

Editorial

Protecting healthcare workers from tuberculosis in the era of extensively drug-resistant tuberculosis

Despite the substantial progress made over the past decade, tuberculosis (TB) remains a major global health concern.¹ Every year, nearly 9 million new cases of TB are reported, and nearly 2 million people die of this curable disease.¹ Because TB patients eventually present to healthcare providers, healthcare workers (HCWs) are especially vulnerable to TB exposure and infection. The risk of transmission of *Mycobacterium tuberculosis* from patients with TB to other patients and HCWs has been recognized for many years.² The level of risk varies by setting, job profile, patient population and effectiveness of TB infection control measures. As expected, the risk is higher in facilities that manage large numbers of infectious TB patients who are not rapidly diagnosed, isolated and treated, particularly in the absence of other infection control measures such as respiratory protection.

Most high income countries implement TB infection control programmes to reduce the risk of nosocomial transmission.³⁻⁵ However, such control programmes are not routinely implemented in low and middle income countries (LMICs). Most healthcare facilities in these countries lack the resources to prevent nosocomial transmission of TB. A recent systematic review published in *PLoS Medicine* summarized the available evidence on the incidence and prevalence of latent TB infection (LTBI) and TB disease among HCWs in LMICs.⁶ This review of 51 studies from several countries showed that the prevalence of LTBI among HCWs was, on average, 54% (range 33%–79%).⁶ In most studies, increasing age and duration of employment in healthcare facilities, indicating a longer cumulative exposure to infection, was associated with a higher prevalence of LTBI. Estimates of the annual risk of LTBI ranged from 0.5% to 14.3%, and the annual incidence of TB disease in HCWs ranged from 69 to 5780 per 100 000.⁶ After accounting for the incidence of TB in the relevant general population (i.e. community transmission), the excess incidence of TB in different studies that was attributable to being a HCW ranged from 25 to 5361 cases per 100 000 people per year.⁶ In addition, a higher risk of acquiring TB was associated with working in specific locations (e.g. inpatient TB facilities or diagnostic laboratories) and with specific occupations, including nurses and radiology attendants. As expected, most healthcare facilities examined in the published studies had no specific TB infection control programmes in place. Due to lack of sufficient published studies, this review found little evidence on the impact of infection control measures in LMICs.⁶

What is the situation in India, a country that has more TB patients than any other country, and accounts for one-fifth of the world's incident TB cases? A recent review of several Indian studies showed that nosocomial transmission of TB is an important but poorly documented problem in India.⁷ The prevalence of LTBI and annual risk of TB infection appears to be high (about 5% per year, much higher than the national average of about 1.5%⁸) even among young HCWs and medical and nursing trainees.^{9,10} For example, based on available data, in a hypothetical Indian hospital with 1000 HCWs, about 500 (50%) will have LTBI, and about 25 (5%) of the uninfected HCWs will be newly infected every year.⁷ The rate of active disease appears to be exceedingly high in subgroups such as interns, residents and nurses.¹¹

The incidence rates of TB disease and infection are higher than the national averages, suggesting an increased risk of acquiring TB in the hospital setting.⁷ For example, the estimated incidence of TB among medical residents was 10-fold higher than the incidence for the country.¹¹ Interestingly, most Indian studies have shown that the predominant clinical presentation of TB in HCWs is extrapulmonary (mostly pleural).^{11–13} This may indicate progression to disease from newly acquired primary infection rather than reactivation of latent TB. Lastly, although limited, there is some evidence from molecular epidemiological studies that nosocomial transmission of TB among hospitalized patients may be occurring in urban hospitals.¹⁴

In summary, there is growing evidence that TB is an important occupational problem among HCWs in poor countries. The available evidence clearly underscores the need to design and implement simple, effective and affordable TB infection control programmes in healthcare facilities in developing countries. The need for implementing interventions is made more urgent because of a new threat identified recently—extensively drug-resistant tuberculosis (XDR-TB).¹⁵ XDR-TB is defined as TB resistant to at least isoniazid and rifampicin (which is the definition of MDR-TB) in addition to any fluoroquinolones, and to at least one of three injectable second-line anti-TB drugs (i.e. kanamycin, amikacin and capreomycin).¹⁵ Because XDR-TB is resistant to several first- and second-line drugs, treatment options are severely limited, and mortality rates are extremely high.¹⁵

With the emergence of XDR strains of TB, there is growing concern about a real need to protect HCWs from TB, especially HCWs who may be infected with HIV (a scenario that is not uncommon in sub-Saharan Africa). In South Africa, a country where XDR-TB has been identified as an emerging problem, there are anecdotal reports of HCWs refusing to work at hospitals until the XDR-TB problem is controlled. There is also a great deal of debate on whether patients with XDR-TB should be involuntarily detained, to assure isolation and prevent infected individuals from possibly spreading infection to others.¹⁶ Indeed, because of the XDR-TB threat, the WHO and the Stop TB Partnership are beginning to highlight the need to implement TB infection control measures in hospitals in poor countries.^{15,17} In fact, the Global Task Force on XDR-TB has outlined a series of measures that countries must put in place to effectively combat the emergence of XDR-TB.¹⁷ Infection control is one of the recommended interventions. Thus, efforts are ongoing to update existing infection control guidelines¹⁸ in the wake of XDR-TB, and to develop programmes that are suitable for resource-limited countries.¹⁹ All HCWs and health agencies must strongly support these initiatives and call for more resources, expertise, funding and partnerships to tackle the chronically neglected problem of nosocomial TB in low-income countries.

In the final analysis, the sobering reality is that we now live and practice medicine in the era of XDR-TB. Given this threat of virtually incurable TB, it is critical that we ask the question: ‘What can we do to protect the health of our HCWs?’ HCWs are essential in the battle against TB, and their health needs to be protected as well.²⁰ India, with its vast human and intellectual capital, growing economy, countrywide DOTS coverage, and a large, well-funded, successful national TB control programme, is well placed to tackle this problem and set an example for other high burden countries.

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*The National Medical Journal of India is indexed in
Current Contents: Clinical Medicine and Science
Citation Index.*

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