



Report of the First Meeting of the WHO Global TB Research Task Force

8-9 December 2016
Geneva, Switzerland

Meeting Report

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THE
END TB
STRATEGY

ACKNOWLEDGEMENTS

We acknowledge with gratitude the Global TB Research Task Force members, technical resource persons, observer and administrative personnel who made this meeting possible and productive. We want to particularly thank Dr. Christine Sizemore for chairing the Task Force and Drs. Priya Shete and Alison Kraigsley for contributing to writing the meeting report, and synthesizing the outcomes. We acknowledge funding support from the Bill and Melinda Gates Foundation through grant project number OPP1131404. All the meeting participants contributed their time to the review of the final document; this support is also gratefully acknowledged.



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DRAFT

Abbreviations

AMR	antimicrobial resistance
CSO	civil society organization
DST	drug susceptibility testing
GTB	Global TB Programme
MDR-TB	multidrug resistant TB
MoH	ministry of health
Mtb	<i>Mycobacterium tuberculosis</i>
NGO	nongovernmental organization
NSP	national (TB) strategic plan
NTP	national tuberculosis programme
TAG	Treatment Action Group
TB	tuberculosis
SDG	Sustainable Development Goal
WHO	World Health Organisation

Background

Tuberculosis (TB) remains a major global health problem. Although a number of significant advances have been made to control TB in the past decade, an estimated 10.4 million people fell ill with TB and 1.8 million died from the disease in 2015. The global TB community has made commendable efforts in the past decade to successfully attain the Millennium Development Goal and other international targets of halting and reversing TB incidence and mortality, respectively. However, despite the achievements to date, the global TB incidence is slowly declining at a rate of 1.5% per year, which is insufficient to eradicate the disease.

Recognizing these challenges, in May 2014 the World Health Assembly approved the new End TB Strategy with a set of ambitious targets, later incorporated within the Sustainable Development Goals for 2030. Targets include the reduction of TB deaths by 90% and of TB incidence by 80% between 2015 and 2030, and by 2020, the elimination of catastrophic costs due to TB in affected households. To achieve these targets, the three-pillar End TB Strategy comprises (i) integrated patient-centered care and prevention; (ii) bold policies and systems, with emphasis on social protection of vulnerable populations; and (iii) intensified research and innovation. The research and innovation pillar of the End TB Strategy promotes the need for research along a continuum that links upstream fundamental research to discovery and new tool development, and ultimately to operational and implementation research, allowing innovative strategic approaches to be adapted to specific country needs.

Promotion of intensified research efforts was first detailed in the Global Action Framework for TB Research¹ published by WHO in November 2015. It outlines above all the development of country-specific TB research plans through the establishment of national TB research networks to promote TB research among national stakeholders engaged in TB product development and global funders.

The 2030 global targets will not be achieved unless all existing interventions are optimized and implemented, and new transformational tools are both developed and operationalized in all settings. To assist with this, the WHO Global TB Programme (GTB) has established a Task Force on Global TB Research assembling scientists from diverse research disciplines, programme managers, funders and advocacy group with the view to advise WHO on means to promote TB Research internationally and align global and national TB research efforts to End TB.

The objectives of the first meeting of the Task Force were to:

1. Advise WHO/GTB within the context of the Global Action framework for TB Research on actions to promote and facilitate translation of science ‘from bench to bedside’;
2. Advise WHO/GTB on the best means to support countries in the identification of specific research needs and innovative strategies to improve domestic TB care and control practices;
3. Advise WHO/GTB on the relevant actions to address global TB R&D support based on identified global and national research needs.

Expected outcome: The expected outcome of this meeting was a set of advice for WHO/GTB on strategies for effectively promoting the conduct and use of TB research to achieve the goals and targets of the WHO End TB Strategy, both at national and international levels.

¹ Global Action Framework for TB Research. Geneva: World Health Organization; 2015 [WHO/HTM/TB/2015.2 (<http://www.who.int/tb/publications/global-framework-research/en/>, accessed 14 September 2016)].

Reporting Structure

This report is presented according to the meeting sessions.

Session 1 “Improving country level research to End TB” Presentations were made by various stakeholders to provide examples of nationally coordinated TB research activities at country level, followed by discussions on how WHO/GTB can assist to further strengthen country-level research and innovation. Highlights of the presentations are summarized on pages 4-5 in this report and advice for WHO following the discussions are summarized in Table 1.

