EXP	207.6	310.7	503.9	738.6	959.0	1166.1	1307.9*	1352.8*	1260.4*	1087.3*
	Elow							1268.1	1271.7	1148.8	960.9
	Eup							1347.7	1436.4	1379.0	1225.8
65	OBS	247.7	367.4	546.7	838.4	1198.3	1495.5	1736.8	1797.3	1724.1	1596.4
	EXP	236.7	363.5	545.1	842.7	1197.0	1504.4	1829.4*	2051.7*	2122.2*	1977.2*
	Elow							1773.7	1928.7	1934.3	1747.3
	Eup							1885.1	2178.5	2321.9	2229.1
70	OBS	293.4	387.7	582.1	850.5	1270.3	1742.6	2124.9	2313.9	2346.6	2219.3
	EXP	288.7	384.9	592.3	847.0	1268.8	1744.7	2192.7*	2666.3*	2990.4*	3093.2*
	Elow							2126.0	2506.5	2725.6	2733.5
	Eup							2259.5	2831.1	3271.8	3487.2
75	OBS	336.7	424.5	555.7	844.0	1166.6	1714.6	2282.8	2546.3	2761.8	2736.3
	EXP	336.7	430.4	575.1	843.8	1169.1	1695.4	2331.2*	2930.0*	3562.8*	3995.9*
	Elow							2260.3	2754.4	3247.3	3531.2
	Eup							2402.2	3111.1	3898.1	4504.9
30-79	OBS	123.3	179.9	263.8	362.6	467.1	560.4	621.1	620.9	602.4	551.4
	EXP	123.5	179.9	263.4	362.5	467.4	560.6	638.2*	688.9*	707.8*	691.6*
	Elow							618.8	647.6	645.2	611.2
	Eup							657.6	731.5	774.5	779.7

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	250.0	258.0	334.0	376.0	397.0	412.0	492.0	419.0	258.0	241.0
	EXP	242.0	275.2	326.7	376.7	395.2	441.1	434.4*	392.4*	352.3*	334.2*
	CHI	0.265	1.073	0.165	0.001	0.008	1.921	7.640	1.810	25.225	25.999
35 -	OBS	773.0	955.0	1018.0	1153.0	1339.0	1336.0	1565.0	1660.0	1320.0	879.0
	EXP	784.7	914.1	1038.1	1180.4	1320.5	1337.8	1497.5*	1493.0*	1352.7*	1213.2*
	CHI	0.176	1.826	0.387	0.636	0.259	0.002	3.039	18.676	0.791	92.066
40 -	OBS	1702.0	2341.0	2828.0	3057.0	3181.0	3549.0	3595.0	4322.0	4690.0	3261.0
	EXP	1716.5	2348.7	2734.0	2996.5	3299.9	3567.0	3595.4*	4048.3*	4042.2*	3662.0*
	CHI	0.122	0.025	3.229	1.221	4.281	0.090	0.000	18.501	103.829	43.914
45 -	OBS	2698.0	4285.0	5921.0	6686.0	6912.0	7540.0	8175.0	8035.0	9655.0	9903.0
	EXP	2861.3	4292.6	5868.9	6600.6	7021.4	7404.9	7975.5*	8147.7*	9188.6*	9163.3*
	CHI	9.318	0.013	0.463	1.104	1.704	2.465	4.991	1.559	23.675	59.715
50 -	OBS	3608.0	6016.0	9202.0	12080.0	13032.0	13517.0	14293.0	15213.0	15641.0	17618.0
	EXP	3780.3	6034.6	9060.7	12021.7	13130.2	13433.3	14175.1*	15428.0*	15804.1*	17774.4*
	CHI	7.857	0.057	2.204	0.283	0.735	0.521	0.981	2.997	1.683	1.376
55 -	OBS	4072.0	7239.0	11731.0	16647.0	21583.0	22468.0	22637.0	23402.0	25717.0	25352.0
	EXP	4087.8	7236.9	11510.4	16762.6	21543.4	22601.9	23156.8*	24691.9*	27058.0*	27677.7*
	CHI	0.061	0.001	4.228	0.797	0.073	0.793	11.669	67.383	66.457	195.430
60 -	OBS	4290.0	7054.0	12523.0	19638.0	27996.0	34215.0	34806.0	33745.0	36411.0	38078.0
	EXP	4202.3	7098.4	12643.7	19669.0	27759.2	34346.4	36093.9*	37448.6*	40068.0*	43919.8*
	CHI	1.832	0.277	1.152	0.049	2.020	0.502	45.956	366.276	333.773	777.010
65 -	OBS	4471.0	6872.0	11615.0	20070.0	30567.0	40960.0	48218.0	47173.0	45856.0	48769.0
	EXP	4272.0	6797.6	11581.6	20172.2	30533.8	41203.8	50787.2*	53851.2*	56444.0*	60404.3*
	CHI	9.271	0.814	0.096	0.518	0.036	1.442	129.972	828.189	1986.141	2241.251
70 -	OBS	4202.0	6128.0	9479.0	16155.0	27351.0	39865.0	52174.0	58203.0	56593.0	54466.0
	EXP	4134.2	6083.8	9646.5	16087.3	27317.7	39912.9	53840.8*	67068.4*	72119.0*	75914.0*
	CHI	1.112	0.321	2.907	0.285	0.040	0.057	51.598	1171.868	3342.498	6059.699
75 -	OBS	3351.0	4937.0	7224.0	11637.0	19096.0	31439.0	44308.0	54007.0	59921.0	57649.0
	EXP	3351.0	5005.8	7476.2	11634.4	19137.3	31086.0	45249.1*	62145.5*	77301.1*	84184.0*
	CHI	0.000	0.947	8.510	0.001	0.089	4.008	19.574	1065.817	3907.688	8363.897
30-79	OBS	29417.0	46085.0	71875.0	107499.0	151454.0	195301.0	230263.0	246179.0	256062.0	256216.0
	EXP	29432.1	46087.7	71886.7	107501.4	151458.7	195335.0	236805.8*	274715.1*	303729.9*	324246.9*
	O/E	0.999	1.000	1.000	1.000	1.000	1.000	0.972	0.896	0.843	0.790

