Differences in lifestyle risk factors between smokers, non-smokers and passive smokers

A review of evidence from three studies and a comparison with some of the published literature

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Date : 15th April 1997

1. Introduction

Recently we have used data from three surveys to conduct analyses comparing the prevalence of a variety of lifestyle risk factors between smokers and non-smokers and, among non-smokers, between those exposed and those not exposed to environmental tobacco smoke (ETS). These three surveys are:

(I) the UK Health and Lifestyle Survey (HALS) in which 9003 British men and women were interviewed in 1984/85, 5,352 of whom were followed up (HALS2) in 1991/2 (Cox *et al*, 1987; Cox *et al*, 1993)

(ii) the Health Survey for England 1993 (HSE93) in which 17,687 English men and women were interviewed in 1993 (Bennett *et al*, 1995) and

(iii) the Hungarian Lifestyle Survey (HULS) in which 2,612 Hungarian men and women were interviewed in 1995/96 (Scientific Association of Hungarian General Practitioners, 1996).

Table 1 shows the numbers of subjects studied in the three surveys by sex and smoking groups considered. Ex-smokers are not considered in this review.

One objective of this review was to summarize data from the three surveys relating to the various risk factors considered. For each of these risk factors we present a table comparing risk factor prevalence, by sex, in current and never smokers and, among never smokers, by ETS exposure.

A second objective was to compare the findings in the three surveys with the results of similar comparisons in the literature. It would have been a daunting, and probably not particularly useful, exercise to obtain all the published literature which relates smoking habits

to the prevalence of other risk factors. In practice we relied on a file of papers giving relevant data, which one of us (PNL) had accumulated over the years. Some of these papers provided information for factors not considered by HALS, HSE93 and HULS. Attention was restricted to studies of at least 500 subjects which were original research rather than reviews of previously published papers. We do not report findings relating to ex-smokers or results based on the HALS data which give no information additional to that in our analyses. We also exclude studies relating to heart and lung disease as these are widely reported elsewhere.

Table 2 summarizes very briefly the 47 studies we have reviewed the results from, giving the location in which the survey was conducted, the number of subjects in the survey, the year(s) during which the survey was carried out, whether ETS exposure was considered and a summary of the main factors considered.

We do not attempt to present detailed data from all the studies reviewed. Rather we simply cite the conclusions from these studies in the text.

2. Alcohol consumption

2.1 Smoking

In HALS, HSE93 and HULS current smokers of both sexes were consistently found to have higher alcohol consumption than never smokers (Table 3). The association between alcohol consumption and smoking is extremely well known and has been reported in numerous studies. All studies we looked at which investigated alcohol and smoking found such an association, regardless of country and culture (see Table 2, Bolton-Smith *et al*, 1993; Fisher and Gordon, 1985; Holly *et al*, 1992; Kato *et al*, 1989; Lee and Markides, 1991; Margetts and Jackson, 1993; Marti *et al*, 1989; McPhillips *et al*, 1994; Steenberg *et al*, 1995; Strickland *et al*, 1992; Tang *et al*, 1995 and Vega *et* al, 1993).

Patterson *et al* (1994) identify seven separate health lifestyle patterns in U.S. adults. These include a Drinking Lifestyle (heavy drinking, some smoking), a Smoking Lifestyle (heavy smoking, some drinking) and a Hedonic Lifestyle characterised by heavy smoking and heavy drinking.

Results from a twin study suggest that there may be a genetic factor which predisposes an individual's joint use of tobacco, alcohol and coffee (Swan *et al*, 1996).

2.2 ETS exposure

The original HALS study found a significant association between household exposure (living with a smoker) and moderate+ alcohol consumption. Both the HALS follow-up (HALS2) and HSE93 found a significant association for men but found no such association for women. No association was found for either sex in HULS. See Table 3.

Matanoski *et al* (1995) found no association between drinking (versus not drinking) and exposure to husband's smoking among American women never smokers but found that, among the women who drank, those exposed to ETS drank more than those not exposed.

Svendsen *et al* (1987) found a significant association, among men who had never smoked, between the number of drinks per week and the smoking status of their wives.

Friedman *et al* (1983) found that total hours per week of passive smoking (total of exposure at home, in other small areas and in large areas) was correlated with alcohol consumption of three or more drinks per day.

3 Coffee, caffeine

3.1 Smoking

Our analyses found a positive association between coffee drinking and current smoking for each of the surveys except the original HALS survey, which showed a non-significant positive association for the small number of subjects who were heavy coffee drinkers. We also found a strong positive association between heavy tea drinking and current smoking in HALS and its follow-up. HSE93 found a small association between tea drinking (compared with drinking no tea) and smoking. Here very few people drank no tea. See Table 4.

As for smoking and alcohol, many studies have found a strong link between smoking and coffee/caffeine consumption (see Bolton-Smith *et al*, 1993; Holly *et al*, 1992; Kato *et al*, 1989; Lee and Markides, 1991 and McPhillips *et al*, 1994).

As mentioned for Alcohol above, there may be a genetic factor which predisposes joint consumption of tobacco, alcohol and coffee (Swan *et al*, 1996).

3.2 ETS exposure

In our analyses no significant associations were found between ETS exposure and coffee or tea consumption except for the men in the original HALS study, Here we found a strong negative association with heavy coffee drinking and a strong positive association with heavy tea drinking. See Table 4.

4 Drug use and drug dependency

None of the surveys we studied had any data on drug use or dependency.

4.1 Smoking

Vega *et al* (1993) found that, among pregnant women in California, smoking was strongly associated with use of illicit drugs, those tested for being cannabinoid, cocaine, opiates and amphetamines.

Steenbergh *et al* (1995) found that, among US college students, smokers reported using a greater amount of marijuana and were 3.72 times more likely to use other illegal drugs than non-smokers.

4.2 ETS exposure

Friedman *et al* (1983) found a trend of greater prevalence of marijuana use (at least once a week) with increasing duration of passive smoking per week.

5. Cholesterol and dietary fats

5.1 Smoking

See Table 5 for results of our analyses. Current smoking was found to be strongly associated with high fried food consumption in HALS and its follow-up, and with eating fried food in HSE93. No association was found with frequent fried food consumption in HULS.

HALS, its follow-up and HSE93 have data on the use of low fat or polyunsaturated fat spreads for bread. Each of these studies found a strong association between current smoking and

not using these spreads.

The original HALS study and HULS have data on subjects' attempts to cut down on fatty foods. The only association found was among women in the HALS survey for whom cutting down on fatty foods was less common among current smokers.

The results of the blood analyses within HSE93 showed an association between current smoking and high cholesterol level.

Tang *et al* (1995) found that, compared with never smokers, current smokers had lower High Density Lipoprotein (HDL), higher total serum cholesterol, less polyunsaturated fatty acid in their diet but more dietary fat. Many of these factors appeared to be related to number of cigarettes smoked per day but not to years of smoking. Zondervan *et al* (1996) found an association between high cholesterol intake and heavy smoking (in analyses adjusted for BMI, total energy and other factors). Margetts and Jackson (1993) found associations of smoking (versus non-smoking) with low polyunsaturated fat intake, with low ratio of polyunsaturated to saturated fat intake and with high percentage of food energy being derived from saturated fat. Marti *et al* (1989) also found an association between smoking and high saturated fat intake.

Strickland *et al* (1992) studied several aspects of diet and dietary fats. They found that smokers had a significantly higher caloric intake than never smokers and that, as a proportion of total energy intake, smokers have a higher intake of fats and alcohol than never smokers. Among types of fats, again as a proportion of total energy intake, smokers had a higher intake of saturated and monounsaturated fats but a similar intake of linoleic acid and polyunsaturated fats as never smokers. They also found that smokers had a higher intake of cholesterol and a lower polyunsaturated/saturated fat ratio than never smokers.

Bolton-Smith *et al* (1993) found associations, for both sexes, of current smoking with low polyunsaturated fat intake, high cholesterol intake and low polyunsaturated-saturated fat ratio. These associations were stronger for men than for women. The associations of smoking with high total fat intake and high saturated fat intake reached significance for men only.

Fisher and Gordon (1985) found an association between heavy smoking and fat intake which was strong for men and for women using gonadal hormones but less strong for women not using hormones.

However, Lee and Markides (1991) found no association between smoking and serum cholesterol level. McPhillips *et al,* (1994) found, in smokers compared with non-smokers, lower HDL levels, no relationship with total serum cholesterol but higher consumption of cholesterol and of total and saturated fat even after adjusting for energy intake from food.