Session 2 “The global TB research landscape in the End TB era” Presentations were made by various stakeholders to provide a summary of global gains and needs in TB research, followed by discussions on how WHO/GTB can assist to further facilitate and drive TB research needs for better vaccines, diagnostics, drugs and implementation strategies. Highlights of the presentations are summarized on pages 6-7 in this report and advice to WHO following the discussions are summarized in Table 1.

Session 3 “Funding for TB Research” Presentations were made by various stakeholders to provide a summary of current TB R&D funding trends and gaps, followed by discussions on how WHO/GTB can assist to further facilitate and promote resource mobilization for TB research funding at both country and global levels (pages 8-9). **Breakout groups** were formed to discuss “Strategies to accelerate clinical research”; “Multisectoral collaboration to drive research in the context of the Sustainable Development Goals (SDGs)”; and “Efforts and opportunities for mobilizing funding for TB research at international level”. The presentation highlights are summarized on pages 12-14 in this report and advice to WHO following the discussions are summarized in Table 1.

Introductory Session

After a welcome by Dr. Christian Lienhardt (WHO/MTB), Dr. Christine Sizemore, Chair of the Global TB Research Task Force, opened the meeting at 9 AM December 8, 2016. Dr. Sizemore reminded the Task Force members of their roles and responsibilities in providing direction, advice and guidance to WHO/MTB on how to best promote TB research in the context of pillar 3 of the End TB Strategy. She also encouraged the Task Force members to consider their recommendations within the context of available, and diminishing global resources for TB research and product development as well as fit with the mission and pre-emptive of the WHO/MTB. The Chair presented the structure of the 2-day meeting ([Annex 1](#)) and introduced the members of the Task Force, technical resource persons and other participants ([Annex 2](#)). Dr. Lienhardt made an introductory presentation before Session 1 opened.

Introductory presentation

Dr. Christian Lienhardt, MTB/WHO

Research and the End TB Strategy – the Global Action Framework for TB Research

Dr. Lienhardt highlighted WHO's current strategy for promoting research and innovation to achieve the goals and targets of the End TB strategy¹ in the context of the SDGs. The Global Action Framework for TB Research² and its fundamental objectives of promoting research both at global and country levels was highlighted as the basis for a cross talk between the three pillars of the End TB Strategy. The rationale of *why research and innovation* was adopted as a pillar in the End TB Strategy was presented using modeling data from a 2014 MTB study that outlined the need for new tools to significantly decrease TB incidence to achieve the target of <10/100,000 new TB cases by 2035. The 10-year vision of addressing the gaps in TB research with a view to develop better vaccines, diagnostics, drugs and innovative strategies were presented. WHO's current efforts in promoting research at Global level were also presented; these include convening of an annual global funders' forum on various topics, support for creation of regional or thematic networks, and further reflections on innovative ways to promote and finance TB research.

¹ Uplekar M, Weil D, Lonroth K, Jaramillo E, Lienhardt C, Dias HM et al., for WHO's Global TB Programme. WHO's new End TB Strategy. *Lancet*. 2015;385 (9979):1799–801.

² A global action framework for TB research. Geneva: World Health Organization; 2015 (<http://www.who.int/tb/publications/global-framework-research/en/>, accessed 4 September 2016)

Day 1 (Session 1): Improving country level research to End TB

1.1 GTB's support to countries:

Development of National TB Research Plans

Dr. Nebiat Gebreselassie, WHO/GTB

Dr. Gebreselassie presented GTB's support to countries to help integrate research & innovation into national TB control efforts by supporting TB research planning and implementation. To drive this, WHO has developed a toolkit to (1) assist countries establish national TB research network of stakeholders, (2) conduct situational assessment of the TB landscape, and (3) develop a prioritized national TB research agenda. Examples from 'pathfinding' countries adopting the tool-kit were presented. **Participants** agreed that since sustainability of the conduct and use of national research is important, GTB should continue to provide technical assistance to support countries in developing their national TB research agenda, map existing financial and non-financial research resources, and link them to identified research priorities to drive implementation.

