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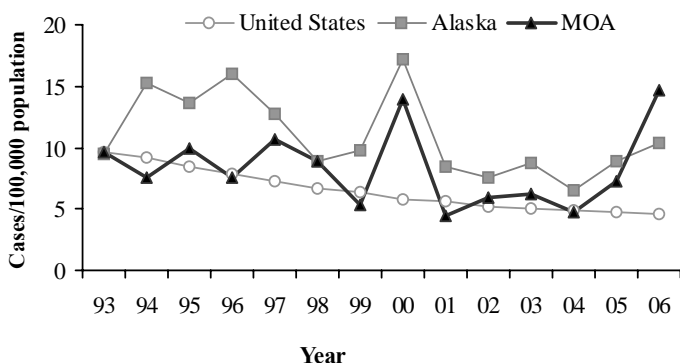
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Tuberculosis — Municipality of Anchorage, 2006

Introduction

During 2006, 41 persons with active tuberculosis (TB) were reported to the Municipality of Anchorage, representing 59% of the 70 cases reported statewide. The annual Anchorage TB rate was 14.7 cases per 100,000 people, the highest rate for more than 14 years. By comparison, Alaska and the U.S. had annual TB rates of 10.4 and 4.6 cases per 100,000, respectively, during 2006 (Figure 1).¹

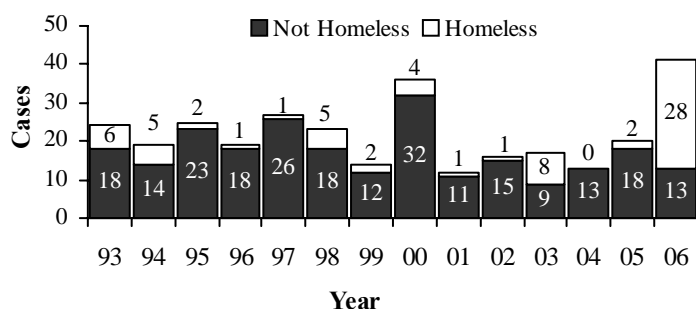
Figure 1. Tuberculosis rates — The United States, Alaska, and the Municipality of Anchorage (MOA), 1993–2006



Outbreak among the Homeless

The Anchorage TB rate more than doubled from 2005 to 2006 due to an outbreak among homeless persons. From 1993 to 2005, on average, three homeless persons with TB were reported per year (Figure 2). During 2006, 28 (68%) of the 41 TB cases reported in Anchorage were among homeless persons.

Figure 2. Number of TB cases by Homelessness Status — Municipality of Anchorage, 1993–2006



Of the 28 homeless TB patients reported in 2006, 18 (64%) were male, 25 (89%) were Alaska Native/American Indian, three (11%) were white, and one (4%) was foreign born. The median age at diagnosis was 45 years; four were children, ages 4 months to 8 years. Seventeen (63%) of the patients were alcoholic, and one (4%) was co-infected with HIV.

Ten (36%) of the homeless TB patients were identified by contact investigation, five (18%) were identified during mass screening at homeless shelters, and four (14%) were identified during evaluation for clinical illness. For the remaining nine cases, the reason for TB evaluation was not available; however, of these, eight were identified at medical facilities and thus might have presented with clinical illness.

Antibiotic Resistance

While 9% of cases from 1993 to 2005 involved *Mycobacterium tuberculosis* isolates that were resistant to isoniazid, none of the 2006 Anchorage cases involved drug resistant TB.

Mortality

Four of the 41 TB patients died. Two were homeless patients who died of hypothermia within five months after starting TB treatment. The other two were elderly non-homeless patients who were not diagnosed with TB until after they had died. One patient had heart failure and end-stage renal disease and died one day after being admitted to the hospital for fever and pneumonia; pleural fluid from the day of admission grew *M. tuberculosis*. The other patient had terminal lymphoma, cardiomyopathy, pulmonary emboli, and anemia; pleural fluid obtained 3 weeks before death grew *M. tuberculosis*.

Current Status

As of April 13, 2007, 27 (66%) of the 41 Anchorage TB patients had completed treatment using directly observed therapy (DOT). Of 14 patients who had not completed TB treatment, nine are still receiving treatment, one (a homeless patient) was lost to follow-up 5 months after starting treatment, and four died.

M. tuberculosis Genotyping

Genotyping showed that while 13 distinct genotypes occurred among Anchorage cases, 79% of the homeless persons had the same genotype. Many homeless patients who had the same genotype were known contacts of each other and thus formed an epidemiologically confirmed genotyping cluster.

Discussion

At least 19 of the homeless TB patients reported here were likely involved in the same chain of transmission. Homeless persons suffer disproportionately from malnutrition, substance abuse, poor sanitation, crowded sleeping arrangements in shelters, and limited access to health care, which increase their risk for developing and transmitting TB. Many of these same factors delay diagnosis, and thus increase the risk of clinical illness and transmission to others. At least four and potentially 12 cases were not identified until they were seen by a medical provider for clinical illness. Another five were identified only as a result of increased screening at the homeless shelters during 2006. These results suggest that ongoing frequent screening of homeless persons will be critical for the foreseeable future to provide early detection and prevention of TB transmission.

Treatment of homeless TB patients is difficult and utilizes considerable public health resources. In 2006, the Alaska TB Program provided funds for temporary housing of homeless persons with TB. This greatly improved the ability of the Anchorage Department of Health and Human Services to deliver DOT and achieve timely completion of treatment. Unfortunately, continued funding is currently not available, making it difficult to interrupt TB transmission in the homeless community.

Two persons were diagnosed with TB post-mortem. Conditions that debilitate the immune system such as HIV, diabetes, renal failure, hematological diseases, and corticosteroid therapy increase TB risk. Health care providers thus should consider TB in persons who present with such debilitating conditions.

Reference

- Centers for Disease Control and Prevention. Trends in tuberculosis incidence — United States, 2006. *MMWR Morb Mortal Wkly Rep* 2007;56:245-250.