TB 2015
burden, challenges, response

Dr Mario RAVIGLIONE
Director

GLOBAL TB PROGRAMME

World Health Organization

Addis Ababa, Ethiopia
11 - 13 November 2015
Overview

TB basics

TB burden & challenges

Response: End TB Strategy
What is TB?

● Definition of TB
  ○ Caused by bacterium called *Mycobacterium tuberculosis*; affects lungs but may also affect rest of the body

● Latent TB
  ○ Strong immune system keeps TB in control

● Active TB (TB disease)
  ○ Pulmonary TB
  ○ Extra-pulmonary TB

TB is curable and preventable!
TB is airborne

TB is transmitted via aerosolized particles from an infectious patient to those sharing the same air.

Of those exposed, some (e.g., 10-15 in 1 year) will get infected (1/3 of humanity!) and of those infected <10% will develop TB.
How is **TB** transmitted?

- Transmitted by person with active TB through tiny droplets when:
  - coughing
  - sneezing
  - spitting

- **TB** is not transmitted by:
  - shaking someone’s hand
  - sharing food or drink
  - touching bed linen or toilet seats

Transmitted by person with active TB through tiny droplets when coughing, sneezing, or spitting without covering mouth and nose.
What are some signs and symptoms of TB?

- Common symptoms of active TB:
  - coughing for more than two weeks
  - coughing up sputum, sometimes with blood
  - fever
  - weight loss
  - night sweats
  - weakness and tiredness
  - chest pains
What are some signs and symptoms of TB?

- Common symptoms in children:
  - persistent cough and persistent fever
  - loss of weight or failure to thrive during the past 3 months
  - tiredness or lack of playfulness

*Note: TB in children is*

- *often a family illness transmitted by someone in household*
- *most common in children below 5 years*
- *difficult to diagnose (children cannot easily cough up sputum to test)*
Who carries the burden of tuberculosis?

...mostly, the most vulnerable

TB spreads in poor, crowded & poorly ventilated settings

TB linked to HIV infection, malnutrition, alcohol, drug and tobacco use, diabetes

Migrants, prisoners, minorities, refugees face risks, discrimination & barriers to care

women and children
How can we prevent TB?

- Early case finding and diagnosis
- BCG (bacillus Calmette-Guérin) vaccine in children
- Prevention with medicines
- Infection control
How is TB treated?

- Active TB treated with a standard six-month course of four anti-TB drugs
  - Patient support to ensure adherence

- Types of drug resistance
  - Primary drug resistance
  - Acquired drug resistance
How is TB treated?

- Forms of drug-resistant TB
  - Multidrug-resistant TB (MDR-TB) – longer course of treatment of 18-24 months with more drugs; toxic; expensive
  - Extensively drug-resistant TB (XDR-TB)
How do **TB** and **HIV** affect each other?

- HIV infection means you are more likely to get TB
- Active TB makes HIV infection worse
- Diagnosing TB can be more difficult
- HIV-associated TB increases the risk of mother-to-child transmission of both HIV and TB
TB cannot any more be addressed alone

HIV, prison, women, diabetes, alcohol, drug use and smoking

TB and alcoholism

- Use of more than 40 gm per day is associated with increased risk of TB.

Pooled RR = 2.94 (95% CI: 1.89–4.59).

TB and diabetes

Pooled RR = 2.52 (95% CI 1.53–4.03)

TB risk is high in PWUD regardless of HIV

Pre-HIV era studies: 10x more risk of TB in PWUD

<table>
<thead>
<tr>
<th>Country (yr)</th>
<th>Drug used</th>
<th>TST +</th>
<th>TB disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran (2001) 1</td>
<td>Heroin, opium</td>
<td>40%</td>
<td>6.4%</td>
</tr>
<tr>
<td>USA (2002)   2</td>
<td>Heroin, crack</td>
<td>29%</td>
<td>NR</td>
</tr>
<tr>
<td>USA (2007)   3</td>
<td>Crack cocaine</td>
<td>28%</td>
<td>NR</td>
</tr>
</tbody>
</table>

TB should be a core function of harm reduction services

TB and smoking

- Prison transmission:
  - 1 in 11 TB cases in high income countries
  - 1 in 16 TB cases in middle income countries