1.2 The role of programmatic research in national TB control:

Professor Nguyen Viet Nhung, Viet Nam

Dr. Nhung presented his experience with an integrative approach to research in programmatic settings in Viet Nam. Viet Nam's NTP is conducting research using its national TB research network [Vietnam Integrated Centre for Tuberculosis and Respiratory Research-VICTORY] as a platform to develop and monitor the implementation of a national prioritized research plan. Examples of high quality studies that were conducted to improve case finding, and drive political advocacy at high level were presented. **Participants** applauded Viet Nam's NTP for leading evidence-driven programmatic work and for its political advocacy that has resulted in the endorsement of Viet Nam's National Strategy for TB control by the country's Prime Minister in 2014.

1.3 The need for supporting basic and clinical research in TB endemic countries:

Dr. Roxana Rustomjee, NIH/NIAID

Dr. Rustomjee presented NIH/NIAID's activities of supporting research in TB endemic countries through the Regional Prospective Observational Research (RePORT) international projects. RePORT is a NIH/NIAID initiated, bilateral, multi-organizational, collaborative set of TB cohorts located in India, Brazil, South Africa (and soon Indonesia) to address a wide array of scientific objectives identified by national stakeholders. RePORT projects also aim to strengthen TB research capacity and infrastructure, and foster research collaboration by providing a platform to link regionally stored biospecimens with clinical data for characterizing biomarkers critical in the optimization of diagnostics and treatments. Most of this work is co-funded by both United States and national stakeholders, although some are nationally funded (e.g. Indonesia). **Participants** applauded this project and encouraged NIAID to expand this work to other high TB burden countries.

1.4 Linking programmes, researchers and policy makers: the experience of Brazil

Professor Afranio Kritski, Brazil

Professor Kritski presented REDE-TB, which is an interdisciplinary group of Brazilian researchers with the common goal of promoting discussion among government, academia, health service providers and civil society on the development and implementation of new technologies and strategies to improve TB and HIV/AIDS care and control across the country. **Participants** applauded REDE-TB's platform and acknowledged its utility in building linkages between NTP and researchers, the public health system, industry and civil society and its utility in prioritizing & conducting studies of strategic importance to the NTP.

1.5 Global ministerial conference on TB in

the context of global health and SDGs

Dr. Tereza Kasaeva, Russian Federation

Dr. Kasaeva discussed the Russian Federation’s plan to host a high-level “Global Ministerial Conference on TB in the Context of Global Health and the SDGs” in November 2017. This conference is to catalyze support to accelerate progress towards the health-related SDG target of ending the TB epidemic by 2030 and to arrive at a actionable strategies endorsed by heads of state and the UN General Assembly. The conference will call for an increase in high-level commitment by governments and their partners to the SDG agenda through innovative collaborations and targeted solutions with special reference to efforts to advance universal health coverage. Dr. Kasaeva requested that the Task Force assist in the preparation of this upcoming ministerial conference to build a strong case for TB research, and the **Task Force** members unanimously agreed on to support this effort.

1.6 Coordinating and streamlining multi-spectrum research in a high TB burden country

Professor Glenda Gray, South Africa

Professor Gray presented the South Africa Medical Research Council’s (SAMRC) contributions to various research disciplines and innovation schemes in biomedical and clinical research in the context of the country’s unique TB/HIV epidemic and related mortality/morbidity. Funding allocations were presented, and collaborative work with the UK MRC and Newton Fund (for implementation research), as well as with US-NIH/NIAID in the RePORT cohorts were highlighted. Other large-scale South African collaborative projects in various TB research areas that contribute to the pipeline of investigational new TB diagnostics and drugs were also presented to the Task Force.

After the presentations, the floor was open to discussions about “*Improving country level research to End TB*”, where participants provided three key recommendations to WHO/GTB on how best to promote and facilitate TB research at country level:

- Support high and medium TB burden countries in the development and implementation of national TB research plans;
- Convene regional meetings to allow exchange of experiences and lessons learnt by early implementers of national TB research plans to support and optimize technical assistance to new countries; and,
- To encourage discussion at the country level on how best to structure TB research programs to fit within the scope and mission of diverse global funders.

The summarized recommendations and outputs from this session are summarized in Table 1.

