

Cambridge University Press

978-1-107-45656-3 - The Causes of Tuberculosis: Together with Some  
Account of the Prevalence and Distribution of the Disease

Louis Cobbett

Excerpt

[More information](#)

## CHAPTER I

## THE TRIBUTE EXACTED BY TUBERCULOSIS

*The Annual Mortality. Its Age and Sex Distribution and the changes which these have undergone in the last half-century.*

Tuberculosis is the commonest of all the important diseases of civilized lands. Over 51,000 deaths were attributed to it in 1910 in England and Wales<sup>1</sup>. This number was the lowest ever recorded; yet it accounted for more than one death in every ten, and was in the proportion of 1434 to every million persons living.

Large as is this mortality at home, in nearly all other countries it is larger still; and in some much larger. In Scotland the death-rate from tuberculosis is a little higher than in England and Wales, and in Ireland half as high again<sup>2</sup>. In Prussia, in 1910, it was 1510 per million; in Austria 2880; and in Hungary 3480. In the Balkan Peninsula tuberculosis is extremely rife<sup>3</sup>. In Paris too it is a frequent cause of death; and in a report of the Préfet de la Seine, some few years ago, it was stated that one person in every four who died there was certified to have died of tuberculosis.

Belgium, alone of all countries of Europe, has a death-rate from pulmonary tuberculosis lower than that in England and Wales—and the difference is inconsiderable; and a review of all the countries of the world for which figures are available shows that only in New Zealand, Australia, and Ontario is the

<sup>1</sup> 73rd Rep. Reg. Gen. England and Wales (1910), p. lv. The actual number was 51,317. In 1911 the deaths from tuberculosis of all kinds were slightly more numerous, and numbered 53,120.

<sup>2</sup> 2150 per million in 1912.

<sup>3</sup> In Servia, for example, in 1910 the death-rate from pulmonary tuberculosis was 3437 per million.

Cambridge University Press

978-1-107-45656-3 - The Causes of Tuberculosis: Together with Some  
Account of the Prevalence and Distribution of the Disease

Louis Cobbett

Excerpt

[More information](#)

mortality from this cause substantially less than it is in this country<sup>1</sup>.

But though the number of deaths certified to be caused by tuberculosis is large it probably falls short of the truth; for there is reason to think that a good many deaths which are really due to that cause become included in bronchitis, pneumonia, or some other category. Both to bronchitis and pneumonia are assigned each year almost as many deaths as to pulmonary tuberculosis itself; and there is considerable uncertainty as to the etiology of bronchitis, and of some kinds of pneumonia also. It seems not unlikely then that, in early life, a good many cases of pulmonary tuberculosis get returned under the latter, and still more, towards the end of life, under the former heading<sup>2</sup>. It has even been suggested that the diminution of the mortality from phthisis towards the latter end of life which appears in our records is not a real one, and would disappear if all deaths from senile phthisis were correctly reported; and that the registered mortality from that cause

<sup>1</sup> The death-rates per million from pulmonary tuberculosis (which are probably more reliable than those for all kinds of tuberculosis) were, in 1910 (unless otherwise stated), as follows in some of the principal countries for which statistics are available.

France	1788	
Ireland	1716	(Excluding acute military tuberculosis)
Germany	1421	
Denmark	1201	(1912. Principal cities only)
Netherlands	1189	
Italy	1174	(Including general tuberculosis)
Scotland	1142	(Excluding acute military tuberculosis)
England and Wales	1015	
Belgium	972	
Ontario	932	(1911)
Australia	700	
New Zealand	587	

(Calculated from figures given in the *74th Report of the Registrar General for England and Wales* (1911), pp. 105 *et seq.*)

These are crude death-rates, uncorrected for sex and age constitution of population, and are therefore only roughly comparable with one another.

See also *73rd Rep.* (1910), p. xcvi.

<sup>2</sup> It was observed in Sheffield, when compulsory notification was introduced, that some of those who had been notified as suffering from pulmonary tuberculosis came in the end to be certified as having died of some other cause. Matthew Hay also has called attention to the confusion of bronchitis and phthisis in Aberdeen (see footnote on p. 13).

Cambridge University Press

978-1-107-45656-3 - The Causes of Tuberculosis: Together with Some  
Account of the Prevalence and Distribution of the Disease

Louis Cobbett

Excerpt

[More information](#)

1]

ITS ECONOMIC IMPORTANCE

3

would then increase right up to the end of life, as it does in New York<sup>1</sup>.

