

SUBMISSION OF ASSIGNMENT 2 FOR THE DIPLOMA IN WASH

BY

CHITI CHOMBO

**AN ASSIGNMENT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE AWARD OF DIPLOMA IN WATER, SANITATION AND HYGIENE TO THE
AFRICA CENTRE FOR PROJECT MANAGEMENT**

JUNE 2019

1. Why is hand washing an essential aspect in WASH interventions?

Hand washing is the act of cleaning hands for the purpose of removing soil, dirt, and microorganisms. It is usually done using water and soap or wood ash. It is recommended that we hand washing should be done: (i) before cooking or preparing food, (ii) before eating or before feeding children, (iii) after defecating and after changing or cleaning babies, and (iv) after touching dead bodies.

According to research (Connolly et al., 2004) faecal-oral disease such as cholera and diarrhoea can account for more than 40% of deaths in the acute phase of an emergency. In some emergencies and post-emergency situations, diarrhoea can lead to increased morbidity. For example, in the Kurdish refugee crisis of 1991, diarrhoea was deemed the leading cause of death (Toole and Waldman, 1997).

Handwashing with soap removes germs from hands. This helps prevent infections because:

- People frequently touch their eyes, nose, and mouth without even realizing it. Germs can get into the body through the eyes, nose and mouth and make us sick.
- Germs from unwashed hands can get into foods and drinks while people prepare or consume them. Germs can multiply in some types of foods or drinks, under certain conditions, and make people sick.
- Germs from unwashed hands can be transferred to other objects, like handrails, table tops, or toys, and then transferred to another person's hands.
- Removing germs through handwashing therefore helps prevent diarrhea and respiratory infections and may even help prevent skin and eye infections. (CDC, 2018)

Systematic reviews have constantly shown that hand washing with soap reduces diarrheal disease effectively and there is evidence that handwashing can reduce the risk of diarrhoea by up to 47% (Curtis and Cairncross, 2003; Fewtrell et al., 2005; Luby et al., 2005). Research and evidence of the benefits of handwashing with soap also extend to emergency settings. For instance, in Nyamithuthu, a refugee camp in Malawi, regular provision of soap was associated with a 27% reduction of diarrhea and soap handwashing has also been shown to be an efficient approach for cholera outbreaks (Peterson et al., 1998; Reller et al., 2001; Hutin et al., 2003).

Since one of the main objectives of water supply and sanitation programmes in WASH interventions is to reduce the transmission of faecal-oral diseases, from the above, it is very evident that hand washing is essential in achieving this.

2. What are the main standards in WASH interventions in emergencies?

i. Water Supply Standard 1: Access and Water Quantity

All people have safe and equitable access to a sufficient quantity of water for drinking, cooking and personal and domestic hygiene. Public water points are sufficiently close to households to enable use of the minimum water requirement.

The Key Indicators for this Standard are:

- Average water use for drinking, cooking and personal hygiene in any household is at least 15litres per person per day. This depends on: needs (such as survival needs, basic hygiene practices, basic cooking needs, etc.), water source selection, measurement, quality and quantity, coverage, maximum numbers of people per water source, queuing time, and access and equity.

- The maximum distance from any household to the nearest water point is 500metres. This depends on: needs (such as survival needs, basic hygiene practices, basic cooking needs, etc.), water source selection, coverage, access and equity.
- Queuing time at a water source is no more than 15 minutes. This depends on queuing time.
- It takes no more than three minutes to fill a 20-litre container. This depends on the queuing time, access and equity.
- Water sources and systems are maintained such that appropriate quantities of water are available consistently or on a regular basis. This depends on water source selection, access and equity.

ii. Water Supply Standard 2: Water Quality

Water is palatable, and of sufficient quality to be drunk and used for personal and domestic hygiene without causing significant risk to health.

The Key Indicators for this Standard are:

- A sanitary survey indicates a low risk of faecal contamination.
- There are no faecal coliforms per 100ml at the point of delivery.
- People drink water from a protected or treated source in preference to other readily available water sources
- Steps are taken to minimise post-delivery contamination
- For piped water supplies, or for all water supplies at times of risk or presence of diarrhoea epidemic, water is treated with a disinfectant so that there is a free chlorine residual at the tap of 0.5mg per litre and turbidity is below 5 NTU.

- No negative health effect is detected due to short-term use of water contaminated by chemical (including carry-over of treatment chemicals) or radiological sources, and assessment shows no significant probability of such an effect.

iii. Water Supply Standard 3: Water Use Facilities and Goods

People have adequate facilities and supplies to collect, store and use sufficient quantities of water for drinking, cooking and personal hygiene, and to ensure that drinking water remains safe until it is consumed.

