Review

Quality of tuberculosis care in high burden countries: the urgent need to address gaps in the care cascade

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SUMMARY

Despite the high coverage of directly observed treatment short-course (DOTS), tuberculosis (TB) continues to affect 10.4 million people each year, and kills 1.8 million. High TB mortality, the large number of missing TB cases, the emergence of severe forms of drug resistance, and the slow decline in TB incidence indicate that merely expanding the coverage of TB services is insufficient to end the epidemic. In the era of the End TB Strategy, we need to think beyond coverage and start focusing on the quality of TB care that is routinely offered to patients in high burden countries, in both public and private sectors. In this review, current evidence on the quality of TB care in high burden countries, major gaps in the quality of care, and some novel efforts to measure and improve the quality of care are described. Based on systematic reviews on the quality of TB care or surrogates of quality (e.g., TB diagnostic delays), analyses of TB care cascades, and newer studies that directly measure quality of care, it is shown that the quality of care in both the public and private sector falls short of international standards and urgently needs improvement. National TB programs will therefore need to systematically measure and improve quality of TB care and invest in quality improvement programs.

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1. Introduction

In May 2014, the World Health Assembly approved the End TB Strategy, which proposes the ambitious target of ending the global tuberculosis (TB) epidemic by 2035.[1] The goal will be met when TB-related deaths and active TB incidence are reduced by 95% and 90%, respectively, compared with the 2015 values. Are we on track to reach these goals?

During the directly observed treatment short course (DOTS) era in the 1990s and early 2000s, high burden countries (HBCs) focused on achieving 'coverage', defined as the availability of free TB diagnostic and treatment services in all regions or districts of a country. While nearly all countries have managed to substantially improve geographic coverage, the 'quality' of services has received little attention. As a result, TB continues to be a major infectious

threat and remains the largest cause of infectious disease mortality worldwide, with 10.4 million new TB cases and 1.4 million TB deaths estimated in 2015.[2] The World Health Organization (WHO) estimates the global burden of multidrug-resistant TB and rifampicin-resistant TB (MDR/RR-TB) to be 3.9% of new cases of active TB disease and 21% of previously treated cases. Of the 10.4 million TB cases, 4.3 million patients are either not diagnosed or not notified to national TB programs. Further, TB incidence is declining at a very low rate of 1.5% per year.[2]

These data suggest that the current approach to global TB control, in which the onus has been on expanding coverage of TB services, needs to be reconsidered. In the era of the End TB Strategy, we need to think beyond coverage and start focusing on the quality of care that is routinely provided to patients in HBCs, in both public and private sectors.[3,4] Quality TB care is patient-centric care that is consistent with international standards and delivered in an accessible, timely, safe, effective, efficient, and equitable manner. In this narrative review, current evidence on quality of TB care in HBCs, major gaps in quality of care, and some novel efforts at

measuring quality of care are described, primarily through examples of recent work conducted in India. Where available, the findings of systematic reviews on quality of TB care or surrogates of quality (e.g., TB diagnostic delays), analyses of TB care cascades, and newer studies that directly measure quality of care using simulated patients are appraised.

2. Quality of care for latent TB infection

The WHO recommends treating latent TB infection (LTBI) in populations at high risk of progressing from LTBI to active TB disease.[5] These include patients with specific immunosuppressive conditions, notably HIV, and adults and children who have had contact with patients with active pulmonary TB (PTB). However, few HBCs implement these recommendations, even among people living with HIV, where the need is most urgent.[2] Some TB experts have recently argued for expanded and more aggressive implementation of LTBI screening and treatment programs in HBCs to mitigate the incidence of active TB disease.[6]

There have been several reviews conducted on LTBI screening, diagnosis, and treatment, but few have appraised the quality of LTBI care. In the most recent systematic review of 58 studies, Alsdurf and colleagues examined patient losses from the cascade of care for LTBI from the identification of those intended for screening to those who completed treatment (Figure 1).[7] The authors identified areas where LTBI care has been successfully delivered (patients receiving tuberculosis skin test results, a referral for further evaluation if a test is positive, starting therapy after it was recommended), but they also identified important gaps in care that were in need of improvement. These gaps include the initial linkage to screening for LTBI, completing a medical evaluation after being referred, being recommended for treatment after a medical evaluation, and completing treatment once started.

