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School-based mass distributions of mebendazole to control soil-transmitted helminthiasis in the Munshiganj and Lakshmipur districts of Bangladesh: An evaluation of the treatment monitoring process and knowledge, attitudes, and practices of the population☆

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ABSTRACT

Bangladesh's national deworming program targets school-age children (SAC) through bi-annual school-based distributions of mebendazole. Qualitative and quantitative methods were applied to identify challenges related to treatment monitoring within the Munshiganj and Lakshmipur Districts of Bangladesh. Key stakeholder interviews identified several obstacles for successful treatment monitoring within these districts; ambiguity in defining the target population, variances in the methods used for compiling and reporting treatment data, and a general lack of financial and human resources. A treatment coverage cluster survey revealed that bi-annual primary school-based distributions proved to be an effective strategy in reaching school-attending SAC, with rates between 63.0% and 73.3%. However, the WHO target of regular treatment of at least 75% of SAC has yet to be reached. Particularly low coverage was seen amongst non-school attending children (11.4–14.3%), most likely due to the lack of national policy to effectively target this vulnerable group. Survey findings on water and sanitation coverage were impressive with the majority of households and schools having access to latrines (98.6–99.3%) and safe drinking water (98.2–100%). The challenge now for the Bangladeshi control program is to achieve the WHO target of regular treatment of at least 75% of SAC at risk, irrespective of school-enrollment status.

1. Introduction

Globally, an estimated 1.2 billion people are infected with one or more species of intestinal nematodes, the most common being *Ascaris lumbricoides*, *Trichuris trichiura*, *Ancylostoma duodenale*, and *Necator americanus*. These parasites are the causative agents of soil-transmitted helminthiasis (de Silva et al., 2003), one of the most prevalent parasitic infections in the world, the majority occurring in poor populations throughout sub-Saharan Africa, East Asia, China, India and South America (Brooker et al., 2006). Children suffer the most intense worm infections, causing significant harmful effects on both physical health and cognitive development (Brooker, 2010).

In support of the World Health Assembly resolution 54.19, which urges member states to achieve "regular treatment of at least 75% of school-age children at risk of morbidity by soil-transmitted helminth (STH) infections by 2010", the World Health Organization (WHO) recommends regular deworming with broad-spectrum anthelminthic drugs to reduce the parasite burden to a level that alleviates morbidity and decreases transmission (WHO, 2006). Mass preventive chemotherapy is currently considered the cornerstone of STH control, however, as reinfection is common, additional measures such as access to clean drinking water, improved sanitation, and health education are crucial to ensure sustainable control (WHO, 2012).

In Bangladesh, a national parasitological survey revealed that 79.8% of school-age children were infected with one or more helminth species Ministry of Health and Family Welfare, 2010. To

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control STH morbidity, the Bangladesh Ministry of Health & Family Welfare (MOH&FW) piloted a school-based mass drug administration (MDA) of mebendazole in three districts in 2005. The pilot was successfully implemented, and in 2008, a national control strategy was formulated. At the time of the evaluation (January 2010), school-based MDAs were implemented bi-annually, targeting all children between the ages of 6–12. In 2011, the control program expanded the definition of school-age children to include children aged 5 years. In October 2012, the definition of school-age children was expanded again to include children aged 5–14, which is in line with the WHO definition.

Since 2007, mebendazole has been donated (by Johnson & Johnson through Children Without Worms [CWW]) for bi-annual MDAs. At the time of the survey donated mebendazole was distributed in 27 of the 64 districts (website CWW). Donated albendazole (by GlaxoSmithKline through WHO) is distributed annually to treat children and adults in 34 districts where lymphatic filariasis is endemic (WHO, 2011). The remaining districts are treated with albendazole procured by the government. Pre-school children are targeted for deworming through the Expanded Program on Immunization in all districts.

Monitoring and evaluation (M&E) activities are essential for disease control programs, as they provide up-to-date information on program performance, as well as opportunities to identify and resolve issues (Gyorkos, 2003). The percentage of individuals treated within a target population (treatment coverage), is used as the primary indicator to monitor and evaluate the performance of MDAs, as it reflects the performance of most of the program processes. The monitoring of treatment coverage contributes to informed programmatic decisions, allows for identification of challenges encountered during MDAs, as well as geographical areas where the program is performing poorly.

