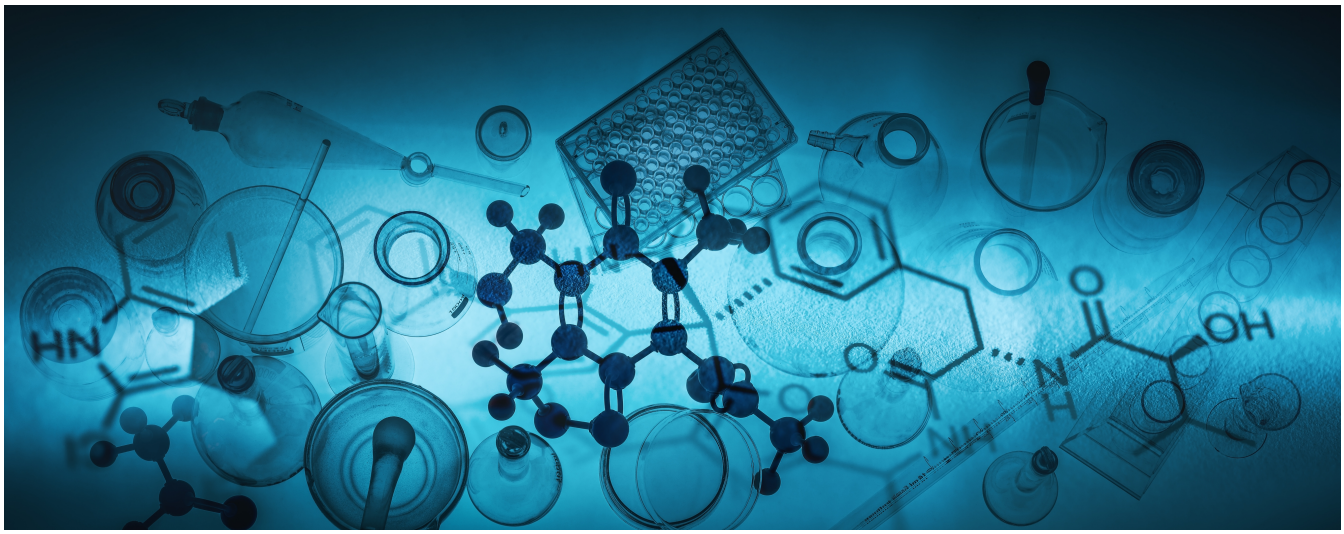
VOLUME 3, ISSUE 7, JULY 2023

# THE MONTHLY DOSE

## Official Newsletter of The Mueller Health Foundation




### WHAT'S NEW AT THE MUELLER HEALTH FOUNDATION:

The Mueller Health Foundation has been working hard to update and upgrade our TBConnect blockchain application, which is the first of its kind and aims to better facilitate information sharing and networking among all stakeholders in the TB community.

We very much look forward to making the new and improved version of TBConnect available free of charge to everyone interested in sharing information, data, and research about tuberculosis in the following weeks!

Additionally, we also want to wish everyone a healthy and happy July 4th celebration!

Stay tuned for more updates!

## LATEST NEWS: SHOWCASING STORIES OF TB SURVIVORS

We at The Mueller Health Foundation continue to be deeply committed to sharing personal stories and giving a voice to TB patients, TB survivors, TB practitioners, and all the friends and family members of the people who have been affected by the disease. The Center for Disease Control and Prevention (CDC) has put together a wonderful collection of stories and this month we would like to highlight Kenni's story:

In early 2012, Kenni, a native Texan, came down with a cough and fever, and she was told by a doctor that it was a respiratory infection. “I took the antibiotics I was given, but felt no better; in fact, it was the worst I’ve ever felt. I was coughing so much my ribs hurt.” Another doctor told her she had severe bronchitis. Given that her symptoms were not improving with medication, she went to see yet another doctor and was told she had pneumonia. She was then sent to a lung specialist who told her it was probably viral. With so many doctor visits and diagnoses, but no medicine that helped, Kenni was exhausted. The next week, with severe pain in her lungs and chest, Kenni was admitted to the hospital for a bronchoscopy and blood work. After 3 days, she was told that she likely did have TB and was started on standard TB treatment. Nine days later, after her TB was confirmed and she was responding to treatment, Kenni returned home. The Texas Department of State Health Services (DSHS) TB control program worked with Kenni as she continued her long treatment regimen of taking multiple pills every day for 9 months. Right before Christmas 2012, Kenni took her last dose of TB medicine. Since then, she has been healthy and TB-free. Kenni does not know where or how she became infected with TB. Looking back, Kenni regrets that it took so long for a diagnosis. Because TB is no longer common in this country, doctors may not “think TB” when they see patients who have TB symptoms. However, Kenni gives her nurse Kim much credit for her success in completing treatment. “I want others to know that if they or their loved ones ever come down with this frightening disease, there is help available from nurses and others in the state public health TB program.” To read her full story please follow the link to the Center for Disease Control and Prevention's website here: https://www.cdc.gov/tb/topic/basics/kennistory.htm

