Essential Pillars

PILLAR 1

INTEGRATED, PATIENT-CENTERED TB CARE AND PREVENTION

PILLAR 2

BOLD POLICIES AND SUPPORTIVE SYSTEMS

PILLAR 3

INTENSIFIED RESEARCH AND INNOVATION

THE END TB STRATEGY

World Health Organization

PILLAR **3**

This pillar on research is critical to break the trajectory of the epidemic and reach the global targets.

INTENSIFIED RESEARCH AND INNOVATION

- *Aims to intensify research from the development of new tools to their adoption and effective roll-out in countries.*
- *Pursues operational research for the design, implementation, and scaling-up of innovations.*
- *Calls for an urgent boost in research investments, so that new tools are developed, and made rapidly available and widely accessible in the next decade.*

FIGURE 2.1 **PROJECTED GLOBAL TRAJECTORY OF TB INCIDENCE RATE 2015-2035 REQUIRED TO REACH 2035 TARGETS (LOG SCALE)**
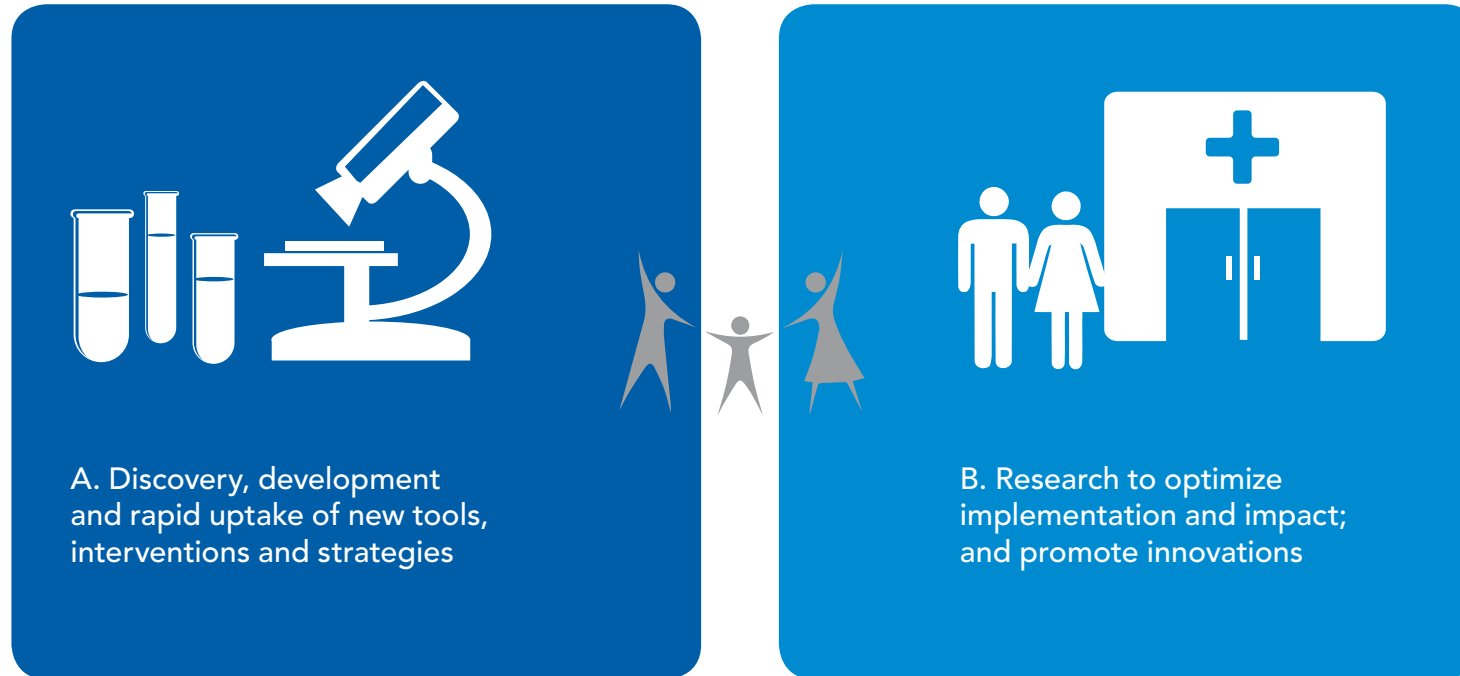
Desired decline in global TB incidence rates to reach the 2035 targets
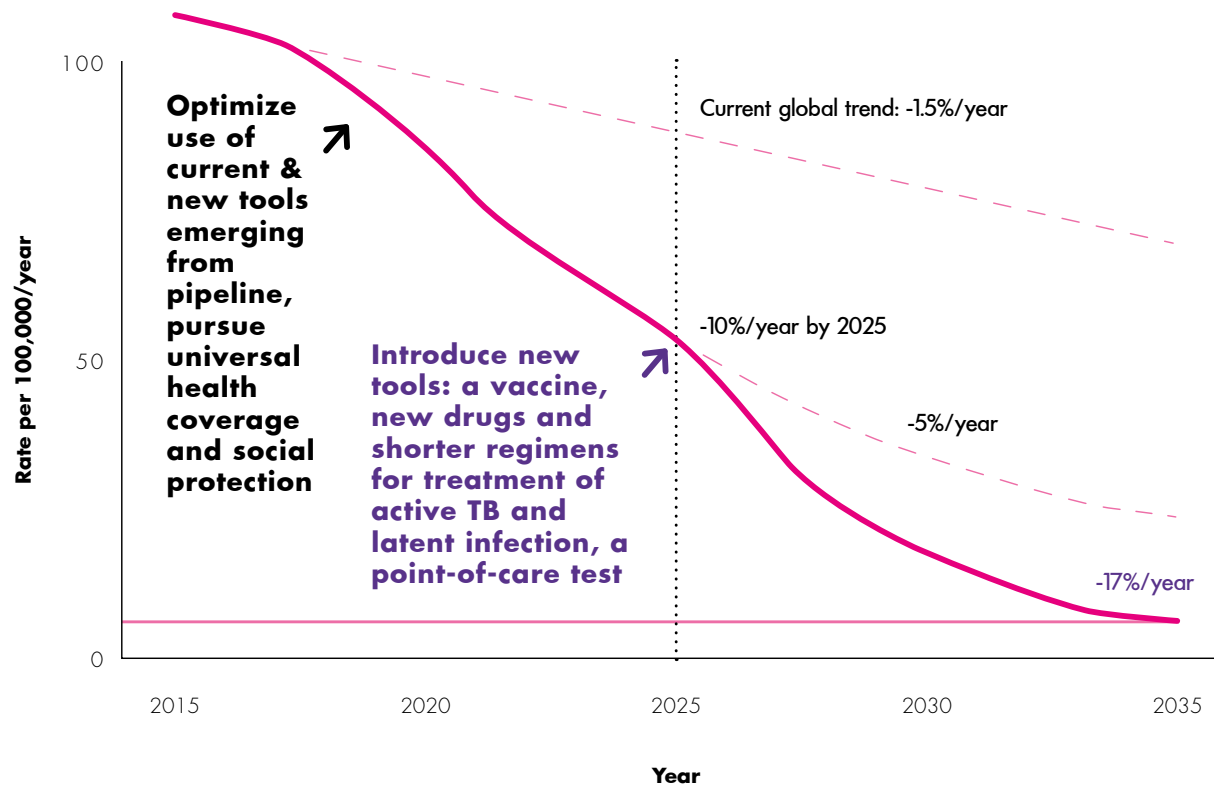
New tools

