Alignment of diagnosis and treatment of drug-resistant TB: current global situation and challenges

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Outline

- Global problem of TB and DR-TB
- DR-TB detection and treatment
- PMDT needs and challenges
  - Diagnosis
  - Drugs
  - Delivery of care
- Conclusions
Global problem of TB and MDR-TB

<table>
<thead>
<tr>
<th>Category</th>
<th>Estimated incidence, 2013</th>
<th>Estimated number of deaths, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>All forms of TB</td>
<td>9.0 million (8.6–9.4 million)</td>
<td>1.1 million* (1.0–1.3 million)</td>
</tr>
<tr>
<td>HIV-associated TB</td>
<td>1.1 million (1.0–1.2 million)</td>
<td>360,000 (310,000–410,000)</td>
</tr>
<tr>
<td>Multidrug-resistant TB</td>
<td>480,000 (350,000–610,000)</td>
<td>210,000 (130,000–290,000)</td>
</tr>
</tbody>
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Source: WHO Global Tuberculosis Report 2014

* Excluding deaths attributed to HIV/TB
Is MDR-TB important?

- Proportion of new and previously treated TB cases with MDR-TB are high in some countries.
- One in five of all TB deaths globally are caused by MDR-TB.
- Higher cost and lengthy course of treatment makes MDR-TB more likely to result in catastrophic costs for the patients.
MDR-TB cases estimated to occur among notified pulmonary TB cases, 2013

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Countries that notified at least one case of XDR-TB
Missing MDR-TB cases

- Large gap between estimated MDR-TB cases and those detected
- Large gap between detected and started on treatment

2013

- Number of MDR-TB cases estimated among all notified: 300,000
- Number of MDR-TB and RR-TB patients detected: 136,126
- Number of patients who started MDR-TB treatment (confirmed and unconfirmed): 96,829

< half

Gap = 39’000

~3 times compared to 2009

Source: Global TB report 2014
DR-TB cases detection and treatment

- Gap between detected and started on treatment is not closing, but
- Increased detection “pulls” number of patients started on treatment*

* Recognizing that not all detected patients start treatment same year

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Source: Global TB report 2014
PMDT needs: 3D’s

**DIAGNOSIS**
- Early (sensitive)
- Rapid

**DRUGS**
- Uninterrupted access
- Quality assured

**DELIVERY OF CARE**
- Appropriate models of quality care delivery
- Human resources
Diagnosis
Advancing TB Diagnostic Landscape

Commercial TB products & development pipeline*

New and emerging technologies in an increasingly competitive market

*Future dates estimated; order may change. Sources: UNITAID landscape, manufacturer outreach. Acknowledgements to Carole Jefferson, Madhu Pai and David Boyle.
Financing new TB diagnostics

- **Domestic funds**
- **Global Fund**: multiple grants to countries
- **UNITAID**: EXPAND-TB and TBXpert projects – 31 countries
- **PEPFAR**: multiple countries
- **USAID**: TB CARE, Challenge-TB and bilateral projects
- **World Bank**: East Africa Public Health Laboratories Project
- **CIDA/DFATD**: TB REACH Initiative
Drugs
Drugs

• SLDs are expensive but prices decreasing (GDF announced - 26%)

• New TB drugs are available (bedaquiline, delamanid)

• New regimens are being developed (shorter regimens, PaMZ)
Financing MDR-TB treatment

- **Domestic funds**
- **Global Fund**: multiple grants to countries
- **UNITAID and GF**: SLD stockpile
- **USAID**: bedaquiline donation programme and bilateral projects
Delivery of Care
DR-TB treatment, quality of care and outcomes

- Increase in number of MDR patients on treatment doesn’t seem to be coupled with better outcomes – health care system constraints?!
- Quality of care for MDR is crucial!
- Inappropriate models of care may lead to DR-TB evolution

![Graph showing percentage of cohort success rates from 2007 to 2011](image)

In countries with >100 patients on treatment success range in 2011 was 26% - 79%
DR-TB diagnosis and care

- Model of care has major impact on overall costs
- Diagnosis is not a major cost component

 Costs estimated from detailed costing studies in Tomsk (Russia), Estonia, the Philippines and Peru, adjusted for pattern of drug resistance, country income level, anticipated use of hospitalization
Conclusions: observations

- DR-TB presents a major challenge to the success of controlling global epidemic of TB
- TB programmes are missing TB and DR-TB patients
- TB programmes do not start treatment promptly for all patients detected
- Capacity to treat is more complex and more costly than capacity to diagnose
- Capacity to diagnose developing faster than capacity to treat
- Increased diagnosis “pulls” more treatment, but gap remains
- Quality of care is crucial
Conclusions: challenges

- Weakness of the broader health systems (including HR gaps) resulting in:
  - Lack of integrated TB diagnostic and treatment algorithms
  - Uneven allocation of resources, where planning for laboratories and treatment capacity is not always well linked,
  - Missing connections between information systems (TB diagnostics and treatment) may lead to missing patients
  - Ethics of diagnosis and treatment to be seriously considered
  - Models of care for MDR-TB and resistance to change = delays
  - Current MDR-TB regimens are lengthy and expensive
FIVE PRIORITY ACTIONS TO ADDRESS THE GLOBAL MDR-TB CRISIS

1. Prevent the development of drug resistance through high quality treatment of drug-susceptible TB

2. Expand rapid testing and detection of drug-resistant TB cases

3. Provide immediate access to effective treatment and proper care

4. Prevent transmission through infection control

5. Increase political commitment with financing
Conclusions: possible solutions

In addition to the five priority actions to address the MDR-TB crisis and to strengthen health care delivery:

• Prevent isolation between diagnostic and treatment streams of work

• Link information systems as feasible

• Implement innovations across systems, even if innovation applies to one stream of work only (diagnostics or treatment)

• Well designed and widely discussed and accepted algorithms can greatly facilitate implementation and scale-up

• Patient centered care and contextualized models of care
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