Editorial

Global Tuberculosis Elimination: The Relevance of Trend Surveillance in Mexico and Beyond☆

Eliminación mundial de la tuberculosis: la importancia de vigilar las tendencias en Méjico y otros lugares

Giovanni Sotgiu,[a] Giovanni-Battista Migliori,[b] Joan B. Soriano[c,]*

[a] Unidad de Epidemiología Clínica y Estadística Médica, Departamento de Ciencias Biomédicas, Universidad de Sassari, Unidad de Investigación, Formación Médica y Desarrollo Profesional, AOU Sassari, Sassari, Italy
[b] Centro Colaborador con la OMS para la Tuberculosis y Trastornos Pulmonares, Fondazione S. Maugeri, Centro de Asistencia e Investigación, Tradate, Italy
[c] IdISPa-FISIB, Hospital Universitari Son Espases, Palma de Mallorca, Spain

From a Public Health perspective, what is not measured does not exist, and more importantly, cannot be tackled. In the case of pulmonary tuberculosis, an all-time partner of mankind, close monitoring and surveillance, both of successes as well as of failures, are considered fundamental for designing national and international strategies for the control and eventual elimination of this disease. In this issue, Archivos et al.,[1] using a case-series analysis of national administrative data, report pulmonary tuberculosis mortality trends in Mexico. They found recent, large decreases in annual pulmonary tuberculosis mortality rates in all regions of Mexico, which is already a success story, although some heterogeneity was observed for gender (men presented higher mortality than women), education (higher in those with incomplete elementary school), and geographical area. This report is significant because it describes the impact of tuberculosis in the general population in terms of mortality, the worst epidemiological indicator and clinical outcome of Mycobacterium tuberculosis infection. From a Public Health perspective, surveillance is crucial for the better understanding of the performance of a healthcare system in a specific geographical setting[2]; in particular, it ascertains the bacteriological efficacy of the therapy prescribed by the physicians, and, indirectly, monitors physicians' ability to diagnose new tuberculosis cases (diagnostic delay is associated with increased mortality), the adherence of patients to anti-tuberculosis regimens, and the performance of the Public Health system in retaining patients in the treatment program [i.e., follow-up with directly observed treatment (DOT)]. The evaluation of one estimate and its trend over time can provide crucial information which should be carefully evaluated by all stakeholders, particularly politicians and policymakers. Of course, an essential prerequisite for these evaluations is the existence of a reliable epidemiological reporting system. A high under-reporting rate could undermine the usefulness of the epidemiological indicators and subsequent Public Health inferences.[2]

Similar approaches to that of Sánchez-Barriga[1] have already been reported in Spain[3] and Latin America,[4] and some limitations might be mentioned. Given that this work is based only on administrative data, no formal validation of diagnoses and other issues can be made and underreporting practices can be widespread. In Mexico, secular changes and the generalized transition, in epidemiological terms, from infectious to non-communicable chronic diseases are other factors that can indirectly, but significantly, modify specific pulmonary tuberculosis indicators, including mortality. When exploring pulmonary tuberculosis mortality and education, the authors' finding of an advantageous association with complete primary education, both versus higher education but also from no education whatsoever, raises more questions than it answers. All in all, these data call for careful interpretation.

The last World Health Organization (WHO) Tuberculosis Global Report, issued in 2013, depicted tuberculosis epidemiology in 2012 and compared the latest epidemiological estimates with those computed in the recent past.[2] Global mortality has declined by 45% since 1990, meaning that the goal set for reduction of tuberculosis mortality by 2015 has almost been achieved. In WHO regions in the Americas and Western Pacific, the 1990 objectives for all the most important epidemiological indicators (i.e., incidence, prevalence, and mortality) have already been reached. In 2012, there were a total of 1.3 million deaths worldwide, of which 940,000 were HIV-negative subjects and 320,000 HIV-positives. In several geographical areas, this outcome is significantly influenced by the high prevalence of concomitant tuberculosis and HIV infection and drug-resistant tuberculosis (particularly, multi- and extensively drug-resistant strains). The increase in incidence recently detected in some WHO regions, associated with poor clinical and Public Health management (e.g., few therapeutic alternatives, poor diagnostic technologies, poorly funded health-care systems, inadequate program integration and cooperation), could impact negatively on the positive results obtained in the last decades.

* Corresponding author.
E-mail address: jbsoriano2@gmail.com (J.B. Soriano).