- **Vaccines for prevention**
- **Point of care molecular diagnosis**
- **Shorter, effective treatment regimens for active TB and LTBI**

How pillar 3 works : Key components

A. Discovery, development
and rapid uptake of new tools,
interventions and strategies

B. Research to optimize
implementation and impact;
and promote innovations

Research Priorities in TB Diagnostics

- **Biomarker test:** a point-of-care, non-invasive and non-sputum-based high accuracy test that can detect all forms of TB (TB infection, DS-TB and DR-TB) in all age groups and subpopulations by identifying characteristic biomarkers or biosignatures, and which can identify people more likely to develop TB disease after infection

- **Triage test:** a point-of-care, simple, low-cost test that can be used by first-contact health care providers to identify those who need further testing

- **Smear replacement test:** a more accurate (high sensitivity and specificity) point-of-care diagnostic test to replace smear microscopy for detecting PTB and to monitor treatment response for all subpopulations and age groups

- **Rapid drug susceptibility test:** a test that can be used at the microscopy center level of the health care system to select appropriate first line regimen- based therapy.

Global strategy for tuberculosis research and innovation, WHO 2020

Research Priorities in TB Treatment

- **TB preventive treatment research:** More effective and shorter treatment options for preventing TB disease are needed, including formulations that safely improve adherence, increase acceptability and feasibility, and improve the cost–effectiveness of TB preventive treatment.

- **DS-TB treatment research:** Novel approaches to improve DS-TB treatment, reducing the duration of therapy while keeping efficacy high

- **DR-TB treatment research:** Novel approaches that could lead to an all-oral, short-term treatment for DR-TB. Breakthroughs in treatment regimens and drugs with high activity and novel mechanisms of action against DR-TB would also play an important role in improved treatments for DS-TB.

