

Rationale and recommendations for an integrated approach to TB and pandemic prevention, preparedness and response (PPPR)

A brief prepared for UN Multi-stakeholder Consultations on TB and PPPR

Airborne infectious diseases are the greatest threat to global health security. Like COVID-19, potential pandemics in the future are likely to be caused by the global spread of communicable diseases that transmit through droplets—either airborne or through direct contact. Tuberculosis (TB) is a communicable airborne disease and is typically fatal without proper treatment. Lessons from the COVID-19 pandemic prove that coordinated efforts to end TB will prevent and respond to future pandemics. This means TB programmes should both contribute to and receive support from pandemic-related efforts.

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High-level planning for TB and for PPPR, however, is unfolding along separate tracks. Current coordination is far from optimal, raising the risk that future TB and other pandemic-related efforts will be siloed, leading to less effective use of resources and avoidable loss of life. As the UN General Assembly prepares for High-Level Meetings on TB and PPPR in September 2023, member states should seek to improve integration between TB and PPPR efforts, so that resources and infrastructure can be used more effectively to achieve both TB and other pandemic-related goals.

A rationale for integrating TB and PPPR efforts

1. Airborne/droplet-borne infectious diseases remain the biggest threat to global health security.

Practically speaking, the PPPR agenda means building capacity to prevent and respond to pandemics triggered by airborne or droplet-borne infectious diseases. Whether it's smallpox, measles, pneumonic plague, Ebola, Marburg virus, influenza, SARS, MERS, COVID-19 or tuberculosis, the infectious diseases that pose grave global health security risks spread through the “universal act of breathing.”¹

¹ Hauser, Janika, and Matt Oliver. Rep. *Ready Next Time: Beating TB Today and Preparing for Pandemics Tomorrow*. Cambridge, UK: Campaigns In Global Health, 2023.
https://www.cghproject.org/_files/ugd/30f987_a9e32d3675964911b501ae0bcb38e618.pdf

While COVID-19 spreads quickly and TB more often requires longer exposure, the infections spread in very similar ways: a person who is infected or sick with the disease expels bacteria (in the case of TB) or virus (in the case of COVID-19) into the air, typically by coughing or sneezing, which others inhale and then become infected.

Many airborne diseases have the potential to affect large numbers of people. Unlike COVID-19, where physical recovery often happens within a week or two, tuberculosis presents as a chronic illness. For each person with TB who goes untreated and survives for a year, between five and 15 additional contacts become infected.² As a result, 10 million people contracted tuberculosis in 2021, and 1.6 million people died from the disease—making TB the world’s deadliest infectious disease after COVID-19.

2. TB programmes exist in every country and provide a foundation on which to build PPR capacity.

Many countries repurposed TB infrastructure to respond to COVID-19. Why? Because TB and COVID-19 require many of the same public health interventions. TB infrastructure provided a ready-made platform for countries to mount a COVID-19 response. Everything from human resources to molecular diagnostics to specialized TB health facilities were used to provide care for people affected by COVID-19.

The government of Kerala, India has acknowledged a range of TB interventions that made the state better able to respond to COVID-19. TB diagnostic infrastructure (e.g., Xpert MTB/RIF machines, Truenat, and biosafety cabinets) helped to provide COVID-19 diagnostic capacity in health facilities. Also within health facilities, Airborne Infection Control help desks, established as a place to provide TB screening services, were used to screen people for COVID-19 symptoms. A “vulnerability mapping” previously conducted by health authorities had already identified groups at higher risk of TB. These data provided health authorities with an understanding of who was also at higher risk of COVID-19, enabling them to proactively reach vulnerable populations (e.g., the elderly and people with comorbidities) with COVID-19 education and disease monitoring.³

Other governments used similar approaches. In Peru, vans operated by Socios En Salud that provide mobile TB screening and testing services, including AI-assisted chest x-ray and PCR testing, integrated COVID-19 testing into their service offerings.⁴ Across Burundi, Kenya, Rwanda, Tanzania and Uganda, a regional laboratory strengthening initiative originally implemented primarily to improve TB diagnosis and disease surveillance capacity has been used

² “Tuberculosis (TB).” World Health Organization. <https://www.who.int/en/news-room/fact-sheets/detail/tuberculosis>.

