OVERVIEW OF TB AND CHILDHOOD TB

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Content

- Global TB picture
- TB in Kenya
- Childhood TB
- Challenges
Tuberculosis is the leading infectious killer

Current actions and investments are falling far short
Estimated TB incidence (countries > 100,000 cases)

- Kenya: 169,000
TB one of top 10 causes of death worldwide

- Ischaemic heart disease
- Stroke
- Lower resp. infections
- COPD
- Tuberculosis
- Cancer: tracheal, bronchus, lung
- Diarrheal diseases
- Diabetes
- HIV/AIDS
- Road injuries

 Millions in 2012

- TB
- HIV/AIDS

 Millions in 2015

Deaths from TB among HIV-positive people
TB has caused more deaths than HIV since 2012

![Graph showing the comparison of TB and HIV deaths between 2000 and 2016. The graph indicates that TB deaths have been higher than HIV deaths since 2012.]
Case notification gap: missing TB cases

- 4.1 million cases
- Underreporting, under-diagnosis

- Incidence
  - 2000: 10.4
  - 2008: 10.4
  - 2016: 6.3

- Case notifications
  - 2000: 6.3
  - 2008: 7.1
  - 2016: 8.1

Treatment success 83% globally in 2015, as in 2014
# TB Burden in Kenya

## Kenya Health Policy 2012 - 2030

### Leading causes of deaths, and disabilities in Kenya

<table>
<thead>
<tr>
<th>Causes of death</th>
<th>% total deaths</th>
<th>Causes of DALY's</th>
<th>% total DALY's</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV/AIDS</td>
<td>29.3</td>
<td>1 HIV/AIDS</td>
<td>24.2</td>
</tr>
<tr>
<td>Conditions arising during perinatal period</td>
<td>9.0</td>
<td>2 Conditions arising during perinatal period</td>
<td>10.7</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>8.1</td>
<td>3 Malaria</td>
<td>7.2</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>6.3</td>
<td>4 Lower respiratory infections</td>
<td>7.1</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>6.0</td>
<td>5 Diarrhoeal diseases</td>
<td>6.0</td>
</tr>
<tr>
<td>Malaria</td>
<td>5.8</td>
<td>6 Tuberculosis</td>
<td>4.8</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>3.3</td>
<td>7 Road traffic accidents</td>
<td>2.0</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>2.8</td>
<td>8 Congenital anomalies</td>
<td>1.7</td>
</tr>
<tr>
<td>Road traffic accidents</td>
<td>1.9</td>
<td>9 Violence</td>
<td>1.6</td>
</tr>
<tr>
<td>Violence</td>
<td>1.6</td>
<td>10 Unipolar depressive disorders</td>
<td>1.5</td>
</tr>
</tbody>
</table>


DALY's = Disability Adjusted Life Years – Time lost due to incapacity arising from ill health
2017 Statistics

TB case finding: 85,188

DR TB case finding: 577

Pediatric TB cases: 7,711
9% of cases notified
Trend of TB cases in Kenya, 2000-2017
558 cases /100,000 population = 169,000 TB incident cases in 2016

TB treatment coverage (notified cases /estimated incidence) of 45%

809 males per 100,000 people; young men 25-35 most affected

Among women, those over the age of 65 have the highest TB burden
CHILDHOOD TB
The global burden of tuberculosis mortality in children: a mathematical modelling study

Peter J Dodd, Courtney M Yuen, Charalambos Sismanidis, James A Seddon, Helen E Jenkins

Summary
Background Tuberculosis in children is increasingly recognised as an important component of the global tuberculosis burden, with an estimated 1 million cases in 2015. Although younger children are vulnerable to severe forms of tuberculosis disease, no age-disaggregated estimates of paediatric tuberculosis mortality exist, and tuberculosis has never been included in official estimates of under-5 child mortality. We aimed to produce a global mortality burden estimate in children using a complementary approach not dependent on vital registration data.

Methods In this mathematical modelling study, we estimated deaths in children younger than 5 years and those aged 5–14 years for 217 countries and territories using a case-fatality-based approach. We used paediatric tuberculosis notification data and HIV and antiretroviral treatment estimates to disaggregate the WHO paediatric tuberculosis incidence estimates by age, HIV, and treatment status. We then applied systematic review evidence on corresponding case-fatality ratios.

