Summary of preliminary estimations of potential health impacts from increased sanitation coverage through the Swachh Bharat Mission

Introduction

Government of India launched a nationwide programme in 2014 named the Swachh Bharat Mission (SBM) aiming to make India free from open defecation by 02 October 2019 (1,2). WHO was requested by the Ministry of Drinking Water and Sanitation to conduct a study to assess the health gains of the Swachh Bharat Mission Gramin (SBM-G). This summary outlines the main methods, data sources and findings of potential health impacts from SBM.

Findings

The findings of the study include:

- It is estimated that *SBM-G* will result in averting more than 300 000 deaths (diarrhoea and protein-energy malnutrition) between 2014 and October 2019.
- Unsafe sanitation caused an estimated 199 million cases of diarrhoea annually before the start of the SBM in 2014. These have been gradually reducing, and will almost be eliminated when universal use of safe sanitation facilities is achieved by October 2019.
- More than 14 million DALYs (Disability-Adjusted Life Years) are estimated to be avoided (diarrhoea and protein-energy malnutrition) between 2014 and October 2019.

Methodology

WHO estimation of health impacts is based on comparative risk assessment (CRA) methods, which are used extensively in burden of disease assessments (3,4). CRA requires as input data: i) the proportion of the population exposed to the conditions of interest, ii) the exposure-response relationship linking exposure and disease, and iii) the total number of deaths and disease burden by disease, country and year, which are combined through an estimated population-attributable fraction (3,4).

Data sources

- The proportion of the population exposed to basic sanitation services (5) and the proportion of the population living in communities with at least 75% coverage with basic sanitation services[1] are based on different Indian national data sources such as third party surveys (9-11), and SBM-G administrative reporting. Indian population figures were taken from the 2017 Revision of World Population Prospects (12).
- The exposure-response relationship for diarrhoea is based on the most recent systematic review of sanitation intervention studies and impacts on diarrhoea (6). Only direct malnutrition impacts are taken into account, which therefore probably represents an underestimation of the estimated deaths from malnutrition.
- Burden of total disease from diarrhoea for India is based on WHO cause-specific mortality and disease burden by country, 2000-2015 (13,14).

[1] recent accumulating evidence points to larger health impacts of basic sanitation in places where coverage with these services is high, examples are (6–8)

Assumptions

- 100% sanitation services is assumed as an outcome of the SBM by October 2019 Calculations are for health impacts from improvements in sanitation coverage. It is possible that the Swachh Bharat Mission led to additional health gains through changes in personal hygiene (e.g., handwashing behaviour) and consumption of safe drinking water (e.g., reduced risk of faecal contamination of drinking water). Had the different scenarios considered the health impacts from hygiene and drinking-water, estimated health impacts would be larger.
- There is evidence that improvements in drinking water supply, sanitation services and personal hygiene have positive health impacts, e.g., improved nutritional status and its benefits, reduced incidence of infectious diseases such as different neglected tropical diseases and acute respiratory infections in addition to reductions in diarrhoeal disease. Therefore, it is possible that the Swachh Bharat Mission has contributed to additional health impacts, which are not quantified in this assessment.
- The figures used for sanitation coverage are assuming usage of sanitation services. This is consistent with recent National Annual Rural Sanitation Survey (NARSS).
- This modelling study uses data from third party surveys as well as SBM-G administrative reporting and its targets up to October 2019.

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