KEY POPULATIONS BRIEF

HEALTH CARE WORKERS

Stop TB Partnership

Health care workers (HCWs) are at an increased risk of acquiring tuberculosis (TB) compared to the general population. In low-resource, high-TB-burden settings, occupationally acquired TB is depleting the very workforce fighting the disease on the frontline. Failures in health systems, occupational health (OH) services and TB infection control (TBIC), staffing shortages, supply issues, lack of funding, and lack of supervision, are putting the lives of HCWs, their families, and those they are tasked with caring for at risk. The fear of stigma, coupled with weak labour protections and poor confidentiality measures, often means that HCWs are afraid to disclose their health status to employers for fear of being ostracized or losing their jobs. Where available, OH services and compensation schemes for HCWs are often poorly resourced and inefficient, leading HCWs to feel as though their TB is their problem alone. HCWs are perhaps the most valuable resource in the fight against TB. However, this is a group that has been neglected by health care systems and policy makers. More must be done to protect them, before it is too late.

Global Plan to End TB and key populations

The Global Plan to End TB outlines a number of key targets to be achieved by 2020, or 2025 at the latest. The plan refers to people who are vulnerable, underserved or at risk as TB "key populations" and provides models for investment packages that will allow countries to achieve the 90-(90)-90 targets[1]. The Plan also suggests that all countries:

Reach at least

90%

OF ALL PEOPLE WITH TB

and place all of them on appropriate therapy—first-line, second-line and preventive therapy as required.

As a part of this approach, reach at least

(90)%

OF THE KEY POPULATIONS

the most vulnerable, underserved, at-risk populations.

Achieve at least

90%

TREATMENT SUCCESS

for all people diagnosed with TB through affordable treatment services, adherence to complete and correct treatment, and social support.

- Identify their key populations at national and subnational levels according to estimates of the risks faced, population size, and particular barriers, including human rights and gender-related barriers, to accessing TB care;
- Set an operational target of reaching at least 90% of people in key populations through improved access to services, rights-based systematic screening where required and new case-finding methods, and providing all people in need with effective and affordable treatment;
- Report on progress with respect to TB, using data that are disaggregated by key population;
- Ensure the active participation of key populations in the development and delivery of services and the provision of TB care in safe and respectful environments.

This guide utilizes the above recommendations in order to outline the risks and barriers to access, discuss strategies for improved access, and highlight opportunities for involvement of HCWs in all stages of programme development and service delivery.

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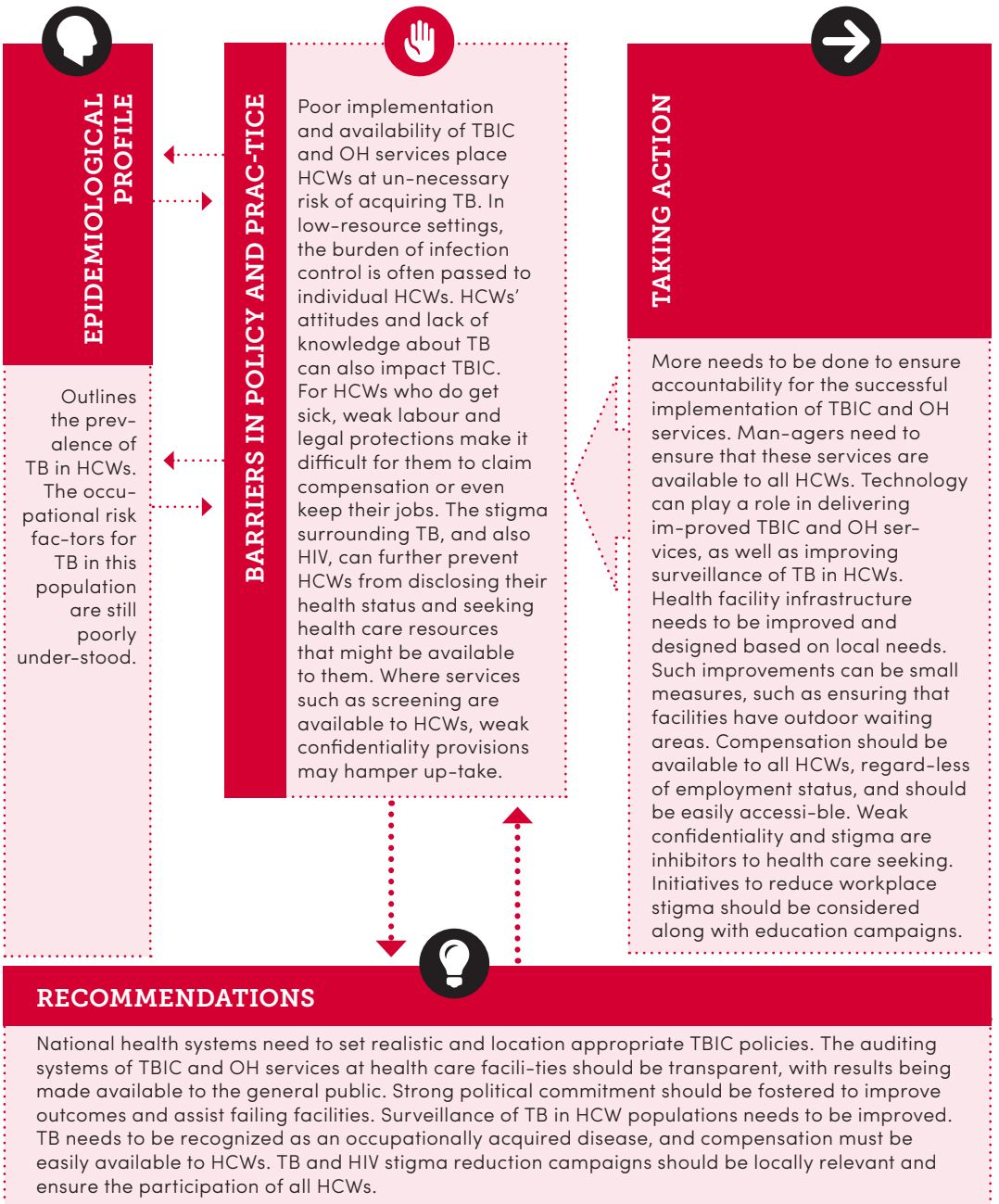
1 The 90-(90)-90 plan calls on NTPs to aim to reach 90% of all people with TB and start them on appropriate therapy. As part of this approach, countries should be reaching 90% of key populations. The final part of the strategy is to achieve at least 90% treatment success for all people diagnosed with TB.