Hebert and Kabat (1990) found no association between smoking and fat intake but, for men only, found an association between heavy smoking and cholesterol intake. Subar *et al* (1990), using 24 hour dietary recall, found no association of smoking with cholesterol intake but did find an association between smoking and high saturated fat intake for middle aged women and older people of both sexes.

Cade and Margetts (1991) found an association between smoking and high energy intake in men but not in women. They found no association with total fat intake but found an association between smoking and low polyunsaturate-saturate ratio which was almost significant.

Salonen *et al* (1981), studying amount smoked (including zero), saturated fat intake, blood pressure and serum cholesterol in Eastern Finland, found that amount smoked was strongly correlated with saturated fat intake and with serum cholesterol level for men only. Saturated fat intake was significantly lower in women smokers. These findings were adjusted for age and body mass index.

5.2 ETS exposure

As for current smoking, our analyses found associations between ETS exposure and consumption of fried food for each of the studies (see Table 5). For male never smokers in the HALS follow-up the association with ETS exposure did not reach significance, however a strong trend relating cotinine level to high fried food consumption was seen for these subjects. Conversely, HSE93 showed an association between eating fried food and ETS exposure but no trend within cotinine levels. Here few subjects said they ate no fried food. For HULS an

association between frequent fried food and ETS exposure was found, which was strong for females, although no such association had been seen with current smoking.

The association between not using low fat or polyunsaturated fat spread and current smoking was also seen with ETS exposure although the association was weakened.

The HSE93 data on high cholesterol level showed no association with ETS exposure.

Matanoski *et al* (1995) found, among never smoking married women, an association of having a husband who smoked with eating beef which was not the leanest and with eating the skin on poultry, these factors having been chosen to represent high fat intake.

Emmons *et al* (1995) found that, among non-smokers, those exposed to ETS at home gained a higher percentage of their calories from fat than did those not exposed to ETS at home. Also, percentage of calories from fat increased with decreasing severity of workplace smoking ban (from total ban to smoking allowed anywhere).

Svendsen *et al* (1987) found, among never-smoking men, no significant differences between those married to smokers and those married to non-smokers with respect to serum cholesterol level, HDL cholesterol level and LDL cholesterol level.

6. Ascorbic acid

None of the surveys we studied had any data on ascorbic acid.

6.1 Smoking

McPhillips *et al* (1994) found an association of smoking with low intake of vitamin C which reached significance for women. Zondervan *et al* (1996) found a similar association which reached significance for heavy smoking men and for moderate and heavy smoking women. Margetts and Jackson (1993) found smokers to have a lower intake of ascorbic acid than non-smokers, this being significant for both men and women and for light and heavy smokers.

Subar *et al* (1990), using 24 hour dietary recall, found an association between smoking

and low vitamin C intake for each of their three age groups which was significant for young white men, middle aged whites of both sexes and older white men. They also found, for whites, a trend of decreasing vitamin C intake with increasing cigarette consumption. Among blacks, smokers tended to have a lower intake than never smokers but this relationship was not significant, possibly due to smaller numbers of black people than white people in the study.

Cade and Margetts (1991) also found an association between smoking and low vitamin C intake which was significant for women and almost so for men. Bolton-Smith *et al* (1993) found this association to be significant for both men and women.

6.2 ETS exposure

Matanoski *et al* (1995) found, among never smoking married women, that the greater her vitamin C intake the less likely the woman was to have a husband who smoked.

Crawley and While (1996) found that teenagers living with parents who smoked had lower intakes of vitamin C than those with non-smoking parents.

Emmons *et al* (19955) found that, among non-smokers, those exposed to ETS at home had a lower intake of vitamin C per 1,000 kcal than did those not exposed to ETS at home. Also vitamin C intake per 1,000 kcal decreased with decreasing severity of workplace smoking ban (from total ban to smoking allowed anywhere). This result was adjusted for household exposure.

7. Carotene

None of the surveys we studied had any data on carotene.

7.1 Smoking

Zondervan *et al* (1996) found that low β-carotene intake was associated with moderate and heavy smoking in men. No such association was found for women. Cade and Margetts (1991) also found an association between smoking and low β-carotene intake which was found to be significant for both women and men. Margetts and Jackson (1993) found an association between smoking and low carotene intake for both sexes.

Emmons *et al* (1995) found a strong association between smoking and low vitamin A

intake. Hebert and Kabat (1990) also found this association which was particularly strong for heavy smokers and for women. McPhillips *et al* (1994) found this association to almost reach significance for women but not to reach significance for men.

Subar *et al* (1990), using 24 hour dietary recall, found no consistent association between smoking and low vitamin A intake. Bolton-Smith *et al* (1993), using a 7-day food frequency questionnaire, also found no association between smoking and vitamin A intake. However, they did find an association of smoking with low carotene intake which was significant for both sexes when adjusted for total energy intake and was significant for men only as an absolute intake.

Fukao *et al* (1996), studying men only, found that smoking and drinking were independently linked with lower serum β-carotene level after adjusting for dietary carotene intake and other factors.

7.2 ETS exposure

Crawley and While (1996) found that teenage girls living with parents who smoked had a lower carotene intake than those with non-smoking parents. No such association was seen for boys. Sidney *et al* (1989) found a highly significant association between household exposure to ETS and lowered carotene intake.

Matanoski *et al* (1995) found that the higher a wife's intake of vitamin A the less likely she was to have a husband who smoked. Most of this association disappeared when the analysis was additionally adjusted for the education level of the woman. Emmons *et al* (1995) found a strong association of low vitamin A intake with living with a smoker which remained significant when adjusted for age, education, gender, job category and race. The also found a trend of decreasing vitamin A intake with decreasing severity of smoking ban at work.

8. Fruit, vegetable and salad consumption

8.1 Smoking

Table 6 gives results of our analyses relating to fruit consumption. All the studies we analysed found a strong relationship between low fruit consumption and current smoking. The only exception was the result for HULS females where the relationship was present but weaker.

Table 7 gives results for vegetable and salad consumption. All the studies we analysed show associations between low salad consumption and current smoking. The results for vegetable consumption show weaker associations but, where a significant association is found, it relates low vegetable consumption with current smoking.

McPhillips *et al* (1994) found smoking to be associated with low vegetable and fruit consumption for women but no such association was seen for men. Zondervan *et al* (1996) found low fruit consumption to be associated with smoking in both sexes, especially for moderate and heavy smokers. Margetts and Jackson (1993) found an association, for both sexes, of smoking with low intake of carrots and of apples and pears taken together.

Hebert and Kabat (1990) found smoking to be associated with low intake of fruit both in summer and in winter (for both sexes) and, for women only, with low intake of vegetables, especially carrots. Subar *et al* (1990), using 24 hour dietary recall, found an association of smoking with low intake of all fruits taken together and with low intake of garden vegetables (all vegetables except white potatoes, dried peas and beans and salad). An association was also seen with salad but this did not reach significance. Serdula *et al* (1996) found associations, which did not reach significance, of heavy smoking with low intakes of fruit juice, fruit and vegetables.

8.2 ETS exposure

Our analyses (Table 6) show associations between ETS exposure and low fruit consumption for each of the studies although the associations are weaker than those with current smoking. Similarly, (Table 7), associations were found between low vegetable/salad consumption and ETS exposure which were weaker but in the same direction as those with current smoking.

Cardenas VM (1994) found a negative association of self-reported ETS exposure (versus none) with number of times of eating fruit and, for men only, with number of times of eating green vegetables. These associations were weakened or even reversed when spousal smoking (spouse ever smoked) was considered.

Crawley and While (1996) found that teenagers living with parents who smoked had lower intakes of salad vegetables than those with non-smoking parents. No such association was seen for all vegetables taken together or for fruit consumption.

Emmons *et al* ((1995) found that, among non-smokers, those exposed to ETS at home had fewer servings of fruit and vegetables than did those not exposed to ETS at home. Also number of servings of fruit and vegetables decreased with decreasing severity of workplace smoking ban (from total ban to smoking allowed anywhere). This result was adjusted for household exposure.

9. Other aspects of diet

9.1 Smoking

Our analyses showed a strong relationship between current smoking and low consumption of sweet foods for all the studies except HULS. However, each study also found a strong association between current smoking and taking sugar in hot drinks (see Table 8).

