



Summary of the Thirty-Third Meeting of the International Task Force for Disease Eradication (ITFDE) March 14-15, 2022

The 33rd meeting of the International Task Force for Disease Eradication (ITFDE) was convened virtually and in-person at The Carter Center in Atlanta, Georgia, USA on March 14-15, 2022. Day 1 focused on “Setting the Stage – Status of the Tuberculosis Pandemic and Impact of COVID-19”, “Recap of What has Transpired Following the United Nations High-Level 2018 Meeting”, and “Way Forward for United Nations High-Level 2023 Meeting.” Day 2 focused on “Who is Doing What to Implement Available Tools and Develop New Tools”. The ITFDE previously discussed tuberculosis (TB) in 2010 and identified the need for the following: accelerated improvements and extension of laboratory services to support diagnosis and treatment, including assessment of drug resistance; increased assistance for improved control and research; increased care access and coverage among the most vulnerable populations; and political advocacy in support of TB control among potential allies within and outside of the health sector. The Task Force members are Dr. Kashef Ijaz, The Carter Center (Chair); Dr. Gautam Biswas, World Health Organization (WHO); Mr. Simon Bland, Global Institute for Disease Elimination (GLIDE); Dr. Peter Figueroa, The University of the West Indies, Jamaica; Dr. Donald Hopkins, The Carter Center; Dr. Patrick Lammie, The Task Force for Global Health; Dr. Fernando Lavadenz, The World Bank; Dr. Ephrem Lemango, UNICEF; Professor David Molyneux, Liverpool School of Tropical Medicine; Dr. Ana Morice, Independent Consultant; Dr. William Schluter, U.S. Centers for Disease Control and Prevention (CDC); Dr. Laurence Slutsker, PATH; Dr. Faisal Sultan, Ministry of National Health Services Regulations and Coordination, Government of Pakistan; Dr. Jordan Tappero, Bill & Melinda Gates Foundation; and Dr. Dyann Wirth, Harvard T.H. Chan School of Public Health.

Presenters included Dr. Nim Arinaminpathy, Imperial College London; Dr. Kenneth Castro, Emory University; Dr. Anand Date, CDC; Dr. Lucica Ditiu, Stop TB Partnership Secretariat; Dr. Patricia Hall-Eidson, CDC; Dr. Tereza Kasaeva, WHO; Dr. Philip LoBue, CDC; Ms. Carol Nawina Nyirenda, Community Initiative for Tuberculosis, HIV/AIDS and Malaria plus related diseases (CITAM+); Dr. Raghuram Rao, Ministry of Health and Family Welfare, Government of India; Dr. Suvanand Sahu, Stop TB Partnership Secretariat; and Dr. Charles Wells, Bill & Melinda Gates Medical Research Institute.

Overview of Global Tuberculosis

Globally, TB remains the highest infectious disease killer, second only to COVID-19. In 2020 alone, an estimated 1.5 million people died from TB and almost 10 million people fell ill with TB. About 5.8 million people were reported to have access to TB care, down from 7.1 million in 2019.

According to the WHO 2021 Global TB report, TB deaths increased for the first time in over a decade, with COVID-19 causing major disruptions to access to TB care. Socio-economic consequences of the COVID-19 pandemic, compounded by ongoing crises and conflict in Eastern Europe, Africa and the Middle East have further exacerbated the situation, especially for the most vulnerable. Global spending on TB programs fell from US\$ 5.8 billion to US\$ 5.3 billion in 2020, which is less than half of the global target of US\$ 13 billion annually by 2022. At the same time, the investments in TB programs have demonstrated benefits not just for people with TB but for health systems strengthening and preparedness efforts that were essential for pandemic response.