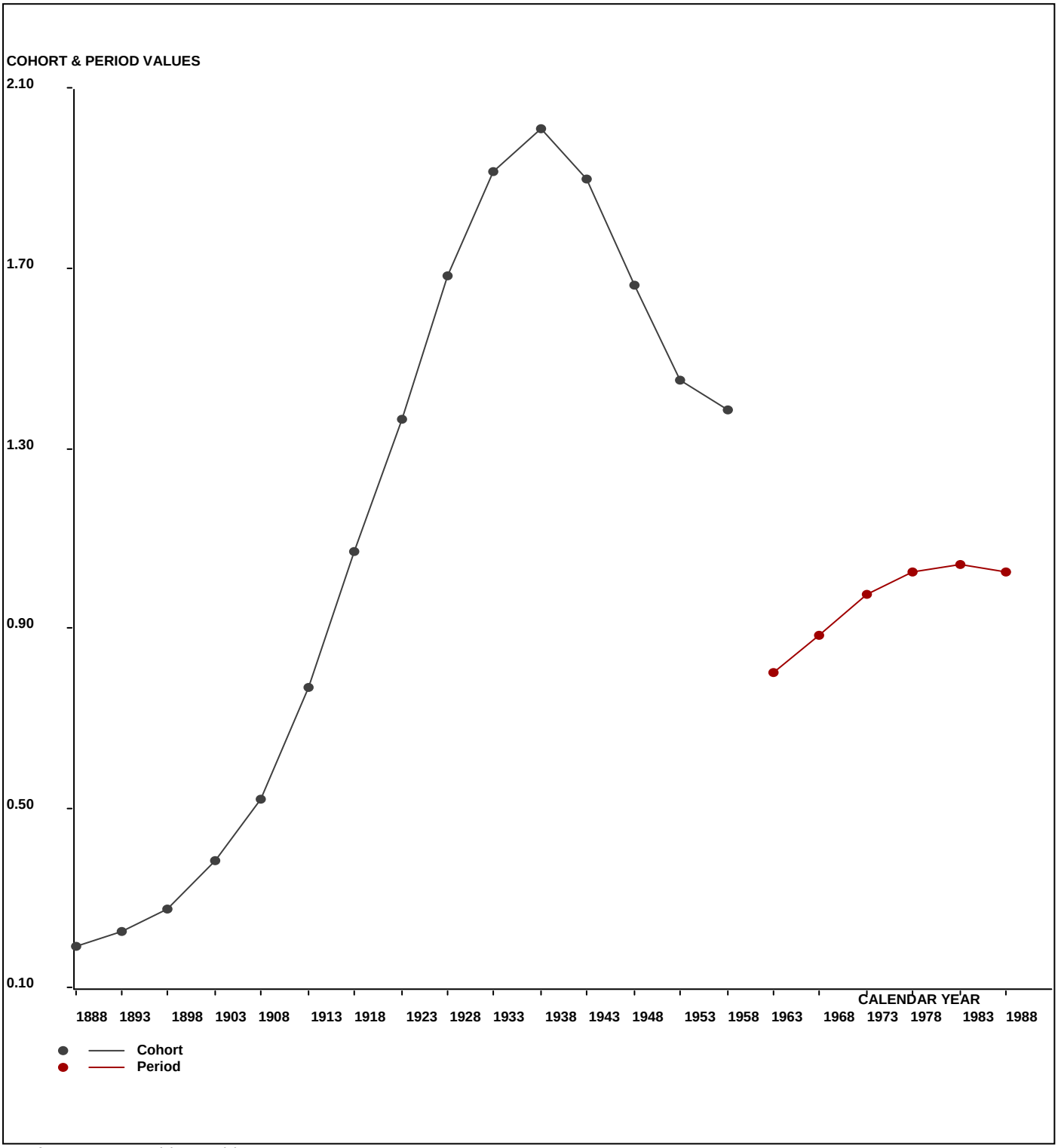
CHI SQUARE (LOG)= 31470.6153 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

