Making informed and smart choices: evidence-based optimisation of national strategies to end TB

CARE CASCADE ANALYSIS
What happens, Where and Why?

Max Meis
Conflict of interest disclosure

I have **no**, real or perceived, direct or indirect conflicts of interest that relate to this presentation.
Delivering quality TB care

- Quality TB services require systems able to deliver an entire pathway of care
- The Care Continuum or Care Cascade

<table>
<thead>
<tr>
<th>People with TB infection or disease, not in the health system</th>
<th>People with TB infection or disease, not identified or diagnosed</th>
<th>People treated for TB infection or disease, not symptom- or relapse-free</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health promotion</td>
<td>Screening Diagnosis</td>
<td>Treatment</td>
</tr>
<tr>
<td>Disease prevention</td>
<td></td>
<td>Disease management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rehabilitation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Palliative care</td>
</tr>
</tbody>
</table>

- Identifying the size and nature of gaps along the care continuum requires data about each part of the TB care cascade
Care Cascade Analysis

WHAT HAPPENS WHERE ALONG THE CARE CONTINUUM?

- Offers a simple, visual way to illustrate what happens where, i.e. where losses occur in the care continuum

| People with TB infection or disease, not in the health system | People with TB infection or disease, not identified or diagnosed | People treated for TB infection or disease, not symptom- or relapse-free |

Source: WHO People centered framework
Care Cascade Steps and Gaps

Broken pathways

A better understanding of the care cascade can provide the evidence needed on where gaps (patient losses) exist in the cascade, hence where to target interventions that reduce losses (patients retained).

Typical TB care cascade Indicators

- Estimated number of people with TB who have not accessed the health system
- Estimated number and proportion of people with TB who have accessed health services but were not screened
- People with TB who were screened for TB
- People with TB who were identified with presumptive TB
- People with presumptive TB who were tested for TB
- Patients diagnosed with TB
- Patients notified
- Patients with bacteriologically-confirmed TB
- Patients started on (dst-based) anti-TB treatment
- Patients who were successfully treated
- Patients who achieve 1-y recurrence-free survival

As much as possible collect data disaggregated for age, sex, new and previously treated, Susceptible and Resistant TB and HIV-associated TB

The historical focus on treatment success rates failed to reflect upstream losses
When to conduct TB care cascade analysis?

NOT ROUTINELY

- When you want to identify which TB interventions to prioritize to improve TB prevention and care efforts and/or quality of care
- When there is a large gap between WHO incidence estimates and those reported by the national TB program
- When there is evidence that patients among the general population or people at risk and key populations for TB are missed from routine surveillance systems
- When you want to test a new approach/intervention

Quote: ‘Capturing data for each step in the cascade can be challenging, unless a robust, integrated and preferably electronic, case-based recording and reporting system is in place’ (WHO 2018 Global Tuberculosis Report Page 94)
Scale for TB care cascade analysis

TO ASSESS QUALITY OF CARE ALONG THE CASCADE

- Global – largest scale evaluations
- National – large scale evaluations
- Sub-national – small scale evaluations
- Facility – smallest scale evaluations
- Community – smaller scale evaluations

- Multi-site studies provide more accurate information on steps in the cascade
- Cohort-based evaluations minimize risk of bias and achieve higher internal consistency
Global cascade visuals

Source: WHO Global Tuberculosis Report 2019
TB Cascades of Care

India*

RSA**


National Treatment Cascades

RR/MDR-TB Treatment Cascade
Kenya 2016

- Incident Cases: 3,000 (100%)
- Initiated Treatment: 473 (16%)
- Treatment Success: 339 (11%)

HIV+TB Treatment Cascade
Kenya 2016

- Incident Cases: 53,000 (100%)
- Notified Cases: 22,911 (43%)
- Initiated Treatment: 22,566 (43%)
- Treatment Success: 18,560 (35%)