The three studies with data on time to first meal of the day each showed a strong association between a long time to first meal and current smoking (see Table 9).

HSE93 collected data on subjects' habits in adding salt to food. A high score for adding salt to food was strongly associated with current smoking (see Table 10).

McPhillips *et al* (1994) found that male smokers ate more snacks and sweets than non-smokers although no association was seen for women. They also found that smokers were less likely to limit their salt intake but that sodium intake did not differ between smokers and non-smokers. Margetts and Jackson (1993) also found an association between smoking and high sugar intake for both sexes.

Bolton-Smith *et al* (1993) found an association, for both sexes, of current smoking with high sugar intake. However, this association disappeared for women (but not for men) when intake was adjusted for total energy intake.

9.2 ETS exposure

The associations of current smoking with sweet food consumption and with taking sugar in hot drinks were also seen for ETS exposure although the associations were weaker (see Table 8).

Similarly, the association of time to first meal of the day with smoking was also seen with ETS exposure although the association was weaker (see Table 9).

The strong association between current smoking and high score for adding salt to food was also found in relation to ETS exposure. However, little trend was found across cotinine levels (see Table 10).

Crawley and While (1996) found that teenagers living with parents who smoked had lower intakes of sweet puddings than those with non-smoking parents.

10. Weight

10.1 Smoking

For each of the surveys we studied, current smokers had a much lower prevalence of overweight and much higher prevalence of underweight than never smokers. All of these associations were significant except the HULS findings for underweight. The original HALS survey found an association between smoking and attempts to lose weight but HULS found no such association (see Table 11). Bernstein *et al* (1996), studying women, found never smokers to be heavier than current smokers but this did not reach significance.

Tang *et al* (1995) and McPhillips *et al* (1994) found that, compared with never smokers and non-smokers respectively, current smokers had lower body mass index (BMI). Lee and Markides (1991) found this association only in middle-aged and older people. Cade and

Margetts (1991) found this association to be significant for women only. Rásky *et al* (1996) found a significant association for smokers, taken as a whole, with low body mass index. However, smokers of more than 20 cigarettes per day were found to be significantly heavier than smokers of 20 or less cigarettes per day.

Fisher and Gordon (1985) found that the heaviest women were those who neither smoked nor drank, even though they consumed fewer calories per day. A similar effect was seen for men although it was less marked.

Marti *et al* (1989) found that the difference in weight between smokers and non-smokers reduced over time (between 1982 and 1987 in a Finnish population).

10.2 ETS exposure

Our analyses found an association between overweight and ETS exposure, except for in the HULS study. This is the reverse of the association with current smoking. No association was found with underweight or with attempting to lose weight (see Table 11).

Svendsen *et al* (1987) found, among never-smoking men, that those married to smokers were heavier than those married to non-smokers.

However, Matanoski *et al* (1995) found no association between the weight of never smoking married women and the smoking status of their husbands. Bernstein *et al* (1996) found, among women, no significant difference between the weight of passive smokers and that of never smokers, either as it had been at age 20 or at current age.

11. Blood pressure

11.1 Smoking

Among the surveys we studied only the original HALS survey and HULS have any data on blood pressure. For these studies the prevalence of high blood pressure was lower for current smokers than for never smokers although this did not reach significance for each sex (Table 12).

Tang *et al* (1995) also found that, compared with never smokers, current smokers had

lower systolic and diastolic blood pressure. Lee and Markides (1991) found this association for middle-aged people only. McPhillips *et al* (1994) found no such association.

Salonen *et al* (1981), studying amount smoked (including zero), saturated fat intake, blood pressure and serum cholesterol in Eastern Finland, found that amount smoked tended to be less for those with high blood pressure although this was not significant for men. These findings were adjusted for age and body mass index.

11.2 ETS exposure

No association was found in the surveys we studied between ETS exposure and high blood pressure (Table 12).

Matanoski *et al* (1995) found, among never smoking married women, an association between high blood pressure and husband's smoking, although this association became insignificant when education was adjusted for.

Svendsen *et al* (1987) studying never smoking men, found no significant difference in blood pressure between those married to smokers and those married to non-smokers.

12. Exercise and actions to keep healthy

12.1 Smoking

Our analyses give mixed results for exercise (Table 13). HALS and its follow-up found strong associations, for females, between smoking and not getting enough exercise, as assessed by the subject. However, the association found in HALS was strongly positive while that found in HALS2 was strongly negative. A similar self-assessment in HULS found a modest negative association for males and no association for females. A more objective measure of physical activity in HSE93 gave a strong association for both sexes between current smoking and being inactive.

A second subjective measure, relating to the questionnaire question "Do you do anything to keep healthy?", gives, consistently across studies, a strong associations between smoking and doing nothing to keep healthy.

Tang *et al* (1995), McPhillips *et al* (1994) and Marti *et al* (1989) found that, compared with never smokers or non-smokers, current smokers reported taking less exercise.

Patterson *et al* (1994) identify seven separate health lifestyle patterns in U.S. adults. These include a Health Promoting Lifestyle (good diet, good activity level, very little smoking), a Good Diet Lifestyle (good diet, poor activity level, very little smoking) a Fitness Lifestyle (poor diet, very good activity level, very little smoking) and a Passive Lifestyle characterised by poor diet and poor activity level but, again, little smoking. The Smoking Lifestyle was associated with poor activity level whereas the Hedonic Lifestyle involved heavy drinking and smoking and a slightly better than average activity level.

12.2 ETS exposure

Our analyses found little association between doing little or no exercise and ETS exposure. HALS and its follow-up found a strong association, for women only, between ETS exposure and doing nothing to keep healthy. No association was found for men in HALS or for either sex in HULS (Table 13).

13. Social factors

13.1 Smoking

The three British surveys we studied found current smoking to be strongly associated, for both sexes, with low social class (Table 14), low household income (Table 16) and having no educational qualifications (Table 17). These surveys also found current smoking to be associated with small household size, for both sexes in HSE93 but for females only in HALS (Table 15). The Hungarian survey (HULS) also found current smoking to be strongly associated with low income and, for males only, with being a manual worker (social class not being available in this survey). HULS showed no association with household size, found no association for males with having a qualification and for females found an association between current smoking and having a qualification, the reverse of the findings of the British studies.

Marti *et al* (1989), Holly *et al* (1992) and Greenlund *et al* (1995) found an association between current smoking and fewer years of education.

Kleinschmidt *et al* (1995) found an association between smoking and deprivation (Carstairs score) of the ward of residence.

13.2 ETS exposure

The three British surveys we studied found strong associations of ETS exposure with low social class (Table 14), large household size (Table 15) and having no educational qualifications (Table 17). Note that at least part of the association with household size is an artefact of the definitions of ETS exposure used in these studies. Very little association was found between ETS exposure and household income (Table 16).

Matanoski *et al* (1995) found, among never smoking married women, that the fewer years of education she had the more likely she was to have a husband who smoked.

Friedman *et al* (1983) found a trend of greater prevalence of no college education with increasing duration of passive smoking per week.

Svendsen *et al* (1987), studying never-smoking men, found that those married to smokers tended to have less years of education than those married to non-smokers. They found no significant difference in income between the two groups.

However, Cardenas VM (1994), analysing the American Cancer Society's Cancer Prevention Study II, found a strong positive association between self-reported ETS exposure (versus none) and education level. When spousal smoking was considered (spouse ever smoked) the strong positive association persisted for men but became a strong negative association for women. Steenland *et al* (1996), analysing the same data on spousal smoking, separate currents spousal smoking from former spousal smoking. For women, current spousal smoking is strongly negatively associated with education level and former spousal smoking shows the same association but less strongly. However, for men there is no significant association between current spousal smoking and education while former spousal smoking is strongly positively associated with education level.

14. Occupation

14.1 Smoking

Three of the surveys we studied had data on risky occupation. Each of these found a strong association between current smoking and having (or having had) a risky occupation (Table 18).

The three British surveys we studied show an association between smoking and unemployment (Table 19). No such association was seen in HULS.

Sterling and Weinkam (1990) found that a number of indices of smoking were associated with occupational exposure to hazardous substances.

Morris *et al* (1992) found that, among those who were employed, there was an association of smoking with subsequent unemployment. Loss of employment was not associated with increased smoking.

Marmot *et al* (1991) found a trend of increasing prevalence of smoking with decreasing employment grade. This study also found trends of increasing prevalence of health problems and poor diet with decreasing employment grade.

