ACCESS TO DRINKING WATER AND PUBLIC HEALTH

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As the global development community and India is focusing on advancing universal health coverage and addressing the social determinants of health, improved provision of safe drinking water should be prioritised. It would reduce hospitalisation and child deaths due to diarrhoeal diseases, would improve school attendance and education outcome, improve worker performance and contribute to the economic growth of a country. This would help India in achieving key development goals at the national and state level. India needs all of these and a healthier population and the road is through improved availability of drinking water and better sanitation.

There are many uses of water, and for domestic purpose, we use water to drink, wash, cook, water plants, and many other things. The fact that major civilizations across the world developed/ evolved along rivers is a testament to the relevance of water in human life. Without water there would not have been human civilization, indeed there would be no life. The Indus Valley Civilization (specially Mohenjo-daro and Harappa) had many water supply and sanitation related provisions: public and private baths in urban areas; sewage was disposed of through underground drains built with precisely laid bricks, and a sophisticated water management system with numerous reservoirs was established. Many of these were the first of their kind for human civilization. There is evidence that the Roman Empire had formalized the role of the state in improving health. The Romans believed that the state has the responsibility of well-being of individuals; had a keen sense of sanitation; hygiene and health. The idea of population health or Public health is said to have born in Rome with the development of bath (for hygiene), sewers (drainage) and aqueducts (to supply safe water to cities). Romans brought pure water to all their cities through aqueducts, drained marshes to combat malaria and built sewerage systems amongst other initiatives. Clearly, the modern quest for improving sanitation and provision of safe drinking water is not new.

The scientific linkage and importance of pure drinking water and good health was established around 1840 with experiments and observations of two British physicians and epidemiologists John Snow, who studied the spread of cholera in London from 1848 to 1854 and then William Budd, who followed up on John Snow's work on Cholera and conducted additional observations based on an

outbreak of typhoid fever in rural north of England and concluded that spread was by drinking water. By the beginning of the twentieth century, clean water was being counted as one of the pillars of public health.

Global Development Agenda and Water and Sanitation

The Millennium Development Goals (MDGs), 2000-2015, had the target of reducing the proportion of the world's population without sustainable access to safe water (MDG 7), measured by the population using improved drinking water sources. In 2010, the UN General Assembly (UNGA) explicitly recognized the human right to water and sanitation. Everyone has the right to sufficient, continuous, safe, acceptable, physically accessible, and affordable water for personal and domestic use.

In 2015, 5.2 billion people used safely managed drinking-water services – that is, they used improved water sources located on premises, available when needed, and free from contamination. The remaining 2.1 billion people were without safely managed services (Box 1). In addition, sharp geographic, socio-cultural and economic inequalities persist, not only between rural and urban areas but also in towns and cities where people living in low-income, informal, or unauthorised settlements usually have less access to improved sources of drinking water than other residents. In September 2015, the global leaders agreed to the Sustainable Development Goal (SDG) agenda 2030. The SDG 6 focuses on water and sanitation and target 6.1, calls for universal and equitable access to safe and affordable drinking water. The target is tracked with the indicator of "safely managed drinking water services" – drinking water from an improved water source that is located on premises, available when needed, and free from faecal and priority chemical contamination.

Box 1: Global situation on drinking water availability, 2015

In 2015, Nearly 72% of the world population or 520 Crore (5.2 billion) people used safely managed drinking-water services –they used improved water sources located on premises, available when needed, and free from contamination.

The remaining 210 Crore (2.1 billion or 28%) people were living without safely managed drinking water services. The distribution of these people

- 130 Crore (1.3 billion; 18%) people were living with *basic* services, meaning an improved water source located within a round trip of 30 minutes
- 26.3 Crore (263 million; 3.6%) people were living with *limited* services, or an improved water source requiring more than 30 minutes to collect water
- 42.3 Crore (423 million; 5.8%) people taking water from unprotected wells and springs
- 15.9 Crore (159 million; 2.2%) people were collecting untreated surface water from lakes, ponds, rivers and streams.

Water and Public Health

Safe and readily available water is important for public health. The basic physiological requirement for drinking water has been estimated at 2 liters per person per day. This is minimum for survival and consumption of water (for drinking and otherwise) depends upon lifestyle, climate condition and habits. The domestic use of water is considered for the purpose of drinking, cooking, bathing, washing, flushing of the toilet as well as for watering the plants at home or kitchen or in home-garden. For urban settings, the water availability of 150- 200 liter per person is considered adequate to meet all domestic purposes. In rural India, a norm of 40 liter per person per day is a set target. From the public health view point and to improve quality of life, water should be provided in adequate quantity and it must be available close to the people.

Contaminated water and poor sanitation are linked to transmission of diseases such as Cholera, Diarrhoea, Dysentery, Hepatitis A, Hepatitis E, Typhoid, and Polio. In addition to these water-transmitted diseases, there are water-borne, water-related and water-washed diseases. Absent, inadequate, or inappropriately managed water and sanitation services expose individuals to preventable health risks.

The water borne diseases are considered public health problem due to a number of reasons, which includes (a) their potential to cause large outbreaks; (b) high disease burden; (c) for being major causes of admissions and outpatient visits to the hospitals and health facilities mainly amongst young children; (d) for many water borne diseases, no specific treatment is available and prevention is the best approach and (c) finally, these diseases spread rapidly and may cause panic in the community.