Global strategy for tuberculosis research and innovation, WHO 2020

Developing New TB Vaccines

Pre-exposure - preventing establishment of an initial infection

Post-exposure - preventing progression to disease

Immunotherapeutic vaccine – used in combination with drugs, could reduce treatment duration and the risk of recurrence after treatment completion thus reducing development and spread of resistance.

Global strategy for tuberculosis research and innovation, WHO 2020

Challenges to developing new vaccines

Lack of validated, predictive animal models of TB infection and disease

Lack of biomarkers that can act as prospective signatures of the risk of developing TB or as correlates of protection

Incomplete understanding of the nature of protective immunity to TB

Vaccine R&D is an expensive process with lengthy timelines

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Advancing basic science research

To give new insights into the molecular and biochemical basis of disease and the associated host or pathogen predictive biomarkers or surrogate end-points associated with disease progression and cure

To improve our understanding of host and bacterial factors (and their interplay), to broaden knowledge and make new discoveries that could ultimately lead to the development of new and more effective diagnostics, medicines and vaccines.

Establish biorepositories for the collection, processing, storage and distribution of biospecimens from the various populations affected (including women and children), to support current and future scientific investigation. Cost–effective way to facilitate the next generation of translational research and precision medicine for patients.

Operational, Implementation, Health System, Social Science, Economic and Policy Research

- To achieve universal access to high-quality TB services and psychosocial support through multisectoral action, enabling patients to complete care without the risk of financial impoverishment.

- To support the development of cost–effective and high-impact service delivery strategies - allow the rapid and equitable introduction and optimization of new products and approaches, tailored to countries' specific needs.

- To assess the feasibility, acceptability, effectiveness and impact of new strategies or interventions on health outcomes – and on broader benefits to communities, health care systems and economies –guide the translation of efficacy into effectiveness in the community.

- Innovative digital technologies (such as electronic reporting and adherence support) offer opportunities to improve the efficiency or the effectiveness of TB care. Implementation research could enhance the scale- up of evidence-informed products in contexts other than those in which they were studied.

Global strategy for tuberculosis research and innovation, WHO 2020

Operational, Implementation, Health System, Social Science, Economic and Policy Research

- Developing the evidence base to better understand and address the structural, social and cultural barriers to TB prevention, diagnosis, treatment and care requires a health system and social science research agenda based on epidemiological findings; requires studies of applicable health economics modelling.

- Evidence-based approaches to enable countries to effectively adapt and implement global recommendations on TB prevention, diagnosis, treatment and care, and to optimize the necessary links with other health services and sectors, including through digital health technologies.

Global strategy for tuberculosis research and innovation, WHO 2020

Strengthening research and innovation

Establish a National TB Research Network

Updated National TB Research Agenda and Research Priorities

Research training and capacity building

Monitoring and evaluation framework

Adequate and sustainable funding for research

Framework for rapid introduction of new tools

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Framework to hasten uptake of science-based tools and innovations

Form a national TB technical group for policy review

Strengthen the legislative environment (for registration, policy adoption)

Identify early implementers (sites ready to be used as demonstration centers or centers of excellence)
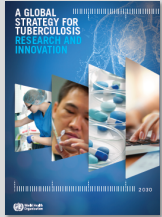
Flexible funding mechanisms (reprogramming the budget)

The way forward – strategic objectives

- Create an enabling environment for high-quality TB research and innovation
  - Public-private partnership
  - Governments, academia, patient organizations and the private sector to create an environment for open sharing of science and resources
- Increase financial investments in TB research and innovation.
- Promote and improve approaches to data sharing.
  - Systematic data integration
- Promote equitable access to the benefits of research through UHC
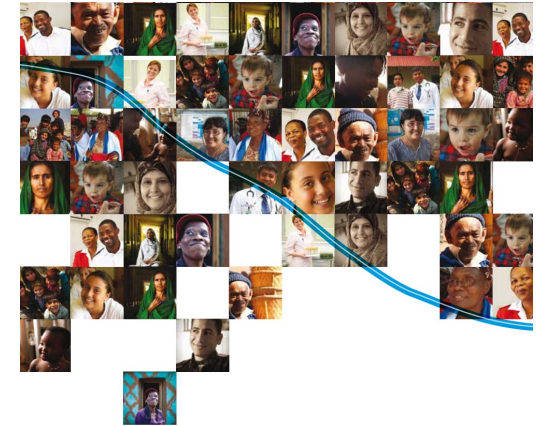
Thank you!