



Guide on the Monitoring of TB Disease Incidence Among Health Care Workers





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Foreword

To assist Member States in preventing Tuberculosis (TB) transmission, in 2009 the WHO developed a 'Policy on TB Infection Control in healthcare facilities, congregate settings and households'. This policy proposed a combination of recommended measures aimed at minimizing the risk of TB transmission both in the general population and among health care workers (HCWs). It is well established that HCWs have a greater risk of developing TB than the general population, and outbreaks of TB among HCWs have also been well documented.

The WHO recommends that all countries strengthen their TB notification systems to include TB among HCWs. Many countries are however not yet systematically collecting such data for a series of reasons, such as the potential stigma and work discrimination faced by HCWs diagnosed with TB.

This guide for monitoring the incidence of TB disease among HCWs specifically addresses issues such as stigma and work discrimination, and also provides practical recommendations on how to establish an effective monitoring system. This document is the result of years of operational research as well as debates and discussions organized by the WHO and TB CARE partners.

This guide is intended for everyone who is responsible for HCWs at all levels and in all settings, including policy-makers and implementers such as National TB Program (NTP) managers, National AIDS Control Program (NACP) managers, as well as those responsible for Infection Prevention and Control (IPC) and Occupational Health and Safety (OHS) programs, managers of Collaborative TB and HIV Partner Organizations and congregate settings where healthcare is provided. It is also useful for representatives from civil society, advocacy groups, HCWs themselves and their professional associations.

Monitoring TB disease in HCWs at the healthcare facility level and at the national level should be beneficial for both HCWs and patients.

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TB CARE I **TB CARE II**



Abbreviations

DR-TB	Drug-Resistant TB
HCW	Health Care Worker
HIV	Human Immune-deficiency Virus
IC	Infection Control
ICN	International Council of Nurses
ICOH	International Commission on Occupational Health
ILO	International Labour Organisation
IPC	Infection Prevention and Control
LTBI	Latent TB Infection
M&E	Monitoring and Evaluation
MDR-TB	Multi-Drug Resistant TB
MoH	Ministry of Health
NACP	National AIDS Control Program
NGO	Non-government organization
NTP	National TB program
OHS	Occupational Health and Safety
TB-IC	Tuberculosis Infection Control
TB	Tuberculosis
WHO	World Health Organization
WMA	World Medical Association





Glossary

(Terms as used in this document)

Healthcare	Services provided to individuals or communities by agents of the health services or professions to promote, maintain, monitor, or restore health. Healthcare is not limited to medical care, which implies therapeutic action by or under the supervision of a physician.
Healthcare facility	Any structure used to deliver healthcare (see definition of Healthcare above).
Health care worker (HCW)	All people engaged in actions whose primary intent is to enhance health [Working Together For Health WHO 2006].
High-burden Country	One of the 22 countries which together account for approximately 80% of all new TB cases arising each year. The WHO also identifies another 27 high MDR-TB burden countries that concentrate more than 85% of MDR-TB cases emerging globally.
Incidence	The number of new and relapse cases of TB (all forms) occurring in a given year per 100,000 population. Incidence should ideally have person-time in the denominator. Relapse patients have previously been treated for TB, were declared <i>cured</i> or <i>treatment completed</i> at the end of their most recent course of treatment, and are now diagnosed with a recurrent episode of TB (either a true relapse or a new episode of TB caused by reinfection).
Indicator	A summary statistic that informs about the status or progress of a process.
Infection Control (IC)	A combination of measures aimed at minimizing the risk of TB transmission within populations.
Latent TB Infection (LTBI)	The presence of Mycobacterium tuberculosis bacteria in the body as evidenced by a significant reaction to a Mantoux tuberculin skin test or positive interferon gamma release assay. A person with latent TB infection does not have an illness (i.e. TB disease) nor is he or she infectious.
Monitoring	The intermittent performance and analysis of routine measurements, aimed at detecting changes in the environment or health status of populations.
National TB Program (NTP)	The official authority responsible for control of TB in the country.
Notification Rate	Number of all TB cases registered during a specified period (usually one year) and notified to the national health authorities per 100,000 population.
Notification Rate Ratio	Ratio of the notification rate of TB in a particular risk group (HCWs in the context of this document) over the TB notification rate in the general population. This ratio should ideally be adjusted for age and sex.



Occupational Disease	Any disease contracted as a result of an exposure to risk factors arising from work activity. Two main elements are present in the definition of an occupational disease: the causal relationship between exposure in a specific working environment or work activity and a specific disease; and the fact that the disease occurs among a group of exposed persons with a frequency above the average morbidity of the rest of the population [ILO 2010].
Prevalence	Number of TB cases (all forms) per 100,000 population at a given point in time.
Risk Groups	A group of individuals in the population with increased likelihood of infection with TB. A subset of this group may be at increased risk of infection with drug-resistant TB strains, such as contacts of MDR-TB patients. Other risk groups are more likely to develop TB disease or to suffer adverse outcomes of TB disease.
Screening	The identification of unrecognized presumptive disease by the application of tests, examinations or other procedures which can be applied rapidly. Screening tests sort out apparently well persons who probably have a disease from those who probably do not. A screening test is not intended to be diagnostic.
Sentinel Surveillance	Surveillance based on selected population samples chosen to represent the relevant experience of particular groups.
Surveillance	Systematic on-going collection, collation and analysis of data and the timely dissemination of information to those who need to know, so that action can be taken.
Tuberculosis (TB)	Active disease attributable to Mycobacterium tuberculosis complex. If the lungs and airways are affected, it is directly transmissible through droplet nuclei.
Sentinel Surveillance	Surveillance based on selected population samples chosen to represent the relevant experience of particular groups.
Surveillance	Systematic ongoing collection, collation and analysis of data and the timely dissemination of information to those who need to know, so that action can be taken.

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Chapter 1: Scope and Purpose

Ideally, all countries should have occupational health programs that include screening for TB among HCWs and data collection and monitoring systems that provide disaggregated data of HCWs with notified TB. In particular, countries with high prevalence of TB, MDR-TB and HIV [WHO Global Tuberculosis Report 2012], should consider the introduction of HCW TB screening and surveillance, in tandem with scaling-up effective TB-IC programs/activities.

1.1 Objectives

The objectives of this guide are the following:

1. To improve national TB case notification systems by disaggregating the numbers of HCWs and the total number of notified patients
2. To periodically analyse the reliability and coverage of TB disease incidence data among HCW data and to monitor their trend
3. To guide healthcare facilities in establishing and conducting a (TB) screening and surveillance program for HCWs.

1.2 Target Audience

This guide is intended for everyone who is responsible for HCWs at all levels and in all settings, including policy-makers and implementers such as NTP managers, NACP managers, as well as those responsible for IPC and OHS programs, managers of Collaborative TB and HIV Partner Organizations and congregate settings where healthcare is provided, e.g. correctional facilities, homeless shelters, barracks, refugee camps. This guide is also useful for representatives from civil society, advocacy groups, HCWs themselves and their professional associations.

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Chapter 2: Background

2.1 Introduction

The risk of developing TB as an occupational disease is well established among HCWs [Joshi 2006]. This risk is most likely due to frequent exposure to patients with both diagnosed and undiagnosed infectious TB disease. The risk of on-going transmission exists if patients have as yet not been put on treatment or if the treatment is ineffective. The transmission of TB to HCWs in healthcare settings has been reported from virtually every country of the world, regardless of the local TB incidence [Baussano 2011]. The risk of transmission varies by setting, occupational group, the TB burden, patient population and the effectiveness of TB infection control (TB-IC) measures.