Ratner *et al* (1995) found that, among smokers, those who were not in a paid job and those who were unemployed were more likely not to identify smoking cessation as a priority strategy for health improvement than those in a paid job or the employed respectively.

14.2 ETS exposure

In our analyses the association of current smoking with risky occupation was also seen between ETS exposure and risky occupation in a slightly weakened form (Table 18).

The association found between smoking and unemployment almost disappears for ETS exposure (Table 19).

Friedman *et al* (1983) found a trend of greater prevalence of exposure to hazardous

substances at work with increasing duration of passive smoking per week.

Cardenas VM (1994) found strong associations of self-reported exposure to ETS (versus none) with occupational exposure to asbestos and with occupational exposure to other lung carcinogens. These associations were considerably weakened when the comparison was with spousal smoking (spouse ever smoked).

15. Marital status

15.1 Smoking

In our analyses current smoking in women was strongly associated with being divorced, separated or widowed (or similar factor, according to survey). No significant association was found for men (Table 20).

Joung *et al* (1995) found that, in both men and women, married people were least likely and divorced people most likely to be current smokers. The percentages of never smokers were highest in the never married without a partner and 'other' categories for men and in the married and 'other' categories for women. Holly *et al* (1992) found, among women, that those who were separated, divorced or living as married had the highest proportion of smokers.

15.2 ETS exposure

For three of the four studies we analysed, those subjects who were divorced, separated or widowed had a lower prevalence of ETS exposure but, as for the factor Household Size, this is, at least in part, an artefact of the definition of ETS exposure. The fourth study, HSE93, found a positive association for male smokers with being widowed, divorced or separated. Both of the surveys for which cotinine data were available showed a trend relating increasing cotinine level to prevalence of divorce, separation or widowhood.

Friedman *et al* (1983) found a trend of greater prevalence of being not currently married with increasing duration of passive smoking per week. They also found that using 'Married to a smoker' as an index of passive smoking was far from reliable. They found that 47% of women married to a smoker were not exposed to ETS in the home and that over 40% of women married to a non-smoker were exposed to ETS somewhere. The equivalent figures for men were 39%

and 49% respectively.

Cardenas VM (1994) found associations of self-reported ETS (versus none) with being married which were negative for men and strongly positive for women.

16. Pregnancy

None of the surveys we studied had any data on pregnancy.

16.1 Smoking

Holly *et al* (1992) found, among women, that smokers were more likely to have been pregnant than non-smokers.

Dejin-Karlsson *et al* (1996) found associations of continuing to smoke during pregnancy with low educational level, being unmarried, unplanned pregnancy, exposure to passive smoking, being a long-term smoker, low involvement in social activities, low level of access to advice and information, low level of support from the child's father and experiencing "job strain" (a combination of high demands with low control).

Trygg *et al* (1995) found that, among pregnant women, smokers had poorer diets than non-smokers in terms of lower intake of bread, vegetables and fruit and higher intake of fat and coffee.

Baird and Wilcox (1985) found that women who smoke tend to take longer to conceive than non-smokers and that heavy smokers tend to take longer than light smokers.

16.1 ETS exposure

As noted above, Dejin-Karlsson *et al* (1996) found an association between continuing to smoke during pregnancy and exposure to passive smoking.

17. Contraception

17.1 Smoking

The HULS data showed current smoking to be associated with taking oral contraceptives and with using any form of contraception (Table 21). None of the other surveys had any data

on contraception.

Holly *et al* (1992) found, among women, that smokers were more likely than non-smokers to have ever taken oral contraceptives but found no association with current birth control use.

Cress *et al* (1994) found that, among sexually active women, smokers were less likely to use oral contraceptives or a diaphragm and more likely to use sterilization than non-smokers.

17.2 ETS exposure

The HULS data (Table 21) showed no significant association between ETS exposure and contraceptive use.

18. Sexual habits

None of the surveys we studied had any data on sexual habits.

18.1 Smoking

Holly *et al* (1992) found, among women, that smokers were more likely than non-smokers to have been 16 years old or less at first intercourse and to have had three or more sexual partners.

Steenbergh *et al* (1995) found that, among US college students, smokers were 1.25 times more likely to have had sexual intercourse, were 1.62 times more likely to have engaged in sexual intercourse with someone they had just met and were 1.81 times more likely to have had sexual intercourse with an unfamiliar person while under the influence of alcohol than non-smokers. Also studying US college students, Richter *et al* (1993) found a strong association of cigarette use with number of sexual partners and some association with failure to use a condom at last intercourse.

18.2 ETS exposure

No information was available on ETS exposure and sexual habits.

19. Personality

19.1 Smoking

HALS and its follow-up used the Eysenck Personality Inventory (Eysenck and Eysenck, 1964) to measure neuroticism and extroversion and measured Type A behaviour as in the Framingham Heart Study (Haynes *et al*, 1978). Our analyses found current smoking to be strongly associated with neuroticism and extroversion but found no association with Type A personality (Table 22).

Patton *et al* (1993) also found an association of current smoking with extroversion (for both sexes) and with neuroticism (but for men only). They also found associations of current smoking with psychoticism for both sexes and with social dissimulation (the Eysenck lie scale) for men only.

Steenbergh *et al* (1995) found that, among US college students, smokers were more likely to practise high-risk behaviours than non-smokers. For example, non-smokers were more likely to wear their seat-belts while smokers were 3.95 times more likely to have been arrested for drunk driving.

Kraft and Rise ((1994) found an association between smoking and Sensation Seeking (as defined by Zuckerman *et al* 1964 and 1979). The four sub-sales of Sensation Seeking were also investigated and smoking was found to be related to Disinhibition and Boredom Susceptibility but not related to Thrill and Adventure Seeking or Experience Seeking.

Rossi *et al* (1995) found that, for 8 out of 10 proposed health promotion and disease prevention behaviours, smokers displayed more resistance to change than never smokers. These results were adjusted for age, sex and education.

19.2 ETS exposure

Our analyses of personality data from HALS and its follow-up found ETS exposure to be associated with neuroticism, for women only, and with extroversion in both sexes. No association was found with Type A personality (Table 22).

20. Depression

20.1 Smoking

The surveys we studied included questions on depression grouped together with nervous illness or mental disorder or, for one survey (HSE93), about mental illness and handicap grouped together. The British surveys each showed an association between smoking and depression which was particularly strong for women. The Hungarian survey (HULS) showed an association with depression or mental disorders for men only (Table 23).

Lee and Markides (1991) also found an association, for women only, between smoking and depression. Parchman (1991) found an association between smoking and the prevalence of depression and found that, even when controlling for the presence of depression as measured by a standard instrument, physicians identify symptoms of depression at a higher rate in smokers than in non-smokers.

20.2 ETS exposure

None of the surveys we studied showed an association between ETS exposure and depression (Table 23).

21. Genetics

21.1 Smoking

Each of the surveys we analysed has data on whether the subjects' parents were still alive. The HULS survey also has data on whether any siblings had died. In each of the surveys current smokers had a greater prevalence of father having died than did never smokers although this was not very strong and often did not reach significance. No association was found with mother having died or, for HULS only, with sibling(s) having died (Table 24).

The original HALS survey also has data on whether either parent had lung cancer or heart trouble (Table 25). Neither of these showed an association with current smoking.

21.2 ETS exposure

No association was found of ETS exposure with father having died, mother having died or sibling(s) having died (Table 24).

Similarly no association was seen between ETS exposure and either parent having had lung cancer or heart trouble (Table 25).

22 Summary

See Table 26 for a summary of the findings of this report relating to active smoking and Table 27 for a summary of the findings relating to ETS.

Active smoking was found unanimously to be associated with a number of factors. These can be summarised as:

High alcohol intake
High coffee intake
Illegal drug use
High caloric intake
Low polyunsaturate-saturate ratio in diet
Low dietary ascorbic acid and carotene
Low intake of salads
Low BMI, although heavy smokers tend to have a higher BMI than light smokers
Low levels of exercise
Low social class
Risky occupation
Using sterilisation as method of contraception
More sexually active
Longer time to conception
Extroversion, neuroticism, high risk behaviour
Depression

For active smoking there are conflicting findings relating to:

Sweet foods, snacks, sugar in hot drinks, total sugar in the diet
Adding salt to food, restricting own salt intake, total sodium in the diet
Education level.

