



The United Nations flag outside the Secretariat building of the United Nations, New York City, United States of America
Mike Segar / Reuters

Executive Summary

Context

On 26 September 2018, the United Nations (UN) will hold its first high-level meeting on tuberculosis (TB), at its headquarters in New York. The title of the meeting – United to End TB: An Urgent Global Response to a Global Epidemic – highlights the need for immediate action to accelerate progress towards the goal of ending the TB epidemic by 2030.

All Member States of WHO and the UN have committed to this goal, initially through their unanimous endorsement of WHO's End TB Strategy at the World Health Assembly in May 2014 and then their adoption of the UN Sustainable Development Goals (SDGs) in September 2015. Specific targets for 2030 set in the End TB Strategy are a 90% reduction in the absolute number of TB deaths and an 80% reduction in TB incidence (new cases per 100 000 population per year), compared with levels in 2015.¹

The UN high-level meeting follows the first WHO global ministerial conference on ending TB in the SDG era, which was held in November 2017 in the Russian Federation. The conference brought together over 1000 participants, including ministers of health and other leaders from 120 countries, and over 800 partners, including civil society. That conference resulted in the Moscow Declaration to End TB. At the World Health Assembly in May 2018, all WHO Member States committed to accelerate their actions to end TB, building on the Moscow Declaration.

In the months leading up to the UN high-level meeting, major country blocs have issued communiqués on the need for action on TB, including drug-resistant TB in the wider context of antimicrobial resistance (AMR). Examples include the G20, the G7, the BRICS group (Brazil, the Russian Federation, India, China and South Africa) and the Asia-Pacific Economic Cooperation (APEC). New commitments were made by ministers from countries in the WHO South-East Asia Region at the Delhi End TB Summit in March 2018 and by African leaders at a meeting of the African Union in July 2018.

This report

WHO has published a global TB report every year since 1997. This 2018 edition is published in the lead up to the UN high-level meeting on TB. It provides a comprehen-

sive and up-to-date assessment of the TB epidemic, and of progress in the response to the epidemic, at global, regional and country levels. The report is based primarily on data reported annually to WHO by countries, and databases maintained by other UN agencies and the World Bank.

Latest status of the TB epidemic

Worldwide, TB is one of the top 10 causes of death and the leading cause from a single infectious agent (above HIV/AIDS). Millions of people continue to fall sick with TB each year.

In 2017, TB caused an estimated 1.3 million deaths (range, 1.2–1.4 million)² among HIV-negative people and there were an additional 300 000 deaths from TB (range, 266 000–335 000) among HIV-positive people.³

Globally, the best estimate is that 10.0 million people (range, 9.0–11.1 million) developed TB disease in 2017: 5.8 million men, 3.2 million women and 1.0 million children. There were cases in all countries and age groups, but overall 90% were adults (aged ≥15 years), 9% were people living with HIV (72% in Africa) and two thirds were in eight countries: India (27%), China (9%), Indonesia (8%), the Philippines (6%), Pakistan (5%), Nigeria (4%), Bangladesh (4%) and South Africa (3%). These and 22 other countries in WHO's list of 30 high TB burden countries accounted for 87% of the world's cases.⁴ Only 6% of global cases were in the WHO European Region (3%) and WHO Region of the Americas (3%).

The severity of national epidemics varies widely among countries. In 2017, there were fewer than 10 new cases per 100 000 population in most high-income countries, 150–400 in most of the 30 high TB burden countries, and above 500 in a few countries including Mozambique, the Philippines and South Africa.

Drug-resistant TB continues to be a public health crisis. The best estimate is that, worldwide in 2017, 558 000 people (range, 483 000–639 000) developed TB that was resistant to rifampicin (RR-TB), the most effective first-line drug, and of these, 82% had multidrug-resistant TB (MDR-TB).⁵ Three countries accounted for almost half of the world's cases of MDR/RR-TB: India (24%), China (13%) and the Russian Federation (10%).

Globally, 3.6% of new TB cases and 17% of previously

treated cases had MDR/RR-TB. The highest proportions (>50% in previously treated cases) are in countries of the former Soviet Union. Among cases of MDR-TB in 2017, 8.5% (95% confidence interval, 6.2–11%) were estimated to have extensively drug-resistant TB (XDR-TB).⁶

About 1.7 billion people, 23% of the world's population, are estimated to have a latent TB infection, and are thus at risk of developing active TB disease during their lifetime.

