

Chapter 6

Interactions Between Health and Socio-Culture in Sanitation



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Abstract This part discusses sanitation from the perspectives of health and well-being. In particular, we focus on the socio-cultural aspects of water, sanitation, and hygiene (WASH) in relation to health. First, we discuss the social determinants of health (SDH) with an in-depth focus on the gender, cultural, and economic disparities that impact access to quality sanitation. We also spotlight sanitation workers, who play a significant part in existing sanitation systems yet unquantified and ostracized. Furthermore, as theoretical underpinnings, we review methodologies to behavioral changes including information dissemination, education approach, and community-based approach. Subsequently, we introduce the three chapters that constitute this part. Chapter 7 examines relationships between child health (e.g., undernutrition and diarrhea) and its associated factors (e.g., water, sanitation, and hand hygiene) in Indonesia. In Chap. 8, we argue the transfer of health risks in sanitation and its social allocation (i.e., genders) in Vietnam. Finally, in Chap. 9, we introduce Participatory Action Research (PAR) involving local children and youth in tackling WASH issues in Sub-Saharan Africa (Zambia). In the end, we reemphasize SDH by mentioning socio-cultural aspects of health and attitudinal and behavioral changes on WASH in society through community-based approach.

Keywords Water, sanitation and hygiene · Socio-culture · Health and well-being · Social determinants of health

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6.1 Introduction

According to the 2017 World Health Organization (WHO) and United Nations Children's Fund (UNICEF) Joint Monitoring Program report, 2.2 billion people (accounting for one-third of the world's population) cannot access safe drinking water; 4.2 billion people are unable to access safely managed toilets, simultaneously resulting in open defecation among 700 million people (WHO and UNCF 2017). Unsafe drinking water has a massive impact on children's health, with 360,000 children under 5 years old dying of diarrhea each year. In addition to biological and medical factors, psychological, social, and environmental factors are important determinants of health. To date, scholars have placed much emphasis on the relationship between health and materials (e.g., infrastructure, technology, economy, resources, etc.), often neglecting the socio-cultural aspects of health. However, our Sanitation Triangle (in Chap. 1) places these socio-cultural aspects as equally, if not even more essential to health. This gap was also highlighted by WHO in 2008 through the issuance of the Social Determinants of Health (SDH) (Marmo et al. 2008). The SDH refers to the conditions in which people are born, grow, live, work, and age and the systems that shape the conditions of daily life. In terms of health, this would include how educational level impacts family planning decisions, income determines whether soap is purchased for handwashing, or residential area determines the ease of access to health centers. These forces and systems include economic and social policies, development agendas, socio-cultural norms, and political systems. This chapter briefly discusses some specific SDH related to sanitation, such as gender differences, culture, education access, employment, and income. Besides, this chapter also discusses solid waste management as well as human excreta as an important part of sanitation to be addressed.

Quality access to safe drinking water and sanitation is the epitome of an environmental determinant of health. There are micro- (individual, household), meso- (school, workplace, community, local government), and macro- (national, international organizations) targets to consider the determinants that affect health. This part presents examples of the micro- (Chap. 7) and meso- (Chap. 8) subjects. Finally, attempts to change people's behavior and transform society (Chap. 9) are discussed. Knowledge about sanitation and hygiene is required to change people's behaviors. Subsequently, through motivation and attitudes, behavior can be changed. The determinants of behavior change differ at the individual, household, and community levels. For example, at the individual level, knowledge about the routes of transmission of pathogens, health effects, proper toilet use, costs and benefits of toilet use, motivation, and adaptation to lifestyle and daily life are necessary for behavior change. At the household level, roles, responsibilities, and division of labor within the household determine behavior. At the community level, social norms and the ability to maintain and manage sanitation facilities define behavior. Determinants of behavior are also related to the context in which the behavior occurs. For example, there are physical determinants, such as climate, geography, and access to resources, economic determinants, such as access to

goods and services, and institutional determinants, such as the availability of subsidies and enforcement of penalties and/or fines. There are also technical determinants, such as ease of use, location, and cost of sanitation facilities. Thus, the determinants of behavior changes related to sanitation are complex.

