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(Not) measuring in the dark

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Do we really care about tuberculosis (TB) mortality? When one looks at global targets for disease control, it certainly seems that the answer is yes. Ambitious global targets were set to reduce TB deaths by 50% by 2015, and the World Health Organization post-2015 strategy includes a target of a 95% reduction in TB mortality by 2035.¹ However, the opposite conclusion might be reached if gauged by the lack of robustness in global measurement of TB mortality.

In 2013, only 124 of 195 countries had vital registration systems that were deemed to be of sufficient completeness and quality to be usable for direct measurement of TB mortality. In addition, India and Viet Nam had conducted mortality surveys, yielding 126 countries with adequate measures of TB mortality. However, only 36% of estimated TB deaths occur in these 126 countries, and none of the countries are in sub-Saharan Africa, where TB-related death is most common.² Further complicating our ability to determine the number of deaths attributable to TB is that deaths due to TB in people with human immunodeficiency virus (HIV) are recorded as HIV deaths in ICD-10. Therefore, even when vital registration or survey data do exist, estimates of TB mortality in people with HIV are limited. Taken together, it is clear that we lack accurate estimates of TB deaths worldwide.

The study by Omar et al. in this issue of the *Journal* suggests that mortality surveillance may not only be important, given the high burden of undiagnosed TB, it may also be feasible with minimally invasive methods.³ Post-mortem specimen collections were conducted within a median of 5 days by a trained nurse who obtained multiple respiratory samples through lung core biopsy and modified bronchoalveolar lavage (BAL). Overall, 32% of decedents had evidence of TB from at least one diagnostic test.

That TB was an exceptionally common cause of death in this population is not a new finding. A recent meta-analysis by Gupta et al. reported that 40% of facility-based deaths in people with HIV were caused by TB.⁴ What is novel is the use of a minimally invasive procedure conducted by a nurse to ascertain cause of death. This approach and finding should encourage the further development of feasible approaches for accurate mortality measurement in high-burden TB countries, including the many countries where vital

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registration and survey data are lacking. Additional studies are needed aimed at identifying a combination of specimens that can be collected through minimally invasive methods which will have high sensitivity and specificity for diagnosing TB.

Death is a common, unifying condition that crosses disease boundaries. As such, it is not just TB for which mortality measurement is important: malaria and HIV programs also seek to reduce mortality, and maternal and child health programs target mortality impact as a key outcome measure. Thus, working across programs, a valid and minimally invasive set of specimens and tests could aim not only to accurately diagnose TB, but also to detect malaria, common opportunistic infections, and other priority health conditions.

TB continues to have an unacceptable impact globally, with an estimated 1.5 million deaths per year, or 150–200 deaths per hour, from a treatable, preventable disease. Currently, TB incidence is falling at a rate of approximately 1% per year globally.² The rate of decline is far slower than the nearly 20% per year required to reach global elimination targets by 2050. Based on modeling data, we could substantially accelerate progress by implementing the right combination of TB program measures, with an even more immediate impact on mortality than on incidence.⁵ Until tools are developed to measure this progress accurately, developing and demonstrating successful models for achieving these goals will be very difficult. We do care greatly about reducing TB mortality. Now is the time to improve surveillance so that high-impact strategies can be identified and more lives saved.

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