

TUBERCULOSIS IN A COMMON LODGING-HOUSE

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In most European countries tuberculosis mortality has been decreasing during the last few decades, but this decrease has not been uniformly experienced by all age and sex groups (Clarke, 1952; Cheeseman, 1952). Generally, old men as a group have benefited least and this contention is supported in some countries by the trends of notification rates (Cheeseman, 1956; Lowe, 1954; Stocks, 1950; Ministry of Health, 1958).

Residents of common lodging-houses in Northern Ireland are mostly old men and their experience of tuberculosis has not been studied with the detail which the apparent vulnerability of this age and sex group would appear to demand. This paper describes a study of the disease in one particular common lodging-house in Belfast and assesses its importance as a focus of infection in the Belfast community.

Laidlaw (1956) reviewed 125 persons in Glasgow suffering from tuberculosis who gave as their place of residence a common lodging-house or a working men's hostel. Of these 34 (27 per cent.) refused to co-operate in any way after diagnosis, and a further 27 (22 per cent.) did not co-operate fully in hospital or out-patient treatment. Tuberculosis was the fourth commonest cause of death amongst lodgers in Glasgow common lodging-houses, accounting for one tenth of all deaths during 1950-53, the average length of survival after diagnosis being 3 years.

In a recent survey of tuberculosis in Glasgow, 860 residents of common lodging-houses were visited and offered examination by mass miniature radiography. Only 193 (22 per cent.) accepted and of these 67 were referred to a chest clinic. Only 56 attended, among whom 22 were found to have significant pulmonary tuberculosis (*i.e.* 26 per 1,000 residents originally visited). Of those admitted to hospital the majority were either prematurely

discharged because of ill-behaviour or left against advice (Geddes, 1959).

MATERIAL

The Northern Ireland Tuberculosis Authority was set up under the Public Health (Tuberculosis) Act (N.I.) 1946. It received all notifications in Northern Ireland until April 1, 1959, when its functions with respect to notification were transferred by the Health Services Act (N.I.) 1958 to the Northern Ireland Hospitals Authority. Notifications made to these Authorities and follow up reports from hospitals and clinics were used in this work.

Notifications include a "state of disease" classification as was suggested for England and Wales by the Ministry of Health (1947), namely:

- Group I —Cases with slight constitutional disturbances;
- Group II —All cases which cannot be placed in Groups I or III;
- Group III —Cases with profound systemic disturbance or constitutional deterioration, and with marked impairment of function, either local or general.

In this work, Groups II and III have been amalgamated for reasons given by Merrett (1959), who suggested that as Group I cases, being symptomless, are detected mainly by mass radiography and the examination of contacts, Groups II and III cases, considered together, would give better estimates of the morbidity rates for comparisons between population sub-groups because mass diagnostic methods were not used to the same extent in all areas, and for all occupational, age, and sex groups. Notifications are also classified by whether or not tubercle bacilli have been found "in any exudate,

excrement, discharge, or tissue" before or within 8 weeks of notification.

The common lodging-house chosen for this study is run by the Belfast Corporation. Built in 1902 and extended in 1933, it is the largest in Belfast, having 369 beds, few of which are ever vacant. The accommodation includes several common sitting rooms, a billiard room, library, and dining room. Food lockers and cooking facilities are provided, but residents have to provide and cook their own food. There are large dormitories which are divided into cubicles by partitions about 6 feet high. Washing and toilet facilities seem adequate, and there is provision for washing and drying clothes.

The lodging house was originally intended for unmarried working men, but over the years the proportion of elderly retired and middle-aged unemployed men has risen. About half the residents are said to be over 65 years of age, though as individuals drift in and out it is impossible to quote a more precise age distribution. The majority are long-term residents, and Sargaïson (1954), in a survey of all common lodging-houses in Belfast, found that only 24 per cent. of the lodgers had been resident for less than 1 year and 50 per cent. for over 5 years.

The lodging-house is situated in the smallest and most densely populated of the fourteen electoral wards in Belfast. Annual tuberculosis notification rates are available for each ward and this particular ward consistently had one of the higher rates over the 10 years of this study. It was against the background of this ward that the disease in the lodging-house was studied.

