

TUBERCULOSIS: A SOCIAL SURVEY.

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Historical. Tuberculosis is essentially a disease of civilization, which dates back to the earliest days of history. Tuberculous lesions have been found in ancient Egypt, in Mummies from the time of Rameses I and II, about 2,000 years before Christ, but whether the Egyptians recognised it or not, is not known.

The earliest published descriptions of tuberculosis are those of the Greek Hippocrates in his *Epidemics*, in which he reports 42 cases of Consumption, 25 of which ended in death (a death rate of 59.5%).

In the first century before Christ, Aretaeus, a Greek physician of a Roman province in Asia Minor, describes the symptoms of tuberculosis in great detail. He refers to the bony fingers, the sharp and slender nose, the prominent Adams apple and the narrow chest. Even at this stage it is recognised that phthisis is more common in those of asthenic or linear diathesis—a factor still held, though never actually proved to my knowledge.

Galen, about the year 175 A.D. knew that phthisis was infectious, saying “It is a matter of experience that those who sleep in the same bed with Consumptives fall into consumption, also those who live long with them, eat or drink with them, or wear their clothes and linen.” See how he interprets his observation. He recognises the infective nature of the disease, while to-day many incorrectly think that it is hereditary.

On 24th March, 1882, Robert Koch announced to the Physiological Society of Berlin, that he had discovered the tubercle bacillus, the cause of tuberculosis.

Thus we see five great historical facts about the disease, (i) its antiquity, (ii) its recognition as a separate disease, (iii) its relation to type or diathesis, (iv) its infectivity and social danger and finally (v) the discovery of the cause.

It is the social aspect or environment of the disease, which concerns us in this paper.

The Investigation.—Information was collected from various sources, to represent as far as possible an accurate cross-section of the community.

(i) Data from a random group of 640 persons attending Dublin Corporation Tuberculosis Dispensary at Charles Street in 1942.

(ii) Data from Domiciliary forms, concerning approximately 2,000 persons, recommended for admission from Dublin City to Sanatoria, during a period of ten years.

(iii) Information from death certificates of all persons dying of tuberculosis in the City of Dublin, during a period of 5 years. (1940-1944).

(iv) The results of a social inquiry on all persons, who died of tuberculosis in Dublin, during the year 1944.

(v) A control group of 1,000 social inquiries in persons attending The National Maternity Hospital, Holles Street.

Incidence and Trend. Since the disease is not notifiable, the exact number of cases in the community is not known. Vines states that 10-20% of an urban population are actively infected with tubercle bacilli, though the conditions may be clinically latent. Using this figure we estimate that 40,000 to 80,000 persons in Dublin, are infected and that approximately 800 die every year—a mortality of 0.5 to 1.0%. Yet Cecil says that infection is common, but that less than 10% of those infected die of the disease. From tuberculin surveys, we know that about 95% of urban populations are infected at some time or other.

In 1942 there were approximately 1,600 new cases of active tuberculosis, among patients attending the Dublin Corporation tuberculosis dispensaries at Charles Street and the Meath Hospital, but how many other cases were there in the city attending hospitals and private doctors? The following investigation was carried out to discover the total number of cases.

A random selection of 610 names of persons, who died of pulmonary tuberculosis, were traced to the records of these dispensaries. It was found that 295 had attended Charles Street and 73 the Meath Hospital dispensary. The total (368) was 60.3% of the deaths examined. We assume that the dispensaries deal with 60% of the cases of tuberculosis in the city (1,600), while other bodies deal with the remaining 40% (i.e., 1,066), making a grand total of almost 2,700 new cases of tuberculosis in Dublin each year, with a mortality of 30.7% (800 out of 2,700).

Hence we may say that 40,000 to 80,000 persons in Dublin are actively infected, that 2,700 are sufficiently affected clinically as to need treatment, while about 800 die per annum.

The mortality from tuberculosis has been steadily falling since 1901 (Geary 1930), apart from intermissions caused by war. A similar intermission occurred during the recent war.

The percentage decrease per annum in the Dublin T.D.R. has been 1.3% compared with an average decrease of 4.4% for 10 Capital Cities of Europe (Dillon 1943). That is, the decline has been less rapid than in other Countries.

Deficit In Certification. Most of the calculations concerning incidence and trend of tuberculosis are based on the Registrar General's returns and collected from the data on death certificates. The question arises: is the information correct, are all the tuberculosis deaths recorded as such and conversely are all the certified tuberculous deaths really due to tuberculosis?

There seems little reason to suspect that other conditions should be certified as tuberculous. The disease is a long one and it occurs at an age, when few similar diseases occur. In view of the duration of the disease there is every chance of bacteriological and X-ray investigation being carried out. This is more likely to be overlooked in the more acute forms, such as we find in childhood and in meningitis.

On the other hand, there seems to be many reasons why a tuberculous condition might not be certified. The history may be concealed and if the patient's own doctor is not called in, another doctor may simply see a wasted patient, dying of terminal pneumonia or an incidental influenza and certify death, as due to that cause. Significant symptoms such as night sweats, hæmoptysis, chronic cough, loss of weight, or family history may be denied in an effort to avert a diagnosis, which might be a "slur on the family."

Another factor to be considered, is that relatives frequently approach

a doctor and ask him to say nothing about tuberculosis on the death certificate. This has been asked of the author, and the reason given was that the patient had taken out an insurance policy with a small company, which accepted him without a medical examination, the patient making a statement that he is free from disease. Should death occur within a certain time, the company may allege, that the patient already had the disease at the time of signing the statement and concealed the fact, making the policy invalid.

In the Meath Hospital branch of the Dublin Corporation tuberculosis dispensary, the cards of patients who die, are filed separately. These are all known cases of tuberculosis and death is reported by the nurses, who visit the patients in their homes. A random selection of 392 of these cases was made and their names traced to the records of the Registrar General. It was found that 315 (or 80.4%) of these were certified as having died of tuberculosis, while the remaining 19.6% were certified as having died of other conditions. It must be admitted that tuberculous patients, are also exposed to the risk of dying from other conditions, to which the rest of the population is exposed. Yet almost all of the cases, thus traced, were certified as having died of a respiratory disease (bronchitis, broncho-pneumonia, pertussis) or myocardial failure—either of which might have been actually caused by tuberculosis.

These figures suggest that even if we know the death rate from tuberculosis, we must add 25% to the estimated result, if we base our calculations on death certificate figures. Thus the figure (mentioned earlier) of 2,700 persons sufficiently affected clinically as to need treatment, should be increased to 3,375, while the mortality in Dublin would be about 950 per annum.

Dillon (1944) in a paper to this Society, gave 195 as the number of new cases per 100 deaths in Eire and 214 per 100 deaths in Dublin; though he suggests that mass radiography has revealed a large number of active cases in addition to those already known—about another 10%. Hence the figure of 235 is reached, and this again must be increased by the 20% due to deficit in certification, making an estimate of about 280 new cases per 100 recorded deaths in Dublin.

Type of Disease. The pulmonary form of the disease is by far the commonest, 10% of all patients attending the Corporation dispensary are non-pulmonary cases, but this is not a true estimate. Many are treated in hospitals or in their own homes and do not pass through Charles Street.

Out of 4,090 deaths from tuberculosis in Dublin in 5 years, 529 were due to non-pulmonary conditions, i.e., 12.8% of all deaths from tuberculosis. This includes 87 cases of miliary tuberculosis and 236 cases of tuberculous meningitis, many of which cases were also pulmonary.

Pulmonary is therefore the commonest cause of death. Meningitis is the next common. It is certainly the commonest cause of death in children. Its death rate is known to be 100%.

Season. Cecil states that climate is of little importance in the aetiology of tuberculosis, though elsewhere he states that meteorological conditions have an influence and help to explain the trend to activation in late winter and spring.

The seasonal distribution of deaths from the disease is presented in quarter years. The quarters January-March; April-June; July-September; and October-December do not conform with the accepted seasons, but it will be noticed that the highest death rate occurs in the

first quarter. Intercurrent disease (bronchitis, pneumonia, influenza, etc.) plays havoc with patients weakened by long illness and probably accounts for the high rate in the first quarter.

