



TB and Air Pollution: Global Evidence and Lessons Learned

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Tuberculosis (TB)

Tuberculosis (TB) remains one of the world's leading infectious disease killers. Despite being preventable, treatable, and curable, this ancient disease continues to kill more people each year than HIV and malaria combined.

TB is a disease caused by bacteria that are spread from person to person through the air. TB usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys, or the spine.

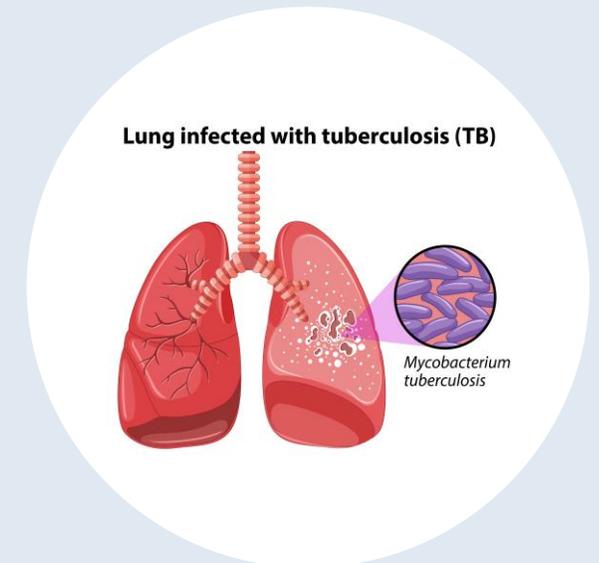
Immunosuppressed (with weak immunity) individuals are at higher risk of contracting the infection.

A person with TB can die if they do not get treatment. Treatment takes 6-12 months.

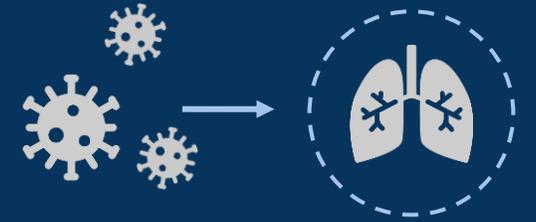
2021 World TB Global Report-

- 1.5 million people died from TB in 2020 .Worldwide, TB is the 13th leading cause of death & the 2nd leading infectious killer after COVID-19.
 - Estimated 10 million people fell ill with tuberculosis (TB) worldwide
 - 1.1 million children fell ill with TB globally
 - 30 high TB burden countries accounted for 86% of new TB cases.
 - Eight countries account for 2/3 of the total, with India leading the count, followed by China, Indonesia, the Philippines, Pakistan, Nigeria, Bangladesh, South Africa
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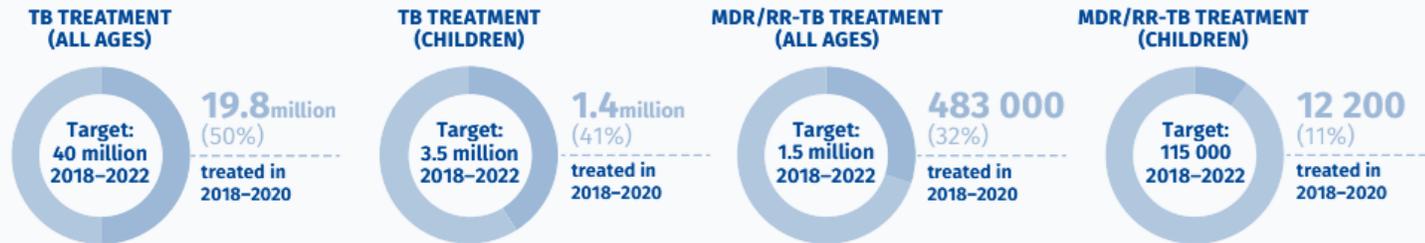
USAID is the lead USG Agency supporting global TB efforts in over 23 high burden countries