1.7 Discussion

Day 1 (Session 2): Global TB Research Landscape in the End TB Era

2.1 Overview of current TB diagnostics and future prospects for ‘test and treat’ strategies

Dr. Claudia Denkinger, FIND

Dr. Denkinger presented the current portfolio and pipeline of TB diagnostics and outlined the “ideal” product characteristics that would improve assignment of patients to currently available therapies. Since determination of drug resistance plays a key role in the patient care algorithm and the proper assignment of curative regimens, close attention needs to be paid to simplifying universal drug susceptibility testing in places where patients seek and/or receive care (point-of-care).

2.2 Overview of current TB drugs and regimens for treatment of all forms of TB – prospects, gaps and needs:

Dr. Daniel Everitt, TB Alliance

Dr. Everitt presented the current product pipeline within the context of the Target Regimen Profiles that were developed by WHO to facilitate integration of new TB drugs into existing regimens. He shared his optimism on the growing portfolio of promising new drugs in the preclinical stage, as well as on current and future trials of new regimens.

Participants discussed various on-going clinical trials for DS-TB and MDR-TB and debated considerations to take into account when evaluating TB regimens, such as length, complexity, and cost.

2.3 The Global pipeline of TB vaccines: the ‘big picture’ and where we really are

Dr. Jacqueline Shea, Aeras

Dr. Shea shared modelling data to outline the potential impact of even just a partially effective vaccine on the global TB epidemic. While the value of vaccines for TB control appears obvious, research investments beyond the preclinical stage are currently very limited. To lower development risk, **Dr. Shea** discussed the current vaccine candidate pipeline in light of three strategies employed by vaccine developers to simplify clinical evaluation and assess relevant endpoints - prevention of TB disease-POD, prevention of established Mtb infection –POI, and prevention of TB disease

recurrence-POR. **Participants** expressed concern that lack of resources is significantly affecting the vaccine pipeline as evidenced by the limited antigenic diversity of current investigative vaccines. **Dr. Shea** reminded that the complexity of the human immune response to *Mycobacterium tuberculosis* (Mtb) as seen during the establishment of infection, latency, and reactivation complicates vaccine R&D and requires multiple preclinical animal models to estimate efficacy before a candidate can advance to clinical testing. **Participants** also discussed potential ways to de-risk vaccine development by limiting the number of animal models required to estimate vaccine efficacy preclinically and increasing funding for vaccine research (especially for the early clinical stage), as well as on the respective advantages of the three strategies for clinical evaluation.

2.4 The role of research in addressing social barriers and reaching the missing cases

Dr Knut Lonnroth, GTB/WHO

Dr. Lonnroth presented the current gap in knowledge about social determinants of TB and outlined research needs to help fill these gaps. He placed the challenges TB patients are faces with into the larger context of public health and society and advocated for the potential role of social protection schemes in addressing socio-economic barriers that are critical to reaching the missing TB cases and assuring full access to care. He presented the S-PROTECT (Social PROtection to Enhance the Control of TB) network, which was established to assess how different SDG targets, such as alleviation of poverty may impact the TB epidemic. He further introduce the newly established ‘Social Protection Action Research & Knowledge Sharing’ network (SPARKS)’, an international research hub aimed at catalyzing social protection research and its impact on health outcomes.

Participants discussed the contribution by global social research networks to the development of operational research evidence for socio-economic interventions that have targeted impact on TB control.

2.5 The role of advocacy in driving TB R&D:

challenges and opportunities

Mr. Mike Frick, Treatment Action Group (TAG)

Mr. Frick presented the global trend in TB R&D funding for the past 10 years and outlined that support is at a 5 year low. The United States is the largest investor in TB R&D, contributing to 50% of global resources in 2015. He discussed how the global contribution to research is affected by domestic policies and political landscape, as was the case during the American Recovery and Reinvestment Act in 2009 that led to a transient spike in TB R&D funding. He also showed that the public sector is the largest investor in TB R&D, followed by philanthropic, private and multilateral funding. Private sector funding was down 40% between 2014 and 2015. This was of concern, and **participants** discussed various ways advocacy from stakeholders, including scientists, WHO, professional advocates, and CSOs are needed to (1) make the case for tangible and significant return on investment for research; (2) motivate governments to pledge sustained, incremental funding for TB research and (3) demonstrate the direct impact of R&D investment on morbidity and mortality from TB.

