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TUBERCULOSIS IN IMMIGRANTS IN BIRMINGHAM 1970-72

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An analysis of notifications of tuberculosis in the City of Birmingham during the three-year period 1960-62 related to the population data from the Census of 1961 showed important differences between the notification rates of groups defined by their place of birth, and also differences in the age distributions of notification rates between these groups (Springett, 1964). A survey of notifications throughout England and Wales during a three-month period in 1965 (British Tuberculosis Association, 1966) showed similar differences on a national scale; the survey of notifications throughout England and Wales was repeated during a four-month period around the time of the 1971 Census, and these results are being prepared for publication. The object of the present paper is to repeat the 1960-62 analysis of notifications in Birmingham for the period 1970-72 in relation to the results of the Census of 1971.

Sources of Data

Notifications

The collection of information about place of birth of each person newly notified as suffering from tuberculosis has continued without change since the 1960-62 analysis. For those born outside Great Britain (that is, England, Wales, Scotland, and associated small islands) the date of first entry to Great Britain is also recorded. Information on sex, age, and localization of disease is also routinely collected, and tabulations of each of these main items are provided each year in the Report of the Medical Officer of Health for the City. Detailed tabulations are prepared each year giving more information on place of birth and age than is given in the published reports. These more detailed tables for the years 1970, 1971, and 1972 have been used as the source of information on notifications, enabling a mean annual number of notifications for five-year age groups for each sex and each birthplace group to be prepared.

Populations

The Warwickshire County Volume, part 1, of the Census 1971 gives in Table 14 a detailed analysis of places of birth of City residents separately for each sex. The information in this table has been condensed to give the population figures shown in Table I distinguishing Great Britain, Ireland, India, Pakistan, and New Commonwealth Countries in Africa and in America, the latter being in effect the West Indies or the British Caribbean area. The remainder group covers the rest of the world.

Table 14 of the Warwickshire County Volume gives no analysis by age. Table 8 gives an analysis by age in five-year groups for each sex but no information on place of birth. To obtain estimates of the population by age group for each sex and birth-place group use has been made of Table 2 of the advance tables of the 1971 Census, giving information on date of birth for the West Midlands conurbation for a limited number of places of birth. For immigrant groups it has been assumed that the age distribution of the group shown in the West Midlands section of the advance tables is valid for the same group in the City of Birmingham. This assumption must be well founded for those born in Pakistan as 75% of all Pakistan-born individuals in the West Midlands live in the City of Birmingham, as do 64% of those born in the West Indies. For those born in India the proportion is about 40%.

The advance tables give an age distribution for those born in the Irish Republic but no separate information on those born in Northern Ireland. It has been assumed that the age distribution of West Midlands residents born in the Irish Republic gives a reasonable representation of the age distribution for the city residents from all Ireland.

The number of city residents born in Great Britain in each five-year age group for each sex has been obtained by subtracting the sums of the population of other birthplace groups from the known total population for all birth places in each age and sex

TABLE I

CITY OF BIRMINGHAM: MEAN ANNUAL NUMBER OF NOTIFICATIONS 1970-72; 1971 CENSUS POPULATION AND ESTIMATED NOTIFICATION RATE, WITH ESTIMATED NOTIFICATION RATES IN 1961, SEPARATELY FOR EACH SEX AND PLACE OF BIRTH

Place of Birth	Males				Females			
	Mean Annual Notifications 1970-72	1971 Census Population	Notification Rates per 1,000 per Year		Mean Annual Notifications 1970-72	1971 Census Population	Notification Rates per 1,000 per Year	
			1971	1961			1971	1961
Great Britain	116·7	421,125	0·28	0·68	81·0	451,110	0·18	0·39
Ireland	28·3	29,875	0·95	2·1	11·7	26,365	0·44	1·3
West Indies	9·3	13,105	0·71	1·3	5·3	12,255	0·44	1·7
Pakistan	105·0	13,435	7·82	18·2	44·0	4,080	10·78	8·3
India	51·7	10,130	5·10	4·5	64·7	7,755	8·34	4·2
New Commonwealth Africa	10·0	2,770	3·61	2·3	7·3	2,150	3·41	0·5
Rest of world and not stated	13·7	11,175	1·22	2·0	3·3	9,340	0·36	1·1
All	334·7	501,615	0·67	0·99	217·3	513,055	0·42	0·48