### I. *Age Distribution of the Mortality from Tuberculosis.*

In order to appreciate fully the economic importance of tuberculosis to the community, one must know at what period of life the deaths fall thickest ; for it is obvious that diseases which destroy infants on the threshold of life, as, for example, measles and whooping cough, and others which, like cancer, carry off for the most part those whose work is nearly done, are of less consequence to the well-being of the state than such as remove the young adult (after much expenditure of labour and money has been incurred in his upbringing) and many of those who are in the full tide of their activity and upon whom, very often, children and wife or husband are dependent. And tuberculosis does just this ; for though it is true that the disease is more fatal in infancy than at any other period of life, yet the great bulk of its mortality falls in middle life<sup>2</sup>.

At the present day, in England and Wales, the incidence of the tuberculosis mortality on the different periods of life is as follows :

*Infancy.* As already mentioned, tuberculosis is more fatal in infancy than at any other time of life, and most of all in the latter part of the first year. In 1911 the deaths from this cause in the first year formed 6·3 per cent. of the total for the whole of life ; those in the second year 5 per cent., and those in the first five years taken together 16·7 per cent.

The distribution of this mortality throughout these five years is shown in the following table, from which it will be seen how greatly it is concentrated into the 18 months which immediately succeed the first half-year of life.

<sup>1</sup> Dr Glover Lyon, quoted by Newsholme in *The Prevention of Tuberculosis* on p. 24.

<sup>2</sup> More than one-half of all the deaths ascribed to tuberculosis fall between the twentieth and the fiftieth year of age.

The deaths in 1911 were actually as follows :

Ages	0-5	5-20	20-50	50+
	3877	8178	27,365	8700

Cambridge University Press

978-1-107-45656-3 - The Causes of Tuberculosis: Together with Some Account of the Prevalence and Distribution of the Disease

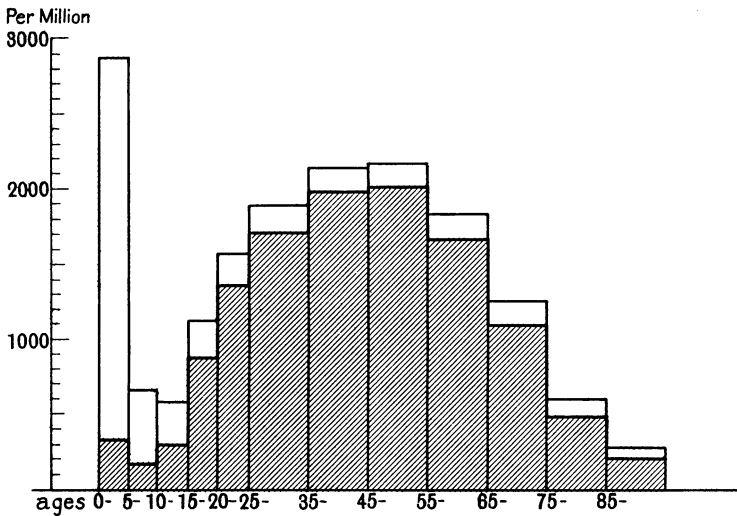
Louis Cobbett

Excerpt

[More information](#)

4 THE TRIBUTE EXACTED BY TUBERCULOSIS [CH.

DIAGRAM I. *The Incidence of the Mortality from Tuberculosis of all kinds and from Pulmonary Tuberculosis at Different Periods of Life, as shown by the mean annual mortality per million persons living at each age period in England and Wales, during the decade 1901-10.*



*All Kinds of Tuberculosis.*

Ages	0-	5-	10-	15-	20-	25-	35-	45-	55-	65-	75-	85-	All ages
Males and													
Females	2883	667	586	1125	1576	1892	2150	2163	1838	1246	602	280	1653

*Pulmonary Tuberculosis only (shaded columns).*

Males and													
Females	327	166	283	873	1370	1708	1983	2004	1673	1095	477	180	1161

(Calculated from the figures published in the Annual Reports of the Registrar General, with the aid of a table giving the mean annual population both male and female at various age periods, kindly supplied by him for the purpose.)