After the presentations, the floor was open to discussions about *“The global TB research landscape in the End TB era”*, where participants provided three key recommendations to WHO/GTB on how best to promote and facilitate TB research at the global level:

- Promote a multidisciplinary approach to research that integrates all aspects of science from bench to bedside;
- Promote and advocate for increased TB research funding and innovative funding mechanisms; and,
- Work on strategies to engage the private sector in conducting and/or funding TB research.

The summarized suggestions and outputs from this session are summarized in Table 1.

2.6 Discussion

Day 2 (Session 3): Funding for TB Research & Breakout Discussions

3.1 Funding gaps in TB R&D: challenges and opportunities

Mr. Mike Frick, Treatment Action Group (TAG)

Mr. Frick shared TB R&D funding data from TAG's 2016 report that indicated that only 1/3 of projected funds for TB research are currently available. In 2015, funding for TB research decreased to US\$620.6 million from US\$674.0 million in 2014, and it can be expected that the prospect for future R&D funding is not promising. **Participants** reflected on the presentation by noting UNITAID's rise as a significant funder. The need for advocacy to include TB in larger Antimicrobial Resistance action plans was also discussed. **Mr. Frick** suggested the development of an advocacy roadmap for R&D funding to help create effective messages and a common voice. **Participants** also discussed the need to advocate for "new" funding programs/schemes rather than the reallocation of already existing funds. **Mr. Frick** mentioned that TAG is willing to re-analyze their funding data over the last ten years to highlight relevant trends and nuances and asked for the Task Force's assistance in shaping this analysis. **Participants** suggested that TAG work with the WHO R&D observatory to align reporting, and further discussed the utility for WHO to convene a meeting on TB research funding (including new funding and financing mechanisms) with a view to attract non-traditional funders.

3.2 Innovative funding mechanisms for TB R&D: the 3P project

Dr. Grania Brigden, The International Union against Tuberculosis and Lung Disease

Dr. Brigden presented the '3P Project' as a new model for leveraging resources and intellectual property for TB regimen development. The '3P Project' aims to create a new open collaborative framework by implementing financial push, pull and pool incentives throughout the whole product development cycle. The ultimate goal of the Project is to contribute to the development of a universal, up to one-month drug regimen for all types of TB. Fair licensing for generic, competitive manufacture of the final regimen components is an important aspect of this mechanism, which should help create returns on investment.

Participants discussed how this innovative project should coordinate activities with developers of regimens with similar target profiles to avoid duplication of efforts and how to work with developers designing regimens not necessarily meeting the target profile of the '3P' project.

3.3 WHO's efforts in mapping & mobilizing R&D resources for diseases where there is no market

Dr. Alastair Robb, IER/WHO

Dr. Robb described WHO's R&D observatory and its aims, goals and objectives in guiding health R&D priority setting and funding for neglected diseases (including TB) at the national, regional and global level, as well as its expansion plan as envisioned by the World Health Assembly. **Participants** discussed the potential role of the observatory in facilitating discussion with researchers in other infectious disease areas, and suggested that public health-focused, rather than disease focused, R&D gap analysis and advocacy through the observatory may significantly contribute to the operationalization of Pillar 3 activities. Highlighting examples about how improved health adds value to economies and political agendas is needed to make a strong investment case for research in TB. However, while modeling data are outlining critical areas of engagement, more data are needed to support R&D financing.

3.4 Compendium of Funding Opportunities for TB Research

Dr. Nebiat Gebreselassie, GTB/WHO

Dr. Gebreselassie presented GTB's initiative to develop a compendium of Global Funders for TB research. The aim was to help guide investigators in approaching existing funding sources/product development resources to structure large scale, or cross-cutting research projects in TB research; to make sense of the nuances of the different funders; and to help investigators understand the internal processes and rules for proposal acceptance, review and funding. The compendium currently lists 18 funders, and **participants** suggested that the funder base be expanded systematically by linking with TAG's annual R&D survey. Participants also suggested that the utility of the compendium for informing funders on each

other's strategies and providing points of contact for inquiries needs to be acknowledged.