The Key Indicators for this Standard are:

- Each household has at least two clean water collecting containers of 10-20litres, plus enough clean water storage containers to ensure there is always water in the household.
- Water collection and storage containers have narrow necks and/or covers, or other safe means of storage, drawing and handling, and are demonstrably used.
- There is at least 250g of soap available for personal hygiene per person per month.
- Where communal bathing facilities are necessary, there are sufficient bathing cubicles available, with separate cubicles for males and females, and they are used appropriately and equitably.
- Where communal laundry facilities are necessary, there is at least one washing basin per 100 people, and private laundering areas are available for women to wash and dry undergarments and sanitary cloths.

- The participation of all vulnerable groups is actively encouraged in the siting and construction of bathing facilities and/or the production and distribution of soap, and/or the use and promotion of suitable alternatives.

3. Waste Management is becoming one problem in the emergencies. Why?

An emergency is a sudden and unforeseen event that calls for immediate measures to minimise its adverse consequences. Emergencies may force the population to move away from their homes to avoid the impacts. Emergency situations are often caused by disasters such as droughts, floods, earthquakes, disease outbreaks, wars and other conflicts. Displaced people may need temporary settlements which, when they are first established, these settlements will probably lack the infrastructure to deal with the sanitation requirements for a large number of people.

The safe disposal of solid waste is critical for public health, especially during an emergency. Not only will existing solid waste collection and disposal systems be disrupted but there will be extra waste caused by the emergency itself. Initially at temporary settlements for displaced people or refugees there will be no arrangements in place at all for solid waste management. If solid waste is not dealt with quickly, serious health risks will develop, which may further demoralise the displaced community already traumatised by the emergency.

If organic solid wastes (such as food waste) are not managed properly, there are major risks of fly and rodent infestation (particularly rats) and surface water pollution. Solid waste often blocks drainage channels and leads to environmental health problems associated with stagnant and polluted surface water that can lead to drinking water contamination. Uncollected and accumulating solid waste and the debris left after an emergency, natural disaster or conflict may

also create a depressing and ugly environment, discouraging efforts to improve other aspects of environmental health.

The Sphere standard for solid waste management is collection and disposal of solid waste, i.e. “people have an environment that is acceptably uncontaminated by solid waste, including medical waste, and have the means to dispose of their domestic waste conveniently and effectively”. The key indicators in the Sphere standards include:

- People from the affected population are involved in the design and implementation of the solid waste programme.
- Household waste is put in containers daily for regular collection, burnt or buried in a specified refuse pit.
- All households have access to a refuse container and/or are no more than 100metres from a communal refuse pit.
- At least one 100-litre refuse container is available per 10 families, where domestic refuse is not buried on-site.
- Refuse is removed from the settlement before it becomes a nuisance or a health risk
- Medical wastes are separated and disposed of separately and there is a correctly designed, constructed and operated pit, or incinerator with a deep ash pit, within the boundaries of each health facility
- There are no contaminated or dangerous medical wastes (needles, glass, dressings, drugs, etc.) at any time in living areas or public spaces.

- There are clearly marked and appropriately fenced refuse pits, bins or specified areas at public places, such as markets and slaughtering areas, with a regular collection system in place.
- Final disposal of solid waste is carried out in such a place and in such a way as to avoid creating health and environmental problems for the local and affected populations.

4. Discuss how environmental health and sanitation affect the nutritional status of the vulnerable groups

Environmental health addresses all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. Vulnerable group refers to those most frequently at risk in emergencies and include are women, children, older people, people living with disabilities and people living with HIV/AIDS (PLWH/A). In certain contexts, people may also become vulnerable by reason of ethnic origin, religious or political affiliation, or displacement.

Lack of access to **environmental health and sanitation** can affect **vulnerable groups'** nutritional status in many ways. Existing evidence supports at least three direct pathways: via diarrhoeal diseases, intestinal parasite infections and environmental enteropathy. **Environmental health and sanitation** may also impact nutritional status indirectly by necessitating walking long distances in search of water and sanitation facilities and diverting a mother's time away from child care (Fenn et al., 2012).

i. Diarrhoea

Diarrhoea and undernutrition form part of a vicious cycle. Diarrhoea can impair nutritional status through loss of appetite, malabsorption of nutrients and increased metabolism (Caulfield et al., 2004; Petri et al., 2008; Dewey & Mayers, 2011). Frequent episodes of diarrhoea in the first 2 years of life increase the risk of stunting and can impair cognitive development (Grantham-McGregor et al., 2007; Victora et al., 2008). At the same time, undernourished children have weakened immune systems, which make them more susceptible to enteric infections and lead to more severe and prolonged episodes of diarrhoea (Caulfield et al., 2004).

ii. Intestinal Parasitic Infections

Soil-transmitted helminth infections – roundworm, whipworm and hookworm – affect millions of people worldwide (WHO, 2013). Soil-transmitted helminth infections are directly caused by poor sanitation. Helminth eggs and larvae can survive for months in the soil and can infect humans when ingested (e.g. via contaminated water or food), by contact with fomites or by direct contact with the skin when walking barefoot on contaminated soil (hookworm larvae).