Cambridge University Press

978-1-107-45656-3 - The Causes of Tuberculosis: Together with Some Account of the Prevalence and Distribution of the Disease

Louis Cobbett

Excerpt

[More information](#)

I] ITS INCIDENCE AT DIFFERENT PERIODS OF LIFE 5

TABLE I. *Number of Deaths at Different Age Periods in Early Life. 1911.*

	Months				Years					Total under 5	Total all ages
	0-1	1-3	3-6	6-12	0-1	1-2	2-3	3-4	4-5		
Pulmonary Tuberculosis *	8	16	63	219	306	356	198	138	123	1121	38,422
All other kinds	33	374	916	1724	3047	2284	1183	721	521	7756	14,698
Total (all kinds)	41	390	979	1943	3353	2640	1381	859	644	8877	53,120

\* Pulmonary tuberculosis (not acute) + acute phthisis.

From figures in *74th Rep. Reg. Gen. E. and W.* (1911), pp. 196, 197.

*Childhood.* What may be called the school age or, more precisely, that which extends from the fifth to the fifteenth birthday, is, if we except extreme old age (and here, as we have seen, the statistics are less reliable), the period of life when deaths from tuberculosis are least frequent. Indeed they are then, comparatively speaking, so uncommon that the death-rate from this cause is only about one-third as high as it is during the greater part of adult life.

*Adolescence, Middle Life, and Old Age.* After the school age the mortality from tuberculosis increases, rapidly at first, and afterwards more slowly, until it attains a second maximum between the ages of 35 and 55. It then again falls slowly, attaining the lowest point of all after 85.

Thus it may be said that the mortality from tuberculosis is concentrated about two distinct periods of life, namely infancy and maturity, culminating in the earlier period about the latter half of the first and the earlier part of the second year, and in the latter period about the very prime of life. Between the two is the school age when deaths from tuberculosis are comparatively rare.

*The relative frequency of deaths from various kinds of tuberculosis at different periods of life.* The type of tuberculous disease which prevails in each of the two periods of maximum fatality is distinct; for, while all kinds of tuberculosis occur at both periods, some kinds preponderate greatly at the one period, and other kinds preponderate at the other. Thus in infancy the commonest type is tuberculous meningitis,

Cambridge University Press

978-1-107-45656-3 - The Causes of Tuberculosis: Together with Some  
Account of the Prevalence and Distribution of the Disease

Louis Cobbett

Excerpt

[More information](#)

## 6 THE TRIBUTE EXACTED BY TUBERCULOSIS [CH.

followed, at an interval, by tuberculous peritonitis and general tuberculosis. At this early period pulmonary tuberculosis accounts for only 12·6 per cent. of all the deaths from tuberculosis<sup>1</sup>. After the 15th year, on the other hand, nearly 90 per cent. of the deaths from tuberculosis are caused by pulmonary disease, and there remains little more than 10 per cent. to include all other kinds of tuberculosis, a category which in infancy comprises 87·4 per cent. of the deaths from all kinds of tuberculosis.

II. *The Incidence of the Mortality from Tuberculosis  
on the Two Sexes.*

The extent to which the two sexes participate in the mortality from tuberculosis is very different to-day from what it has been in the past. Formerly the mortality was divided fairly evenly between the sexes, rather more women dying of tuberculosis than men. At the present day men suffer much more than women; taking all ages together, four males die from tuberculosis for every three females.

The following description is based on the figures of the first decade of this century.

In the first five years of life, taken as a whole, boys die of tuberculosis more frequently than girls, in the ratio, broadly speaking, of six to five. But after the fifth year the incidence on the sexes is reversed, and from 5 to 20 tuberculosis claims more victims among girls than boys. It may be said then that during childhood and adolescence girls suffer more than boys, the greatest difference between the sexes at that period occurring between 10 and 15, when the ratio of the

<sup>1</sup> *Deaths from Tuberculosis under 5 years. 1911.*

Tuberculous Meningitis	..	..	..	..	..	3347
Tuberculosis of Peritoneum and Intestines	..	..	..	..	..	2700
Acute miliary Tuberculosis	..	..	..	..	..	327
Disseminated Tuberculosis	..	..	..	..	1185	} 1512
Pulmonary Tuberculosis (not acute)	..	..	..	..	961	
Acute Phthisis	..	..	..	..	..	160
All other kinds	..	..	..	..	..	197

Tuberculosis, all forms .. .. . 8877

From the 74th Ann. Rep. Reg. Gen. E. and W. pp. 196 *et seq.*

Cambridge University Press

978-1-107-45656-3 - The Causes of Tuberculosis: Together with Some Account of the Prevalence and Distribution of the Disease

Louis Cobbett

Excerpt

[More information](#)

1]