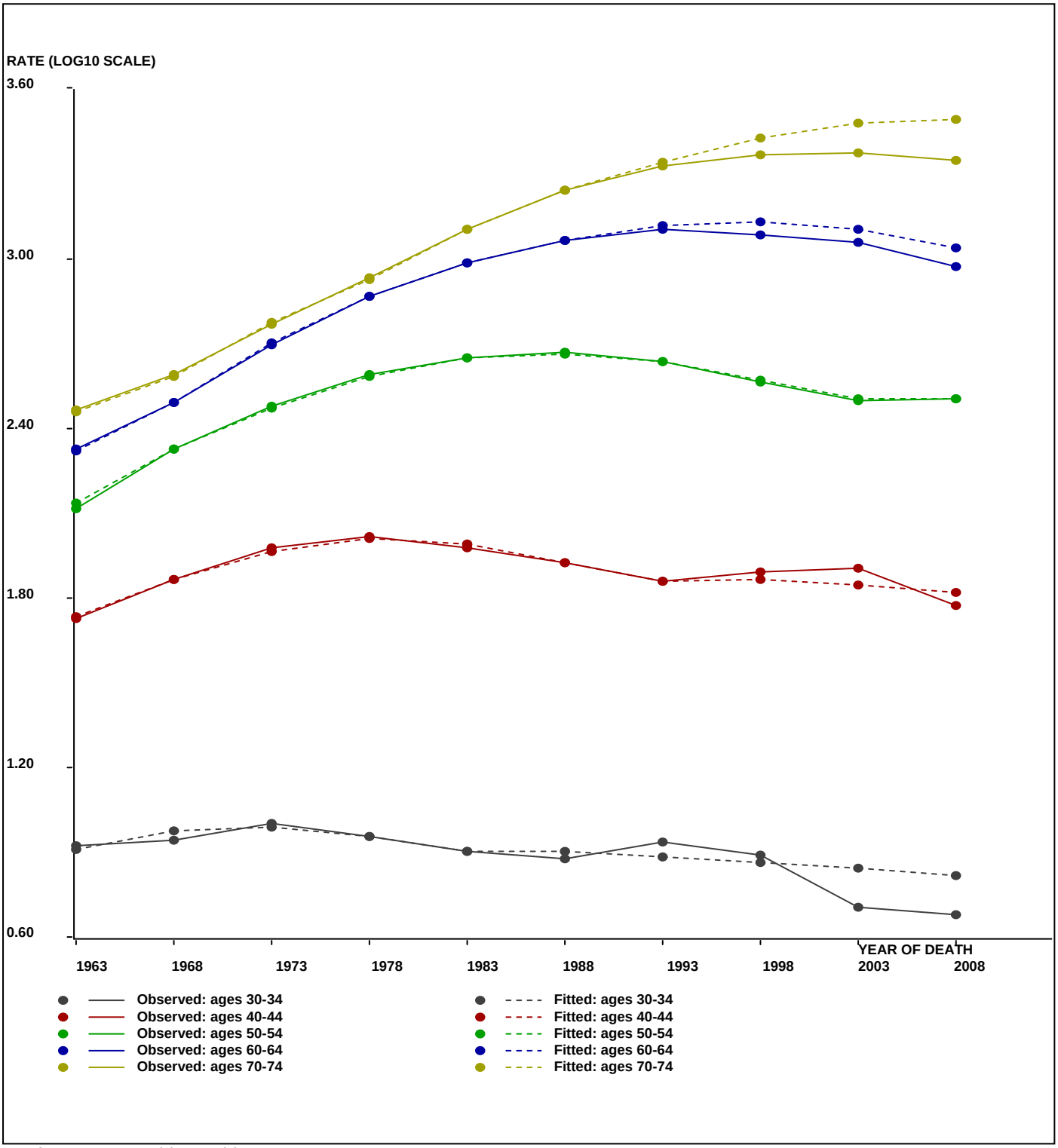


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA Lung Cancers, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	8.7	28.5	72.7	196.6	433.8	797.6	1261.2	1736.8	2124.9	2282.8
PRE	7.7	27.3	72.7	191.8	430.3	815.9	1307.9	1829.4	2192.7	2331.2
RES	1.023	1.230	-0.009	4.797	3.579	-18.316	-46.668	-92.545	-67.881	-48.487
1996- OBS	7.8	28.9	78.4	162.5	366.0	720.5	1219.0	1797.3	2313.9	2546.3
PRE	7.3	26.0	73.4	164.8	371.2	760.2	1352.8	2051.7	2666.3	2930.0
RES	0.499	2.907	4.962	-2.280	-5.174	-39.710	-133.789	-254.440	-352.450	-383.711
2001- OBS	5.1	24.1	81.0	174.8	315.7	623.3	1145.3	1724.1	2346.6	2761.8
PRE	7.0	24.7	69.8	166.4	319.0	655.8	1260.4	2122.2	2990.4	3562.8
RES	-1.869	-0.598	11.194	8.445	-3.292	-32.500	-115.034	-398.096	-643.785	-801.056
2006- OBS	4.8	17.0	59.2	171.1	319.2	516.3	942.7	1596.4	2219.3	2736.3
PRE	6.6	23.5	66.5	158.3	322.0	563.7	1087.3	1977.2	3093.2	3995.9
RES	-1.854	-6.483	-7.278	12.779	-2.833	-47.365	-144.621	-380.860	-873.912	-1259.502

Observed and predicted deaths (5 year periods)

