

Time Between Tuberculosis Reporting And Death

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THE REPORTING of tuberculosis cases to health departments is one of the most important administrative procedures in tuberculosis control. Such reporting identifies the person who is in need of medical and public health supervision. It results in getting him registered for such supervision and keeps him so until death, cure, transfer, or other reason for discontinuation of supervision. Each newly reported case is a new source for contact investigations leading to the possible discovery of other new cases, and reporting provides valuable statistics for the study of tuberculosis morbidity.

It has long been known that a substantial proportion of persons who die from tuberculosis have never been reported as cases before death. Each such death represents a person who either was not found as a case during life or at least failed to be reported officially as a case. Since reporting is the event which, generally speaking, puts the public health machinery into action for a given case and possible associated cases, such nonreporting signifies lack of opportunity for care and supervision by official agencies and for fulfillment of all the other purposes of reporting.

This is a report of a partial study over a period of years of tuberculosis deaths unreported as cases in New York State, exclusive of

New York City. The "unreported deaths" consist of cases reported on the same day as the date of death, cases reported after death, and deaths never reported as cases. The study was partial in that only certain information from death certificates was analyzed. A complete study would necessarily include a detailed field investigation of many factors pertaining to each unreported death, with perhaps a similar investigation, as a control, of deaths previously reported as cases.

The purpose of the study was to analyze some of the characteristics of the unreported deaths and particularly to determine, if possible, whether there might be some extenuating factors to account for the nonreporting as had been suggested by some earlier observations.

Frequency of Unreported Deaths

Table 1 shows the distribution of tuberculosis deaths according to the time of reporting as cases for two 5-year periods (annual average for 1940-44 and for 1945-49) and for 1951. The fourth column shows that slightly over 20 percent of the total deaths were never previously reported as cases before death; for example, during the period 1945-49, out of an annual average of 1,761 total tuberculosis deaths, 398 or 22.6 percent were unreported deaths.

Information is not readily available as to how this figure of a little over 20 percent for upstate New York compares with other States. (This figure should not be confused, of course, with the percentage of the total reported cases in a given year which are first "reported" by

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death certificate. In upstate New York the latter figure was 9 percent in 1940 and 5 percent in 1951.)

Table 1 shows also the number and percentage of deaths which were reported before death, divided into four "time" groups. It is encouraging that the percentage reported less than 3 months before death decreased during the period from 16.7 in 1940-44 to 10.1 (sixth column) in 1951; at the same time, the percentage reported 12 months or more before death increased from 46.0 to a peak of 56.2.

In considering the significance of the unreported deaths, the third column of table 1 shows that the number has decreased substantially from an average of 451 deaths during 1940-44 to a low of 235 in 1951. However, the percentage of unreported deaths in relation to the total deaths has shown little change since at least 1940; the annual fluctuation has been only from a high of 23.7 to a low of 20.6. This slight variance occurred during a period when there was a great expansion and improvement in case-finding techniques. It is one of the observations which has raised the question as to whether at least some of the nonreporting during life may be due to some "uncontrollable" factors.

Characteristics of Unreported Deaths

Certain characteristics of the unreported deaths for the three representative periods were analyzed.

Sex and Age

There is apparently no difference in the proportion of unreported deaths in the two sexes.

In each sex group there is a higher proportion of the unreported deaths in the age group 65 or over than would be expected by chance alone.

Place of Death

There is no difference in the proportion of unreported deaths in cities with populations of 50,000 or more as compared with the rest of the area. Table 2 shows the distribution of unreported and reported deaths in 1951 in relation to the place of death within urban and rural areas. The striking fact is that out of 194 tuberculosis deaths in general hospitals, 111, or 57 percent, were not reported before death, as compared to the 21 percent total unreported, to the 9 percent in tuberculosis hospitals (includes general hospitals with separate tuberculosis buildings or services), the 21 percent in other institutions, and the 22 percent in private dwellings. Stated another way, general hospitals contributed only 17 percent of all the deaths (194 out of 1,134), whereas they account for 47 percent of the total unreported deaths (111 out of 235).

This could mean that general hospitals are lax in reporting tuberculosis cases; perhaps this is due in some instances to failure to assign specific responsibility for official case reports. Also, it may be assumed that for the most part, patients admitted to general hospitals are more likely to have the acute types of disease, including pulmonary tuberculosis, with a diagnosis of tuberculosis being made only a short time before death.

Regardless of the explanation, this finding provides eloquent additional evidence for the

Table 1. Tuberculosis deaths in relation to time of reporting as cases, New York State, exclusive of New York City, 1940-44, 1945-49, and 1951

Year	Total deaths		Not reported before death		Reported before death							
					Less than 3 months		3 to 6 months		6 to 12 months		12 months or more	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
1940-44 ¹ ----	2, 024	100. 0	451	22. 3	338	16. 7	132	6. 5	172	8. 5	931	46. 0
1945-49 ¹ ----	1, 761	100. 0	398	22. 6	264	15. 0	104	5. 9	140	8. 0	855	48. 6
1951-----	1, 134	100. 0	235	20. 7	114	10. 1	63	5. 6	84	7. 4	638	56. 2

¹ Annual average.