An evaluation of the treatment monitoring process was conducted in the Munshiganj and Lakshmipur Districts of Bangladesh (Fig. 1) using a combination of key stakeholder interviews and surveys. The primary objective was to review the performance of the treatment monitoring process and to identify challenges and solutions. The second objective was to validate reported mebendazole treatment coverage in school age children, and the third objective was to assess water and sanitation conditions in households and schools, and assess knowledge, attitudes, and practices (KAP) of the population regarding water purification methods, awareness of the mebendazole distribution, and STH prevention.

2. Methods

2.1. Study sites

The Munshiganj and Lakshmipur districts were selected to conduct the key stakeholder interviews and surveys due to country representative school enrollment rates, good accessibility, and population size. Munshiganj contains a population of roughly 1.4 million, and Lakshmipur a population of 2 million inhabitants. In addition, both districts have consistently conducted bi-annual MDAs between 2007 and 2009. For the key stakeholder interviews, the sub-districts Gazaria and Screenagar were randomly selected from Munshiganj district, and the sub-districts Raipur and Ramgati from Lakshmipur district. The evaluation occurred in 2010, from February 25th to March 4th and again on March 15th in Munshigonj district, and from March 7th through the 10th in Lakshmipur district.

2.2. MDA and treatment monitoring

School-based MDAs are implemented bi-annually, targeting all school-age children. Each school director participates in a training given by sub-district health staff prior to each MDA, where they receive information on the benefits of deworming, how to administer the deworming drug, how to respond to (serious) adverse reaction, and how to report treatment data. School directors are then responsible for training the teachers in their respective schools. Health assistants are responsible for distributing mebendazole along with the treatment reporting forms to schools prior to the MDA. On the day of the MDA, each health assistant visits all schools in the assigned working area to supervise the administration of drugs and monitor for adverse events. Treatment data are collected by teachers and health assistants at the school level and submitted to the sub-district level. Here, the data are compiled and reported to the district level, which in turn compiles and submits data to the central level STH program, where the national treatment coverage report is prepared. Districts and sub-districts both set their own timeline for receiving treatment data reports. The central level requires the district level reports to be submitted within one month of the MDA.

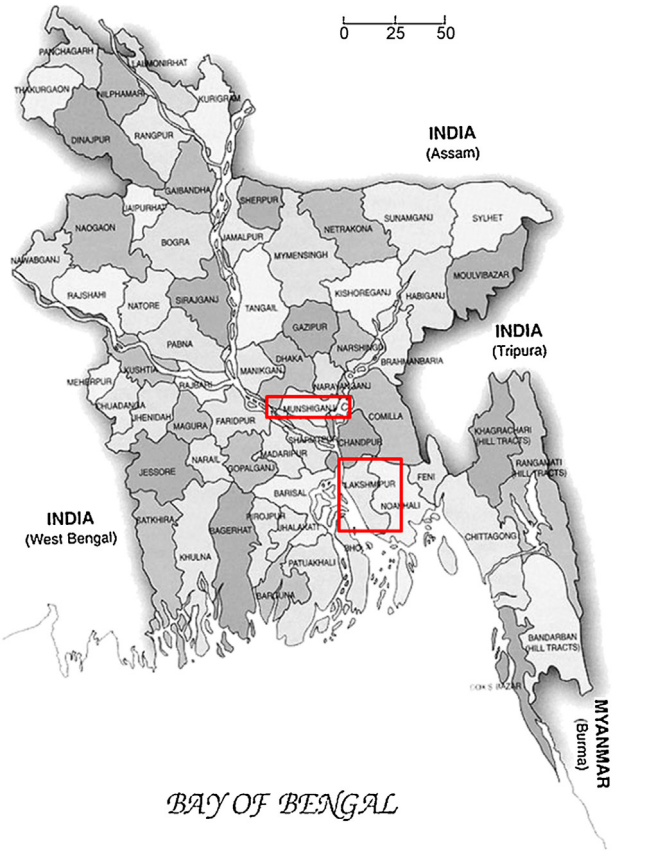

Fig. 1. Munshiganj and Lakshipur study districts, STH treatment evaluation, Bangladesh, 2010.

Source: Google Maps: Bangladesh, 23.402765, 90.439453, Map data 2013 AutoNavi, Retrieved from: http://www.istanbul-city-guide.com/map/country/bangladesh-map.asp.

2.3. Key stakeholder interviews

Separate semi-structured, open-ended, interview guides were prepared for teachers and health and education officers from the sub-district and district levels, as well as for staff members of the STH control program at the central level. From each sub-district, two schools were selected by the sub-district health or education staff for inclusion in the evaluation. In each of the eight participating schools, at least three school staff members were interviewed; the head master/mistress, and at least two teachers. In cases where

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