What's in this guide?



Epidemiological profile

Health care workers (HCWs) are at an increased risk of acquiring TB compared to the general population, regardless of economic setting and local TB incidence (1–3). However, the risk is higher in low-resource, high-TB-burden settings, where HCWs are in more frequent and prolonged contact with people in an infectious stage of active TB (4–9). Health care facilities in low- and middle-income countries (LMICs), where TB is more likely to be endemic, lack the resources to implement effective TB infection control (TBIC), placing HCWs at serious risk (5–9). An estimated 81% of TB cases among HCWs are attributable to occupational exposure (2).

Surveillance data for occupationally acquired TB in HCWs in low-resource, high-burden settings are limited, due in part to the lack of HCW medical surveillance systems in these settings, lack of TB-related data recorded at the national level, and frequently, a culture of inadequate implementation of HCW safety measures (10). Fear of stigma and discrimination may force HCWs to delay health care seeking or to seek TB care from private providers, further hampering surveillance efforts (11). A 2006 study estimated the prevalence of latent TB infection (LTBI) among HCWs in LMICs to be between 33% and 79%, with a pooled prevalence estimate of 54% (5). The annual risk of TB infection (ARTI) was estimated to be between 3.9% and 14.3% (5). Overall, the risk of acquiring TB can be three times higher for HCWs than for the general population (5, 9, 11).

In resource-constrained settings, occupationally acquired TB depletes the already scarce workforce and drives absenteeism, sick leave and attrition (12). The risk of acquiring TB varies by occupation, but is highest for frontline workers such as nurses, ward clinicians, and cleaners, who spend prolonged periods of time caring for people with undiagnosed TB or individuals with TB who have been started on inadequate treat-

ment regimens (3, 6, 11, 13-18). TB laboratory staff also constitute a high-risk occupational category due to poor occupational biosafety measures, such as biological safety cabinets, proper ventilation, ultraviolet germicidal lights, and personal respiratory protection in labs (14, 16). Often forgotten and at severe risk are medical and nursing students, who are intensely involved in delivering services to people with TB during their training. A study in India noted a high prevalence of LTBI in nursing trainees, with an ARTI of 7.8% compared to the national average of 1.5% (8). Even less attention has been paid to community health workers (CHWs), who commonly receive less formal training, remuneration and support, yet work in similar high-risk environments (19). It should be noted that the specific occupational risk factors for TB in HCWs are still poorly understood and continue to receive little attention (20).