COVID-19 impact on TB

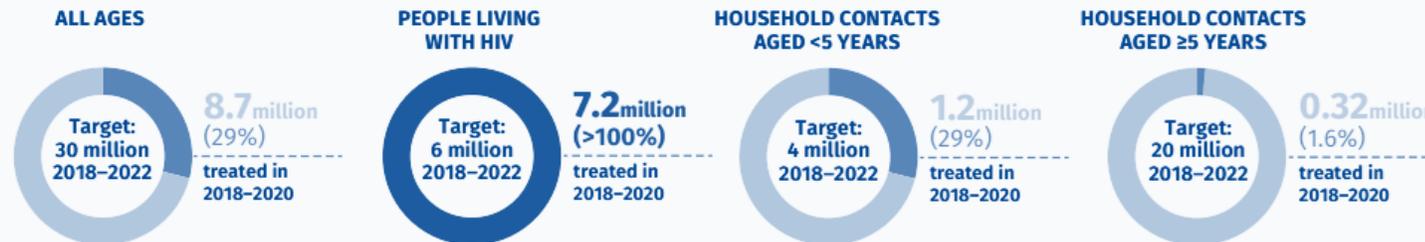


UN high-level meeting on TB: Treatment targets



Diagnosing and enrolling 40 million people on TB treatment & Enrolling 30 million on TB preventive therapy by 2022.

UN high-level meeting on TB: TB preventive treatment targets



COVID-19 impact on TB

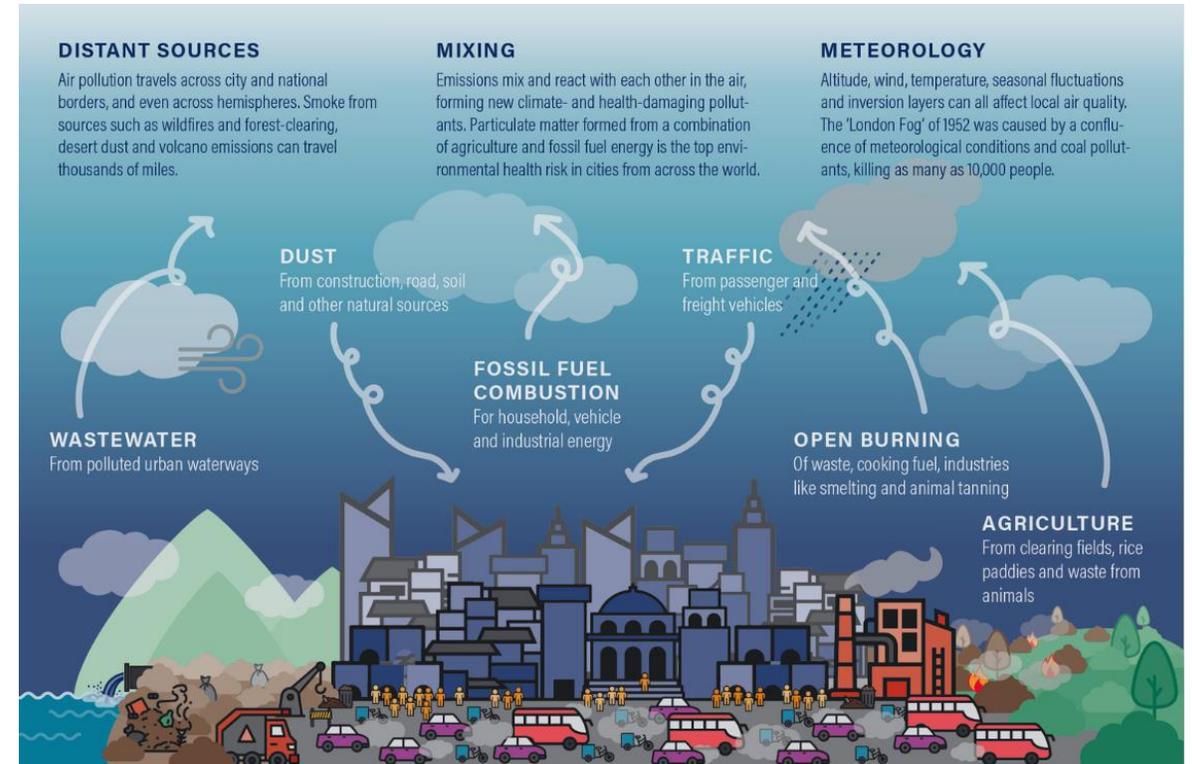
21% less people treated leaving an estimated 4.3 million people with untreated TB ~ 1/2 could die

Air Pollution & Health

In 2018 World Health Organization (WHO) hosted the first Global Conference on **Air Pollution and Health** calling to reduce the number of deaths a year due to air pollution from **7 million by two thirds by 2030**.

The conference was critically important to raise awareness of the # of people worldwide that live with unsafe levels of air pollution, sources of air pollution, and some of the detrimental health impacts

The effort was focused on air pollution impact on non-communicable such as lung cancer, heart attacks and strokes.