group. The alternative method used for immigrant groups of applying the age distribution for the West Midlands conurbation to the city population is regarded as less appropriate for this group because of the age-selective effects of rehousing on estates outside the city. There are differences of up to 10% in some age groups between the results of the two methods, but even 10% variations in the calculated age-specific rates for those born in Great Britain do not seriously affect the main results. This possible 10% variation applies only to age-specific rates for those born in Great Britain and does not apply to the main analysis for all ages by place of birth.

RESULTS

For each of the major birth places Table I shows the tuberculosis notification rate in the City of Birmingham separately for each sex. The mean annual number of notifications and the population from which these rates are calculated are also shown together with the corresponding rates obtained 10 years previously. Figures 1 and 2 are diagrammatic representations of the 1971 results.

For *males* of all birth places the notification rate has declined from 0·99 to 0·67 per 1,000 per year between 1960-62 and 1970-72. Most groups have shown a decline in rate, which is over 50% for those

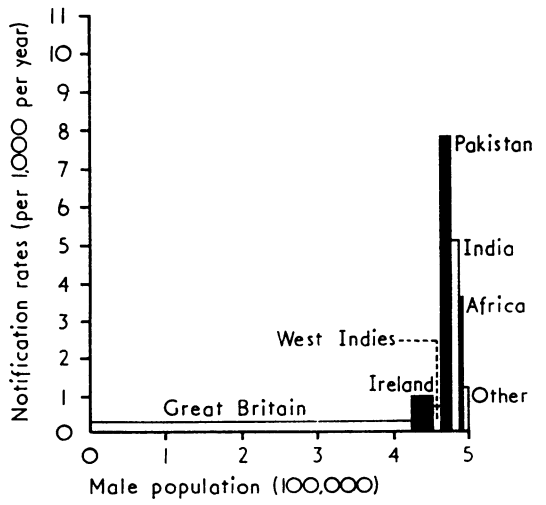

FIG. 1. Tuberculosis notification rates related to place of birth: males in Birmingham 1970-72.

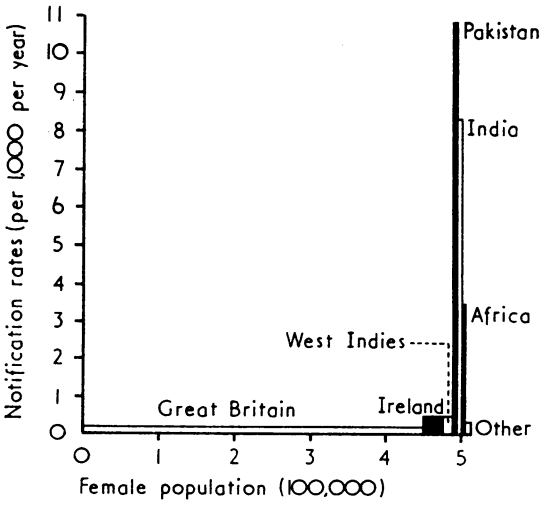

FIG. 2. Tuberculosis notification rates related to place of birth: females in Birmingham 1970-72.

born in Great Britain, Ireland, and Pakistan, and is only a little below 50% for those born in the West Indies. The rate for males born in India has increased by 13% and there is a larger percentage increase in those from the New Commonwealth Countries of Africa, possibly related to the recent migration from those countries of persons of Indian descent. There have, therefore, been only relatively small changes in the ratios of the rates for immigrant groups to that for those born in Great Britain. For those born in Ireland and the West Indies the rate remains about three times that of the native-born: for males born in Pakistan the ratio is almost unchanged at 28 times instead of 27 times that of the native-born in 1961. Among the major identifiable groups of males, only those born in India have shown a relative increase in rates, from six to 18 times that of the native-born.