Total Deaths in the Combined Quarters of 1940-1944.

First Quarter	...	...	...	1207=29.0% of total.
Second	..	...	...	1194=28.5% ..
Third	..	...	...	892=21.4% ..
Fourth	..	...	...	858=20.6% ..

It will be noticed that the second highest rate occurs in the second quarter, which corresponds to spring rather than the early winter quarter (Oct.-Dec.)

These figures however, relate to the time of death and are probably not as important as the time of infection. The latter is difficult to estimate, since the disease is of insidious onset and the patient is unaware of it for some time.

Death certificates provide space for recording the duration of illness. This information is not always available and then often not very accurate, particularly where the illness has been prolonged.

Using the date of death and taking all cases of less than two years duration as being reasonably accurate, the actual month of onset of clinical diseases was calculated and the results are tabulated below.

Estimated Month of Onset of Disease.

Month	Pulmonary	Non-Pulmonary	Total
January	63	21	84
February	63	6	69
March	60	25	85
April	56	20	76
May	59	20	79
June	78	9	87
July	65	9	74
August	63	9	72
September	38	9	47
October	52	10	62
November	59	11	70
December	62	13	75

Although there appears to be a tendency for most disease to begin in winter and spring, the figures do not appear to be sufficiently significant to justify any definite conclusions.

Occupation. It was hoped to estimate the mortality from tuberculosis in different occupational groups, but several factors made this investigation of doubtful value.

The first difficulty was to obtain a satisfactory classification. Geary used a modified form of the Registrar General's Classification, in which the occupations are divided into four groups (plus a fifth for work-house inmates), subdivided into a total of 17 sub-sections.

The second was to estimate the correct status of a patient from his occupation, which was often described by one word. A "Clerk" may mean any member of a very extensive group of persons. "Civil Servant" may describe a writing assistant or a secretary of a Department. Domestic servants are number 15 on the list, yet many of them enjoy the same conditions as their employers. They have a room

to themselves (often the only members of the household to have a bedroom of their own), and eat the same food.

The next difficulty is that occupation only applies to adult males and some females. Children, wives, students cannot be classified.

The final difficulty was to discover the actual number of persons in the group, i.e., those exposed to the risk of the disease. It would be useless to say that there was a greater number of deaths among printers than among bishops, unless we know the number of bishops and printers in the country. This information could be obtained from the census, but it is given in such detail that it would be an investigation in itself to work out a standard.

Information concerning occupation, although collected, is not presented, since it is not considered to be of sufficient value, under the circumstances.

Race. When tuberculosis first attacks a community, infection is widespread, resistance is low and there is a high mortality after a rapid course. In the second phase, the disease is chiefly concentrated in the most susceptible group—the young adult group. Others have gained some immunity and the disease is more chronic than in the first phase. In the third phase, the disease is found in the older persons, it is more chronic and there is increasing resistance in the younger adults.

The Jews, being an ancient civilisation, have passed into the third phase and have an unusual degree of resistance to the disease. On the other hand, the Irish are a younger race and are particularly susceptible to the disease, though their resistance is greater than that of a primitive tribe which has never been exposed to it.

Geary, in an excellent paper on the mortality from tuberculosis, read to this Society in 1930, refers to an investigation carried out by Dublin and Baker on the "Mortality of Race Stocks in Pennsylvania and New York, 1910", in which it is shown that "in both States the male phthisis mortality rate (of Irish Immigrants) was $3\frac{1}{2}$ times as great as among the native-born and more than twice as high as for any other race stock on the list".

Age. Age is probably the greatest factor in the aetiology of tuberculosis. Primary infection and bone disease are most common under the age of 15 years, while the true adult or tertiary type of pulmonary disease is most prevalent in the 5-25 years age group.

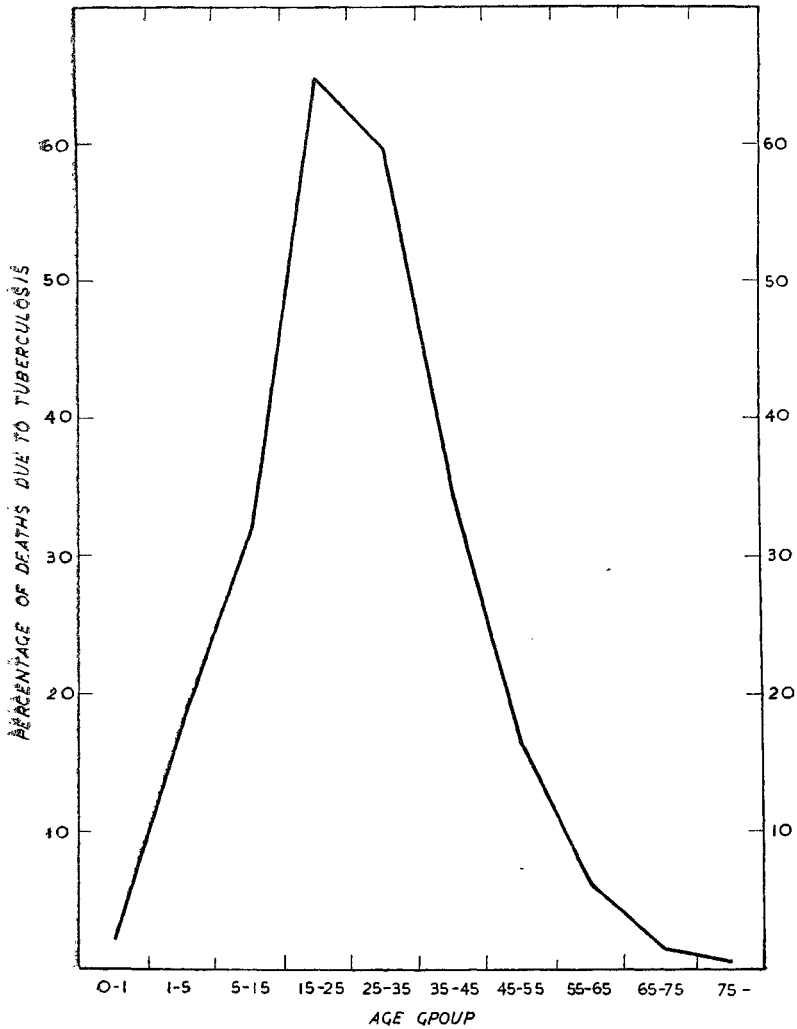
Table I gives the actual number of deaths in each of the age groups. It shows that there is a steady rise in the number of deaths in each group up to the 15-25 group, and then a falling off as age increases. So, too, we see that the percentage of the total deaths from tuberculosis in Dublin gives a similar group. Likewise, the deaths from tuberculosis expressed as a percentage of the total deaths, rises from 2.21 per cent. in infancy to 65 per cent. in the 15-25 group and thereafter fall away, until only 0.59 per cent. of the total deaths over the age of 75 are seen to be due to tuberculosis.

The age groups are not really comparable, however. The first group is 1 year, the second is 5, and all others are 10, except the last, which is limited only by the maximum span of life.

Similarly, the expressing of the tuberculosis deaths as a percentage of the total deaths is misleading unless we are told the number of deaths due to other causes. That 65 per cent. of all deaths in the 15-25 group are due to tuberculosis is due in no small way to the fact that there are very few other causes of death at this age. Only 300 deaths out of a total of over 7,077 occurred in this group.

GRAPH I.

Deaths from Tuberculosis expressed as a percentage of the Total Deaths in each Age Group (Dublin, 1944).



The size of the group is also of importance. In a growing population the younger the group, the greater the number of persons in that group, but in a country with a falling birth rate the older group become relatively larger, provided the other limits of the groups are equal. However, this is not so in several cases. The individuals in the under 1 group are only exposed to the hazard of 1 year, while those of the groups over 5 years are exposed to it for 10 years. Hence these latter groups appear bigger and have correspondingly larger numbers of cases of the hazard. In other words, the distribution of the population into groups depends on the number of persons and the number of years.

TABLE I.