There has been more limited research examining impact on infectious diseases but there are linkages for TB and other respiratory pathogens such as COVID-19

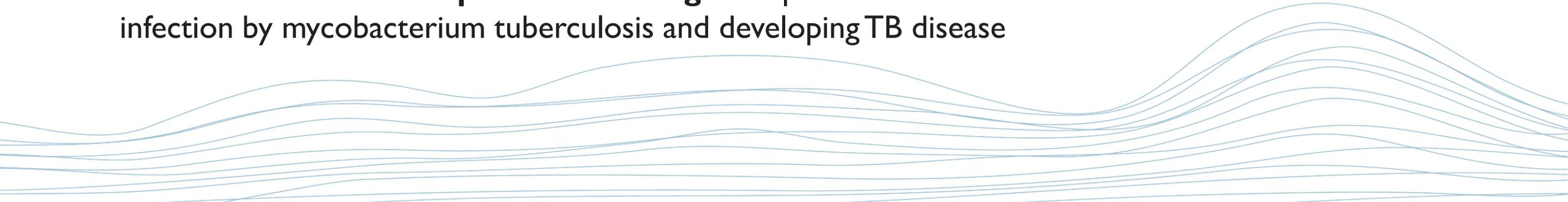
TB & Air Pollution

Air pollutants may directly or indirectly affect the immune process that inhibits TB in humans. As such, upon exposure to TB air pollution exposure would increase susceptibility to developing active TB following primary infection or latent infection

Epidemiological research shows that **TB is more prevalent in people exposed to air pollution**, especially indoor air pollution in homes where, for example, firewood or charcoal is used to cook.

Urbanization is increasing in tuberculosis endemic areas, and air pollution is expected to increase in urban settings because of greater industrialization, vehicular traffic, garbage burning, and often a lack of regulation of air pollution sources, “It’s important to understand the contribution of potentially modifiable risk factors to control tuberculosis.”

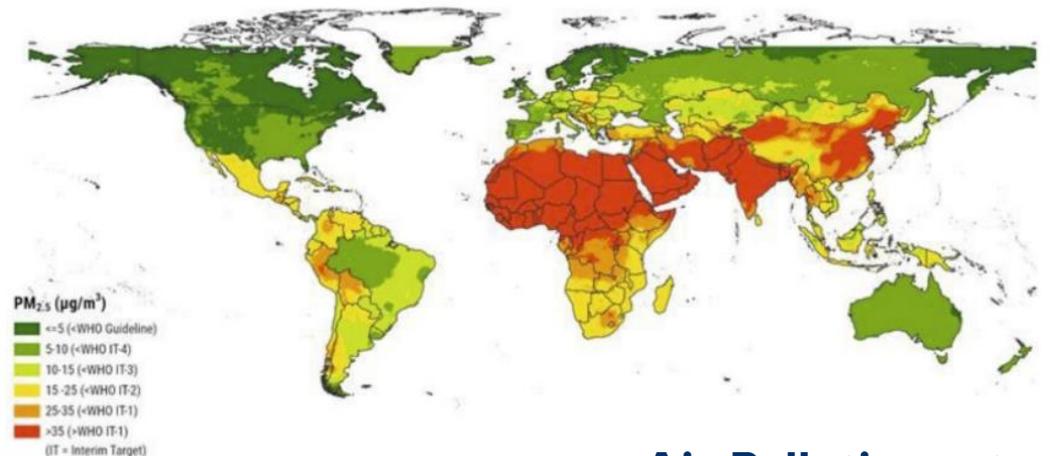
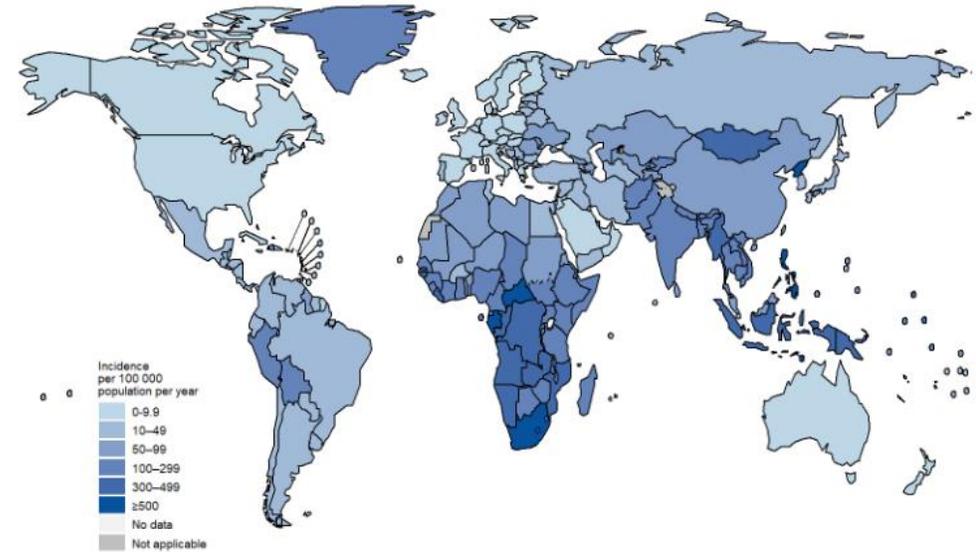
Research has shown that **passive smoking** or exposure to second-hand smoke is a risk factor for infection by mycobacterium tuberculosis and developing TB disease



