Program Evaluation
The National TB Indicators Project

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Background: The National TB Indicators Project

- TB Program Evaluation Work Group (EWG) Initiative
  - Reinforce the national priorities for TB programs
  - Increase use of existing data for program improvement
  - Build capacity for program evaluation
  - **Product**: The National TB Indicators Project (NTIP)

What Makes NTIP Different?

- According to CDC, NTIP enables:
  - Consensus on performance measures
  - Standardized measure of program progress and impact using existing data
  - Provides performance targets to be used as benchmarks for self-assessment
  - Enhanced ability to assess impact
  - Prioritization of efforts for program improvement, reporting and technical assistance
NTIP Performance Targets

**Current Performance Targets**

1. Known HIV Status
2. Contact Investigation
3. Completion of Treatment
4. Drug Susceptibility Results
5. TB Case Rates
   (i.e., US-born, Foreign-born, US-born Non-Hispanic Blacks, Children younger than 5 yrs old)

**Future Performance Targets**

6. Recommended Initial Therapy
7. Treatment Initiation
8. Sputum-Culture Reported
   (Document results)
9. Data Reporting
   (More Complete RVCT, ARPEs, EDN)
10. Sputum culture conversion
11. Evaluation of Immigrants and Refugees
12. Laboratory Turnaround Time
13. Universal Genotyping

See: [http://www.cdc.gov/tb/Program_Evaluation/Indicators/default.htm](http://www.cdc.gov/tb/Program_Evaluation/Indicators/default.htm)

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**Example: Performance Targets**

<table>
<thead>
<tr>
<th>Objective Categories</th>
<th>Objectives and Performance Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Completion of Treatment</strong></td>
<td>For patients with newly diagnosed TB for whom 12 months or less of treatment is indicated, increase the proportion of patients who complete treatment within 12 months to 93.0%.</td>
</tr>
<tr>
<td><strong>Contact Investigation</strong></td>
<td>Increase the proportion of TB patients with positive acid-fast bacillus (AFB) sputum-smear results who have contacts elicited to 100.0%.</td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td>Increase the proportion of contacts to sputum AFB smear-positive TB patients who are evaluated for infection and disease to 93.0%.</td>
</tr>
</tbody>
</table>

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**NTIP Reports**

- Use existing reportable data / standardizes measurements to track state/local progress toward objectives
- Illustrate national/state progress towards national objectives
- Guide program evaluation efforts
- Help to prioritize areas for improvement
  - Detect and understand barriers, and improve program effectiveness
  - Facilitate discussion, education, and problem solving
In a nutshell .... What is expected?

- Programs will be required to:
  - Provide an evaluation plan for one objective selected in consultation with DTBE consultants
  - Report based on evaluation plan
  - Provide justifications for objectives for which performance targets have not been met

- Time Line
  - 2009: Pilot for Cooperative Agreement progress reporting
  - 2010: Reporting progress using NTIP

Under NTIP providing surveillance and monitoring data is NOT enough ...
Need to provide an answer to the question “Why?”

- **TB Program Day-to-day Operations & Initiatives**
- **How are You Getting from Point A to Point B?**
- **Surveillance & Monitoring Data**

**Surveillance:** tracks occurrence of disease or risk behaviors

**Monitoring:** tracks changes in program outcomes over time

**Evaluation:** More specific ... May incorporate surveillance / monitoring data
Getting Started

1. Examine NTIP Indicators in Relation to State/Local Program

2. Develop questions around the objective/outcome to answer "Why?" is your program seeing:
   • Increases
   • Decreases
   • No Changes

3. Look at the "big picture" and all factors needed to achieve the objective/outcome.
   • Logic models help with this process
   • Guide what to evaluate - generate hypotheses re: problems / no changes

4. Drill Down
   • What resources are available/missing to accomplish these objectives?
   • What factors/issues contributed to no change/failure/success?
   • What activities have been undertaken (or planned) to achieve the intended outcomes?
   • What has been the impact of these activities?
Logic Models: Organizing the “Big Picture”