The authors also found that higher proportions of people tested positive for LTBI in low- and middle-income countries (LMICs) versus high-income countries, 61.3% and 24.8%, respectively.[7] Treatment completion rates also differed between LMICs and high-income countries. Of people who started preventive therapy, only 52% of those in LMICs completed treatment, as compared to 70% in high-income countries. When comparing treatment completion among those who were eligible, less than 17% in LMICs, and 23% in high-income countries completed treatment; not nearly as large a difference as among those starting treatment.[7] A variety of factors contributing to these gaps were highlighted, including low TB risk perceptions, financial hardships among patients, and the lack of provider knowledge regarding LTBI treatment.[7]

This review highlights that studies focusing on LTBI diagnosis (usually as a result of contact investigations) and adherence to treatment, need to recognize the various interim steps where patient attrition can occur in order to improve the quality of LTBI care in its entirety. The authors found fewer losses to occur among high-risk populations (i.e., close contacts or patients with serious medical disorders), likely as a result of intensified follow-up, suggesting the need for improved quality of care to ensure successful completion of preventive TB therapy.[7]

3. Quality of care for active TB

Only one systematic review that explicitly reviewed studies on quality of TB care was identified; the review was performed in India. Satyanarayana and colleagues conducted a systematic review of Indian studies on health care providers' knowledge and self-reported practices regarding TB, and used the International Standards for TB Care (ISTC) to benchmark quality of care.[8] Of the 47 studies identified in the review, 12 used medical records and 35 were based on questionnaires. None assessed actual practice
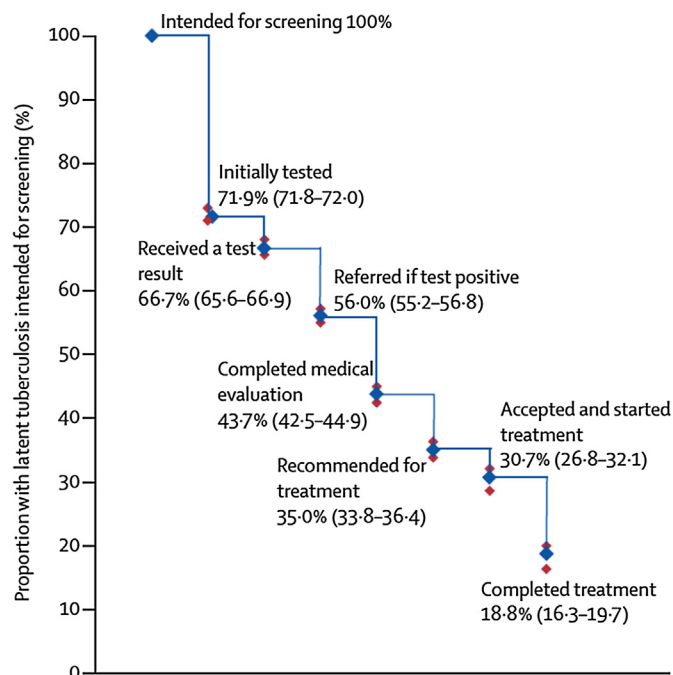
Figure 1. Losses and drop-outs at each stage of the cascade of care in latent tuberculosis infection (LTBI). Numbers in parentheses are 95% confidence intervals. The value for each level is calculated as the product of the value from the preceding step, multiplied by the pooled estimate for that step (from fixed-effects analysis). Source: Alsdurf H et al. Lancet Infect Dis 2016[7] (reproduced with permission).

using standardized (simulated) patients. Ten of 22 studies evaluating provider knowledge about TB diagnosis found that less than half of providers had correct knowledge of using sputum microscopy for persons with typical TB symptoms. Of the four studies that assessed self-reported practices by providers, three found that less than one-fourth reported ordering sputum smears for persons with typical TB symptoms. In 11 of 14 studies that assessed treatment, less than one-third of providers knew the standard four-drug regimen (HRZE: isoniazid, rifampicin, pyrazinamide, ethambutol) for drug-sensitive TB. Across all standards, providers had better knowledge as compared to self-reported practices. In this review, eleven studies included both public and private providers; in general, public sector providers had relatively higher levels of appropriate knowledge as well as practice.

Other systematic reviews have focused on TB diagnostic delays, which is a surrogate for quality of TB care. In a systematic review of 39 studies, including data from 45 countries, Sreeramareddy and colleagues estimated that the median time interval between the onset of symptoms suggestive of PTB and the patient's first contact with a health care provider was 31.7 days (patient delay).[9] The median time interval between the first health consultation and the date of diagnosis was 28.4 days (health system delay). The median time interval between the onset of PTB symptoms and the initiation of anti-TB therapy was 67.8 days (total delay).

A subsequent systematic review that focused on 23 studies from different parts of India, identified that the median patient, diagnostic, and total delays were 18.4 days (interquartile range (IQR) 14.3–27 days), 30 days (IQR 24.5–35.4 days), and 55.3 days (IQR 46.5–61.5 days), respectively.[10] This review also found that Indian TB patients, on average, are diagnosed after three health care provider visits. These studies show that TB diagnosis may be delayed even when patients present with overt TB symptoms, and underscores the need to address this major diagnostic gap.