



# Deworm the World Initiative: How much Progress India has Made?

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In the review article published in the current issue of *Journal of Laboratory Physicians*, Chopra et al<sup>1</sup> present the analysis on prevalence of soil-transmitted helminthic (STH) infections, retrieved from more than 1,400 published articles until 2021, available on various search engines. Though the data was extracted only from the publications made in English language, the findings are significant. The STH infections have remained neglected tropical diseases and in 2010, the World Health Organization (WHO) took cognizance of this condition more seriously and prepared a framework to assess and treat these infections. The WHO called an expert committee meeting in April 2011 at Geneva and this committee discussed the progress made in the STH elimination program from 2001 to 2010 and strategic plan for 2011 to 2020. The recommendations of this expert committee were later published in 2012.<sup>2</sup> One of the expert committee members (Lesley Drake), had already started working in India under the umbrella organizations of Deworm the World (DtW) and Partnership for Child Development.

In 2009, the State Government of Bihar had already planned to initiate a statewide, evidence-based deworming program. Various other donor agencies and volunteering organizations, such as Innovations for Poverty Action, were also invited to get involved. In the beginning to collect the scientific evidence of true prevalence using standardized parasitological techniques and robust survey instruments, 60 schools of rural Bihar were targeted and 3,000 school children (age 6–14 years) were investigated between 2009 and 2010. The overall prevalence of STH infection in these 3,000 school-age children was found to be 42%, ranging from 10% to 96% and from 23 to 80% in surveyed districts.<sup>3</sup>

After success of the Bihar model, the DtW started several surveys in various other states of India, where high preva-

lence was reported in various publications as shown by the authors of this review in their figures 3, 4, and 5, where hill states are shown significantly high prevalence in multiple studies, which is not surprising yet important, due to the scarcity of safe water leading to poor hygiene.

Very few published studies are available in the literature or included in this review from the urban settings, which are home to heterogeneous populations with varying socioeconomic backgrounds. It is also well established that helminthic infections affect the poorest of the poor of the society. Therefore, to estimate the prevalence of STH in different socioeconomic settings in Delhi National Capital Territory, with a large population of school children in 2011, the fecal samples of 3,251 children under 18 years of age were analyzed for STH worm prevalence and intensity. The parasite prevalence levels in different socioeconomic settings, namely the Municipal Corporation of Delhi (MCD) schools and Delhi government-run schools were analyzed. We included children from Delhi government schools (40 schools, 999 samples), MCD schools (40 schools, 1,108 samples), and Delhi slums (48 slums, 1,144 samples) spread across Delhi. Children in the latter group were school dropouts or never sent to schools, while 525 were preschool children (1–6 years age group). Meerabai Polytechnic College (now Meerabai Institute of Technology) of Delhi acted as hub of the prevalence study and 20% of the samples were randomly checked at the All India Institute of Medical Sciences (AIIMS), New Delhi, India, for quality assurance. The whole work was done in a mission mode under the supervision of various experts including this author (AIIMS, New Delhi), Prof. Lesley Drake (Imperial College London, London, United Kingdom), and Dr. Donald Bundy (World Bank, Washington, DC, United States). The average prevalence of STH infection was 16.09%. *Ascaris* infection was most prevalent (11.84%) followed by