3.5 Session 3 - Discussion, Breakout Groups and Conclusion

After the presentations, participants briefly discussed the TB research landscape at global level, and then re-convened in three breakout groups for discussion of:

- *Strategies to accelerate clinical research;*
- *Multi-sectoral collaboration to drive research in the context of the SDGs; and*
- *Efforts and opportunities for mobilizing funding for TB research at international level".*

Suggestions about how WHO/GTB can contribute to facilitating TB research in these topic areas were made by each breakout group (Table 1).

At the conclusion of the meeting, the Chair presented a brief summary of the day. All members of the Task Force agreed that the meeting was productive and

engaging, and agreed to re-assemble to monitor progress in the implementation of the suggestions that were presented to WHO/GTB. It was agreed that WHO would reconvene the Task Force in 2017 to contribute to the preparation of the Ministerial Conference in Moscow in Nov 2017, as requested by Dr Kasaeva. The Chair then asked each Task Force members to communicate one recommendation from the 2-day discussion to Dr. Mario Raviglione, Director of GTB who joined the meeting at 4:45PM via Skype. After each Task Force member read his/her recommendation (consolidated in Table 1), Dr. Raviglione re-iterated the important role of this Task Force in supporting high level meetings like the upcoming Ministerial Conference in Moscow, advocating for and encouraging member states and the international community to set tangible and concrete targets for TB research across the SDG agenda. Dr. Raviglione then thanked the Task Force with closing remarks.

The Chair announced that the draft minutes will be circulated electronically in two weeks and the final draft will be published online. The Chair closed the meeting at 5:30PM on December 9, 2016.

TABLE 1. Recommendations for GTB/WHO

<p>At country level</p>	<p>1) Development of National TB research plans</p> <ul style="list-style-type: none"> • Continue supporting high and medium TB burden countries in the development and implementation of national TB research plans to address context specific gaps in TB control. • Support countries in how to use context-specific national research plans to advocate for high-level government commitment, innovative collaboration and problem-solving to end the TB epidemic. • Advocate for innovative cross-disciplinary multi-sectoral TB research approaches across the SDG agenda. For this, WHO should: <ul style="list-style-type: none"> • develop a collection of examples of country-level case studies that describe inter-sectoral approaches to TB research • develop a strategic plan for inter-sectoral collaborations in TB based on existing data from implementation of the Global Action Framework. <p>2) Sharing lessons learned from pathfinding countries</p> <ul style="list-style-type: none"> • Convene representatives from countries that are developing and implementing national TB research plans to share lessons learned, knowledge and opportunities for collaboration in various country contexts, as well as to align messages for research advocacy. <p>3) Funding for TB research at country level</p> <ul style="list-style-type: none"> • Assist Global Fund eligible countries to integrate implementation research into their national strategic plans (NSPs); • Assist countries put together strategies on how to approach national and global funders to support TB research; and • Promote 'TB R&D as a necessity - not a luxury': Advocating and promoting the role of R&D for socio-economic development and overall economic improvement to create a strong business case for research investment.
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Within the WHO**1) Strategic planning**

- Establish focal persons for research at WHO regional offices to support countries for research planning and implementation;
- Ensure that the need for MDR-TB research is visible in the global antimicrobial resistance (AMR) agenda to justify inclusion in country-level and local policies;
- Position TB as a proxy (indicator) for monitoring of successes against goals and targets of the SDGs and to advocate for stronger commitment and action to fight the disease at both country and global levels;
- Define concrete operational research projects with countries for targeted support through Global Fund collaborations;
- Work with countries to develop a “good practice” roadmap for conducting translational research to help bridge the gap between science and practice.

2) Accelerating clinical research

- Advocate for expedited approvals of TB research as part of priority review processes at country level to incentivize and speed up product development;
- Integrate information on Good Pharmaco-epidemiology Practices (GPP) into the Toolkit for Developing a National TB Research Plan to assist with planning, conduct, and evaluation of clinical research projects;
- Map and promote open science initiatives to improve reproducibility and transparency of scientific data, stimulate innovation and discovery and facilitate information sharing between disciplines and sectors; and
- Encourage countries to invest in country-level ‘Centers of Excellence’, and engage in iterative preclinical/clinical research to maintain trials capacity, to fuel knowledge and improve practice through continuous learning.

3) Advocacy with member states

- Advocate for TB specific research funding, particularly from the European Commission (EC) through individual member states.