	Under 1	1-5	5-15	15-25	25-35	35-45	45-55	55-65	65-75	75-	TOTAL
DUBLIN :											
Total Deaths in 5 years 1940-44	96	215	243	1,080	897	657	529	315	115	25	4,170
Average	19.2	43.0	48.6	216.0	179.4	131.4	105.8	63.0	23	5	834
Total Deaths all causes, 1944	1,443	254	143	300	290	340	622	1,079	1,438	1,168	7,077
Estimated Population	12,328	36,135	92,670	87,120	66,825	51,975	51,480	45,035	33,165	14,850	495,000
EIRE :											
Total Deaths from T.B., 1944	58	170	234	926	874	625	460	302	161	29	3,839
Total Deaths all causes	5,198	1,286	869	1,552	1,689	1,890	2,966	5,606	11,165	12,907	45,128
CHARLES ST. New Cases (Living). Jan-Jun., 1942	4	32	152	206	117	54	35	18	2	0	626

Table I gives the distribution of the population in Éire and, in the absence of figures for Dublin City, it may be assumed that it is similar to that of Éire. It will be seen that 1.81 per cent. of the population are under 1 year, 7.23 between 1 and 5, and 18.60 between 5 and 15. Thereafter the size of the group falls slowly by about 12 per cent. per decade, until those over 75 years constitute only 2.96 of the population. These difficulties can be overcome by estimating a rate per 1,000 of the population living in each age group (Table III). This shows that the highest rate of deaths from tuberculosis is in infancy 2.69 per 1,000 population (Table III). In childhood this rate falls to 0.49 in the 5-15 group and rises rapidly to a second peak in the 25-35 group and then falls away again. This is the most accurate estimate of the distribution of the disease. It shows that there is a high mortality in infancy and again in young adult life.

The population of Dublin constitutes 16.6 per cent. of the total population of Éire, yet 21 per cent. of the deaths from tuberculosis.

TABLE II.

Distribution of Tuberculous Deaths, as percentage of Total.

(Average 1940-1944).

Under 1 year	1-5 years	5-15 years	15-25 years	25-35 years	35-45 years	45-55 years	55-65 years	65-75 years	75- years
2.30	5.15	5.82	25.89	21.51	15.75	12.68	7.55	2.75	0.59

occur in the city, which is consistent with the usual finding, that the disease is more prevalent in urban areas.

Expressing the deaths in Dublin in each age group as a percentage of the total deaths in Éire, we find that the figures vary between 18 per cent. and 28 per cent., except in the case of infancy, in which it is 55 per cent., and in the 65-75 age group, in which it is only 13.6 per cent. Speculation on the high infant death rate from the disease suggests that

- (I) there is a greater danger of infection in the city, or
- (II) the disease can be more accurately diagnosed in infants in the city, due to better hospital facilities,
- (III) the rate for the year under examination (1944) was abnormally high in infancy. However, the average for 5 years (19.0) is 32 per cent. of the Éire rate of 1944 (Table III).

TABLE III.

Death Rate from Tuberculosis.

Per 1000 Population (1944).

Under 1 year	1-5 years	5-15 years	15-25 years	25-35 years	35-45 years	45-55 years	55-65 years	65-75 years	75- years
2.69	1.32	0.49	2.23	2.58	2.23	2.00	1.50	0.66	0.47

To summarize the value of the classification by age groups: We see that tuberculosis is most common in Dublin in the 15-25 year age group (25.89 per cent. of the total). This shows that we are still in the second phase of tuberculosis as a disease of the community. It constitutes the commonest cause of death in the age groups 15-35 years. It causes 65 per cent. of all deaths in the 15-25 year group.

Finally, the distribution of the ages of the living cases attending the Corporation tuberculosis dispensary at Charles Street in 1942 (January-June) is added for comparison. Very few infants attended and there were no new cases over 75 years. The cases mostly consisted of children 5-15 (cases of primary tuberculosis) 24.5 per cent., and young adults 15-25 years, 33.2 per cent.

Sex. Sex has little influence on the incidence of tuberculosis. Of the 1,902 cases on the domiciliary forms, i.e., recommended for admission to Sanatoria, the males numbered 965 and the females 937; i.e., the incidence is almost equal.

If these are divided into pulmonary and non-pulmonary (mostly surgical cases), we find that the surgical show a significant preponderance of females (170) against males (119), while the pulmonary group are almost equal (846 males against 767 females).

The new cases attending Charles Street consisted of 326 males and 294 females.

The sex distribution of all deaths from the disease in 1940 to 1944 was 2,204 males against 1,967 females.

In each of these groups (except the surgical) there appears to be a very slight though persistent preponderance of males, while the surgical cases show a 2·1 ratio between females and males.

Marital Condition. According to information received from the domiciliary forms, 35 per cent. of all cases were married, 62 per cent. single, 2 per cent. widowed (and 1 per cent. not stated). The surgical group showed a higher incidence of single, 75 per cent., against 24 per cent. married and 4 per cent. widowed—probably due to the greater number of younger patients in the group. The pulmonary groups had 37·5 per cent. married, 59·8 per cent. single and 1·7 per cent. widowed, while there was no information in the remaining 0·6 per cent.

The Statistical Abstract provides information as to the number of married, single and widowed males and females. Using these figures, it is found that 28·37 per cent. of the total population are married, 65·5 per cent. single and 6·16 per cent. widowed.

The male tuberculous deaths are divided as follows :—19·3 per cent. married, 30·8 per cent. single and 2·8 per cent. widowed, while the females are 12·1 per cent. married 32·5 per cent. single and 2·5 per cent. widowed. The table shows the comparison between the age groups of the tuberculous and non-tuberculous. It will be seen that in those age groups in which there is a high tuberculous mortality there is a greater proportion of tuberculous persons in each of the groups, roughly twice the percentage in the corresponding group of the total population, i.e., in all classes the figure is higher for the tuberculous in the 15 to 45 age groups and lower in all other age groups. The same observation applies to the (single) infants under 1 year.

Apart from this observation, which is due to the age distribution of tuberculosis, marital condition appears to have little effect on the incidence of the disease and conversely tuberculosis does not appear to influence the incidence of marriage.

TABLE IV.

Comparison between Marital Conditions of Total Pop., and that of Total Tuberculous Cases dying in 1940-1944, by ages and expressed in percentages of the Totals.

MALES		0-1	1-5	5-15	15-25	25-35	35-45	45-55	55-65	65-75	75-
Married	Pop.	0	0	0	0·14	1·85	3·24	3·23	2·73	2·02	0·62
	T B	0	0	0	·45	3·35	5·08	5·60	3·48	0·72	0·01
Single	Pop.	0·91	3·78	9·15	8·50	5·37	2·72	1·72	1·35	0·99	0·30
	T.B.	1·27	2·65	2·47	10·08	6·52	2·92	2·77	1·45	0·55	0·02
Widowed	Pop.	0·0	0·0	0·0	0·0	0·03	0·10	0·22	0·40	0·68	0·51
	T.B.	0·0	0·0	0·0	0·02	0·20	0·35	0·77	0·92	0·55	0·05
FEMALES :											
Married	Pop.	0·0	0·0	0·0	0·52	3·16	3·88	3·14	2·25	1·28	0·31
	Tub.	0·0	0·0	0·0	1·77	3·02	4·00	2·22	0·80	·22	0·50
Single	Pop.	0·88	3·65	8·87	7·92	3·88	1·92	1·28	1·05	·85	·37
	Tub.	1·12	2·05	3·12	13·55	7·27	2·77	1·07	0·77	·40	·17
Widowed	Pop.	0·00	0·0	0·0	0·0	0·05	0·24	0·54	1·00	1·39	1·00
	Tub.	0·0	0·0	0·0	0·0	0·37	0·50	0·80	0·30	0·35	0·17

Place in Household. The status of the patient in his household is of considerable importance. If the principal wage earner is affected, the whole family will be deprived of the means of existence and, as is frequently found, may try to manage on National Health Insurance of 15/- per week (reduced to 7/6 after six months). The lack of adequate nutrition, associated with the presence of an infected adult in the house, is probably the biggest factor in the spread of the disease. It is not uncommon to see two or even three deaths among children, from tuberculous meningitis in a single family, while a known tuberculous adult is awaiting sanatorium treatment.

