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Open Defecation in Sub-Saharan Africa and Asia: A Review

Kalu Randymay Eja [1], Etim Kimboline Donatus [2], Okon Aniekanabasi Jonathan Okon[2], Eja Matthew Egbobor[2]

[1]Federal Medical Centre, Yenogoa, Bayelsa, Nigeria
[2]Department of Public Health, University of Calabar, Cross River State, Nigeria
email: mattheweja@gmail.com; randymaykalu@gmail.com

Abstract: Although open defecation (OD) is worldwide, its prevalence is more significant in sub-Saharan Africa and Asia. The aim of this study was to review literature on scholarly publications relevant to open defecation in sub-Saharan Africa and Asia, with a focus on open defecation prevalence, factors influencing the open defecation and impacts and interventions by governments and organizations which aim at eliminating open defecation in sub-Saharan Africa and Asia. Internet search for relevant publications on open defecation in many sub-Saharan African and Asian countries were carried out and reviewed. Some findings emerged: 2.3 billion people in the world have no access to sanitation facilities and about 892 million of the total world population are still practising open defecation, while 90% of people who practise open defecation reside in rural areas of sub-Saharan Africa, Central Asia and Southern Asia. Nigeria is placed third in the world in open defecation prevalence after India and China, while India accounts for 60% of the world's open defecation prevalence. With respect to OD prevalence, WHO/UNICEF have ranked Malawi (7%), Uganda (10%), Tanzania (40%), Kenya (17%), Indonesia (35%), India (66%) and Cambodia (69%); Malawi and Uganda have respectively 53% and 35% ownership of improved latrines unlike India (24%) and Cambodia (22%). Factors identified to influence open defecation were lack of sanitation facilities, remoteness, demographic and geographic factors, socio-economic factors and social norms and behavioural patterns. The impacts of open defecation identified were gastrointestinal diseases, loss of women and girl's dignity and privacy, shame and embarrassment, coupled with impact on national GDP. Interventions by WHO/UNICEF and governments targeted provision of improved sanitation for all, which was not met after 15 years of Millennium Development Goals. In other ways, Indian government embarked on sensitization and provision of latrines for rural communities, but little has been achieved. The World Bank has initiated studies in several developing countries, using the conceptual framework of SaniFOAM (Sanitation Focus, Opportunity, Ability, Motivation) aimed at changing the behaviour of rural communities to sanitation and access to and availability to functioning latrines. Overall positive results are lacking. It is recommended that government should do more.
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1. Introduction

Open defecation (OD) has been defined as the act of disposing human waste in garbage bins, water bodies, public areas, forests, farmlands or other open and green spaces (UNICEF/WHO, 2015; Abubakar, 2018). Open defecation has also been referred to as the practice of defecating in open fields, waterways and open trenches without any proper disposal of human excreta (Boschi-Pinto *et al.*, 2009; Jones *et al.*, 2012; Saleem *et al.*, 2019). Open defecation is noted to be more prevalent in Asia and sub-Saharan Africa than other regions of the world (WHO/UNICEF, 2017; Saleem *et al.*, 2019). Saleem *et al.* (2019) reports that despite 15 years of conjunctive efforts under the global action plans like Millennium Development Goals (MDGs), 2.3 billion people have no access to improved sanitation facilities, such as flush latrine or pit latrine, and about 892 million of the total world population are still practising open defecation. Some 90% of people who practise OD reside in rural areas of sub-Saharan Africa, Central Asia and Southern Asia (WHO/UNICEF, 2017; Salem *et al.*, 2019). 25.1% or 46 million people practising OD in Nigeria in 2015 placed Nigeria in the third position in the world in OD prevalence after India and China (Abubakar, 2018). However, using recent Joint Monitoring Program (JMP) prevalence figures in open defecation and latrine ownership in 2011, WHO/UNICEF (2013), reported by O'Connell (2014), has ranked the following sub-Saharan African and Asian countries in

ascending order: Malawi (7%), Uganda (10%), Tanzania (16%), Kenya (17%), Indonesia (35%), India (66%) and Cambodia (69%). The picture also shows that Malawi and Uganda have better improved latrine ownership (53% and 35% respectively) than India (24%) and Cambodia (22%).

Galan *et al*. (2013) analysed seven country-level indices such as the presence of a national sanitation policy, budget line for sanitation, budget allocation, annual per capita GDP, GDP growth, implementation of total sanitation approaches and per capita aid disbursement for 34 sub-Saharan African countries to establish the relationships between these country-level indices and the change in open defecation from 2005 to 2010. It was established that only 3 countries like Ethiopia, Angola and Sao Tome and Principe decreased open defecation by 10% or more between 2005 and 2010, and only Angola was on track to end open defecation by 2015.