TUBERCULOSIS IN THE COMMON LODGING-HOUSE

During the 10 years 1950-59, 36 cases of tuberculosis were notified from the lodging-house of which one was non-respiratory. The annual notification rate per 1,000 residents, assuming the lodging-house to have been constantly full, varied from 2.7 in 1955 (one case) to 24.4 in 1952 (nine cases), with a yearly average of 9.8. The average yearly rate for the rest of the ward during the same period was 1.7 per 1,000 males of all ages. While age-specific rates could not be calculated for the lodgers, their rate of 9.8 is very much higher than those for older males in the rest of the ward—2.8 per 1,000 in men aged 40-60 years, and 3.2 per 1,000 in men aged 60 years and over.

Table I classifies 34 of the cases according to the stage of disease at notification and the isolation of tubercle bacilli. No such information was available about two men who died of tuberculosis within one month of admission to an acute general hospital and

TABLE I
CLASSIFICATION OF LODGING-HOUSE CASES COMPARED WITH SURROUNDING AREA

Classification		Lodging House*		Rest of Ward	
		No.	Per cent.	No.	Per cent.
Stage of Disease	Group I ...	5	15	120	47
	Groups II and III	29	85	107	53
Tubercle Bacilli	Not found ...	25	26	105	54
	Found ...	9	74	122	46

* Two cases omitted for whom this information is not available
Stage of disease $\chi^2 = 17.26; P < 0.001$
Bacilli found $\chi^2 = 8.81; 0.01 > P > 0.001$

who were notified after death. Corresponding percentage classification is shown for all persons notified as tuberculous from the rest of the ward during the same period. A significantly higher proportion of cases from the lodging-house (at $P < 0.05$, the criterion used throughout) had advanced disease at the time of notification than of cases of the rest of the ward. The proportion found to be excreting tubercle bacilli was also significantly higher in the lodging-house cases, though classification by this finding is not entirely satisfactory, as the likelihood of finding bacilli varies not only with the stage of the disease but also with the thoroughness of the search.

Table II shows the fate of the 36 cases at the end of 1959. Of the thirteen who were treated in hospital before being discharged as quiescent, one left against medical advice but subsequently returned, and two defaulted as out-patients after discharge. Thirteen men died of tuberculosis in hospital, the average duration of life after notification of the nine notified before death being 25 months. Five died within 1 month of admission to hospital, and one further man refused treatment of any kind when first seen, but was admitted 7 years later and died

TABLE II
FATE AT THE END OF 1959 OF THE LODGING HOUSE CASES NOTIFIED, 1950-59

Fate	Cases Notified	
	No.	Per cent.
Discharged as quiescent ...	13	36
Died of tuberculosis ...	13	36
Out of hospital against medical advice ...	6	17
Lost sight of after diagnosis ...	1	3
In hospital under treatment ...	3	8
Total ...	36	100

within 3 months. Another who died 4 years after notification left hospital twice against medical advice, returning to the lodging-house on both occasions. Three men were receiving treatment in hospital at the end of 1959. Two of them, both open cases, spent several weeks out of hospital, one against medical advice and the other after a disciplinary discharge.

It is clear, therefore, that the cases which occurred in the common lodging-house constituted an especial danger to the other residents because of their usually advanced and open disease at the time of notification and their unwillingness to co-operate with isolation and treatment in hospital.

TUBERCULOSIS OUTSIDE THE COMMON LODGING-HOUSE

To investigate the part played by the lodging-house in the spread of disease in the surrounding community, the spatial pattern of notifications with relation to the lodging-house was examined. The ward was divided into three areas:

- (1) Six streets immediately adjacent to the lodging-house;
- (2) Six streets, not so close, but within 500 yards of the lodging-house;
- (3) The remaining streets of the ward.

In the absence of up-to-date census information in the detail required, the population at risk in these areas was estimated from the electoral roll for the city which lists by address all persons over 21 years of age, except those without a permanent residence. The latter are almost certainly a very small number and there is no reason to suppose that they are not scattered evenly throughout the ward.