Progress in reducing TB cases and deaths

The disease burden caused by TB is falling globally, in all WHO regions, and in most countries, but not fast enough to reach the first (2020) milestones of the End TB Strategy.

By 2020, the TB incidence rate (new cases per 100 000 population per year) needs to be falling at 4–5% per year, and the proportion of people with TB who die from the disease (the case fatality ratio, CFR) needs to fall to 10%.

In 2017, the proportion of people with TB who died from the disease was 16%, down from 23% in 2000.

Worldwide, the TB incidence rate is falling at about 2% per year.⁷ The fastest regional declines from 2013 to 2017 were in the WHO European Region (5% per year) and the WHO African Region (4% per year). In the same 5 years, particularly impressive reductions (4–8% per year) occurred in southern Africa (e.g. Eswatini, Lesotho, Namibia, South Africa, Zambia and Zimbabwe), following a peak in the HIV epidemic and the expansion of TB and HIV prevention and care; and in the Russian Federation (5% per year), following intensified efforts to reduce the burden of TB and scrutiny of progress from the highest political levels.

Globally, the absolute number of TB deaths among HIV-negative people has fallen by a best estimate of 29% since 2000, from 1.8 million in 2000 to 1.3 million in 2017, and by 5% since 2015 (the baseline year of the End TB Strategy). The number of TB deaths among HIV-positive people has fallen by 44% since 2000, from 534 000 in 2000 to 300 000 in 2017, and by 20% since 2015.

The TB mortality rate (i.e. TB deaths among HIV-negative people per 100 000 population per year) is falling at about 3% per year, and the overall reduction in the period 2000–2017 was 42%. Of the WHO regions, the fastest declines in the 5 years 2013–2017 were in the WHO European Region (11% per year) and the WHO South-East Asia Region (4% per year). High TB burden countries with rates of decline exceeding 6% per year in the 5 years 2013–2017 include the Russian Federation (13% per year), Ethiopia (12% per year), Sierra Leone (10% per year), Kenya (8% per year) and Viet Nam (8% per year).

TB diagnosis and treatment

Diagnosis and successful treatment of people with TB averts millions of deaths each year (an estimated 54 million over the period 2000–2017), but there are still large and persistent gaps in detection and treatment.

Worldwide in 2017, 6.4 million new cases of TB were officially notified to national authorities and then reported to WHO. This number has been increasing since 2013, following 4 years (2009–2012) in which 5.7–5.8 million new cases were reported annually, mainly due to increased reporting of detected cases by the private sector in India and, in 2017, an upturn in notifications in Indonesia.

The 6.4 million cases reported represented 64% of the estimated 10.0 million new cases that occurred in 2017. Ten countries accounted for 80% of the 3.6 million global gap, the top three being India (26%), Indonesia (11%) and Nigeria (9%).⁸

Gaps between the estimated number of new cases and the number actually reported are due to a mixture of underreporting of detected cases, and underdiagnosis (either because people do not access health care, or because they are not diagnosed when they do). Underestimation or overestimation of the total number of new cases is also possible. An informative example is Indonesia; in 2017, a national study found that although about 80% of new cases were detected, 41% of these cases were not reported. Actions to correct underreporting are being put in place.

There were 464 633 reported cases of TB among people living with HIV in 2017 (51% of the estimated 920 000 new cases in the same year), of whom 84% were on antiretroviral therapy. Most of the gaps in detection and treatment were in the WHO African Region, where the burden of HIV-associated TB is highest.

To support countries to close gaps in TB detection and treatment, in 2018 WHO, in collaboration with the Stop TB Partnership and the Global Fund to Fight AIDS, Tuberculosis and Malaria, launched an initiative called Find. Treat. All.⁹ The initiative includes a target of detecting and treating 40 million people with TB in the period 2018–2022.

The latest treatment outcome data for new cases show a global treatment success rate of 82% in 2016. This is a reduction from 86% in 2013 and 83% in 2015; in countries where notifications have increased, reporting of treatment outcomes has not kept pace.

Drug-resistant TB: diagnosis and treatment

Urgent action is required to improve the coverage and quality of diagnosis, treatment and care for people with drug-resistant TB.

Globally, 160 684 cases of MDR/RR-TB were detected and notified in 2017 (a small increase from 153 119

in 2016). Of these, a total of 139 114 people (87%) were enrolled on treatment with a second-line regimen, up from 129 689 in 2016 but still only 25% of the estimated 558 000 people who developed MDR/RR-TB in 2017. China and India alone accounted for 40% of the global gap; these and eight other countries¹⁰ accounted for 75%.

