Strengthening Surveillance: The TB Surveillance Checklist of Standards and Benchmarks – Rationale and Development

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WHO Global Task Force on TB Impact Measurement
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Acknowledgements

- **Contributors to the development of the standards and benchmarks checklist and/or user guide:** Members of the Task Force

- **Countries contributing to the work around standards and benchmarks:** Brazil, China, Côte d’Ivoire, Egypt, Estonia, Ghana, Indonesia, Japan, Kenya, Netherlands, Nigeria, Thailand, Uganda, UK, USA, Viet Nam
Background and Rationale
Task Force strategic areas of work

- Surveys of the prevalence of TB disease
- Methods to estimate disease burden
- Strengthening routine surveillance
  - The goal is the direct measurement of TB cases and deaths from notification and vital registration data
    - TB notifications in surveillance system ~ TB incidence
    - TB deaths in vital registration system ~ TB mortality
Why strengthen surveillance?

- Estimates of disease burden are currently highly reliant on expert opinion
  - Two main reasons why this is the case
    - TB cases are diagnosed but not reported
    - TB cases are not diagnosed

- Vital registration data not frequently utilized by National TB Programs

- No systematic method for assessing data quality and coverage prior to 2010
Standards and benchmarks (S&Bs): Definitions

- **Standards** are general statements about the characteristics that define a high-performance TB surveillance system.

- **Benchmarks** define in quantitative terms wherever possible the level of performance that is considered good enough to meet the standard.
Assess a surveillance system’s ability to accurately measure TB cases and deaths in all settings in a standardized way

- Use surveillance data for direct measurement
- Identify and better quantify shortcomings in surveillance systems that need to be addressed

Inform tuberculosis program staff, policy-makers and partners about aspects of surveillance systems that need to be strengthened to improve TB control

Develop a monitoring and evaluation investment plan to address identified gaps in surveillance
Overview of the standards and benchmarks for TB surveillance: A checklist
Standards and benchmarks for TB surveillance: Overview

- Checklist consists of a set of 13 standards and their associated benchmarks
  - Nine standards are related to measurement of TB cases and one is related to measurement of TB deaths

- Checklist includes standards and benchmarks related to data quality, system coverage, TB mortality data, and surveillance of drug resistant TB (DRTB), TB/HIV and TB cases in children
# Standards and benchmarks for TB surveillance: Data Quality

<table>
<thead>
<tr>
<th>STANDARDS</th>
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<tbody>
<tr>
<td><strong>B1.1</strong></td>
</tr>
<tr>
<td><strong>B1.2</strong></td>
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<td><strong>B1.3</strong></td>
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<td><strong>B1.4</strong></td>
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Standards and benchmarks for TB surveillance: Data Quality

<table>
<thead>
<tr>
<th>STANDARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B1.5</strong> Data in national database are accurate, complete, internally consistent and free of duplicates <em>(For electronic case-based or patient-based systems only)</em></td>
</tr>
<tr>
<td><strong>B1.6</strong> TB surveillance data are externally consistent</td>
</tr>
<tr>
<td><strong>B1.7</strong> Number of reported TB cases is internally consistent (within country)</td>
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</tbody>
</table>
### Standards and benchmarks for TB surveillance: Coverage

<table>
<thead>
<tr>
<th>STANDARDS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1.8</td>
<td>All diagnosed cases of TB are reported</td>
</tr>
<tr>
<td>B1.9</td>
<td>Population has good access to health care</td>
</tr>
</tbody>
</table>
### Standards and benchmarks for TB surveillance: Vital Registration

<table>
<thead>
<tr>
<th>STANDARDS</th>
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</thead>
<tbody>
<tr>
<td><strong>B1.10</strong> Vital registration system has high national coverage and quality</td>
</tr>
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## Standards and benchmarks for TB surveillance: DR TB, TB/HIV, and children