The first two of these are subject to subtle differences of definition. Some of the measures are

subjective, such as the subject's assessment of whether they restrict their salt intake. Most of them are derived from food frequency questionnaires with quantities derived from standard portion size tables and so are not necessarily an accurate reflection of intake. The association of education level with smoking seems to vary according to the country studied.

For passive smoking (ETS) unanimous associations were found with:

Amount of alcohol drunk
Marijuana use
Low polyunsaturated fat intake
Low ascorbic acid and carotene intake
Low social class
Risky occupation
Extroversion.

Conflicting evidence found for active smoking was also found for passive smoking for sweet food intake and education level. Additional conflict was found in relation to passive smoking and coffee intake.

In general the findings for passive smoking were in the same direction as those for active smoking but the associations were less strong. However this was not true for weight, blood pressure and household size. The reversal of the association for household size (negative or none for active smoking, positive for passive smoking) may be an artefact of the definition of passive smoking.

The reversal of the associations for weight and blood pressure (low or no effect for smokers, high or no effect for passive smokers) may represent real effects of tobacco use for which the doses found in passive smokers are too small to show the effect. This is supported by the findings that smokers tend to take in more calories than non-smokers but are less likely to be overweight. Smokers and passive smokers share a tendency to have a high fat diet which would be expected to give higher weight. The association of high blood pressure with passive smoking became insignificant when education level (as a marker of social class) was adjusted for.

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Table 1

Sample sizes in HALS, HSE93 and HULS

	Sex	Survey			
		HALS	HALS2	HSE93	HULS
Current smokers	Male	1811	767	2698	376
	Female	1718	854	2355	341
Never smokers					
(i) Total	Male	969	969	2050	429
	Female	2353	2351	3748	948
(ii) Unexposed to ETS†	Male	714	493	1598	322
	Female	1673	974	3007	643
(iii) Exposed to ETS†	Male	255	111	411	107
	Female	678	291	657	305
(iv) With cotinine data	Male	-	473	643	-
	Female	-	879	1098	-

† Definitions of ETS exposure were as follows:
HALS - Anyone else in the household smokes regularly (1cigarette/1 pipe/1 cigar per day)
HALS2 - Anyone else in the household smokes regularly (unspecified)
HSE93 - Anyone else in the household smokes 1 or more cigarette per day
HULS - Anyone else in the household smokes regularly (unspecified)

Table 2
Other studies reviewed

Reference	Location/race/ age group	Number of subjects	Year(s) of survey	ETS?	Factors Considered
Baird and Wilcox (1985)	United States women	678	1983	No	Pregnancy
Bernstein *et al* (1996)	Geneva, women residents	928	1992-93	Yes	Weight
Bolton-Smith *et al* (1993)	Scotland	9,035	1989	No	Alcohol Ascorbic acid Carotene Coffee/caffeine Cholesterol/dietary fat Diet
Cade and Margetts (1991)	Britain	2,340	Not specified	No	Ascorbic acid Carotene Cholesterol/dietaryfats Weight
Cardenas VM (1994)	United States	497,680	1982-89	Yes	Fruit/vegetables/salad Marital status Occupation Social factors
Crawley and While (1996)	Britain, 16-17 year olds	2,957	1986-87	Yes	Ascorbic acid Carotene Other aspects of diet
Cress *et al* (1994)	Californian women	550	1987-90	No	Contraception
Dejin-Karlsson *et al* (1996)	Swedish women	872	1991-92	Yes	Pregnancy
Emmons *et al* (1995)	United States blue-collar workers	10,833	? Working Well trial	Yes	Ascorbic acid Cholesterol/dietaryfats Fruit/vegetables/salad
Fisher and Gordon (1985)	US and Canada	4,374	1972-76	No	Alcohol Cholesterol/dietaryfats Weight
Friedman *et al* (1983)	San Francisco	35,169	1979-80	Yes	Alcohol Drug use/dependency Marital status Occupation Social factors

Reference	Location/race/ age group	Number of subjects	Year(s) of survey	ETS?	Factors Considered
Fukao *et al* (1996)	Japanese men	1,902	1990	No	Alcohol
Greenlund *et al* (1995)	United States, young adults	5,115	1985-86	No	Social factors Smoking by parents
Hebert and Kabat (1990)	United States	2,191	1985-88	No	Cholesterol/dietaryfats Carotene Fruit/vegetables/salad
Holly *et al* (1992)	Californian women	697	1987-90	No	Alcohol Coffee Contraception Marital status Pregnancy Social factors Sexual habits
Joung *et al* (1995)	The Netherlands	16,311	1991	No	Marital status
Kato *et al* (1989)	Japan	30,916	1985	No	Alcohol Caffeine
Kleinschmidt *et al* (1995)	London	8,251	1990	No	Social factors
Kraft and Rise (1994)	Norwegian adolescents	1,841	1989-90	No	Personality
Lee and Markides (1991)	Mexican Americans	3,326	1982-84	No	Alcohol Blood pressure Coffee Cholesterol Depression
Margetts and Jackson (1993)	Britain	1,842	1990	No	Alcohol Ascorbic acid Carotene Dietary fats Fruit/vegetables/salad Other aspects of diet
Marmot *et al* (1991)	British civil servants	10,314	1985-88	No	Occupation
Marti *et al* (1989)	Finnish men	4,508	1982-87	No	Alcohol Dietary fats Exercise Social factors Weight

Reference	Location/race/ age group	Number of subjects	Year(s) of survey	ETS?	Factors Considered
Matanoski *et al* (1995)	United States, women	3,896	1971-75	Yes	Alcohol Ascorbic acid Blood pressure Dietary fats Social factors Weight
McPhillips *et al* (1994)	New England	1,608	1987-90	No	Alcohol Ascorbic acid Blood pressure Caffeine Cholesterol/dietaryfats Diet Fruit/vegetables/salad Weight
Morris *et al* (1992)	British men	6,057	1978-80	No	Occupation
Parchman (1991)	United States	704	Not specified	No	Depression
Patterson *et al* (1994)	United States	5,484	1987-88	No	Alcohol Diet Exercise
Patton *et al* (1993)	Canada	1,257	1992?	No	Personality
Rásky *et al* (1996)	Austria	27,344	1989-93	No	Weight
Ratner *et al* (1995)	Canada	853	1993	No	Occupation
Richter *et al* (1993)	United States, adolescents	3,893	1990	No	Sexual habits
Rossi *et al* (1995)	United States	13,560	Not specified	No	Personality
Serdula *et al* (1996)	United States	21,892	1990	No	Fruit/vegetables/salad
Sidney *et al* (1989)	California	2,142	1985	Yes	Carotene
Steenbergh *et al* (1995)	United States college students	769	Not specified	No	Alcohol Drug use/dependency Personality Sexual habits
Steenland *et al* (1996)	United States	309,599	1982-89	Yes	Social factors
Sterling and Weinkam (1990)	United States	75,497	1970	No	Occupation
Strickland *et al* (1992)	American midwest	3,495	1986-89	No	Alcohol Cholesterol/dietary fat

Reference	Location/race/ age group	Number of subjects	Year(s) of survey	ETS?	Factors Considered
Subar *et al* (1990)	United States	10,000 approx.	1976-80	No	Ascorbic acid Cholesterol/dietaryfats Carotene Fruit/vegetables/salad
Svendsen *et al* (1987)	United States, men	1,245	1973-82	Yes	Alcohol Blood pressure Cholesterol Social factors Weight
Swan *et al* (1996)	United States, caucasian male twins	712	1969,80-81	No	Alcohol Coffee Genetics
Tang *et al* (1995)	Britain Alcohol	8,000	? OXCHECK		No Blood pressure Cholesterol/dietary fat Exercise Weight
Trygg *et al* (1995)	Norwegian pregnant women	821	Not specified	No	Pregnancy
Vega *et al* (1993)	Californian women	29,494	1992	No	Alcohol Drug use/dependency
Zondervan *et al* (1996)	The Netherlands	4,244	1993	No	Ascorbic acid Carotene Cholesterol/dietary fat Fruit/vegetables/salad