A more comprehensive list of the possible determinants of open defecation behavior is as follows: (1) no toilet available, (2) distasteful toilet environment (e.g., smells and dirt), (3) convenience, (4) habit, (5) lack of familiarity with toilets, (6) lack of knowledge of health effects, and (7) lack of substances (e.g., toilet paper) for bodily disposal after defecation. The issue of sanitation is linked to physical health through the dangers of unsafe feces disposal; for instance, pathogenic *E. coli* enters the mouth through various routes, known as the F-diagram (WHO 2018). The following is a summary of the health effects of unsafe sanitation. Direct effects cover:

1. Diarrhea is a major public health problem and the primary cause of illness and death among children under five in low- and middle-income countries (Prüss-Ustün et al. 2014), along with cholera, dysentery, polio, typhoid, and other fecal-oral infections.
2. Neglected tropical diseases, such as soil-transmitted helminth infections (e.g., ascites, hookworm, and blood-sucking worms), schistosomiasis, and trachoma, are a major global burden (WHO 2017).
3. Vector-borne diseases, such as the West Nile fever, lymphatic filariasis, and malaria (Curtis et al. 2002; van den Berg et al. 2013), are caused by poor sanitation that fosters mosquito proliferation.

This results in the physical deterioration of children. In the short term, “wasting” (extremely low body weight for height) and “underweight” (extremely low body weight for age) occur, accompanied by “stunting” (extremely short stature for age) in the long term. Cognitive decline, pneumonia, and anemia can also occur. Long-term poor nutrition, disease, and chronic health conditions lead to reduced educational achievement, school absenteeism, and dropout, which result in lower average income and higher unemployment and poverty. This perpetuates a generational cycle that denies improved quality of life and allows minimal improvements to the government economy.

6.2 Sanitation and Gender

In addition, unsafe sanitation can affect broader well-being. Immediate impacts include anxiety, shame, and embarrassment due to open defecation and communal toilets (Sclar et al. 2018). This expands when sanitation does not meet gender-specific requirements, particularly those of women and girls who are at risk of sexual assault. Multiple studies in low- and middle-income countries have shown that women, girls, and even boys report feeling shame, fear, embarrassment, and experiencing nonpartner verbal and physical violence when defecating due to

inadequate and inaccessible sanitation services. Similar to sanitation discrimination against women and girls, recent studies have also documented that denied access to sanitation facilities among transgender and gender nonconforming people leads to higher odds of suicide attempts and inability to provide private household sanitation that offers visitors and/or guests a safe and private setting to defecate, generating shame and embarrassment among hosts. These discriminations subsequently influence the social and educational engagement of these groups, causing loss of dignity. For example, in addition to inaccessible sanitation, which leads to open defecation, users with poor-quality toilet access have to endure (1) toilet design issues (lack of doors, locks, roofs, and walls), (2) non-gender-segregated toilets, and (3) poorly maintained facilities with feces and urine contaminating the environment, which causes users to feel forced to defecate in ways that erode dignity. Eventually, some people choose to openly defecate and/or develop unsafe sanitation behaviors to avoid the above-mentioned issues with sanitation facilities. Studies have shown that these discriminations and limitations negatively impact the socioeconomic status of women and girls due to school and work absenteeism, among other factors.