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>Description</th>
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<tbody>
<tr>
<td>B2.1</td>
<td>Surveillance data provide a direct measure of drug resistant TB in new cases</td>
</tr>
<tr>
<td>B2.2</td>
<td>Surveillance data provide a direct measure of the prevalence of HIV infection in TB cases</td>
</tr>
<tr>
<td>B2.3</td>
<td>Surveillance data for children reported with TB (defined as ages 0-14 years) are reliable and accurate or all diagnosed childhood TB cases are reported</td>
</tr>
</tbody>
</table>
Development of the standards and benchmarks for TB surveillance
Underlying principles

- Built on experience of regional workshops, 2010 – 2011
- TB epidemiology
- Evidence-based (WHO data and literature)
- High performing systems used as models
- Aimed for a minimum set of standards
- Applicable across different geographic areas (high and low burden settings) and systems (electronic and paper-based)
- Involved partners from national programs and technical agencies
Timeline for development of standards and benchmarks
Timeline for development of standards and benchmarks

March 2010
Task Force meeting, S&Bs first introduced in background document
Timeline for development of standards and benchmarks

April 2009 - December 2010
Regional workshops
Timeline for development of standards and benchmarks

July 2011
First draft of S& Bs developed
Timeline for development of standards and benchmarks

July – September 2011
First draft of S&Bs field tested

Brazil, China, Egypt, Estonia, Japan, Kenya, Netherlands, Thailand, UK, USA
Timeline for development of standards and benchmarks

- September 2011: Meeting of sub-group
Lessons learned – Pilot Testing

- Perceived to be useful and feasible
- Some parts needed to be removed or changed
- Can be done in about ~1 week, except for cross checking of source documents (paper-based)
- Users required some epidemiology background to conduct assessment
Lessons learned – Pilot Testing

- Some challenges to identifying standards and benchmarks that are appropriate for all systems and settings
  - One standard different for electronic and paper-based

- Evidence from previous studies may be used for some standards, e.g.
  - B1.4 - requiring cross checking of source documents
  - B1.8 - assessing under-reporting

- User guide needed
Timeline for development of standards and benchmarks

November 2011
Small group refined checklist
Timeline for development of standards and benchmarks

2008              2009               2010              2011              2012            2013

January 2012
First draft of user guide
Timeline for development of standards and benchmarks

2008  2009  2010  2011  2012  2013

March-May 2012
Re-test of checklist and user guide

Kenya, Uganda, UK, USA
Timeline for development of standards and benchmarks

May 2012
Revised S&Bs and user guide shared at Task Force meeting
Timeline for development of standards and benchmarks

May – December 2012
Feedback from re-test and Task Force incorporated into S&Bs and user guide
Timeline for development of standards and benchmarks

- December 2012: Version 1.0 of S& Bs and user guide finalized
Implementation of standards and benchmarks

January – April 2013
Version 1.0 of S&Bs and user guide rolled out in seven of the Global Fund’s high impact/high-burden/TERG priority countries

Côte d’Ivoire, Ghana, Indonesia, Kenya, Nigeria, Uganda, Viet Nam

Global Fund priority countries
TB surveillance checklist applied
Methods
Standards and benchmarks for TB surveillance: Intended use

- Designed to allow a national assessment for the most recent complete calendar year
  - Lag time may range from no delay to one year

- An assessment of a TB surveillance system using this checklist would take place at least every 3-5 years (or more often, if feasible)
Standards and benchmarks for TB surveillance: Intended use

- Checklist can be used by in-country staff for self-assessment or by external reviewers, e.g.
  - Global Fund
  - National Program Reviews
Standards and benchmarks for TB surveillance: Methods used

- Desk review of documents, datasets, and electronic surveillance systems
- Data quality audits
Standards and benchmarks for TB surveillance: Requirements

- Description of the TB surveillance system

- Data sources
  - Surveillance data for analyses
  - Program documents, manuals, SOPs
  - Facility and district level source documents
  - Previous studies (e.g. TB, HIV, DRTB surveys, inventory and mortality studies)
  - Data external to the program