*Source: Kenya NTP*
## National Contact investigation cascades

**Cascade comparison Contact investigation 2018**

<table>
<thead>
<tr>
<th></th>
<th>Contacts</th>
<th>Screened</th>
<th>Presumptives</th>
<th>Tested</th>
<th>Diagnosed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td>104928</td>
<td>102915</td>
<td>1789</td>
<td>1789</td>
<td>362</td>
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<tr>
<td>Indonesia</td>
<td>87071</td>
<td>87971</td>
<td>12135</td>
<td>9422</td>
<td>448</td>
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<tr>
<td>Tanzania</td>
<td>63170</td>
<td>60748</td>
<td>21799</td>
<td>18466</td>
<td>2488</td>
</tr>
</tbody>
</table>

*Source: Challenge TB End of Project reports*
Facility Case finding cascades

**Cascade comparison intervention and control sites**

<table>
<thead>
<tr>
<th></th>
<th>OPD attendees</th>
<th>Screened</th>
<th>Presumptives</th>
<th>Tested</th>
<th>Diagnosed</th>
<th>Bac +</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
<td>336581</td>
<td>219872</td>
<td>11190</td>
<td>9539</td>
<td>1279</td>
<td>1010</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>478319</td>
<td>303406</td>
<td>2814</td>
<td>2701</td>
<td>706</td>
<td>258</td>
</tr>
</tbody>
</table>

*Source: Challenge TB Malawi*
Community Case finding cascades

Active case finding 2018

- Participants: 56783
- Presumptives: 5152
- Tested: 4853
- Diagnosed: 813
- Started Tx: 763

Intervention: Mobile diagnostic units, CXR (CAD4TB) & Xpert4All

*Source: Challenge TB Nigeria*
Subnational Care seeking vs diagnostic services availability

*Source: Ghana NTP*
Care cascade analyses complement Epi analyses

- Traditionally, programmatic effects and outcomes have been defined primarily by epidemiological measures.
- Such a focus, however, overlooks additional operationally relevant people and systems evidence tied to improving quality of care and accelerating progress by closing gaps along the care continuum:
  - *patient perspectives, priorities and preferences*
  - *health and social systems related gaps*

Source: WHO People centered framework
### Guiding questions to consolidate Epi, People & Systems evidence

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<tr>
<td>People with TB infection/ high risk for (progression to) TB disease</td>
<td>People presenting to health services, not identified or diagnosed</td>
<td>People diagnosed, but not started on treatment</td>
</tr>
<tr>
<td>People with asymptomatic TB disease, not seeking care</td>
<td>People seeking care from non-NTP service providers, not diagnosed</td>
<td>People started, but not successfully treated</td>
</tr>
<tr>
<td>People with symptomatic TB disease, not seeking care</td>
<td>People seeking care from NTP service providers, not diagnosed</td>
<td>People successfully treated, but not symptom- or relapse-free</td>
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</table>

### What are the best available latest (estimated) data and 5-year trends for each of the steps in the care continuum?

### Are there any differences or variations in patient preferences and pathways for each of the steps in the care continuum?

### Are there any health systems or social protection related gaps affecting each of the steps in the care continuum?

### Knowing your Epidemiology
Knowing your Epidemiology provides evidence on the burden of TB disease, including its distribution (e.g. by age and sex) and trends, for both drug-susceptible and drug-resistance TB.

### Knowing your People
Knowing your People provides evidence on risk profiles (e.g. age, sex, socioeconomic status, HIV status), TB literacy, perceptions, expectations and behaviour of people with TB or at risk of developing TB.

### Knowing your System
Knowing your System provides evidence on the capacity, performance, limitations and distribution of health and social services, both TB-specific and general.
What happens Why?

ROOT CAUSE ANALYSIS OF KEY GAPS (LOSSES)

- What is known about the factors contributing to this problem?
- What additional evidence is needed to better understand the root cause of this problem?
- Of the possible root causes, which would be the most feasible and impactful to address?
Measuring quality of TB care

Using the cascade of care as an organising framework, national TB programs can measure quality of TB care with a set of indicators that represent key steps in the Care Cascade.


Fig: LTBI care cascade*
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