High Burden TB countries:
India, China, Indonesia,
Philippines, Pakistan, Nigeria,
Bangladesh, South Africa

**Countries with most
polluted air (PM2.5
concentration)**
India, China, Pakistan,
Bangladesh, Kazakhstan,
Chad, Turkey

Estimated TB incidence rates, 2020



Air Pollution rates

USAID Global Projects

- USAID's Clean Air Catalyst is a new flagship program of USAID and a global partnership led by World Resources Institute (WRI) and Environmental Defense Fund (EDF).
 - The USAID-funded **Building Healthy Cities (BHC)** project, implemented by JSI, is testing healthy urban planning approaches in Indore, India; Makassar, Indonesia; Kathmandu, Nepal; and Da Nang, Vietnam
 - BHC works in partnership with Smart City initiatives and urban sector departments to build this new vision for healthy urban planning and engages Smart City citizens of every demographic so that they have a voice (via citizen reporting systems and participatory research) and are empowered to advocate for the needs of their communities.
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Tackling Air Pollution through Community Engagement

- Building Healthy Cities in partnership with Indore Smart City Development Limited, Indore School of Social Work, and SkyMet installed 20 low-cost air quality sensors across Indore to collect quantitative data.
 - Trained and supported 20 local Clean Air Guides (CAGs), who work within their communities to raise awareness and develop solutions for the air quality issues they face.
 - The air sensors send CAGs real-time data on the quality of the air in their location and drive community solutions
 - The data and community engagement continues to drive changes such as increased use of bicycles to get to work in locality where transportation is the driver of pollution, working with local crematorium to implement safer practices for burning bodies.
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Key Take Aways



Air quality should be counted as an important part of an integrated approach toward public health protection



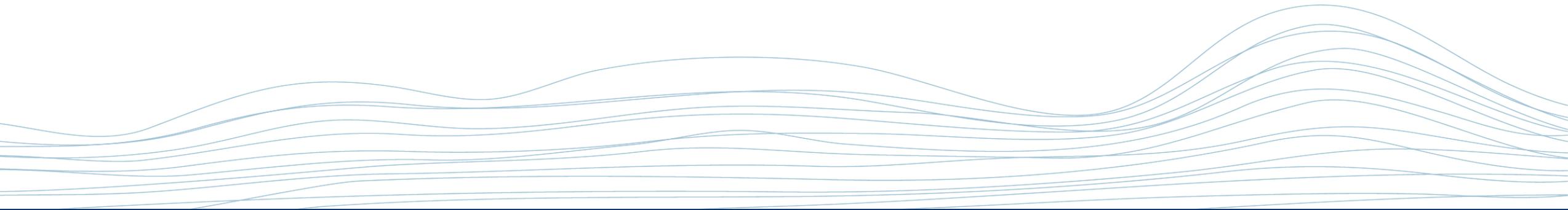
Increase research and data collection to continue to examine impact of air pollution on TB and other respiratory diseases



Improved regulation of pollution sources, more thoughtful urban development, or rigorous health monitoring of at-risk people.



Support multi-sectoral and innovative strategies through community engagement





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Thank you.

For Additional information visit:

[Tuberculosis | U.S. Agency for International Development \(usaid.gov\)](#)

[USAID Reducing Pollution | U.S. Agency for International Development](#)

[Building Healthy Cities - JSI](#)

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