In the survey, in which 382 completed forms were returned, 72 (19.0 per cent.) of the cases were described as the father, husband or principal wage earner, while the mother or wife was affected in 12.7 per cent. of cases. Other dependents were 68 per cent. of the cases. They included children, relatives and single persons.

TABLE V.

	Occupied	Dependent
Father (or Husband)	72	—
Mother (or Wife)	—	48
Son	42	36
Daughter	52	65
Relative	6	2
Lodgers	13	—
Adult Families	14	1
Domestic Servants	6	—
Other Employees	3	—
Inmates in Institutes	—	11
Religious in Institutes (Male)	3	—
Religious in Institutes (Female)	4	—
Army, Gardai in Institutes	4	—
	219	163

The dependents (other than wives) were divided into unoccupied (30.7 per cent.) and occupied (27.2 per cent.), i.e., those earning sufficient to contribute to the family exchequer or to relieve part of the cost of keeping them.

If the mother is the patient, the family income is not appreciably altered (except for extra expenditure on medicines, etc.), but there is probably a greater danger of children being infected.

The matter of source of infection will be treated further on in this paper.

The domiciliary forms show that 17.7 per cent. of the total 1,902 cases were principal wage earners.

ANTI-TUBERCULOSIS SECTION, IRISH RED CROSS SOCIETY.

SOCIAL INQUIRY.

Confidential.

1. Name :..... 2. Age 3. Sex.....
4. Place in Household : 5. Occupation :
6. Address :
7. Type of Dwelling :
 - (a) Street :..... Number..... District.....
 - (b) House ; Flat over Shop ; Flat ; Tenement?.....
 - (c) Floor in House :..... No. of Rooms.....
 - (d) Number of Rooms in House :
 - (e) Number of Persons in House :
 - (f) Landlord ; Corporation ; Building Society ; Private
 - (g) Where is Water Supply ?.....
 - (h) Where is Lavatory ?
 - (i) Is there a Bath ?.....
 - (j) Where is Fuel Kept ?.....
 - (k) Condition of House—Clean?..... RepairCondemned?.....
8. Examination of Contacts :
 - (a) Number in Family Examined
 - (b) Number Diagnosed as Tuberculous
 - (c) When Examined
 - (d) Where Examined
 - (e) Deaths from Tuberculosis in Family ?.....
 - (f) Are other members with Disease
 - (i) Getting Treatment ?
 - (ii) Where ?
 - (g) Have Patients Separate Sleeping Accommodation ?.....
9.
 - (a) Date of Death of Patient
 - (b) Place of Death :.....
 - (c) Was the Patient receiving Sanatorium Treatment ?.....
 - (d) For How Long ?.....
 - (e) Was Patient Discharged from the Sanatorium ?.....
 - (f) Did Patient Leave for any other reason ?.....
10. Number in Family

(a) At Date of Diagnosis : (Including the Patient)	Under 15	Over 15	Total in Family
	Males	Females	
			
(b) At Present :			

II. INCOME AND EXPENDITURE.*Confidential.***(N.B. Income should not include St. Vincent de Paul or other Charity.)**

INCOME OF PATIENT (per week).	At Date of Diagnosis	During Illness	At Present
Wages or Salary			
Unemployment Insurance ...			
Unemployment Assistance ...			
National Health Insurance ...			
Home Assistance			
Pensions			
Other Sources			
Food Vouchers			
Tuberculosis Nourishment ...			
TOTALS ...			
INCOME OF FAMILY (per week). (Other than Patient).			
Father			
Mother			
Sons			
Daughters			
Lodgers' Contributions			
Others			
Food Vouchers			
Fuel Vouchers			
Family Allowances			
Pensions			
Infant-Aid Milk			
Other Sources,			
TOTALS ...			

EXPENDITURE (per week).						
Rent	...	...	...			
Fuel and Light	...	...	...			
Clothing	...	...	...			
Weekly Payments	...	...	...			
Burial Society	...	...	...			
Insurance	...	...	...			
N.H. and U.I.	...	...	...			
Clothing Clubs	...	...	...			
Interest on Loans	...	...	...			
Other	...	...	...			
TOTALS				...		
INCOME LESS EXPENDITURE				...		
Given to Housekeeper				...		

Signature of Investigator :..... Date :.....

The Survey. Hitherto the investigation has dealt with factors concerning the patient himself and most of the information was derived from death certificates.

In order to obtain data concerning the housing and economic circumstances of the patient, it was decided to carry out a social inquiry. It was necessary to obtain a representative group of the tuberculous population, not confined to any district dispensary or social status. The chosen group were all patients who died of the disease in Dublin during the latest available statistical year 1944.

It was found possible to visit the relatives of 608 patients. The visiting was carried out by Social Science Students at University College, Dublin, under the direction of Mrs. Maguire. It was an arduous and unattractive job and each visit averaged nearly one hour. The results were classified into groups as follows:—

TABLE VI.

Information Supplied	...	...	...	347 cases	(57.7%)
Information Refused	...	...	...	65 "	(10.7%)
Not Traced	...	...	...	131 "	(21.5%)
No Source of Information	...	...	...	25 "	(4.1%)
Institutions (Inmates)	...	...	...	29 "	(4.7%)
Domestics	...	...	...	11 "	(1.3%)
				608	100%

The response was excellent. Almost 60 per cent. of the relatives supplies the requested information, 10.7 refused information and many of these protested against the survey. They resented the fact that the nature of the disease was known to anyone and in several

cases wrote abusive letters to the directors of the survey. Others complained bitterly about details concerning the patients' disease—delay in diagnosis, waiting for sanatorium treatment and other inconveniences.

In 21·5 per cent. of cases the patient was unknown at the stated address or his family had moved to a new address, leaving no information as to their whereabouts. It is remarkable that in these days 21·5 per cent. of the population can disappear. Some of these cases may not have been traced because of wrong or insufficient address.

In 4 per cent. there were no survivors (e.g., the patient may have lived alone), while in the remaining 6 per cent. the information was of little value, because the "house" was an institution or because the patient was a domestic and the address gave no information as to the social status. "Institution" was used to cover (1) inmates in special hospitals or other places (2) religious male; (3) and female; (4) lodging houses, Army, *Gárdaí* in barracks, etc.

The inquiry was divided into certain sections. The first dealt with personal factors, name, address, age, sex, occupation, position in household, which have already been discussed. The second section dealt with the house, the third with the contacts and the fourth with the patient's own disease and treatment.

Finally, the income of the patient and of the whole family and the expenditure on certain details was investigated, with reference to its state before, during and after the illness. The answering of this last section was unsatisfactory and there was little data of value, beyond total income, rent and insurance. These will be discussed later.

The Patient's Dwelling. Much of the information treated in this paper is supplied by the relatives and may not be very accurate. Hence we make our own observations on the social status of the patient, on his environment and on the dangers to which he is exposed. The dwelling or the house of the patient usually reflects these with a considerable degree of accuracy.

Once again, however, we are faced with the problem of showing whether the tuberculous patient is living under conditions similar to or differing from those of the rest of the population. Standards are only available for certain factors, such as house density, hence these will be our most valuable criteria in estimating the effect of economic conditions on the incidence of the disease.

District. There appears to be a high incidence of tuberculosis in certain streets and districts. It is hoped to investigate this later. Dillon (*Studies*, June, 1943), pointed out the remarkably high death rate in Crumlin in 1942 and suggested that it was due to the high proportion of adolescents and young people in this artificial community. Another reason which he overlooks is that tuberculosis in a family is one of the deciding factors in the patient's favour in allotment of Corporation houses. This means that there is a greater number of tuberculous persons introduced into the community and also there must, therefore, be an increased risk of infection. The latter danger, however, is offset by the removal of the danger due to overcrowding.

It has not been found possible to obtain figures giving the population of various districts, e.g., electoral districts, registration, etc. These districts have been altered in the past few years, and so far no official figures for population have been made available.

Type of Dwelling. The table (VIII) shows the type of dwelling occupied by the relatives of the cases in the survey.

TABLE VIII.