Moreover, both global and national economic crises might affect pulmonary tuberculosis mortality.[5] Worse tuberculosis-related outcomes have been shown to be associated with poor socio-economic status, both at a macro- and micro-economic level. In the current situation, governments are cutting their annual health budgets: this political decision, forced by the global emergency, goes in contrary to the recommended WHO Public Health strategies (DOTS Strategy and Stop-TB Strategy),[6] which encourage a continuous political commitment toward tuberculosis and strengthening of healthcare systems. The decision of politicians to make economic cuts means that less money is allocated to the health field and even less to human resources; this results in a malfunctioning system that in the mid-term translates to an increase in deaths from tuberculosis. Direct and indirect costs associated with tuberculosis are significant. It has been systematically proven that low- and middle-income countries suffer in terms of epidemiological outcomes following a decrease of financial support from central governments.[7]

Furthermore, tuberculosis is a disease resulting from a qualitative and quantitative immune imbalance; immunological failure can depend on several clinical and/or social factors, including comorbidities, such as diabetes mellitus, chronic renal failure, silicosis, drug or alcohol addiction, malnutrition, poverty, and others.[8] Hence, the pathogenesis of the disease may depend not only on clinical conditions but also on social conditions that can foster the progression of disease until death. Social discrimination, routinely experienced by migrants coming from low-income countries to high-income countries, is common and gender bias may be an issue in some geographical areas: females with severe disease might be obliged to stay at home because their transfer to hospital can be interpreted as a stigma for the entire family.[9,10] A socio-cultural revolution is needed because detection rates and, consequently, treatment outcomes improve among an educated population, particularly in marginalized groups.

Management of the above-mentioned factors for tuberculosis prevalence and incidence requires an increased effort in terms of financial, human, organizational and operational resources. The coordination of national programs must be continuously monitored. This multi-dimensional problem has been addressed by the new WHO Public Health strategy, aimed at eliminating tuberculosis by 2050 (*i.e.*, global incidence <1 case per 1 000 000 population).[11] It is called the Post-2015 Strategy and is based on three principles: integrated patient-centered care and prevention; bold policies and support systems; and intensified research and innovation. All these elements are patient-centered, but the classical, old-fashioned, clinical view is maintained: individuals with tuberculosis (or at high risk of developing it) should be managed in a specific framework where the various risk factors can be fought in a coordinated, multi-dimensional, multi-disciplinary manner. This scenario is healthcare-focused, politics-driven and allows economic and financial resources to be allocated on the basis of an evidence-based approach. By following this tactical political methodology, strategic goals can be realized: no deaths and no suffering from tuberculosis.

Any chest physician or primary care doctor in Mexico might be approached by a pulmonary tuberculosis patient asking: "Doctor, ¿estoy chingao?" (*Doctor, am* I *a goner?*).[12] Answers for these and other questions are desperately and urgently needed.[13] All in all, coordinated political action is needed. Despite the present economic climate, interventions from all stakeholders must be adequate and appropriate. The first step must be the adoption and adaptation of the new WHO strategy and the reliable translation of these strategic formulas into real-world actions, focused on addressing the goal of the elimination of tuberculosis.

References

1. Sánchez-Barriga JJ. Mortality trends and risk of dying from pulmonary tuberculosis in the 7 socioeconomic regions and the 32 states of Mexico, 2000–2009. Arch Bronconeumol. 2015;51:16–23.
2. WHO TB Global. Report 2013. Ginebra: World Health Organisation; 2013.
3. Calpe JL, Chiner E, Marín J, Armero V, Calpe A. Evolución de las características epidemiológicas de la tuberculosis en el Área 15 de la Comunidad Valenciana en el período 1987–2001. Arch Bronconeumol. 2005;41:118–24.
4. Palmero DJ, Laniado Laborín R, Caminero Luna JA. Guías latinoamericanas de diagnóstico y tratamiento de la tuberculosis farmacorresistente. Arch Bronconeumol. 2008;44:578.
5. Sotgiu G, Mauch V, Migliori GB, Benedetti A. Evidence-based, agreed-upon health priorities to remedy the tuberculosis patient's economic disaster. Eur Respir J. 2014;43:1563–6.
6. Raviglione MC. The new stop TB strategy and the global plan to stop TB, 2006–2015. Boletín de la OMS. 2007;85:327.
7. Tanimura T, Jaramillo E, Weil D, Raviglione M, Lönnroth K. Financial burden for tuberculosis patients in low- and middle-income countries: a systematic review. Eur Respir J. 2014;43:1763–75.
8. Creswell J, Raviglione M, Ottmani S, Migliori GB, Uplekar M, Blanc L, et al. Tuberculosis and noncommunicable diseases: Neglected links and missed opportunities. Eur Respir J. 2011;37:1269–82.
9. Krishnan L, Akande T, Shankar AV, McIntire KN, Gounder CR, Gupta A, et al. Gender-related barriers and delays in accessing tuberculosis diagnostic and treatment services: A systematic review of qualitative studies. Tuberc Res Treat. 2014;2014:215059.
10. Chang SH, Cataldo JK. A systematic review of global cultural variations in knowledge, attitudes and health responses to tuberculosis stigma. Int J Tubercul Lung Dis. 2014;18:168–73.
11. Junta Ejecutiva de la OMS. Estrategia y objetivos para la prevención de la tuberculosis, la atención y el control mundial después de 2015. Informe de Secretaría.
12. Montes de Oca Sicilia MP. El Chingonario. Uso, reuso y abuso del chingar. Editorial Otras Inquisiciones. 2010.
13. Vázquez-García JC, Salas-Hernández J, Pérez Padilla R, Montes de Oca M. Salud respiratoria en América Latina: número de especialistas y formación de recursos humanos. Arch Bronconeumol. 2014;50:34–9.