HCWs are also at greater risk for multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB) than the general population (21, 22). For example, HCWs are up to six times more likely to be hospitalized for MDR-TB than the general population (22). A study conducted in South Africa found that HCWs diagnosed with XDR-TB were subject to delayed diagnosis, poor treatment outcomes and high mortality (21). The high prevalence of HCWs living with HIV in HIV-endemic and low-resource settings, such as some countries in Eastern Europe, former Soviet Republics and southern Africa, further exacerbates the risk of drug-susceptible TB (23-25).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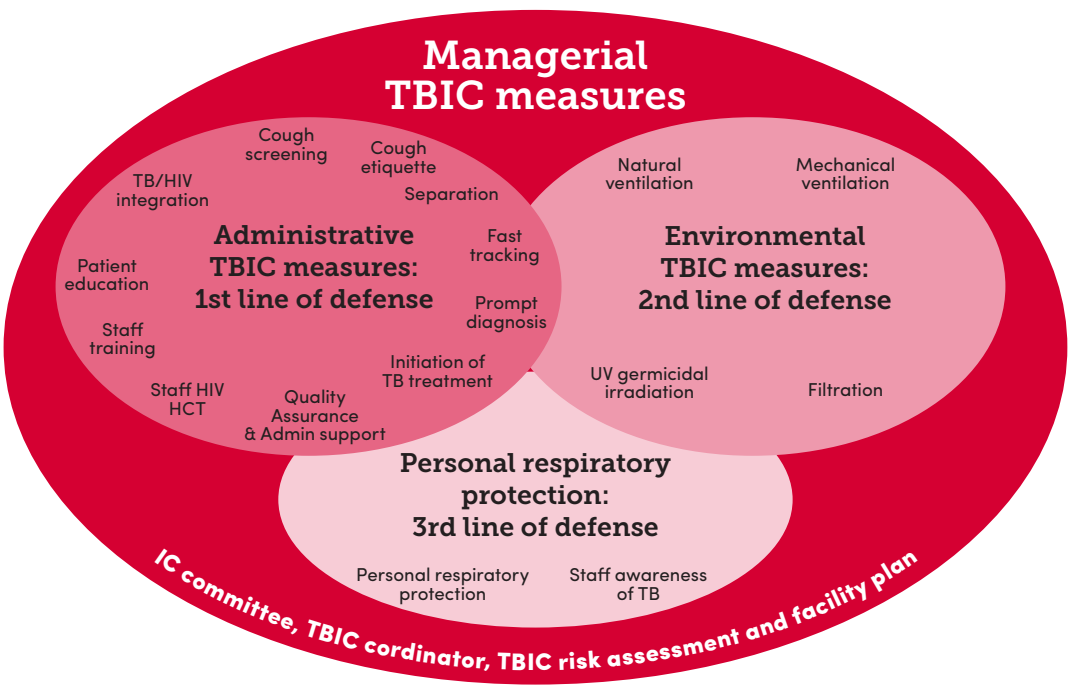
Ministerio de Salud Pública
AREA DE SALUD DE RETALHU

Barriers in policy and practice

Inadequate implementation of TB infection control (TBIC)

TBIC is vital in reducing the risk of occupationally acquired TB, but its application remains inconsistent and inadequate (3, 26). This places HCWs serving on the frontline in the battle against TB at an increased risk of acquiring the disease in all its forms (8, 18, 27). World Health Organization (WHO) guidelines suggest four levels of TBIC for use in low-resource settings, each consisting of control measures that can be deployed to reduce transmission in health care facilities (28). An overarching managerial level feeds into administrative, environmental and respiratory controls implemented at the facility level (see Fig. 1) (28). At the managerial level, WHO recommends that national governments and health agencies develop country-specific policies to support the implementation and subsequent monitoring of the three lines of TBIC (administrative, environmental and respiratory) at individual health care facilities (9). The managerial level also includes measures such as conducting facility TBIC risk audits, appointing a TBIC coordinator for each health care facility, and developing occupational safety policies (9).

FIGURE 1: **THE FOUR LEVELS OF TBIC (VERKUIJI AND MIDDELKOOP, 2016)**



Administrative control measures are interventions put in place at the facility level to reduce the risk of TB transmission among HCWs, patients and visitors (28). Examples include effectively triaging people with TB symptoms when they first arrive at the health facility, promoting good cough etiquette, diagnosing people with TB symptoms early and screening HCWs regularly for TB (9). HCWs with LTBI need to be able to access isoniazid preventative therapy (IPT). A 12-dose, once-weekly regimen of rifapentine plus isoniazid can be just as effective as the previously recommended isoniazid treatment options; this regimen has been reported to contribute to higher treatment completion rates (29). Although this treatment option is recommended by WHO and the Centers for Disease Control and Prevention (CDC) in the United States, it has yet to see widespread adoption in high-burden settings (30–32).

It is also important to ensure that HCWs living with HIV have access to antiretroviral therapy (ART) and IPT. Other administrative measures include ensuring that HCWs are able to be redeployed to positions where they are less likely to be exposed to people with untreated TB, and ensuring that HCWs, regardless of health status, are easily able to access testing, counseling and care, should it be required (9). As most TB transmissions occur before a diagnosis can be confirmed, environmental control measures seek to halt the transmission of TB by reducing concentrations of infectious respiratory aerosols in the air (9). Such measures include ensuring proper ventilation, both natural and mechanical, in health care facilities and the use of upper-room ultraviolet germicidal irradiation (UVGI) to kill or inactivate airborne mycobacteria (9). Finally, personal respiratory protection involves HCWs using personal particulate respirators, N95 respirators, to reduce their chance of inhaling tuberculosis bacilli (9). People with TB symptoms should be offered surgical masks to wear as a way of decreasing TB transmission in health facilities (33).

The rate of TB in HCWs serves as an indicator as to the effectiveness of the TBIC measures in place (3). Studies have found TBIC measures to be effective in reducing the risk of TB transmission in low-resource settings, but implementation is often inconsistent and inadequate (9, 34, 35). Successful TBIC relies on a hierarchy of measures that work in unison at all levels of the health system to reduce TB risk (24). Any gaps in delivery, be they in procurement, financing, infrastructure, human resources, supply chain management or monitoring, increase the risk of TB transmission to HCWs, patients and visitors (24).

