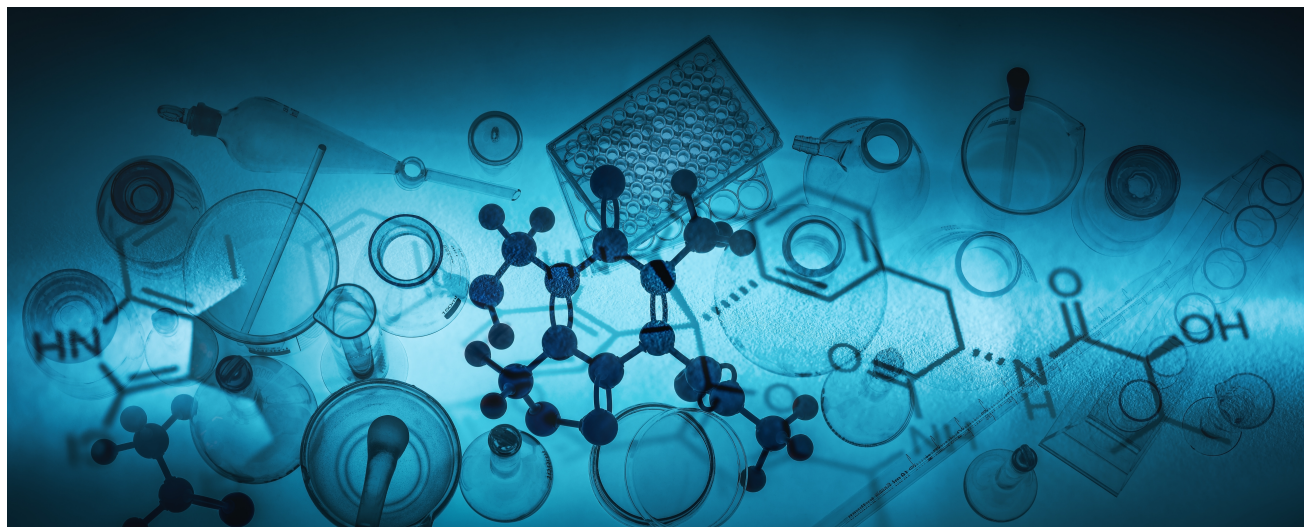


THE MONTHLY DOSE

Official Newsletter of The Mueller Health Foundation



WHAT'S NEW AT THE MUELLER HEALTH FOUNDATION:

We hope you had a healthy and happy Thanksgiving!

We are working hard on our annual report that will showcase the many wonderful advancements and achievements of our grantees and our MHF Foundation.

Stay tuned for more updates!

LATEST NEWS: TWO EPIDEMICS ON THE RISE: DIABETES MELLITUS AND TUBERCULOSIS

The global increase in type 2 diabetes mellitus (DM) due to population ageing, urbanization, changes in diet and reduced physical activity patterns resulting in increasing obesity, is a recognized re-emerging risk and challenge to tuberculosis (TB) control as well as the management of other respiratory diseases, such as Covid-19. Many studies suggest that individuals with DM have, on average, three times the risk of developing TB, have worse TB treatment outcomes and have twice the risk of death during TB treatment. There are now more individuals with TB-DM co-morbidity than TB-HIV co-infection. Consequently, the WHO has identified DM as a neglected, important and re-emerging risk factor for TB. A scientific paper cited below aimed at better illustrating the interaction of diabetes and tuberculosis also found that the profile of TB-DM patients versus TB only is strikingly different, with TB-DM patients being older, obese and more likely to be females who are not likely to present behaviors classically associated with TB such as alcohol abuse, consumption of illicit drugs, incarceration or HIV-AIDS. There is currently much more additional research needed to answer important questions on how to manage both diseases: How can we prevent the development of TB among DM patients? How can we reduce the prevalence of adverse TB treatment outcomes in TB-DM patients? How can we better tailor and reduce costs for treating patients with latent TB and diabetes? A unifying factor from epidemiological, clinical and immunological studies on TB and DM is the importance of glucose control on TB risk and adverse TB treatment outcomes. However, this apparently simple goal of achieving good glucose control among DM patients, particularly in low- and middle-income countries, is a major challenge that will likely require a multi-disciplinary approach. To learn more, the following paper by Blanca Restrepo provides an initial overview of these two epidemics and their interactions: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5240796/>

