

Factors Influencing Sanitation Conditions in Ghana

Abstract

Sanitation and hygiene practices can have a significant impact on the health of individuals and constitute a substantial factor in the transmission of diseases. In developing countries, the provision of adequate sanitation services is an issue which has not been thoroughly addressed. The aim of the research study was to assess the use of sanitation services and hygiene practices in Ghana and to identify factors, particularly socio-cultural factors, which may influence the use of these services. A systematic literature review was conducted to identify relevant research studies published in 2012 or later. The majority of identified relevant publications were found to have occurred in low-income populations. It was found that there are very few private sanitation services: the majority of the population either use public sanitation services, defecate in the home environment or practise open defecation. A substantial portion of the respondents indicated that they did not use the public sanitation services due to cost, poor management, safety fears or lack of privacy. The defecation practices which are engaged in by the majority of low-income populations in Ghana are likely to contribute significantly towards the transmission of diarrheal diseases and are a contributing factor to high child mortality rates that urgently need to be addressed.

Chapter 1 – Introduction

1.1 Introduction

Water is a highly effective disease vector (Hunter, 2003). A contaminated water resource can rapidly affect the utilising population, spreading diseases that can result in severe and prolonged health impacts and even death (Pruss et al., 2002). However, water is a necessity of life and some populations have no alternative options to using contaminated and unsafe water resources (Wright et al., 2016). At the current time, it is estimated that approximately 2.1 billion individuals across the world do not have access to safely managed drinking water resources (WHO/UNICEF, 2017). Whilst the use of unsafe water is the vector by which diseases can be spread, the processes that result in unsafe water resources must also be considered as an intrinsic aspect of the issue. Thus, sanitation and hygiene practices are integral to the ideal of safe water provision for all.

In 2016, the United Nations (UN) issued their Sustainable Development Goals, comprised of 17 key goals for aiding sustainable development (UN, 2018). Goal 6 is 'ensure access to water and sanitation for all' (UN, 2018). Goal 6 encapsulates the fact that clean water, sanitation and hygiene are intrinsically linked and that high standards in all three aspects are necessary to prevent the spread of disease and to ensure good health and well-being (goal 3 of the UN Sustainable Development Goals; UN, 2018). It has been estimated that approximately 80% of the wastewater produced globally is not treated before discharging into the natural environment (UNESCO, 2017). This factor is a highly likely contributor to the contamination of water resources with fecal matter. It is thought that approximately 1.8 billion individuals are utilising water

resources that are contaminated by fecal matter (UN, 2016). A lack of access to clean water and appropriate sanitation services is predominantly an issue in developing countries, in particular those in Africa (see figure 1; Pruss-Ustun et al., 2014). Prior to the UN Sustainable Development Goals, the Millennium Development Goals were implemented by the UN. Under the Millennium Development Goals access to clean water has increased substantially: it has been reported that over 90% of the global population has access to clean water (WHO, 2018). However, sanitation services have not experienced the same level of improvement - it is estimated that only 68% of the global population has access to at least basic sanitation services (WHO, 2018). In figure 2, the use of at least basic sanitation services in each country is shown. It is evident that the provision of clean water resources and sanitation services is lacking in many African countries in comparison to the wider world. The lack of progress in improved sanitation services has been suggested as a factor which is threatening the status of the clean water progress (Monney and Antwi-Agyei, 2018).

Hygiene practices are also a contributing factor to the global issue. Whilst data is more limited regarding global hygiene practices, in figure 3 limited data is shown detailing the availability of basic handwashing facilities. As with clean water and sanitation services, the provision of handwashing services in Africa is lacking.

In general, Sub-Saharan Africa has experienced lower rates of improvement in sanitation and hygiene than other locations (Fuller et al., 2016). The rates of improvement also vary substantially between countries of Sub-Saharan Africa (Munamati et al., 2016). Ghana is an example of a country that has achieved significant progress in access to clean water. Under the UN Millennium Development Goals, Ghana achieved the target for clean water provision ahead of the 2015 deadline (Monney and Antwi-Agyei, 2018). However, the progress in sanitation services and hygiene practices has not been as rapid and has been suggested to be a factor which may threaten the progress made in clean water provision (Monney and Antwi-Agyei, 2018). Sanitation and hygiene development strategies were implemented in Ghana alongside water improvement programmes yet have not seen the same success. For example, in 2012 13.7% of the Ghanaian population had access to safe toilets; by 2015 this figure had only marginally increased to 14.3% (Centre for Science and Environment, 2018). The lack of success of improvement programmes suggests that there are underlying influencing factors which need to be understood to enable the development of targeted strategies to overcome these barriers, thereby preventing a lack of sanitation services and poor hygiene practices from undoing the progress made in clean water services.

