Opportunities to Tackle TB in the Wake of Natural Disasters, Haiti, 2010-2016

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February 28, 2020

Disclaimer: The findings and conclusions in this presentation are those of the author(s) and do not necessarily represent the views of the Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry.
Objectives

- Describe the epidemiology of TB in Haiti in the wake of the 2010 earthquake
- Discuss the interventions that contributed to the successful control of TB in the wake of natural disasters in Haiti (Earthquake and Hurricane Matthew)
TB in Haiti, 2018

- **Incidence Rate**
  - All: 176 (135-222)/100,000
  - HIV+ TB: 27 (20-34)/100,000

- **Incident TB cases**
  - Notified: 13,713
  - Estimated: 20,000 (15-25,000)

- **Incident HIV+ TB cases**
  - Notified: 1,867
  - Estimated: 2,900 (2,3-3,700)

Source: www.who.int/tb/data
TB Treatment in Haiti

- Of Haiti’s 907 health facilities:
  - 234 Centres de Diagnostic et de Traitement
  - 30 Centres de Traitement provide treatment to patients who have a confirmed TB diagnosis from another facility.
- All TB facilities have TB case registers and notify cases to the National TB Program through the departmental TB coordinator.
- Cough register, Microscopy register, Patient Treatment card
- Data quality is ensured through quarterly meetings with departmental staff.
TB Network in Haiti
# TB Activities, Haiti, 2010-2016

<table>
<thead>
<tr>
<th>Case Finding</th>
<th>Diagnosis</th>
<th>Treatment</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active case finding in slums, IDP camps, prisons</td>
<td>LED Fluorescent microscopy in the top 80 treatment facilities</td>
<td>Implement short-course FDC under DOTS</td>
<td>Implement TBIC guidelines and measures</td>
</tr>
<tr>
<td>Cough screening across all TB facilities</td>
<td>Xpert MTB/RIF testing in high burden TB facilities, Culture capacity (BSL-3)</td>
<td>Revise MDR-TB guidelines, Better management of TB patients living with HIV</td>
<td>IPT for HIV-positive individuals and TB exposed children under 5</td>
</tr>
<tr>
<td>Contact tracing at selected TB facilities</td>
<td>Strengthen EQA</td>
<td>Expand access to MDR-TB treatment</td>
<td>Advocate for TB</td>
</tr>
</tbody>
</table>
Active Case Finding in Urban Slums and Internally Displaced Camps

- GHESKIO and the NTP implemented a program of household level active case-finding for TB (TB REACH) in 2014-2015.
- Community health workers (CHW) went door-to-door to identify individuals with cough of >2 weeks and referred them to a TB clinic for testing with sputum microscopy, Xpert, and chest radiograph.
- Community Healthcare Workers were trained to use smartphones to record coordinates of the households they visited and whether household members reported cough.

Active Case Finding in Urban Slums and Internally Displaced Camps

- 104,097 individuals in 8 Port-au-Prince slums were screened for TB
- 5,598 people with presumed TB were referred for evaluation
- 1,170 (20%) were diagnosed with TB
- 71 patients with MDR-TB were identified and referred for treatment
- The NTP plans to expand this program to other slums in the country

Patients with Suspected TB Screened and Tested, HIV/TB Facilities, Haiti, 2012-2019

The Haiti Integrated Monitoring, Evaluation, and Surveillance System (MESI)
HIV Testing of TB Patients
PNLT, 2010 – 2017

TB cases notified
TB patients tested for HIV
% TB patients tested for HIV

<table>
<thead>
<tr>
<th>Year</th>
<th># of Cases Notified</th>
<th>% Tested for HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>10,000</td>
<td>50%</td>
</tr>
<tr>
<td>2011</td>
<td>12,000</td>
<td>60%</td>
</tr>
<tr>
<td>2012</td>
<td>14,000</td>
<td>70%</td>
</tr>
<tr>
<td>2013</td>
<td>16,000</td>
<td>80%</td>
</tr>
<tr>
<td>2014</td>
<td>18,000</td>
<td>90%</td>
</tr>
<tr>
<td>2015</td>
<td>20,000</td>
<td>100%</td>
</tr>
<tr>
<td>2016</td>
<td>22,000</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>24,000</td>
<td></td>
</tr>
</tbody>
</table>
GeneXpert Network – LNSP, 2010 – 2019

• Decentralized at the departmental level
• Hub-and-spoke model
• Funded through Global Fund and PEPFAR
• Patients with RR-TB are referred for treatment
# Xpert MTB/RIF Results

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Patients Tested</strong></td>
<td>5,657</td>
<td>20,471</td>
<td>31,100</td>
<td>27,489</td>
<td>25,156</td>
</tr>
<tr>
<td><strong>MTB Detected - RIF Sensitive</strong></td>
<td>1,053 (18.6)</td>
<td>3,488 (17.0)</td>
<td>6,648 (21.4)</td>
<td>6,478 (23.6)</td>
<td>5,824 (23.2)</td>
</tr>
<tr>
<td><strong>MTB Detected - RIF Resistant</strong></td>
<td>108 (1.9)</td>
<td>329 (1.6)</td>
<td>309 (1.0)</td>
<td>284 (1.0)</td>
<td>232 (0.9)</td>
</tr>
<tr>
<td><strong>MTB Detected - RIF Indeterminate</strong></td>
<td>27 (0.5)</td>
<td>14 (0.1)</td>
<td>29 (0.1)</td>
<td>108 (0.4)</td>
<td>142 (0.6)</td>
</tr>
<tr>
<td><strong>MTB Not Detected</strong></td>
<td>4,469 (79.0)</td>
<td>16,640 (81.3)</td>
<td>24,114 (77.5)</td>
<td>20,619 (75.0)</td>
<td>18,958 (75.4)</td>
</tr>
</tbody>
</table>
Biosafety Level 3 Laboratory