Nurses were the first occupational group identified to be at increased risk of TB [Heimbeck 1928/1938, Israel 1941, Mikol 1952], which is not surprising, given the prolonged and often close contact between them and patients. Physicians, particularly those aged 20-35 years and specialists in internal medicine, experience substantial rates of TB infection and disease [Barrett-Connor 1979, Gieseler 1986]. Specialists in respiratory medicine have higher rates of infection than those in other areas, probably because of the extra risk associated with performing bronchoscopy or caring for ventilated patients in intensive care units [Malasky 1990]. Pathologists represent an additional risk group [Sugita 1990]. In a review of the global literature, TB was reported to be the sixth most common occupationally acquired infection among laboratory workers, and it has been estimated that laboratory workers have a two to nine times higher risk of contracting TB than the general public [Jensen 2005]. In particular those conducting culture and drug susceptibility testing have the highest risk [Kim 2007]. Although all cadres of HCWs are at risk of increased exposure to TB, HCWs with HIV are at higher risk of developing TB disease.

Despite the fact that studies show that HCWs are at higher risk of TB infection and disease than the general population, several methodological problems may affect the interpretation of these studies. HCWs may be more likely to seek medical care for symptoms of TB disease, and hence case-detection rates may be higher than in the general population [Seidler 2004]. On the other hand, HCWs may be less likely to seek medical care or allow notification due to the perceived stigma attached to having TB disease, leading to under-reporting of the true TB disease incidence among HCWs; particularly in settings where having TB is strongly associated with HIV/AIDS.

2.2 Methods used in Preparing the Guide

This guide is based on three WHO guidelines: 1) The WHO Policy on TB Infection Control [WHO/HTM/TB/2009.419], 2) The Joint WHO-ILO policy guidelines for improving health worker access to HIV and TB prevention, treatment, care and support [WHO/ILO 2010] and 3) The WHO Guidance on Ethics of Tuberculosis Prevention, Care and Control [WHO/HTM/TB/2010.16]. Together with an update of the review of the literature and identification of tools used by different countries to monitor TB incidence among HCWs, a consultative meeting for the development of tools for monitoring TB incidence among HCWs was organized in The Hague, Netherlands, by WHO and KNCV Tuberculosis Foundation (13-14 July 2011), as part of the USAID funded core project of the TB CARE I and II consortia together (www.tbcare.net).

Prior to finalizing the draft guide, it was field-tested in three countries; one in Southeast Asia, one in Eastern Europe and one in Africa, in order to achieve regional representation. The criteria used to select the countries for field-testing included the following: facilities with high TB case rates, existing screening and surveillance system, and a willingness to participate in the activity. The guide was field-tested by a team of international and national consultants according to a





protocol developed specifically for conducting the country/facility visits. Discussions were held with country representatives to look at different options for using the guide. Lessons from the field testing and first steps in implementing a system to monitor TB disease among HCWs are described in Chapter 8, page 28.

2.3 Rationale for Monitoring the Incidence of TB Disease among HCWs

One of the major objectives of the 2009 'WHO Policy on TB infection control in healthcare facilities, congregate settings and households' is to establish effective TB-IC measures at healthcare facilities. Successful implementation of TB-IC programs is also important in preventing HCWs from becoming infected with drug-susceptible and drug-resistant TB, and thus prevents the development of occupationally acquired TB disease.

This guide refers to TB disease rather than TB infection when speaking of TB incidence. Latent TB Infection (LTBI) is a more sensitive indicator of TB transmission, but monitoring new LTBI among HCWs requires a different methodological approach, which may be too complicated and expensive for large-scale implementation in medium and high prevalence countries.

The WHO recommends that all countries strengthen their TB surveillance systems to include TB disease among HCWs. The WHO has developed an impact indicator defined as the ratio of TB notification rate (all forms) in HCWs (all staff) over the TB notification rate in the general population, adjusted for age and sex as a proxy indicator for TB transmission in healthcare facilities. (See Box 1 page 11)

Many countries are as yet not systematically collecting data on TB among HCWs. The various reasons given include the need to involve multiple partners, e.g. The Ministry of Health and other ministries (e.g. Labour, Justice, etc.), and the potential for stigma and work discrimination faced by HCWs diagnosed with TB [WHO/ILO 2010]. In order to be able to use the indicator described above, countries must be able to collect such data at the facility level and accurately report it to the central level.

This guide recognizes the feasibility of monitoring the incidence of TB disease among HCWs and the need to maintain a certain level of consistency in order to allow comparisons over time and across geographic areas and programs/reporting sites. Countries should adapt and adopt this guide based on the results from evaluations of the process of implementing, monitoring, and evaluating the HCW TB surveillance activities. Implementation of the guide should enable countries to report to the WHO the number of HCWs diagnosed with TB disease in a year.

2.4 Potential Benefits of Screening HCWs for TB

Screening HCWs at high risk of TB is likely to reduce transmission and with earlier diagnosis and treatment, prevent serious illness and disability. In an era of inadequate human resources for health, improving OHS services etc. and introducing the screening of HCWs for TB is crucial.

The introduction of HCW screening and surveillance for TB is consistent with existing international labour policy guidelines. Also, it is often recommended in national regulatory frameworks related to labour laws and OHS. If not, the introduction of HCW screening and surveillance for TB may be a driver to ratify international labour policy recommendations and revise labour laws and national regulations that lack specific detail on TB as occupational disease, strengthen OHS services if they



are weak or underutilized, increase access to free or subsidized staff services, and raise awareness of the risk among HCWs.

There are two methods of screening HCWs for TB, a standardized symptom questionnaire or chest radiography, which can be used separately or in combination with each other. Screening by asking about TB symptoms is simple, inexpensive and potentially cost-effective in many settings when compared to screening using chest radiography (see Chapter 4 page 15).

Box 1: WHO Indicator on TB among HCWs

Ratio of TB notification rate (all forms) in HCWs (all staff) over the TB notification rate in the general population, adjusted by age and sex.

Rationale

The ratio of the risk of developing active TB among HCWs compared with the risk in the general population ranges from 1.9 to 5.7, depending on country setting and on the existence of IC measures in healthcare facilities. Administrative and environmental measures, as well as the use of personal protective equipment by HCWs (as recommended in IC policy guidelines) should progressively reduce the occurrence of TB infection and the development of active TB among HCWs. When greater than one, the ratio of TB notification rates in HCWs to the TB notification rate in the general population reflects the excess risk of TB in HCWs due to exposure in healthcare settings.

Definition of the Indicator

Numerator: Number of TB cases (all forms) among HCWs (all types) during the assessment year divided by the total number of HCWs (mid-year population).

Denominator: Number of TB cases (all forms) among general population during the assessment year divided by the population size.

Measurement

This indicator is a ratio (and has no unit) and reported annually. Data for the numerator of this indicator should be obtained from annual surveys or routine reporting. Data for the denominator are reported routinely by all countries.

The indicator should be adjusted for differences in age and sex distributions between HCWs and the general population.

Platform: Annual report

Data source: Aggregated programmatic reports and or Facility Assessments reports

Frequency: Annually





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Chapter 3: Measuring incidence of TB disease among HCWs

3.1 Introduction

The incidence of TB disease is defined as the number of new TB cases that occur in a population at risk during a defined period of time (usually one year). To obtain the incidence of TB among HCWs, two figures are required: the numerator and the denominator. The numerator is the number of TB (all forms) cases that occur among HCWs in a defined period; the denominator is the population of HCWs at risk of TB during the same period. More specifically, the denominator should be 'All HCWs working at facilities which report TB among HCWs.'

In the box below the definition of HCWs is given according to the WHO [Working Together For Health WHO 2006]:

Box 2: Definition of HCWs

The WHO defines HCWs as 'all people engaged in actions whose primary intent is to enhance health'

For the purposes of TB-IC, it is proposed to also include other personnel working in healthcare facilities that may have contact with TB patients, or the infectious materials from TB patients. These personnel include all those persons who provide health services, such as doctors, nurses, pharmacists and laboratory technicians. Also included are management and support workers, such as finance officers, cooks, drivers, cleaners and security guards.