At global level

1) Promote a multidisciplinary research approach

- Update the International Roadmap for TB Research¹ in the context of the goals & targets of the End TB Strategy, linking them with tangible health outcomes and the larger country TB research agendas, and in the context of the End TB Strategy with special efforts to address socio-economic barriers that are critical to reaching the missing TB cases;
- Emphasize the need for globally distributed, multidisciplinary research, building on the experience from current multi-country cohorts (e.g. RePORT);
- Advocate for and support BRICS countries (Brazil, Russia, India, China and South Africa) to lead the product development in TB;
- Engage the Global TB Research Task Force to support global TB ministerial conferences and forums to promote TB research. The first engagement can occur for the Global Ministerial Conference on TB in the context of Global Health and SDGs (November 2017, Moscow); and,
- Consider establishing a “Global Alliance for TB Research” to bring stakeholders together from various TB research themes, with a view to generate cross-cutting “big research ideas with big impacts” and to brainstorm on how to fund and facilitate their implementation

2) Mobilize funding for TB research

- Advocate for a BRICS pooled funding source for TB research;
- Effectively message the impact of research funding in terms of impact on health, social and economic outcomes (create a business case for investment in research for governments, as well as for current and potential TB research funders);
- Map and communicate available innovative funding mechanisms for TB R&D to the research community;
- Position TB research to benefit from already established funds for broader disease categories (through advocacy); and,
- Maintain and expand the Funders’ Forum to include large-scale TB research funders from regional/country levels.

3) Advocacy to engage the private sector in TB research

- Message to manufacturers and other stakeholders that there is a market for TB products, using country examples to make the case like China, India and South Africa;
- Communication strategy to map and share available non-market incentives for TB products; and,
- Provide normative standards that include transparent dialogue with the private sector on developing & providing global access to TB vaccines, diagnostics and drugs.

¹ An international roadmap for tuberculosis research. Geneva: World Health Organization; 2011 (<http://www.stoptb.org/assets/documents/resources/publications/technical/tbresearchroadmap.pdf>, accessed 4 September 2016).

Implementation Plan

WHO/GTB will follow up on these suggestions by assessing them in the context of its vision and mission, and within bounds of available resources. To that end, a prioritized action plan will be developed and shared with the Task Force in the first quarter of 2017 on what can be accomplished in the short, medium and long term. WHO/GTB's roles and responsibilities, as well as that of collaborators and close partners will be shared to better coordinate our efforts on delivering our promise of effectively promoting and facilitating TB research in the context of these suggestions and the End TB Strategy.

Summary

Research along its full spectrum, from basic to implementation, is critical to develop new tools and strategies for better TB care and control and provide scientific evidence for programme practitioners and policymakers to alleviate morbidity and mortality from TB. The Task Force's advice for WHO/GTB to facilitate, promote, and advocate for new tools, evidence and strategies that align global and country specific needs is a critical initial step. WHO is strategically positioned to advocate for and inform the debate on the need for more research, and more funding for TB R&D. In practice, this relies on mobilizing resources for WHO/GTB itself to conduct this work as envisioned by its Task Force. The support of partners is therefore critical.

Establishing a WHO Task Force for global TB research presents a new opportunity for promoting and enhancing targeted prioritization & implementation of TB research, as well as for advocating for TB research funding and capacity building. WHO/GTB looks forward to working with the Task Force to deliver on the suggestions it has been entrusted to act on and implement.