- Personnel
  - National, district and facility levels
  - M&E officers, data managers, lab staff, epidemiologists, statistician, TB program officers
  - Vital registration and HIV staff
Standards and benchmarks for TB surveillance: Interpretation

- For a country's TB surveillance system to be certified as providing a direct measurement of TB cases:
  - 10 standards need to be met
    - 1 is specific to paper-based systems
    - 1 is specific to electronic case-based systems
    - 2 assess system coverage

- For a country's TB surveillance system to be certified as providing a direct measure of the number of cases of DR-TB, TB/HIV, and TB in children specifically, 3 additional standards must be met

- For a surveillance system to provide a direct measure of TB deaths, there is one standard that must be met
What have we learned so far in rolling out the TB surveillance checklist?
Common findings from roll-out of TB surveillance checklist

- Sub-optimal or unknown data quality at facility and district levels, based on available information, but difficult to assess
  - Need to conduct national level data quality audits
  - Electronic recording and reporting systems needed

- Limited use and analysis of TB surveillance data
  - Guidance (TB surveillance analysis handbook) is being developed
Common findings from roll-out of TB surveillance checklist

- Limited understanding of level of underreporting of TB
  - Inventory studies can be used to measure unreported cases

- Poor measurement of TB mortality
  - Need to strengthen vital registration systems and coding of causes of death
Importance of linkages with other initiatives and closely related efforts

- Supports Global Fund approach to strengthening impact measurement

- Uses the Service Availability and Readiness Assessment (SARA) tool to systematically assess data quality nationally
  - Tracks progress in health systems strengthening

- Feeds into workshops by the Commission on Information and Accountability for Women’s and Children’s Health (COIA)
  - Developing country roadmaps for health systems strengthening
Next steps
Roll-out checklist to other Global Fund priority countries for impact assessment beyond seven already completed

* Cambodia, Côte d'Ivoire, DR Congo, Ethiopia, Kenya, Haiti, India, Malawi, Mozambique, Myanmar, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Ukraine, Zambia, and Zimbabwe, Bangladesh, China, Ghana, Indonesia, Pakistan, Philippines, Sudan; Angola, Madagascar, Namibia, Papua New Guinea, Thailand, Swaziland, Viet Nam.
Thank you
Framework for assessment of TB surveillance data

DATA QUALITY
- Completeness
- No duplications, no misclassifications
- Internal and external consistency

IMPROVE surveillance system

TRENDS
Do surveillance data reflect trends in TB incidence and mortality?
- Analyse time-changes in notifications and recorded deaths alongside changes in case-finding, case definitions, HIV prevalence and other determinants of changes in TB incidence and TB mortality

EVALUATE trends and impact of TB control

ARE ALL TB CASES AND DEATHS CAPTURED IN SURVEILLANCE DATA?
- "Onion" model
- Inventory studies
- Capture re-capture studies
- Prevalence surveys
- Innovative operational research

UPDATE estimates of TB incidence and mortality

TB notifications = TB incidence
TB deaths in VR system = TB mortality

If appropriate, CERTIFY TB surveillance data as direct measure of TB incidence and mortality
Framework for assessment of TB surveillance data

- Framework and associated tools applied in regional workshops conducted for 96 countries
  - Revision of estimates
  - Develop plans for strengthening surveillance system

- Lacked definition of essential characteristics and quantitative measures against which to assess the surveillance system
Standards and benchmarks for TB surveillance: User Guide

- Rationale and methods are explained for each standard and benchmark
- Examples help illustrate the recommended methods
- Corrective actions are provided, if the benchmarks are not met
- A glossary of terms is included
Feedback from May Task Force meeting and re-test incorporated into checklist

- Strengthened link between description of surveillance characteristics (Table A) and best practices

- Revisited benchmarks on internal and external consistency and data quality
  - Further analysed global data to inform benchmarks
  - Collected examples from Netherlands, UK, and USA

- Reviewed, revised and updated user guide

- Established contribution agreement between WHO and Global Fund for institutionalization of checklist and M&E investment plans to be supported by Global Fund