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The pros of plurality for tuberculosis burden estimates

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Tuberculosis (TB) is now reckoned to be the leading infectious cause of death.¹ That multiple people die every minute from a cheaply curable disease, which has been reduced to incidence rates of below 0.01% per year in many rich countries, is plainly unacceptable. The evidence to support statements on the extent of the TB pandemic most often comes from the burden estimates released annually by the Global TB Programme at the World Health Organization (WHO).¹ The other set of global TB disease burden estimates are those of the Global Burden of Disease studies from the Institute of Health Metrics and Evaluation (IHME), which include TB as part of a large range of causes of deaths and disability.² Both sets of estimates for mortality rely on high quality vital registration systems in countries where they exist; unfortunately, in many high TB burden countries such systems are lacking, and differences in the modelling approaches used to leverage other data sources (and to some extent, the inclusion of additional mortality data such as verbal autopsy by IHME) lead to differences between the WHO and IHME estimates, particularly at the country level.

In this issue of *International Journal of Epidemiology*, García-Basteiro and colleagues systematically compare the two sets of TB mortality estimates, finding a 29% difference globally relative to their average.³ While there is 92% correlation between this set of WHO and IHME country-level estimates, the global difference is larger than it has been in previous estimation rounds and is clearly worthy of scrutiny. García-Basteiro and colleagues find that the difference is largest in countries with a low case detection rate (which is likely to correlate negatively with availability or quality of vital registration data) and countries with recent prevalence surveys (suggesting the importance of methodological differences in utilizing such data in indirect estimates of mortality). It is striking that of the 12 countries with the largest absolute difference in estimated TB deaths in this analysis, none was based straightforwardly on vital registration data in the 2016 WHO round considered here. As authors from both WHO⁴ and IHME² have noted: the differences are greatest where the data are weakest; where good quality vital registration data exist, as one would hope, the estimates closely align. The obvious implication of this is that the best way to improve TB mortality estimates is to promote the wider development of high quality vital registration systems (which WHO is supporting), and to undertake mortality surveys in the interim.

Estimates of disease burden are undeniably important. They are used in advocacy, planning and prioritization, development assistance funding applications, and in allocating resources. They are also used to monitor progress at the global level, for example towards the targets of the End TB strategy. This implies that there is power associated with generating estimates,⁵ whether sought for or not, and its legitimacy rests partially on the reproducibility and transparency to scientific criticism of the results. Initiatives such as the GATHER (Guidelines for Accurate and Transparent Health Estimates Reporting) statement and checklist⁶ should help spur improvements in this regard, although challenges are likely to remain around ownership and public availability of certain data, and around the sheer complexity of some of the methods and their communication.

Communication is key, however. While it can create recognized challenges for advocacy when burden estimates change in light of new evidence, and subsequent revisions have been misinterpreted as trends, it is crucial for the legitimacy and utility of such estimates that they are based on the best possible current science and data. Creating a wider understanding of the processes of estimation, and the limitations and uncertainties inherent in their outputs would help avoid detracting from valid messages when revisions occur, and also reduce the chance of estimates being misused.

Ultimately, the fact that this paper exists should be a cause for celebration. That more than one body undertakes independent estimates of the global toll from one of mankind's most important pathogens should be applauded. That the results have been available in a form that enabled this comparative analysis is also positive. Competition is likely to be healthy, and collaboration and cross-fertilization do occur (e.g. the use of IHME mortality data for 18 countries by WHO in 2017, where IHME had access to additional data or used improved approaches to TB/HIV miscoding). Far from a duplication of effort, without this plurality of approach, comparative analyses such as this one by García-Basteiro and colleagues would not be possible. Here, country estimates that differ most and are likely less reliable have been flagged for additional attention. It is these countries where methodological refinements and/or additional data would be most useful in improving estimates. The analysis itself helps communicate that neither source of estimates should be considered completely authoritative, and that our understanding is incomplete. However, valid areas of uncertainty must not be used as a pretext to undermine the global importance of improving TB control.

Conflict of interest: PJD has received research funding on TB burden estimation; has undertaken consultancy for the WHO; and is a member of the WHO Global Task Force on TB Impact Measurement.

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