	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991- OBS	492.0	1565.0	3595.0	8175.0	14293.0	22637.0	34806.0	48218.0	52174.0	44308.0
PRE	434.4	1497.5	3595.4	7975.5	14175.1	23156.8	36093.9	50787.2	53840.8	45249.1
CHI	7.640	3.039	0.000	4.991	0.981	11.669	45.956	129.972	51.598	19.574
1996- OBS	419.0	1660.0	4322.0	8035.0	15213.0	23402.0	33745.0	47173.0	58203.0	54007.0
PRE	392.4	1493.0	4048.3	8147.7	15428.0	24691.9	37448.6	53851.2	67068.4	62145.5
CHI	1.810	18.676	18.501	1.559	2.997	67.383	366.276	828.189	1171.868	1065.817
2001- OBS	258.0	1320.0	4690.0	9655.0	15641.0	25717.0	36411.0	45856.0	56593.0	59921.0
PRE	352.3	1352.7	4042.2	9188.6	15804.1	27058.0	40068.0	56444.0	72119.0	77301.1
CHI	25.225	0.791	103.829	23.675	1.683	66.457	333.773	1986.141	3342.498	3907.688
2006- OBS	241.0	879.0	3261.0	9903.0	17618.0	25352.0	38078.0	48769.0	54466.0	57649.0
PRE	334.2	1213.2	3662.0	9163.3	17774.4	27677.7	43919.8	60404.3	75914.0	84184.0
CHI	25.999	92.066	43.914	59.715	1.376	195.430	777.010	2241.251	6059.699	8363.897

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the Age, Period, Cohort Models

Model	RSS	MRSS	DF	Factor	%Account	ChiSq	P
AGE-ONLY	10815.21	212.06	51	P, C	99.41	60223.74	0.0000
AGE-PERIOD	2228.98	49.53	45	Cohort	97.13	12182.69	0.0000
AGE-COHORT	287.47	7.99	36	Period	77.73	1527.37	0.0000
PERIOD-COHORT	774.33	19.36	40	Age	91.73	4153.34	0.0000
FULL AGE-PERIOD-COHORT	64.03	2.00	32			339.84	0.0000

AGE-GROUP	LOG(AGE-VALUE)	AGE-VALUE
30	1.070631	11.766049
35	1.196325	15.715393
40	1.390117	24.553687
45	1.633664	43.019376
50	1.894094	78.359970
55	2.177947	150.642253
60	2.458794	287.603566
65	2.729171	536.007213
70	2.984137	964.132129
75	3.202580	1594.336136

PERIOD	LOG(PERIOD-VALUE)	PERIOD-VALUE
1961	-0.113175	0.770594
1966	-0.003639	0.991655
1971	0.018597	1.043750
1976	-0.022881	0.948678
1981	-0.010298	0.976567
1986	0.032739	1.078298

COHORT	LOG(COHORT-VALUE)	COHORT-VALUE
1886	-0.483343	0.328592
1891	-0.477238	0.333244
1896	-0.392830	0.404734
1901	-0.235516	0.581412
1906	-0.108797	0.778401
1911	0.012927	1.030212
1916	0.114135	1.300573
1921	0.162255	1.452966
1926	0.200155	1.585461
1931	0.198604	1.579807
1936	0.152617	1.421074
1941	0.035036	1.084018
1946	-0.119258	0.759875
1951	-0.213786	0.611243
1956	-0.238001	0.578094

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Fitting the FULL AGE-PERIOD-COHORT Model
Matrix of observed and expected deaths and (O-E)2/E Values**

		1961-	1966-	1971-	1976-	1981-	1986-
30 -	OBS	342.0	476.0	546.0	350.0	312.0	399.0
	EXP	423.6	483.2	442.0	353.2	345.5	399.0
	CHI	15.7	0.1	24.4	0.0	3.3	0.0
35 -	OBS	535.0	739.0	786.0	503.0	443.0	543.0
	EXP	613.1	731.9	680.3	540.0	489.2	512.1
	CHI	10.0	0.1	16.4	2.5	4.4	1.9
40 -	OBS	822.0	1310.0	1322.0	890.0	727.0	894.0
	EXP	868.8	1230.4	1197.8	973.4	874.6	848.2
	CHI	2.5	5.2	12.9	7.1	24.9	2.5
45 -	OBS	1243.0	2102.0	2374.0	1745.0	1547.0	1729.0
	EXP	1259.6	1937.2	2237.2	1905.9	1756.9	1675.1
	CHI	0.2	14.0	8.4	13.6	25.1	1.7
50 -	OBS	1685.0	3004.0	3730.0	3522.0	3316.0	3659.0
	EXP	1705.7	2883.1	3622.0	3676.7	3555.3	3492.7
	CHI	0.3	5.1	3.2	6.5	16.1	7.9
55 -	OBS	2084.0	4137.0	5660.0	6143.0	6939.0	7667.0
	EXP	2199.0	4097.9	5632.7	6216.5	7144.3	7353.0
	CHI	6.0	0.4	0.1	0.9	5.9	13.4
60 -	OBS	2577.0	5018.0	7514.0	9570.0	11813.0	14684.0
	EXP	2607.8	5071.1	7760.2	9449.3	11812.4	14481.7
	CHI	0.4	0.6	7.8	1.5	0.0	2.8
65 -	OBS	3231.0	5642.0	9094.0	12551.0	17589.0	22836.0
	EXP	3017.2	5779.8	9252.7	12540.3	17365.6	22999.8
	CHI	15.1	3.3	2.7	0.0	2.9	1.2
70 -	OBS	3693.0	6038.0	9434.0	13627.0	21278.0	30448.0
	EXP	3545.9	6115.8	9528.2	13523.0	20884.6	30932.4
	CHI	6.1	1.0	0.9	0.8	7.4	7.6
75 -	OBS	4018.0	5976.0	8610.0	12383.0	20055.0	32290.0
	EXP	4018.0	6128.0	8755.1	12125.2	19838.4	32474.8
	CHI	0.0	3.8	2.4	5.5	2.4	1.1

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT
Effects for extending model to project rates to 1991 to 2010
Projections using parameters Log Transformed

