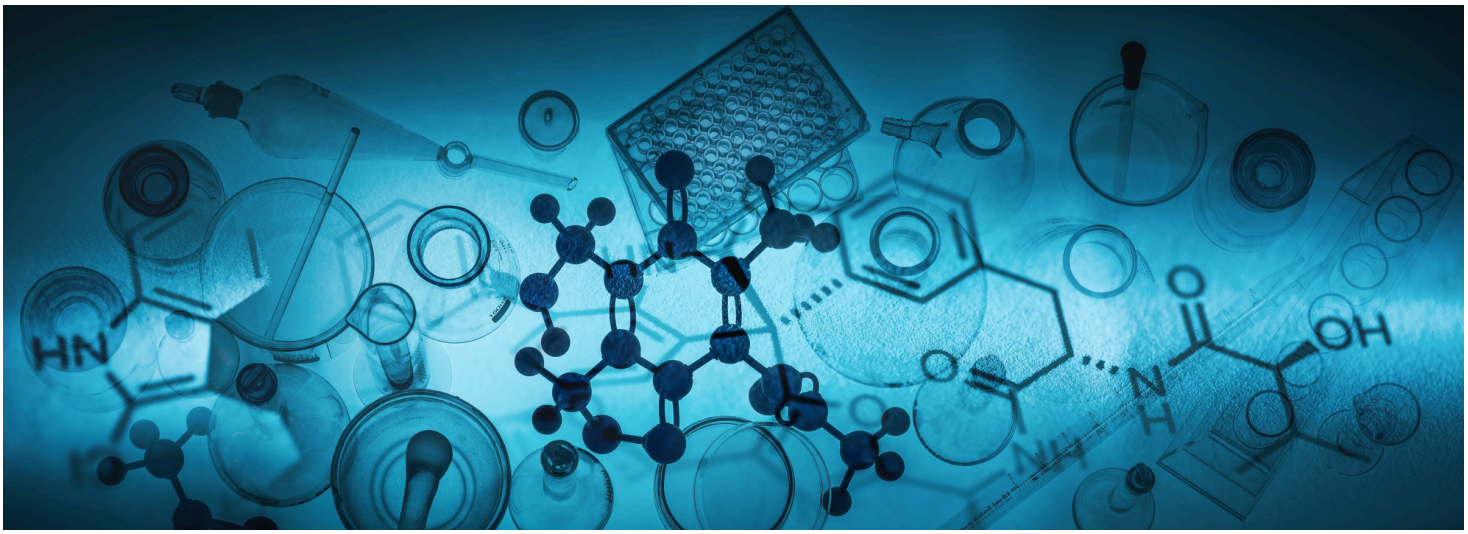
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THE MONTHLY DOSE

Official Newsletter of The Mueller Health Foundation



WHAT'S NEW AT THE MUELLER HEALTH FOUNDATION:

At the Mueller Health Foundation, we are proud to support Tamasha, one of APOPO's remarkable HeroRATs working to improve tuberculosis detection in Tanzania.
With her extraordinary sense of smell, Tamasha evaluates sputum samples rapidly and helps to identify TB cases that might otherwise go undetected. On average, she evaluates 100 samples in just 10 minutes. This year alone, Tamasha was able to identify 213 TB cases that may have otherwise been missed. Over the course of her 2-year career, Tamasha has now helped to find 505 additional TB cases. Her achievements demonstrate how an innovative approach can complement conventional testing, accelerate diagnosis, and help more people begin lifesaving treatment.



Stay tuned for more updates!

PC: APOPO HeroRats

LATEST NEWS: SHOWCASING STORIES OF TB SURVIVORS

We at The Mueller Health Foundation remain deeply committed to sharing personal stories and giving a voice to TB patients, TB survivors, TB practitioners, and all the friends and family members affected by the disease. We are also proud to continue our support of our HeroRat Tamasha, who has been trained by APOPO, a charity focused on training rats to detect TB in sputum samples across Africa. APOPO has put together a wonderful collection of success stories, and this month, we would like to highlight Maria's story:

Maria Nhamtumbo, a 39-year-old mother of four living in Mozambique, became ill after caring for her husband while he was being treated for tuberculosis. She believes she contracted TB from him during this period, although his experience also helped her understand the disease and recognize that proper treatment could cure it. Maria became extremely weak, suffered constant pain, and lost her appetite. Her illness severely affected her ability to work and caused a dramatic decline in her income. Although TB carries considerable stigma in her community, Maria was relieved to receive kindness and acceptance from her friends and members of her church. Her clinic sent her sputum sample to APOPO, where trained HeroRATs detected signs of TB. APOPO's laboratory then confirmed the result and notified her clinic, allowing Maria to begin treatment promptly. Because she had drug-sensitive TB, she took several antibiotics for six months and underwent regular follow-up testing while continuing her medication. Community health workers from APOPO's partner organization, Kenguelekeze, encouraged her throughout the process. Eventually, Maria's tests came back negative, enabling her to regain her health and return to her life and work. She recognizes that without an accurate diagnosis, she might have died or unknowingly transmitted TB to one of her children. Maria was amazed when she saw the African giant pouched rats trained to detect the disease and initially wondered whether they could smell TB on her. She later learned that they had examined her heat-inactivated sputum sample. Deeply grateful to APOPO and its HeroRATs, Maria now encourages others to seek testing at clinics partnered with APOPO, crediting their quick and accurate diagnosis with saving her life and helping her get back on track. To read Maria's full story, please follow the link: https://apopo.org/what-we-do/detecting-tuberculosis/success-stories/maria/

For more news, please also take a look at our top 3 picks for **October** in this newsletter, where we highlight novel research findings and news about the prevention and treatment of tuberculosis around the world.