Houses	...	...	...	...	232=53.9%	of total.
Flats	...	...	...	...	80=18.5%	"
Tenements	...	...	...	...	90=20.8%	"
Institutions	...	...	...	...	22=5.0%	"
Lodging Houses	...	...	...	...	8=1.8%	"

The flats included 18, which were described as "flats over shops". A further group of 18 are domestic servants, whose status is not related to their type of house. It will be noticed that the number of domestics in this classification is greater than in the previous classification. This variation is due to the answers in the survey form. If all information is complete in the section under consideration, the case is included, although information may not be sufficient to warrant inclusion in other sections.

The Corporation of Dublin was approached with a view to finding out the total number of dwellings in each of these classes, but such information is not available, beyond the fact that there are over 104,000 dwellings in the City.

Rooms. The number of rooms per dwelling is of more interest. If we take the number of rooms as an index of the size of the dwelling, we find that there are more patients from "single-room" dwellings than from any other type.

TABLE IX.

Distribution of Cases according to Number of Rooms expressed as a percentage, and compared with Total Population.

Rooms	1	2	3	4	5	6	7	8	9
Tuberculous Cases	23.7	13.4	15.3	23.1	15.3	3.4	3.4	0.9	1.2
Total Population ...	19	16	18	15	12	8	5	3	3

A table of the number of cases coming from dwellings of different sizes shows a peak in the 1-room dwellings and an almost equal peak in the 4-room dwelling. It also shows the distribution of the population of Dublin County Borough according to similar groups. Here we see that more people live in 1-roomed dwellings than in any other group, but the secondary rise is in the 3-roomed group, as compared with the 4-roomed group in the survey. Is this explained by the fact that Corporation dwellings are mostly 4-roomed?

Forty-eight out of a total of 74 4-roomed dwellings were owned by the Corporation, while only 8 of the same group were privately owned.

Of the survey cases, 36 per cent. lived in 1 or 2 rooms, compared with 34.9 per cent. for the whole population of Dublin City and 16.3 per cent. for the whole of Éire.

The average number of persons per room in the "domicillary form" cases was 1.9 persons per room, compared with 1.09 for the whole of Éire and 1.26 for Dublin City Census, 1936. In the survey, 361 cases came from families, the members of which totalled 1,991 and who occupied 1,220 rooms between them, making a rate of 1.6 persons per room.

These figures show that there is a marked difference between the room density of the tuberculous and that of the total population and confirms the belief that overcrowding is a significant factor in the aetiology of tuberculosis.

Number in Family. Closely related to the number of rooms occupied and the number of persons per room is the size of the family. The larger the family the greater the risk of disease passing to the other members, since there are more persons exposed and ultimately there are more cases per family. Besides this, we must realise that there is usually only one person providing for the family and, since his income remains the same, larger families must be exposed to the dangers of overcrowding and must exist on a proportionately smaller expenditure per head on food.

It was not possible to discover the average size of families in the whole country, but a very rough estimate can be made from the following figures:—There are approximately 1,000,000 married or widowed persons in the community, i.e., 500,000 families, with almost 1,000,000 persons under the age of 20 years, i.e., 2 children per family, or 4 persons per family, including parents.

The survey figures give an average family size as being 5.43 persons (including parents).

The domiciliary forms number 9,079 dependents on 1,902 families—an average of 4.7 persons per family.

The control group taken from the National Maternity Hospital showed that 1,000 random families had 3,798 dependents—almost 3.8 persons per family. These, however, appear to be young families, since the mother was still in the child bearing-age, but this is also the age at which tuberculosis is most common.

It would seem, therefore, that the tuberculous families in two separate investigations average 5.43 and 4.7 persons per family, compared with 3.8 and 4.0 persons per family in two different control series.

Contacts. There was a definite history of known contact with another tuberculous patient in 28 per cent. of all cases attending Charles Street in a period of six months, and in almost all these cases the contact was a relative or member of the patient's family. How often have we heard a new patient say: "But it's not in the family, doctor". This must be true for 72 per cent. of all cases of tuberculosis.

The domiciliary forms reveal a slightly higher incidence of contact, 35.6 per cent. were known to have been in contact with cases, though some of these (5.2 per cent.) were not members of the family.

The incidence of contact between various members of the family is set out below. It is interesting to note that most infection comes from brother and sister. However, it must be borne in mind that one is liable to have several brothers or sisters, but only one father or mother. If we allow for this, we will find that most infection probably comes from fathers and mothers to their children.

It is surprising to see that there appears to be less infection between husbands and wives than between any other group. Also we see that children do not often infect their parents.

Contacts of the survey cases were sought by investigating the whole household in 181 cases and part of the household in 78. None were

examined in 96 cases and 24 were not stated. These figures are a tribute to the work of the Corporation tuberculosis dispensaries.

TABLE X.

Contacts.

Father	75	Uncle	30
Mother	64	Aunt	27
Husband	15	Neighbour	17
Wife	16	Relative	14
Son	33	Others	11
Daughter	38		
Brother	117		
Sister	141		
2 or more in family	91		

Total family contacts, 590, and total "outside" contacts, 99.

The source of infection was in the family in 75·2 per cent. of these cases, while 24·8 were from outside. It must be realised that family contacts will always be recognised, while external sources may not be obvious. There must always be a source of infection, whether it be known or not. Therefore, we must say that the family was the source in 590 out of 1,902 cases, i.e., 31 per cent., while in nearly 70 per cent. the infection came from outside the family. It is possible that some members of the family may have been overlooked, though this is becoming less likely, particularly in patients attending Charles Street, since every effort is made to discover contacts.

This section has been included here, because the results of overcrowding due to room density is most clearly reflected in this section.

Price, in a report on a tuberculin survey carried out by the Irish Pædiatric Association, gives a table indicating the source of infection in 38 cases.

The cases were mostly under 5 years and the source was in the parents in over 50 per cent. of the cases—due, no doubt, to the close contact between young children and their parents.

Landlord. One of the questions in the inquiry sought to obtain information concerning the ownership of the dwelling. Apart from institutions and lodging houses, all others were divided into (1) houses; (2) tenements, and (3) flats, each of these groups was classified according to ownership.

The total number of houses occupied by the patient was mentioned earlier in this paper as being 232, but in this section sufficient information was available to classify 153 houses occupied solely by the patient and his family.

TABLE XI.

Owner	Houses	Tenements	Flats
Landlord	26	71	34
Owned by tenant	31	0	2
Corporation	70	7	31
Building Society	19	3	7
Employer	3	1	2
Not stated	5	8	2

The word "landlord" is used to describe any person who owns a dwelling and lets it to others for gain. Such dwellings in all but 4

cases were less than 5-roomed houses. Seventy-one out of a total of 90 tenements were owned by landlords. Thirty-four out of 77 flats were owned by landlords.

It appears that the smaller the dwelling the more likely is it to be owned by a person other than the tenant.

Privately-owned dwellings numbered 31 out of 153 houses. All of them had more than 4 rooms. None of the patients living in tenements owned their premises and only 2 of the flat dwellers owned the property (out of 77 flats).

The Corporation owned one-third of the dwellings of the tuberculous patients in this series—70 out of 153 of the houses, 7 out of 90 tenements and 31 out of 77 flats. The important question which arises is this: Is there a higher incidence of tuberculosis among the class which occupies Corporation dwellings or are tuberculous patients more likely to acquire Corporation houses and flats? Almost all of the Corporation houses were 4-roomed, though a few were 3 and 5-roomed, while most of the Corporation flats were 3-roomed, with a smaller number 2 and 4-roomed.

Building Societies, British Legion and Army dwellings numbered 19 houses (10 being 4-roomed); 3 tenements, and 7 flats (2·5 rooms in each).

Employers or firms for whom the patient worked provided accommodation in 6 cases (3 houses, 1 tenement and 2 flats).

Other Measures of Status of Dwellings. I—Water Supply. There was a supply of water to all houses in the survey. The accompanying table (XII) shows the type of water supply:—

TABLE XII.