³ “How the Preparedness of TB Elimination Has Helped Kerala in Fighting Covid.” Government of Kerala. <https://dhs.kerala.gov.in/wp-content/uploads/2021/01/How-the-preparedness-of-TB-Elimination-has-helped-Kerala-in-fighting-COVID.pdf>.

⁴ Blades, Robin. “An Unexpected Pandemic Side Effect in Peru: A Comeback for TB.” NPR. April 28, 2021. <https://www.npr.org/sections/goatsandsoda/2021/04/28/988742791/an-unexpected-pandemic-side-effect-in-peru-a-comeback-for-tb>.

to provide laboratory services for other communicable diseases. In 2020, the World Bank, a key partner in the initiative, highlighted how these governments were leveraging the lab network’s capacity in its COVID-19 response.⁵ WHO has also highlighted the “heavy reliance” on lab systems built and developed by HIV and TB programmes now being used for COVID-19.⁶

While TB programmes have been critical in the world’s response to COVID-19, they have been constrained by a chronic lack of resources. So the approach of using TB programmes as a platform for responding to COVID-19, while rational, created a dual problem in practice. First, TB programmes’ surge capacity was limited. As a result, they were quickly overwhelmed by the added demands of the COVID-19 response. Second, repurposing those resources meant countries were unable to maintain essential TB services.

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As a result, a reported 1.4 million people with TB lost out on treatment in the first year of COVID-19.⁷ The numbers of people newly diagnosed with TB plummeted. During the summer of 2020 in India, China and Pakistan—three countries with some of the world’s largest numbers of people affected by TB—the daily numbers of TB cases being reported declined between 75 and 80 percent.⁸

Such setbacks were one of the main causes responsible for the first increase in global TB deaths in more than a decade.⁹ Before the first year of the pandemic was over, experts were already warning that progress against global TB was being set back by an estimated five to eight years.¹⁰ Statistical modeling conducted by the Stop TB Partnership in collaboration with Imperial College, Avenir Health, Johns Hopkins and USAID projects that three months of lockdown followed by 10

⁵ “How the World Bank Is Mitigating the Impacts of Covid-19 in the Health Sector.” World Bank Group, June 24, 2020. <https://www.worldbank.org/en/news/feature/2020/06/16/how-the-world-bank-is-mitigating-the-impacts-of-covid-19-in-the-health-sector>.

⁶ “Existing HIV and TB Laboratory Systems Facilitating COVID-19 Testing in Africa.” World Health Organization, November 26, 2020. <https://www.who.int/news/item/26-11-2020-existing-hiv-and-tb-laboratory-systems-facilitating-covid-19-testing-in-africa>.

⁷ “1.4 Million with Tuberculosis, Lost out on Treatment during First Year of Covid-19 | UN News.” United Nations, March 22, 2021. <https://news.un.org/en/story/2021/03/1087962>.

⁸ Malik, Aamir A, Nauman Safdar, Subhash Chandir, Uzma Khan, Saira Khowaja, Najam Riaz, Rabia Maniar, Maria Jaswal, Aamir J Khan, and Hamidah Hussain. “Tuberculosis Control and Care in the Era of Covid-19.” *Health Policy and Planning* 35, no. 8 (2020): 1130–32. <https://doi.org/10.1093/heapol/czaa109>.

⁹ “Tuberculosis Deaths Rise for the First Time in More than a Decade Due to the COVID-19 Pandemic.” World Health Organization, October 14, 2021. <https://www.who.int/news/item/14-10-2021-tuberculosis-deaths-rise-for-the-first-time-in-more-than-a-decade-due-to-the-covid-19-pandemic>.