Some documented and equally unsafe alternatives to open defecation are the use of flying toilets and chambers and disposing of diapers in solid waste, toilet structures, and open spaces (UNICEF and WHO 2018). In the absence of toilets and in instances where toilets were not easily accessible, a survey of Zambian periurban settlements found that several residents attested to the use of “chambers” within their households, characterized as “easily” disposable or cleanable containers for excrement, for example, buckets, bottles, plastic bags, etc. After use, containers could be emptied into the toilet, disposed of with solid waste, or thrown into open spaces and on rooftops, hence being termed “flying toilets” (Nyambe et al. 2018). Results of a bivariate odds ratio on heads of households with toilet access in one of the surveyed settlements further revealed that women had higher odds for chamber use, which was also linked to higher odds of using unimproved sanitation and higher diarrhea prevalence based on a 2-week recall (Nyambe et al. 2020). A study in a Kenyan informal settlement similarly reported that women most frequently suffered respiratory cough/illness, diabetes, and diarrhea, alongside violence, economic, and social impacts, owing to unsafe and unhygienic sanitation access (Corburn and Hildebrand 2015). When compared to discomfort and risks associated with unsafe sanitation use, chambers may benefit users (Bhatt et al. 2019; Cherunya et al. 2020; Kwiringira et al. 2014). In locations where outdoor toilets are the norm, toilets are far from home, or a fee must be paid for toilet use, chambers would be cost-effective, convenient alternatives for child toilet training, during illness, at night, or in poor weather, for example (Corburn and Hildebrand 2015; Nyambe et al. 2020).

6.3 Health and Socio-Culture

Moreover, in situations where sanitation facilities are inadequate, cultural factors can lead marginalized people, such as women, to engage in riskier behaviors. Due to these common difficulties, women may be encouraged to own chambers as part of their wifely duty to cater to the family's sanitation, even when improved sanitation systems are owned. Sadly, whether it is the use of chambers or unsafe, unhygienic, inaccessible sanitation facilities, the costs of health, nutrition, and safety lead to economic burdens experienced through missed work due to illness or caring for the ill, health-care costs, and toilet and transportation fees (Corburn and Hildebrand 2015; Nyambe et al. 2020). Particularly for women and girls, cultural practices may also stipulate that they do not share a toilet with males during menstruation. In some cultures, women and girls cannot share a toilet regardless of menstruation. Nonetheless, in addition to unsafe sanitation, shame, and embarrassment, cultural beliefs and restrictions have been cited as reasons for girls to be absent from school during menstruation (Chinyama et al. 2019), which highlights the requirement to consider the detrimental impacts of cultures on health.

Strong cultural beliefs passed down through generations can perpetuate discrimination, harmful practices, and attitudes and hinder individual and societal development amidst broader societal changes, even when backed with scientific evidence. This emphasizes the requirement to thoroughly consider the culture and education of locals in the development and implementation of health interventions, including sanitation. Studies on child fecal management provide examples of culture and social norms encouraging and/or allowing unsafe sanitation behaviors despite available infrastructure, because caretakers believe that child feces are insignificant and harmless (Aluko et al. 2017; Cronin et al. 2016). Therefore, disposable diapers are not emptied before discarding them into solid waste and open spaces (Bain and Luyendijk 2015; Sahiledengle 2020). This could be seen as a classic example of introducing hardware (diapers) without software to educate users on proper disposal (Preeti et al. 2016; Sahiledengle 2020). In both chambers and diapers, common societal and cultural practices increase the risk of human-fecal contact and allow for unsafe sanitation that risks the health of household members, the community, and the broader environment through unsafe handling and poor disposal.

The situations above provide evidence that safe sanitation is essential for health, from preventing infectious diseases to improving and maintaining mental and social health. Moreover, the success of safe sanitation depends on its ability to consider societies-specific cultural dynamics by either supporting the culture through offering safe and healthy alternatives or educating the culture about healthy behavior change. In addition to the socio-cultural environment, safe sanitation must consider the costs and utility services available to users for them to adequately use and maintain a safe and hygienic process from start to finish. To reduce the negative impact of sanitation on health, “software” approaches are necessary for changing people's hygiene behavior alongside “hardware”—the building of toilets, sewage systems, and sludge treatment facilities. This is important, because appropriate sanitation facilities would

be meaningless if people did not use or maintain them properly. It is also crucial to ensure the continued use and maintenance of sanitation facilities and proper disposal of infant waste to ensure minimal fecal-human contact.