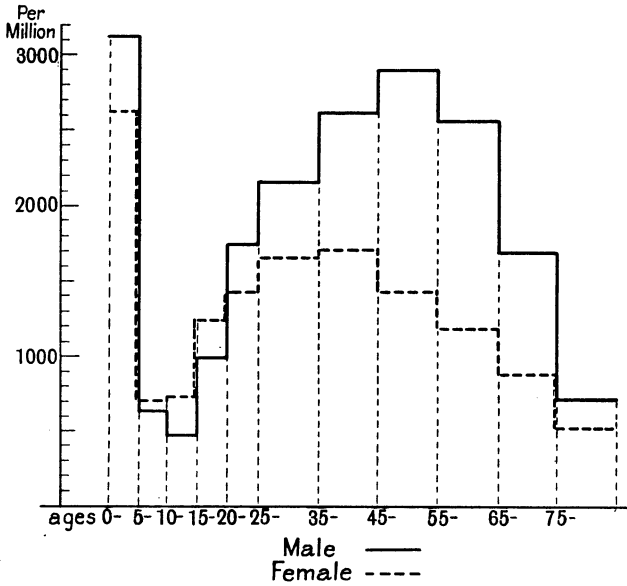
HOW SHARED BY THE SEXES

7

tuberculosis mortality of females to that of males is about three to two.

From about the age of 20 onwards young men begin to die from tuberculosis more frequently than young women; and the difference increases and becomes very considerable as age

DIAGRAM II. *The mean annual Mortality from Tuberculosis of all kinds at different ages in Males and Females in England and Wales, 1901-10.*



Ages	0-	5-	10-	15-	20-	25-	35-	45-	55-	65-	75-	85-	All ages
Males	3129	636	463	997	1774	2159	2622	2934	2574	1688	708	332	1902
Females	2636	698	710	1250	1425	1651	1710	1449	1186	894	529	250	1421

*Ratio of the male to female death-rate from tuberculosis (the latter being taken as 100) at different ages.*

118.7 91.1 65.2 79.8 122.4 130.8 153.3 202.5 217.0 188.8 133.8 132.8 133.8

advances, until the maximum disparity is reached between 45 and 65, when the mortality among men is twice as high as it is among women. In old age (if the figures for this period of life can be trusted) the disparity of the incidence diminishes and after 85 about four men are certified to die of tuberculosis for every three women.

Cambridge University Press

978-1-107-45656-3 - The Causes of Tuberculosis: Together with Some Account of the Prevalence and Distribution of the Disease

Louis Cobbett

Excerpt

[More information](#)

## 8 THE TRIBUTE EXACTED BY TUBERCULOSIS [CH. I

The maximum mortality in adult life is attained considerably later among men than it is among women, occurring in the case of the former between 45 and 55, and in that of the latter between 25 and 45.

This was not always the case. In 1861-70 both maxima occurred earlier in life, and very much at the same period in the two sexes; the maximum among women being then between 25 and 35 and that among men between 25 and 45. Thus we see that one of the important changes which have been taking place is the shifting of the maximum mortality from tuberculosis to a later period of life, and this to a greater extent among men than among women.

These and other changes which have taken place must be considered in greater detail in the following chapters.

## CHAPTER II

## THE DECLINE OF TUBERCULOSIS

At the present day, as we have seen, tuberculosis of all kinds claims rather more than 50,000 deaths per annum. Half a century ago the number was between 60,000 and 70,000. In *actual numbers* then, and not only in proportion to population, tuberculosis has declined, and the magnitude of that decline in the last fifty years has been, let us say, 20 per cent.<sup>1</sup>

The decline in the *death-rate* from this cause has, of course, been much greater, for the population has greatly increased during this period<sup>2</sup>. As we shall see, this decline, during the period under consideration, amounted to about 50 per cent.

<sup>1</sup> A decline in the number of deaths assigned to tuberculosis has occurred in other countries also. Thus Koch, in 1906, pointed out in his Nobel Lecture that the actual number of deaths from pulmonary tuberculosis in Prussia each year was then about 20,000 less than it was twenty years previously.

<sup>2</sup> For every 100 people living in England and Wales in 1851, there were estimated to be 197 in 1908. See *Public Health and Social Conditions*, p. 2, issued by the Local Government Board, 1909, Cd. 4671.



