

Nearly one in five Tibetan refugee schoolchildren has tuberculosis infection, study finds

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In a tuberculosis screening and treatment initiative covering the entire population of Tibetan refugee schoolchildren in northern India, a team directed by researchers at Johns Hopkins Medicine and the University of Wisconsin says it has found not only a startlingly high prevalence of TB disease and infection, but also a potentially workable strategy to eliminate the disease in a large, high-risk group.

"Our innovative initiative includes population-level implementation of TB preventive therapy as part of a multipronged strategy to control and eliminate TB in an at-risk population in India," says lead study author Kunchok Dorjee, Ph.D., M.B.B.S. Dorjee is a research associate at the Johns Hopkins University School of Medicine and director of the Zero TB in Tibetan Kids project—an initiative implemented locally by the Delek Hospital in Tibet and the Central Tibetan Administration health and education departments. "With the support of local leadership and community mobilization, including support from His Holiness the Dalai Lama, we have demonstrated that TB control can be achieved on a population level. The findings provide a benchmark to measure and compare progress toward elimination in the future."

Findings from the first year of the initiative were published in the December issue of the journal *Clinical Infectious Diseases*.

Tibetan refugees in India have high rates of TB, and many children live

in congregate settings such as boarding schools, say the researchers. For the [study](#), program staff members first met with parents, educators and home mothers at boarding schools to gain their support. Then, they screened children in Tibetan schools class by class. Using the schools' administrative records, the researchers ensured that every student and staff member was screened—they were screened for TB symptoms such as cough, fever and night sweats, and were interviewed about TB exposure history. Those presenting with TB symptoms were further evaluated using chest X-ray and laboratory testing. People with no prior history of TB also underwent tuberculin skin testing, a field-friendly screening tool that allows clinicians to diagnose TB infection by measuring immune response.

Between April 2017 and March 2018, the Zero TB in Tibetan Kids project conducted school-based screening for TB disease and infection among a total of 5,391 children and 786 staff members in seven boarding schools and four day schools in the state of Himachal Pradesh. Children ranged in age from 5 to 19. Active TB disease was found in 46 children and one staff member, for a prevalence in children of 853 per 100,000. An active TB case-finding campaign by the Johns Hopkins Center for Tuberculosis Research and the Delek Hospital in Tibet from 2011 to 2013 identified a prevalence of 394 cases per 100,000 among Tibetan schoolchildren in India, much lower than the current findings. For the current study, the researchers say that nearly one in five children in this population has TB infection. Worldwide, an estimated one in 28 children has TB infection according to a 2014 Lancet Global Health study.

TB infection without disease was detected in 930 of 5,234 schoolchildren (18 percent) and 334 of 634 staff members (53 percent). TB rates among children in the boarding schools in Dharamsala (which is in Himachal Pradesh) are about five to eight times higher than the average for India, China or globally. The rates are higher for a variety of

reasons, says Dorjee, who was born and raised in the Tibetan refugee community. About 26 percent of students reported exposure to someone with active TB in the previous two years at school.

All those found to have active TB were treated with a standard six-month course of antibiotics, while those with drug-resistant TB received a prolonged course of combination drugs. A three-month course of daily preventive therapy (isoniazid and rifampicin) was provided to 799 of 930 (86 percent) schoolchildren and 101 of 334 (30 percent) staff members with TB infection. The Zero TB program paid for the study drugs, with support from the Johns Hopkins Center for Tuberculosis Research.

While treatment adherence tends to be a challenge in many populations impacted by TB, most participants in this study (nearly 95 percent, or 857) successfully completed their drug regimen for TB prevention. Less than 2 percent of the participants (12 people) were unable to complete the full recommended therapy, mostly due to side effects. Therapy was ongoing for 3 percent of the participants at the time of the study's publication.

The program staff is now conducting follow-up examinations of schoolchildren and staff members every six months, Dorjee says. In 2018, the program was expanded to screen Tibetan refugees living in monasteries and nunneries in the region.

"Through comprehensive approaches that include TB case-finding, treatment and [preventive therapy](#), TB control in high-burden settings is achievable," says the project's principal investigator Richard Chaisson, M.D., professor of medicine at the Johns Hopkins University School of Medicine and director of the Johns Hopkins Center for Tuberculosis Research.

After China invaded Tibet in the 1950s, many Tibetans fled to India and settled in exile in Dharamsala, now home to the Dalai Lama and the Tibetan central government, Dorjee explains. It is unknown whether the community previously had any immunity to TB, but exposure to the new environment in India, plus communal living in refugee areas and schools, and cold winter weather discouraging ventilation, provided a means for the infection to spread easily.

Approximately 1 million children worldwide develop tuberculosis and 250,000 die of the disease annually, the authors note. The average cost to treat the condition for a patient in the U.S. is \$19,000 for drug-susceptible TB and \$164,000 for multidrug-resistant TB. Globally, the average treatment cost is \$1,224 for drug-susceptible TB and \$7,141 for drug-resistant TB.

More information: Kunchok Dorjee et al. High Prevalence of Active and Latent Tuberculosis in Children and Adolescents in Tibetan Schools in India: The Zero TB Kids Initiative in Tibetan Refugee Children, *Clinical Infectious Diseases* (2018). [DOI: 10.1093/cid/ciy987](https://doi.org/10.1093/cid/ciy987)

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