Among *females* of all birth places combined, there has been very little decline in notification rates, from 0·48 to 0·42 per 1,000 per year between 1960-62 and 1970-72. The rates for females born in Great Britain, Ireland, and the West Indies all show declines of at least 50%, while for women born in Pakistan there has been an increase of 30%, and for those born in India the rate has almost doubled in the 10-year period. The effect of these increases in rate on the overall rate is enhanced by the fact that there has been a considerable immigration of these groups of women during the 1960s. Relative to the notification rate of females born in Great Britain, the rate for Irish and West Indian groups at 2·4 times shows some decline, but the Pakistan-born females now show a rate 60 times that for native-born females, and for Indian-born females the rate is 46 times that of those born in Great Britain. These high rates cannot be accounted for by small numbers as the numbers of notifications on which the rates are based are substantial, and for both Pakistan and India the number of cases is over half that for the native-born group.

Age Distribution of Notification Rates

Table II shows for males and females the age distribution of notification rates for the five major birthplace groups. The rates for the native-born groups have the usual features of the highest rate (0·44) occurring in older males, with rates for young adults of both sexes and for older females at lower levels, between 0·1 and 0·2 per 1,000. The rates for those born in Ireland show much the same features at a slightly higher level, and there is no clearcut pattern for those from the West Indies whose rates do not rise above 1·1 per 1,000 at any age in either sex.

The age distributions of notification rates for males and females born in India and Pakistan are quite different. The main feature is, of course, that they are at a much higher level. The majority of these immigrant groups are aged between 15 and 55, and for both groups of females and for males from India there is little variation in the rates within this age band. The widely differing rates under age 15 and over age 55 years may well be due to the small numbers at risk in these age groups. The rate for males aged 15-24 years born in Pakistan is, however, considerably higher than for older males from Pakistan.

There is at present no information from the Census data concerning length of stay in this country, and it is therefore not possible at present to undertake analyses of notification rates related to duration of stay in this country prior to notification.

Table II

CITY OF BIRMINGHAM 1970-72: ANNUAL TUBERCULOSIS NOTIFICATION RATES PER 1,000 FOR AGE-GROUPS OF EACH SEX FOR SELECTED PLACES OF BIRTH

	Age-Group	Place of Birth				
		Great Britain	Ireland	West Indies	India	Pakistan
Males ..	0-14	0·29	(0·0)	(0·5)	2·6	5·8
	15-24	0·14	(0·4)	(0·0)	5·3	12·8
	25-34	0·20	0·6	(0·9)	6·4	7·7
	35-44	0·22	1·0	(0·8)	3·4	6·5
	45-54	0·34	1·3	(1·1)	6·6	6·3
	55-64	0·34	1·3	(0·5)	7·1	(6·0)
	65 and over	0·44				
Females ..	0-14	0·29	(0·6)	(0·0)	4·6	7·0
	15-24	0·15	(0·8)	(0·4)	8·4	11·0
	25-34	0·17	(0·4)	(0·7)	8·1	13·1
	35-44	0·19	(0·4)	(0·4)	9·0	14·5
	45-54	0·14	(0·2)	(0·3)	10·8	(2·0)
	55-64	0·10	(0·5)	(0·7)	15·7	(6·5)
	65 and over	0·12				

( ) Rates based on less than 10 cases in the three-year period 1970-72

Localization of Tuberculosis

The now well-established fact of the much higher proportion of non-respiratory forms of tuberculosis in Asian immigrants is confirmed in these figures. For Indian and Pakistan groups, the proportions with non-respiratory tuberculosis are 39·5% and 36·2% respectively compared with 11·6% for those born in Great Britain. Many of these non-respiratory cases are tuberculosis of lymph glands but there is also a number of unusual forms and presentations of tuberculosis which are now rare in the population of western Europe.