- Illustrates:
  - Scope of activities
  - How activities fit together logically
- Maps relationships between needed resources, activities and intended effects (expected changes)
- Good starting point to help focus the evaluation
- Find TB Control Logic Models: CDC’s “A Guide to Developing a TB Program Evaluation Plan”

Logic Model: Contact Investigation

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Activities</th>
<th>Short-term Outcomes</th>
<th>Intermediate Outcomes</th>
<th>Long-term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cases identified</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Reporting</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Cases updated</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Cases identified</td>
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<tr>
<td></td>
<td></td>
<td>Reporting</td>
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<td></td>
<td></td>
<td>Data collected</td>
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<td>Data management</td>
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<td>Data analysis</td>
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<td>Reporting</td>
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<tr>
<td></td>
<td></td>
<td>Data analysis</td>
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</tr>
</tbody>
</table>

Objective Categories:

- **Contact Elicitation**: Example
  - Increase the proportion of smear+ cases who have contacts elicited to 100.0%.
- **Contact Evaluation**: Increase the proportion of contacts to smear+ cases who are evaluated for infection and disease to 93.0%.
- **Contact Treatment Initiation**: Increase the proportion of contacts to smear+ cases with newly diagnosed latent TB infection (LTBI) who start treatment to 88.0%.
- **Contact Treatment Completion**: For contacts to smear+ cases who start treatment for newly diagnosed LTBI, increase the proportion who complete treatment to 79.0%.
Example: Examining Data Related to NTIP Objectives and Performance Targets

- "State X" leaders are examining the NTIP indicators for their state and note that there were 100 smear +, non-cavitary pulmonary cases of tuberculosis diagnosed in 2008.
- Among these 100 cases - there were 15 cases (15%) for which no contacts were identified.
- Upon further review they found:
  - 10 cases - only 1 contact had been entered into the data management system
  - 8 cases – only 2 contacts were recorded
- In total, 33% of non-cavitary pulmonary cases had 2 or less contacts identified. This in contrast to an average of 6 contacts for smear+ cases with cavitary disease (not including cases at the center of targeted testing).

Note: These data have been created for this presentation and are an example only.

Example: Gather Information for Justification / Evaluation Plan

- Leaders brainstormed reasons why so few contacts are being identified for this group of cases and generated some hypotheses ... including:
  a. High turnover in staffing – new staff are not experienced in interviewing cases
  b. Hiring freezes have led some areas to be short-staffed & struggles with workload
  c. There has been a significant influx of refugees from country "X" – TB is highly stigmatized in that country and staff are having difficulty eliciting contacts
  d. There are large numbers of homeless persons in the 2 major cities in the state, it is hard to track contacts in this population
  e. Some staff may only be entering data for contacts who are identified with LTBI
  f. A few cases were diagnosed at the time of their death

After much discussion – the group feels that the most influential factor is staff experience. Reason: new staff are working in areas that have few experienced staff and there has been a loss of institutional knowledge .......

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Example: Evaluation Update – Initial Evaluation

An examination of staff experience and possible factors contributing to 2 or less contacts being reported for smear +, pulmonary, non-cavitary cases in State “X” in 2008

<table>
<thead>
<tr>
<th>Frequency Count</th>
<th>New Staff (12 months or less with TB program)</th>
<th>Experienced Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cases with 2 or less contacts (Total = 33)</td>
<td>57% (19)</td>
<td>42% (14)</td>
</tr>
<tr>
<td>Case was foreign-born</td>
<td>53% (10)</td>
<td>57% (8)</td>
</tr>
<tr>
<td>Case was homeless</td>
<td>31% (6)</td>
<td>29% (4)</td>
</tr>
<tr>
<td>Case was diagnosed at time of death</td>
<td>5% (1)</td>
<td>7% (1)</td>
</tr>
<tr>
<td>Other contacts identified, but TST non-reactive: all case contacts not entered into information system</td>
<td>11% (2)</td>
<td>7% (1)</td>
</tr>
</tbody>
</table>

The differences between the groups are not significant

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Example: Refining/Developing Program Activities