People-centered delivery of TB prevention, diagnosis, treatment, and care services should be ensured in tandem with COVID-19 and other emergency responses. Rapid uptake of new WHO guidelines and tools, including all-oral treatments, novel disease screening approaches, and molecular diagnostic tests, can significantly improve access, quality of care and treatment outcomes for patients. Extending social protection and universal health coverage, combating stigma and discrimination, as well as strengthening multisectoral engagement and accountability are essential to address the social determinants and drivers of the TB epidemic. Ending TB, defined as an incidence rate of less than 10 people per 100,000 population per year, is possible. The main targets in the End TB Strategy are to reduce TB deaths by 95%, to cut new cases of TB by 90% between 2015 and 2035, and to ensure that no family is burdened with catastrophic expenses due to TB.

Ending TB in a Low Burden Country: The United States

Since 1953, when the United States began systematically recording data, TB cases have decreased substantially, though this decrease has not been consistent over time. From 1953 through 1985, TB cases and case rates (per 100,000 population) declined by 74% and 82%, respectively, as housing, nutrition and general health improved and effective treatment for TB became available. This trend reversed over the next several years as cases and case rates increased by 17% and 12%, respectively, from 1986 through 1992. The resurgence coincided with the onset of the HIV epidemic, increased immigration from countries with higher TB rates, and reduced funding for TB programs. Following renewed investments in TB prevention, control and research, TB cases and rates declined by 62% and 69%, respectively, from 1993 through 2013. Increased funding at all government levels resulted in programmatic improvements such as directly observed therapy, systematic contact investigations, and outbreak response. Research produced new tools such as interferon-gamma release assays (IGRA) and shorter treatment regimens. Between 2014 and 2019, progress slowed as cases and case rates only decreased by 5% and 7%. This was followed by an unexpected 19% decrease in TB cases in 2020, the first year of the COVID-19 pandemic. The exact causes of this decrease are still being evaluated.

Immediately prior to the COVID-19 pandemic, progress toward ending TB in the United States had been leveling off. This is likely because most TB disease in the United States results from reactivation of latent tuberculosis infection (LTBI) and not recent transmission, and most TB infections are likely acquired outside of the United States. LTBI occurs when people are infected with the TB bacteria but do not develop symptoms; however, without proper treatment, the bacteria may later become active and cause TB disease. The major effort following the TB resurgence in the 1980s and early 1990s was directed at ensuring detection and treatment of TB disease. While

successful in a substantial reduction of TB during the next two decades, it is likely that the limits of this effort are being reached. To make additional progress, expansion of testing and treatment for LTBI will be necessary.

Ending TB in a High-Burden Country: India

The Government of India has set an ambitious goal to end TB in India by 2025, five years ahead of the Sustainable Development Goal (SDG) target of 2030. India's National TB Program started in 1962 and adopted the WHO recommended Directly Observed Treatment, Short-Course (DOTS) strategy in 1997. In 2017, the National Strategic Plan 2017-2025 was introduced with an aim to end TB by 2025 through the Prevent, Detect, Treat and Build strategies. Focus areas include expansion of TB preventive treatment (TPT), development of artificial intelligence-enabled screening tools, active case finding, decentralization of screening and case management to the primary care level, and an integrated health system approach.

To generate healthy competition and incentivize graded milestones towards SDGs, the National TB Elimination Program has initiated sub-national certification of states, union territories, and districts for achieving "progress towards TB free status" for every 20% decrease in incidence as compared to TB incidence levels of 2015. As a result of intensive efforts, India has seen substantial increases in notification of TB cases and an expansion in diagnostic services. India is the only high TB burden country having a real-time TB notification system at a national level with sub-national disaggregation.

The COVID-19 pandemic posed a significant challenge, but the program adapted to ensure continuity of TB services. TB diagnostic labs remained open, and provisions were made for ensuring uninterrupted drug supply to people with TB, including door-to-door delivery of drugs. TB-COVID-19 bidirectional screening and diagnostic testing, targeted active case finding, intensified case finding in priority areas and private sector engagement were implemented as a rapid response to reach pre-COVID-19 levels.

HIV-Associated TB

Scale-up of interventions targeted to reduce morbidity and mortality due to HIV-associated TB, including antiretroviral treatment (ART), averted about 12 million deaths among people living with HIV (PLHIV) between 2000-2020. During the same period, the estimated incidence of TB cases among PLHIV was halved from 1.5 million to 740,000, and TB-related deaths among PLHIV declined from 680,000 to 214,000. Despite this progress, TB remains the leading cause of death among PLHIV. Ongoing scale-up of interventions to reduce HIV-associated TB is critical.