¹⁰ “The Potential Impact of the COVID-19 Response on Tuberculosis in High-Burden Countries: A Modeling Analysis.” Stop TB Partnership, Imperial College, Avenir Health, Johns Hopkins University, USAID. Accessed April 27, 2023. https://stoptb.org/assets/documents/news/Modeling%20Report_1%20May%202020_FINAL.pdf.

months of TB service recovery would lead to 6.33 million excess people to become sick with TB, and 1.37 million excess deaths worldwide between 2020 and 2025.¹¹

When preparing for future pandemics, the world cannot afford to repeat these mistakes. Anticipating that future pandemics will also most likely be caused by outbreaks of airborne infectious disease,¹² countries can prepare for future pandemics by building strong TB programmes and investing in clinical research capacity in low and middle-income countries. This would deliver dual benefits: building the capacity needed to end TB, and creating greater surge capacity for PPR needs when facing future pandemic scenarios.

There is historical precedent for using TB, HIV, and other infectious disease programmes as platforms for building broader health systems capacity.¹³ Known as the “diagonal approach,” it’s been described as “a strategy in which explicit intervention priorities are used to derive the necessary improvements into the health system.”¹⁴

TB programmes are especially useful platforms for improving PPR capacity.

Some of the most successful efforts to build and strengthen health systems have followed different iterations of this approach. After World War II, Japan rebuilt its decimated health system by building up programmes to address TB and other priority diseases, supplemented with the recruitment of community health workers and local volunteers.¹⁵ This approach helped to position the country to effectively invest in universal health coverage, which has resulted in its population having among the world’s best health outcomes.¹⁶ Mexico reformed its health system, dramatically

¹¹ “The Potential Impact of the COVID-19 Response on Tuberculosis in High-Burden Countries: A Modeling Analysis.” Stop TB Partnership, Imperial College, Avenir Health, Johns Hopkins University, USAID. Accessed April 27, 2023. https://stoptb.org/assets/documents/news/Modeling%20Report_1%20May%202020_FINAL.pdf.

¹² Suvanand Sahu, Ditiu Lucica, Amy Bloom, Kenneth Castro, Tara Ornstein, and Cheri Vincent. The AIDP: Potential Impact for TB, Airborne Infectious Diseases, and Pandemic Preparedness. Global Health Security and COVID-19 Task Force. Accessed April 27, 2023. https://www.global-solutions-initiative.org/wp-content/uploads/2022/11/TF6_The-AIDP_-Potential-Impact-for-TB-Airbone-Infectious-Diseases-and-Pandemic-Preparedness.pdf.

¹³ Frenk, Julio. “Bridging the Divide: Global Lessons from Evidence-Based Health Policy in Mexico.” *The Lancet* 368, no. 9539 (September 6, 2006): 954–61. [https://doi.org/10.1016/s0140-6736\(06\)69376-8](https://doi.org/10.1016/s0140-6736(06)69376-8).

¹⁴ Horton, Richard. “Offline: UHC—One Promise and Two Misunderstandings.” *The Lancet* 391, April 7, 2018. [https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(18\)30847-X.pdf](https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(18)30847-X.pdf).

¹⁵ Harries, Anthony D, Paul M Jensen, Rony Zachariah, I D Rusen, and Donald A Enarson. “How Health Systems in Sub-Saharan Africa Can Benefit from Tuberculosis and Other Infectious Disease Programmes.” *International Journal of Tuberculosis and Lung Disease* 13, no. 10 (October 2009). <https://pubmed.ncbi.nlm.nih.gov/19793422/>.

