

Targeting tuberculosis 'hotspots' could have widespread benefit: study

May 28 2012

Reducing tuberculosis transmission in geographic "hotspots" where infections are highest could significantly reduce TB transmission on a broader scale, according to a study led by researchers at the Johns Hopkins Bloomberg School of Public Health. An analysis of data from Rio de Janeiro showed that a reduction in TB infections within three high-transmission hotspots could reduce citywide transmission by 9.8 percent over 5 years, and as much as 29 percent over 50 years. The study was published May 28 by the journal *PNAS*.

"Targeting treatment of 'core groups' as a way to reduce community-wide transmission is common with diseases like HIV and [malaria](#), but is less accepted as a mantra for [TB control](#)," said David Dowdy, MD, PhD, ScM, lead author of the study and assistant professor in the Bloomberg School's Department of Epidemiology. "Our findings suggest that hotspots containing 6 percent of a city's population can be responsible for 35 percent or more of its ongoing TB transmission. Controlling TB in these hotspots may have a similar impact on long-term, community-wide TB incidence as achieving the same targets in the remaining 94 percent of the population."

For the study, Dowdy and his colleagues developed mathematical models for TB transmission using [surveillance data](#) from Rio de Janeiro. Each model tested different scenarios for TB transmission between the hotspot and the rest of the community. Co-infection with HIV was also factored into the model.

According to the study, reducing TB [transmission rates](#) in the hotspot to those in the general community reduced citywide TB incidence by a mean 2 percent per year over the first 5 years. By year 50, TB incidence was reduced by 29.7 percent, reflecting a 62.8 percent reduction in incidence in the [hotspot](#) and a 23.1 percent reduction in the remaining community.

Tuberculosis infects more than 8.8 million people worldwide, resulting in 1.4 million deaths each year. The disease is known to cluster in hotspots typically characterized by crowding, poverty and other illnesses such as HIV. Nevertheless, TB transmission appears to be more homogeneous than that of many other infectious diseases, in which 20 percent of the population may generate 80 percent of infections.

According to Dowdy, "TB may not follow the same '80/20' rule that we see in parasitic or sexually transmitted diseases, but the '35/6' rule seen in our study suggests that targeting hotspots is still the best way to control TB in a community."

More information: "Heterogeneity in tuberculosis transmission and the role of geographic hotspots in propagating epidemics", *PNAS*, May 28, 2012.

Provided by Johns Hopkins University Bloomberg School of Public Health

Citation: Targeting tuberculosis 'hotspots' could have widespread benefit: study (2012, May 28) retrieved 2 May 2024 from

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