

## Ethnic differences in respiratory disease

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### Summary

Hospital admission statistics from a district general hospital for patients aged 30-59 years over a 6-year period were analysed. There were 40 034 admissions excluding obstetrics. The overall distribution by place of birth was 9.2% West Indies, 13.5% Asia and 71.9% Northern Europe. This distribution was compared with the distributions for 4 groups of respiratory diseases. There were highly significant differences between these distributions for each diagnostic category. Asthma and respiratory tuberculosis were very much more common amongst Asians whilst West Indians suffered very little carcinoma of bronchus or bronchitis. Data collected from a factory screening showed that cigarette smoking could not account for these differences.

### Introduction

The study of differences in common diseases in the 3 main ethnic groups in Britain (whites, black West Indians and Asians) may provide important clues to aetiology which would otherwise only be available from international comparisons. Conclusions from international studies are made more difficult by criteria for diagnoses and different methods of reporting in different countries. The authors have gained the clinical impression from experience in a busy district general hospital that there are important differences in chest diseases in the ethnic groups, and that these cannot be explained by cigarette smoking. They have investigated this hypothesis in 2 ways, one from clinical data and the other from an epidemiological survey.

The authors have examined the frequency of admissions to their hospital for the common chest diseases in the 3 ethnic groups and calculated which diseases occurred with other than the expected frequency. They have also mounted an epidemiological screening survey of cardiovascular risk factors, from which the frequency of cigarette smoking in black, white, and Asian employees in their district was obtained.

### Methods

Hospital admission analysis (HAA) data for the 6 years from 1974 to 1979 were collected. Four diagnostic categories were investigated based on the International Classification of Disease (VIII revision) coding. These were: acute bronchitis, chronic bronchitis and emphysema (465, 466, 490, 491, 492); respiratory tuberculosis (TB) (011, 012); asthma (493); carcinoma of bronchus (162.1).

Ethnic group itself is not included in HAA statistics, place of birth was therefore used as a marker of ethnic group. In this population this is reliable in those aged 25 years or over (S. H. D. Jackson, L. T. Bannan and D. G. Beevers, unpublished observations). Northern Europeans were classified as white, West Indians as black and those from India, Pakistan and Bangladesh as Asians. Analysis was confined to patients aged between 30 and 59 years and was performed by means of the  $\chi^2$  test comparing for each diagnostic category the observed distribution among the ethnic groups with the distribution of total admissions excluding obstetrics.

The second part of the study involved a factory screening survey including 753 black, white and Asian males. This was designed to investigate ethnic differences in cardiovascular risk factors including cigarette smoking. Employees were asked details of their current and past cigarette smoking habits. In addition to noting ethnic group, place of birth was recorded. Those screened represented 83% of the available work force.

### Results

The majority of admissions were classified as white (71.9%) with an excess of Asians (13.5%) over blacks (9.2%) (Table 1). For each diagnostic category there were significant ethnic differences when compared to the distributions of all admissions (Table 2).

For respiratory TB this difference was contributed solely by the markedly increased rate amongst Asians. Similarly with bronchitis the ethnic differences

were contributed by a reduced rate amongst blacks (Table 2). The rates for both asthma and carcinoma of the bronchus were significantly different in all 3 ethnic groups. Asthma was common in both the immigrant groups while carcinoma of bronchus was rare in these groups, particularly so amongst the blacks (1.1/1000 admissions) (Table 2). Among the factory employees screened, the whites were the heaviest smokers (Table 3). Whilst more blacks were smokers than were Asians, those that were smokers smoked similar numbers of cigarettes (Table 3).

TABLE 1. Distribution by ethnic group for all admissions excluding obstetrics

Group	All admissions	(% of total)
Asian	5386	(13.5)
Black	3669	(9.2)
White	28 793	(71.9)
Not known	644	(1.6)
Others	1540	(3.8)
Total	40 034	(100.0)

By comparing place of birth with ethnic group in each age group it was found that above the age of 25 years place of birth gave an accurate reflection of ethnic group. Below this age many Asians and blacks were born in the United Kingdom. Above the age of 59 years, the proportion of the total admissions contributed by immigrants becomes increasingly smaller.

### Discussion

Whilst these data provide neither population morbidity nor actual numbers of patients they are a good reflection of both. The authors' method provides an almost unique tool for the investigation of ethnic differences for 2 reasons. First, the size of the 2 minority groups is large enough to study and,

second, the proportion of admissions coded by place of birth (98.4%) is high enough to provide reliable information and is certainly the highest in the West Midlands Region.

Furthermore, the U.K.-born offspring of immigrants will, as the years pass, give rise to incorrect assumptions of ethnic group based on place of birth.

TABLE 3. Prevalence of smokers in a population of factory workers

	Asian	Black	White
Number	76	113	296
Smokers (%)	40.8	58.2	52.2
Cigarettes/day/smoker (median)	15.0	10.5	20.0

The most marked ethnic difference exposed by this study was the extremely low rate of admission amongst blacks for both carcinoma of bronchus and bronchitis. Asians had a rate for bronchitis similar to whites and for carcinoma of bronchus between blacks and whites. Both these diseases are related to inhaled pollutants yet differences in smoking habits cannot explain the differences between the 2 immigrant populations. Similarly, atmospheric pollution would be expected to be similar in these groups. The higher rates for these diseases seen in the whites may be due to a combination of smoking habits and prolonged exposure to atmospheric pollutants.

Asians appear more susceptible to both respiratory TB and asthma than are either blacks or whites. Whilst the frequency of respiratory TB could be explained by differential exposure to infection or such environmental hypothesis could reasonably explain the difference in rates for asthma.

Finally, it is possible that cultural factors such as tolerance of symptoms or refusal of admission may bias findings based on hospital admission data. However, the authors feel that genuine ethnic differences are present and cannot be adequately explained by environmental factors.

TABLE 2. Distribution of admissions by ethnic group for each diagnosis. Rate (no. per 1000 admissions) is shown in parenthesis

Group	Respiratory TB	Asthma	Carcinoma of bronchus	Bronchitis
Asian	47 (8.7)	183 (34.0)	18 (3.3)	53 (9.8)
Black	6 (1.6)	78 (21.3)	4 (1.1)	12 (3.3)
White	23 (0.8)	278 (9.7)	246 (8.5)	273 (9.5)
$\chi^2$	142.6	202.7	37.9	14.7
<i>P</i>	<0.001	<0.001	<0.001	<0.001