¹⁶ Reich, Michael R, Keizo Takemi, Marc J Roberts, and William C Hsiao. “Global Action on Health Systems: a Proposal for the Toyako G8 Summit.” *The Lancet* 371 (March 8, 2008). https://cdn1.sph.harvard.edu/wp-content/uploads/sites/100/2012/09/hsiao_et_al_2008_-_global_action_on_health_systems.pdf.

improving child survival, through a diagonal approach that built on vertical immunization programs. The country expanded its single-day polio immunization campaign in 1985 to a vaccination week by 1988, and then used that platform to introduce a broader package of essential health services in 1993.¹⁷ Similarly, by 2015 Ethiopia had secured health systems improvements, sufficient to achieve most of the health-related Millennium Development Goals, intentionally by building on disease-specific programs supported by the Global Fund, PEPFAR and Gavi.¹⁸

TB programmes are especially useful platforms for improving PPPR capacity because they involve specialized human resources, physical infrastructure, procurement and distribution systems, disease surveillance capabilities, and monitoring and evaluation systems—all essential elements needed for PPPR.¹⁹ TB programmes also have a long history of excellence in case finding, conducting contact investigations, supporting treatment adherence, airborne infection control, and ability to reach remote, vulnerable and marginalized communities, which make them uniquely suited to serve as platforms for building PPPR capacity.²⁰ To help guide the development of PPPR capacity using such an approach, in 2022 the Stop TB Partnership and the US Agency for International Development (USAID) proposed an Airborne Infectious Disease Platform (AIDP) that would enhance the use of existing TB services for the detection, treatment and prevention of airborne infectious diseases in high TB burden countries.²¹

¹⁷ Sepúlveda, Jaime, Flavia Bustreo, Roberto Tapia, Juan Rivera, Rafael Lozano, Gustavo Oláiz, Virgilio Partida, Lourdes García-García, and José Luis Valdespino. “Improvement of Child Survival in Mexico: The Diagonal Approach.” *The Lancet* 368, no. 9551 (2006): 2017–27. [https://doi.org/10.1016/s0140-6736\(06\)69569-x](https://doi.org/10.1016/s0140-6736(06)69569-x).

¹⁸ Assefa, Yibeltal, Dessalegn Tesfaye, Wim Van Damme, and Peter S Hill. “Effectiveness and Sustainability of a Diagonal Investment Approach to Strengthen the Primary Health-Care System in Ethiopia.” *The Lancet* 392, no. 10156 (2018): 1473–81. [https://doi.org/10.1016/s0140-6736\(18\)32215-3](https://doi.org/10.1016/s0140-6736(18)32215-3).

¹⁹ Harries, et al. 2009.

²⁰ “Innovations for Tackling Tuberculosis in the Time of COVID-19.” National Academies of Sciences, Engineering, and Medicine, 2021. Washington, DC. <https://doi.org/10.17226/26404>.

²¹ Sahu, Suvanand, Lucica Ditiu, Amy Bloom, and Kenneth G Castro. Issue brief. *The AIDP: Potential Impact for TB, Airborne Infectious Diseases, and Pandemic Preparedness*. Global Solutions: The World Policy Forum, November 3, 2022. https://www.global-solutions-initiative.org/policy_brief/the-aidp-potential-impact-for-tb-airborne-infectious-diseases-and-pandemic-preparedness/.

Areas of dual-purpose investment that can drive progress in both TB elimination and PPPR¹

Detection and care

- Diagnostic capacity including:
 - multiplex molecular testing platforms for respiratory pathogens provided at point of care
 - X-ray screening, including the use of AI to read images in areas facing shortages of radiologists
 - Diagnostic services provided at people-centred access points (i.e., mobile diagnostic vans)
- Systems for contact tracing, including human resources, technology and infrastructure needed to do this activity in community and at scale
- Respiratory care infrastructure (e.g., human resources, hospital beds, equipment, supply, surge capacity, private-sector care)
- Delivery of community-based/led screening, referral, care and monitoring
- Digital health tools (e.g., remote patient support and ‘stay-home’ care)

Prevention

- Airborne infection prevention and control, implemented across the health system, congregate settings and public spaces
- Systems for vaccine procurement, distribution and delivery

Disease surveillance

- Real-time data surveillance and analysis with public-facing dashboards that report key indicators and serve as a early warning system (e.g., influenza-like illness/severe acute respiratory infection [ILI/SARI], testing information, positive case numbers, variants, deaths and other outcomes)
- Genome sequencing