Soil-transmitted helminth infections can affect nutritional status by causing malabsorption of nutrients, loss of appetite and increased blood loss. Heavy infections with whipworm and roundworm can impair growth (O’Lorcain & Holland, 2000). Hookworm infections are a major cause of anaemia in pregnant women and children. As many as one third of pregnant women in Africa are at risk of hookworm-related anaemia (Brooker, Hotez & Bundy, 2008), which in turn increases the risk of preterm delivery and low birth weight babies and, eventually, child undernutrition (Black et al., 2013).

iii. Environmental Enteropathy

Enteric pathogens can impair nutritional status even in the absence of symptoms such as diarrhoea. Children living in poor sanitary conditions are exposed to a high load of pathogens, especially between 6 months and 2 years of age, when they start crawling on the floor and putting objects into their mouths (Ngure et al., 2014). Chronic ingestion of pathogens can cause recurring inflammation and damage to the gut, leading to malabsorption of nutrients. This condition is often referred to as environmental enteropathy or environmental enteric dysfunction (Humphrey, 2009).

Researchers suggest that environmental enteropathy may be an important cause of poor growth and may compromise the efficacy of nutritional interventions (Humphrey, 2009; Korpe & Petri, 2012). Several reviews highlighting the mounting evidence for links between unhygienic environments and gut dysfunction have recently been published (Humphrey, 2009; Korpe & Petri, 2012; Prendergast & Kelly, 2012).

5. Assuming you have been appointed to head an organization dealing with health development in your area, describe the critical factors that you will consider in planning for health service in that area.

Health services planning is a process that appraises the overall health needs of a geographic area or population and determines how these needs can be met in the most effective manner through the allocation of existing and anticipated future resources (Thomas, 2003).

Planning will primarily be concerned with developing and supporting a health system that delivers high quality services to the community. Therefore, this will involve aligning existing health service delivery arrangements with changing patterns of need, to make the most effective use of the available resources.

- i. Type of population and population needs- Different populations have different healthcare needs. Assessment of population characteristics (e.g. growth, age groupings, cultural diversity and socioeconomic status) and anticipated changes in these will provide a useful guide for health service delivery. Similarly, by identifying population risk factors (e.g. obesity, smoking and excessive alcohol consumption) that contribute to various health issues, services can be designed to reduce these risks for targeted population groups.
- ii. Existing Health Service Environment- this will involve gathering, analysing and dispensing of information for healthcare planning purposes. It will aim to consider all the factors that may influence the design of service directions, objectives and strategies and their implementation. This includes information such as (i) existing policies, strategies, plans, commitments to which the planning should align, (ii) strategic directions or goals related to the provision of particular services, (iii) known issues that may impact the delivery of the health services in scope, (iv) the status of implementation of previous plans (including lessons learned), (v) general service trends in the literature (e.g. latest clinical evidence, guidelines), etc.
- iii. Profile of the geographical context- An analysis of the geographical catchment will highlight challenges and opportunities the physical area presents in delivering health services. This further involves information such as (i) size, boundaries and major centres of the planning area, (ii) key economic, environmental and social factors that impact health of the population, (iii) areas within the catchment that may have difficulties accessing services, (iv) geographic conditions or infrastructure that present difficulties for service delivery and (v) remoteness of the region.

- iv. Profile of the health status- Analysis of health status and health indicators informs identification of health need, which is essential to any planning process. Epidemiological information may help to identify causes of health burden (significant diseases and health conditions); causes of illness and death; health risk factors and potentially preventable factors; and comparative health status of those in the focus population. Examples of health status profile information include:
- self-reported health status
 - population at risk identification (e.g. incidence and prevalence)
 - mortality data (e.g. rates and causes of death, life expectancy)
 - morbidity data (e.g. rates of illnesses, hospitalisations)
 - burden of disease and injury (e.g. disability adjusted life years).
- v. Other critical factors that I will consider include:
- a. Economic activities, including food production;
 - b. Literacy rates;
 - c. Access to water and sanitation facilities;
 - d. Health resource data (human, material, financial) including distribution and gaps;
 - e. Major health status and health service problems by priority;
 - f. Membership of district health board and facility committees;
 - g. Communication facilities (transport, telephone, radio, roads);
 - h. Major key partners in health in the district, e.g. NGOs, private (for profit and non-profit) community;
 - i. Existing training institutions and training resources;