Systematically reporting TB disease among HCWs as part of the national TB surveillance system is probably the most straightforward policy requirement to ensure that TB disease incidence among HCWs will be monitored at all levels. However, another possible option for some countries could be to build/use a dedicated HCW health monitoring/occupational database. This option will require the existence/creation of an occupational health data system, and the TB data existing in this system could then be linked to the national TB surveillance system.

3.2 Numerator

To obtain the number of TB cases among HCWs in a year, it is essential to ensure that in the general TB notification register all HCWs with TB are registered for treatment and that their job category (i.e. HCW: Yes/No) is captured in the information system of NTPs. At the NTP, the starting point is to indicate on the TB treatment card whether the patient is a HCW. This could simply be 'yes' or 'no' tickboxes. To perform routine surveillance of TB disease among HCWs, this information then needs to be captured on the TB treatment register and to be included in routine quarterly reports.

3.3 Denominator

As HCWs are a dynamic population, the denominator could be the mid- or end-year size of the population of HCWs in a given setting. If the number of HCWs in a setting is not available, the number of HCWs registered with TB from this setting should not be included in the calculation of the incidence of TB disease among HCWs.





The lists of HCWs should be validated on a regular basis (e.g. annually) to ensure that they are up-to-date and accurate. All employees who provide direct patient care, and also those who do not (e.g. administrative staff, cleaners and drivers etc.) should be included [WHO/ILO 2010]. See also the classification of HCWs in the Guide to Measure the Prevalence of active TB disease Among Health Care Workers [TB CARE 2012].

After obtaining the numerator and the denominator (in absolute numbers) the incidence of TB disease among HCWs can be expressed as the annual number of TB cases per 100,000 HCWs. If it is difficult to obtain data from all healthcare facilities, conducting sentinel surveillance (see glossary page 6) in a sample of HCWs could also be considered.

Countries should report the numerator and denominator to the WHO. The WHO will then calculate the ratio as defined in Chapter 1, Page 8.

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Chapter 4: Screening, Diagnostic Evaluation and Surveillance of TB among HCWs

4.1 Introduction

Passive case finding of TB, forms the basis in the surveillance of TB among HCWs. HCWs should be encouraged to present themselves for examinations if they are symptomatic. However, symptomatic HCWs may delay seeking healthcare for various reasons, such as stigma or an incorrect perception of risk. Therefore screening may help identify undiagnosed TB among HCWs in a more timely manner. The WHO guidelines on early detection of TB [WHO/HTM/STB/PSI/2011.21] list HCWs as one of the TB risk groups where screening is feasible and should be prioritized.

4.2 Methods

Methods used for screening TB disease include:

- Symptom Monitoring
- Chest Radiographs

4.2.1 Symptom Screening

Symptom screening should be done at least annually or on a more regular basis. The country approved standard TB screening tool (questionnaire) should be used. Those who meet the definition of a person with presumptive TB should have further investigations done according to the diagnostic algorithm of the NTP. See Annex 1 page 30 for a country example.

4.2.2 Chest Radiography

The chest radiograph is a more sensitive tool than symptom screening. However, it requires more resources and is often not available in primary health facilities. Chest radiography should be done annually. Those with an abnormal chest X-ray should be investigated further according to the diagnostic algorithm of the NTP.

4.3 Diagnostic Evaluation

Those HCWs found to have positive symptoms (such as cough, chest pain, fever, coughing up sputum or blood) or abnormalities on their chest radiographs should have a sputum examination to confirm the diagnosis of TB while keeping in mind that a negative examination does not fully exclude TB disease, e.g. sputum smear negative pulmonary TB and extrapulmonary TB.

Sputum smear microscopy remains the cornerstone in the diagnosis of TB in resource limited settings. Other sputum investigations, e.g. WHO-recommended molecular tests such as Xpert® MTB/RIF, or culture, may be applied according to the country approved diagnostic algorithm.

As all healthcare facilities may not have the capacity for sputum investigations, mechanisms must be established to ensure that HCWs in such facilities are provided with access to TB diagnostic services from another facility.





4.4 Screening and Surveillance

The recommended screening strategies dependent on available resources, are:

1. Symptom screening
2. Chest Radiography
3. A combination of both of the above

Using symptoms of any duration as eligible criteria for sputum examination may be more sensitive than using symptoms of 2 weeks or more. A shorter recommended duration of cough leads to higher sensitivity of screening but lower specificity. Appropriate cut-off depends on the prevalence of TB in the community, which determines the yield, as well as the positive and negative predictive value of the symptom screening step.

As demonstrated in prevalence surveys, 10–25% of bacteriologically culture-confirmed cases do not report any symptoms early in the disease course [WHO/HTM/STB/PSI/2011.21]. Such cases may be identified only through screening by chest X-ray, regardless of symptoms. If a country opts for chest radiography for screening TB among HCWs, arrangement must be made for those HCWs from healthcare facilities without the capacity of chest radiograph.

Screening for TB-compatible symptoms, with targeted further chest X-ray evaluation as needed, may yield more true cases and be more cost-effective.

Entry screening, done at the time when a HCW is hired by a healthcare facility, provides a baseline for follow-on TB screening in this individual.

It is preferable to screen all HCWs annually and those at particularly high risk of TB more frequently.

The frequency of screening depends on the screening strategy applied and the capacity/resources of the setting to conduct the screening. Symptom screening can be performed more frequently than annually, as it is relatively easy to conduct and costs are lower than chest radiography.

In all settings with a screening program, a mechanism and tools need to be put in place to clearly document who conducts the screening, where and when the screening is done, who were screened, the results of the screening and who is diagnosed and treated for TB. See Annex 3 page 33.

For the routine surveillance of TB, any HCW diagnosed with TB disease must be consistently entered in the TB register and notified to the NTP. Any HCW diagnosed inside or outside of the facility must be confidentially recorded at the facility where they work.

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Chapter 5: Data Management of HCW TB Surveillance Systems

5.1 Data Management Plan

In order to ensure that all data management activities are correctly and uniformly followed, surveillance of TB disease among HCWs should be embedded into the overall data management plan of the national TB surveillance system.

Good data management will be essential for the surveillance of TB disease among HCWs as it will require the collection of reliable, high-quality surveillance data that can be analysed and reported. Data management consists of the processes and procedures for collecting, monitoring, handling, storing, processing, validating and archiving of data from the surveillance system [Teutsch 1994]. The following paragraphs outline general data management practices that should also apply to TB surveillance among HCWs.

5.2 Data Collection

Sound epidemiologic principles, including use of standardized case definitions and data collection tools must form the foundation of effective HCW TB surveillance systems [Scheckler 1998]. HCW TB surveillance systems should use standardized TB case definitions [WHO/HTM/TB/2013.2] to ensure the consistency and comparability of data across reporting sites and the ability to appropriately interpret temporal trends. The TB case definitions used in HCW surveillance systems should be consistent with those used in other TB case notification systems.

HCW TB surveillance data should be collected and managed by trained personnel. Data collectors can include occupational health providers, infection control staff or other professionals as well as staff with designated responsibility for the surveillance activities.

Different types of data collection tools may be used, depending on the resources available at the reporting site. Forms for data collection could include intranet-based, computerized data entry screens, handheld personal digital assistant devices, smart phone technology and/or paper forms.

Box 3: Characteristics of HCW TB Surveillance Systems

To facilitate regular and complete reporting, HCW TB surveillance systems should have the following characteristics:

- Simple and user-friendly data collection forms
- Harmonized data collection efforts across different health programs
- Collection of information that is only used for program management and decision-making
- Data collection methods and tools that are harmonized between the public sector, private sector and civil society
- Reporting systems at the regional and national levels that can aggregate data from the various local sources (e.g., public sector, private sector and civil society)





5.3 Data Analysis and Interpretation

Data on TB disease among HCWs should be aggregated at the facility and/or district level and reported to the NTP in accordance with the country's existing policy for TB case notifications.