Research and development

- Fast-track mechanisms for accelerating research and development and regulatory approval
- Use of new technology (such as mRNA) and faster clinical trial methods for vaccine development for TB and other new emerging threats
- Expanded clinical trial sites

Other programme functions

- Human resources
- Stigma reduction
- Monitoring and evaluation
- Systems and processes for coordinating public- and private-sector health services

3. Tuberculosis is an ongoing pandemic.

A general definition of “pandemic” is a disease that spreads across whole countries or the whole world.²² Tuberculosis has been labeled a pandemic many times.²³ In 1993, the World Health Organization declared TB a global public health emergency and urged countries to work together to prevent millions of avoidable deaths.²⁴ Tuberculosis has claimed more than 30 million lives since then.²⁵

*“TB meets every test of counting as a pandemic.” – Peter Sands,
Executive Director, Global Fund to Fight AIDS, Tuberculosis and Malaria*

The global TB pandemic is further complicated by antibiotic resistance to TB treatment. An estimated 450,000 people contracted a drug-resistant form of TB in 2021—most of whom went without adequate treatment, enabling the continued transmission of resistant TB strains.²⁶ Compared with drug-susceptible TB, drug-resistant TB (DR-TB) is harder to treat and has a higher mortality rate. With TB treatment services disrupted by COVID-19, we may see a disproportionate increase in the numbers of people with DR-TB.

TB also creates severe economic impacts. Most people who contract TB are in their most economically productive years.²⁷ In 2017, before the COVID-19 pandemic saw an increase in TB incidence, KPMG international analyzed the global economic impact of TB. It found that “in the absence of radical actions to curb the disease,” the global TB pandemic would be responsible for US\$984 billion in economic losses between 2015 and 2030. The analysis projected that some

²² Wingfield, Tom, Luis E Cuevas, Peter MacPherson, Kerry A Millington, and S Bertel Squire. “Tackling Two Pandemics: A Plea on World Tuberculosis Day.” *The Lancet Respiratory Medicine* 8, no. 6 (2020): 536–38. [https://doi.org/10.1016/s2213-2600\(20\)30151-x](https://doi.org/10.1016/s2213-2600(20)30151-x).

²³ Ibid.

²⁴ Chaisson, Richard E. Like COVID, TB Is a Pandemic and Must Be Treated as an Emergency. *The Conversation*, February 2, 2022. <https://theconversation.com/like-covid-tb-is-a-pandemic-and-must-be-treated-as-an-emergency-177559>.

²⁵ Hauser, Janika, and Matt Oliver. Rep. *Ready Next Time: Beating TB Today and Preparing for Pandemics Tomorrow*. Cambridge, UK: Campaigns In Global Health, 2023.

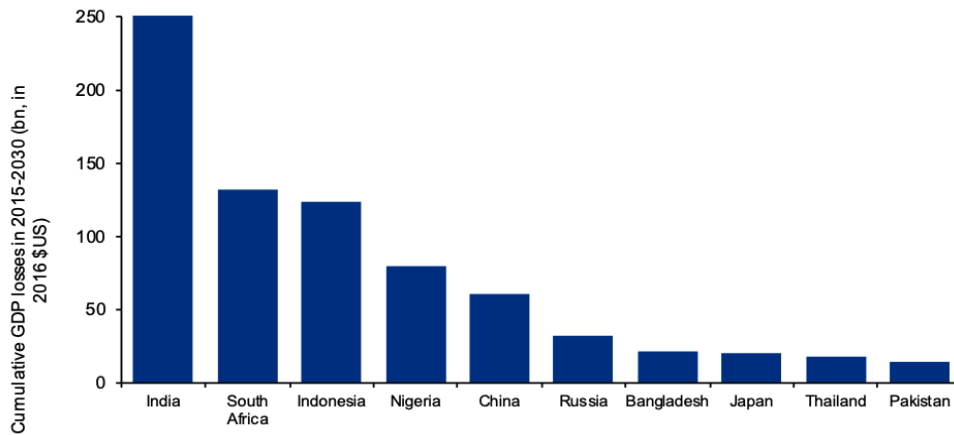
²⁶ Global Tuberculosis Report 2022. World Health Organization. Geneva, Switzerland, 2022. <https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2022/tb-disease-burden/2-3-drug-resistant-tb>.