	Houses	Tenements	Flats	Total
Laid On	197	7	54	258
In the Landing	0	43	10	53
Outside (in yard, etc.) ...	15	32	11	58
Not Stated	20	7	5	32

It will be noticed that one-third of the patients had to leave their dwelling to obtain the first necessity of life in some public place.

II—Lavatory. The same division was used to estimate the number of cases which had to use sanitary accommodation available to more than his household.

TABLE XIII.

Lavatory	Houses	Tenements	Flats
Inside the dwelling	119	36	57
Outside the dwelling	91	49	18
Not Stated	22	6	5

Almost 40 per cent. of the patients in this survey had sanitary accommodation outside the dwelling.

III—Bath. Whether a bath is a necessity or a luxury is still a matter of discussion. Nevertheless, it is very desirable. 52·8 per cent. of all cases in the survey had not got a bath in the home.

TABLE XIV.

	Houses	Tenements	Flats
Bath	122	1	37
No Bath	90	84	39
Not Stated	20	6	4

It will be noticed that only 1 tenement boasted a bath and that more than 50 per cent. of the flats were without one.

IV—Fuel Storage. Fuel is a necessity and provision must be made for storing it. In many dwelling there is no such place provided and the fuel encroaches on the living accommodation. In these days it is essential to keep the fuel (turf) under cover. The following table shows how often accommodation is provided for fuel without having to have it in the living room:—

TABLE XV.

	Houses	Tenements	Flats
(a) Fuel Kept in the Room ...	19	72	39
(b) Coal House	58	9	27
(c) Outside Shed (under cover)	50	3	2
(d) Outside Shed (open) ...	74	1	6
(e) Not Stated	28	7	6

Floor Level. Where the patient's family did not occupy the whole of the building the floor level was noted.

TABLE XVI.

Floor	Cases
Basement	2
Ground Floor	31
First „	42
Second „	35
Third „	20
Fourth „	35

In 134 cases the patient had to climb stairs to enter or leave his home.

Condition of Premises. Ignorance, unhygienic conditions and lack of sunshine are referred to by Griffith and Mitchell (1942) as pre-disposing causes of tuberculosis of the greatest importance. Cecil, too, refers to ignorance as a big factor.

Without doing intelligence tests on the patients and relatives, it was felt that the way they lived and kept their homes was the most important tangible index of how they ordered their lives. Consequently, the investigators were instructed to assess the general

condition of the premises. The following is a summary of the results:—

TABLE XVII.

Condition of Premises.

	Houses	Tenements	Flats
Clean	176	50	69
Otherwise	25	34	13
Not Stated	26	8	8

Dirty or badly kept premises constituted 11·0 per cent. of the houses, 14·4 per cent of the flats and 38·0 of the tenements, indicating that ignorance, lack of interest and dirt are more common in the poorer classes, but whether these are the results or the causes of poverty is very difficult to decide.

State of Repair. The answers to the questions in the last section were decided on by the condition of the premises in relation to defects that could and should be corrected by the occupier, such as dirtiness or untidiness.

A separate section questioned the structural condition of the home. Leaking roofs, broken floors and woodwork were the main criteria of structural defects. The results were stated as follows:—

TABLE XVIII.

Repair of Premises.

	Houses	Tenements	Flats
Good	143	27	61
Otherwise	19	53	14
Not Stated	65	12	15

Here again the same distribution of defects is seen. The highest proportion is in the tenements and the lowest in the houses. While education would be necessary to decrease the incidence of dirty houses, the law is responsible for taking any action necessary to insure that houses are kept in a fit condition for human habitation.

Twelve premises were said to have been condemned. Nine were tenements, 1 was a flat and 2 were houses.

Valuation. The valuation of a premises is defined as the amount that might be derived from them, if let at a reasonable rent (excluding rates, etc.).

It is felt that the valuation of a dwelling should give a true index of the occupier's economic status. Where there are a number of occupants, the valuation divided by the number of occupants might be used.

TABLE XIX.

Valuation of Patients' Houses.

	Valuation in Pounds												over 60
	0-5	5- 10	10- 15	15- 20	20- 25	25- 30	30- 35	35- 40	40- 45	45- 50	50- 55	55- 60	
Families per House ..													
One	11	90	27	9	8	6	2	1	0	0	0	0	0
Two or More	3	5	19	22	24	14	12	5	6	1	7	3	20
TOTAL ..	14	95	46	31	32	20	14	6	6	1	7	3	20

Difficulties were as follows :—

I—A family might occupy only part of the house—hence it would be necessary to divide the total valuation by the total number of occupants—and this would only be of value if the occupants were evenly distributed throughout the house.

II—There is no classified list giving the number of houses of each value, i.e., a standard is needed.

III—Shops and business premises may be responsible for most of the valuation, and since many families may live in part of such premises, it is difficult to assess the true value of their holdings.

There are approximately 104,000 houses in Dublin County Borough and the total valuation is £2,818,555, i.e., an average of £27·1 per house. The population in 1943 was 618,997, making an average valuation of £4·5 per person. (Stat. Abstract, 1945.)

Sleeping Accommodation. Overcrowding is reflected to some degree in the provision of sleeping accommodation. Sleeping with a tuberculous patient is one of the easiest ways of becoming infected. Hence it is necessary to ensure that the patient has his own separate bed and, if possible, his own bedroom.

The following distribution of sleeping accommodation was observed in 1,959 cases—mostly taken from the domiciliary forms—with the addition of a number from the survey :—

TABLE XX.

Sleeping Accommodation.

	Married	Single	Widowed	Total
Had Separate Bed ...	181	769	21	971
Had Not Separate Bed	580	398	10	988

More than half the cases slept in beds occupied by at least one other person, who must have acquired some infection. These included 400 single or widowed persons who, through poverty, were unable to provide separate beds.

Rent. The final and most accurate index of housing standard is:

the rent. It may be expressed as actual rent, as rent per person and as a percentage of the family income. All three methods are important and are shown in the accompanying tables.

TABLE XXI.

Rent in Shillings.

Shillings	...	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Cases	...	84	128	85	20	4	4	6	1

TABLE XXII.

Rent per Person in Shillings.

Shillings	...	1	2	3	4	5	6	7	8	9	10	11	12	over 12
Cases	...	59	133	66	25	11	5	8	2	3	1	3	0	3

It has already been stated that one-third of all those in the survey lived in Corporation property. In this class the rent paid by the tenant is not the economic rent. The Report on the Inquiry into the Housing of the Working Classes in Dublin showed that the Corporation flat dweller is charged about one-third of the economic rent, the rest being borne by a State subsidy and by the rates. The occupant of a 4-roomed cottage is charged about two-thirds of the full economic rent.

These figures must be remembered when considering the rents.

The average rent paid by families in the survey was 9·80 shillings per week, compared with an average of 9·5 shilling per week in the control group attending the National Maternity Hospital. The average rent per person per week was 1·79 shillings, compared with 2·5 shillings in the control group.

These figures show that there is some agreement, though not in the rent per person, because the National Maternity Hospital families were young families and were therefore smaller than the tuberculosis families.

