Assessing tuberculosis prevalence through population-based surveys

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Contents

Executive Summary

Tuberculosis (TB) prevalence surveys are most valuable in areas where notification data obtained through routine surveillance are of unproven accuracy or incomplete, and in areas with an estimated prevalence of bacteriologically confirmed TB of more than 100 per 100 000. To help in assessing the performance of TB control programmes, to provide information for planning, and to assess trends of the disease burden over time, data on TB can be collected through standard methods in a well-defined study population. This document gives overall guidance in conducting cross-sectional surveys of pulmonary TB disease. It is intended for TB experts and advisers at national and international levels, and investigators involved in prevalence surveys.

In general, the primary objective of TB prevalence surveys is to determine the prevalence of pulmonary TB in the general population aged 15 years and above. Such surveys can also be used to establish the prevalence of different TB risk factors and to study the determinants of TB disease. Objectives involving testing for HIV or TB drug sensitivity are discussed here as well but are not systematically recommended because of ethical, statistical, and logistical limitations. A specific limitation of TB prevalence surveys is their inability to estimate the burden of childhood TB due to the unsuitability of the currently available methods for diagnosing that form of the disease.

Because of the nature of TB and its low rate of occurrence in general populations, survey samples will be large (typically more than 10 000 individuals), and the sampling methodology will most often involve the selection of clusters from a population. Besides being at least 15 years old, the participants in a TB prevalence survey must meet residency criteria. A simple criterion renders eligible any individual of the targeted age group who slept in a selected household the night before the first visit of the survey investigators.

Screening is based on symptom assessment using a standardized questionnaire, chest X-ray examination, and bacteriological examination of sputum samples. Four alternative strategies in this regard can be considered:

Strategy 1. Identifying **all** smear- or culture-positive individuals by collecting two sputum samples for microscopic examination and culture from all eligible individuals. This strategy does not involve screening. It provides high-quality information but has been used in only a few small-scale studies because of the high costs and the significant demand for laboratory capacity. Besides sputum collection, a chest X-ray and the completion of a symptom questionnaire by all eligible individuals are recommended to provide more information and allow a comparison of the results of the survey with those of other surveys.

Strategy 2. Identifying **all** smear-positive individuals by requiring all eligible individuals to submit two sputum samples for microscopy examination and to undergo chest X-ray and symptom assessment. The sputum samples of all individuals who show any abnormality on any of these three tests (one or more smear-positive results, abnormality on chest X-ray, or presence of symptoms) are cultured. No chest X-ray abnormality is sensitive and specific enough for a definite diagnosis of TB. Therefore, individuals with abnormalities on their chest X ray should be considered suspect pulmonary TB cases. A symptom that has been used to identify suspects in TB prevalence surveys is cough that lasts for three weeks or more. A limitation of this screening strategy is that some individuals with culture-positive pulmonary TB may not be identified through chest X-ray examination, symptom assessment, and sputum smear screening. Furthermore, the sputum examination must