Table 2. Tuberculosis deaths according to place of death and time of reporting as cases, New York State, exclusive of New York City, 1951

Place of death	Total deaths		Not reported before death		Reported before death	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
Total.....	1, 134	100	235	21	899	79
Tuberculosis hospi- tals.....	654	100	62	9	592	91
General hospitals....	194	100	111	57	83	43
Other institutions....	105	100	22	21	83	79
Private dwellings....	181	100	40	22	141	78

need of extending to all general hospitals the program of routine chest X-ray examinations of all patients admitted. Also, cases of tuberculosis should be promptly reported in order that the necessary examinations of the family-household contacts may be made.

With reference to deaths in private dwellings, the percentage of unreported deaths, 22 percent, was about the same as the total of 21 percent for all places; moreover, it is significant that only 40, or 17 percent, of the total 235 unreported deaths occurred in private dwellings.

Site of Disease

Of the total 1,134 tuberculosis deaths in 1951, 44, or 4 percent, were due to tuberculosis of the meninges or to acute disseminated tuberculosis; 25 of these were unreported before death and 19 were reported. The 25 unreported deaths represent 11 percent of the total 235 unreported deaths, whereas the 19 reported are but 2 percent of the total 899 which were reported. This then is another group of deaths the nonreporting of which may be accounted for by the acuteness of disease and the usually early fatality. All 44 deaths, incidentally, occurred in either tuberculosis or general hospitals.

Performance of Autopsy

Of the total 1,134 deaths, 317 autopsies were performed; 96 of these were among the unreported and 221 among the reported deaths. The 96 unreported deaths with autopsy repre-

sent 41 percent of all 235 unreported deaths, whereas the 221 reported are only 25 percent of the total 899 reported. Unfortunately, it is impossible, without a field investigation, to determine in which instances diagnosis was not made until the autopsy was performed. But it may safely be assumed that this was so in many of these 96 unreported deaths, and this might thus be another reason for nonreporting. One can only surmise as to the number in this group in whom a diagnosis could have been made during life by means of proper and adequate diagnostic procedures.

Other Possible Factors

Deaths from tuberculosis occurring in New York State are allocated to the place of residence of the decedent, regardless of the length of such residence. Some of the unreported deaths may thus be of persons who have moved into the upstate New York area only a short time before death. Factual data on this point, however, could be secured only through a field study.

Finally, errors in the certification of the cause of death may account for some of the unreported cases.

Discussion

If it is accepted that reporting of tuberculosis cases is an essential administrative procedure in tuberculosis control, then the proportion of tuberculosis deaths not reported during life as cases becomes an important measure of some of the control activities. The observations reported here suggest that some of the nonreporting may be due to certain extenuating—or even uncontrollable—factors.

But, to the extent that such factors do play a part, at best they can account for only a portion of the unreported deaths. Nonreporting is often due to a lack of awareness of the need and purpose of reporting or a lack of a feeling of responsibility.

To be sure, the patient who is in a hospital or some other institution is at least segregated from his household associates. But one of the purposes of reporting is to assure that such associates are examined promptly. Besides, at the time of diagnosis, a fatal outcome cannot

be foretold, and reporting is thus essential for the sake of the posthospital care and supervision of the person diagnosed.

Thus, although there may be certain pathogenetic or other factors which tend to result in delayed reporting of tuberculosis cases, efforts must be intensified to improve the status of this essential activity in tuberculosis control. The health officer or other administrator responsible for tuberculosis control in a community can use each unreported death as a lead in such efforts.

Summary

Approximately 20 percent of persons dying from tuberculosis in New York State, exclusive of New York City, have not been reported as cases during life. Because of the vital place of reporting in tuberculosis control, this is a significant index in relation to the planning, conduct, and evaluation of the program.

However, certain observations suggest that nonreporting of cases before death may be due

in part to factors which are uncontrollable or, at least, difficult to control: (a) Although the number of unreported deaths has decreased substantially since 1940, the proportion of these to the total tuberculosis deaths has shown little change; (b) the proportion of unreported deaths is very high (57 percent) in general hospitals, where, on the whole, patients with acute types of tuberculosis are more likely to be admitted; (c) some of the unreported deaths are due to acute tuberculous meningitis and acute disseminated tuberculosis; (d) in some instances the diagnosis of tuberculosis is not made until autopsy; (e) some of the unreported deaths may be of persons who have only recently moved to the area; (f) erroneous certification of the cause of death may account for some unreported deaths.

But much of the delayed reporting is controllable, and efforts must be continued and intensified to secure the reporting of all tuberculosis cases promptly at the time of first diagnosis.

Reported Tuberculosis Morbidity and Mortality, 1952

Provisional reports from State health departments indicate that there were approximately 111,300 cases of tuberculosis newly reported in the United States during the calendar year 1952. Of these, about 85,000 were active and probably active cases (group "A" cases), giving an annual rate of 55 per 100,000 population.

Total new cases reported during 1952 represented a decline of about 6 percent from the number reported in 1951. A large portion of this decline is no doubt due to the new practices in reporting cases of tuberculosis and in counting them—*Public Health Reports*, 66:1291-1294 (1951).

The National Office of Vital Statistics' 10-percent sample of death certificates indicates that there were approximately 25,000 tuberculosis deaths, all forms, in 1952. This is a decline of approximately 16 percent from a similar provisional figure for 1951. Thus, the trends of the past several years are continued in 1952: a substantial decline in tuberculosis mortality but a comparatively small decline in the number of newly reported cases.