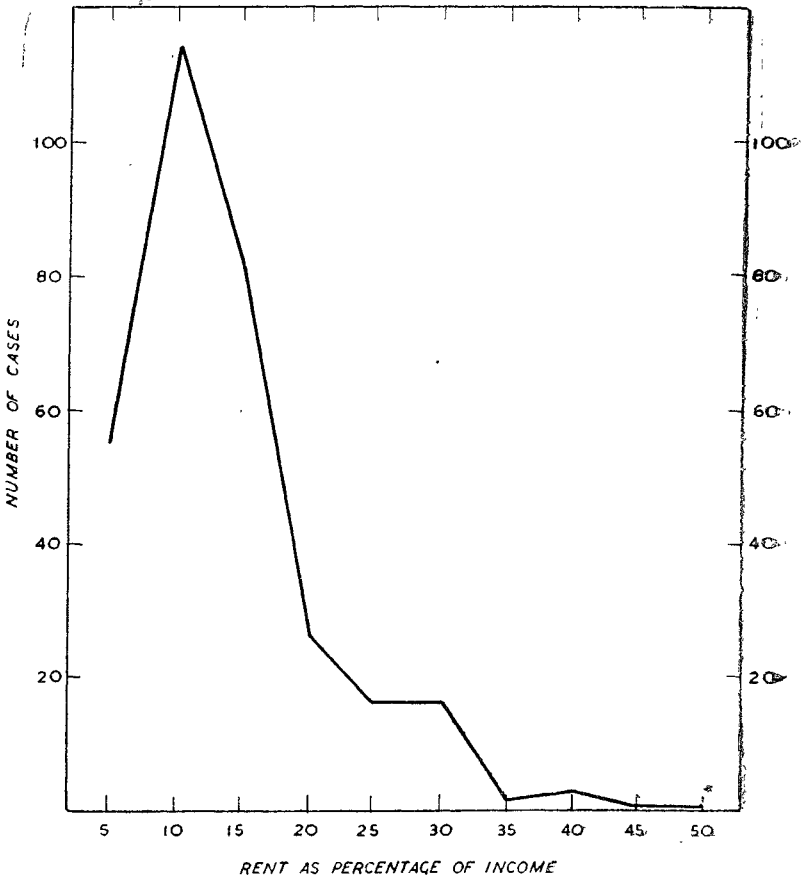
Income. The final aspect of the investigation deals with the income of the patient and his family. This should be the absolute and final index of the economic condition, yet it was the factor which caused most trouble.

Many patients refuse to give indications of their incomes, others—in fact, almost all, minimised the amount in order to obtain as much assistance as possible. Many of the wages stated were far below the minimum trade union rates. Hence the figures became unreliable. Nevertheless, they are presented for what they are worth.

The average income per family in the domiciliary form cases was 34·3 shillings per week, or 7·38 shillings per person per week. These figures are based on incomes examined during the years 1934 to 1944—most of which were at pre-war levels. However, it was felt that these constituted a more stable amount than that which now applies.

Most wages have now risen by 70 per cent, since before the war and

GRAPH II.

Rent expressed as a percentage of Total Income.

the new standards can be calculated accordingly. In spite of this increase (where it has occurred), the elevated cost of living has more than offset the income increase and the average wage earner is not as well off as when the estimates of income were made.

The average income per family in the control series was 58·8 shillings per week, or 15·5 shillings per person per week. These figures, which were taken from 1,000 public patients seeking admission to the National Maternity Hospital in the year 1939. This year was chosen, since it represented the last normal year before the war.

The Statistical Abstract (1945) gives the average male income in 1938 as 54/11 and as 64/7 in 1944. The average female income was 29/10 in 1938 and 35/- in 1944.

The average family income in the survey cases was 90·3 shillings per week, or 16·6 shillings per person per week.

This large variation between the income of the living tuberculous, the control, the average of the country and that of the survey group (dead tuberculous) indicates how unreliable are the figures. The

TABLE XXIII

Income per Family in Shillings			
	Source		
Income in Shillings	Domicillary Forms	Survey	Control Group
20	351	10	141
40	524	34	286
60	432	70	370
80	283	74	152
100	134	56	40
120	45	32	0
140	10	26	1
160	8	15	0
180	1	7	0
200	3	8	0
over 200	0	15	0

TABLE XXIV

Income per Person in Shillings			
	Source		
Income in Shillings	Domicillary Forms	Survey	Control Group
10	1,096	80	368
20	540	155	356
30	99	65	206
40	23	24	49
50	6	8	10
60	1	2	0
70	1	2	0
80	1	1	0
90	1	0	0
100	1	4	0

survey was carried out in 1945 and based on cases which died in 1944. The question sought was the family income *before* the onset of the disease—in most cases this must have been at least 2 years prior to death, i.e., about 1942 or even 1941, a time when the figures should correspond rather closely to the average. It is possible that the relatives stated the family income at the time of questioning, not realising that there was a change in the income during the course of the previous few years.

It was hoped to show the loss of income resulting from the patient's illness and death. Hence the information was sought: Income before and during the illness and the income at present. In almost all cases the income had remained the same or had improved considerably.

The average income is not so important, since it may be increased by a few persons with high incomes. The domicillary forms gave a much lower average than other sources. This must have been due in no small measure to the fact that 85 patients claimed that they had no family income at all and a further 223 stated that the whole family earned less than 20/- per week.

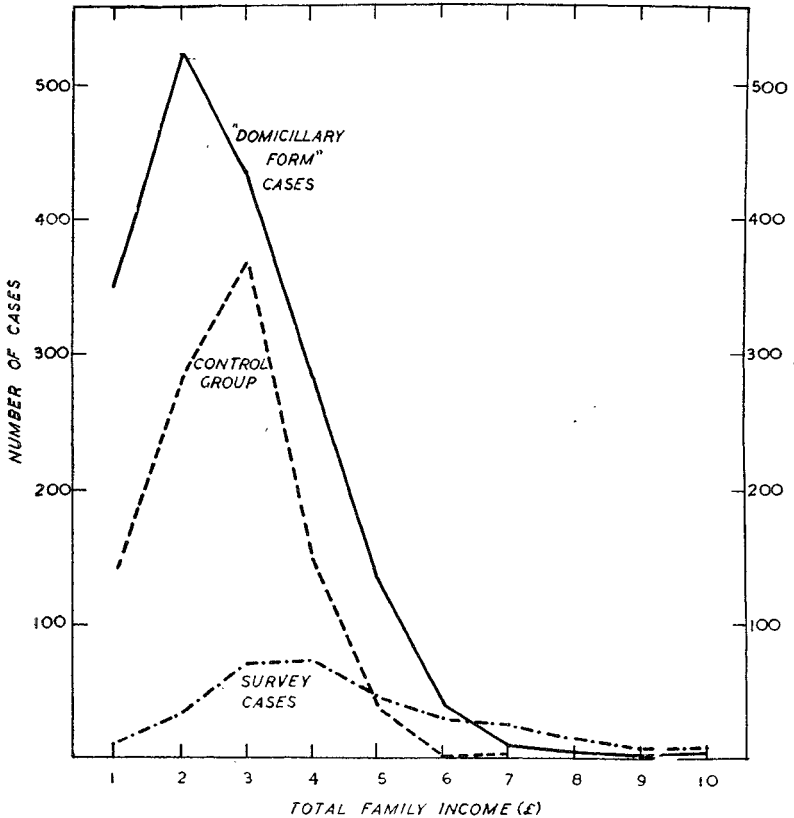
The really important point is the number of persons who earn less than a living wage.

Insurance. Insurance only applies to occupied persons. Of the new cases attending the tuberculosis dispensary at Charles Street, 218 were insured, 272 non-insured and 130 "not stated". Forty-six per cent. of the cases in the domicillary forms were insured.

Deficit in Income. According to Dillon (personal communication), the minimum income desirable for the necessities of life is 18/- per adult and 9/- per child.

Using these figures, the amount by which the incomes of tuberculous patients fell short of the minimum was estimated in the "domicillary

GRAPH III.
Distribution of cases according to Income.



form" cases. 19.6 per cent. of the total had adequate and 80.4 per cent. had inadequate incomes. Table XXV shows the distribution of these cases according to the amounts by which the incomes were deficient.

TABLE XXV
Income Deficit in Shillings

	Income Inadequate by													
	10	20	30	40	50	60	70	80	90	100	110	120	130	140
Shillings	10	20	30	40	50	60	70	80	90	100	110	120	130	140
Cases	216	256	255	228	178	140	111	68	48	18	19	5	2	1
Adequate Income 342 Cases														

Duration of Illness. Death Certificates provide space for "duration of illness"—information which is not always supplied, and when supplied is not always accurate. Nevertheless, some information is obtained from them which is of value in estimating the bed needs in terms of months and in assessing the cost of providing for the patient and his family during his illness and the cost of keeping him.