The data collected at national level should allow for the calculation of HCW TB case rates, stratified by gender and age, so as to enable an adjustment for age and sex when calculating the rate/ratio for TB disease among HCWs and general population. The data collected should be reported to the WHO as a contribution to the WHO Global TB annual report.

Surveillance data also may be used to raise awareness and advocate for resources, the establishment of HCW occupational safety regulations to protect HCWs from getting TB at their places of employment, and to develop or review TB-IC policies and work practices.

5.4 Data Quality Issues

Data quality includes accuracy, reliability, precision, completeness, timeliness, integrity and confidentiality. In establishing HCW TB surveillance systems, countries should develop and establish procedures to ensure the collection of quality data at each level of the reporting system as part of their routine data collection mechanisms, as poor quality data can adversely impact decision making and program management. In addition, regular data quality audits should be performed to complement routine quality assurance procedures. Data quality audit tools, such as the Routine Data Quality Assessment Tool (RDQA), have been developed for use by countries to facilitate quality assurance of their routine data [Data Quality Audit Tool]. Continuous professional education and supportive supervision should be an integral part of the quality assurance process.

Periodic supervisory visits to reporting sites should be done by NTP staff to assist in managing, ensuring quality and resolving problems that may arise with the surveillance system. The visits should focus on all aspects of the surveillance process to help identify and address problems. It is important to assess the functioning of the surveillance system/activities, using a set of standardized indicators (see Chapter 6, Page 21) so that results can be compared across reporting sites. Such visits are particularly important at the beginning of data collection to ensure that logistics are running smoothly and to assess how well the facility's staff is prepared for the surveillance activities. Subsequent supervisory visits should focus on the quality of data and process issues such as HCW participation rates. During such visits, supervisors also can observe the procedures used in the screening and management of HCWs participating in the system.

5.5 Data Dissemination

HCW TB surveillance systems should operate in a manner that allows the effective dissemination of health data so that decision makers at all levels can readily understand the implications of the information [Teutsch 1995]. Options for disseminating data and/or information from the system include:

- Electronic data interchange
- The Internet
- Press releases
- Newsletters
- Bulletins
- Annual and other types of reports
- Publication in scientific peer-reviewed journals
- Poster & oral presentations, including those at individual, community and professional meetings.



5.6 Security and Confidentiality

Any data collected from HCWs who participate in the system are confidential. In conducting surveillance of TB disease in HCWs, healthcare providers and public health agencies have an obligation to protect against the inappropriate use or release of that data. The protection of the HCW's privacy (recognition of a person's right not to share information about themselves), data confidentiality (assurance of authorized data sharing), and system security (assurance of authorized system access) is essential to maintaining the system's credibility. Protection must be in place to ensure that data in a surveillance system regarding a HCW's health status are shared only with authorized persons. Physical, administrative, operational, and computer safeguards for securing the system and protecting its data must allow only authorized access.

All data collection instruments containing personal identifiers, such as names, addresses and ID numbers should be kept confidential. If ID numbers are used, it is essential that at least one form should link the name and address of the HCW with their unique ID number to allow for the identification of the participant, if follow-up activities are required for surveillance purposes. ID numbers should appear on all data collection forms and questionnaires from each participant. It is up to the country to decide whether to also add the HCW's name on some or all case-based reporting forms, depending on what is ethically and culturally acceptable. Names could offer a cross-check in addition to ID numbers, but would also require enhanced confidentiality measures. When personal identifiers are retained in the system, procedures should be in place to ensure the confidentiality of the data and to describe who will have access to the data.

At the time of enrollment in the screening program, all HCWs should receive information on the measures taken to maintain data confidentiality. All participants should be informed about who can access the data and how the collected data will be used, including how the results will be disseminated (e.g. in reports, publications and presentations, etc) and the fact that TB is a notifiable disease in most countries.

All staff handling HCW TB surveillance data (both on paper and electronically) should respect the confidentiality of the information collected. All paper forms and registers that allow an individual to be identified should be kept securely locked in a designated place in the facility. Data entry systems should use electronic signatures (passwords) and any electronic files and associated datasets used in the surveillance system should be secured with appropriate access controls in place to ensure that only authorized survey staff can view, edit or delete them. All computers used for surveillance activities should have effective and up-to-date anti-virus programs/firewalls and must be protected from physical risks such as theft, power breaks or power surges (e.g. by using uninterruptable power supply units).

A related concern in protecting health data is data release, including procedures for releasing record-level data, aggregate tabular data and data in computer-based, interactive query systems. Information which can identify a participant should not be included in aggregate data used for the purposes of statistical analysis or reports. Even though personal identifiers are removed before the data is released, the removal of these identifiers might not be a sufficient safeguard for sharing health data. For example, the inclusion of demographic information in a line-listed data file for a small number of cases could lead to indirect identification of a person, even though personal identifiers were not provided. Policies should be developed for the release of HCW TB surveillance data which facilitate its use for public health, whilst preserving confidentiality. Standards for the privacy of individually identifiable health data have been proposed [Department of Health and Human Services, Georgetown University Law Center, 1999]. In addition, a series of papers have been published that outline basic statistical methods to limit disclosure (e.g. rules for data suppression to protect privacy and to minimize mistaken inferences from small numbers) and provide recommendations for improving practices that limit disclosure.





5.7 Storage and Archiving

There should be a clear procedure for if, when and how the paper documents and electronic data files will be archived/destroyed or deleted to ensure that confidentiality is not violated. All staff handling surveillance data (both on paper and electronically) should respect the confidentiality of the information collected. All essential documents pertaining to the HCW TB surveillance system should be stored safely at least until follow-up is complete and/or the HCW no longer works at the facility.

Protective measures such as securing data storage media using encryption or passwords could be considered, especially if the media are at risk of theft (e.g. if stored off-site or if carried into the field) [Privacy Law Advisory Committee].

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Chapter 6: Monitoring and Evaluation of TB disease Incidence among HCWs

6.1 Introduction

The incidence of TB disease among HCWs and HCW TB surveillance systems should be monitored and evaluated periodically to ensure that they are functioning efficiently and effectively, and meeting their stated objectives [WHO 2004]. Additionally, countries also should have a system for ensuring that M&E data from the screening of HCWs for TB disease are fed back to stakeholders and used to improve program performance.

6.2 Indicators for HCW TB Surveillance Systems

Four provisional core indicators for the country and/or regional level are proposed for the monitoring and evaluating of TB disease incidence among HCWs, they are as follows:

1. The percentage of HCWs who had a documented TB screening according to national and/or institutional screening algorithms/guidelines in the past 12 months
2. The percentage of HCW TB cases placed on TB treatment consistent with national guidelines out of all registered TB patients in the past 12 months.
3. The number of TB cases (all forms) among HCWs during the past year divided by the total number of registered HCWs (mid- or end-year population)
4. The total number of TB deaths per year among HCWs divided by the total number of HCWs (mid- or end-year population in the past year)

These indicators were selected as measures of the routine system's performance characteristics and its impact on practice and health outcomes [CDC/MMWR 1988]. A detailed description of the proposed indicators is shown in Table 1 page 22. For each indicator, the table provides an operational definition, the method of data collection, the source of information, the level at which the data should be collected and the frequency of data collection. The use of these indicators does not preclude countries from collecting additional information or indicators which they consider necessary to monitor the progress of their individual HCW surveillance activities. However, adoption of this minimum set of core indicators, especially in regions or groups of countries with similar epidemiology and intervention strategies will greatly facilitate monitoring, at the global level, of the progress and the impact of HCW TB surveillance.