Table 3
Alcohol consumption (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of alcohol consumption	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Moderate+	M	22.1	39.3	+++	28.9	37.9	++	
		F	14.6	23.2	+++	15.2	20.6	+++	
HALS2	Moderate+	M	31.3	47.9	+++	27.5	57.4	++	+++
		F	17.5	27.1	+++	17.3	18.1	NS	NS
HSE93	Moderate+	M	38.0	57.4	+++	36.2	48.8	+++	+++
		F	21.5	36.7	+++	21.6	20.1	NS	NS
HULS	Occasional+	M	53.7	74.2	+++	50.0	51.9	NS	
		F	14.8	28.9	+++	15.4	11.8	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 4
Coffee and tea consumption (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of coffee or tea consumption	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Coffee, 7+ cups per day	M	2.2	7.4	NS	4.4	1.2	- - -	
		F	4.6	8.5	NS	4.6	5.7	NS	
HALS2	Coffee, 7+ cups per day	M	4.2	11.4	(+)	4.1	5.2	NS	NS
		F	5.1	14.1	++	4.5	7.4	NS	NS
HSE93	Drinks coffee	M	88.4	89.6	++	88.4	91.3	NS	NS
		F	87.9	88.9	(+)	88.1	86.7	NS	NS
HULS	Coffee once a day or more	M	47.5	73.3	+++	42.5	39.5	NS	
		F	64.6	85.1	+++	62.8	66.4	NS	
HALS	Tea, 7+ cups per day	M	22.8	38.4	+++	18.3	25.4	+++	
		F	20.1	35.6	+++	16.5	17.1	NS	
HALS2	Tea, 7+ cups per day	M	16.7	37.0	+++	16.3	16.9	NS	NS
		F	17.4	30.0	+++	17.6	16.1	NS	NS
HSE93	Drinks tea	M	94.9	95.9	(+)	94.7	94.6	NS	NS
		F	95.4	95.8	NS	95.6	94.9	NS	NS
HULS	Tea once a day or more	M	43.0	40.6	(-)	44.7	36.7	NS	
		F	52.5	48.2	-	50.7	54.0	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 5
Dietary fats and cholesterol (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of dietary fat consumption	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Fried foods score 8+	M	45.8	58.3	+++	49.5	64.9	+++	
		F	26.5	34.7	+++	27.5	39.0	+++	
HALS2	Fried foods score 8+	M	29.8	48.0	+++	29.3	31.0	NS	+++
		F	13.6	23.2	+++	12.4	16.6	+	+
HSE93	Eats fried food	M	85.9	89.3	+++	85.1	90.6	+	NS
		F	82.2	85.7	+++	81.7	85.4	(+)	NS
HULS	Eats food fried in fat weekly or more often	M	48.6	51.0	NS	46.6	50.9	(+)	
		F	37.5	40.2	NS	33.3	49.1	+++	
HALS	Don't use low fat/PU spread	M	70.7	83.2	+++	70.1	70.5	+	
		F	70.2	82.6	+++	67.6	76.6	+++	
HALS2	Don't use low fat/PU spread	M	25.1	42.1	+++	22.9	33.9	++	+
		F	25.2	37.2	+++	23.8	30.9	(+)	(+)
HSE93	Don't use low fat/PU spread	M	54.8	59.6	+++	53.7	58.1	++	NS
		F	50.6	58.3	+++	50.6	49.6	NS	NS
HALS	Not cut down on fatty foods	M	53.7	57.5	NS	52.9	53.5	NS	
		F	36.9	42.9	+	36.4	41.0	(+)	
HULS	Ever tried to cut down on fatty and fried food	M	34.7	35.9	NS	34.8	23.1	(-)	
		F	51.9	47.8	NS	53.2	50.1	NS	
HSE93	Total cholesterol level 5.2 or greater	M	68.3	69.1	+	68.6	68.8	NS	-
		F	67.6	70.2	+	67.6	68.4	NS	NS

PU Polyunsaturated fat.

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.

p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).

p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 6
Fruit consumption (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of fruit consumption	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Fruits score <8	M	37.4	61.4	+++	40.4	46.1	NS	
		F	30.9	49.1	+++	29.7	33.1	+	
HALS2	Fruits score <8	M	35.7	61.3	+++	33.8	45.6	+	(+)
		F	24.4	49.1	+++	23.1	30.5	(+)	+
HSE93	Fruit less than	M	49.7	68.5	+++	48.2	59.8	+++	++
	once a day	F	39.2	63.5	+++	38.3	43.8	++	+++
HULS	Fresh fruit in summer	M	95.4	93.0	---	96.4	94.3	-	
	weekly or more often	F	97.3	94.1	-	97.7	96.9	-	
	Fresh fruit in winter	M	82.0	71.3	---	83.3	78.7	NS	
	weekly or more often	F	81.9	74.3	-	83.3	80.8	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	---	$p<0.001$
	++,	--	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 7
Vegetable and salad consumption (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of vegetable or salad consumption	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Vegetables score <8	M	54.2	51.9	NS	55.6	56.7	(+)	
		F	49.4	52.3	NS	52.6	49.1	NS	
	Salads score <6	M	53.1	71.7	+++	55.4	65.0	++	
		F	48.3	57.6	+++	45.6	48.3	NS	
HALS2	Vegetables score <8	M	55.2	54.9	NS	54.6	59.4	NS	NS
		F	48.7	53.2	++	48.9	46.1	NS	NS
	Salads score <6	M	58.6	74.4	+++	56.2	72.5	+	NS
		F	41.9	56.4	+++	41.0	43.8	NS	NS
HSE93	Vegetables/salad less than once a day	M	31.6	40.4	+++	30.3	35.4	++	+++
		F	28.1	39.4	+++	27.3	32.4	+	+
HULS	Cooked vegetables weekly or more often	M	36.2	30.8	-	36.2	32.7	NS	
		F	49.1	43.4	NS	50.4	45.9	NS	
	Salads in summer weekly or more often	M	90.2	89.8	-	90.4	88.4	(-)	
		F	93.9	88.1	--	94.7	89.8	NS	
	Salads in winter weekly or more often	M	62.1	50.6	--	63.1	55.8	NS	
		F	62.9	56.4	(-)	64.8	56.4	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	---	$p<0.001$
	++,	--	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 8
Sweet food consumption (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of sweet food consumption	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Sweet foods score 13+	M	64.3	51.2	---	62.5	54.3	--	
		F	60.5	44.9	---	58.6	56.1	NS	
HALS2	Sweet foods score 13+	M	59.1	41.9	---	60.3	54.4	NS	---
		F	55.2	38.1	---	56.0	52.5	NS	NS
HSE93	Sweet foods score 11+	M	52.3	42.1	---	53.3	50.7	-	---
		F	49.0	36.9	---	49.5	47.2	(-)	NS
HULS	Sweets, weekly or more often	M	59.4	56.5	NS	63.0	63.3	NS	
		F	60.7	55.6	(-)	58.7	62.0	NS	
HALS	Takes sugar in hot drinks	M	55.9	77.6	+++	57.1	65.7	+	
		F	43.3	54.2	+++	39.9	41.1	NS	
HALS2	Takes sugar in tea/coffee	M	49.4	71.6	+++	48.3	57.9	NS	(+)
		F	31.0	46.9	+++	30.4	32.1	NS	NS
HSE93	Sugar taken in hot drinks	M	52.1	70.7	+++	50.0	63.0	+++	NS
		F	37.7	49.0	+++	36.8	40.6	+	(+)
HULS	Sugar in coffee, 2 or more spoonfuls	M	53.4	61.8	NS	54.1	54.4	NS	
		F	44.0	45.3	NS	40.2	46.9	++	
	Sugar in tea, 2 or more spoonfuls	M	66.7	72.6	+	69.0	65.9	NS	
		F	53.0	65.6	++	48.0	59.4	+++	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	---	$p<0.001$
	++,	--	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 9
Time to first meal of the day (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of time to first meal of the day	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	2 hrs+ to first meal	M	12.0	27.9	+++	15.7	25.0	+	
		F	11.8	32.0	+++	15.8	21.1	++	
HALS2	2 hrs+ to first meal	M	17.0	35.3	+++	16.1	24.4	NS	+
		F	15.2	38.0	+++	13.9	20.0	+	+
HULS	1 hr+ to first meal	M	42.4	60.1	+++	39.6	45.1	NS	
		F	44.8	57.5	+++	42.1	50.2	+	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	---	$p<0.001$
	++,	--	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 10
Salt consumption (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of salt consumption	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HSE93	Score for salt in food	M	44.5	60.5	+++	42.8	51.5	+++	NS
	5+	F	38.7	49.8	+++	37.8	41.8	+++	+