- The Evaluation Focal Point, the Education/Training Focal Point and Program Leaders (stakeholders) brainstorm potential “next steps” or an action plan for “New” Staff:
  1. Plan to repeat the standard CI course for all new staff in 2009
  2. Critically examine content of CI course – to ensure that the inputs and activities outlined in the logic model (for successful CI) are reflected in the curriculum
  3. Conduct phone interviews with a sample of field staff; ask for suggestions regarding content that might be added to the CI course to address obstacles to eliciting contacts from foreign-born and homeless cases
  4. Identify existing training materials that are responsive to staff suggestions and/or speakers with expertise in logic areas
  5. Update and expand CI Course based on staff suggestions and available materials/experts
  6. Evaluate short term outcomes and intermediate outcomes of the action plan that is implemented

Example: Refining/Developing Program Activities

Potential data to be collected ...

Implementing Improvements

1. Proportion of new staff who attended course.
2. Description of staff reported obstacles to eliciting contacts from foreign-born and homeless cases.
3. Recommendations / decisions regarding updating/expanding course after reconciling CI course content with CI logic model.
4. Description of training materials or presentations by persons with expertise incorporated into updated/expanded course
5. Others? ____________________

Short-term Progress Towards Objectives

1. Changes in staff knowledge
2. Changes in staff attitudes
3. Changes in staff members’ confidence (self-efficacy) to elicit contacts from hard to reach populations
4. Staff members perception of the course, specifically if it met their learning needs
5. Staff members planned changes in personal practices (personal action plans)
6. Others? ____________________

Example: Coming Around the Evaluation “Cycle” Again

Looking at Progress Towards Meeting the Target

Performance Targets

- Proportion of smear + cases with non-cavitary pulmonary TB with:
  - No contacts identified
  - Only 1 contact identified
  - Only 2 contacts identified
- Ask public health areas to provide justifications for cases with 0, 1, or 2 contacts
- Others? ____________________

Program Initiative / Use of Resources

- Examine the relationship between:
  - Staff trained using the old CI course curriculum with those who have been trained using the updated/expanded
- In relation to:
  - The proportion of smear + non-cavitary pulmonary TB cases with “0” contacts and only 1 or 2 contacts
Progress Attributed to Program Initiative
Examine the relationship between training and contacts elicited

Contact Elicitation (Jan-Dec 2010) by Status of Training Curriculum

<table>
<thead>
<tr>
<th>Number of contacts with 2 or less contacts (Total = 33)</th>
<th>N=13</th>
<th>N=20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Contacts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;0&quot; Contacts</td>
<td>15%</td>
<td>30%</td>
</tr>
<tr>
<td>1-2 Contacts</td>
<td>85%</td>
<td>70%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

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Selecting an Evaluation Approach
Think of these approaches this way......
How strong is your "evidence" to answer WHY your program is seeing no change .... Increases .... or decreases

Evaluation Approaches

<table>
<thead>
<tr>
<th>Approach</th>
<th>Design</th>
<th>Some Limits of the Design</th>
</tr>
</thead>
</table>
| One-Shot Case Study       | X               | Historically things happen... In the past "things" may have been the same, better or worse – you do not know.
|                           | O Post-intervention observation |                                                                 |
| Pretest-Posttest          | O               | Changes detected may come from familiarity with evaluation tool – not the intervention itself.
|                           | X Observation   | The amount of an "intervention" that is received varies and cannot be controlled.
|                           | O Intervention  | Example: quantity and quality of patient education provided.

"Intervention" can be defined as a new policy, procedure, form that is used, training or in-service provided etc.
### Evaluation Approaches

<table>
<thead>
<tr>
<th>Approach</th>
<th>Pretest-Posttest Control Group Design</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td>Group 1</td>
</tr>
<tr>
<td></td>
<td>Pretest Observation</td>
</tr>
<tr>
<td></td>
<td>Pretest Observation</td>
</tr>
</tbody>
</table>

**Strong, Popular Design**
- Features of the Design: Can detect changes in knowledge, attitudes, behaviors, practices, patient outcomes. Despite many factors outside the control of the TB program (i.e., media hysteria re: a TB outbreak)

<table>
<thead>
<tr>
<th>Approach</th>
<th>Posttest Only Comparison Group Design</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td>Group 1</td>
</tr>
<tr>
<td></td>
<td>Intervention</td>
</tr>
<tr>
<td></td>
<td>O</td>
</tr>
</tbody>
</table>