Model	ChiSq	MChiSq	DF	Factor	%Account	P
AGE-ONLY	311950.72	7798.77	40	P, C	86.67	0.0000
AGE-PERIOD	254678.92	6366.97	40	Cohort	83.67	0.0000
AGE-COHORT	60912.59	1522.81	40	Period	31.73	0.0000
PERIOD-COHORT	37003.02	925.08	40	Age	-12.39	0.0000
FULL AGE-PERIOD-COHORT	41587.73	1039.69	40			0.0000

AGE	EFFECT
30	11.766049
35	15.715393
40	24.553687
45	43.019376
50	78.359970
55	150.642253
60	287.603566
65	536.007213
70	964.132129
75	1594.336136

PERIOD	EFFECT	LOWER	UPPER
% Period Change	110.4172	107.4172	113.4172
1961	0.770594		
1966	0.991655		
1971	1.043750		
1976	0.948678		
1981	0.976567		
1986	1.078298		
1991	1.190626	1.158277	1.222975
1996	1.314656	1.244188	1.387064
2001	1.451606	1.336472	1.573169
2006	1.602822	1.435601	1.784243

COHORT	EFFECT	WEIGHT	ORIGINAL
1886	0.328592	1.000000	
1891	0.333244	2.000000	
1896	0.404734	4.000000	
1901	0.581412	8.000000	
1906	0.778401	16.000000	
1911	1.030212	32.000000	
1916	1.300573	64.000000	
1921	1.452966	128.000000	
1926	1.585461	256.000000	
1931	1.579807	512.000000	
1936	1.421074	1024.000000	
1941	1.084018	2048.000000	
1946	0.759875	4096.000000	
1951	0.611243	8192.000000	
1956	0.525044	EXTRAPOLATION	0.578094
1961	0.432834	EXTRAPOLATION	
1966	0.356819	EXTRAPOLATION	
1971	0.294153	EXTRAPOLATION	
1976	0.242494	EXTRAPOLATION	

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected rates including predictions (shown by *)
Total over ages standardized using: The 1976 European Standard Population

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30	OBS	11.6	16.3	16.4	8.4	6.3	7.3	8.6	8.6	8.0	6.9
	EXP	14.3	16.6	13.3	8.5	7.0	6.7	6.1*	5.5*	5.0*	4.6*
	Elow							5.9	5.2	4.6	4.1
	Eup							6.2	5.8	5.4	5.1
35	OBS	16.8	24.9	26.9	15.1	10.6	11.0	13.1	14.3	14.7	11.9
	EXP	19.2	24.6	23.3	16.2	11.7	10.4	9.8*	8.9*	8.1*	7.4*
	Elow							9.6	8.5	7.5	6.6
	Eup							10.1	9.4	8.8	8.2
40	OBS	26.0	41.1	44.7	30.3	21.6	21.2	23.5	27.8	28.7	25.9
	EXP	27.5	38.6	40.5	33.1	26.0	20.1	17.9*	16.9*	15.4*	14.0*
	Elow							17.4	16.0	14.2	12.6
	Eup							18.4	17.9	16.7	15.6
45	OBS	42.5	67.3	75.5	59.0	52.6	51.9	49.6	51.1	56.3	64.4
	EXP	43.1	62.0	71.2	64.5	59.7	50.3	38.9*	34.6*	32.8*	29.8*
	Elow							37.9	32.7	30.2	26.7
	Eup							40.0	36.5	35.5	33.2
50	OBS	61.5	105.3	122.4	112.9	112.8	125.8	124.4	116.9	112.4	131.5
	EXP	62.2	101.1	118.8	117.9	120.9	120.1	101.1*	78.3*	69.5*	65.9*
	Elow							98.4	74.1	64.0	59.1
	Eup							103.9	82.6	75.3	73.4
55	OBS	85.6	155.4	205.5	205.2	226.5	267.6	280.9	276.1	255.1	240.0
	EXP	90.4	153.9	204.5	207.6	233.2	256.6	254.9*	214.7*	166.2*	147.6*
	Elow							248.0	203.2	153.0	132.2
	Eup							261.8	226.5	180.1	164.3
60	OBS	127.3	219.7	299.4	359.4	408.1	498.6	565.3	576.7	571.8	509.8
	EXP	128.9	222.0	309.3	354.9	408.1	491.7	541.0*	537.3*	452.6*	350.3*
	Elow							526.3	508.5	416.7	313.7
	Eup							555.7	566.9	490.5	389.9
65	OBS	179.0	301.7	428.0	524.3	689.5	833.8	995.8	1075.9	1068.0	1034.5
	EXP	167.2	309.0	435.5	523.9	680.8	839.8	1011.8*	1113.2*	1105.7*	931.3*
	Elow							984.3	1053.6	1018.0	834.1
	Eup							1039.3	1174.5	1198.3	1036.7
70	OBS	257.9	382.0	579.3	717.4	988.3	1330.9	1582.8	1767.2	1821.3	1772.2
	EXP	247.6	387.0	585.1	712.0	970.0	1352.1	1667.9*	2009.6*	2211.0*	2196.0*
	Elow							1622.6	1901.9	2035.6	1966.9
	Eup							1713.2	2120.3	2396.2	2444.6
75	OBS	403.7	513.8	662.4	898.1	1225.2	1761.0	2272.9	2603.4	2778.3	2761.0
	EXP	403.7	526.9	673.5	879.4	1212.0	1771.1	2468.8*	3045.4*	3669.3*	4037.1*
	Elow							2401.7	2882.2	3378.3	3615.9
	Eup							2535.9	3213.2	3976.6	4494.1
30-79	OBS	82.8	130.8	172.8	193.7	236.4	299.4	351.3	379.7	385.9	375.5
	EXP	83.1	130.6	172.5	194.4	237.7	298.3	353.4*	391.9*	410.4*	397.8*
	Elow							343.8	370.9	377.8	356.3
	Eup							363.0	413.5	444.7	442.8