The Mueller Health Foundation

MHF TOP PICKS FOR OCTOBER

Every month, we at the Mueller Health Foundation like to showcase interesting news and updates in the field of tuberculosis (TB). Below are our top **3** picks for **October:**

1. Study Shows Indoor Airflow Patterns Can Shape Tuberculosis Transmission

New research suggests that the way air moves through an indoor space may be as important as the overall ventilation rate in determining how tuberculosis and other airborne diseases spread. An interdisciplinary team from MIT and the University of Texas Southwestern Medical Center combined animal transmission experiments, particle tracking, and computational modeling to examine how bacteria-containing aerosols travel through controlled environments. The researchers found that local airflow patterns shaped by the placement of air inlets and outlets, leakage paths, room seals, and air currents created by an infected individual could either promote or reduce exposure. Even a small leak could redirect fresh air toward an exhaust rather than moving contaminated air across a room, dramatically changing transmission conditions. The findings suggest that simply measuring how much fresh air enters a building may not adequately capture infection risk. Instead, detailed airflow patterns should be considered when designing or retrofitting healthcare facilities, laboratories, and crowded public spaces. Although further research is needed to determine how well the findings translate from controlled models to real-world settings, the study provides evidence that relatively low-cost airflow modifications could become a valuable tool for reducing airborne disease transmission. To learn more, you can access the article here: https://news.mit.edu/2026/indoor-airflow-patterns-importance-spreading-airborne-disease-0821

2. Drying Airborne TB Bacteria May Promote Drug-Resistance Mutations

New research suggests that tuberculosis bacteria may evolve during airborne transmission rather than simply passing unchanged between people. When an infected person coughs, speaks, or breathes, bacteria-containing droplets enter the air and evaporate into tiny particles. Weill Cornell Medicine researchers recreated this drying and rehydration process in the laboratory and found that desiccation caused oxidative stress and DNA damage in *Mycobacterium tuberculosis*. The bacteria responded by activating a DNA-repair program that helped them survive but also increased mutations associated with resistance to rifampin, a cornerstone TB medication. Researchers identified the DNA-repair gene *Mfd* as a possible treatment target given that reducing its activity lowered the survival of rifampin-resistant bacteria during laboratory aerosol experiments. An analysis of more than 50,000 TB genomes from patients worldwide also supported a relationship between *Mfd* and rifampin resistance. Although these findings require further study and have not yet produced a new therapy, they reveal the airborne stage of TB's life cycle as a potential target for slowing the emergence and spread of drug-resistant disease. To learn more, you can access the paper here: https://www.nature.com/articles/s41564-026-02437-w

3. GLP-1 Drugs Associated With Lower Tuberculosis Risk in People With Type 2 Diabetes

A large global health-record study suggests that GLP-1 receptor agonists may be associated with a lower risk of tuberculosis among people with type 2 diabetes, a condition that increases susceptibility to active TB. Researchers used the TriNetX network, which includes records from approximately 153 million people, to compare patients beginning GLP-1 therapy with matched patients starting metformin, sulfonylureas, DPP-4 inhibitors, or SGLT2 inhibitors. After balancing demographic, clinical, lifestyle, and socioeconomic characteristics, GLP-1 use was associated with significantly lower overall and pulmonary TB incidence across all four comparisons. Lower extrapulmonary TB risk was found only in comparisons with sulfonylureas and DPP-4 inhibitors. The findings may reflect the anti-inflammatory or immune-modulating effects of GLP-1 drugs, although the study did not examine the underlying mechanism. Because the analysis was observational, it cannot prove that GLP-1 medications prevent TB. Missing information, including TB exposure, latent infection, disease severity, dosage, and medication adherence, could also have influenced the results. Prospective studies are needed before TB risk should affect diabetes-treatment decisions. You can read the paper here: https://www.nature.com/articles/s41467-026-77068-0

DID YOU KNOW?

Tuberculosis affects far more than the lungs; it can also take a significant toll on a person's mental health. In India, the physical demands of illness and treatment may be compounded by stigma, social isolation, lost income, family pressures, and fear about the future. We chose to highlight India because the Mueller Health Foundation supports people-centered TB programs there through our partnership with REACH. Furthermore, research increasingly shows that addressing mental health is essential to comprehensive TB care. Here are some important facts about TB and mental health in India:

- A systematic review of 25 Indian studies involving more than 12,000 people with TB estimated that 37% experienced depression.
- A separate review of 13 studies from six Indian states estimated that 34% of people with TB experienced anxiety.
- Additionally, stigma, discrimination, limited social support, financial hardship, homelessness, and prolonged treatment have all been associated with emotional distress among people receiving TB care.
- Depression and anxiety can affect quality of life, motivation, appointment attendance, and the ability to take medication consistently, potentially influencing treatment outcomes.
- TB and some mental health conditions share symptoms, including fatigue, appetite changes, sleep difficulties, and reduced energy, which may make psychological distress easier to overlook.
- Family members and caregivers can play an important role by offering encouragement, helping with treatment routines, and reducing isolation. Peer-support groups can also provide a safe space to share experiences with others who understand the challenges of TB. In collaboration with REACH, we at MHF have made caregiver training modules and monthly support groups for those affected by TB an integral part of our programming.
- Counseling and routine mental health screening can help identify people who need additional support. WHO India has emphasized integrating TB, mental health, undernutrition, and noncommunicable disease services to provide a more complete continuum of care.

The connection between TB and mental health reinforces a central lesson: successful treatment involves more than providing medication. Integrating respectful counseling, peer and family support, financial and nutritional assistance, and referral to mental health services can help people complete treatment and rebuild their health and well-being.

Information Source:
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