1.2 Aim and Objectives

The overall aim of this research study is to assess the factors that have influenced sanitation services and hygiene practices in Ghana. This aim was developed from the clear gap identified between the progress made in improvements to clean water access and improvements to sanitation services and hygiene practices in Ghana even when all three have been prioritised. To achieve the aim of this research, the following objectives will be met:

- To review the current situation in Ghana including the currently and historically implemented improvement programmes.
- To identify links between sanitation services, hygiene practices and diseases/deaths in Ghana.
- To assess what factors are influencing sanitation services and hygiene practices in Ghana and how these factors are exerting influence.
- To develop recommendations for further action strategies to improve sanitation services and hygiene practices in Ghana and the wider world.

The attainment of these objectives will allow robust and accurate conclusions to be drawn related to the overall research aim, which will enable recommendations to be developed for further policy and improvement action strategies for both Ghana and the wider world.

Chapter 2 – Literature Review

In the following chapter a review of the current literature is presented. The topics covered in the literature review include: how sanitation and hygiene practices can influence the spread of disease, what factors can potentially influence sanitation and hygiene practices, and the Ghanaian situation.

2.1 Sanitation, hygiene practices and disease

There are five categories which are commonly used to describe the status of sanitation services, from most desirable to least desirable. These categories are:

- Safely Managed
- Basic
- Limited
- Unimproved
- Open Defecation (JMP, 2017).

Safely managed sanitation services are those where individuals are able to excrete hygienically and the excreta is either contained and treated in-situ, or treated prior to final disposal ex-situ (Mara et al., 2010). Basic sanitation services are those which are classed as improved sanitation service that are not shared (JMP, 2017). Limited sanitation services are those which are shared between households (JMP, 2017). Examples of unimproved sanitation services include buckets and pit latrines with a hanging slab (JMP, 2017). Open defecation occurs when there are no available sanitation services.

In terms of potential impact on health, the least desirable sanitation categories are those which are most likely to have an adverse impact on human health. There are two key reasons for this potential health impact: firstly, the more basic the sanitation service then the lower the likelihood of there being facilities available for handwashing with soap subsequent to service use. Secondly, there is a higher potential of fecal contamination of water resources if the sanitation services do

not provide for adequate treatment and disposal of excreta (Berendes et al., 2017). In figure 4 the pathways for feco-oral disease transmission are shown - it is evident that adequate sanitation and hygiene practices are vital to prevent the spread of disease through fecal matter.

Fecal matter disease transmission is a significant factor in human diseases. In particular, diarrheal diseases are a significant concern. A study conducted by Eisenberg et al., (2007) found that even in scenarios where safe water is available, if the sanitation conditions are lacking then there is a minimal impact of water quality improvements in terms of reducing disease transmission. It has also been found that there are variations in the success of transmission reduction with the implementation of different sanitation improvements. Wolf et al., (2014) found that even in scenarios where the sanitation is described as improved, there is still relatively high potential for disease transmission.

2.1.1 Diarrheal disease burden due to poor sanitation and hygiene practices

The impact of diarrheal disease is disproportionate: children under the age of 5 are most likely to suffer adverse health impacts due to diarrheal diseases (Hetherington et al., 2017). It has been estimated that more than 800 children under 5 die from diseases, predominantly diarrheal, linked to unsafe water, inadequate sanitation and poor hygiene practices (Liu et al., 2016; UN, 2016). In figure 5 a comparison between a lack of access to improved water and sanitation service and deaths in children less than 1 year old is shown. It is evident that there is a higher rate of childhood mortality in regions with lower access to improved sanitation and water resources, which are predominantly classed as developing regions (Ashbolt, 2004). Baker et al., (2016) reported that limited sanitation services, even when shared between only 1 or 2 other households, were a factor increasing the risk of diarrheal diseases in young children. However, this was found to be impacted by the standard of the shared sanitation facility and whether there is access to adequate handwashing stations (Baker et al., 2016).

A meta-analysis conducted by Pruss-Ustun et al., (2014) which examined data collected from 145 countries suggests that in 2012 approximately 280,000 deaths could be attributed to inadequate sanitation and 297,000 deaths to inadequate hand hygiene. When all three aspects (safe water, sanitation and hygiene practices) were considered, it was found that 842,000 deaths in total were attributable to diarrheal diseases linked to these risk factors (Pruss-Ustun et al., 2014). In the same study, it was estimated that 361,000 deaths in children under 5 could have been prevented by access to improved water, sanitation and adequate hygiene practices (Pruss-Ustun et al., 2014). Similar studies have reported the link between all three aspects, with findings typically suggesting that synergistic improvements are needed addressing all three aspects to enable a significant reduction in the potential for diarrheal disease transmission, particularly in young children (Fuller et al., 2015; Lakshminarayanan and Jayalakshmy, 2015; Wolf et al., 2018).

2.2 Factors other than service provision influencing sanitation and hygiene practices

Arguably the most obvious factor influencing sanitation and hygiene is the provision of services and infrastructure - as previously mentioned, there are different categories of sanitation services that are globally recognised. Current evidence suggests that only safely managed sanitation and basic sanitation services will substantially contribute towards a reduction in the transmission of diarrheal diseases (Baker et al., 2016). However, it is not solely the provision of infrastructure for sanitation and hygiene practices that can potentially influence improvements in these factors.