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Matrix of observed and expected deaths including predictions

		1961-	1966-	1971-	1976-	1981-	1986-	1991-	1996-	2001-	2006-
30 -	OBS	342.0	476.0	546.0	350.0	312.0	399.0	485.0	459.0	404.0	346.0
	EXP	423.6	483.2	442.0	353.2	345.5	362.4	341.4*	295.0*	253.3*	229.9*
	CHI	15.736	0.107	24.450	0.028	3.253	3.700	60.424	91.235	89.618	58.611
35 -	OBS	535.0	739.0	786.0	503.0	443.0	543.0	719.0	822.0	806.0	615.0
	EXP	613.1	731.9	680.3	540.0	489.2	512.1	538.7*	513.7*	445.2*	382.0*
	CHI	9.956	0.070	16.423	2.536	4.355	1.868	60.383	185.005	292.313	142.135
40 -	OBS	822.0	1310.0	1322.0	890.0	727.0	894.0	1161.0	1532.0	1663.0	1426.0
	EXP	868.8	1230.4	1197.8	973.4	874.6	848.2	883.4*	934.7*	892.8*	773.7*
	CHI	2.524	5.151	12.874	7.141	24.896	2.476	87.201	381.636	664.434	549.874
45 -	OBS	1243.0	2102.0	2374.0	1745.0	1547.0	1729.0	2063.0	2526.0	3110.0	3728.0
	EXP	1259.6	1937.2	2237.2	1905.9	1756.9	1675.1	1618.8*	1708.8*	1810.9*	1727.5*
	CHI	0.218	14.026	8.364	13.591	25.088	1.732	121.919	390.770	931.917	2316.483
50 -	OBS	1685.0	3004.0	3730.0	3522.0	3316.0	3659.0	4098.0	4861.0	5567.0	7261.0
	EXP	1705.7	2883.1	3622.0	3676.7	3555.3	3492.7	3332.0*	3253.7*	3444.1*	3639.9*
	CHI	0.252	5.067	3.219	6.512	16.106	7.916	176.118	793.984	1308.487	3602.426
55 -	OBS	2084.0	4137.0	5660.0	6143.0	6939.0	7667.0	7973.0	8967.0	10527.0	11786.0
	EXP	2199.0	4097.9	5632.7	6216.5	7144.3	7353.0	7233.9*	6973.4*	6856.1*	7246.9*
	CHI	6.017	0.373	0.133	0.868	5.901	13.412	75.512	569.966	1965.491	2843.025
60 -	OBS	2577.0	5018.0	7514.0	9570.0	11813.0	14684.0	15600.0	15963.0	18178.0	20593.0
	EXP	2607.8	5071.1	7760.2	9449.3	11812.4	14481.7	14929.5*	14873.8*	14387.3*	14149.3*
	CHI	0.363	0.557	7.809	1.541	0.000	2.825	30.112	79.754	998.753	2934.508
65 -	OBS	3231.0	5642.0	9094.0	12551.0	17589.0	22836.0	27645.0	28239.0	28404.0	31604.0
	EXP	3017.2	5779.8	9252.7	12540.3	17365.6	22999.8	28089.9*	29218.9*	29407.7*	28451.6*
	CHI	15.147	3.286	2.722	0.009	2.874	1.167	7.046	32.859	34.260	349.293
70 -	OBS	3693.0	6038.0	9434.0	13627.0	21278.0	30448.0	38863.0	44451.0	43923.0	43493.0
	EXP	3545.9	6115.8	9528.2	13523.0	20884.6	30932.4	40953.4*	50548.1*	53322.3*	53896.1*
	CHI	6.105	0.990	0.931	0.799	7.412	7.585	106.702	735.435	1656.845	2008.014
75 -	OBS	4018.0	5976.0	8610.0	12383.0	20055.0	32290.0	44116.0	55219.0	60279.0	58168.0
	EXP	4018.0	6128.0	8755.1	12125.2	19838.4	32474.8	47919.4*	64593.7*	79611.1*	85053.0*
	CHI	0.000	3.773	2.403	5.480	2.365	1.052	301.883	1360.571	4694.465	8498.257
30-79	OBS	20230.0	34442.0	49070.0	61284.0	84019.0	115149.0	142723.0	163039.0	172861.0	179020.0
	EXP	20258.8	34458.5	49108.2	61303.6	84066.7	115132.2	145840.3*	172913.8*	190431.0*	195549.9*
	O/E	0.999	1.000	0.999	1.000	0.999	1.000	0.979	0.943	0.908	0.915