6.4 Tailored Sanitation Services and Behavioral Changes

With behavior change aimed at the use of safe sanitation, safe sanitation infrastructure must be tailored to match the requirements of the society and consider not only the elimination of fecal-human contact but also (1) diverse groups: culturally appropriate, (2) proper fecal disposal, including diapers, (3) environmentally compatible human waste storage, transport, and treatment facilities, and (4) reliable sanitation systems. This also means that sanitation service providers and workers should be considered. According to the WHO, sanitation workers, such as garbage workers, play a significant role in society, because they “bridge the gap between sanitation infrastructure and the provision of sanitation services . . . often at the cost of their dignity, safety, health, and living conditions.” Despite this, they are “far too often invisible, unquantified, and ostracized (WHO 2019).”

The situation is worse in low- and middle-income countries, which are characterized by a lack of sophisticated sanitation infrastructure, such that solid waste management has been largely dependent on the informal sector of garbage workers (Sharma et al. 2020). Two problematic scenarios are possible given the direct handling of waste. Sometimes, garbage workers execute their duties without proper personal protective equipment (PPE). However, their duties can involve unsegregated waste, sometimes including infected or hazardous materials (e.g., biomedical waste). Both scenarios predispose these workers to a range of health risks daily, such as cuts, wounds, and respiratory and infectious diseases (Kuijter et al. 2010; Rahman et al. 2020; Sai et al. 2020; Sharma et al. 2020). Given that the current war against COVID-19 has generated a massive amount of biomedical and household waste, improper collection, handling, and sorting practices are quite likely to place these workers in great danger of infection and transmission of pathogens. Furthermore, they may also be exposed to social stigmatization from society because of the nature of their work (Hamilton et al. 2019), which requires daily contact with waste by insulating cleanliness from dirtiness among society. This has created the social category of “dirty workers” (Ashforth and Kreiner 1999).

As methodologies for behavior change, information dissemination, educational approaches, community-based approaches, and commercial marketing approaches have been used. An example of an informational and educational approach is the existing methodology called Participatory Hygiene and Sanitation Transformation (PHAST). This approach is a participatory learning method that aims to empower communities to improve hygiene behavior, reduce diarrheal diseases, and promote effective community management of water and sanitation services (WSSCC 2009). While informational and educational approaches aim at individual behavior change, the community-based approach aims at collective behavior change. Community-led

total sanitation is a well-known initiative of the community-based approach, which consists of a series of community-based activities conducted by trained facilitators. This aims to create a sense of disgust and shame among community members about the impact of open defecation on community health and well-being (Kar and Chambers 2008). Another example of an approach aimed at changing the behavior of a group is the community health club (CHC) (Waterkeyn and Cairncross 2005). CHCs maintain a long-term engagement with the target community and hold a series of meetings to address health, hygiene, and sanitation behaviors. CHCs focus on using local resources and innovations to create change, and group activities can establish a new positive norm for improved hygiene and sanitation behavior. In Chap. 9, Nyambe et al. report on Dziko Langa, a club for periurban children and youth in the capital city of Zambia.

6.5 Chapter Overview

This part comprises three chapters that focus on the relationship between health and socio-culture. This was done in two ways: through understanding the socio-cultural factors, which determine how people and communities relate to the hardware (material) available to them; and by discussing the socio-cultural narratives that shape their health interactions. First, Chap. 7 demonstrates that poor personal hygiene at the individual and household levels places children living in periurban settlements at greater risk of malnutrition and diarrhea. Second, Chap. 8 highlights the social allocation of health risk in sanitation that focuses on female farmers' fecal handling and modern sewerages, resulting in transferring health risks along a river. Finally, Chap. 9 discusses PAR involving local children and youth in (1) water, sanitation, and hygiene (WASH) assessment and intervention, (2) development of a self-assessment methodology for fecal contamination, and (3) a visualization approach for local stakeholders.