HIV testing among TB patients and among those with presumptive TB is a high yield strategy to contribute to the HIV 95-95-95 targets set by UNAIDS: diagnose 95% of all HIV-positive individuals; provide antiretroviral therapy (ART) for 95% of those diagnosed; and achieve viral suppression for 95% of those treated by 2030. In 2020, 73% of TB patients knew their HIV status. Although 88% of notified HIV-positive TB patients were initiated on ART, this is only 42% of the estimated incident HIV-positive TB cases and much lower than ART coverage of 73% among all

PLHIV. Fifty one percent of incident HIV-positive TB cases remained undiagnosed and untreated in 2020.

Improving TB case finding among PLHIV is also critical. Although most HIV programs have been consistently screening PLHIV for TB using symptom screening, data from the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) program show that the yield remains unacceptably low. Adoption of new, targeted TB screening recommendations, including the use of chest radiograph and artificial intelligence for radiology reading, C-reactive protein, and molecular WHO-recommended rapid diagnostic (mWRD) tests can improve the screening yield.

TB Preventive Treatment (TPT) is another very effective intervention known to reduce morbidity and mortality due to HIV-associated TB. Following the commitments made during the United Nations High-Level Meeting (UNHLM) on TB, the target of providing TPT to 6 million PLHIV between 2018-2022 was surpassed in the first three years. However, only 28% of all PLHIV have received at least one course of TPT, thus highlighting the need for ongoing scale-up of TPT.

Multidrug Resistant TB

Drug-resistant TB (DR-TB) is caused by TB bacteria that are resistant to isoniazid or rifampin, the two most potent TB drugs, or in the case of Multidrug Resistant TB (MDR-TB), to both drugs. In 2020, only 1 out of 3 people who needed treatment for DR-TB globally were enrolled on treatment. Compared to the UNHLM targets, only 32% of the 1.5 million targeted patients started DR-TB treatment from 2018-2020. Moreover, only 11% of 115,000 targeted children received DR-TB treatment during this period. Gaps in overall TB diagnosis, treatment, and cure can lead to undiagnosed, untreated, and transmissible MDR-TB. Although 71% of bacteriologically confirmed pulmonary TB cases were tested for resistance to rifampin in 2020, this accounted for only 50% of all pulmonary TB cases diagnosed.

In 2020, success among patients treated for DR-TB remained at 59%, with a large proportion of patients lost due to discontinuation of treatment or death. There are several regimens now available for the management of DR-TB. These newer, more effective all-oral regimens can improve management and outcomes of DR-TB. In 2020, 105 countries used a bedaquiline containing regimen, 90 used an all-oral longer regimen, and 65 employed the WHO recommended short regimen for DR-TB. The pace of progress and adoption of the new guidelines, however, remains slow and needs to be accelerated and matched with drug susceptibility testing to support efficacy of treatments.

Status of TB Diagnostics

Data in the 2021 WHO Global TB Report highlighted continued gaps in patient access to essential TB diagnostic and drug susceptibility services in 2020. Of the 5.8 million incident TB cases notified to WHO, only 48% were bacteriologically confirmed and only 33% received mWRD testing, falling well short of the 100% global confirmatory testing goals.

Encouragingly, 2021 saw rapid market expansion of testing options across the TB clinical spectrum. In response, WHO streamlined their evidence review procedures for timely endorsement of novel diagnostic products, revised their diagnostic classification scheme, and published new

and updated policy guidance. Global diagnostic stakeholders simultaneously advanced practical guidance and tools to ensure equitable access to rapid molecular diagnosis and guide diagnostic network assessment and optimization activities for data-driven, patient-centered testing and continuous improvement. These resources guide review of national and subnational policies and priorities to inform access, test selection, placement, and health facility linkages that can be tailored to meet setting-specific patient testing needs.