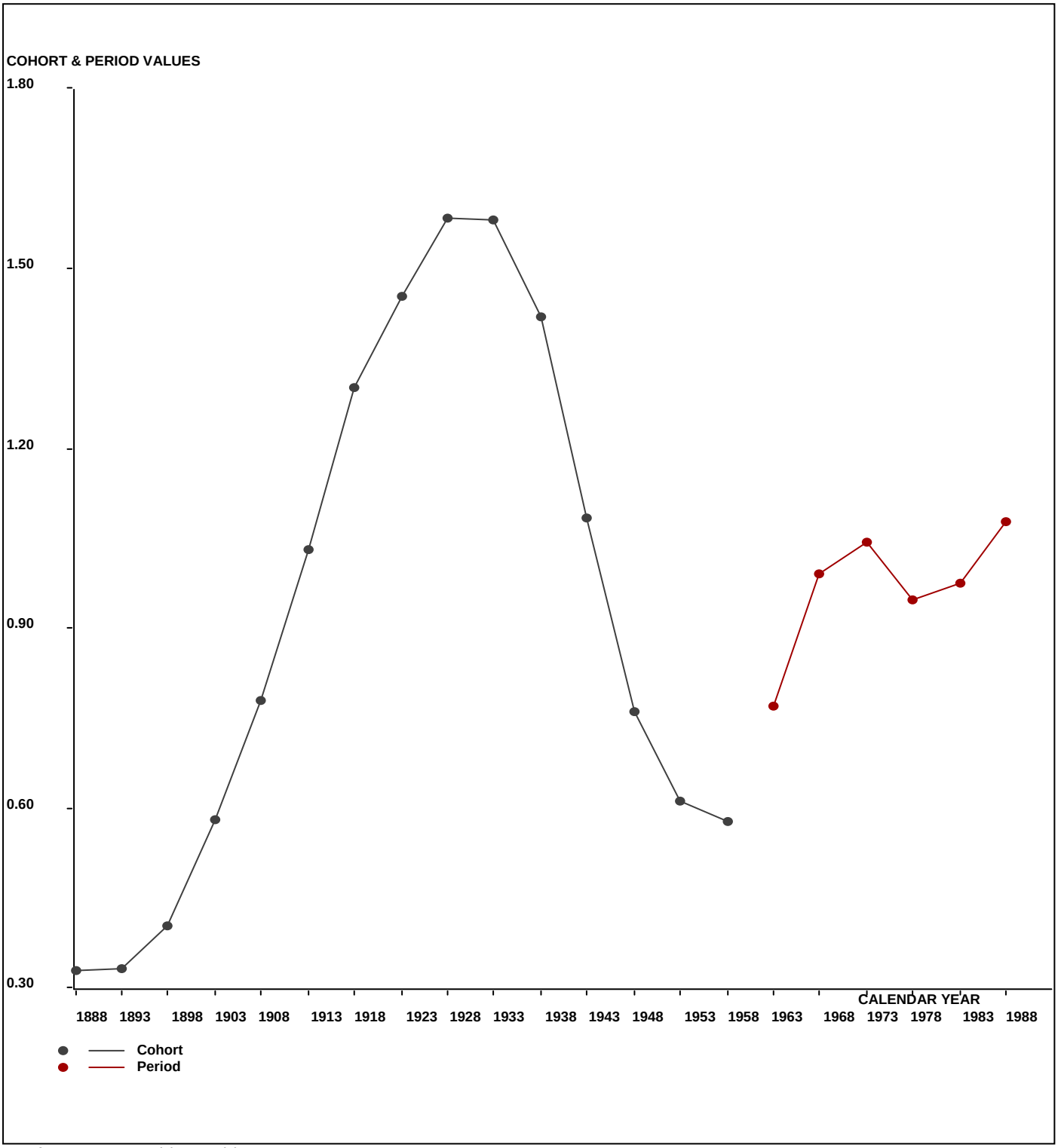
CHI SQUARE (LOG)= 41587.7262 ON 40 D.F., P = 0.0000

Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

O&G Cohort and Period parameter values

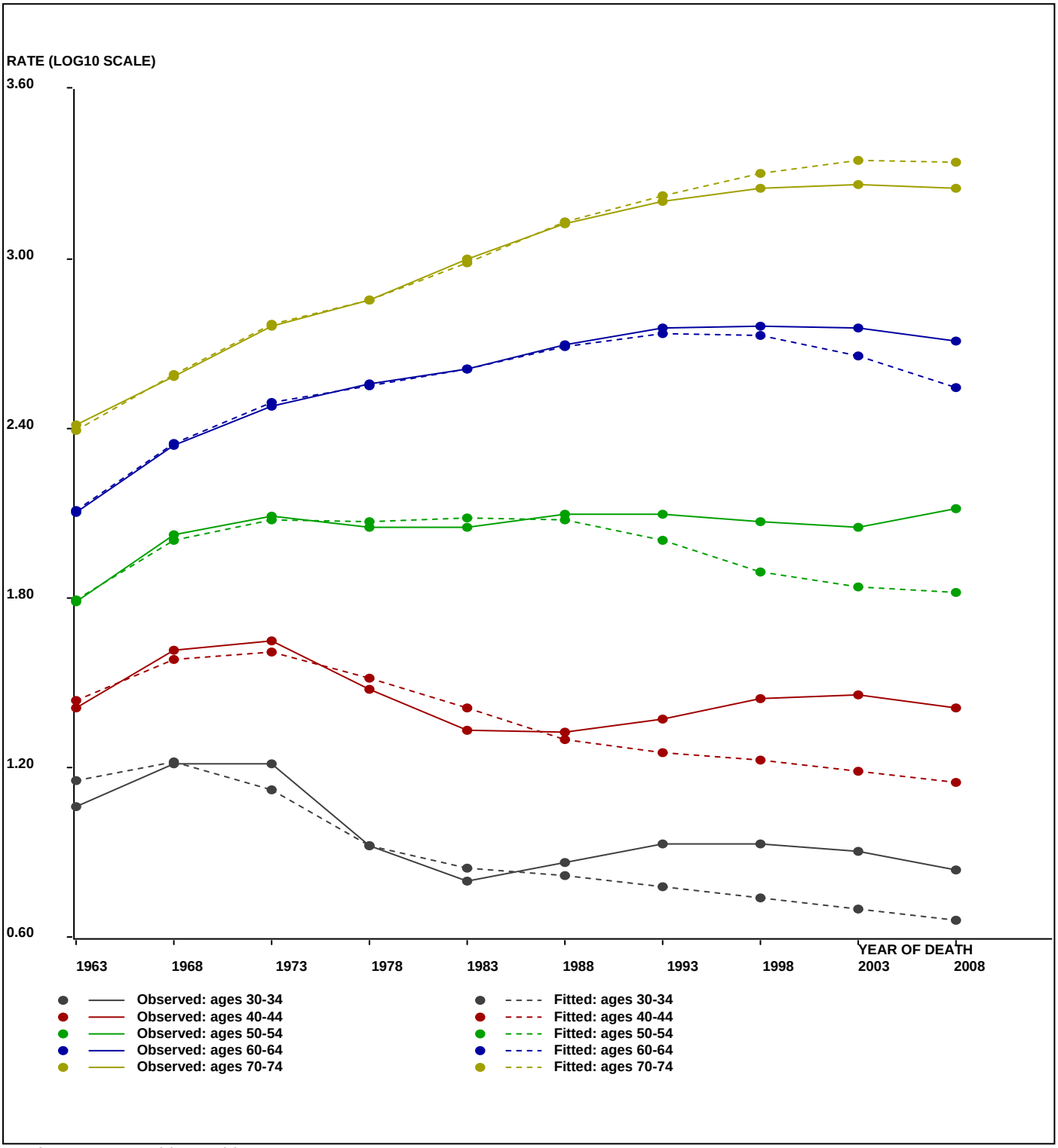


Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and fitted rates for selected age groups



Run by JS Fry on 14-MAY-14

Osmond and Gardner Modelling

USA COPD, Females, based on 1961-1990 (UN) Replace last cohort value
Extrapolating Model: FULL AGE-PERIOD-COHORT

Observed and predicted rates (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	8.6	13.1	23.5	49.6	124.4	280.9	565.3	995.8	1582.8	2272.9
	PRE	6.1	9.8	17.9	38.9	101.1	254.9	541.0	1011.8	1667.9	2468.8
	RES	2.551	3.289	5.614	10.681	23.252	26.041	24.295	-16.025	-85.135	-195.954
1996-	OBS	8.6	14.3	27.8	51.1	116.9	276.1	576.7	1075.9	1767.2	2603.4
	PRE	5.5	8.9	16.9	34.6	78.3	214.7	537.3	1113.2	2009.6	3045.4
	RES	3.070	5.366	10.829	16.531	38.669	61.376	39.345	-37.332	-242.395	-441.991
2001-	OBS	8.0	14.7	28.7	56.3	112.4	255.1	571.8	1068.0	1821.3	2778.3
	PRE	5.0	8.1	15.4	32.8	69.5	166.2	452.6	1105.7	2211.0	3669.3
	RES	2.988	6.596	13.309	23.521	42.855	88.968	119.239	-37.739	-389.741	-891.025
2006-	OBS	6.9	11.9	25.9	64.4	131.5	240.0	509.8	1034.5	1772.2	2761.0
	PRE	4.6	7.4	14.0	29.8	65.9	147.6	350.3	931.3	2196.0	4037.1
	RES	2.309	4.520	11.838	34.560	65.604	92.440	159.523	103.189	-423.880	-1276.114

Observed and predicted deaths (5 year periods)

		30-	35-	40-	45-	50-	55-	60-	65-	70-	75-
1991-	OBS	485.0	719.0	1161.0	2063.0	4098.0	7973.0	15600.0	27645.0	38863.0	44116.0
	PRE	341.4	538.7	883.4	1618.8	3332.0	7233.9	14929.5	28089.9	40953.4	47919.4
	CHI	60.424	60.383	87.201	121.919	176.118	75.512	30.112	7.046	106.702	301.883
1996-	OBS	459.0	822.0	1532.0	2526.0	4861.0	8967.0	15963.0	28239.0	44451.0	55219.0
	PRE	295.0	513.7	934.7	1708.8	3253.7	6973.4	14873.8	29218.9	50548.1	64593.7
	CHI	91.235	185.005	381.636	390.770	793.984	569.966	79.754	32.859	735.435	1360.571
2001-	OBS	404.0	806.0	1663.0	3110.0	5567.0	10527.0	18178.0	28404.0	43923.0	60279.0
	PRE	253.3	445.2	892.8	1810.9	3444.1	6856.1	14387.3	29407.7	53322.3	79611.1
	CHI	89.618	292.313	664.434	931.917	1308.487	1965.491	998.753	34.260	1656.845	4694.465
2006-	OBS	346.0	615.0	1426.0	3728.0	7261.0	11786.0	20593.0	31604.0	43493.0	58168.0
	PRE	229.9	382.0	773.7	1727.5	3639.9	7246.9	14149.3	28451.6	53896.1	85053.0
	CHI	58.611	142.135	549.874	2316.483	3602.426	2843.025	2934.508	349.293	2008.014	8498.257

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