REFERENCES

- Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M et al. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet*. 382(9890):427–51.
- Brooker S, Hotez PJ, Bundy DA (2008). Hookworm-related anaemia among pregnant women: a systematic review. *PLoS Negl Trop Dis*. 2(9):e291. doi:10.1371/journal.pntd.0000291.
- Caulfield LE, de Onis M, Blössner M, Black RE (2004). Undernutrition as an underlying cause of child deaths associated with diarrhea, pneumonia, malaria, and measles. *Am J Clin Nutr*. 80(1):193–8.
- CDC. (2018) “Show Me the Science - Why Wash Your Hands?” Retrieved Accessed 17 September 2018, from <https://www.cdc.gov/handwashing/why-handwashing.html>
- Curtis, V. and S. Cairncross (2003). “Effect of washing hands with soap on diarrhoea risk in the community: a systematic review.” *Lancet Infect Dis* 3(5): 275-281.
- Dewey KG, Mayers DR (2011). Early child growth: how do nutrition and infection interact? *Matern Child Nutr*. 7(Suppl. 3):129–42.
- Fewtrell, L., R. B. Kaufmann, D. Kay, W. Enanoria, L. Haller and J. M. Colford (2005). “Water, sanitation, and hygiene interventions to reduce diarrhoea in less developed countries: a systematic review and meta-analysis.” *Lancet Infectious Diseases* 5(1): 42-52.

- Grantham-McGregor S, Cheung YB, Cueto S, Glewwe P, Richter L, Strupp B (2007).
Developmental potential in the first 5 years for children in developing countries. *Lancet*.
369(9555):60–70.
- Humphrey JH (2009). Child undernutrition, tropical enteropathy, toilets, and handwashing.
Lancet. 374(9694):1032–5.
- Hutin, Y., S. Luby and C. Paquet (2003). “A large cholera outbreak in Kano City, Nigeria: the
importance of hand washing with soap and the danger of street-vended water.” *J Water
Health* 1(1): 45-52.
- Korpe PS, Petri WA Jr (2012). Environmental enteropathy: critical implications of a poorly
understood condition. *Trends Mol Med*. 18(6):328–36
- Luby, S. P., M. Agboatwalla, D. R. Feikin, J. Painter, W. Billhimer, A. Altaf and R. M. Hoekstra
(2005). “Effect of handwashing on child health: a randomised controlled trial.” *Lancet*
366(9481): 225-233.
- Ngure FM, Humphrey JH, Mbuya MN, Majo F, Mutasa K, Govha M et al. (2013). Formative
research on hygiene behaviors and geophagy among infants and young children and
implications of exposure to fecal bacteria. *Am J Trop Med Hyg*.89(4):709–16.
- O’Lorain P, Holland CV (2000). The public health importance of *Ascaris lumbricoides*.
Parasitology. 121 (Suppl.):S51–S71.
- Peterson, E. A., L. Roberts, M. J. Toole and D. E. Peterson (1998). “The effect of soap
distribution on diarrhoea: Nyamithuthu Refugee Camp.” *International Journal of
Epidemiology* 27(3): 520-524.

- Petri WA Jr, Miller M, Binder HJ, Levine MM, Dillingham R, Guerrant RL (2008). Enteric infections, diarrhea, and their impact on function and development. *J Clin Invest.* 118(4):1277–90.
- Reller, M. E., Y. J. Mong, R. M. Hoekstra and R. E. Quick (2001). “Cholera prevention with traditional and novel water treatment methods: an outbreak investigation in Fort-Dauphin, Madagascar.” *Am J Public Health* 91(10): 1608-1610.
- Thomas, R.K. (2003) *Health Services Planning* New York: Kluwer Academic Publishers
- Toole, M. J. and R. J. Waldman (1997). “The public health aspects of complex emergencies and refugee situations.” *Annu Rev Public Health* 18: 283-312.
- Victora CG, Adair L, Fall C, Hallal PC, Martorell R, Richter L et al. (2008). Maternal and child undernutrition: consequences for adult health and human capital. *Lancet.* 371(9609):340–57.
- WHO (2013). *Global Health Observatory (GHO) data: soil-transmitted helminthiases – global prevalence estimates.* Geneva: World Health Organization
(http://www.who.int/gho/neglected_diseases/soil_transmitted_helminthiases/en/, accessed 2nd October 2015).