²⁷ Muniyandi, M, R Ramachandran, R Balasubramanian, and P R Narayanan. “Socio-Economic Dimensions of Tuberculosis Control: Review of Studies over Two Decades from Tuberculosis Research Center.” *Journal of Communicable Disease* 38, no. 3 (March 2006). <https://pubmed.ncbi.nlm.nih.gov/17373353/>.

countries' GDPs would be up to 3.2% smaller in GDP terms by 2030 because of the prevalence of TB.²⁸

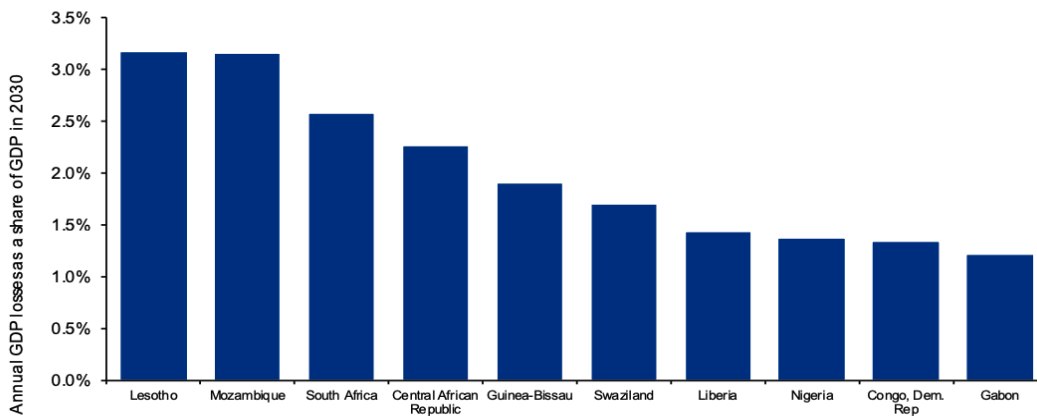
As Peter Sands, Executive Director of the Global Fund To Fight AIDS, Tuberculosis and Malaria, has expressed: "TB meets every test of counting as a pandemic." Yet we have not seen a TB response anything like the global response we saw to COVID-19.

Figure 1: Largest individual country GDP losses due to TB-related mortality, 2015-30



Source: KPMG, *Global Economic Impact of Tuberculosis*²⁹

Figure 2: GDP losses as a share of GDP, 2015-2030



Source: KPMG, *Global Economic Impact of Tuberculosis*³⁰

²⁸ Rep. *Global Impact of Tuberculosis*. KPMG, October 2017.
https://docs.wixstatic.com/ugd/309c93_bf9baa1398334a8aa1ff19cb083b129e.pdf?index=true.

²⁹ Ibid.

³⁰ KPMG, 2017

Economic modeling conducted for the Global Plan to End TB 2023-2030 found that if the status quo continues in the global TB response, from 2023 through 2030 an additional 43 million people will develop TB and an additional 6.6 million people will die, at a global economic cost of US\$ 1 trillion. More recently, the Copenhagen Consensus Center has identified ending TB as one of the 12 “best investments for the world,”³¹ with an economic return of US\$46 for every \$1 invested.³²

African Union member states have called the TB response “shockingly underfunded.”

