

## COPD and environmental risk factors other than smoking

### 6. Race

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#### 1. Paper identified

Using the procedures described in “COPD and risk factors other than smoking. 1. Identifying Relevant Papers,” 25 papers were identified as relevant.<sup>1-25</sup>

#### 2. Summary of studies

Table 1 summarizes very briefly the results from the 25 papers. In nine of them<sup>2,4,7,10,12,13,22,23,25</sup> race was not a major concern of the paper, as judged by the title and abstract, with usually very limited results presented. Apart from two studies in Canada, one in Jamaica and one in New Zealand, all the papers concerned US studies. A wide variety of racial comparisons were made which, along with the variety of endpoints studied and study designs used, made reaching an overall impression difficult. This is added to by the fact that no attempt was made to adjust for smoking habits in 14 of the 25 papers, though some of those that did not speculated that smoking was a major contributor to any racial differences observed. Even in those that did adjust for smoking habits it seems likely that the adequacy of adjustment is questionable in a number (though this has not been formally investigated).

The most commonly observed endpoints were COPD and lung function. Of the 11 studies of COPD, nine were of mortality (the other two<sup>4,22</sup> being based on self-reports of a physician diagnosis) and only one<sup>13</sup> adjusted for smoking. This, a comparison of decedents from COPD and from other diseases, reported three-fold higher risks in whites than blacks after adjustment for smoking. Higher rates in whites were generally found in other studies, though differences appear to vary over time.

Of the seven studies of lung function, various differences by race are noted depending on the measure used. Perhaps the most relevant paper is Vollmer et al (2000)<sup>24</sup> which described a meta-analysis of eight cross-sectional studies and found little difference by race after adjustment for smoking (see Table 1 for texts from this paper).

### 3. Overall thoughts

The available evidence does not clearly show any racial differences that cannot be explained by smoking or other factors. However, there are a number of possible differences that might emerge more clearly from a more detailed analysis.

It should be noted that, in this note, I have not attempted to summarize COPD mortality data by sex, age, race and year, which are available from national statistics. However, this would not be adjusted for smoking.

As reported earlier, some of the NHANES surveys have data on COPD morbidity (GOLD), race, sex, age and smoking habits. It may well be possible to analyze them to obtain clearer insights. Some of the publications considered already use NHANES data.<sup>1,6,12,23</sup>

### 4. References

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**TABLE 1** Summary of studies of COPD and race

<u>Source</u>	<u>Country</u>	<u>Study design<sup>a</sup></u>	<u>Endpoint<sup>b</sup></u>	<u>Comparisons made and results</u>	<u>Adjusted for smoking</u>
Bang et al (1990) <sup>1</sup>	USA	C	CB	Puerto Ricans > Cuban Americans = Mexican Americans	No
Bradshaw et al (1988) <sup>2</sup>	NZ	C	CB	Polynesian v other; no difference	Yes
Crapo et al (1988) <sup>3</sup>	USA	C	Lung function curves	American Indians v whites; different in men not women	No
Eisner et al (2005) <sup>4</sup>	USA	C	COPD	White v others; no difference	No
Espino et al (1994) <sup>5</sup>	USA	DC	COPD	Mexican Americans v non-Hispanic whites; lower in Mexican Americans in females (not males)	No
Gillum et al (1990) <sup>6</sup>	USA	VS	COPD, CBE	Blacks v whites; lower in blacks overall, but higher at younger ages	No
Hammarsten et al (1970) <sup>7</sup>	USA	CC	CB, OLD	Whites > Negroes > Indians	Yes
Hayes (1970) <sup>8</sup>	Jamaica	PM	EMP	Negro v Chinese v E Indian v White; no differences in frequency or severity of panacinar EMP, but centrilobular EMP commoner in E Indians and less common in Chinese	No
Horne et al (1989) <sup>9</sup>	Canada	C	AO	British v German v E European v N American; British > E European only difference	Yes
Kuller et al (1989) <sup>10</sup>	USA	P	COPD	Blacks v whites; no difference	No
Lanese et al (1978) <sup>11</sup>	USA	C	Lung function	Blacks v whites v American Indians; blacks generally lower than whites, except higher for FEV <sub>1</sub> /FVC – Indians generally intermediate	Yes
Mannino et al (2000) <sup>12</sup>	USA	C	OLD	Whites higher than blacks	Yes
Meyer et al (2002) <sup>13</sup>	USA	CC	COPD	Whites higher than blacks	Yes
Oscherwitz et al (1972) <sup>14</sup>	USA	C	Lung function	Whites v Negroes v Asians; FEV <sub>1</sub> higher but FVC and FEV <sub>1</sub> /FVC lower in Whites	Yes
Rhoades et al (1990) <sup>15</sup>	USA	VS	COPD	Whites higher than American Indians	No
Rode and Shephard (1973) <sup>16</sup>	Canada	C	Lung function	FEV <sub>1</sub> and FVC higher but FEV <sub>1</sub> /FVC lower in Canadian Eskimos than in whites	No
Rossiter and Weill (1974) <sup>17</sup>	UK	C	Lung function	For given height, whites have larger chest volume than blacks of African descent, which accounts for other differences in lung function	No
Samet et al (1980) <sup>18</sup>	USA	VS	COPD	Whites v American Indians v Hispanic; Hispanic males and American Indians of both sexes have low rates	No

**TABLE 1** Summary of studies of COPD and race  
(cont'd)

<u>Source</u>	<u>Country</u>	<u>Study design<sup>a</sup></u>	<u>Endpoint<sup>b</sup></u>	<u>Comparisons made and results</u>	<u>Adjusted for smoking</u>
Samet et al (1982) <sup>19</sup>	USA	C	CBE	Hispanic v non-Hispanic whites; no difference	Yes
Samet et al (1988) <sup>20</sup>	USA	VS	COPD	Whites > Hispanics > Native Americans	No
Seltzer et al (1974) <sup>21</sup>	USA	C	Lung function	Markedly higher in whites than in blacks or orientals	Yes
Trupin et al (2003) <sup>22</sup>	USA	C	COPD	White non-Hispanic v Hispanic v black v other; no difference	No
Turkel and Gergen (1991) <sup>23</sup>	USA	C	CB	Whites > blacks	Yes
Wise (1977) <sup>25</sup>	USA	VS	COPD change 1965-85	Rising more rapidly in African-Americans than in whites	No
<u>Meta-analysis</u>					
Vollmer et al (2000) <sup>24</sup>	USA	C	Lung function	White v black v Hispanic v Asian/Pacific v North American; "Significant racial differences in the effects of smoking were seen only for men, with Asian/Pacific Islanders having smaller smoking-related declines than white men in both models. In summary, this analysis generally failed to support the hypothesis of widespread differences in the effects of cigarette smoking on lung function between gender or racial subgroups."	Yes

a Abbreviations used for study design:

C Cross-sectional

CC Case-control

DC Death Certificate

<sup>b</sup> Abbreviations used for endpoint:

AO Airways obstruction

CB Chronic bronchitis

CBF Chronic bronchitis and emphysema

P Prospective

PM Post-mortem

VS Vital statistics

COPD Chronic obstructive lung disease

EMP Emphysema

OLD Obstructive lung disease