Cambridge University Press

978-1-107-45656-3 - The Causes of Tuberculosis: Together with Some  
Account of the Prevalence and Distribution of the Disease

Louis Cobbett

Excerpt

[More information](#)

## CH. II] DECLINE IN ANNUAL MORTALITY FROM TUBERCULOSIS 9

*Can the Figures be Trusted?*

This decline in the death-rate of tuberculosis is one of the most important and astonishing facts in medical history, and the question immediately arises whether it indicates a real decline of the disease, and how far the figures on which it rests can be trusted. The figures are based on death certificates; and these, as one knows, are likely too often to be the result of faulty or incomplete diagnosis. But when we are attempting to compare the records of the present day with those of previous times, it is perhaps not so much the mistakes due to human fallibility which concern us—for these are much the same in one period as in another—as the changes which the discoveries of recent times and the progress of medical education have deliberately wrought in the nomenclature of diseases—changes which have undoubtedly led to the attributing of many deaths at the present day to causes other than those to which they would have been assigned in the past.

We must therefore inquire how far the changes which have taken place in recent times invalidate a comparison of the records of the present day with those of a few decades ago.

It will be convenient to consider separately infantile and adult tuberculosis. Let us begin with the former.

The sum of infantile tuberculosis is, as we have seen, made up mainly of tuberculous meningitis, tuberculous peritonitis, and general tuberculosis. And to these must be added another category, namely tabes mesenterica, which formerly included a large number of deaths, but which is now comparatively unimportant. Pulmonary tuberculosis forms only about one-eighth of the whole.

It is in the large group of abdominal tuberculosis that most uncertainty is likely to be felt in diagnosis, and most change in the fashion of nomenclature has probably taken place. In 1891 over 7000 deaths were ascribed to tabes mesenterica in England alone. In 1910 there were less than 800 in England and Wales assigned to this cause. What has become of the

Cambridge University Press

978-1-107-45656-3 - The Causes of Tuberculosis: Together with Some Account of the Prevalence and Distribution of the Disease

Louis Cobbett

Excerpt

[More information](#)

others? Surely they have not all found a haven in "tuberculous peritonitis"? Is it not more probable that in the past, when there was less precision in diagnosis, many a case of wasting, associated with chronic diarrhoea or other abdominal symptoms, was put down to tabes mesenterica, and that now many such cases are recognized to have nothing to do with tuberculosis<sup>1</sup>?

If for this reason there is cause to think that the official figures may exaggerate the decline of infantile tuberculosis, there is yet another probable source of error which goes far to counteract this one, if not to overrule it altogether. For some authorities believe that tuberculosis is a much commoner cause of death among children than the death certificates show. Coates<sup>2</sup>, for example, found that out of 77 children who died in Great Ormond Street Hospital in 1877, no less than 35 per cent. succumbed to some kind of tuberculosis. These were no doubt for the most part children of the poorer classes, among whom tuberculosis is very common, but Coates was of opinion that we might safely affirm that of

<sup>1</sup> See Tatham in the Supplement to the 65th Annual Report of the Registrar General, 1891-1900, Part I, p. lxxxiv. "It is reasonable to assume that in a considerable proportion of the deaths even now referred to 'tabes mesenterica' the tubercle bacillus would be sought for in vain." In this article the whole question of the comparability of the older with the recent statistics of tuberculosis, and of the reality in the decline in the mortality which they show, is briefly discussed.

On this subject see also Newsholme, *The Prevention of Tuberculosis*, Chap. III, "Are the statistics relating to tuberculosis trustworthy?" Also in *The Relative Importance of the Constituent Factors involved in the Control of Pulmonary Tuberculosis*, Section headed "Can the Official Figures be Trusted?" *Trans. Epidemiol. Soc.* xxv, p. 31. Newsholme is "not inclined to attach much value to the figures before 1870, or possibly 1866." Arthur Ransome, on the other hand, in "Phthisis Rates," *Trans. Epidemiol. Soc.* xxiv, is "inclined to think that it is not necessary entirely to reject the mortality figures during the thirty years preceding 1868." "There may be, and probably are," he adds, "inaccuracies in the returns for individual years; but for the most part these inaccuracies will be in defect, not in exaggeration of the phthisis rate. It is more likely, for instance, that phthisis has been entered as bronchitis than that the converse has been the case. We may then, perhaps, accept the general outline of the curve" (showing the decline of phthisis from 1838) "as a fair representation of the truth" (*loc. cit.* pp. 261, 262).

See also Matthew Hay, quoted in footnote on p. 13, and Bulstrode, *loc. cit.* p. 32.

<sup>2</sup> Quoted by Newsholme, see *The Prevention of Tuberculosis*, 1908, p. 23.