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## Tuberculosis in a Small Semi-Rural County

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### Synopsis .....

*Tuberculosis cases in a semi-rural county of western Maryland have been reviewed in an attempt to identify high-risk groups at which tuberculosis control efforts could be targeted.*

*Although the cases were concentrated to some extent among nonwhites, older persons, and unmarried city residents, it appears that a general approach will be needed, emphasizing greater collaboration of health departments with the medical profession and a general health education approach to the public.*

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UNTIL 1984, TUBERCULOSIS case rates in the United States had been falling at a relatively uniform rate, both in the nation as a whole and in places with populations of less than 100,000 persons, according to a personal communication we received from Gloria Kelly of the Division of Tuberculosis Control, Centers for Disease Control.

This is shown in the chart for the 15-year period, 1975 through 1989. From 1975 to 1984, case rates decreased by an average of 6.7 reported cases per million population per year for the United States as a whole, and in the least populous areas by 5.6 per million per year. For the last 5 years of this period, both rates remained almost level, and the average annual decline was virtually imperceptible.

During the entire 15-year period, however, small cities and rural areas produced more than half of the reported cases in spite of their lower case rates. The fact that the majority of tuberculosis cases occurred in a segment of population at low risk is often overlooked in the general concern about the problems of large cities. If tuberculosis is to be eliminated in the foreseeable future, programs will have to be developed to find and treat cases of tuberculosis in small cities and rural areas. The problems of accomplishing this when cases are few and scattered may well be difficult.

As a step toward developing a local plan to eliminate tuberculosis, we reviewed the tuberculosis case load for Washington County, MD, for the period July 1975 through September 1990. Even

though the number of cases was small, they may act as a "straw in the wind" to illustrate the distribution of tuberculosis in a nonurban area.

### Materials and Methods

Washington County is a semi-rural area in western Maryland. Most of its 462 square miles lie in the broad valley between the Blue Ridge Mountains on the east and the rest of the Appalachian Mountains on the west. Its population was 103,829 in 1970 and 121,393 in 1990. Losses from outmigration are low, especially among persons older than age 35. Farming still remains important to the economy. The industrial base consists largely of small private firms, although State and local governments are the largest employers in the area, as they are in most small communities. The county seat, Hagerstown, has approximately 35,000 inhabitants. The remainder of the population is divided more or less evenly between the suburbs of Hagerstown and the scattered small towns of the surrounding rural areas.

All tuberculosis cases reported to the Washington County Health Department from July 1975 through September 1990 were reviewed and abstracted. There is no evidence to suggest that there are tuberculosis cases not reported to the health department in this small and closely knit community. Attempts were also made to link reported cases to the private census of Washington County con-

Observed and expected cases of tuberculosis, by demographic characteristics and smoking history of patients, Washington County, MD, July 1975 through September 1990

Characteristics	Number of cases		O:E <sup>2</sup>
	Observed	Expected <sup>1</sup>	
<b>Race:</b>			
White .....	54	66.0	0.8
Black .....	8	1.6	5.0
Asian .....	6	0.5	12.0
<b>Sex:</b>			
Male .....	39	33.8	1.2
Female .....	29	34.2	0.8
<b>Age (years):</b>			
0-14 .....	2	14.1	0.1
15-24 .....	3	12.6	0.2
25-44 .....	16	18.7	0.9
45-64 .....	21	14.6	1.4
65 or older .....	26	8.1	3.2
<b>Marital status (ages 15 and older):</b>			
Married .....	38	41.2	0.9
Single .....	13	16.0	0.8
Separated .....	1	1.7	0.6
Divorced .....	5	3.5	1.4
Widowed .....	11	5.5	2.0
<b>Residence:</b>			
Hagerstown .....	37	20.5	1.8
Suburbs .....	11	18.6	0.6
Towns (1-2,000 population) ..	5	3.9	1.3
Rural .....	15	25.0	0.6
<b>Education (years) for persons 25 and older in 1975 (N = 39):</b>			
0-11 .....	26	<sup>3</sup> 17.3	1.5
12 .....	5	<sup>3</sup> 14.0	0.4
13 or more .....	9	<sup>3</sup> 7.8	1.2
<b>Smoking history (N = 39):</b>			
Never smoked .....	17	<sup>3</sup> 16.6	1.0
Ever smoked .....	22	<sup>3</sup> 22.4	1.0

<sup>1</sup> Based on sex and age distribution of 1980 Census population.

<sup>2</sup> Ratio of observed cases to expected cases.