Table 1: Provisional Indicators for Monitoring the TB Incidence among HCWs Surveillance Systems

Indicator	Operational Definition	Numerator	Denominator	Level	Source of Information	Periodicity of data collection
Participation Rate	Percentage of HCWs who had documented TB screening in the past year according to national and/or institutional screening algorithms/ guidelines	Number of HCWs with TB screening documented in the past year	Total number of registered HCWs per past year mid-or end-point count	Facility, sub-national, national	Occupational health records/logs, Hospital employment data; NTP HCW surveillance system; MOH Human Resources data system	Annually
Tuberculosis treatment of HCWs identified with TB	Percentage of HCW TB cases placed on TB treatment consistent with national guidelines out of all registered TB patients in the past year	Number of HCWs placed on TB treatment in the past year	Number of TB patients started on treatment in the past year	Facility, sub-national, national	TB case logs; TB case report forms	Annually
Tuberculosis Incidence among HCWs	Number of TB cases (all forms) among HCWs during the past year divided by the total number of HCWs (mid-or end-year population)	Number of TB cases among HCWs in the past year	Total number of registered HCWs per past year mid-or end-point count	Facility, sub-national, national	TB case logs; occupational health records/ logs; Hospital employment data; NTP HCW surveillance system; MOH Human Resources data system	Annually
Tuberculosis Related Mortality among HCWs	Total number of TB deaths per year among HCWs divided by the total number of HCWs (mid-or end- year population)	Number of HCWs per year who died of TB	Total number of registered HCWs per past year mid-or end-point count	Facility, sub-national, national	TB case report forms	Annually



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Chapter 7: Ethics, Human Rights and the Legal Basis for TB Monitoring among HCWs.

The WHO (2010) guidance on ethics highlights HCWs' rights and obligations [WHO/HTM/TB/2010.16]. The key themes are that, while HCWs have a duty to care for patients even when a degree of risk is involved, employers are expected to create an environment where adequate precautions have been taken to reduce the risk of exposure to occupational hazards. In addition, HCWs should be able to access confidential and good-quality healthcare, diagnosis and treatment and patients should not be put at risk of infection by those caring for them.

7.1 Codes of Ethics

Health professional codes of ethics including: the International Council of Nurses (ICN) Code of Ethics for Nurses [ICN 2012], the World Medical Association (WMA) International Code of Medical Ethics [WMA 2006] and the International Code of Ethics for Occupational Health Professionals [ICOH, 2002] refer to these HCWs' rights and responsibilities. For example, the ICN Code states that nurses should maintain safe working conditions, ensure they maintain a good level of personal health and take appropriate action if a co-worker threatens to endanger the health of others. The International Code of Ethics for Occupational Health Professionals further states that the primary purpose of health surveillance in the workplace should be to adapt working conditions to reduce risks.

According to the experiences of nurses in a variety of countries with a high burden of TB, there are on-going challenges with regard to following the principles laid out in the ethical codes mentioned above. The most common concerns are the overcrowding of healthcare facilities and staff shortages, both of which result in less than adequate IC and an increased risk faced by HCWs who are in regular contact with all forms of TB.

In addition, nurses report poor access to care, as well as a lack of confidentiality, with HCWs often having to use the same services as the patients they serve. The result might be that HCWs present late, rely on private providers and maybe even leave their posts before they seek care.

There is an ethical dimension to the monitoring of TB in HCWs, both in order to assess the occurrence of TB in this occupational group in relation to the general population and also to monitor the trend, whilst ensuring incidence is being kept to a minimum with the help of good TB-IC, prompt diagnosis, treatment and care of HCWs.

7.2 Rights and Responsibilities of HCWs

Table 2 (page 25) summarizes the rights and responsibilities of HCWs as discussed at a consultative expert meeting in The Hague (2011). Expectations with regard to these rights and responsibilities need to be agreed among HCWs, with an understanding that the personal rights of HCWs take precedent over their responsibilities, if adequate IC measures are not in place.



Table 2: Rights and Responsibilities of HCWs

Health Care Workers Rights	Health Care Workers Responsibilities
The right to work in a safe and healthy environment where adequate precautions have been taken to reduce occupational risk	To be aware of and adhere to infection prevention and control policies and practices
Informed consent for health surveillance	To be aware of and adhere to, the applied OHS policy and protocol for screening TB among HCWs
Compensation in the case of disability due to occupational infection	Duty of Care
Access to information and education about risks and how to minimize them as well as how to recognize early signs of disease	Report any inadequate precautions to management, and even to the National TB Program
Access to quality diagnosis, treatment and care, including opportunity for screening	Report symptoms early and if diagnosed with TB report to appropriate person
Confidentiality	Present for screening
Abide by a workplace policy which is free of stigma or discrimination	Disclose to the service provider (e.g. in a staff clinic) health status that may increase the risk to self (e.g. diabetes or HIV) in order to manage/reduce risk of exposure in the workplace
Prioritized diagnosis, care and treatment - (TB/ DR-TB and HIV)	Keep appointments, adhere to treatment and advice regarding care and precautions to prevent transmission to others

International instruments governing the right to decent work and use of health surveillance are addressed in the following ILO Conventions: Technical and ethical guidelines for workers health surveillance (1998) and Guidelines on occupational safety and health management systems ILO-OSH 2001 which states: 'The results of surveillance should be used to protect and promote the health of the individual, collective health at the workplace, and the health of the exposed working population'.

The rights of HCWs infected with TB and/or HIV is an important consideration in the joint WHO-ILO policy guidelines for improving HCW access to HIV and TB prevention, treatment, care and support [WHO/ILO 2010]. As noted by the ILO and the WHO in previous guidelines, all workers should have the right to a healthy and safe workplace. Adopted in 1998, the ILO Declaration on Fundamental Principles and Rights at Work is an expression of commitment by governments, employers' and workers' organizations to uphold basic human values [ILO 1998].

It would be difficult within the scope of this document to make any recommendations with regard to any relevant legal issues, apart from to acknowledge that the legal framework with regard to employment rights and public health needs to be taken into account, especially with regard to any existing laws and regulatory frameworks which may be relevant.

7.3 Workplace Policy and Compensation Scheme which Avoids Stigmatization

While it may be difficult to establish exactly when and where a HCW may have been infected with TB, we know that HCWs are at higher risk of TB than persons in the general population.





Therefore, HCWs who develop TB should be entitled to some level of compensation from their employer, at least to assist with lost work and costs associated with the disease.

The following topics are suggested for inclusion in a workplace policy:

- An occupational health physician or designated physician, independent of the healthcare facility where the HCW is employed, needs to be identified to confirm cases eligible for compensation.
- This physician will then need to liaise with administration management units at facility level to ensure confidentiality and non-discrimination.
- Guidelines must be in place regarding compensation, rights and responsibilities at a national as well as at facility level, to ensure HCWs are aware of what they should do and what they can expect if they develop symptoms.
- Priority access for HCWs and their families to services for the prevention, treatment and care of HIV and TB should be ensured.
- Free HIV and TB treatment and services should be provided for HCWs in a non-stigmatizing, gender-sensitive, confidential and convenient setting when there is no staff clinic, or where HCWs prefer services off-site.
- TB awareness and health education should be made available to HCWs so that they will recognize their symptoms and come forward for investigation. In addition, HCWs need to be well-informed regarding any screening program which is put in place, including clear guidance regarding HCWs' rights and responsibilities

7.4 Priority access for HCWs

WHO and ILO [WHO/ILO 2010] recommend that national policies to ensure priority access for HCWs and their families to services for the prevention, treatment and care for HIV and TB should be introduced or refined. Healthcare facilities which can demonstrate that they value HCWs through the services they offer to their staff can potentially benefit from improved recruitment and retention. No area in a healthcare facility is without risk of TB transmission, however risks can be managed: A risk assessment of the work environment in tandem with HCW screening for TB and/or HIV and other co-morbidities helps to evaluate the risk profile. It is important that HCWs know where they can seek help and be confident that they will be attended to promptly and confidentially, and receive any tests and treatment they require.