Maternal TB increases mother to child transmission of HIV

TB should be a core function of MNCH activities

END TB
## The Global Burden of TB, 2014

<table>
<thead>
<tr>
<th>Estimated number of cases</th>
<th>Estimated number of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All forms of TB</strong></td>
<td></td>
</tr>
<tr>
<td>9.6 million</td>
<td>1.5 million*</td>
</tr>
<tr>
<td>133 per 100,000</td>
<td></td>
</tr>
<tr>
<td>1 million children</td>
<td>140,000 in children</td>
</tr>
<tr>
<td>3.2 million women</td>
<td>480,000 in women</td>
</tr>
<tr>
<td>5.4 million men</td>
<td>890,000 in men</td>
</tr>
</tbody>
</table>

| HIV-associated TB         |                            |
| 1.2 million (12.5%)       | 390,000                    |

| Multidrug-resistant TB    |                            |
| 480,000                   | 190,000                    |

*Including deaths attributed to HIV/TB

Source: WHO Global TB Report 2015

The Global Burden of TB, 2014

Multidrug-resistant TB

HIV-associated TB

All forms of TB

Source: WHO Global TB Report 2015

*Including deaths attributed to HIV/TB
Estimated TB incidence rates and case distribution, 2014

- **Americas**: 3%
- **Europe**: 3%
- **E. Mediterranean**: 8%
- **Africa**: 28%
- **Western Pacific**: 17%
- **South-East Asia**: 41%

- **23% in India**
- **10% each: Indonesia, China**
Accelerating response to TB/HIV

Estimated HIV prevalence in new TB cases, 2014

74% of TB/HIV cases in Africa

Other co-morbidities emerging in other regions
Addressing MDR-TB as a crisis

Percentage of new TB cases with MDR-TB

Highest % in the former USSR countries

India, China, Russia, Pakistan and Ukraine have 62% of all MDR-TB cases
Goal 6 – Combat HIV/AIDS, malaria and other diseases: Achievements in TB

TARGET 6.C
Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases

Tuberculosis

Through effective prevention, diagnosis and treatment, the burden of tuberculosis has decreased

- 43M lives saved since 2000
- 66M people cured since 1995

Note: In both panels, the green box marks the Stop TB target of a 50 per cent reduction by 2015 compared with 1990. Incidence rate refers to new cases per 100,000 population including people who are HIV-positive. Mortality rate refers to deaths due to tuberculosis per 100,000 population excluding people who are HIV-positive.
Challenges: Priorities for action 2015

5 PRIORITIES FOR ACTION

- Reaching the “missed” cases (3.6 million not in the system)
- Address MDR-TB as crisis
- Accelerate response to TB/HIV
- Increase financing to close resource gaps
- Intensify research and ensure rapid uptake of innovations
Evolution of WHO strategies and targets

1994-2005
- 70% case detection
- 85% Rx success

2006-2015
- DOTS targets
- Incidence reduced (MDG)
- Prevalence & death: by 50% vs 1990

2016-2035
- <10 TB cases per 100,000 population
SDG 3 and its 13 targets by 2030

3.1 Reduce Maternal mortality

3.2 Reduce child and neonatal mortality

3.3 End the epidemics of AIDS, tuberculosis, malaria & neglected tropical diseases and combat hepatitis, water-borne and other communicable diseases

3.4 Reduce mortality due to NCD and improve mental health

3.5 Strengthen Prevention and treatment of substance abuse (narcotics, alcohol)

3.6 Reduce Mortality due to road traffic injuries

3.7 Universal access to sexual and reproductive health-care services

3.8 Achieve universal health coverage

3.9 Reduce deaths and illness due to pollution and contamination

3.a Strengthen implementation FCTC (tobacco)

3.b Access to affordable essential medicines and technologies

3.c Increased health financing and health workforce in developing countries

3.d Enhance capacity for early warning, risk reduction and management of national and global health risks
67th World Health Assembly, Geneva, May 2014

THE END TB STRATEGY
### Vision:
A world free of TB
Zero TB deaths,
Zero TB disease, and
Zero TB suffering

### Goal:
End the Global TB epidemic

#### TARGETS

<table>
<thead>
<tr>
<th>MILESTONES</th>
<th>SDG*</th>
<th>END TB</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>35%</td>
<td>90%</td>
</tr>
<tr>
<td>2025</td>
<td>75%</td>
<td>95%</td>
</tr>
<tr>
<td>2030</td>
<td>80%</td>
<td>90%</td>
</tr>
<tr>
<td>2035</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Reduction in number of TB deaths**
compared with 2015 (%)