Findings We estimated that 239 000 (95% uncertainty interval [UI] 194 000–298 000) children younger than 15 years died from tuberculosis worldwide in 2015; 80% (191 000, 95% UI 132 000–257 000) of these deaths were in children younger than 5 years. More than 70% (182 000, 140 000–239 000) of deaths occurred in the WHO southeast Asia and Africa regions. We estimated that 39 000 (17%, 23 000–73 000) paediatric tuberculosis deaths worldwide were in children with HIV infections, with 31 000 (36%, 19 000–59 000) in the WHO Africa region. More than 96% (230 000, 185 000–289 000) of all tuberculosis deaths occurred in children not receiving tuberculosis treatment.

Interpretation Tuberculosis is a top ten cause of death in children worldwide and a key omission from previous analyses of under-5 mortality. Almost all these deaths occur in children not on tuberculosis treatment, implying substantial scope to reduce this burden.
Childhood TB in Kenya 2017

- Estimated 22,000 children fell sick with TB
- Only 7711 were diagnosed and treated
- 65% were undiagnosed
Trends of Childhood TB cases in Kenya, 2008-2017
Childhood TB in Kenya 2016

<table>
<thead>
<tr>
<th>Year</th>
<th>% 0-14 (all cases)</th>
<th>% 0-14 (new cases)</th>
<th>Ratio of 0-4:5-14</th>
<th>% bact confirmed</th>
<th>Xpert done</th>
<th>MTB confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>10.6</td>
<td>11.3</td>
<td>0.9</td>
<td>10.2</td>
<td>0.38</td>
<td>42.5</td>
</tr>
<tr>
<td>2013</td>
<td>9.5</td>
<td>10.2</td>
<td>0.9</td>
<td>10.7</td>
<td>0.35</td>
<td>50.0</td>
</tr>
<tr>
<td>2014</td>
<td>9.5</td>
<td>10.2</td>
<td>0.8</td>
<td>11.3</td>
<td>0.94</td>
<td>61.3</td>
</tr>
<tr>
<td>2015</td>
<td>8.6</td>
<td>9.1</td>
<td>0.9</td>
<td>15.2</td>
<td>5.3</td>
<td>65.2</td>
</tr>
<tr>
<td>2016</td>
<td>8.8</td>
<td>9.2</td>
<td><strong>1.0</strong></td>
<td>18.3</td>
<td>12.5</td>
<td>63.3</td>
</tr>
</tbody>
</table>

**Two indicators**

- 0-14 years expected to be between 5-15%
- 0-4:5-14 years old ratio between 1.5-3

Under-diagnosis and/or under-reporting of children under 5 years old
Increase in Xpert > increase in bact confirmed
Of those with an Xpert 63.3% were bact confirmed
Paediatric cases from the ward are not being captured or followed up on discharge
Deaths in community not captured

Expand Xpert to all children suspected of TB
Better sample collection for children
Maternal child health > look for cases and roll out presumptive register to all facilities
Contact tracing of household contacts, source case finding and public health action around schools
IPT uptake among <5 years in Kenya, 2014-17

Year | No. of children | No. of Bact confirmed | Uptake |
--- | --- | --- | --- |
2014 | 3% | 40000 | 3% |
2015 | 8% | 50000 | 8% |
2016 | 11% | 60000 | 11% |
2017 | 14% | 70000 | 14% |
Childhood TB in Kenya 2016

All counties were within the expected range for 0-14 year olds

Lamu 19.4
Pokot 17.1
Tharaka Nithi 16.2
Mandera 15.6

More childhood TB than expected

None of the counties were within the expected range for 0-4:5-14 year olds apart from those listed below

Lamu 1.5
Meru 1.6
Laikipia 1.7
Kwale 1.9
Kiambu 2.0
Tharaka N 2.1
Taita Tave 2.2
Embu 3.6
Kirinyaga 5.1

These counties met the target- so what are they doing?

This is a bit high- over diagnosis or missing 5-14 year olds
Challenges in childhood TB prevention and care

• Diagnosis
  – Limited capacity of paediatric diagnosis - worse in lower level health facilities
  – Insufficient integration into other services leading to missed opportunities for case identification

• Prevention
  – A low Latent TB infection (LTBI) treatment coverage
  – A low contact investigation coverage
The majority of children with TB are NOT diagnosed

Only 30% of an estimated 22,000 children with TB were diagnosed and put on treatment in 2016

Children die from TB every year (avoidable!)
  - Children that die are often young and/or never accessed treatment

Children exposed to TB do not access preventive therapy;
  - 34.5% of the 23,000 eligible children were initiated
Thank you!