7.5 Separate Access

WHO and ILO [WHO/ILO 2010] recommend that free HIV and TB treatment and services should be provided for HCWs. Services should be provided in a non-stigmatizing, gender-sensitive, confidential and convenient setting. When there is no staff clinic, or when HCWs prefer services off-site, plans need to be made about how services should be provided. This will all be easier if at least one HCW representative is involved in the planning from the start. An analysis would be useful about what occupational health services are already available and could be used and/or developed to carry out TB screening and on-going care. If occupational health services do not exist, it may be possible to collaborate with the general infection prevention & control and/or needle-stick prevention committee to provide efficient services for HCWs. In case of an existing health insurance scheme, the conditions, responsibilities and rights stipulated in the insurance policy should be followed, such as the right to choose a health provider.



7.6 Awareness

TB awareness and educational materials should be made available to HCWs so that they will recognize their symptoms and come forward for investigation. In addition, HCWs need to be well-informed regarding any screening program which is put in place (see Annex 2 page 31 Example of Handout), including clear guidance regarding HCWs' rights and responsibilities: what will happen if they do not attend for screening and what to expect if they do, i.e. confidentiality, access to treatment, sick pay, job security.

HCWs also need to know what to do if they develop symptoms, irrespective of recent screening. A program of awareness-raising should be included in the planning to support efforts to monitor TB among HCWs. Awareness-raising activities should include posters and information leaflets encouraging HCWs to report to the person responsible for screening, especially if they develop symptoms between screening intervals. In addition, there should be education and regular reminders for HCWs on the benefits and responsibilities associated with screening, including discussions on human rights and stigma reduction. Awareness-raising activities need to involve all health care providers, including private providers and those working for civil society organizations and NGOs.

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Chapter 8: Implementation of the Guide

The lessons learned from the country visits are highlighted in this implementation chapter.

8.1 Lessons from the field

Field-testing of the draft guide in several countries showed that “one size does not fit all.” The guide will need to be adapted to the specific circumstances of the country which wishes to monitor the incidence of TB disease among HCWs. For instance, there may be countries which already have an established surveillance system for capturing TB incidence among their HCWs. Some countries may have large TB facilities or organizations which are collecting data on HCWs but do not have a nation-wide program. Lastly there may be countries which do not have any system to capture the incidence of TB disease among HCWs.

The field-testing also showed that countries wanted examples of templates and tools for screening and data collection. Thus tools were garnered from the countries visited and/or developed with country representatives during the missions to the three countries. Countries which are just embarking on the establishment of a surveillance system may wish to utilize some of the following suggested implementation steps and/or adopt or adapt the screening and data collection tools and records found in Annexes 1-3 (pages 30-34). For countries which already have a surveillance system in place, the tool in Annex 4 (page 35) can be used to evaluate the robustness of the system and to fine tune it to reflect the true incidence.

Regardless of the stage a country is at with the monitoring of HCW TB Screening and Surveillance, this guide can serve as an advocacy tool to either initiate the process or to fine tune the process and use the resulting data to advocate for a safe work environment for its HCWs and to leverage for resources for the prevention of TB transmission among HCWs.

8.2 Steps in implementing a system to monitor TB disease among HCWs

1	Appoint someone or assign an existing coordinating body to take overall responsibility for setting up a screening program and/or ensuring the collection and monitoring of the quality of data on TB among HCWs <ul style="list-style-type: none">• Link up with an existing occupational health service program, if appropriate• Involve national health insurance schemes for HCWs, if available
2	Review (institutional, national and international) documents, policies and guidelines and programs/compensation schemes relevant to the medical screening of employees and employee health programs, including screening of HCWs for TB
3	Sensitize relevant parties from the Ministry of Health (MoH) and other stakeholders on the importance of monitoring TB disease among HCWs
4	Develop the screening protocol, data collection tools and accompanying documents; discuss and agree on the following: <ul style="list-style-type: none">• The screening algorithm• The data collection tools• The indicators to be collected• The practicalities of utilizing informed consent as part of the screening process



5	Select sites for piloting the screening program, data collection <ul style="list-style-type: none">• Ensure cooperation and collaboration by making a presentation on the current TB-IC situation (nationally or at the selected sites), with a focus on TB disease among the HCWs at the site(s)
6	If deemed necessary, obtain ethics approval from the national ethics committee <ul style="list-style-type: none">• Develop the research questions for ethical review
7	Review the existing TB case notification forms and registers to see how data on HCW cases shall be collected routinely <ul style="list-style-type: none">• In a facility-based or occupational health data collection and monitoring system, with the understanding that results be shared with the NTP• Modification of the existing NTP TB notification system to include data on TB disease among HCWs



Annex 1: Example of TB Screening Questionnaire (Ghana)

Name: Department:

Age: Sex: M/F Date:

Symptom Screen

Do you have any of the following symptoms? (Please circle grade for response)

	Yes	No
Cough more than 2 weeks	2	0
Cough less than 2 weeks	1	0
Sputum production	2	0
Coughing up blood	2	0
Loss of weight in last 3 months	1	0
Drenching night sweats	1	0
Fever	1	0
Chest Pain	1	0
History of contact with a TB case	1	0
History of Smoking/Alcohol	1	0

Total Score	<input style="width: 80%;" type="text"/>	<input style="width: 80%;" type="text"/>
-------------	--	--

Consider Client a SUSPECT IF:	Interpretation
Cough is for 2 weeks or more	Suspect
Cough is less than 2 weeks & score 3 or more on symptom screen	Suspect
Score of 4 or more on symptom screen	Suspect

Conclusion (Circle)

SUSPECT

NON-SUSPECT



Annex 2: Example of a Hand Out on the Screening of HCWs for TB (Ghana)

The screening of health care workers (HCWs) for TB in your health facility is established. It is well-documented that HCWs have a higher risk of getting TB than the general population because of their frequent contact with (undiagnosed) patients. The screening is part of a surveillance program. This screening program is run by the Public health and Chest Departments and approved and supported by the Hospital administration. All HCWs will be encouraged to participate in the TB screening program. You will be asked to sign an informed consent form that you understand the need to be screened for TB, agree to being screened and that your results will be registered. The screening program has been explained to you during a special staff meeting.

Voluntary participation

Participation is voluntary. You are not obliged to participate. You have the right to ask questions. You can withdraw at any time and this will not negatively affect your job (performance appraisal) or medical care for you.

Who are health care workers that will be screened?

Health care workers are all persons registered to work in a health care facility. This can be medical officers, nurses, laboratory personnel, health care assistants, orderlies, cleaners, drivers, administrators, and other paid such as registered TB treatment supporters.

What is tuberculosis?

Tuberculosis is a disease caused by a germ, called *Mycobacterium tuberculosis*. It is spread through the air. One third of the world population has the germ in their body; and in countries like Ghana more than half of the adults have the germ in their body. This is called TB infection. Only few people with tuberculosis infection get the disease. Symptoms of TB disease are prolonged cough (2 weeks or more), fever, night sweats, losing weight and coughing up blood. The disease usually occurs in the lungs but can also occur in other organs with varying symptoms related to the affected organ. This is called extra-pulmonary TB and is more common among people living with HIV. The disease can be cured by taking 6 months or more of medication.

Procedures: what is screening for tuberculosis?

All HCWs will be approached by/asked to report to the TB screening person [Public health nurse or health promotion officer or health educator] of this facility once per year. You will be asked for possible symptoms of TB as well as past history of TB. Any persons with possible TB symptoms will be referred to the Chest Department for further evaluation of TB. They will be asked to submit two sputum samples to the laboratory. These sputum samples will be used for a sputum smear and a culture test. You will also be asked to undergo a chest x-ray at the Chest Department. The TB screening person will assist and refer you to the Chest Department.