MHF TOP PICKS FOR NOVEMBER

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

1. Tuberculosis and Diabetes Mellitus: Convergence of Two Epidemics

Diabetes mellitus prevalence is soaring globally, fuelled by obesity. There is growing evidence that diabetes mellitus is an important risk factor for tuberculosis and might affect disease presentation and treatment response. Furthermore, tuberculosis might induce glucose intolerance and worsen glycaemic control in people with diabetes. The researches of this paper review the epidemiology of the tuberculosis and diabetes epidemics, and provide a synopsis of the evidence for the role of diabetes mellitus in susceptibility to, clinical presentation of, and response to treatment for tuberculosis.

To learn more, you can access the full journal article at:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2945809/>

2. The Interaction of Diabetes and Tuberculosis: Translating Research to Policy and Practice

Diabetes Mellitus increases the risk of developing Tuberculosis (TB) disease by about three times; it also doubles the risk of death during TB treatment and other poor TB treatment outcomes. Diabetes may increase the risk of latent infection with *Mycobacterium tuberculosis* (LTBI), but the magnitude of this effect is less clear. There are substantial research and policy gaps, particularly with regard to prevention of TB disease in people with diabetes and management of patients with TB–diabetes, both during TB treatment and after successful completion of TB treatment, when they likely remain at high risk of TB recurrence, mortality from TB and cardiovascular disease. Potential strategies to prevent development of TB disease might include targeted vaccination and treatment programs, screening for LTBI and preventive therapy among diabetes patients or, perhaps ideally, improved diabetes management and prevention.

To learn more, you can read the full article here:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7838867/>

3. Diabetes Status and Association With Risk of Tuberculosis Among Korean Adults

In a Korean population-based study, adults with diabetes had a 48% increased risk for developing tuberculosis compared with adults without diabetes. The extent of risk for tuberculosis seemed to be dependent on blood glucose levels. Individuals with impaired fasting glucose only, blood glucose levels of 100-125 mg/dL but no diabetes diagnosis did not seem to be at an elevated risk for infection. However, those with new-onset diabetes in the highest decile of fasting blood glucose levels (202 mg/dL or higher) had a 79% higher risk for tuberculosis than those with lower glucose levels (fasting plasma glucose of 126-128 mg/dL). The researchers concluded that diabetes appears to be associated with increased risk of lower respiratory tract infection, including TB, and to have a profound adverse effect on TB treatment outcomes.

To learn more, you can access the full paper here:

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2784396>

DID YOU KNOW?

This month, we would like to highlight some interesting facts related to Diabetes Mellitus (DM) and Tuberculosis (TB).

- Diabetes mellitus has affected approximately 425 million individuals in 2017 and is estimated to grow to 629 million people in 2045.
- More than 80% of type 2 diabetes mellitus, referred to colloquially as "diabetes", is found in low- and middle-income countries and in areas where TB remains endemic.
- The risks of TB disease are significantly elevated in people with diabetes, about 2–3 times higher.
- Diabetes may also slightly increase the bacterial load of *M. tuberculosis* and lengthen the time to smear or culture negativity; nearly twice as many patients with TB and diabetes remain culture positive at Months 2–3 compared to those with only TB.
- Many studies and reviews have now demonstrated that diabetes worsens TB treatment outcomes, in particular doubling the risk of death during TB treatment.
- Other studies have found that diabetes seems to increase the risk of TB recurrence and also appears to be associated with a doubling of the risk of identification of multi-drug resistant TB.

Source:

Van Crevel, Reinout, and Julia A Critchley. "The Interaction of Diabetes and Tuberculosis: Translating Research to Policy and Practice." *Tropical medicine and infectious disease* vol. 6, 1 8 Jan. 2021, doi:10.3390/tropicalmed6010008