Barriers to implementation of TBIC

A study in South Africa found that barriers to the successful implementation of TBIC usually fall into three categories: 1) lack of resources, 2) HCWs' distrust of TBIC efforts, and 3) disproportionate focus on individual-level personal protections (24). The study found that managers of health facilities lacked resources to adopt policies set at the national health system level, thereby passing the burden of TBIC implementation and oversight to individual HCWs, who themselves often lacked support, adequate knowledge, and training in TBIC (24). A Nigerian study reported similar findings, noting that TBIC typically failed due to weak managerial support, lack of funding, inadequate human resources, stigmatization against TB and inadequate infrastructure to provide a suitable space for treating people with TB away from the rest of the facility population (25).

Researchers in Henan Province, China, found that barriers to effective TBIC resulted from failures across all three lines of defense, including failure to triage people with TB symptoms, lack of appropriate ventilation in health facilities, and low availability of N95 respirators for HCWs and surgical masks for people with TB or TB symptoms (36). Another South African study found that barriers to successful implementation of TBIC included the non-proactive use of respirators, overstretched HCWs who lacked time to implement TBIC, lack of shared responsibility for TBIC among HCWs, inadequate training, and poor ventilation in health facilities (37). The same study found that successful implementation of TBIC depended on the availability of resources, effective facility leadership on TBIC, supervision of HCWs, fear of transmission, and regular screening of HCWs for TB (37).

Poor availability of occupational health (OH) services

The International Labour Organization (ILO) first recognized TB as an occupational disease in 2005 (38). In 2010, ILO, UNAIDS and WHO jointly developed policy guidelines aimed at improving HCWs' access to HIV and TB prevention, treatment, care, and support services (26). The 14-point joint guidelines provide recommendations to assist in the implementation of national- and facility-level policies, including the provision of OH services and adequate protection and compensation for HCWs (39). Nevertheless, the protection of HCWs' health and wellbeing has been largely neglected in many LMICs, where, according to WHO, working conditions are often characterized by "understaffing, excessive workloads, stress, exposure to occupational hazards, unsafe environments, occupational ill health and violence" (40).

OH services are intrinsically linked to TBIC, as both are critical for providing a safe environment for HCWs and those they have been tasked with caring for (39, 41). OH measures should include having an OH representative responsible for each health care facility; ensuring that HCWs are able to access an OH practitioner; establishing an OH and safety committee; providing wellness services; conducting pre-employment screening of HCWs for TB; continuing to screen for TB during employment; compensating workers in the event of illness or injury; providing HIV testing and counseling services (HCT); providing personal protective equipment; providing IPT and ART for HIV-positive HCWs; and reassigning immune-compromised HCWs to low-risk areas of practice (41).

2 Research conducted by the International Human Rights Clinic at the University of Chicago Law School and the University of Cambridge Faculty of Law, under the Supervision of Brian Citro, Clinical Lecturer in Law and Associate Director, International Human Rights Clinic.

As with TBIC, the implementation of OH services is often inconsistent and inadequate (41). A recent study of OH services offered by three hospitals in KwaZulu-Natal, South Africa, found that although some OH services were available to HCWs, there were gaps in delivery and in the adherence to and enforcement of national recommendations and guidelines (41). For example, the study found that there was inadequate screening for TB among HCWs, with stigma and perceived lack of confidentiality comprising major barriers to HCWs disclosing their health status or taking up testing services (41). Given the importance of screening as an OH and TBIC measure, it is essential that OH and IC services are able to collaborate in order to improve TB screening among HCWs (41).

Non-responsive compensation schemes

A central tenet of OH for anyone in employment is the ability to access compensation should they be forced to leave the workforce as a result of injury or occupational disease. However, in many settings, HCWs are not covered by OH policies; they are therefore unable to access compensation. Even when compensation is available, HCWs still face numerous barriers to access it. For example, in South Africa, although occupationally acquired TB is compensable and delivered under a 'no fault system', many HCWs have little awareness of the compensation process and their legal right to claim (24, 37). In two South African studies, HCWs were under the mistaken impression that the high prevalence of TB in the country meant that it would be difficult for them to prove that their TB had been acquired at work, rather than elsewhere in their community (24, 37). Furthermore, because the HCWs saw the system of compensation in South Africa as overly bureaucratic and inefficient, many of them viewed TB as a personal problem, rather than an institutional one (37). Claiming compensation may also require HCWs to disclose their health status, which could leave them vulnerable to stigma and discrimination.

Although ILO has defined TB as an occupational disease among HCWs, labour law deficiencies at the national level may block HCWs' access to compensation. A study in China found that, despite the irrefutable evidence of increased exposure, the Ministry of Health does not recognize TB as an occupational disease. As a result, HCWs are not legally protected against acquiring TB at their place of work and so do not receive routine screening and treatment (3). HCWs with TB would only be entitled to work-related injury insurance, which may not be available to them; even if it were, such compensation would only provide limited benefits once the HCW has been diagnosed with active TB (3).