Water Borne Diseases: Globally & in India

Diarrhoea is the most widely known disease linked to contaminated food and water but there are other hazards. Issue of drinking water is closely linked to waste (water) disposal and sanitation. Inadequate management of urban, industrial, and agricultural wastewater means the drinking-water of hundreds of millions of people is dangerously contaminated or chemically polluted. Globally, an estimated 842 000 people die each year due to diarrhoea as a result of unsafe drinking water, sanitation, and hand hygiene. Yet diarrhoea is largely preventable, and the deaths of 361 000 children aged under 5 years could be avoided each year if these risk factors were addressed. Where water is not readily available, people may decide handwashing is not a priority, thereby adding to the likelihood of diarrhoea and other diseases.

The water borne diseases are one of the key health challenges in India. As per official data published in national health profile of India-2018, nearly a quarter or one in every 4 cases reported and one in every 5 deaths reported are attributable to communicable diseases in India.

Access to Drinking Water in Rural India

Rural drinking water supply is a state subject in India. The Ministry of Drinking water and Sanitation (MoDWS) under the centrally sponsored National Rural Drinking water Programme (NRDWP) provides financial and technical assistance to State Government. The NRDWP aims at providing every person in rural India with adequate safe water for drinking, cooking and other domestic basic needs on sustainable basis. A strategic Plan for the rural drinking water sector has been prepared for the period 2011-2022, by the Government of India. The plan aims to extend the piped water supply to more households in the rural areas. The interim goal till 2017 was to cover 50% of all rural households with piped water supply which reportedly has been achieved. By 2022, the goal is to cover 90% rural households. A National Water Quality Sub-Mission was launched by the MoDWS, in March 2017, to address the problem of Arsenic & Fluoride affected habitations in the country and mitigate concerns.

Availability of Water Adversely Affects Health Service Delivery

Availability of water also affects the effective functioning of healthcare facilities where both patients and staff are placed at additional risk of infection and disease when water, sanitation, and hygiene services are lacking. The WHO/UNICEF Joint Monitoring Program (JMP) report, 'WASH in Health Care Facilities', is a comprehensive global assessment of Water, Sanitation and Hygiene (WASH) in health care facilities. It finds that 1 in 8 health care facilities has no water service and 1 in 5 has no sanitation service – impacting close to 900 million and more than 1.5 billion people, respectively. Globally, 15% of patients develop an infection during a hospital stay, with the proportion much greater in low-income countries. In India, in March 2017, nearly 20% of Health Sub-Centres and 4% of Primary Health Centres in rural India did not have access to running water. This adversely affects practices such as Hand washing, which is a very proven and cost-effective health intervention. Yet, lack or insufficient availability of water is amongst the reason that it is not practiced. There are ways available to make improvement in this area. In 2015, WHO & UNICEF jointly developed WASH FIT (Water and Sanitation for Health Facility Improvement Tool). WASH FIT aims to guide small, primary health care facilities in low- and middle-income settings through a continuous cycle of improvement through assessments, prioritization of risk, and definition of specific, targeted actions.

Economic and Social Effects

Improved water supply and sanitation, and better management of water resources, can boost countries' economic growth and can contribute greatly to poverty reduction. When water comes from improved and more accessible sources, people spend less time and effort in physically collecting it,

meaning they can be productive in other ways. Better water sources also mean less expenditure on health, as people are less likely to fall ill and incur medical costs, and are better able to remain economically productive. It is not the drinking water only which is linked to better health. Water, sanitation & Hygiene are interlinked, and the availability of safe drinking water is very much linked to the overall availability of water (for domestic use and otherwise) which in turn affects the overall health of people. With children particularly at risk from water-related diseases, access to improved sources of water can result in better health, and therefore better school attendance, with positive longer-term consequences for their lives. It is estimated that by 2025, nearly half of the world's population will be living in water-stressed areas. There is a need to conserve water, adopt approaches to re-use water, and invest enough resources to ensure the availability of water. This is not only a good return on investment but will result in a healthier and economically productive population with reduced healthcare cost. Ensuring drinking water availability and improving sanitation is a development issue and agenda, which will contribute to economic growth and achievement of many other Sustainable Development Goals in India and globally.

Conclusion:

Drinking water is a human necessity. From the health sector perspective, water & sanitation, hygiene, amongst others are considered Social Determinates of Health, which are attributed to nearly half of the improvements in health outcomes. There is a high burden of water-borne diseases such as diarrhoea, typhoid and hepatitis, which can be prevented with impoved availablity of drinking water. Availability of safe drinking water has a close link with the overall availability of water and sanitation conditions at the household level as well as at health facilities. The sufficient availability of water for sanitation services can facilitate hand hygiene, a proven and cost-effective intervention. As the global development community and India is focusing on advancing universal health coverage and addressing the social determinants of health, improved provision of safe drinking water should be prioritised. It would reduce hospitalisation and child deaths due to diarrhoeal diseases, would improve school attendance and education outcome, improve worker performance and contribute to the economic growth of a country. This would help India in achieving key development goals at the national and state level. India needs all of these and a healthier population and the road is through improved availability of drinking water and better sanitation.

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