- National Public Health Laboratory;
- Inaugurated in 2017
- Culture and DST
# Patient Characteristics, Haiti, 2011-2016

<table>
<thead>
<tr>
<th></th>
<th>N=97,117</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>51,134 (52.7)</td>
</tr>
<tr>
<td>Female</td>
<td>45,983 (47.3)</td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
</tr>
<tr>
<td>0-14 years old</td>
<td>10,382 (10.7)</td>
</tr>
<tr>
<td>15-34 years old</td>
<td>51,526 (53.1)</td>
</tr>
<tr>
<td>35-54 years old</td>
<td>25,547 (26.3)</td>
</tr>
<tr>
<td>55+ years old</td>
<td>9,662 (9.9)</td>
</tr>
<tr>
<td><strong>Patient category</strong></td>
<td></td>
</tr>
<tr>
<td>New</td>
<td>91,373 (94.1)</td>
</tr>
<tr>
<td>Retreatment</td>
<td>5,744 (5.9)</td>
</tr>
<tr>
<td><strong>TB category</strong></td>
<td></td>
</tr>
<tr>
<td>Smear+ PTB</td>
<td>62,670 (64.5)</td>
</tr>
<tr>
<td>Smear- PTB</td>
<td>12,081 (12.4)</td>
</tr>
<tr>
<td>Smear not performed PTB</td>
<td>12,049 (12.4)</td>
</tr>
<tr>
<td>Extrapulmonary TB</td>
<td>10,317 (10.6)</td>
</tr>
</tbody>
</table>
Geographic distribution of TB cases, Haiti, 2011-2016

Ouest: 45,000 cases, 50%
Artibonite: 20,000 cases, 45%
Nord: 15,000 cases, 40%
Sud: 10,000 cases, 35%
Nord-Ouest: 7,500 cases, 30%
Centre: 5,000 cases, 25%
Grand'Anse: 2,500 cases, 20%
Sud-Est: 1,500 cases, 15%
Nord-Est: 1,000 cases, 10%
Nippes: 500 cases, 5%
Others: 0 cases, 0%
TB Case Notification and Treatment Success
PNLT – Haiti, 2010 – 2018

- # of TB Cases
- Treatment Success Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Total TB Cases</th>
<th>Treatment Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>15,000</td>
<td>95%</td>
</tr>
<tr>
<td>2011</td>
<td>15,500</td>
<td>92%</td>
</tr>
<tr>
<td>2012</td>
<td>16,000</td>
<td>90%</td>
</tr>
<tr>
<td>2013</td>
<td>16,500</td>
<td>88%</td>
</tr>
<tr>
<td>2014</td>
<td>17,000</td>
<td>86%</td>
</tr>
<tr>
<td>2015</td>
<td>17,500</td>
<td>84%</td>
</tr>
<tr>
<td>2016</td>
<td>18,000</td>
<td>82%</td>
</tr>
<tr>
<td>2017</td>
<td>18,500</td>
<td>80%</td>
</tr>
<tr>
<td>2018</td>
<td>19,000</td>
<td>78%</td>
</tr>
</tbody>
</table>
Hurricane Matthew, 2016

• On October 4, 2016, Hurricane Matthew struck southwest Haiti as a category 4 storm, causing widespread devastation and approximately 500 deaths.
• An estimated 1.6 million people were affected and over 50,000 were displaced.
• Sud, Grand’Anse, and Nippes
The NTP convened a team of local and international partners to conduct an assessment of health facilities in the affected regions.

We developed a standard questionnaire to assess a convenience sample of 31 of the 66 facilities in the affected regions.

- Extent of structural damage
- Availability of TB drugs
- Whether patients returned for care
- Patient tracking activities

Data from the National TB surveillance system to determine outcomes for patients who were receiving anti-TB treatment before the hurricane.
January  |
--------|
April   |
--------|
July    |
--------|
October |
--------|
December|
--------|

Q1      |
--------|
Q2      |
--------|
Q3      |
--------|
Q4      |

Hurricane Matthew

1,201 patients receiving anti-TB treatment in 66 health facilities in Sud, Grand’Anse, and Nippes before Hurricane Matthew

551 patients in 31 assessed facilities

650 patients in 35 unassessed facilities
Findings in the 31 Assessed Health Facilities

- 3 TB facilities in Grand’Anse sustained moderate to severe damage: loss of roof, wall collapse, and flooding resulting in loss of equipment and materials.
- 18 were closed for less than one week and 5 were closed for one week or longer.
- TB case registers were damaged or lost at 5 facilities.
- Microscopes were damaged at 4 facilities.
- The drug supply was adequate at all health facilities.
Within 4 weeks of the hurricane, 398 of the 551 (72%) patients in the assessed facilities were located.

Treatment success for the 1,201 patients at one year after the hurricane was 81%.
Conclusions

- Active case finding in urban slums/camps and improved diagnostics contributed to an increase in case notification in the five years after the earthquake.
- Treatment success rates during 2010-2016 remained stable at ~80%.
- Hurricane Matthew had a little effect on treatment success owing to robust efforts to track patients.
- NTP and partners focusing on active case finding in high-risk communities and on strengthening surveillance system.
Acknowledgments

- TB Providers
- The NTP
- The National Public Health Laboratory
- CDC Haiti Office
Thank you!