Health care trainees who acquire TB during their training also often lack access to compensation (42). Despite falling into one of the most vulnerable categories of TB health care, trainees in many settings receive no financial support for medical expenses should they fall ill (42). Students who acquire TB during their training are often forced to discontinue their studies, suffering the loss of bursaries and scholarships (42). In addition, many compensation schemes do not extend coverage to temporary, domestic, independent and self-employed HCWs (10).

Weak legal and labour protections

Closely related to stigma (see below) are weak labour laws to prevent discrimination against HCWs with TB. Although non-discrimination based on health status is constitutionally protected in many countries, the reality is not so simple. A yet to be published survey of 22

high-burden countries found that very few countries have TB-specific laws designed to protect the rights and privacy of HCWs with TB[2]. Where legislation exists, it may still be difficult for HCWs to use it effectively. For example, legislation in Russia extends various legal protections to HCWs, such as shortened working hours and compensation in the event of occupationally acquired TB (43). However, whether or not HCWs feel that they are able to use the law and protections available to them is less clear. The same survey noted a general dearth of case law relating to TB in these countries, suggesting that few cases involving HCWs with TB reach the courts.

Weak labour protections may also prevent HCWs from speaking out about poor working conditions (18). This same fear of loss of employment may also prevent HCWs from disclosing their health status (18). Anecdotal evidence suggests that many HCWs are employed on temporary contracts, barring them from legal recourse should they lose their jobs as a result of disclosing their health status. This is particularly problematic among CHWs, who frequently work on a contract basis at (close to) minimum wage levels, with very few protections or benefits.

Peru has recently introduced comprehensive legislation establishing various rights for all workers affected by TB, including protection against dismissal, continuity in the workplace upon recovery, right to a leave of absence due to a TB diagnosis, and favourable conditions (such as reduced working hours) to help workers complete their treatment (44). Peru's 2014 Act of Congress is unique among high-burden countries in that additional provisions are also extended to HCWs with TB (44). The law mandates that health care facilities have a plan for the control of respiratory diseases. The law also sets out the rights of HCWs to occupational medical examinations at the beginning of their duties, throughout their tenure and when they end their work relationship. The law also guarantees treatment and insurance payments in the event of illness. While it remains to be seen if the Peruvian law will have a positive impact on HCWs' situation, this law represents an encouraging step forward in securing the rights of HCWs with TB.

Stigma

In the general population, stigma surrounding TB can lead to delayed health care seeking and poor treatment outcomes (45). TB stigma is linked to many factors, including assumptions that people with TB are somehow careless and thus responsible for their own infection, limited knowledge of how TB is transmitted, the perception that TB is incurable, and the perceived links that TB has with poverty and malnutrition (45, 46). The convergence of HIV and TB epidemics in many low-resource settings has served to create a form of overlapping, dual stigma between the diseases (47). In areas of high TB and HIV prevalence, it is often impossible to disentangle the two forms of stigma (45, 46, 48).

HIV- and TB-related stigma among HCWs can serve as a significant barrier to accessing and utilizing available health care resources, either at the facility where the individual HCW works or at other health care locations (1, 12, 18, 48, 49). Public disclosure of TB could cause the HCW to be ostracized by colleagues who are afraid of acquiring the disease or lead to unfair loss of employment (18, 49). Because of dual HIV and TB stigma, HCWs who disclose their TB status could face further discrimination if their colleagues assume the HCW is coinfected with HIV (18).

A study in Swaziland noted a high degree of self-stigmatization among HCWs living with HIV (50). The respondents felt a sense of professional embarrassment about contracting HIV; when combined with a perceived, or actual, lack of confidentiality, this embarrassment led to self-stigmatization (50). The study noted a professionally imposed sense of morality whereby HCWs viewed HIV as something only acquired by the general population, by "others" (50). A positive HIV diagnosis, therefore, pushed HCWs to the other side of the line separating the HIV-free HCW population from "the other" (50).

Fear of stigma and discrimination can be particularly harmful for medical trainees (51). A study in India found that medical trainees presenting with TB symptoms were reluctant to seek early medical care because of stigma, loss of training time, poor knowledge of the disease, and a perceived lack of vulnerability to TB (51). Because many medical trainees in the study lived in crowded hostels, the risk of transmission to other medical students, family members and patients was high (51).

Anecdotal evidence also suggests that there is a level of political stigma, according to which facility managers and national health systems are unwilling to disclose the true extent of the TB burden in HCW populations, if it is even known, since TB is synonymous with low economic development and poverty. This hampers surveillance efforts and prevents the implementation of effective OH and TBIC measures.

Weak confidentiality

Regular screening of HCWs is a vital component of successful OH and TBIC (28). However, studies conducted in several high-burden settings suggest that screening is often unavailable (23, 41). Where screening is available, uptake can be low because of fears of stigma and being discriminated against, either in the workplace or in other social settings, should a TB diagnosis be confirmed (9, 41). The understandable unwillingness of many HCWs to disclose their TB or HIV status makes the delivery of effective care interventions and redeployment to lower risk areas of practice (a recommended TBIC and OH measure) problematic (18, 24). Studies in Uganda and South Africa have found that, apart from stigma, a major barrier to the uptake of HCT services offered to HCWs at their place of work is the lack of confidentiality provisions in place (49, 52). Weak confidentiality measures mean that HCWs may be less inclined to disclose their health status or to use the testing services available to them (49, 52).

