Assessment of the fraction of cases being missed by routine TB notification data, based on the "Onion" model

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The Onion Model

- Recorded in notification data
- Diagnosed by NTP or collaborating providers
- Diagnosed by public or private providers, but not notified
- Presenting to health facilities, but undiagnosed
- Access to health facilities, but don't go
- No access to health care

All TB cases

- Notified cases
- Diagnosed but not notified cases
- Undiagnosed cases
The "Real" Onion Model

1. Cases recorded in *TB notification data*
2. Cases diagnosed by the NTP or by providers collaborating with the NTP, but not recorded/reported
3. Cases diagnosed by public or private providers, but not notified
4. Cases presenting to health facilities, but not diagnosed
5. Cases with access to health services that do not go to health facilities
6. Cases with no access to health care
What is needed to increase the fraction of notified TB cases

1. Recorded in notification data
2. Diagnosed by NTP or collaborating providers but not reported
3. Diagnosed by public or private providers, but not notified
4. Presenting to health facilities, but undiagnosed
5. Access to health facilities, but don't go
6. No access to health care

PPM

Communication, social mobilization

Supervision, investment in recording and reporting

HSS strengthening

PAL, Laboratory strengthening

Programmatic or health system interventions
What is needed to quantify the fraction of TB cases missing from the notification data?
<table>
<thead>
<tr>
<th>Possible reasons for cases to be missing from TB notification data</th>
<th>Examples of methods to assess number of cases missing from TB notification data</th>
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</thead>
<tbody>
<tr>
<td><strong>Ring 2</strong>&lt;br&gt;Diagnosed by NTP but not recorded in notification data</td>
<td><strong>1. Source of TB patients:</strong>&lt;br&gt;  - Variable that records in which provider or type of health care facility the patient was diagnosed as having TB</td>
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<td><strong>Ring 3</strong>&lt;br&gt;Diagnosed by non-NTP providers but not notified</td>
<td><strong>2. Inventory studies:</strong>&lt;br&gt;  - Cross-referencing with analysis of existing data&lt;br&gt;    - Laboratory&lt;br&gt;    - HIV notification data&lt;br&gt;    - Vital-registration data&lt;br&gt;    - Hospital registers&lt;br&gt;    - Pharmacies&lt;br&gt;    - Paper-based records X Electronic records&lt;br&gt;  - Cross-referencing with analysis of newly collected data&lt;br&gt;    - New study registers at NTP and non-NTP facilities (public and private)&lt;br&gt;    - New study registers at laboratories</td>
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<td><strong>Ring 4</strong>&lt;br&gt;Presenting to health facilities that are not diagnosed</td>
<td>1. <strong>Estimation of burden of TB from sampling health care facilities</strong>&lt;br&gt;- % of chronic respiratory cases attending out-patient clinics&lt;br&gt;- % of TB suspects attending out-patient clinics&lt;br&gt;- % of TB suspects submitting sputum samples for smear and culture&lt;br&gt;- % of TB suspects that are TB cases (lab confirmed or clinically diagnosed)</td>
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<td><strong>Ring 5</strong>&lt;br&gt;With access to health services but do not seek care</td>
<td>2. <strong>Prevalence of TB disease surveys</strong>&lt;br&gt;- % of previously undiagnosed patients&lt;br&gt;- Delay studies&lt;br&gt;- Health care seeking behavior studies</td>
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<td>3. <strong>Studies of the yield of patients diagnosed through</strong>&lt;br&gt;- Active case finding&lt;br&gt;- Contact investigation</td>
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<td>Ring 6</td>
<td>Capture – recapture studies</td>
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<td>No access to health services</td>
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</table>
What is needed to assess whether TB cases are really TB cases

Validate diagnoses performed under routine conditions in a representative sample of TB patients

External panel of independent experts → "gold standard"