

National Survey of Soil-Transmitted Helminths in Pakistan

Soil-transmitted helminths: the problem

The World Health Organization (WHO) estimates that over 1.5 billion people are infected globally with soil-transmitted helminths (STH), with 835 million children in need of treatment. STH infections result from poor sanitation and hygiene conditions, and tend to have highest prevalence in children of school-going age. The consequences of chronic worm infections in children are both widespread and debilitating. Worm infections interfere with nutrient uptake; can lead to anemia, malnourishment and impaired mental and physical development; and pose a serious threat to children's health, education, and productivity. Infected children are often too sick or tired to concentrate at school, or to attend at all. STH exacts a clear toll on human capital, hindering economic development, yet not all at-risk children are currently treated.

STH in Pakistan: the need for evidence

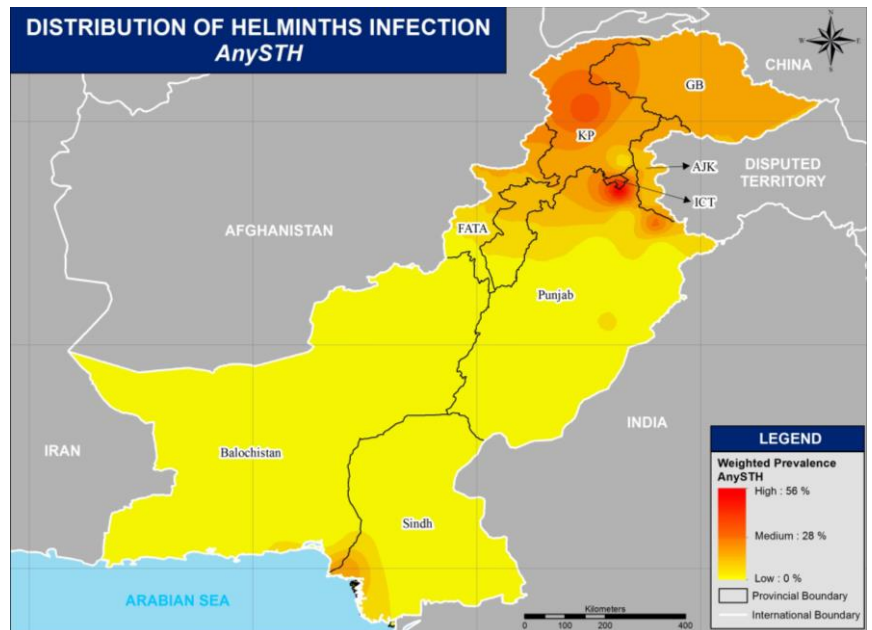
While the WHO considers Pakistan a high burden country for STH, there has been no large-scale deworming program targeting school-age children. To address the lack of epidemiology data on a national level and to provide information upon which informed decisions can be taken about the most appropriate strategy to pursue for combatting STH in Pakistan, Evidence Action's Deworm the World Initiative collaborated with Interactive Research and Development (IRD), the Indus Hospital, and Institute of Development and Economic Alternatives (IDEAS) to conduct the first nationwide STH survey in Pakistan.

The survey: design

Pakistan's first national STH survey utilized the WHO-recommended sentinel school and ecological zone strategy. The sample size was based on selecting one school for every 300,000 children aged 5-10 years in each of the ecological zones of Pakistan; at each randomly-selected school, at least fifty children were randomly-selected to provide stool samples which were examined for the presence of STH eggs using the Kato-Katz technique. Mobile lab teams were deployed in the four provinces (Punjab, Sindh, Balochistan and Khyber Pakhtunkhwa (KPK)) as well as the territory of Azad Jammu & Kashmir (AJK), visiting a total of 77 schools across the country and analysing stool samples from 4,166 children.