Lack of confidentiality may also prompt HCWs to seek care in the informal private, for-profit health care sector. In low-resource settings, overwhelmingly people initially seek health care in this sector, even though it represents an out-of-pocket expense (53). Although no studies have examined HCW utilization of this sector, a significant pull factor for people with TB seeking treatment and care is that providers in the informal health care sector often offer greater levels of confidentiality than might be expected at public facilities or through OH services in the workplace (45, 54, 55). Confidentiality could be especially important for HCWs who do not wish to disclose their health status to other colleagues for fear of stigma and discrimination. Reporting between the private sector and national TB programmes is often weak, hampering TB surveillance (56). Furthermore, TB care provided by this sector is often low-quality and inappropriate, which increases the risk of drug resistance and treatment failure (57).

Issues of privacy and confidentiality for people with TB are often not addressed at a national policy level. For example, India's National TB

Control Programme Technical and Operational Guidelines, published in 2016, contain no privacy or confidentiality provisions for people with TB (58). Similarly, laws in China exclude people with TB from the protection of confidentiality that is extended to people with other infectious diseases, such as gonorrhea, syphilis, leprosy and HIV/AIDS (59). Accordingly, it may be difficult for individual health care facility managers to prioritize confidentiality and privacy when leadership at the national level is lacking.

HCW attitudes

A South African report found that, although HCWs often have a heightened awareness of TB in others, they also tend to have a low perception of self-risk (18). Externalizing the risk of TB is a rational coping mechanism; however, the misperception that HCWs are imbued with some form of immunity against TB may make HCWs less inclined to follow TBIC measures (18). For example, the report noted that trainee doctors often stop wearing protective respirators on the advice of more senior doctors (18). Given that TBIC in low-resource settings is often reduced to individual-level personal protections, this low percep-tion of self-risk is dangerous. A separate study in South Africa found that HCWs who knew colleagues who had contracted and/or died from TB were more aware of and concerned about exposure to TB (9). These individuals were not only less motivated to work in high-risk areas, but also more likely to give up working as an HCW (9).

General fears surrounding TB can negatively impact the level of care that HCWs are able to deliver (60). A study of HCWs working in MDR- and XDR-TB wards in South Africa found that respondents had fears surrounding the TB

treatment course, the financial implications of a TB diagnosis, the risk of infecting other family members with TB, what would happen to their families in the event of illness or even death, and stigma and discrimination (60). The study also found that concerns over the work environ-ment, such as poor implementation of basic TBIC and feeling that facility managers did not care about protecting them, also negatively impacted the care that HCWs were able to provide (60). A study in Rus-sia found that the fear of TB transmission to their family members was an important motivating factor for HCWs to follow TBIC measures (61).

Lack of HCW knowledge of TB

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Lack of HCW knowledge of TB

In endemic settings, it is crucial that employees in all parts of the health system have at least some level of awareness of TB. In addition, they should not only be capable of identifying and correctly screening and referring people with TB, but also be able to ensure self-protection and infection control for themselves, other HCWs and patients. In the general population, lack of TB knowledge can contribute to delayed health seeking (62). The same lack of knowledge of TB and TBIC among HCWs could also increase the risk of nosocomial TB transmission. A study among Russian HCWs found knowledge deficits surrounding how TB was transmitted and how it should be treated (7). For example, 55% of HCWs working in rural settings responded that TB was transmitted by ingesting contaminated meat and liquid (7). A third of the participants included in the study did not believe that MDR-TB could be treated (7). Knowledge of TBIC was also found to be low, with many HCWs not knowing when personal respirators should be worn (7).

Taking action

Ensuring accountability for TBIC and OH

Successful TBIC and OH relies on interventions at all levels of the health system. However, in many low-resource, high-burden settings, such services are not well developed. As such, the responsibility for TBIC is passed to individual HCWs. Effective TBIC is dependent on a sense of shared responsibility, yet individual HCWs are having to shoulder more than their fair share of the burden. Policy makers at the national level need to establish realistic policies and ensure that individual health care facilities have the tools and resources they need to implement and continuously monitor TBIC. Improving TB and TBIC education for HCWs should also be considered a priority for NTPs.

At the facility level, managers should be held accountable for the preventable spread of TB. Managers also need to ensure that OH services are readily available and provided in a safe and confidential manner. Confidentiality systems need to be strengthened in order for HCWs to feel comfortable being screened and receiving treatment at their place of work, should it be required. Measures to incentivize case reporting, screening, and the implementation of OH services and TBIC should also be considered.

There is a need to sensitize and educate HCWs on the importance of knowing their HIV status and being screened for TB. If positive, a confidential link to care and treatment and compensation should be provided. HCWs also need to find ways to use their collective voice in order to ensure that their rights are being protected. Unions can play a powerful role in holding governments accountable, but these often exclude some of the most vulnerable HCW groups, such as medical/nursing students, contract workers and CHWs. HCW collectives should be utilized in an advocacy role.