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	---	$p<0.001$
	++,	--	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 11
Weight (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of weight	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Mildly overweight or obese	M	56.1	45.6	--	42.6	57.6	+	
		F	58.5	48.8	---	44.8	53.2	+++	
HALS2	Mildly overweight or obese	M	54.9	48.6	-	53.1	63.1	(+)	(+)
		F	57.6	53.5	--	55.9	62.9	+	++
HSE93	Overweight or obese	M	58.3	51.2	---	58.0	61.3	NS	++
		F	60.2	55.1	--	58.7	68.2	+++	+
HULS	Overweight or obese	M	57.5	46.3	-	51.9	50.4	NS	
		F	58.9	49.0	--	59.6	61.9	NS	
HALS	Underweight	M	1.7	8.4	+++	6.6	2.9	(-)	
		F	2.7	6.9	+++	3.6	1.9	NS	
HALS2	Underweight	M	2.3	5.1	+	2.1	4.4	NS	NS
		F	1.4	4.7	+++	1.4	0.8	NS	NS
HSE93	Underweight	M	3.9	6.6	++	3.8	3.5	NS	NS
		F	2.0	3.2	+	2.1	1.2	NS	NS
HULS	Underweight	M	4.5	7.5	NS	5.3	7.6	NS	
		F	4.9	6.3	NS	4.7	6.8	NS	
HALS	Ever tried to lose weight	M	73.3	79.3	+	73.3	78.1	NS	
		F	56.7	64.2	+++	55.4	50.1	-	
HULS	Has seriously attempted to lose weight	M	10.8	8.6	NS	8.6	12.8	NS	
		F	25.1	28.0	NS	22.4	26.4	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	---	$p<0.001$
	++,	--	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 12
High blood pressure (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of high blood pressure	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Ever had high blood pressure	M	19.4	15.2	NS	12.2	16.0	NS	
		F	22.6	17.8	-	18.7	17.7	NS	
HULS	Ever had high blood pressure	M	37.9	28.4	-	31.4	38.0	NS	
		F	36.4	32.5	NS	37.7	41.6	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 13
Exercise and actions to keep healthy (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of exercise or actions to keep healthy	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Do not get enough exercise	M	32.4	39.1	+	43.1	35.5	-	
		F	36.7	48.2	+++	48.3	46.1	NS	
HALS2	Do not get enough exercise	M	50.5	49.2	NS	51.1	50.7	NS	(-)
		F	58.9	50.0	---	57.6	67.0	+	NS
HSE93	Inactive or lightly active	M	15.4	17.3	+++	15.6	16.6	NS	NS
		F	19.5	18.6	+++	19.7	17.2	(+)	+
HULS	Average or more active than average for age	M	86.4	74.6	-	88.3	85.2	NS	
		F	79.7	71.0	NS	78.8	80.4	NS	
HALS	Does nothing to keep healthy	M	32.4	39.1	+	31.1	32.3	NS	
		F	36.7	48.2	+++	33.8	43.7	+++	
HALS2	Does nothing to keep healthy	M	30.3	39.4	+++	30.4	27.7	NS	NS
		F	33.8	43.7	+++	31.0	44.2	+++	+++
HULS	Does nothing to keep healthy	M	30.5	46.5	+++	28.2	37.3	NS	
		F	21.5	30.3	++	20.1	22.8	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	---	$p<0.001$
	++,	--	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 14
Social class (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of social class	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Social class IIIM or below	M	47.0	66.7	+++	45.6	67.7	+++	
		F	52.5	66.4	+++	46.2	57.1	+++	
HALS2	Social class IIIM or below	M	45.6	65.0	+++	43.0	59.9	+++	+++
		F	46.6	64.9	+++	43.1	58.3	+++	+++
HSE93	Social class IIIM or below	M	45.1	59.1	+++	43.0	54.0	+++	+++
		F	35.3	47.1	+++	32.7	46.4	+++	+++
HULS	Manual worker	M	64.1	76.8	+++	62.3	73.8	NS	
		F	58.2	59.5	NS	57.5	67.7	+	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 15
Household size (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of household size	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Household size 3+	M	40.3	43.7	NS	48.9	73.5	+++	
		F	40.0	35.4	---	50.2	66.2	+++	
HALS2	Household size 3+	M	48.8	49.3	NS	44.4	69.4	+++	NS
		F	47.8	47.1	(-)	45.2	58.1	+++	NS
HSE93	Household size 3+	M	52.1	47.9	---	49.2	61.8	+++	NS
		F	49.6	45.4	---	45.5	65.1	+++	NS
HULS	Household size 3+	M	39.8	42.0	NS	39.6	50.4	+++	
		F	38.0	37.3	NS	31.6	43.4	+++	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	---	$p<0.001$
	++,	--	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 16
Income (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of income	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Household income	M	53.0	64.8	+++	45.6	52.7	NS	
	< £135 per week	F	64.9	75.3	+++	56.7	55.2	-	
HALS2	Household income	M	41.7	58.0	+++	41.1	47.2	NS	+
	< £250 per week	F	55.7	69.9	+++	55.5	53.5	NS	+++
HULS	Self rating on financial	M	42.5	32.9	---	45.2	33.6	(-)	
	ladder 4+	F	38.8	28.8	---	39.2	32.9	(-)	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	---	$p<0.001$
	++,	--	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 17
Education (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of education	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	No educational qualification	M	53.2	63.9	++	35.6	53.3	+++	
		F	63.1	73.8	+++	43.6	51.5	+++	
HALS2	No educational qualification	M	30.8	47.8	+++	28.6	44.5	++	+++
		F	41.2	59.5	+++	39.4	45.8	++	+++
HSE93	No educational qualifications	M	25.9	39.6	+++	24.5	32.0	+++	+++
		F	38.0	54.1	+++	36.0	46.3	+++	+++
HULS	Has a qualification	M	75.1	76.6	NS	75.7	67.8	(-)	
		F	53.8	64.0	+	52.6	43.4	-	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 18
Risky occupation (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of risky occupation	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Risky occupation (current or last main job)	M	36.7	51.1	+++	36.8	52.5	+++	
		F	24.6	34.5	+++	19.5	25.3	++	
HALS2	Risky occupation (current or most recent job)	M	36.3	46.8	+++	33.7	51.2	++	++
		F	18.9	32.1	+++	16.4	25.6	++	+++
HULS	Ever worked in any of 40 specified harmful jobs	M	29.1	47.3	+++	24.6	32.4	NS	
		F	7.2	11.4	+	5.9	11.4	+	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 19
Unemployment (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of unemployment	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Not in paid employment	M	41.5	46.7	+	28.7	31.3	++	
		F	62.4	63.5	NS	53.3	49.2	(-)	
HALS2	Not in paid employment	M	31.8	41.1	+++	31.2	36.2	NS	NS
		F	47.0	53.1	+	46.1	46.6	NS	(-)
HSE93	Out of work	M	33.1	41.3	+++	32.8	32.2	NS	NS
		F	48.6	56.1	+	47.8	50.1	+	NS
HULS	In active employment	M	54.6	55.3	NS	57.8	51.0	(-)	
		F	44.0	47.1	NS	38.8	37.0	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 20
Marital status (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of marital status	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Divorced, separated or widowed	M	12.5	13.3	NS	9.8	6.4	---	
		F	25.0	31.5	++	20.1	6.7	---	
HALS2	Divorced, separated or widowed	M	10.2	15.9	(+)	11.1	7.5	-	NS
		F	20.5	30.3	+++	22.2	10.2	-	+
HSE93	Widowed, divorced or separated	M	7.6	11.8	NS	7.9	4.4	+++	++
		F	19.4	25.8	+++	20.5	10.9	NS	+
HULS	Divorced or widowed	M	8.0	6.6	NS	7.0	6.1	NS	
		F	20.2	29.6	+++	25.9	14.7	---	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	---	$p<0.001$
	++,	--	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 21
Contraceptive use (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of contraceptive use	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HULS	Takes oral contraceptives regularly	M	-	-		-	-		
		F	11.5	12.9	+	9.0	11.9	NS	
	Using contraception currently	M	-	-		-	-		
		F	56.5	65.3	+	52.0	59.3	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 22
Personality (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of personality	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Neuroticism	M	30.5	37.3	++	32.3	30.1	NS	
		F	51.1	59.4	++	52.0	58.5	(+)	
HALS2	Neuroticism	M	32.0	39.9	+++	31.2	38.2	NS	NS
		F	51.5	59.9	+++	48.8	59.4	+	+
HALS	Extroversion	M	34.3	44.6	+++	40.1	54.3	++	
		F	36.3	44.8	+++	40.5	49.2	++	
HALS2	Extroversion	M	41.3	49.1	+++	39.5	56.5	(+)	+++
		F	37.2	52.7	+++	35.5	43.3	(+)	+++
HALS	Type 'A' personality	M	45.9	46.2	NS	54.0	48.2	NS	
		F	43.4	40.5	NS	48.0	47.9	NS	
HALS2	Type 'A' personality	M	52.0	50.2	NS	50.3	65.1	NS	NS
		F	45.7	48.0	NS	46.5	44.4	NS	NS