From an economic perspective, it has been identified that there is a variation in the potential health risk to individuals due to economic status (Williams et al., 2016). Rheingans et al., (2012) found that there is a disproportionate occurrence of diarrheal disease in individuals classed as low-income: whilst this was predominantly due to the availability of sanitation services and the hygiene practices implemented, it was suggested that the lower nutritional status was an additional factor increasing susceptibility. Additionally, there was found to be a rural-urban divide, where the urban population was found to be more susceptible to diseases from inadequate sanitation and hygiene practices due to the higher population density, even when the rural populations were found to have lower-quality services (Rheingans et al., 2012). The higher population density is likely to be a contributing factor due to an increased number of individuals utilising the same services (especially in the case of shared sanitation services) and a greater ease of disease transmission between individuals due to increased contact. This would suggest that the provision of safely managed sanitation and infrastructure for best hygiene practices would provide a solution to disrupting the pathways for disease transmission. However, it has been highlighted in other studies that there are additional factors, aside from purely economical influences, that present barriers to improvements.

2.3 The Ghanaian Situation

Over 20% of the Ghanaian population use surface waters to meet their daily needs - this is nearly 6 million individuals (Water, 2018). Concurrently, approximately 67% of the population do not have access to improved sanitation, with many having no access to any sanitation services, approximately 18 million individuals (Water, 2018). Although Ghana met their target for improved water resources established under the UN Millennium Development Goals, improvements in sanitation have been substantially lower and the target for improvements was not reached (Alagidede and Alagidede, 2015). During the time period for the UN Millennium Development Goals, the access to basic sanitation services increased from 6 to 15% in 15 years, a very minimal rate of increase. The UN has reported that since 2011 the access to basic sanitation services has remained static at 15%, with a high rate of individuals continuing to practise open defecation (UN, 2018). The lack of progress in sanitation and hygiene practices has been acknowledged, and targeted improvements, including education programmes, have been outlined in the Ghanaian government's National Community Water and Sanitation Strategy (NCWSS, 2014). Additionally, there is a substantial difference between the access to sanitation services in rural communities in comparison to urban communities. Akpakli et al., (2018) reported

that 19% of urban populations have sanitation services access, whereas only 8% of rural populations have the same access.

There have been reported decreases in the rate of child mortality (in children under 5 years of age; Arku et al., 2016). Arku et al., (2016) investigated the child mortality rates in Ghana between 2000 and 2010 and found that there was a decrease in mortality rates across all districts (see figure 6). It is likely that the access to improved drinking water and improved sanitation services over this time period contributed to the decrease in the child mortality rate (see figure 7; Arku et al., 2016).

The burden of diarrheal diseases in children under 5 in Ghana remains relatively high. A study conducted by Kumi-Kyereme and Amo-Adjei (2016) examined the incidence of diarrhoea in Ghanaian children in relation to the socioeconomic characteristics. It was found that there was no difference in the diarrhoea rates of children in households with improved drinking water resources compared to those with unimproved (Kumi-Kyereme and Amo-Adjei, 2016). However, it was found that there was a significant difference in the reported diarrhoea rates of households with unimproved sanitation facilities, which were found to have a higher reporting of instances of diarrhoea, in comparison to households with improved sanitation facilities where lower rate of diarrhoea were reported (Kumi-Kyereme and Amo-Adjei, 2016). Wang et al., (2017) investigated the exposure of children in 4 neighbourhoods of Accra in Ghana to fecal contamination. It was found that there was a lower exposure rate among children in higher-income areas with access to more improved sanitation services (Wang et al., 2017). In comparison children in lower-income neighbourhoods with lower access to sanitation services and higher rates of open defecation were found to have significantly greater rates of exposure to fecal contamination (Wang et al., 2017).

It has been suggested that whilst there has been a decrease in the rate of child mortality in Ghana, recently the rate of decrease has stalled and no significant decrease in child mortality rate has been achieved over the past few years (Acheampong and Avorgbedor, 2017). One potential explanation for this is the continued high rates of diarrheal diseases among young children in Ghana. Research has indicated that the high level of access to improved water resources means that these continued high rates are unlikely to be primarily due to contaminated water resources (Kumi-Kyereme and Amo-Adjei, 2016). A lack of access to sanitation services and poor hygiene practices have been suggested as potential explanations for the persistence of relatively high child mortality and diarrheal disease rates (Ritter et al., 2018).

2.4 Summary

In summary, it is evident that whilst substantial progress has been made in the provision of safe water resources to the Ghanaian population, this has not been matched by improvements in access to adequate sanitation services or with improvements in hygiene practices. Although sanitation and hygiene have been focal points of government policy and action strategies, including non-governmental organisation-led programmes, there has been a very low relative

rate of access improvement. It is a cause for concern as the poor sanitation services access and poor hygiene practices may counter the improvements and progress made in clean water provision. It is suggested that inadequate sanitation and hygiene practices are also a contributing factor to the stalling of the decrease in childhood mortality rates which has been identified subsequent to 2015. It is therefore important that the factors which are impacting the low rate of sanitation services growth and the poor hygiene practices are understood so that targeted action strategies can be developed.

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