It has been reported that over ½ the population of India defecate in the open, and the prevalence of childhood stunting linked to open defecation remains very high in 112 districts, in consideration of some factors such as socio-economic status, maternal education and calorie availability (Spears *et al*., 2013). Many rural communities still have a preference to open defecation. For instance, over 40% of households with a working latrine in Bihar, Haryana, Madya, Pradesh, Rajasthan and Uttar Pradesh, all in India, have at least one member who defecates in the open (Coffey *et al.*, 2014). It has been reported that there are more open defecators in rural than in urban areas in many developing countries like Nigeria (Abubakar, 2018), Indonesia (Kerstens *et al*., 2016), India (O'Reilly *et al*., 2017) and Mali and Tanzania (Gentler *et al*., 2015) beliefs and attitudes toward open defecation that make some communities in Asia and sub-Saharan Africa not to perceive faeces as harmful to the environment or as a source of pollution. This is more particularly so in Bihar, East Java and Kenya (O'Connell, 2014). For instance, farmers from Bihar believe that faeces increase fertility of the land and so it is beneficial for crop production; in East Java, there is a belief that it is not harmful to defecate into water bodies since fish feed on the faeces (O'Connell, 2014).

The aim of this study was to carry out a review of scholarly publications in notable journals and print media on open defecation prevalence and factors that influence and sustain the act, coupled with impact and interventions aimed at eliminating the open defecation.

2. Factors influencing open defecation

Several studies have shown that several factors are determinants of open defecation in most of the regions where OD is prevalent. The factors may be absence of sanitation facilities, socio-economic, cultural, remoteness from urban centres, little or no education and behavioural pattern, etc.

2.1 Remoteness, demographic and geographic factors

O'Reilly *et al*. (2017) has deployed the concept of remoteness as an analytical tool to answer the question of sustainability of open defecation in rural Uttarakhand, India. Remoteness, in this context, means absolute distance, inaccessibility, lack of connectivity to urban centres due to poor roads and infrequent transportation, erratic electricity, and poor healthcare and education services, thus keeping off rural Indians from the craze for sanitation facilities which their counterparts in urban centres enjoy (O'Reilly *et al*., 2017). Similarly, it means the geographic and material infrastructure that separates the urban from underdeveloped rural places (Cook, 2013; O'Reilly *et al*., 2016; Jakimow, 2017). O'Reilly *et al*. (2016) further explain that by remoteness as social distance, it means economic, political and cultural margination or exclusion of certain communities due to extreme poverty and lack of capital and lopsided policies by government. Therefore remoteness is a determinant of open defecation as a function of physical and social distance (O'Reilly *et al.* (2016). Desai *et al*. (2015) carried out an ethnographic fieldwork interviews and observations in India on OD and associated geographic, income, cultural and political factors with open defecation.

In a study exploring the socio-economic, demographic and geographic factors that influence and determine the practice of open defecation among Nigerian households, Abubakar (2018) reports that the practice is significantly influenced by households' place of residence, geo-political region and wealth index as well as by households' head's education level, including ethnicity and gender. It is an unpublished fact that in Nigerian urban centres, night security personnel, homeless beggars and lunatics defecate in open corners, partially because of absence of public toilets in Nigerian urban centres. Coombes & Devine (2010) describe availability of latrine (or toilet) as an external factor influencing open defecation. O'Connell (2014) reports that one of the background characteristics which influences sanitation behaviours is perceptions of physical and geographical conditions, e.g., access to water and social profile.

In India, through the use of questionnaire survey analysis, Coffey *et al*. (2014) observed that age, gender, area of residence, population density, and behaviour were significant factors which influence open defecation. This finding was in the five north Indian states of Bihar, Haryana, Madhya Pradesh, Rajasthan and Uttar Pradesh. Also in India, Hathi *et al*. (2016) investigated the influence of behaviour change on OD, and found that caste system, ethnic

conflict and rural lifestyles were the factors that influence the practice of open defecation. Also, data analysis in Ghana and Ethiopia using multivariable logistic regression (Crocker *et al*., 2017) showed that gender, education, household size, region, access to drinking water and housing characteristics, were determinants of open defecation. The proximity to water bodies and vegetation, behaviour change communication and community-provided subsidies were reported by Mukherjee *et al*. (2012) to significantly influence OD. Cookey *et al*. (2008) reports that in communities of the Niger Delta region of Nigeria, there is an absence of sanitation facilities and direct defecation into water has become a culture. In Bangladesh, Noor & Ashrafee (2004) undertook a household survey, direct observation and focus group discussion study and found that income, prestige, education, religious beliefs and attitudes were key factors influencing open defecation. Sara & Graham (2014) report that in rural Tanzania, income, religion, occupation, livestock ownership, condition of toilet, privacy, safety and prestige are factors that influence the practice of open defecation. Also, areas of residence, health insurance coverage, income, gender, age, education, race and employment status influence OD in South Africa (Kirigia and Kainyu, 2000). Equally, Gentler *et al*. (2015) has found that education is a factor which influences open defecation in India, Indonesia, Mali and Tanzania.