Chapter 7 introduces a study that aimed to (1) evaluate child health and nutritional status, (2) demonstrate the factors affecting child health and nutritional status with special attention to WASH, and (3) examine fecal contamination on the hands of children and its factors related to fecal contamination. The study was conducted at a preschool and two elementary schools in the densely populated area of Bandung, targeting 228 pairs of children and their caretakers. Anthropometric measurements, handwashing observation, hand bacteria test, and questionnaires were employed. Based on the multivariate logistic regression analysis, using a towel for handwashing practices was significantly associated with an increased risk of stunting. In household environments, the use of tap water compared to tank water as drinking water by children was a significant predictor of the increased risk of stunting and thinness. In addition, children from households that used open containers for water storage significantly predicted an increased risk of diarrhea. Most children (98.7%) had fecal contamination, and girls had significantly fewer *E. coli* cases than boys. *E. coli* occurrences were negatively correlated with handwashing technique, handwashing

with soap (HWWS), and the study's developed WASH index. This indicates the importance of using the proper handwashing technique and HWWS at appropriate times for the reduction of fecal contamination. The findings also indicate that drinking water management at home and proper personal hygiene practices of children are essential for maintaining and promoting child health in urban slums. Regarding the necessity to pay attention to socio-cultural aspects of health, as discussed above, school sanitation is also discussed in Chap. 5 of Part I in terms of menstrual hygiene management (MHM) among schoolgirls in Uganda.

Sanitation can have an enormous impact on the journey of excreta in the living and surrounding environment, which contributes to the reduction in fecal exposure and subsequent fecal-oral infection risk. However, the fluidity of excreta and its associated health risks should be treated cautiously. Based on examples in Vietnam, Chap. 8 demonstrates the transfer of health risks in sanitation and its allocation in society. Along the river, fecal pollutants and the associated health risks were transferred from urban upstream areas to rural downstream areas, causing a massive impact on livelihoods downstream. Resource-oriented sanitation was enabled at the cost of female farmers' health risks through fecal handling, suggesting a gender-related risk allocation. This chapter also emphasizes the health risk allocation that occurs through modern sewerages, in which flushed excreta reaches those who work in them and on-site sanitation along the sanitation service chain. These findings suggest that sound social allocation and mitigation of health risks are indispensable elements in tackling sanitation-related social issues. As shown here, the allocation of health risk in society is discussed based on the case of sanitation workers in India (Chap. 3 of Part II). It also shows that sanitation work allocates not only health risks but also labor and stigma.

Chapter 9 outlines rich and unique experiences and findings from our WASH participatory action research in two periurban settlements in Lusaka, Zambia. The main participants in the chapter are children and youth, who are key but rare actors in WASH intervention, more so because the sub-Saharan African nation has a young population. This chapter will outline the conceptualization of the Dziko Langa Club as a suitable, engaging means of incorporating and empowering children and youth as coresearchers and participants capable of intervening in the periurban WASH environment. It will then elaborate on three research topics: (1) periurban WASH assessment and intervention through participatory approaches, (2) development of a self-assessment methodology for fecal contamination in the living environment, and (3) visualization approaches for community and stakeholder engagement. These topics can be associated with Chap. 13 of Part III, which refers to using existing social relationships in Indonesia that involve local players (i.e., sanitation workers: garbage collectors).

Based on the above description of the three chapters, we re-emphasize social determinants of health with four important key points: (1) software approaches that are attitudinal and behavioral changes with consideration of socio-cultural aspects related to health as well as hardware approaches (e.g., infrastructures), (2) continued attention from the micro- (e.g., individual) to the macrolevel (e.g., community, society), (3) equitable allocation of health risks in households, regions, and society;

and (4) development and implementation of community-based transformation methodologies of attitudes and behaviors toward sustainable solutions.

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