Annex 1. Agenda

DAY 1 - 8 December 2016		Chair: Christine Sizemore
Introductions		
09:00 - 09:10	Welcome and Introduction	Christian Lienhardt Task Force Chair
09:10 - 09:20	Objectives and TORs of the Task Force	Christian Lienhardt
09:20 - 09:35	Research and the End TB Strategy – the Global Action Framework for TB Research	Christian Lienhardt
Session 1 - Improving country level research to End TB		
09:35 - 09:50	GTB's support to countries: Development of National TB Research plans	Nebiat Gebreselassie
09:50 - 10:05	The role of programmatic research in national TB control	Nguyen Viet Nhung
10:05 - 10:20	The need for supporting basic and clinical research in TB endemic countries	Roxana Rustomjee
10:20 - 10:35	Linking programmes, researchers and policy makers: the experience of Brazil	Afranio Kritski
10:35 - 11:00	<i>Coffee break</i>	
11:00 - 11:10	Global ministerial conference on TB in the context of global health and SDGs	Tereza Kasaeva
11:10 - 11:30	Coordinating and streamlining multi-spectrum research in a high TB burden country	Glenda Gray
11:30 - 12:30	<i>Taskforce discussion:</i> WHO's role in supporting country level research	All
12:30 - 13:30	<i>Lunch</i>	
Session 2 - Global TB research landscape in the End TB Era		
13:30 - 13:50	Overview of current TB diagnostics and future prospects for ' <i>test and treat</i> ' strategies	Claudia Denkinger
13:50 - 14:10	Overview of current TB drugs and regimens for treatment of all forms of TB – prospects, gaps and needs	Dan Everitt
14:10 - 14:30	The Global pipeline of TB vaccines: the ' <i>big picture</i> ' and where we really are	Jacqui Shea
14:30 - 14:50	The role of research in addressing social barriers and reaching the missing cases	Knut Lonnoth
14:50 - 15:10	The role of advocacy in driving TB R&D: challenges and opportunities	Mike Frick
15:10 - 15:30	Discussion	All
15:30 - 16:00	<i>Coffee break</i>	
16:00 - 17:30	<i>Taskforce discussion:</i> WHO's role in promoting multidisciplinary TB research in the End TB era	All
17:30 - 18:30	<i>Reception – Building D Restaurant</i>	

DAY 2 - 9 December 2016		Chair: Christine Sizemore
09:00 - 09:15	Recap of Day 1	Chair
Session 3 - Funding for TB research		
09:15 - 09:30	Funding gaps in TB R&D: challenges and opportunities	Mike Frick
09:30 - 09:45	Innovative funding mechanisms for TB R&D: the 3P project	Grania Brigden
09:45 - 10:00	WHO's efforts in mapping & mobilizing R&D resources for diseases where there is no market	Alastair Robb
10:00 - 10:15	The funding compendium for TB research	Nebiat Gebreselassie
10:15 - 10:30	Discussion	All
10:30 - 10:50	<i>Coffee break</i>	
10:50 - 12:45	<p>Breakout sessions:</p> <p><i>Group 1: Strategies to accelerate clinical research</i> <i>Group 2: Intersectoral collaboration to drive research</i> <i>Group 3: Efforts and opportunities to mobilizing funding for TB research at international level</i></p>	
12:45 - 13:45	<i>Lunch</i>	
Session 4 - WHO-GTB's role to facilitate global TB research in the End TB Era		
13:45 - 14:45	<i>Breakout sessions (continued)</i>	All
14:45 - 15:45	Group Feedback	All
15:45 - 16:00	<i>Coffee break</i>	
16:00 - 16:45	Consolidation of the framework on WHO-GTB's role to promote TB R&D in the End TB Era	All
16:45 - 17:00	Final recommendations and next steps	Chair
17:00 - 17:15	Conclusions and closing	Mario Raviglione
Adjourn		

Annex 2. List of Participants

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Deputy Director of the Department of Medical
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Infectious Diseases
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Directorate-General for Research
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National Tuberculosis Programme
Manager and Director of National
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17. Dr Roxana Rustomjee

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on behalf of
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18. Dr Christine Sizemore (Chair)

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Secretary to the Government of India
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Observer

25. Dr Mohammed Yassin

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- 27. **Dr Christian Lienhardt**, GTB/RTE
- 28. **Dr Nebiat Gebreselassie**, GTB/RTE
- 29. **Dr Priya Shete**, GTB/RTE
- 30. **Dr Ernesto Jaramillo**, GTB/LDR
- 31. **Mrs Lou Maureen Comia**, GTB/PMU
- 32. **Dr Knut Lonroth**, GTB/PSI
- 33. **Dr Linh Nhat Nguyen**, GTB/TSC
- 34. **Dr Haileyesus Getahun**, GTB/THC
- 35. **Dr Avinash Kanchar**, GTB/THC

- 36. **Dr Dermot Maher**, TDR
- 37. **Dr Andrew Ramsay**, TDR
- 38. **Dr Alastair Robb**, IER
- 39. **Dr Rob Terry**, TDR

** Cannot attend*