**Features of the Design**
- Good when pre-test is not possible, particularly if an “intervention” has already been implemented in some areas or with some of the intended audience

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### Words of Advice: Evaluation & Data Collection

- Brainstorm in advance

**Collecting Data**

- **What will be collected**
  - Provide a definition for each piece of data
  - The ability to detect differences / changes will depend on the "operational definition" for each data point so that observations can be compared in a meaningful way (to a standard or another group)

- **Why it will be collected / how the information will be used**
- **Where the data/information will come from**
- **Who will collect the data (or how will data be collected)**
- **How often will data be collected**
Collecting Data: Gathering Credible Information

Examining TB Program Staff Work Load Throughout State

<table>
<thead>
<tr>
<th>Public Health Area</th>
<th>1/2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7/8/9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Area</td>
<td>%</td>
<td>%</td>
<td></td>
<td>%</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Staff Members</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td># New Cases since beginning of the year</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td># Contacts Investigated</td>
<td>367</td>
<td>105</td>
<td>50</td>
<td>20</td>
<td>243</td>
<td></td>
</tr>
<tr>
<td># Contacts per Case</td>
<td>92</td>
<td>7</td>
<td>2</td>
<td>3.5</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td># Cases per Staff Member</td>
<td>1</td>
<td>7.5</td>
<td>6</td>
<td>1</td>
<td>0.8</td>
<td>0.5</td>
</tr>
<tr>
<td># Contacts per Staff Member</td>
<td>92</td>
<td>15</td>
<td>12.5</td>
<td>3.5</td>
<td>3</td>
<td>13.5</td>
</tr>
</tbody>
</table>

There is significant variation in some numbers... why?
Data points were not specifically defined — staff reported what they thought was wanted

Note: These data have been created for this presentation and are an example only

Preparing for Data Analysis

- At the time data collection methods are selected... begin to think of how the data will be analyzed.

  **Suggestion:** Set up mock tables or diagrams that you want to include in an evaluation report. (This also helps avoid collecting extraneous information)

- To present the data... do you want to show?

  **Quantitative Information**
  - Counts / Numbers / Ranges
  - Means and Medians
  - Frequencies / Percentages
  - Patterns or trends
  - Comparisons of groups
  - Relationships between factors

  **Qualitative Information**
  - Feedback from focus groups
  - Responses to open-ended interview questions
  - Observations / Anecdotal comments

Preparing for Data Analysis: Example of a Mock Table

<table>
<thead>
<tr>
<th>Purpose of the Analysis</th>
<th>Table 1: Consistency in Reporting of HIV Test Results based on Staffing Model in Public Health Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Staffing Model in Public Health Areas</td>
</tr>
<tr>
<td>Record of HIV Tests Results</td>
<td>Staff who work with TB Control expending ≥30% of work effort in TB (Record of test result will serve as a measure of test administration)</td>
</tr>
<tr>
<td>Proportion of TB Cases with HIV Test Result Recorded</td>
<td>Staff who work with TB Control expending ≥40% of work effort in TB (Proportion of TB Cases with HIV Test Result Recorded)</td>
</tr>
</tbody>
</table>

Break out the reasons why the HIV test was not recorded:
- Already confirmed to be HIV+... patient refused...
- Not offered... don’t know... etc.

Purpose of the Analysis: Table 1: Consistency in Reporting of HIV Test Results based on Staffing Model in Public Health Areas

| Proportion of TB Cases with HIV Test Result Recorded | Total | 100% | 100% |
National Tuberculosis Indicators Project
Frequently Asked Questions

References / Resources

- CDC Evaluation Working Group
  http://www.cdc.gov/eval
- TB Program Evaluation Handbook
- Guide to Developing A TB Evaluation Plan
  http://www.cdc.gov/tb/Program_Evaluation/default.htm
- National TB Program Objectives and Performance Targets for 2015
  http://www.cdc.gov/tb/Program_Evaluation/Indicators/default.htm
- The National Tuberculosis Indicators Project (NTIP)
- National Tuberculosis Indicators Project (NTIP): Frequently Asked Questions