

## Eliminating tuberculosis: the importance of paediatric tuberculosis surveillance



Until recently, tuberculosis in children has received little attention from the international public health community, despite it being a key sentinel event indicating recent transmission and hence a window into efforts to control transmission.<sup>1</sup> It was not until 2012 that WHO published its first estimate of the global incidence of tuberculosis in children.<sup>2</sup> However, in the 7 years since the first WHO estimate, much has changed; overall worldwide incidence rates are decreasing, but the burden of tuberculosis incidence and mortality caused by tuberculosis for children and adolescents have increased from 2012 to 2018.<sup>3,4</sup> This finding is due to many factors, but shows improvement in tuberculosis detection in children younger than 15 years. This improvement is despite the fact that children usually have paucibacillary disease, leading to an over reliance on clinical criteria, such as chest radiograph findings, which lead to underestimates of the true incidence of disease in children.<sup>5</sup>

Given the high mortality rate of children and adolescence due to non-detection and treatment of tuberculosis disease,<sup>3</sup> increased surveillance of tuberculosis among children and adolescents yields important insights into programme performance and is a crucial step on the path towards the elimination of tuberculosis. In *The Lancet Public Health*, Tori Cowger and colleagues<sup>6</sup> describe the national epidemiology of tuberculosis among children and adolescents in the USA. Cowger and colleagues analysed data for children and adolescents with tuberculosis disease reported to the National Tuberculosis Surveillance System between 2007 and 2017. From these data, they calculated tuberculosis incidence rates using population estimates from the United States Census Bureau.

Cowger and colleagues report stark racial and ethnic disparities in tuberculosis incidence among children with tuberculosis in the USA. During the study period of 2010–17, 6072 cases of tuberculosis among children and adolescents were reported. The burden of disease was unevenly distributed depending on geographic and ethnic or racial differences with an incidence rate of 1 per 100 000 person years among white US-born children and 14.4 per 100 000 person-years among

children in the US-affiliated Pacific Islands, meaning that they were 114.0 times (95% CI 96.6–134.4) higher than non-Hispanic white children. Cowger and colleagues provided evidence that having at least one parent born outside of the USA increases the likelihood of developing tuberculosis 3.5 times (3.0–4.0), and having two parents born outside of the USA increases the risk to 8.5 times (7.7–9.3) more likely. Despite the significant disparity in incidence rates, Cowger and colleagues report that the overall decline in tuberculosis incidence during the study period was a substantial 47.8% (95% CI –51.4 to –44.1) between 2007 and 2017.

These results have several important implications for the control and eventual elimination of tuberculosis in the USA and other countries on the path towards elimination. The first is that this report is generally good news. Imagine the incidence of any other disease decreasing by almost half within a 10-year period. This trend should be encouraging to those working to eliminate tuberculosis and provide evidence that current strategies of control, including early initiation of therapy, screening of close contacts, and aggressive treatment of latent tuberculosis infection, are highly effective when applied consistently.<sup>7,8</sup>

However, these data are overshadowed by the most important finding of this report: the stark disparity between various subpopulations. In the Marshall Islands and Federated States of Micronesia, tuberculosis rates among children and adolescents exceed 150 per 100 000 per year and account for a staggering 11% of all tuberculosis disease and more than 50% of all deaths among children and adolescents with tuberculosis in the USA. This is remarkable when considering that children in the affiliated Pacific Islands make up less than 0.1% of the population of the age group included in the study.

These findings are a window into the disparity in outcomes that probably exist in other national tuberculosis programmes and thus provide a roadmap for addressing the limitations of current approaches.<sup>9</sup> As Cowger and colleagues state, one-third of children with tuberculosis occurred outside of groups currently recommended for screening and would have been missed for screening even if current guidelines were adhered

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See [Articles](#) page e506

to perfectly. Including children and adolescents with at least one parent born in a country with a high incidence of tuberculosis in targeted testing and treatment programmes is an important next step to address these disparities. Additionally, in certain ethnic and national groups, current efforts are inadequate, especially in certain geographic areas, so more specific interventions to address local epidemiology are necessary. Control programmes would do well to remember that all public health is local.

These findings give grounds for cautious optimism, however daunting the task of elimination might be. Tuberculosis control efforts work but need proper leadership, guidelines should be adjusted to address disparity within populations, and a better understanding of the social determinants of tuberculosis is needed if we are to keep on the path towards elimination.

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We declare no competing interests.

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