Projected advances in the TB diagnostic pipeline remain promising. These advances include geographic and sectoral market diversification, performance enhancement, and introduction of novel TB and COVID-19-stimulated testing approaches that aim to bring simple testing solutions closer to patients. In the meantime, urgent uptake and implementation of existing, WHO-recommended testing technologies are essential for improved detection and treatment of all TB patients, while establishing systems capable of incorporating any new diagnostic solutions.

Status of TB Therapeutics, Regimens and TB Vaccine

New TB treatment regimens of substantially shorter duration (< 3 months) that are safe, simple to administer and able to treat all forms of TB, including both drug-susceptible and drug-resistant TB, are urgently needed to close important gaps in TB case finding and treatment. The success of the U.S. Centers for Disease Control and Prevention and National Institutes of Health clinical trial networks' Study 31/Trial A5349 has provided an important blueprint for next generation treatment. Results demonstrated that with improvements to the current standard of care, high cure rates across a heterogenous patient population of drug-susceptible TB patients could be achieved with 4 months of treatment. This blueprint coupled with the pipeline of candidate TB drugs and regimen development collaborations established through support from the European-based Innovative Medicines Initiative and the Bill & Melinda Gates Foundation holds great promise for success.

In terms of prevention, an effective and affordable vaccine with an acceptable safety profile for prevention of disease (POD) and prevention of infection (POI) in adolescents and adults is key among WHO's priority targets for vaccine development. Multiple vaccine candidates are in Phase 2b/3 evaluation for POD and POI. Among these, two development programs (both sponsored by the Gates Medical Research Institute) are currently underway. For POI, the BCG revaccination trial (ClinicalTrials.gov Identifier: NCT04152161) is underway to further evaluate the efficacy, safety and immunogenicity of BCG revaccination building on the findings from a previous trial. For POD, results reported in 2018 from the Phase 2b trial in an IGRA-positive population demonstrated vaccine efficacy of 49.7% and an acceptable safety profile of M72/AS01E. The Phase 3 development program for this vaccine candidate is in planning, including conduct of a Phase 2 trial evaluating the safety of M72/AS01E among people living with well-controlled HIV currently underway (ClinicalTrials.gov Identifier: NCT04556981).

Modelling TB Elimination: Global Plan for STOP TB 2023-2030

The sustainable development goals for TB call for an 80% reduction in incidence rates by 2030, compared to 2015, and a 90% reduction in total TB deaths. Reaching these targets will involve a combination of interventions acting at various stages of the 'care cascade'. For example, improved treatment regimens would increase cure rates and reduce the risk of post-treatment relapse but

would only benefit patients who are diagnosed. Improved diagnostics would increase the opportunities for early recognition of TB but will only benefit those seeking care. Additional measures are required to diagnose TB proactively amongst those who have not yet sought care; ultimately, there is a need for measures to prevent TB on a population scale, such as the rollout of a new, effective TB vaccine.

Mathematical modelling can be a helpful tool for estimating the potential impact of different interventions. Figure-1 shows modelling projections in the example of Indonesia, illustrating the

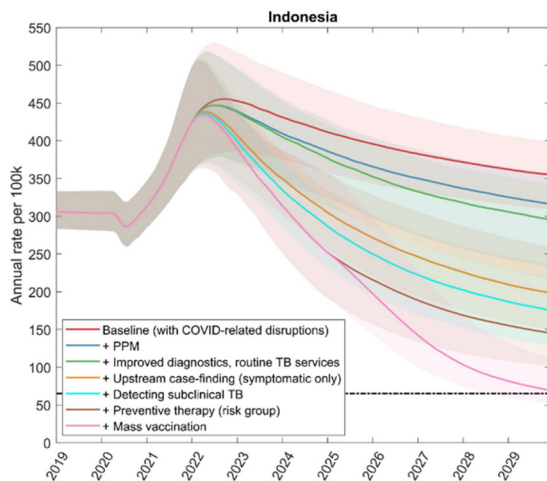


Fig-1: Interventions needed to meet the 2030 sustainable development goals for ending TB. Figure shows results of mathematical modelling in the example case of Indonesia, a high TB burden country. Each successive curve shows interventions acting in combination, and shaded areas show 95% uncertainty intervals. For the impact of vaccination (bottom curve), it is assumed that a vaccine is licensed in 2025 and rolled out over the following three years, to cover two-thirds of individuals with latent TB infection by 2028

