

‘Sufficient to Act’ and ‘Desire for More’ — Finding Convergence in Evidence for Public Health Interventions

CHANDRAKANT LAHARIYA

World Health Organization Country Office, New Delhi, India.

lahariyac@who.int

The importance of water, sanitation and hygiene has been recognized for centuries. At the beginning of civilization, the size of human settlements was influenced by the availability of water. Indus valley civilization (Harappa and Mohenjo-Daro) had a sanitation system in the early 3000 BC [1], and personal hygiene has been promoted as religious and cultural practice for centuries. However, the linkage between water, sanitation, hygiene and better health has been scientifically established in the last two centuries. In 1846, Ignaz Semmelwies provided the first scientific proof that washing hands prevents infections. Eight years later, in 1854, John Snow conducted the famous investigation of Broad Street cholera outbreak. This investigation underscored the importance of safe water and improved sanitation [2,3].

After about a century and half, the importance of safe water, sanitation and hygiene (WASH) was realized, acknowledged and supported by the availability of increasing body of evidence. WASH interventions proved beneficial in combating diarrhea, while having a considerable impact on nutrition, complementary food hygiene, school attendance, oral vaccine performance and elimination of neglected tropical diseases [4,5]. WASH interventions have had a reasonable and cumulative effect on child growth in multiple ways. Half of the under-nourishment in the world is a result of factors such as no access to clean water and sanitation, and poor hygiene practices. WASH interventions are cost-effective as well. For every US\$ invested in sanitation, the return on investment is US\$ 5.50 with lower health costs, more productivity and fewer preterm births [6]. In 1990s, unsafe water, unsafe sanitation and improper handwashing were the second, seventh and ninth major risk factors for diseases, respectively. Things have improved in last two and half decades with scale-up of WASH interventions. By the end of 2015, their ranking has fallen to fourteenth, nineteenth and eighteenth, respectively [7]. In India, the WASH risk factors were the

second biggest (~13% of attributable burden) contributors to diseases in 1990, which were brought down to seventh (with 4.6% attributable burden) by 2015 [8].

Despite the progress, the WASH risk factors continue to be the leading causes of health inequities amongst the women and children while having a considerable effect on other vulnerable populations in low- and middle-income countries (LMICs) [6]. The United Nations General Assembly (UNGA) in 2010 had explicitly recognized the human right to water and sanitation [9]. In this background, it is no surprise that the need for safe water was given its due place, earlier in the Millennium Development Goals (MDGs) and now, in the Sustainable Development Goals (SDGs). While the SDG-6 focuses on water and sanitation, the target 6.1 mentions – “By 2030, achieve universal and equitable access to safe and affordable drinking water for all.” The target 6.2 says that “By 2030, achieve access to adequate and equitable sanitation and hygiene for all, end open defecation and pay special attention to the needs of women and girls and those in vulnerable situations.” The achievement of SDG-6 and related targets would contribute to achieve most of the other sixteen SDGs [10].

This issue of *Indian Pediatrics* carries a systematic review on the effects of WASH interventions on growth, non-diarrheal morbidity and mortality in children residing in LMICs [11]. The authors analyze evidence on the effect of WASH interventions on non-diarrheal morbidity and mortality, and report little or no effect on the anthropometric indices in LMICs. In the end, the authors support the ongoing provision of WASH interventions. As this review [11] has reported the quality of evidence to be from ‘low to very low’ for most of the studies, one might be tempted to suggest the need for methodological rigor for studies, including Randomized Controlled Trials (RCTs), specifically for WASH interventions. However, in the research studies and RCTs on WASH interventions, one may face logistical

challenges of randomization, which precludes evidence generation and reduces the quality of evidence. There are logical and ethical arguments against the use of ‘death from diarrhea’ as the principle health outcome of interest. The alternative outcomes, particularly self-reported diarrhea morbidity, have proven validity. A lot of evidence in this field is based upon consensus and plausibility of WASH interventions contributing to a number of additional benefits. A parallel challenge in LMICs is failure to introduce and scale-up of public health interventions with sufficient evidence and proven cost effectiveness. The setting-specific evidence that can stand all scrutiny is not always available and feasible. Conducting such studies requires a large sample size, long follow-up, and a lot of financial resources, which is not always possible in LMICs. Research would prove an important tool in achieving universal health coverage and SDGs [12]. The untiring desire to generate additional scientific evidence contributes to the advancement of medical science and public health. However, scientific community is also mindful of the fact that no randomized control trials have been conducted to check the effectiveness of parachute in gravitational challenges and injury prevention [13]. In public health, there is ample evidence (on many aspects) concerning the scaling-up of interventions. The situation demands convergence between academicians and the policy makers/program managers to ensure that introduction and scaling-up of interventions is not unnecessarily delayed for want of additional and impeccable evidence [12,14]. The additional studies on benefits of WASH interventions would contribute to a pool of scientific evidence; however, the immediate programmatic relevance and utility of all new findings might remain arguable.

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REFERENCES

- De Feo G, Antoniou G, Fardin HF, El-Gohary F, Zheng XY, Reklaityte I, *et al*. The historical development of sweres worldwide. *Sustainability*. 2014;6:3936-74.
- World Health Organization. WHO Guidelines on Hand Hygiene in Health Care. WHO: Geneva; 2009. Available from: http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf?ua=1. Accessed March 31, 2018
- Brody H, Rip MR, Vinten-Johansen P, Paneth N, Rachman S. Map-making and myth-making in Broad Street: the London cholera epidemic, 1854. *Lancet*. 2000;356:64-8.
- United Nations. UN Millennium Development Goals (MDGs). Available from: <http://www.un.org/millenniumgoals/>. Accessed March 31, 2018.
- Mills JE, Cumming O. The Impact of Water, Sanitation and Hygiene on Key Health and Social Outcomes: Review of Evidence. SHARE and UNICEF: 2016. Available from: https://www.unicef.org/wash/files/The_Impact_of_WASH_on_Key_Social_and_Health_Outcomes_Review_of_Evidence.pdf. Accessed March 31, 2018.
- World Health Organization. Water, Sanitation and Hygiene. Available from: http://www.who.int/water_sanitation_health/en/. Accessed March 31, 2018.
- GBD 2015 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*. 2016;388:1545-602.
- India State-Level Disease Burden Initiative Collaborators. Nations within a nation: variations in epidemiological transition across the states of India, 1990–2016 in the Global Burden of Disease Study. *Lancet*. 2017; 390: 2437-60.
- United Nations. The Human Right to Water and Sanitation. Resolution 64/292. United Nations General Assembly. 2010. Available from: http://www.un.org/waterforlifedecade/human_right_to_water.shtml. Accessed March 31, 2018.
- United Nations. Sustainable Development Goals or SDGs. Available from: <https://sustainabledevelopment.un.org/sdgs>. Accessed March 31, 2018.
- Gera T, Shah D, Sachdev HS. Impact of water, sanitation and hygiene interventions on growth, non-diarrheal morbidity and mortality in children residing in low- and middle-income countries: a systematic review. *Indian Pediatr*. 2018;55:381-93.
- World Health Organization. World Health Report 2013: Research for Universal Health Coverage. WHO: Geneva; 2013. Available from: http://apps.who.int/iris/bitstream/10665/85761/2/9789240690837_eng.pdf?ua=1. Accessed March 31, 2018.
- Smith GCS, Pell JP. Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials. *BMJ*. 2003; 327: 1459-61.
- Lahariya C, Menabde N. Evidence to implementation continuum for universal health coverage. *Lancet Infect Dis*. 2015;15:250-1.