Notifications are classified into 5-year age groups, so that only those over 20 years of age, a group

which corresponds most nearly to the available population data, were used in what follows. The distribution of these notifications throughout the three areas in terms of their populations is shown for each sex in Table III. This Table shows that, relative to the population, adult male notifications came significantly more frequently from streets adjacent to the lodging-house than would be expected on the null hypothesis (*i.e.* that only chance differences occurred between the ratios of the three areas), the bulk of this excess coming from six streets nearest to the lodging-house. No such significant differences occurred in the female notifications. While the excess of male notifications from streets near the lodging-house could have been due to a higher proportion of elderly males living in those streets than elsewhere, who would have had a high incidence of tuberculosis in any case, nothing was found in a detailed examination of the ward to suggest that this might be the case; the age distribution of the notifications themselves were very similar in the two areas of the ward for which comparison was possible (Table IV).

TABLE IV

AGE DISTRIBUTION OF MALE NOTIFICATIONS FROM DIFFERENT PARTS OF THE WARD

Age Group (yrs)	20-39	40-59	60+	Total
Adjacent to Lodging-house:				
(i) Nearest six streets	8	9	6	23
(ii) Intermediate six streets				
Rest of Ward	24	37	18	79
Totals	32	46	24	102
				Total $\chi^2 = 0.427$ D.F. = 2 0.9 > P > 0.8

TABLE III

ADULT NOTIFICATIONS FROM THE STREETS NEAR THE LODGING-HOUSE AND THE REST OF THE WARD, 1950-59 BY SEX

Location	Males			Females			
	Electors	Notifications*		Electors	Notifications*		
		Observed	Expected		Observed	Expected	
Adjacent to Lodging-house (i) Nearest six streets ...	214	13	5.58	273	7	6.14	
(ii) Intermediate six streets	275	10	7.18	340	7	7.65	
Rest of Ward	3,419	79	89.24	3,745	84	84.22	
Totals	3,908	102	102.00	4,358	98	98.01	
				Total $\chi^2 = 12.15$ D.F. = 2 0.01 > P > 0.001		Total $\chi^2 = 0.64$ D.F. = 2 0.8 > P > 0.7	

* Distribution of expected notifications based on number of electors.

DISCUSSION

Two factors facilitating the spread of tuberculosis are a lowered resistance of the individual and opportunities for receiving frequent doses of infection. Both of these factors apply to residents of a common lodging-house where many men are undernourished and in poor general condition, and in close social contact (Sargaison, 1954; Laidlaw, 1956).

In the lodging-house studied, the incidence of tuberculosis is shown to have been high, and the proportion of open cases to have been significantly higher than in the outside community. Clearly such a focus of disease must be of great importance in the perpetuation of infection amongst the lodging-house population, and the lack of co-operation of the majority of those notified, such as observed here, adds considerably to the problem (*Lancet*, 1960).

It is difficult to assess the importance of this focus in the dissemination of disease in the community at large. At first sight residents of a common lodging-house would seem to form a community of their own with few points of contact with the outside world. According to the warden of the lodging-house studied, not more than ten or fifteen (less than 5 per cent.) of the residents ever visited homes in the district, and then only rarely.

Therefore other means of spread of the disease between residents and the community need consideration, and local public houses and turf commission agents' premises might well be considered as likely places of contact. It was estimated by the warden that about two-thirds of the lodgers spend part of most evenings in a public house, and a few hours of most afternoons at a betting shop. There are 44 public houses scattered throughout the ward, and as in Northern Ireland most patrons of a public house live locally, the residents from the lodging-house will probably come into contact there more frequently with men from the adjacent streets than from other parts of the ward. While it is not suggested that these are the only places in which the two populations meet, they would both appear to have conditions particularly favourable to the spread of disease, contacts there being usually relatively close and prolonged.

The finding of an excess only in adult male notifications in the streets adjacent to the lodging-house would suggest that the disease had been spread amongst men, possibly in a place where women

were absent. The public houses and betting shops would fit these criteria as women rarely visit either.

SUMMARY

The common lodging-house examined would appear to be an important reservoir of tuberculosis. The high incidence of open tuberculosis and the uncooperative behaviour of those lodgers who were found to have the disease are problems of particular importance in considering spread to other residents. However, it is unlikely that spread occurs only within the lodging-house, as, like most common lodging-houses, it is situated in a densely populated area. This work suggests that spread to the surrounding area does, in fact, occur, though it would seem mainly to involve other males. It is suggested, therefore, that spread occurs in places where males predominate and the public houses and betting shops of the area are considered to be the most likely places.

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