following key points: First, COVID-19-related disruptions have had severe adverse outcomes in Indonesia and other high-burden countries, reversing years of declining TB incidence, and thus necessitating even greater efforts to meet the 2030 goals for ending TB. Second, the combined deployment of different interventions to diagnose and treat TB (dark brown curve) would lead to substantial reductions in TB burden but would not be sufficient by themselves to meet the 2030 goals. Finally, it is only with an effective vaccine that the goals can be met (pink curve); here, it is assumed that such a vaccine is licensed by 2025 and rolled out over the following three years. Overall, these projections highlight the scale of effort that is needed, to end TB by 2030.

Patient Perspective on Ending TB

In recent years there has been significant progress in terms of implementation of Community, Rights, and Gender (CRG) programming. There are several Stop TB Partnership developed CRG tools like CRG assessments, stigma assessments, and community-led monitoring platforms. TB CRG assessments have been completed in over 20 countries and are now guiding investments in these areas. In the future, completing CRG assessments and implementing national costed CRG action plans will be a global target for TB response.

In most of the high burden countries, TB survivors have set up civil society organizations (CSOs) or gone further to organize networks and coalitions at many levels. Some of the areas they are engaged with include community TB screening, contact tracing, loss to follow-up tracing, sputum collection and transportation to diagnostic sites, referral, adherence support including directly observed therapy (DOTs), awareness raising and giving talks at health facilities. CSOs are also engaged in Advocacy, Communication and Social Mobilization (ACSM) activities, as well as evidence building, monitoring and accountability. TB-affected communities are part of decision-making bodies at national, regional and global levels. This includes country coordinating mechanisms and boards such as the Global Fund, Unitaaid, and the Stop TB Partnership.

The main global mechanism that has championed support for TB-affected communities and civil society is the Challenge Facility for Civil Society (CFCS) of the Stop TB Partnership. Because of support from CFCS, there are now global and regional networks of TB affected communities, including networks in Anglophone and Francophone Africa and a global network of women affected by TB. It is essential that the TB survivor networks are coordinated, capacitated and sustainable in all high burden countries and that these networks hold positions on the country coordinating mechanisms. Accountability requires investment in communities and their priorities.

Financing to End TB: The Needs and the Gaps

Despite the high global burden of TB, TB programs have been chronically underfunded, and during the COVID-19 pandemic years of progress were wiped out. Ending TB is possible only if investments are increased substantially. Of the US\$13 billion per year committed for TB care and prevention globally in the 2018 UNHLM political declaration, only US\$5.3 billion (41%) was available in 2020. Funding for research into new tools stood at US\$0.9 billion in 2020, 45% of the US\$2 billion committed. In Global Fund eligible low- and middle-income countries, the funding gap for TB in 2020 was US\$6.43 billion (68% of the need). Lack of funding has led to serious consequences. For example, in 2020 countries received a third of the funding needed for laboratory strengthening, resulting in continued reliance on microscopy-based detection methods instead of mWRD tests. As a result, only 1 out of 3 people diagnosed with TB received mWRD testing.

Current progress against the SDG Target 3 of ending TB is off-track. Despite the setback due to COVID-19, it is possible to end TB by 2030. However, it will require increased investments for diagnosis and treatment of all TB, early diagnosis including at the sub-clinical stage of disease, prevention including scale-up of TB preventive therapy, and vaccination with a new TB vaccine. During 2023-2030 an average of US\$19.6 billion per annum will be needed for TB care and prevention and an additional US\$4 billion per annum for research and development. When one or more new and effective TB vaccines are available, an additional US\$53 billion will be needed for vaccination up to 2030. To end TB by 2030, a total investment of US\$242 billion will be needed, of which US\$157 billion is for TB care and prevention, US\$32 billion for research and development and US\$53 billion for vaccination. A fully funded TB response is estimated to achieve, in 2030, a 90% decline in TB deaths and 80% decline in incidence rate, as compared to 2015.