The survey: key findings

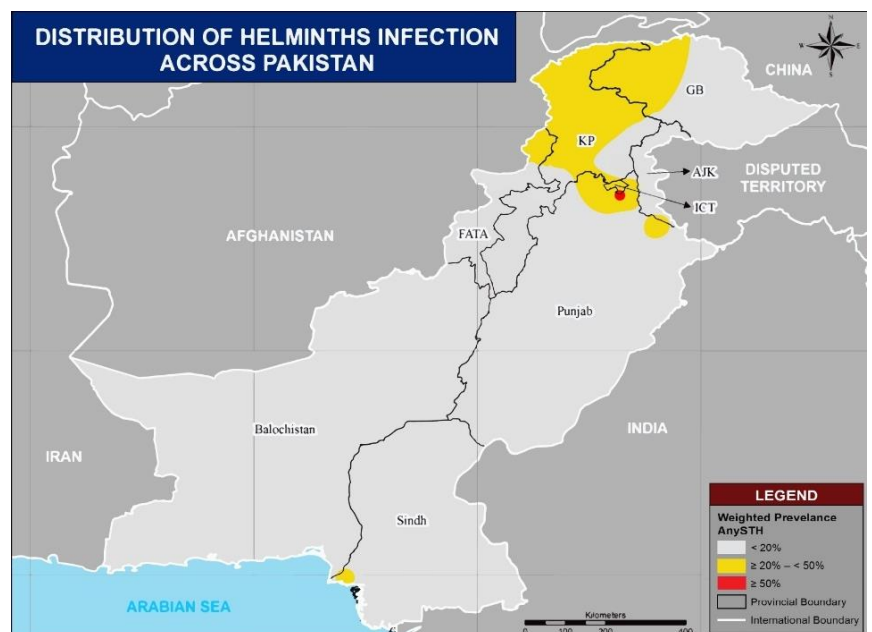
The findings from this nationwide survey indicate that STH appears to be focused in selected regions of the country. While the overall weighted prevalence of any form of STH across Pakistan is low (6.9%), there are regions where prevalence is significantly higher. Northern regions of Punjab have high prevalence, with Rawalpindi and Gujrat representing the areas of highest prevalence (56% and 31% respectively). STH is endemic across northern regions of KPK, with the highest prevalence around the district of Swat (37%). Much of the southern region of Pakistan have very low levels of infection, with the notable exception of the Karachi area where prevalence reaches 20%.



All three forms of STH (roundworm, whipworm and hookworm) were identified, although hookworm was identified only at low levels. Following the WHO classification of intensity of infection, the majority of infections were of light intensity. The Northern Dry Mountains was the region with the highest levels of moderate or high intensity infections: 13.6% of the population in this ecological zone had moderate or high roundworm infections; and 1.63% had moderate or high whipworm infections. Overall, 1.25% of the sampled population had moderate or heavy intensity roundworm infections, 0.12% had moderate or heavy intensity whipworm infections, and 0.1% had moderate or heavy intensity hookworm infections.

Recommendations

With a baseline established through this survey, Pakistan now has the opportunity to design a targeted deworming program in at-risk areas. The predictive maps developed by this study will serve to inform programmatic decisions regarding what areas are most in need of treatment. The national survey has identified areas with sufficiently high prevalence of STH to warrant pursuing MDAs. In accordance with WHO-recommended strategies we recommend that annual school-based MDAs should be prioritized in regions of northern Punjab, Islamabad, regions of northern KPK and the vicinity of Karachi. Regions in western GB, northern FATA and southern AJK also exceed 20% prevalence, so annual school-based MDAs should also be considered in these regions. While the vicinity of Rawalpindi and Islamabad was identified as warranting biannual MDAs, due to the fact that this is a very focalized area and the prevalence only slightly exceeds the WHO threshold of 50%, we recommend commencing annual deworming – this will allow the authorities in that region to learn how to plan and conduct deworming campaigns, and if needed, biannual strategies can be considered in the future. Following WHO treatment thresholds, the number of administrative units identified



as warranting MDAs is quite limited (40 districts, including Islamabad Capital Territory). In geographical terms, this is a small proportion of the country, but in population terms the target number of beneficiaries is large, with these areas having a combined estimated population of 17 million children in the 5-15 year age group.