<sup>3</sup> Based on distribution in 1975 private census.

ducted in July 1975 by the Training Center for Public Health Research as a basis for subsequent studies. Characteristics of the people with tuberculosis were compared with characteristics of the general population as reported in the 1980 Census (1). In the 1975 private census, estimated to have obtained information on approximately 90 percent of the population, those people with the disease were compared with all those enumerated in that census.

## Results

Of the 74 persons reported to the health department during the 15-year period as having tuberculosis considered to be in need of treatment, 6 were

excluded. One of the 6 was eventually diagnosed as having lung cancer, another as having disease due to *Mycobacterium kansasii*, one was living on an adjacent military reservation, and three were inmates of a State prison situated in the county.

The 68 remaining cases were reported by 74 sources, since six cases were reported twice. Of the 74 reports, 54 percent were received from private physicians, 34 percent from hospitals, and 12 percent from the health department. The last group consisted either of persons whose disease was detected by passive screening or of recently immigrated persons directed to the health department by the U. S. Immigration and Naturalization Service.

Diagnoses were based on microscopic smears and cultures in 59 percent of the cases, on culture alone in 13 percent, and on smear alone in 6 percent, with 22 percent being diagnosed only on pathological or clinical grounds. Information on risk factors was poorly recorded, largely because histories on referrals from private physicians were rudimentary. Risk factor information was noted in only 33 cases. In 11 cases it was specifically stated that there were no known risk factors, in 12 there had been a prior diagnosis of tuberculosis, 5 cases were among immigrants from high prevalence countries, 4 persons had only a history of prior contact with tuberculosis, and 1 had been treated with high doses of corticosteroids.

Nearly half of the people with tuberculosis (44 percent) were treated by the health department, and a third (34 percent) by private physicians. Another 15 percent were treated jointly by private physicians and the health department. The Veterans Administration and other hospitals furnished treatment and supervision for the remaining 7 percent. At the time that this paper was prepared, 3 persons were still under treatment, and 11 had died during treatment, 4 of tuberculosis and 7 of nontuberculous causes. Of the remainder, 50 were considered to have been cured, and the status of 4 is unknown. When the health department was involved in treatment and supervision of the cases, the cure rate was 94 percent, compared with 74 percent when other caregivers had sole responsibility ( $P = 0.07$ ).

The demographic characteristics of the patients and comparisons with the 1980 Census population of Washington County are shown in the table. Only 21 percent of the afflicted persons were nonwhites, but the risk of developing tuberculosis among them appeared to be far greater than among whites. There was a slight excess of cases among men, and a considerable excess of cases among

older persons, equally noticeable among white men and women. The excess of cases among widowed persons is largely the result of their older ages. The excess of cases among inhabitants of Hagerstown, however, cannot be attributed to an excess of older persons in its population. Compared with the age distribution of the 1980 Census population, elderly persons with tuberculosis were concentrated disproportionately in the rest of the county rather than in the city. Unmarried persons ages 15 and older with tuberculosis were concentrated in Hagerstown. Of those with the disease living in the city, 54 percent were unmarried, compared with 24 percent in the rest of the county, and 39 percent in the total county population in 1980.

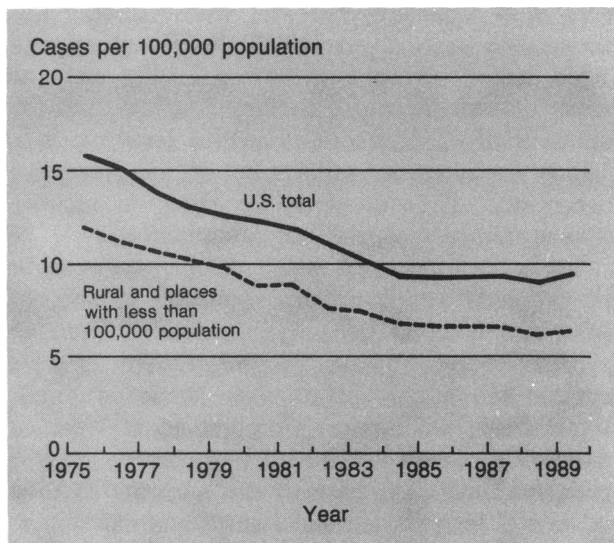
Only 41 of the 68 persons with the disease had been enumerated in the 1975 private census. If people with tuberculosis had been enumerated in the private census to the same extent as the rest of the population, and if their immigration into the county had also been similar, a total of some 50 cases would have been expected in the 15-year period. This excess of expected cases suggests that persons likely to develop tuberculosis were concentrated to some extent among nonparticipants in the private census, or among post-census immigrants to the county, or most likely, among both groups.