Discussion

The main results of this analysis confirm previous reports rather than add anything new. However, certain aspects of the results justify further consideration to see if any modification or extension of existing measures for control of tuberculosis in the community are required.

The greatest differences in tuberculosis notification rates are now shown between groups defined by their place of birth, and these differences are much larger than the differences between age and sex groups. Birthplace groups can be divided into three main categories according to the level of their notification rates. The lowest rates are shown by the numerically largest group who were born in Great Britain. Next come two groups who have rates greater by a factor of about three times, namely those born in Ireland and the British Caribbean area. The highest rates are shown by those born in India and Pakistan, with rates about 30 times that for those born in Great Britain and about 10 times the rates for immigrants from Ireland and the British Caribbean area.

The information available does not give any certain reasons for these large differences. The fact that some immigrant groups, including one group (West Indian) who have come to this country mainly in the last 15 years, have notification rates only moderately above those of the native-born groups suggests that the very much higher rates in the other groups of recent immigrants are not due to the circumstances of life and work experienced after immigration. This view is supported by the fact that both Ireland and the West Indies can be regarded as areas of low prevalence of tuberculosis whereas it is known that the prevalence is high in India and Pakistan. Some further indication of the importance or otherwise of the prevalence of tuberculosis in the countries of origin should be given by notification rates for immigrant groups related to duration of time since entry. If exposure to tuberculosis before migration is an important factor in determining tuberculosis experience after migration, then it would be reasonable to expect that notification rates would be at their highest shortly after arrival and would decline with length of stay in this country.

With regard to control measures, the present policy in Birmingham and the United Kingdom generally of prompt and effective treatment for all patients as soon as possible after diagnosis, coupled with contact examinations and BCG vaccination for schoolchildren, appears to be reducing tuberculosis notification rates by more than 50% in a 10-year period for those born in this country or moving here from low prevalence areas; this is equivalent to an annual rate of decline of about 7%. While a more rapid decline in tuberculosis would be welcome, there is no obvious method of accelerating this decline.

The groups from high prevalence countries do not in general share in this decline in rate. It is already the policy in Birmingham to *x*-ray as many as possible of these groups soon after arrival if they have not been *x*-rayed at the port of entry. Children of school age are tuberculin tested and vaccinated if negative or *x*-rayed if positive. Children born into Asian households are offered BCG vaccination soon after birth. Clearly, these additional measures need to be continued and intensified for this group of immigrants, and all doctors need to be aware of the frequency of tuberculosis in this group and the relatively common occurrence of forms of tuberculosis which have become uncommon in those who have always lived here.

Summary

Tuberculosis notification rates by place of birth for each sex have been calculated by relating the mean annual number of notifications in Birmingham during the three years 1970-72 to the 1971 Census population, and the results have been compared with a similar analysis made 10 years previously. For all males the notification rate declined from 0·99 to 0·67 per 1,000 per year during this 10-year period, and for all females there was a decline from 0·48 to 0·42 per 1,000 per year.

The lowest notification rates were for those born in Great Britain, 0·28 per 1,000 per year for males in 1971 and 0·18 for females; for those born in Ireland the rates were 0·95 and 0·44 for males and females respectively, and for those born in the West Indies, 0·71 and 0·44; all these rates have declined by 50% or more in the last 10 years and the rates for those from Ireland and the West Indies remain about three times the rate for those born in Great Britain.

The highest rates were recorded in immigrants from Pakistan, 7·8 per 1,000 per year for males, 10·8 per 1,000 per year for females; the rates for immigrants from India were only a little less at 5·1 per 1,000 per year for males and 8·3 for females. The rates for those born in India and females born in Pakistan have increased in the past 10 years, but the rate for males born in Pakistan has declined by more than 50% from its very high level 10 years ago.

The differences between age groups and between sexes for any one birthplace group were very much less than the difference in rates between groups defined by place of birth.

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