Technology can also play a role in improving OH and TBIC delivery. The Occupational Health and Safety System (OHASIS) – an initiative between Canadian and South African partners – is a computerized occupational health and safety surveillance programme (63). At the individual level, OHASIS provides HCWs with procedures to better protect their health and safety. At the facility level, this programme allows for better information sharing between departments and facilities, and helps to establish processes to oversee the creation of safe and healthy working environments (63). At the national level, this system should help to improve surveillance of the health of HCWs. However, OHASIS faces challenges such as limited technical capability to support computerized systems and restricted staff access to computer terminals. Despite these challenges, the value of such a system should be realized over time (63). The South African government is also in the process of launching a series of mobile health applications targeted at HCWs, with the aim of strengthening infection prevention and control (IPC) procedures (64).

Improving surveillance of TB in HCWs

In order to combat TB in HCW populations, it is important to understand their baseline status, the true burden of the disease and the specific occupational risk factors. At the structural level, policy makers need to look at initiatives to strengthen confidentiality; to improve access to compensation and care; to expand the protections afforded by anti-discrimination labour laws; to ensure that sufficient resources are available for individual facilities; and to reduce the stigma surrounding TB and HIV. It is important that HCWs be made aware of their rights and responsibilities, as well as the benefits of screening. Such initiatives would encourage more HCWs to disclose their health status and participate in regular screening. A key component of surveillance is also to ensure the collection of high-quality, confidential, disaggregated data at the national and facility level. Technology has an important role to play here, and initiatives such as OHASIS should be considered and adapted to suit local needs and capacity. WHO should also include occupation in the WHO list of key TB indicators in order to promote mandatory notification of all occupational TB cases in addition to documentation of TBIC compliance.

Since the utilization of private health care providers is also high in low-resource, high-burden settings, more needs to be done to engage this sector. Private–public mix (PPM) models linking private and public providers should be consid-

ered (65). In most PPM models, private providers are incentivized to refer people with TB or TB symptoms to public providers for treatment. Private providers could be encouraged to recommend OH services to HCWs who first access treatment in the private sector.

Improving health facility infrastructure

Environmental controls are a central tenet of TBIC. Allowing for adequate natural ventilation so as to ensure sufficient air changes per hour is perhaps the most cost–effective and practical measure, as it can be as simple as making sure that doors and windows are kept open. However, a study in Uganda showed that ventilation was inadequate in over 50% of the health facilities included in the study (66).

Other TBIC environmental controls that should be considered are the use of exhaust and ventilation fans and UVGI. However, UVGI is thought to be less effective in places where the relative humidity is over 70%, which is not uncommon in low-resource, high-burden settings (9). The 2009 WHO guidelines also note the need to use appropriate building design, construction and renovation, tailored to local climatic and socioeconomic conditions (28). In high-burden, resource-constrained settings, this could entail simple, low-cost provisions such as ensuring that health facilities have plenty of outdoor waiting spaces and well-ventilated indoor spaces where people with TB can be treated in privacy.

There should be a focus on administrative controls, as there is a consensus that these are more effective than environmental controls. Measures include triaging and either fast-tracking or separating coughing patients; screening patients entering facilities for signs and symptoms of TB; teaching cough etiquette and/or asking coughing patients to wear surgical masks; ensuring prompt diagnosis and treatment for TB; and separating patients with TB from other patients. Many of these controls are also inexpensive and can be done by anyone; they do not require huge expenditures for expensive equipment that is often not maintained and thus does not function properly.

Improving and expanding compensation provisions

TB in HCWs is an occupational disease and needs to be recognized as such. HCWs are perhaps the most valuable resource in the fight against TB, and governments must ensure that public and social laws, policies and measures are in place to make sure that HCWs and their families are cared for if they acquire TB in the line of duty. A failure to adequately protect HCWs risks squandering this valuable resource.

National governments need to ensure that HCWs are aware of what help they are entitled to and how they can access it. In most LMICs, compensation and other protections afforded to HCWs with TB are either nonexistent or woefully inadequate. Where available, compensation schemes are often overly bureaucratic, deterring HCWs from filing claims and forcing them instead to make their own provisions for dealing with their illness. The Government of South Africa, through the Medical Bureau of Occupational Disease (MBOD) and the Compensation Commissioner for Occupational Disease (CCOD), recently launched Project Ku-Riha, which aims to eliminate the backlog of compensation claims from miners with occupational lung diseases (67). In addition to this project, a number of one-stop service centres have been opened in mining communities, providing a place where miners can seek advice as to how to access compensation, treatment and care for occupation-

ally acquired diseases, such as TB (67). This model could be applied to other parts of the labour market, such as for HCWs, in a number of settings.

Compensation should be a basic provision made available to all HCWs, regardless of their employment status. It is especially important to ensure that trainee HCWs are protected, since this group constitutes the TB fighters of the future.

