

# Undernutrition prior to and at treatment initiation for tuberculosis associated with unfavorable outcomes

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In 2021, an estimated 10.6 million individuals developed tuberculosis (TB) and 1.6 million died, making it the second most lethal infection in

the world after SARS-CoV-2. Undernutrition, a deficiency of macronutrients and micronutrients, is the leading risk factor for TB globally, however its impact on treatment outcomes is poorly defined.

In a new study, researchers from Boston University Chobanian & Avedesian School of Medicine found that severe undernutrition greatly increases the risk of unfavorable outcomes like death, treatment failure and relapse for persons undergoing treatment for TB.

"We found that even after adjusting for the other risk factors, severe undernutrition before TB disease and at treatment initiation doubled the risk of unfavorable outcomes," explained corresponding author Pranay Sinha, MD, assistant professor of infectious diseases.

The researchers followed nearly 3,000 persons with TB disease in five hospitals that are part of the Regional Prospective Observational Research on Tuberculosis (RePORT) consortium in India for two years. They recorded data on their demographic, socioeconomic and medical [risk factors](#) for poor treatment outcomes such as death, treatment failure and relapse.

Using [statistical analysis](#), they tested the relationship between unfavorable outcomes and undernutrition. They found those with severe undernutrition at the start of TB therapy had a four-fold increase in their risk of death. Persons with TB who did not gain weight after two months of therapy had a five-fold increase in their risk of death.

According to Sinha, one of the novel findings of the study is that severe undernutrition prior to the onset of TB was associated with unfavorable outcomes. "Many researchers believe that undernutrition is only associated with poor outcomes because it signifies that those individuals had really severe TB which has been untreated for a long time. By showing that undernutrition before TB strongly predicts poor outcomes,

we shift that paradigm," adds Sinha, who also is an infectious diseases physician at Boston Medical Center.

The researchers believe their findings have important implications for TB programs because they show that undernutrition is an important prognosticator for TB outcomes. They recommend these programs should systematically screen for undernutrition at diagnosis and during treatment and provide greater scrutiny to severely undernourished patients and patients who are not gaining weight during TB therapy.

Although TB elimination programs have long understood that social determinants of health play a role in fueling the TB epidemic, attention has largely focused on diagnosis and treatment. "Our study urges TB advocates, clinicians, researchers and [policy makers](#) to recognize that undernutrition—which is often a product of economic hardship, keeps TB entrenched in our population and reducing [undernutrition](#) may lower the number of lives lost and devastated by TB."

These findings appear online in the journal *Clinical Infectious Diseases*.

**More information:** Pranay Sinha et al, Impact of Undernutrition on Tuberculosis Treatment Outcomes in India: A Multicenter Prospective Cohort Analysis, *Clinical Infectious Diseases* (2022). [DOI: 10.1093/cid/ciac915](#)

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