TABLE XXVI

DURATION OF ILLNESS IN YEARS		
Years	Pulmonary	Non-Pulmonary
1	463	245
2	203	14
3	96	4
4	54	3
5	30	5
6	14	4
7	9	0
8	7	1
9	2	2
10	9	1
10-20	12	2
20-30	10	0
over 30	3	0

TABLE XXVII

DURATION OF ILLNESS IN MONTHS OF CASES DYING WITHIN 1 YEAR		
Months	Non-Pulmonary	Non-Pulmonary
1	65	191
2	61	21
3	61	5
4	56	8
5	26	1
6	83	10
7	26	0
8	42	2
9	22	2
10	13	3
11	6	2

The non-pulmonary deaths constituted 281 of the 1,191 cases so recorded, 191 of which died within 1 month of onset of disease. These were mostly cases of tuberculous meningitis.

The Table (XXVI) shows the duration of illness in the pulmonary cases and the other Table (XXVII) shows the duration of illness of those who died in the first 12 months.

Over 50 per cent. of the patients died within the first year and over 20 per cent. died in the next year, i.e., 70 per cent. died within 2 years.

Place of Death. A dying tuberculous patient needs a good deal of nursing and is more infectious than at any other stage of the disease. Large quantities of infectious sputum are produced and must be disposed of in a safe way.

Such conditions are hardly to be found in the patient's home. Hence it is desirable that patients should be isolated at this and, indeed, at all stages of the disease.

The Registrar-General, in his annual returns, gives the place of death of all persons dying of tuberculosis in each year. The table below is a summary of this information for Dublin City in 1944:—

TABLE XXVIII.

			General and Special Hospitals	Mental Hospitals	County Homes and Hospitals	Elsewhere
DUBLIN :						
Respiratory	M.	...	167	16	30	114
	F.	...	151	11	22	106
	Total	...	318	27	52	220
Non-Respiratory	M.	...	61	0	17	19
	F.	...	59	2	13	26
	Total	...	120	2	30	45
Total	...	...	438	29	82	265
Percentage	...	...	53.8%	3.5%	10.0%	32.5%
EIRE :						
Total	...	...	1,237	244	784	1,574
Percentage	...	...	32.2%	6.3%	20.4%	41.0%

This table shows that 32·5 per cent. of the Dublin cases die elsewhere, which, usually means at home. This rate is not as high as that of the whole of Éire.

The rate for mental hospitals is also lower in Dublin than in the rest of Éire, as it is the rate in the "County Homes and Hospitals, District Hospitals and County Infirmaries".

The information that 53·8 per cent. of the patients die in General and Special Hospitals is interesting, but the questions of greater importance are these. How many died in Special and how many in General Hospitals? How long had they been in these hospitals before death? This information would tell us how many patients are compelled, through absence of bed accommodation in Special Hospitals, to enter General Hospitals to die. Many of these are deprived of full special treatment and occupy beds which are badly needed for non-tuberculous cases, and are probably a source of infection to other debilitated patients in the General Hospital.

On the other hand, the fact that the patient died in hospital is no indication that he was under full and expert treatment, he may have been admitted in the last stages of the disease when nothing can be done for him.

In the survey the relatives were asked whether the patient had ever been in a sanatorium or other hospital, and how long he stayed. The results are as follows:—

TABLE XXIX.

Duration of Hospital Treatment.

Duration				In Special Hospitals	In General Hospitals
Under	1 month	...	...	21	16
"	2 months	...	...	18	10
"	3	"	...	10	5
"	4	"	...	7	1
"	5	"	...	8	5
"	6	"	...	12	3
"	12	"	...	24	5
"	18	"	...	14	2
Over	18	"	...	8	6

Over 32 per cent. of the patients died in hospitals other than those meant for the treatment of tuberculosis.

Over 40 per cent. of the patients who died in Special Hospitals died within 3 months of admission or were in these hospitals for less than that time.

The duration of hospital treatment is usually about 25 to 35 per cent. of the duration of the illness.

Acknowledgments. The collecting of data for this paper took three years, during which every assistance was given by the authorities concerned and by other investigations.

The first acknowledgment must go to the late Professor T. W. T. Dillon, who suggested the survey and encouraged it in every possible way. Indeed, the paper is presented as a tribute to his memory and for his kindness and enthusiasm for the problems of tuberculosis. His place was taken in this work by Mr. Frank McDermott, Secretary of the Anti-Tuberculosis Section of the Irish Red Cross Society, who should really be considered as a co-author of this publication.

Thanks are due to the Irish Red Cross Society for a part-time grant to enable the work to be carried out.

The social survey was carried out by Social Science Students under the direction of Mrs. Maguire, University College, Dublin. Their care and attention to detail, in a work that was often unpleasant, contributed largely to the success of the survey.

Thanks are also due to the Registrar-General for supplying data from death certificates, and to the Dublin Corporation officials for permission to carry out some of the work at Charles Street Tuberculosis Dispensary. And to the Master of the National Maternity Hospital, Holles Street, for permission to collect and use a control group.

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Summary. Investigations were made into the circumstances and other social factors concerning representative groups of tuberculous patients.

The work was confined to the City of Dublin and involved all deaths and as many patients as possible.

Tuberculosis is definitely related to overcrowding, poverty and ignorance. Conclusions were more satisfactory when based on observations of the environment than on information obtained from the relatives.

The importance of age was discussed and death rates examined from several viewpoints.

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DISCUSSION ON MR. KIDNEY'S PAPER.

Mr. F. C. McDermott.—The paper reveals the following facts:—

Of those who died of tuberculosis in Dublin, 35 per cent. were married as against 28 per cent. ordinary population. There were 4.7 to 5.4 persons per family as against 3.8 to 4. There were 1.6 persons per room as against 1.26. From 35.6 cases there was a known contact. In the tenements in which a large number of those who died had lived, one had a bath, 75 out of 89 had their water supply outside their room, and fuel was kept in the room in 72 out of 92 cases. Thirty-eight per cent. were classed

"dirty." Of the single patients 398 out of 1,167 had not a separate bed and 580 out of 861 married had not a separate bed.

On the basis of a calculation of the minimum necessary to provide a diet capable of maintaining normal health, the income of 4 out of every 5 who died was inadequate. While complete accuracy is not possible in social investigations, the trend here is unmistakable. Obviously a large number of deaths were caused by infection spread in overcrowded living conditions amongst undernourished people.

The problem of bed accommodation is now being tackled on a sufficient scale. Until the social problems involved are dealt with on the same scale, these unnecessary deaths will continue to occur.

Mr. Whitaker.—Whenever experts find something in their own field surprising, the foolish layman is tempted to rush in with an explanation. Both Dr. Kidney and Dr. Deeny are surprised at the relatively slight degree of infection of one another by married couples, but I suggest that the former has already supplied the explanation, namely, that the incidence of tuberculosis varies with age, decreasing after the peak in the 15-25 years group. Married couples come together at an age when the risk of infection is getting less intense. It is also possible that the *effective* duration of exposure to infection is less with married couples than with the younger children in a family who spend most of their time together.

Dr. Kidney is also surprised at the discrepancy between the average weekly income per person found in the control and survey cases and what he calls "the average of the country." The figures, he quotes for the latter from the *Statistical Abstract* are, however, the average income per week of male and female *workers*, which is quite a different thing from income per *person*. The control and survey findings of average weekly incomes per person of 15·5 shillings and 16·6 shillings do not look so queer when compared with the average weekly income per head of the population in 1939, which was roughly £1.

I inferred that it was mostly the relatives of the better-off patients who refused to co-operate in the survey. This makes the data less representative and tends to vitiate deductions therefrom as to the connection between tuberculosis and poverty.

On this question generally, it seems to me that in seeking to establish a correlation between tuberculosis and economic and social conditions, it is not enough to show that most of the deaths from tuberculosis occur in families with low incomes or poor housing accommodation. The same may be true of *all* deaths or of deaths from, say, cancer. No significant deduction as to the connection between tuberculosis and economic, etc. conditions can be made unless comparison of the distribution of deaths from tuberculosis according to income groups with a similar distribution of *all* deaths shows a disproportionately large number of deaths from tuberculosis in the lower income categories.

I was struck by the fact that many of the relatives of deceased patients approached by the investigators complained bitterly of delay in diagnosis. Progress towards the eradication of the disease is seriously hampered if patients are already badly infected when they come under medical care. As infection in a mild form is so widespread, should there not be more publicity about how to recognise the early symptoms of active disease, so that treatment will be sought in good time?