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 23
Depression and mental disorders (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of depression or mental disorder	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Had depression or nervous illness	M	11.6	16.1	+	9.1	10.8	NS	
		F	20.2	32.8	+++	16.8	17.0	NS	
HALS2	Had depression or nervous illness	M	6.7	11.9	++	6.0	9.8	NS	NS
		F	17.2	28.4	+++	16.5	19.0	NS	NS
HSE93	Has mental illness or handicap	M	1.0	2.0	++	0.9	1.1	NS	NS
		F	1.3	3.3	+++	1.4	0.4	(-)	NS
HULS	Depression or mental disorders in last month	M	6.6	14.2	++	4.9	8.8	NS	
		F	19.8	20.9	NS	19.1	22.8	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 24
Genetic influences (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of genetic influences	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Father dead	M	81.0	87.3	++	55.9	55.8	NS	
		F	84.6	87.6	+	57.6	59.1	NS	
HALS2	Father dead	M	66.8	67.3	NS	67.6	64.9	NS	NS
		F	67.5	70.2	NS	67.1	67.3	NS	NS
HSE93	Father dead	M	59.8	62.1	(+)	59.7	61.8	NS	NS
		F	60.5	62.0	NS	60.7	59.5	NS	NS
HULS	Father dead	M	54.6	61.0	+	47.4	42.4	NS	
		F	61.1	59.5	NS	63.1	66.7	NS	
HALS	Mother dead	M	69.7	72.7	NS	44.4	41.5	NS	
		F	71.6	73.2	NS	44.5	46.1	NS	
HALS2	Mother dead	M	51.0	53.6	NS	51.4	52.8	NS	NS
		F	50.9	53.8	(+)	49.9	51.2	NS	+
HSE93	Mother dead	M	48.6	48.7	NS	48.5	50.4	NS	NS
		F	48.5	49.8	NS	48.1	50.7	NS	+
HULS	Mother dead	M	37.5	40.4	NS	31.2	33.5	NS	
		F	44.5	41.2	NS	48.3	51.4	NS	
HULS	Sibling(s) dead	M	14.4	19.0	NS	11.4	18.0	NS	
		F	22.8	23.6	NS	24.9	31.0	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 25
Family history of disease (%) by smoking and ETS exposure in HALS, HSE93 and HULS

Study	Index of family history of disease	Sex	Smoking			ETS exposure			
			Never	Current	p_1	No	Yes	p_2	p_3
HALS	Either parent had lung cancer	M	5.5	6.0	NS	4.5	4.4	NS	
		F	5.4	5.7	NS	4.8	4.4	NS	
HALS	Either parent had heart trouble	M	24.0	23.8	NS	24.4	18.7	NS	
		F	31.9	28.0	(-)	28.7	25.9	NS	

P_1 significance of age-adjusted comparison of prevalence between current and never smokers.
p_2 significance of age-adjusted comparison of prevalence between ETS-exposed and non-ETS-exposed never smokers (see Table 1 for definition of ETS exposure).
p_3 significance of age-adjusted trend relating cotinine level in never smokers to prevalence of risk factor (cotinine data available for HALS2 and HSE93 only).

Significances are coded as:			
	+++,	- - -	$p<0.001$
	++,	- -	$p<0.01$
	+,	-	$p<0.05$
	(+),	(-)	$p<0.1$
	NS		Not significant ($p \geq 0.0$)

Table 26
Summary of findings: Smoking

Factor	Findings: associations with smoking Unanimous	Conflicting or Not unanimous
Alcohol	Positive association	
	Genetic link postulated	
Coffee, caffeine	Positive association	
	Genetic link postulated	
Drug use, dependency	Positive association	
Cholesterol, dietary fat	Caloric intake: positive	Fried food intake: positive or none
	Dietary cholesterol: positive	Dietary fat: positive or none
	Dietary PUFA: negative	
	Dietary SFA (men): positive	Dietary SFA (women): mostly positive, one study found negative
	PUFA/SFA ratio: negative	
	Serum HDL: negative	Total serum cholesterol:positive or none
Ascorbic acid	Dietary: negative	
Carotene	Dietary β-carotene: negative	Dietary vitamin A: negative or none
	Dietary carotene: negative	
	Serum β-carotene: negative	
Fruit, vegetable and salad consumption	Fruit: negative for women	Fruit: negative or none for men
	Vegetables: negative for women	Vegetables: negative or none for men
	Salad: negative	
Other aspects of diet	Time to first meal of the day: positive	Sweet foods and snacks, sugar intake: conflicting
		Adding salt to food, sodium intake: positive or none

	Findings: associations with smoking	
Factor	Unanimous	Conflicting or Not unanimous
Weight	Overweight: negative	
	Underweight: positive	
	BMI: negative	
	BMI, 20+/day vs <20/day: positive	
	Intake of calories: positive	
Blood pressure		Negative or none
Exercise and actions to keep healthy	Do anything to keep healthy: negative	Subject believes they get enough exercise: conflicting
	Amount of exercise: negative	
Social factors	Social class: negative	Years of education, having qualifications: conflicting. Culture dependent?
	Household income: negative	Household size: negative or none
Occupation	Has/had a risky occupation: positive	Unemployment: positive or none
	Employment grade: negative	
Marital status	Being married: negative	
	For women, being separated or divorced: positive	
Pregnancy	Has been pregnant: positive	
	Time to conception: positive	
Contraception	Taking oral contraceptives (OC's), all women: positive	Currently uses contraceptives: positive or none
	Ever taken OC's, all women: negative	
	Taking OC's, sexually active women: negative	
	Sterilization, sexually active women: positive	

	Findings: associations with smoking	
Factor	Unanimous	Conflicting or Not unanimous
Sexual habits	<16 yrs old at first intercourse: positive	
	Had 3+ sexual partners: positive	
	Had sex with new acquaintance (among college students): positive	
	Didn't use a condom at last intercourse (among college students): positive	
Personality	Neuroticism: positive	
	Extroversion: positive	
	Type 'A' personality: none	
	Psychoticism: positive	
	Dissimulation (men only): positive	
	Sensation Seeking: positive	
	High risk behaviour: positive	
	Resistance to change for health promotion: positive	
Depression	Positive	
Genetics	Father dead: positive	
	Mother or sibling dead: none	
	Parent had lung cancer: none	

Table 27
Summary of findings: ETS

Factor	Findings: associations with ETS Unanimous	Conflicting or Not unanimous
Alcohol	Among drinkers, amount drunk: positive	Moderate+ vs little or abstainer: positive or none
Coffee, caffeine		Conflicting
Drug use, dependency	Marijuana use: positive	
Cholesterol, dietary fat	Dietary PUFA: negative	
	Fried, fatty food: positive	
	Ratio of calories from fat to total calories: positive	
	Serum cholesterol: none	
Ascorbic acid	Dietary: negative	
Carotene	Dietary carotene, women: negative	Dietary carotene, men: negative or none
	Dietary vitamin A: negative	
Fruit, vegetable and salad consumption		Negative or none
Other aspects of diet		Time to first meal of the day: positive or none
	Adding salt to food: positive	Sweet foods, sugar in tea and coffee: conflicting
Weight	Underweight: none	Overweight: positive or none
Blood pressure		Positive or none
Exercise and actions to keep healthy		Do anything to keep healthy: negative or none
Social factors	Social class: negative	Years of education, having qualifications, education level: conflicting
	Household size: positive	
	Household income: none	
Occupation	Has/had a risky occupation: positive	Unemployment: positive or none

	Findings: associations with ETS	
Factor	Unanimous	Conflicting or Not unanimous
Marital status	Being married (men): negative	Being married (women): conflicting
		Being separated or divorced: conflicting
Pregnancy	Continuing to smoke while pregnant: positive	
Contraception	None	
Sexual habits	None	
Personality	Neuroticism: positive for women only	
	Extroversion: positive for both sexes	
	Type 'A' personality: none	
Depression	None	
Genetics	None	