Reducing stigma and improving confidentiality

Stigma is an incredibly powerful inhibitor of health care seeking. For HCWs, stigma can be particularly harmful, as it places the health of individual HCWs, as well as those they treat, at risk. Initiatives to reduce stigma should focus on the factors that drive stigma in the first place at the individual, community and structural level (12).

Stigma and concerns surrounding confidentiality impact the willingness of HCWs to utilize OH services that might be available to them. In order to increase uptake, there is a need for well-publicized and enforced codes of conduct for OH services (12). These require the buy-in and organizational support from facility health care managers, and managers at the regional and national level (12). It is important to foster a sense of community among HCWs, so that they will be more willing to speak out against stigmatizing behaviour and poor confidentiality (12). Willingness to stand up to stigmatizing behaviour has been linked to HCWs knowing workplace codes of conduct, having been taught the importance of confidentiality, and knowing a colleague with HIV (12). Locally relevant visual health promotion messages can serve as useful tools for encouraging solidarity among HCWs and reinforcing the need for confidentiality and stigma reduction (12). Better education and counseling are needed for HCWs to understand how TB is transmitted, how it can be treated, and the socio-psychological impact it can have. This knowledge could be shared through workplace campaigns, workshops and skills training (12). Successful workplace stigma reduction initiatives in the areas of HIV and mental health have recognized the importance of widespread participation and buy-in during the design, implementation and evaluation phases of the campaign (12). Therefore, it is important that TB stigma reduction campaigns seek similar participatory approaches.

The International Council for Nurses, along with other national and international partners, has established a number of Wellness Centres for HCWs in countries all over southern Africa. These centres provide dedicated care for HCWs and their immediate families. HCWs are able to receive antiretroviral therapy, TB screening, and treatment and psychosocial support – all in a safe and confidential environment (68). In areas where Wellness Centres are accessible, TB screening has been well accessed and presumptive TB cases have been identified early (68). The model has seemingly worked well in low-resource settings and could be expanded further.

Recommendations

Civil Society	HCWs Living with TB	National Health Systems	Donor Community
Provide forums for HCWs to highlight where TBIC and OH measures are failing. Raise awareness of the importance of TBIC and OH.	Hold governments and facility managers accountable for failures in TBIC and OH.	Set realistic and location-appropriate TBIC policies, focusing on measures that are high-impact and low-cost. Ensure transparent auditing systems of TBIC and OH at health care facilities, with results being made available to the general public. Foster strong political commitment to improve outcomes and assist failing facilities.	Develop stronger guidelines for the implementation of TBIC and OH services in low-resource, high-TB-burden settings. Promote standardized checklists to evaluate TBIC and OH.
Raise awareness of TB screening services available. Where services are not available, lobby national governments to introduce them.	Assist in the development of health literacy messages and awareness campaigns to ensure that HCWs understand the importance of being screened for TB. Encourage HCWs to share their experiences of TB to help reduce stigma.	Improve surveillance of TB in HCW populations. Ensure that HCWs have a safe and confidential space where they can be screened. Screening should be employer-funded.	Support national health systems with innovative ways to track and monitor TB in HCW populations. Donor communities should require accurate occupational TB data when evaluating national TB programmes.
Lobby governments to ensure that compensation is available to HCWs. Support HCWs trying to access compensation. Ensure that HCWs are aware of their rights.	Hold governments to account to ensure that TB is recognized as an occupational disease. Help develop locally relevant awareness campaigns to ensure that HCWs know their rights.	Recognize TB as an occupationally acquired disease and provide compensation to HCWs with TB. Improve access to compensation by simplifying claims systems.	Support further research into creating safer health care environments for both HCWs and patients.

Civil Society	HCWs Living with TB	National Health Systems	Donor Community
Monitor TBIC measures at individual health care facilities. Provide a forum for HCWs to highlight where TBIC measures are failing.	Hold governments and facility managers accountable for failures in TBIC. Foster a sense of community among HCWs, so that HCWs feel able to speak up against failures in TBIC.	Improve facility infrastructure and set basic standards for TBIC in all facilities. Establish minimum TBIC requirements for all new facilities that are built, and commit to a timeline according to which all facilities will be upgraded to meet minimum requirements.	Fund research into low-cost, high-impact environmental measures that health facilities can use to reduce TB transmission.
Monitor the availability of OH services available to HCWs, and lobby national governments for better coverage. Ensure that HCWs are aware of their rights.	Raise awareness of services that are available, and hold facility managers and governments to account where services are not available.	Ensure that OH services are available to HCWs. Tighten confidentiality to ensure greater uptake of services such as TB screening.	Develop guidelines for the delivery of occupational health services to HCWs in low-resource, high-TB-burden settings.
Foster the creation of HCW TB communities that can empower and support each other and educate others in order to reduce stigma. Assist in developing educational and awareness-raising tools that can help combat stigma.	Identify sources of stigma, and help develop locally relevant initiatives to reduce stigma.	Reduce TB and HIV stigma through HCW education and locally relevant awareness campaigns. Ensure the participation of HCWs and facility managers in the development, implementation and evaluation of any activity.	Support HCW communities and organizations working with them to reduce stigma.

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