Do I also report for screening if I do not have any symptoms?

Yes, this is an annual check-up that every HCW should attend irrespective of whether you have symptoms of TB or not

What happens if I have TB symptoms in between screening rounds?

It is important that throughout the year you are aware of symptoms that may be suggestive of TB. If you have any of the above TB symptoms, in particular cough that lasted longer than two weeks, you can go to the same TB screening person [Public health nurse or health promotion officer or health educator] who can refer you for further evaluation for TB. Specially assigned screening officers (colleagues) may encourage you to get screened if you cough!





Confidentiality

The results of your test will be registered. The results with your name on it will be kept confidential by the Chest Department in a locked cabinet or room. All persons involved in screening you, have signed to maintain confidentiality. The combined results of all HCWs of the facility, without your name or other personal information, will be reported to the Public Health Unit.

What are the benefits of TB screening?

Since HCWs have a higher risk than the general population to get TB, it is important that they are more aware of the risks. HCWs are entitled to priority access to health care and diagnostics for TB. When you report for screening and you do have TB, it is likely that you are diagnosed earlier and this improves your treatment outcome. When results of all HCWs are registered and aggregated, occupational risks may be identified and avoided.

What are the disadvantages or risks of HCW screening?

There are no disadvantages for you. There is a small risk that HCWs who are undergoing diagnostic tests for TB may already be considered TB cases before the diagnosis is confirmed. There is also a small risk that HCWs who have TB will be avoided by colleagues, due to stigma. We try to avoid this by proper health education about TB to all HCWs. Since results of TB tests are kept confidential it is up to you to disclose your TB status.

Why do we not all get an annual chest x-ray or sputum test or tuberculin skin test?

If you do not have any symptoms, the chance is very small that you have TB. If a chest x-ray or sputum test is used in people with a very low risk on TB, there is a higher risk that the test gives false-positive results. A tuberculin skin test measures tuberculosis infection and not tuberculosis disease. As stated above, most adults in Ghana have been infected with tuberculosis. A positive test therefore does not mean that you have or will get TB disease.

What are the costs?

TB diagnostics and TB drugs are for free. You are responsible for your own transport to and from the locations for submitting sputum for TB smears and obtaining a chest x-ray.

Questions and complaints

If you have any questions or complaints, you can go to the screening person in your department/unit or the Public health staff at Chest Department or the Public Health Unit.



Annex 3: HCW Screening Management Register

Use this register for management of the screening.
Year

Fill in this register for all HCW eligible for TB screening

PART 1 Information about the HCW

Number	HHC code	Name	Job/current occupation	Name Province	Name District	Name Health Care Center (HCC)	Place of work within the HCC	Employed since (date of employment)	Sex		Date of Birth	Participate in the screening		If no, please indicate why not (i.e. refusal)
ID	HCC_CODE	NAME	JOB	PROVINCE	DISTRICT	HCC	WORKPLACE	DATE_EMPLOYED	SEX		DATE_BIRTH	PARTICIPATE		REASON_NO_PART
1								.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> Male	<input type="checkbox"/> Female	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
2								.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> Male	<input type="checkbox"/> Female	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
3								.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> Male	<input type="checkbox"/> Female	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
4								.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> Male	<input type="checkbox"/> Female	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
5								.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> Male	<input type="checkbox"/> Female	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

PART 2 Screening results

Number	HHC code	Name	Screened for Symptoms		Date of Symptoms Screening	Symptoms				Chest X-ray done		Date of Chest X-ray	Result Chest X-ray?				
ID	HCC_CODE	NAME	SCREENED_SYMPTOMS	DATE_SYMPTOMS	SYMPTOMS	CHEST_XRAY		DATE_XRAY	RESULTS_XRAY								
1			<input type="checkbox"/> Yes <input type="checkbox"/> No	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> >2 wks cough <input type="checkbox"/> fever <input type="checkbox"/> weight loss <input type="checkbox"/> night sweats	<input type="checkbox"/> Yes <input type="checkbox"/> No	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> abnormality <input type="checkbox"/> old TB	<input type="checkbox"/> no TB <input type="checkbox"/> Abnormality <input type="checkbox"/> no abnormalities	<input type="checkbox"/> unknown							
2			<input type="checkbox"/> Yes <input type="checkbox"/> No	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> >2 wks cough <input type="checkbox"/> fever <input type="checkbox"/> weight loss <input type="checkbox"/> night sweats	<input type="checkbox"/> Yes <input type="checkbox"/> No	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> abnormality <input type="checkbox"/> old TB	<input type="checkbox"/> no TB <input type="checkbox"/> Abnormality <input type="checkbox"/> no abnormalities	<input type="checkbox"/> unknown							
3			<input type="checkbox"/> Yes <input type="checkbox"/> No	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> >2 wks cough <input type="checkbox"/> fever <input type="checkbox"/> weight loss <input type="checkbox"/> night sweats	<input type="checkbox"/> Yes <input type="checkbox"/> No	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> abnormality <input type="checkbox"/> old TB	<input type="checkbox"/> no TB <input type="checkbox"/> Abnormality <input type="checkbox"/> no abnormalities	<input type="checkbox"/> unknown							
4			<input type="checkbox"/> Yes <input type="checkbox"/> No	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> >2 wks cough <input type="checkbox"/> fever <input type="checkbox"/> weight loss <input type="checkbox"/> night sweats	<input type="checkbox"/> Yes <input type="checkbox"/> No	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> abnormality <input type="checkbox"/> old TB	<input type="checkbox"/> no TB <input type="checkbox"/> Abnormality <input type="checkbox"/> no abnormalities	<input type="checkbox"/> unknown							
5			<input type="checkbox"/> Yes <input type="checkbox"/> No	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> >2 wks cough <input type="checkbox"/> fever <input type="checkbox"/> weight loss <input type="checkbox"/> night sweats	<input type="checkbox"/> Yes <input type="checkbox"/> No	.. / .. / (dd/mm/yyyy)	<input type="checkbox"/> abnormality <input type="checkbox"/> old TB	<input type="checkbox"/> no TB <input type="checkbox"/> Abnormality <input type="checkbox"/> no abnormalities	<input type="checkbox"/> unknown							



PART 3 TB test results

Number	HCC code	Name	Date of smear examination 1	Smear result 1			Date of smear examination 2	Smear result 2			Date of smear examination 3	Smear result 3			Date of culture/	Culture result/DST				Date of GeneXpert	GeneXpert result		
ID	HCC_CODE	NAME	DATE_SMEAR_1	SMEAR_RESULT_1			DATE_SMEAR_2	SMEAR_RESULT_2			DATE_SMEAR_3	SMEAR_RESULT_3			DATE_CULTURE	CULTURE_DST_RESULT				DATE_GXT	XPERT_RESULT		
1			.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> RIF resistant	<input type="checkbox"/> INH resistant	.././.... (dd/mm/yyyy)	<input type="checkbox"/> MTB positive	<input type="checkbox"/> MTB negative	<input type="checkbox"/> RIF resistant
2			.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> RIF resistant	<input type="checkbox"/> INH resistant	.././.... (dd/mm/yyyy)	<input type="checkbox"/> MTB positive	<input type="checkbox"/> MTB negative	<input type="checkbox"/> RIF resistant
3			.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> RIF resistant	<input type="checkbox"/> INH resistant	.././.... (dd/mm/yyyy)	<input type="checkbox"/> MTB positive	<input type="checkbox"/> MTB negative	<input type="checkbox"/> RIF resistant
4			.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> RIF resistant	<input type="checkbox"/> INH resistant	.././.... (dd/mm/yyyy)	<input type="checkbox"/> MTB positive	<input type="checkbox"/> MTB negative	<input type="checkbox"/> RIF resistant
5			.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> Not received	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	<input type="checkbox"/> RIF resistant	<input type="checkbox"/> INH resistant	.././.... (dd/mm/yyyy)	<input type="checkbox"/> MTB positive	<input type="checkbox"/> MTB negative	<input type="checkbox"/> RIF resistant