**Reduction in TB incidence rate**
compared with 2015 (%)

**TB-affected families facing catastrophic costs due to TB (%)**
The End TB Strategy: 3 pillars and 4 Principles

PILLAR 1
Integrated, patient-centered TB care and prevention

PILLAR 2
Bold policies and supportive systems

PILLAR 3
Intensified research and innovation

Government stewardship and accountability, with monitoring and evaluation

Building a strong coalition with civil society and communities

Protecting and promoting human rights, ethics and equity

Adaptation of the strategy and targets at country level, with global collaboration
1. INTEGRATED, PATIENT-CENTRED CARE AND PREVENTION
   A. Early diagnosis of tuberculosis including universal drug-susceptibility testing, and systematic screening of contacts and high-risk groups
   B. Treatment of all people with tuberculosis including drug-resistant tuberculosis, and patient support
   C. Collaborative tuberculosis/HIV activities, and management of co-morbidities
   D. Preventive treatment of persons at high risk, and vaccination against tuberculosis

2. BOLD POLICIES AND SUPPORTIVE SYSTEMS
   A. Political commitment with adequate resources for tuberculosis care and prevention
   B. Engagement of communities, civil society organizations, and public and private care providers
   C. Universal health coverage policy, and regulatory frameworks for case notification, vital registration, quality and rational use of medicines, and infection control
   D. Social protection, poverty alleviation and actions on other determinants of tuberculosis

3. INTENSIFIED RESEARCH AND INNOVATION
   A. Discovery, development and rapid uptake of new tools, interventions and strategies
   B. Research to optimize implementation and impact, and promote innovations
Research is critical to break the trajectory of the TB epidemic

- Better diagnostics, including new point-of-care tests;
- Safer, easier and shorter treatment regimens;
- Safer and more effective treatment for latent TB infection;
- Effective pre- and post-exposure vaccines.
Looking beyond 2015
Ending TB is one of the **Best Returns on Investment**

**Development** - The economics of optimism, Jan 24th 2015 - The debate heats up about what goals the world should set itself for 2030

### No-brainers

<table>
<thead>
<tr>
<th>Benefit per dollar spent for various development targets, $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade liberalisation</td>
</tr>
<tr>
<td>Access to contraception</td>
</tr>
<tr>
<td>Reducing tax evasion</td>
</tr>
<tr>
<td>Increasing migration</td>
</tr>
<tr>
<td>Reducing stunting</td>
</tr>
<tr>
<td><strong>Reducing tuberculosis</strong></td>
</tr>
<tr>
<td>Reducing malaria</td>
</tr>
<tr>
<td>Greater pre-school access in sub-Saharan Africa</td>
</tr>
<tr>
<td>Increasing circumcision for those at risk from HIV</td>
</tr>
<tr>
<td>Reducing coral loss</td>
</tr>
<tr>
<td>Source: Copenhagen Consensus Centre</td>
</tr>
</tbody>
</table>

![Diagram showing the economics of optimism](image)

**WHAT ARE THE BEST TARGETS TO FIGHT INFECTIOUS DISEASES?**

- Reduce TB deaths by 95% and TB incidence by 90% which returns $43 for every dollar spent
- Delay artemisinin resistance greater than 1% and reduce malaria incidence by 50% between 2015 and 2025 which returns $36 for every dollar spent
- In hyper-endemic countries, attain circumcision coverage of at least 90% amongst HIV-negative adult men which returns $28 for every dollar spent

*The economic case, put simply, is that TB treatment is low cost and highly effective, and on average may give an individual... around 20 years of additional life*
Take-home messages – TB 2015

1. **2015 MDG target** of reversing the TB epidemic reached, but....

2. **Burden of TB remains enormous:** 9.6 million new cases and 1.5 million deaths per year

3. **Challenges are great:** missed cases, MDR-TB, TB/HIV, funding and research investments

4. **WHO new global End TB Strategy based on 3 pillars** – (i) addressing TB specific interventions; (ii) broad health system and social issues; are (iii) research

5. **Role of NGOs and other CSOs** is crucial to end TB!
Join us in the fight to END TB

Thank you.