The number of years of school completed was available from the private census as one index of socioeconomic status for persons ages 25 and older. The distribution of cases by years of schooling and the expected number based on the private census participants adjusted for sex and age are shown in the table. The greatest excess of cases was among persons with less than a high school education. Surprisingly, there was not a downward gradient with the number of years of schooling; since there was also an excess of tuberculosis cases among those who had had some education after high school. Smoking history in 1975 was not associated with subsequent tuberculosis.

## Discussion

This review of tuberculosis cases reported during a 15-year period has been of only slight help in targeting high-risk populations for tuberculosis control activities. Of the six cases among Asians, a group at highest risk, three were reported by the immigration authorities. The other three developed after arrival in this country: one, an infant, developed military tuberculosis shortly after a long visit with a tuberculous grandmother in an Asian country. Among the small black population, casefinding

Tuberculosis case rates for the United States and for rural areas and places with less than 100,000 population, 1975 through 1989



has always been plagued by low participation, possibly because it has not been feasible to employ black outreach workers. Although almost half of the cases among whites were in persons older than age 65, this proportion amounts to an average of less than two cases per year, making them small needles in a large and diffuse haystack of senior citizens.

Persons with broken marriages living in inner cities have been reported to account for a disproportionately high percentage of tuberculosis cases (2). Of the 21 unmarried persons with tuberculosis living in Hagerstown, seven were black, a group already identified as high risk. Only two of them were enumerated in the private census—one was a college graduate and the other had completed high school. Ten of the 14 unmarried whites were identified in the private census; their educational status was essentially the same as the total case group. A review of the addresses of these 21 unmarried patients showed a slight concentration toward the center of the city. No persons with the disease, white or black, lived in the affluent areas of the city. A detailed review of case characteristics failed to show a concentration sufficient to be attractive for casefinding purposes.

None of the people with tuberculosis was known to have been HIV-infected; none was a known drug abuser; and none was homeless in the usual sense, though a few put severe strains on their ties to families and friends.

An encouraging finding was that only 2 of 33 persons with adequate medical histories could be identified as having had contact with someone

suffering from tuberculosis within the period of this review. In each of these two cases, contact had been with a person elsewhere whose disease was active. We would like to think that the absence of cases among contacts identified locally was the result of our preventive therapy program, but the numbers of cases are too small to justify such a claim. In addition, as is true of all preventive procedures, failures are much easier to identify than successes, which usually go unnoticed.

There are some areas where our program can be strengthened with a reasonable chance of success. Adequate histories need to be obtained from all persons reported to have tuberculosis. When people are treated solely by private physicians or hospitals, information should also be obtained at frequent intervals to assure that adequate treatment is being prescribed and that patients are adhering to their regimens. Infants and children from high prevalence areas need to be tuberculin tested, and if positive, put on preventive therapy. Presenting the findings of this review to the local medical society should strengthen the argument for this minimal intrusion into medical practice.

Perhaps a major lesson for areas where tuberculosis cases are few and scattered is that both the medical profession and the public need to be reminded periodically that tuberculosis is still with us. For the medical profession, an annual review of the reported cases during a year and the missed opportunities for prevention of disease, disability, or death could be made, somewhat along the lines of the once successful maternal mortality committees (3). For the public, this annual review could be used as a framework for a news article that would include hints for minimizing the risk of tuberculosis and improving personal health in general.

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## Use of Seatbelts in Cars with Automatic Belts

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**Synopsis**.....

*Use of seatbelts in late model cars with automatic or manual belt systems was observed in*

*suburban Washington, DC, Chicago, Los Angeles, and Philadelphia. In cars with automatic two-point belt systems, the use of shoulder belts by drivers was substantially higher than in the same model cars with manual three-point belts. This finding was true in varying degrees whatever the type of automatic belt, including cars with detachable non-motorized belts, cars with detachable motorized belts, and especially cars with nondetachable motorized belts.*

*Most of these automatic shoulder belts systems include manual lap belts. Use of lap belts was lower in cars with automatic two-point belt systems than in the same model cars with manual three-point belts; precisely how much lower could not be reliably estimated in this survey. Use of shoulder and lap belts was slightly higher in General Motors cars with detachable automatic three-point belts compared with the same model cars with manual three-point belts; in Hondas there was no difference in the rates of use of manual three-point belts and the rates of use of automatic three-point belts.*