Treatment success remains low, at 55% globally. Examples of high burden countries in which better treatment success rates are being achieved include Bangladesh, Ethiopia, Kazakhstan, Myanmar and Viet Nam (all of which have rates above 70%).¹¹

Closing gaps in detection and treatment requires much higher coverage of drug susceptibility testing among people diagnosed with TB, reducing underdiagnosis of TB, models of care that make it easier to access and continue treatment, new diagnostics, and new medicines and treatment regimens with higher efficacy and better safety.

In July 2018, the latest evidence on treatment of drug-resistant TB was reviewed by an independent panel of experts convened by WHO. A rapid communication on key changes to recommendations for the treatment of drug-resistant TB has been issued by WHO, to be followed by the release of updated and consolidated WHO policy guidelines later in the year.

TB prevention services

The main health-care interventions to prevent new infections of *Mycobacterium tuberculosis* and their progression to TB disease are treatment of latent TB infection and vaccination of children with the bacille Calmette-Guérin (BCG) vaccine. TB preventive treatment for a latent TB infection is expanding, but most of those for whom it is strongly recommended are not yet accessing care, whereas coverage of BCG vaccination is high.

WHO has strongly recommended treatment for latent TB infection in two priority groups: people living with HIV, and children aged under 5 years who are household contacts of someone who has bacteriologically confirmed pulmonary TB.

The number of people living with HIV reported to have been started on preventive treatment was 958 559 in 2017. Of the 15 high TB/HIV burden countries that reported data, coverage ranged from 1% in Eswatini to 53% in South Africa. The number for children aged under 5 years reached 292 182 in 2017 – a threefold increase from 2015 but still only around 23% of the 1.3 million estimated to be eligible.

In countries with a high incidence of TB, WHO guidance issued in 2018 includes a new recommendation to consider testing and treatment for people aged 5 years or more who are household contacts of bacteriologically confirmed pulmonary TB cases. This substantially increases the potential number of people eligible for treatment.

WHO estimates that at least 30 million people will be eligible for TB preventive treatment between 2018 and 2022.

BCG vaccination should be provided as part of national childhood immunization programmes according to a country's TB epidemiology. In 2017, 158 countries reported providing BCG vaccination, of which 120 reported coverage of at least 90%.

Financing for TB prevention, diagnosis and treatment

Funding for the provision of TB prevention, diagnostic and treatment services has more than doubled since 2006 but continues to fall short of what is needed.

In 119 low- and middle-income countries that reported data (and accounted for 97% of reported TB cases globally), funding reached US\$ 6.9 billion in 2018. The amount available each year has been in the range US\$ 6–7 billion since 2014, after increasing from US\$ 3.3 billion in 2006. The Stop TB Partnership's Global Plan to End TB 2016–2020 estimated that US\$ 10.4 billion is required in these countries in 2018, leaving a gap of US\$ 3.5 billion. Without an increase in funding, the annual gap will widen to US\$ 5.4 billion in 2020 and to at least US\$ 6.1 billion in 2022.¹²

As in previous years, most of the funding (86%) available in 2018 is from domestic sources. However, this global aggregate figure is strongly influenced by BRICS, in which 96% (range 91–100%) of funding is from domestic sources. In India, domestic funding more than tripled between 2016 and 2018.

International donor funding (US\$ 0.9 billion in 2018, a slight decrease from 2017) accounts for 39% of funding in the 25 high TB burden countries outside BRICS and for 57% of funding in low-income countries.

Universal health coverage, social protection and social determinants

The End TB Strategy milestones for 2020 and 2025 can only be achieved if TB diagnosis, treatment and prevention services are provided within the context of progress towards universal health coverage (UHC), and if there is multisectoral action to address the social and economic factors that drive TB epidemics.

TB incidence needs to be falling at 10% per year by 2025, and the proportion of people with TB who die from the disease needs to fall to 6.5% by 2025. Such levels have only been achieved in the context of UHC, combined with social and economic development that reduces known risk factors for TB infection and disease.

UHC means that everyone – irrespective of their living standards – receives the health services they need, and that using health services does not cause financial hardship. SDG Target 3.8 is to achieve UHC by 2030.

A 2017 WHO/World Bank report on UHC found that at least half of the world's population lacks access to essential health services and almost 10% experience catastrophic expenditures on health. All of the 30 high TB burden countries need to increase service coverage and reduce levels of catastrophic expenditures to reach UHC, consistent with findings from surveys of costs faced by TB patients and their households.