The potential sources for additional funding for TB, particularly for low- and lower-middle-income countries, are domestic budget increases, the Global Fund, social health insurance, loans, blended loan and grants, loan buy downs, debt swaps, private sector financing and high net-worth individuals. The Global Fund provides only 18% of its resources to TB despite TB accounting for over 60% of deaths due to HIV, TB and Malaria put together. A high replenishment of Global Fund would increase the funding allocation for TB, but the increase would not be substantial compared to the need. Therefore, it is important to explore new external financing beyond the Global Fund.

Not making the funds available would be more expensive. TB, an airborne disease with drug-resistant variants, could go out of control with huge implications for global health security and

antimicrobial resistance (AMR), and addressing TB in future would become more and more expensive.

Conclusions and Recommendations:

ITFDE members recommend the following actions as a framework for the public health community, governments, and funders to elevate TB as a global priority. The possibility to significantly reduce and eventually end TB is realistic and achievable – but securing the funding as well as setting clear priorities are required to make the goal of “Invest to End TB, Save Lives” a reality.

Innovation: Fuel breakthrough solutions in prevention, diagnostics, treatment, and vaccines

- Advance research on TB diagnostic and drug susceptibility tests and intensify case-finding using technological advances for artificial intelligence-enabled tools.
- Develop safer and shorter oral treatment regimens with newer drugs, including for treatment of drug-resistant TB, and enable their rapid uptake.
- Prioritize development of safe and effective vaccines that work on all forms of TB disease and prevention of TB infection.
- Develop innovative approaches for active case finding and multi-disease screening, testing, and surveillance.

Scale: Make accessible proven tools, technology, and treatments to people from countries with high TB incidence

- Dramatically scale up provision of TB preventive treatment.
- Improve equitable patient access to WHO-recommended diagnostic tools globally, especially to low- and middle-income countries.
- Develop and improve digital tools for use by public health workers in the field.

Communities: Engage civil society to mobilize support for TB action and health justice

- Promote human rights, employ gender-sensitive approaches, and combat stigma and discrimination, working with and supporting civil society and people affected by TB.
- Advance universal health coverage to ensure all people with TB have access to affordable, quality care and resolve underreporting challenges.
- Promote active participation of communities in policymaking, program monitoring, and management.
- Encourage multilateral and bilateral donors to join USAID and Global Fund to fund the Stop TB Challenge Facility for Civil Society, which is the only mechanism currently supporting TB Community, Rights and Gender (CRG) and Advocacy, Community and Social Mobilization (ACSM) activities.

Leadership: Secure consistent, long-term political and financial support

- Quickly expand diagnosis and treatment to meet the 2018 United Nations High Level Meeting goals and accelerate progress toward an ambitious but credible target.
- All stakeholders should engage and participate in the TB United Nations High-level Meeting in 2023 as requested by the U.N. Secretary-General.

- Work with countries willing to provide sustained political support for ending TB to encourage them to fulfill their commitments.
- Build champions to elevate TB as a health priority at global forums and in media.

Investment: Sustained funding for TB

- Advocate with governments to increase investments from domestic budgets for national TB programs.
- Ensure TB elimination receives a proportionate allocation of funds from the Global Fund to Fight AIDS, Tuberculosis and Malaria.
- Increase funding for essential TB services, including for the health workforce.
- Seek new external financing mechanisms outside the Global Fund, inclusive of governmental, philanthropic, private sector, and innovative financing.

The world has a great opportunity in 2022 to combine the tools and lessons learned from COVID-19 with decades of progress to reduce the global burden of TB mortality by 2030. Strategic investments in diagnostic tools, treatment regimens, and new vaccines could rapidly turn the tide against one of the planet's leading killers, activating economic and societal benefits beyond measure.