PART 4 TB Diagnosis and Treatment

Number	HCC code	Name	Date of TB diagnosis	Diagnosis/Site classification			Date of start treatment	Date of HIV test	HIV status			Remarks (ie 2 wks antibiotics, quality of sputum example, etc)		Validated by (name)
ID	HCC_CODE	NAME	DATE_DIAGNOSIS	DIAGNOSIS			DATE_TREATMENT	DATE_HIV_TEST	HIV_STATUS			REMARKS		VALIDATED_BY
1			.././.... (dd/mm/yyyy)	<input type="checkbox"/> pulmonary TB	<input type="checkbox"/> Extra-pulmonary TB	<input type="checkbox"/> Pulm&Extra-pulmTB	.././.... (dd/mm/yyyy)	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Pos	<input type="checkbox"/> Neg	<input type="checkbox"/> Not tested			
2			.././.... (dd/mm/yyyy)	<input type="checkbox"/> pulmonary TB	<input type="checkbox"/> Extra-pulmonary TB	<input type="checkbox"/> Pulm&Extra-pulmTB	.././.... (dd/mm/yyyy)	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Pos	<input type="checkbox"/> Neg	<input type="checkbox"/> Not tested			
3			.././.... (dd/mm/yyyy)	<input type="checkbox"/> pulmonary TB	<input type="checkbox"/> Extra-pulmonary TB	<input type="checkbox"/> Pulm&Extra-pulmTB	.././.... (dd/mm/yyyy)	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Pos	<input type="checkbox"/> Neg	<input type="checkbox"/> Not tested			
4			.././.... (dd/mm/yyyy)	<input type="checkbox"/> pulmonary TB	<input type="checkbox"/> Extra-pulmonary TB	<input type="checkbox"/> Pulm&Extra-pulmTB	.././.... (dd/mm/yyyy)	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Pos	<input type="checkbox"/> Neg	<input type="checkbox"/> Not tested			
5			.././.... (dd/mm/yyyy)	<input type="checkbox"/> pulmonary TB	<input type="checkbox"/> Extra-pulmonary TB	<input type="checkbox"/> Pulm&Extra-pulmTB	.././.... (dd/mm/yyyy)	.././.... (dd/mm/yyyy)	<input type="checkbox"/> Pos	<input type="checkbox"/> Neg	<input type="checkbox"/> Not tested			



Annex 4: Checklist to Assess Quality of Systems for Monitoring TB disease among HCWs

	Quality Aspect	Yes/no/partly/not applicable (NA) (if partly, please explain)
1	Is any working group/organization responsible for monitoring active TB disease among HCWs?	
2	Occupational health issues	
A	Is there an occupational health policy/workplace policy?	
B	Is TB among HCW recognized as occupational disease?	
C	Are occupational health services provided through a staff clinic?	
D	Is there any compensation mechanism for HCWs with TB? <ul style="list-style-type: none"> • Are they protected from being fired while being treated for TB? • Are they allowed paid sick leave? • Does a social security scheme exist in case of permanent disability as a result of TB or its treatment? • Is there a national compensation policy for TB disease as an occupational disease of HCWs? 	
3	Screening system	
A	Is there a periodic TB screening system of HCWs?	
B	If yes, are all types of HCW included: <ul style="list-style-type: none"> • Non-TB HCW • Support staff • Volunteers • Students • NGOs who provide support to the TB control programme • Administrative offices that need to supervise TB control (for example NTP staff, DMO staff) 	
C	Are all facilities included, including prison sector, NGOs, MoH, NTP, district health offices, private facilities, etc.	
D	Is the participation rate (coverage) and yield of screening regularly analysed? When yield of screening is analysed, is it divided into yield for any lung pathology; yield for any TB suspects; yield for any TB cases?	
E	In case of refusal for screening, are the reasons for refusal systematically recorded and analysed so strategies can be developed to increase participation?	
F	Is the algorithm for screening the same throughout the country?	
G	Does the algorithm at least involve regular symptom screening?	
H	Is a person designated to be responsible for screening in each facility?	
I	Is screening integrated with that for other diseases? At least for HIV?	
J	Is screening free of charge? Is transportation, if required, provided/covered?	
4	Algorithm for TB diagnosis	
A	Is the algorithm for TB diagnosis the same as for general population?	



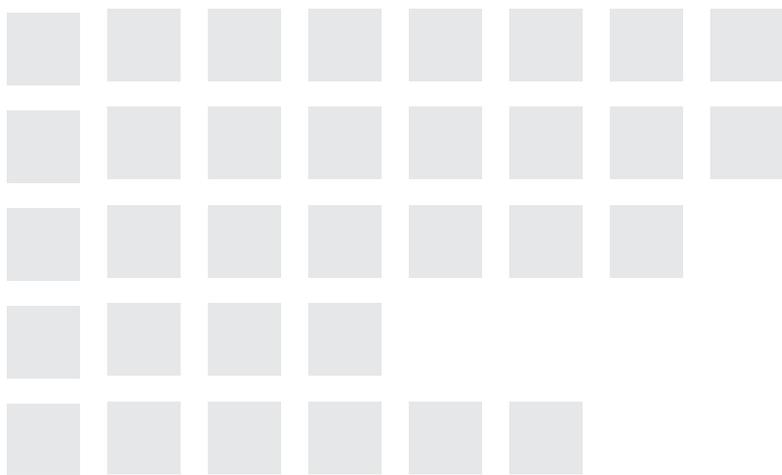


B	Do all health facilities have a designated trusted doctor or staff clinic where staff with TB symptoms can refer themselves?	
5	Data flow	
A	Is TB among HCW currently being monitored annually?	
B	If data flow on TB among HCW is separate from that in the general population, are the TB cases among HCWs ALSO reported in the general TB surveillance system?	
C	Are the results of TB disease surveillance among HCWs being analysed as part of the routine M&E for TB infection control?	
D	Is the screening and data flow system part of a general risk group policy?	
E	Is there a denominator for the number of HCWs that is annually updated?	
F	If yes, is the denominator known for all above mentioned target groups (see question 3B) for screening?	
G	Is the denominator information communicated to the persons in charge of screening?	
H	Are there any gaps in the data that may be different from gaps in TB data among the general population? (for example, cases diagnosed in private sector may be underreported)	
6	Indicators	
A	Which indicators can be calculated with the current system? i. Participation rate: Proportion of HCWs with documented screening? ii. TB incidence among HCW (WHO/GF indicator)(possibly disaggregate by M/F, age and drug susceptible or drug-resistant TB) iii. TB related mortality among HCW iv. HCWs placed on treatment for TB	
7	Ethics issues	
A	Is screening voluntary?	
B	Is written or verbal informed consent asked before screening?	
C	Are data collected anonymously?	
D	Are data reported anonymously?	
E	Do the NTP/facilities give any attention to stigma reduction, for example in undergraduate curricula, individual health education, behavior change campaigns?	
F	Are data on TB among HCW stored with limited access?	
8	TB incidence among HCW	
A	Is the TB incidence among HCWs the same or lower than that in the general adult population?	
B	If higher, is there any policy in place to reduce TB among HCW?	
C	If lower, is any analysis done or on-going on possible reasons and why possibly cases are missed?	

Further guidance on how to assess the quality of public health surveillance systems can be found in the following publication:

CDC. Guidelines for evaluating surveillance systems. MMWR 1988;37:No. S-5.





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