

Part II – Tuberculosis in Social Context

E.L. Trudeau was quick to distinguish between a helpful therapy and a cure. He opened the Adirondack Cottage Sanitarium, where poor and rich alike could come and receive the benefits of fresh air, plenty of sunlight, rest, and abundant but simple nourishing food. Hundreds benefited. Similar institutions opened up in the U.S., and the movement was already well underway in Western Europe. But the cure would only come in the 1950s with the discovery of antibiotics that were effective against the mycobacterium.

Question 1: The curve shown in Figure 2 has three parts, from 1700–1800, 1800 to approx. 1955, and 1955 to approximately 1985. The data used to produce the curve are from Western Europe, but a similar one could be expected for the United States. From what you know of the history and culture of the United States and Western Europe, write a sentence telling why each part of the curve looks the way it does. In looking just at this graph, what would you predict about the death rate from TB in 2000 and 2005?

In recent years, a combination of development of antibiotic resistant strains of MTb along with the creation of a reservoir of immunocompromised people by the worldwide AIDS epidemic have contributed to a resurgence of tuberculosis in the United States and a worldwide upswing in TB cases and deaths. This resurgence has been accompanied by a resurgence of interest in the disease by scientists asking new questions about the nature of true host genetic susceptibility/resistance genes for tuberculosis, about virulence genes within the mycobacterium itself which might offer new drug targets, and about the epigenetic factors that may influence disease predisposition and outcome in people with tuberculosis.

Question 2: Tuberculosis causes nearly 2 million deaths worldwide each year. Between 1985 and 1992, cases of TB in the United States increased by 20 percent, as shown in Figure 3. Write a paragraph suggesting a few reasons why this resurgence of TB might have occurred in the United States.

Question 3: The resurgence lasted until approximately 1992, then, in the United States, it began to abate. In 2005 the TB case rate in the U.S. was 4.8 per 100,000, as the U.S. medical community brought the epidemic under control (Centers for Disease Control & Prevention, National Prevention Information Network, n.d.). However, in U.S. prisons and all over the world TB remains a serious health problem. In the U.S., zero tolerance drug laws have resulted in a burgeoning incarcerated population, which constitutes a significant reservoir of disease, with a far higher incidence rate than the general population. In New York prisons, the incidence rate of TB is 156.0/100,000 compared to the rate of 10.4/100,000 in the general population (U.S. Agency for International Development, 2009). Considering all you have learned in Parts I and II, discuss why these rates may be so much higher in prison.

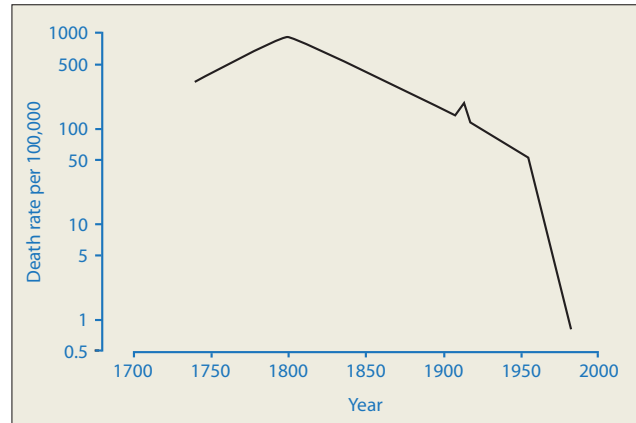


Figure 2: Western European mortality statistics—TB deaths over time (Based on Murray, 2001).

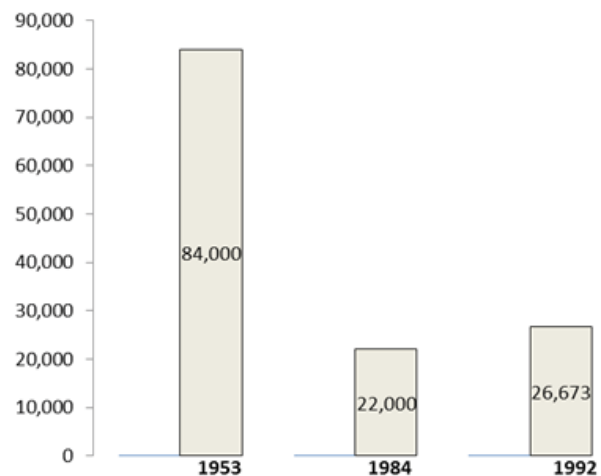


Figure 3: TB Cases in the United States

In 2006, there were 9 million new cases of tuberculosis worldwide, many of these caused by drug-resistant strains of the mycobacterium. Scientists struggle to find new drugs that will be effective against the resistant strains and to propose better treatment regimens involving more direct observation of treatment (DOT) to assure patient compliance. Additionally, many have called for public acceptance and physician support for more responsible dispensing of antibiotics. These are difficult and complex problems that require a resolve on the part of many sectors coupled with a willingness to devote adequate resources to a fight a disease that most often strikes people in the poorest of places.

Additionally, it is certainly the case that many modern TB cases occur in a global incarcerated population of approximately 8 million (U.S. Agency for International Development, 2009). Many of those incarcerated were political prisoners taken prisoner in war zones. Conditions in the prisons include inadequate ventilation, poor nutrition, negligent healthcare, HIV co-infection, and rampant despair. How does this resonate with what you've learned of E.L. Trudeau's experience in the late 19th century?

We know a lot about how to prevent and treat tuberculosis. There is much more to be learned. In 2010, 8.8 million people in the world fell ill with TB and 1.4 million died (World Health organization, 2012).

Question 4: All of the following factors are important in causing the worldwide resurgence of tuberculosis:

- (a) emergence of strains that are resistant to one or more of the available antibiotics effective against MTb;
 - (b) incomplete or inadequate understanding by scientists of the details of the host/pathogen interaction in MTb infection;
 - (c) lack of a universally-accepted vaccine;
 - (d) lack of financial support for science and for public health initiatives in developing countries;
 - (e) famine;
 - (f) geopolitical instability in the developing world; and
 - (g) inadequate public awareness of public health issues.
- If you were a billionaire philanthropist like Warren Buffet or Bill Gates, where would you focus your efforts against tuberculosis?

References

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