Tuberculosis Surveillance: Data for Decision-Making

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(See the article by Falzon and Ait-Belghiti on pages 1261–7)

Disease surveillance has often been described as the “conscience” of an epidemic. Surveillance represents a discipline that is often taken for granted in the practice of epidemiology, yet surveillance data are commonly requested and quoted. Surveillance data are crucial to measuring the burden of diseases and, thus, serve as the basis for informed decisions regarding the planning and targeting of health care interventions. Ideal surveillance systems are comprehensive, accurate, and timely. Analysis and reporting of information to those “who need to know” completes the “feedback loop” of robust and useful surveillance systems. An early example of the analysis and use of tuberculosis mortality trends in the United Kingdom was published by Frost [1], who helped to elucidate the influence of cohort year of birth.

The article by Falzon and Ait-Belghiti [2], published in this issue of Clinical Infectious Diseases, reflects a commendable assessment of tuberculosis trends in the 25 countries belonging to European Union, based on data collected and collated by EuroTB, a surveillance network implemented in 1996 [3]. Before the implementation of EuroTB, tuberculosis surveillance data in the various European countries was heterogeneous and lacked agreed-upon case definitions, which made it difficult to draw valid comparisons.

Taken at face value, the report by Falzon and Ait-Belghiti [2] provides a mixture of good news and bad news about recent trends in tuberculosis. The good news is that tuberculosis trends have decreased between 1999 and 2003—the time period examined—throughout all European Union countries except for Italy and United Kingdom. However, the bad news includes worrisome new trends that suggest an increasing convergence between the occurrence of tuberculosis and HIV infection, a growing proportion of drug-resistant Mycobacterium tuberculosis complex strains in some countries, and the inevitable reflection of the global public health problem of tuberculosis in developing countries, manifesting throughout Europe as a larger proportion of foreigners reported with tuberculosis in countries with low incidences of tuberculosis. These appear to be the main messages inferred from tuberculosis surveillance in European countries.

Close scrutiny of these findings reminds us of the limitations of these valuable data. Surveillance data are influenced by the completeness and comprehensiveness, as well as the accuracy and validity, of the collected information. The authors indicate that the analyses were neither adjusted for underreporting nor independently validated, and they disclose limitations of the EuroTB data. Three important limitations must be borne in mind when interpreting these data, so that readers can readily temper each of the main findings with a full understanding of the reported information.

First, the HIV infection status of patients with tuberculosis was reported by 13 (52%) of 25 countries. The exact number of persons tested in each country is not provided, thus restricting a full understanding of these findings. Second, drug-susceptibility data were reported for 15 (60%) of 25 countries in which ≥50% of reported cases were confirmed by culture and in which drug-susceptibility testing was performed for ≥80% of patients with tuberculosis who had positive cultures. This suggests that, in some countries, as many as almost one-half of patients do not have their tuberculosis infection status confirmed by culture, and even fewer patients have drug-susceptibility test results. Third, data about place of birth is shown, but incidences were not calculated on the basis of systematically collected information; the authors had to rely on information provided by each country about “population statistics…to derive rates by geographic origin” [2, p. 1263]. Uncertainties associated with census information regarding immigrant populations, who are often residing ille-
gally in these countries, make these estimates suspect.

What are decision-makers to do with these data? This question represents the quintessential challenge of public health practice. Despite the aforementioned limitations, informed interventions can and should be undertaken while awaiting the collection of additional information. It is reasonable to suggest, as the authors have, that these European Union countries must now strive to focus attention on the highlighted findings. Thus, immediate interventions are now required in 3 specific areas.

First, all European Union countries must work to achieve better coordination between HIV infection and tuberculosis services, to ensure that all persons with tuberculosis are offered testing for HIV infection. Conversely, those individuals who are known to have HIV infection deserve to be screened for the presence of latent *M. tuberculosis* infection or tuberculosis disease (a very common HIV-associated opportunistic infection, as shown by data reported to EuroHIV) and offered safe and effective treatment. Attention to infection-control precautions is also necessary, with special emphasis on settings in which persons with HIV infection and tuberculosis converge and congregate. A policy framework is available from the global Stop TB Partnership Working Group on TB/HIV [4]. These interventions will, in turn, serve to provide more-robust and more-representative data about the prevalence of HIV infection in persons with tuberculosis and the frequency of tuberculosis as an HIV-associated opportunistic disease. In addition, these figures can be used to monitor and evaluate the impact of interventions.

The second identified need is to sustain and expand adherence to the core principles of tuberculosis control, which are aimed at improving individual outcomes, reducing the risk of ongoing community transmission of *M. tuberculosis* complex, and preventing the development of drug resistance. Recently published international standards for tuberculosis care offer the opportunity for broad-based implementation of these sound practices [5]. Furthermore, European Union countries already have a robust and ambitious framework for the elimination of tuberculosis in areas of low incidence [6]. In this context, countries with established market economies ought to implement routine access to real-time culture and drug-susceptibility testing for all persons suspected of having tuberculosis. Once persons are identified as having multidrug-resistant (MDR) strains, access to subject matter expertise and second-line drug regimens are necessary to help guide clinicians through the complexities associated with the administration of the relatively toxic drugs used to treat MDR tuberculosis. In response to the relatively high prevalence of MDR tuberculosis, authorities in Latvia made a commitment to develop collaborations to create a center of excellence for care of persons with MDR tuberculosis, where training, education, and expertise can be accessed [7, 8]. Furthermore, the recent description of extensively drug-resistant tuberculosis—including in samples obtained from patients in the European region—provides a rude “wake-up call” to cease long-standing hesitation and indecisive “hand-wringing” and, instead, to mobilize resources to promptly provide access to the latest diagnostic tools for optimal patient care [9–12]. Additional resource investments are required to carry out the necessary research, development, and rapid translation of new rapid diagnostic methods and new safe and effective drug regimens for those with virtually untreatable forms of extremely drug-resistant tuberculosis.

Third, the very fact that ~9 million incident cases of tuberculosis and almost 2 million annual tuberculosis-related deaths are estimated by the World Health Organization—mostly from developing countries, where the cases in foreign-born patients reported in EuroTB originate—compels us all, including countries in the European Union, to become fully engaged in the global fight against tuberculosis [13, 14]. Migration of persons from countries with a high burden of tuberculosis to European Union countries with low tuberculosis incidence clearly demonstrates how local victories are being counteracted by global realities. This situation is very similar to that seen in the United States [15, 16]. A recent decision analysis suggested that investments by the United States in the control of tuberculosis in Mexico, the Dominican Republic, and Haiti—where a large fraction of patients with cases of tuberculosis in the United States originate—“is the most effective long-term approach to reducing tuberculosis morbidity and mortality among migrants from those countries and would produce net savings to the United States” [17, p. 1018]. European Union countries should consider undertaking similar decision analyses to ascertain the value of such foreign health policy investments.

In sum, the EuroTB data are telling us that this is no time for complacency. They suggest the need for concerted action to both sustain hard-won achievements and adapt to the changing epidemiology of tuberculosis in these countries if we are to reduce unnecessary suffering, address the HIV infection and tuberculosis pandemics, and develop safe and effective treatment regimens to protect future generations.

Acknowledgments


References