WHO projections published in 2017 suggest that most middle-income countries could mobilize the funding needed to achieve UHC by 2030 from domestic resources, while this is unlikely in low-income countries.

This report features a TB-SDG monitoring framework that focuses attention on 14 indicators (from seven SDGs) that are associated with TB incidence. Monitoring of these indicators can be used to identify key influences on the TB epidemic at national level and inform the multisectoral actions required to end it.

Many new cases of TB are attributable to undernourishment, HIV infection, smoking, diabetes and alcohol use (five of the indicators featured in the TB-SDG framework). A recent modelling study shows that eliminating extreme poverty and providing social protection (both targets under SDG 1, and two other indicators in the TB-SDG framework) could substantially reduce TB incidence.

TB research and development

The SDG and End TB Strategy targets set for 2030 cannot be met without intensified research and development.

Technological breakthroughs are needed by 2025, so that the annual decline in the global TB incidence rate can be accelerated to an average of 17% per year. Priorities include a vaccine to lower the risk of infection, a vaccine or new drug treatment to cut the risk of TB disease in the 1.7 billion people already latently infected, rapid diagnostics for use at the point of care and simpler, shorter drug regimens for treating TB disease.

The development pipelines are progressing, but slowly. Few diagnostic technologies emerged in 2017. There are 20 drugs, several treatment regimens and 12 vaccine candidates in clinical trials.

Annual reports by Treatment Action Group published since 2006 show that funding for TB research and development has increased in recent years, peaking at US\$ 724 million in 2016. However, this is only 36% of the estimated requirement of US\$ 2 billion per year.

Actions needed to accelerate progress

Accelerating progress towards ending TB requires closing gaps in TB diagnosis, treatment and prevention within the context of progress towards UHC, multisectoral efforts to address the social and economic determinants and consequences of TB, intensified TB research and development, and strengthened accountability using a framework to track and review progress towards

commitments and actions needed to end TB at global, regional and national levels. These are only possible with increased and sustained funding, including from domestic sources (especially in middle-income countries), international donors and public-private partnerships.

For countries where the burden of TB is already low, the focus should be on actions needed to eliminate TB, paying particular attention to vulnerable groups with the highest risk of infection and disease.

Conclusion

TB is an old disease that was once a death sentence. Effective drug treatments first became available in the 1940s, and in combination with social and economic development they allowed countries in western Europe, North America and some other parts of the world to reduce their burden of TB disease to very low levels.¹³ For most countries, however, the "end" of TB as an epidemic and major public health problem remains an aspiration rather than a reality. The UN high-level meeting on TB on 26 September 2018, with attendance of heads of state and other eminent people, provides a platform to step up the commitments and actions needed to end the global TB epidemic, by the SDG deadline of 2030.

¹ The first milestones, for 2020, are a 35% reduction in TB deaths and a 20% reduction in TB incidence, compared with 2015. The SDG target of ending the TB epidemic is part of SDG Target 3.3, under the SDG health goal (SDG 3).

² Here and throughout the report, "range" refers to the 95% uncertainty interval.

³ When an HIV-positive person dies from TB disease, the underlying cause is coded as HIV in the International classification of diseases system.

⁴ The other 22 countries are Angola, Brazil, Cambodia, Central African Republic, Congo, the Democratic People's Republic of Korea, the Democratic Republic of the Congo, Ethiopia, Kenya, Lesotho, Liberia, Mozambique, Myanmar, Namibia, Papua New Guinea, the Russian Federation, Sierra Leone, Thailand, the United Republic of Tanzania, Viet Nam, Zambia and Zimbabwe.

⁵ Defined as resistance to rifampicin and isoniazid.

⁶ Defined as MDR-TB plus resistance to at least one drug in the following two classes of medicines used in treatment of MDR-TB: fluoroquinolones and second-line injectable agents.

⁷ The absolute number has been around 10 million per year since 2000, and has fallen slowly since 2005.

⁸ The other seven countries are shown in Fig. 4.17.

⁹ <http://www.who.int/tb/joint-initiative/en/>

¹⁰ The other eight countries are shown in Fig. 4.21.

¹¹ The countries listed are those treating at least 500 MDR/RR-TB patients annually.

¹² This figure is based on a recent extension of Global Plan projections, which indicate that at least US\$ 13 billion will be required annually by 2022.

¹³ Around 10 or fewer new TB cases per 100 000 population per year and less than one TB death per 100 000 population per year.



UNITED TO END TUBERCULOSIS:
AN URGENT GLOBAL RESPONSE TO A GLOBAL EPIDEMIC