World Health Organization
India

Estimating potential health gains from increased access to safely managed drinking-water services following the Jal Jeevan Mission initiative

Summary

Introduction

Government of India launched the Jal Jeevan Mission (JJM) in 2019, a nationwide programme designed to provide all households in rural India with safe and adequate drinking-water through individual household tap connections. World Health Organization (WHO) was requested by the Department of Drinking Water and Sanitation, Ministry of Jal Shakti to conduct a study to assess potential health gains and associated cost savings due to increased access in safely managed drinking-water services in India. This summary outlines the methods, data sources and findings of potential health impacts from JJM.

Key findings

- It is estimated that if the Jal Jeevan Mission provided safely managed drinking-water to all of India, this would result in averting almost 400 000 diarrhoeal disease deaths.
- With universal coverage of safely managed drinking water in India, almost 14 million DALYs (Disability Adjusted Life Years) from diarrhoeal disease are estimated to be averted, resulting in estimated cost savings of up to US $101 billion.
- Providing tap connection to every household would result in significant time saved on water collection (66.6 million hours each day), especially among women.

Methods

WHO estimation of health impacts is based on comparative risk assessment (CRA) methods, which are used extensively in burden of disease assessments (Ezzati 2002, Pruss-Ustun 2019). CRA requires as input data: 1) the proportion of the population exposed to the conditions of interest, 2) the exposure-response relationship linking exposure and disease, and 3) the total number of deaths and disease burden by disease, country and year, which are combined through an estimated population-attributable fraction.

The analysis estimated potential health gains from the Mission by comparing two scenarios: the Jal Jeevan Mission scenario assumed that coverage of safely managed drinking-water services in India increases linearly from baseline levels to 100% coverage at the end of the programme, the business-as-usual scenario, assumed improvements in coverage rates are in line with historical annual rates of 0.5 percentage points change per year published by the JMP.

For the economic analysis, the value per DALY averted from the JJM initiative was based on an approach described in the 2001 report of the WHO's Commission on Macroeconomics and Health which assign each life year a value of three times GDP per capita.

Data sources

- Populations: Population data is drawn from the 26th round of the UN Population Division's revision of the World's Population Prospects (UNPD, 2019).
- Exposures: The proportion of the population exposed to safely managed drinking-water services are calculated using a combination of data from the 2018 National Sample Survey (NSS) and data routinely collected by the JJM.

- The exposure-response relationship for diarrhoea is based on the most recent systematic review of sanitation intervention studies and impacts on diarrhoea (Wolf et al. 2022).
- Burden of total disease from diarrhoea for India is based on WHO cause-specific mortality and disease burden by country, 2000-2019 (WHO 2020).
- Estimated health gains from JJM required estimated disease statistics and hypothetical estimates for population exposures especially for the more recent and future years.

Assumptions

- It is assumed 100% access to safely managed drinking water in rural areas as an outcome of JJM. It was also assumed that access to SMDW in urban areas would also increase steadily, reaching 100% by the end of the programme.
- It is assumed that the new water connections provided under the JJM will be used by households.
- It is assumed that the limiting factor for SMDW in urban areas was “availability when needed”, rather than “free from contamination”.
- When modelling the business-as-usual scenario, it is assumed that the annual rate of growth documented by the JMP for basic drinking water services (0.5 percentage points) applies also to safely managed drinking water services.
- It is assumed that the ratio of deaths and DALYs to total population remains the same during the study period.

References

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