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

The Mueller Health Foundation

# MHF TOP PICKS FOR JULY

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 **July**:

### 1.SickKids Researchers Discover New Way to Attack Treatment-resistant TB Infections

The current treatment for drug-resistant TB relies on a recently developed drug called bedaquiline (BDQ), which targets ATP synthase, effectively stopping the bacteria from producing the energy they need to survive. Despite the success of BDQ in treating drug-resistant TB, resistant mycobacteria have started to emerge and BDQ's side effects can include liver toxicity and heart failure. Given the adverse side-effect profile, the researchers therefore examined two new compounds that target ATP synthase, called TBAJ-876 and SQ31f. The study showed why TBAJ-876, which is derived from BDQ and is currently undergoing clinical trials, binds to ATP synthase better than BDQ. The team also discovered that although the current form of SQ31f prevents mycobacteria from growing but does not kill them, it binds to ATP synthase at a previously unknown site, which could allow development of an entirely new class of antibiotic that could work even for BDQ-resistant strains. To learn more, you can access the full paper at: https://www.embopress.org/doi/epdf/10.15252/embj.2023113687

### 2. Promising Vaccine Candidate Receives Funding for Phase III Trial

A promising vaccine candidate for tuberculosis is getting a new lease of life after two major funders have decided to pour $550 million USD into its final phase of clinical trials. If successful, it would be the first new tuberculosis vaccine on the market in more than a century. The vaccine candidate, called M72/AS01E, aims to tackle the latent infections. And it showed promise in data published from phase II trials in 2019, demonstrating a 54% efficacy in adults who hosted the bacterium. M72/AS01E consists of a fused protein called M72, which is comprised of two M. tuberculosis antigens, and an adjuvant, AS01E. Researchers chose the antigens on the basis of their high immunogenicity, which is defined as a strong ability to provoke the immune system and which stimulates the crucial T-cell response needed to fight the bacteria as well as to create memory cells for future attacks. The Phase III trial will recruit 26,000 participants in several countries across Asia and Africa. To learn more, you can read the article here: https://www.nature.com/articles/d41586-023-02171-x

### 3.Study Finds High TB Case Rates and Low Detection in Prisons across the Globe

In the first global assessment of TB among incarcerated people, a new study found consistently high TB case rates and low case detection in prisons. The study found that 125,105 of the 11 million people incarcerated worldwide developed tuberculosis in 2019, a rate of 1,148 cases per 100,000 persons per year. Despite this high case rate, nearly half of TB cases among incarcerated people were not detected. The findings reveal the first global and regional estimates of new TB cases among incarcerated people, a population at high risk of developing this life-threatening disease. Collectively, the high case rate and low detection underscore the need for greater awareness and resources to reduce the burden of TB in prisons and other high-risk settings. We at MHF have highlighted some additional key findings from the study in our "Did You Know" section and you can learn more and access the full paper here: https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(23)00097-X/fulltext

## DID YOU KNOW?

People who are incarcerated are at high risk of developing tuberculosis. The first global study that was sponsored by the NIH and published this month, aimed to estimate the annual global, regional, and national incidence of tuberculosis among incarcerated populations from 2000 to 2019 using published and unpublished data as well as annual tuberculosis notifications among incarcerated individuals at the country level. Below is a summary of key findings from the study:

- Using Bayesian meta-regression models integrating multiple sources of incarceration and tuberculosis data, the researchers estimated that approximately 125,105 of the 11 million incarcerated individuals globally developed tuberculosis in 2019.
- The estimated global incidence of tuberculosis among incarcerated individuals is approximately **nine** times greater than the estimated incidence among all individuals.
- The elevated risk of tuberculosis among incarcerated populations exceeds that of diabetes, alcohol use disorders, smoking , and undernourishment.
- The five countries with the highest number of incident tuberculosis cases among incarcerated individuals in 2019 included Brazil (15,266), Russia (12,993), China (11,347), Philippines (6,357), and Thailand (5,249).
- The researchers found a low case-detection ratio in 2019 both globally and across WHO regions, ranging between 42% and 68%. These case-detection ratios are lower than for the general population and similar to ratios for pediatric tuberculosis, which is particularly difficult to diagnose.
- The large gaps in tuberculosis case detection in incarcerated populations should be addressed with interventions specifically tailored to improve diagnoses and prevent transmission as a part of the broader global tuberculosis control effort.

**Information Source:**
**https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(23)00097-X/fulltext**