Recognizing the need for a stronger response to TB, UN member states have pledged to increase funding for TB programmes.³³ Yet WHO’s analysis of TB financing shows that “[s]pending on TB prevention, diagnostic and treatment services in LMICs falls far short of the globally estimated need and the UN global target, and *has fallen since 2019*” [emphasis added].³⁴ In November 2022, African Union member states signed onto a statement describing the TB response in member states as “shockingly underfunded.” They declared an “urgent need for increased funding from both domestic and international sources, including innovative financing approaches.”³⁵

In his remarks on 11 March 2020, WHO Director-General Dr. Tedros Adhanom Ghebreyesus described how WHO considered COVID-19’s alarming levels of spread and severity, and the alarming levels of inaction when declaring COVID-19 a pandemic. While COVID-19 is a new disease in humans and TB a very old disease, the sheer global burden of TB, the ongoing community-level spread in many countries, critical challenges posted by the rise of drug resistance, and a global response widely recognized to be inadequate, justify considering TB a pandemic and including efforts to end the disease within the global PPPR agenda. Doing so will also help to accelerate TB clinical research—currently proceeding at a pace some experts have described as

³¹ “The 12 Best Investments for the World.” Halftime for the Sustainable Development Goals 2016-2030.

Copenhagen Consensus. Accessed April 27, 2023. <https://www.copenhagenconsensus.com/halftime-sustainable-development-goals-2016-2030/12-best-investments-world>.

³² Pretorious, Carel, Nim Arinaminpathy, Sandip Mandal, Suvanand Sahu, Madhukar Pai, Roland Mathiasson, and Brad Wong. Rep. One Million Lives Saved per Year: A Cost-Benefit Analysis of the Global Plan to End TB, 2023–2030 and Beyond. Copenhagen Consensus Center, February 11, 2023. https://copenhagenconsensus.com/sites/default/files/2023-03/Tuberculosis_Best_Investment_Manuscript_230211.pdf.

³³ Political Declaration of the UN General Assembly High Level Meeting, United Nations High Level Meeting on the Fight Against Tuberculosis. United Nations, 2018. https://cdn.who.int/media/docs/default-source/documents/tuberculosis/political-declaration-un-general-assembly-tb-tuberculosis77cd7a27-7e8d-4fbb-9729-a5dbd505798f.pdf?sfvrsn=4f4090dc_1&download=true.

³⁴ World Health Organization 2022.

³⁵ “Communiqué: Improved Political Commitment and Financing for TB For.” Stop TB Partnership, November 29, 2022. <https://www.stoptb.org/news/communique-improved-political-commitment-and-financing-tb-high-burden-countries-africa>.

“glacial,”³⁶—while strengthening public health platforms that will make the world better prepared to prevent and respond to future pandemics.

Recommendations

Without action, COVID-19’s impact on global TB will be lasting.³⁷ Today we need a fully resourced and capacitated approach that puts countries on a sustainable path to end TB, while protecting populations from future pandemics. If leaders fulfill their commitments to strengthen national TB programmes, with proper planning those programmes can provide even more effective platforms for PPPR capacity, while avoiding setbacks in future cases where countries need to respond to emerging outbreaks.

We can accomplish this through an integrated approach to TB and PPPR. To this end, 2023 Declarations endorsed by the General Assembly at upcoming High Level Meetings on TB and PPPR should identify the links between TB and PPPR agendas and integrating TB and PPPR efforts by implementing commitments to:

1. Include TB as a centerpiece in national pandemic preparedness and response agendas, infectious disease response platforms and multi-disease decentralized diagnostic networks that can rapidly detect TB, its drug-resistant forms along with other diseases, as a foundation for preparedness and response to new outbreaks while closing long-standing access gaps.
2. Formulate plans to ensure the uninterrupted diagnosis, prevention, treatment and research-related activities of TB during outbreaks of other diseases, as well as in other situations of crisis and state fragility.
3. Integrate airborne infection prevention and control (IPC) into wider infection prevention and control policies and procedures, based on the experience and expertise of TB programmes.

³⁶ Chaisson, 2022.

³⁷ Keene, Claire, Erika Mohr-Holland, Tali Cassidy, Vera Scott, Aurelie Nelson, Jennifer Furin, and Laura Triviño-Duran. “How COVID-19 Could Benefit Tuberculosis and HIV Services in South Africa.” *The Lancet Respiratory Medicine* 8, no. 9 (August 3, 2020): 844–46. [https://doi.org/10.1016/s2213-2600\(20\)30311-8](https://doi.org/10.1016/s2213-2600(20)30311-8).