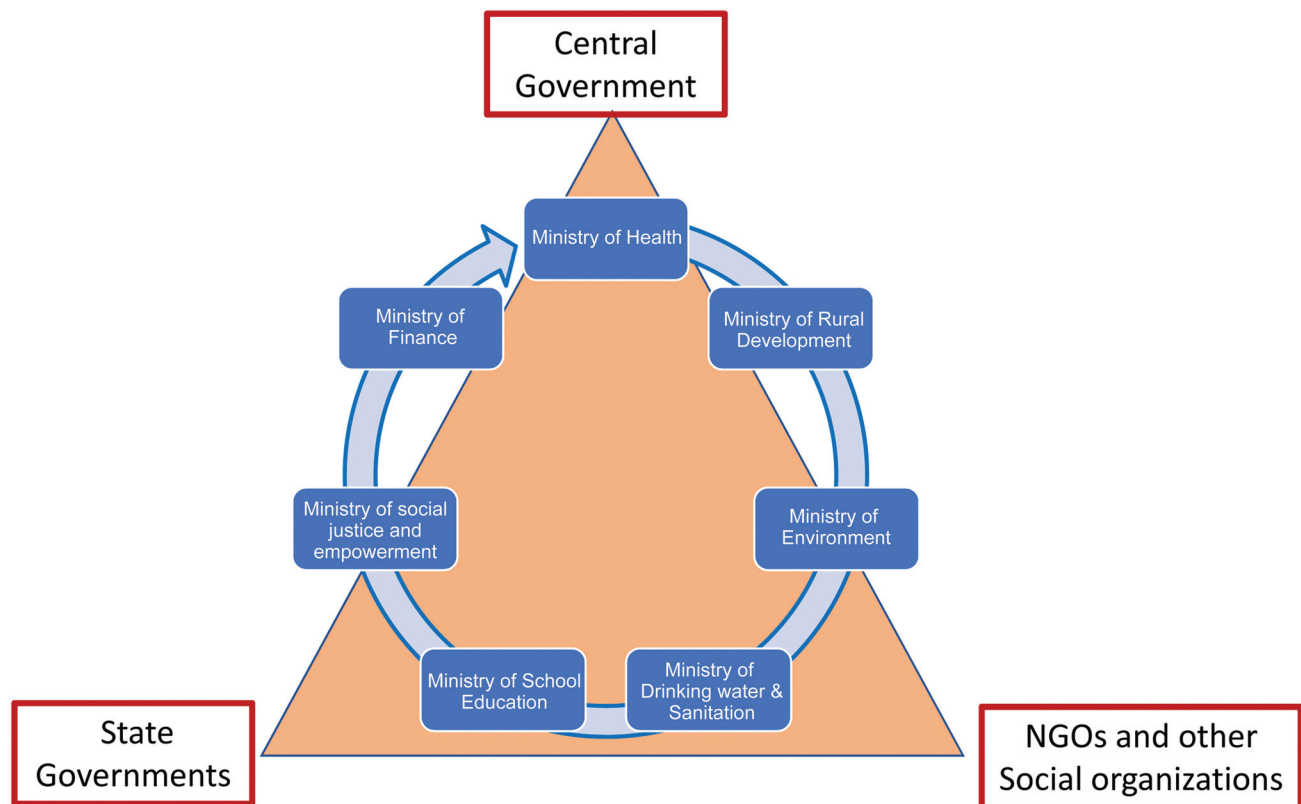
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**Fig. 1** The proposed work plan to eliminate soil-transmitted helminthic infections, no single ministry or state government can achieve the goal. Hence, it is to be a shared responsibility of various stakeholders.

Trichuris infection (5.63%) and hookworm (1.38%) infestation. Worm burden was highest for Ascaris, as determined by eggs per gram count. Burden of infection was significantly associated with the setting from which the individual resided, with the highest worm load of both Ascaris and Trichuris being in the slum dwellers. Interestingly, hookworm load was less in slum dweller as compared with MCD school children. Though this study is not yet published formally, the data was presented in the World Bank Meeting at Washington, DC on November 17, 2012 under the umbrella of Uniting to Combat Neglected Tropical Diseases. On the basis of astonishing results of this study, we concluded that high burden of infections were found in out of school slum dwellers and under 5 years of age. These children form a reservoir of infection and would not ordinarily be included in a school-based deworming program. We also concluded that in designing prevalence surveys and deworming programs in areas with diverse socioeconomic backgrounds, different platforms and strategies must be considered to ensure that the vulnerable and most at-risk members of society are included in health initiatives (Makkar P, Appleby LJ, Stylianou A, Kumar Y, Drake L, Singh S. A prevalence survey and deworming program in an urban setting in India: heterogeneous levels of infection amongst heterogeneous population groups [Unpublished study]).

It needs to be emphasized that worm infestation and consequences in children is not only a health problem which

can be resolved by a single ministry but a national priority. Safe drinking water, poverty alleviation, mandatory primary education, hygiene, and awareness encompassed with appropriate human and financial resources. Several ministries and local governments must join hands to eliminate STH infections, as shown in **Fig. 1**. Minimizing open defecation, which is a major role player, under the Swachh Bharat Mission of Prime Minister of India Mr. Narendra Modi through the Ministry of Jal Shakti, Department of Drinking Water and Sanitation, has made a significant stride in this direction. According to the Government of India, the country has become open-defecation-free in October 2019. Yet, on the ground the facts may be different, and a lot more has to be done.<sup>4</sup>

In India, there are over 250 million children between the age of 5 and 14, with a 97% school enrolment rate, but a large number of children drop out of school, and the heavy STH infestations are one leading reason added with prevalent poverty in the families of these children. The current review even though was not aimed to analyze the effect of deworming before and after the mass drug distribution of anthelmintics was implemented in India. The effect of coronavirus disease 2019 on parasitic infestations, especially when most of the educational activities were through online, and where poor families could not afford these platforms, is yet to be seen and reported.

#### Conflict of Interest

None declared.

## References

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