2.2 Absence of sanitation facilities

Some studies have proved that absence of sanitation facilities, among other factors, influences open defecation in many rural communities of developing countries (Coffey *et al*., 2014; O'Reilly *et al*., 2016). O'Connell (2014), researching on factors influencing open defecation and latrine ownership, adopted sanitation behaviour, among other factors, as a factor influencing open defecation in rural communities of developing countries. Access and availability of sanitation facilities is described as the extent to which the promoted product or service is perceived to be available (Conteh and Hanson, 2003; O'Connell, 2014). Latrine ownership varies from country to country especially in sub-Saharan Africa and Asia. Latrine ownership varies from 31% in Cambodia to 93% in Malawi (O'Connell, 2014). The alternative is open defecation for those without latrines. According to O'Connell (2014), if an individual does not have access to a latrine at work or the homestead, open defecation is the usual alternative. Odagiri *et al*. (2017), researching on Community Approaches to Total Sanitation (CATS) in Indonesia, observed that weak social norms as measured by respondents' perceptions around latrine ownership coverage in their communities, a lack of all-year round water access and wealth levels, were significantly associated with slippage occurrences. Slippage rate has been defined by Odagiri (2017) as a combination of sub-optimal use of latrine and OD. O'Connell (2014) reports that in Peru and East Java, having a sanitation facility at home, represents modernity and progress, while in Tanzania, modernity is the most common reason for households to improve existing latrine. One of the key findings that influence OD reported by O'Connell (2014) in his research on "What influences open defecation and latrine ownership in rural household?, findings from a global review", include "access to and availability of functioning latrines, sanitation products, and services, latrine product attributes, i.e., perception of cleanliness and durability; social norms around open defecation; perception of latrine affordability; self-efficacy to build latrines, and competing priorities for other household items". Competing priorities for a low-income household as exhibited in Ghana can be a factor for not owning a latrine due to strong financial stress (Jenkins and Scott, 2007). Okon *et al*. (2017) report that a larger percentage of households in upland and coastal communities of Akwa Ibom State defecate in the open because of absence of sanitation facilities.

2.3 Social norms (or behavioural pattern)

Social norms or behavioural patterns are known to influence OD in different communities in Asia and sub-Saharan Africa. Behavioural pattern or social norms may be cultural. According to Coombes & Devine (2010), behaviour in this context, is an internal factor like belief or knowledge that occurs inside one's mind. It is a social norm. Invariably, some communities in Asia and sub-Saharan Africa see nothing wrong in OD. For instance, in Tanzania, 40% of all survey respondents agree strongly that it is normal to defecate in the open in their communities; in Rajasthan 28% respondents state that OD is a generational practice, while 47% say that they are used to OD; in Bihar, 49% also agree that they are used to OD (O'Connell, 2014; Coffey, *et al*., 2014).

3. Effects of open defecation

3.1 Gastrointestinal diseases

The adverse health effects on 965 million people who practised open defecation in 2015 were enormous (Mara, 2017). The effects were acute and included water-related diseases such as infectious intestinal diseases like diarrhoeal diseases acquired through drinking poor water supplies and sanitation, while the chronic effects included soil-transmitted helminthiasis, increased anaemia, giardiasis, environmental enteropathy, small intestinal bacterial overgrowth and stunting (Mara, 2017). The 965 million people in 2015 had no sanitation facilities and were therefore forced to defecate in the open (WHO/UNICEF, 2015). Spears *et al*. (2013) conducted a research in 112 districts in

India on open defecation, and observed that a 10% increase in open defecation was associated with 0.7% increase in both stunting and severe stunting. It has been reported that poor sanitation is associated with stunting and environmental enteropathy, resulting in increased risk of infectious diseases, poor cognitive development, lower educational outcomes at schools and lower productivity in adult life (Mbuya & Humphrey, 2016; Odagiri *et al*., 2017).

It is worrisome, according to NewsBank (2019), that tones of human faeces from open defecation by Nigerians sadly find their way into canals, rivers, gutters and places where human daily activities occur, hence putting the people at risk of various communicable diseases leading to some of the health challenges currently being experienced in Nigeria. It is reported that careless handling of faeces is dangerous to health, and that one gram of fresh faeces from an infected person can contain about 106 viral pathogens, 106 to 108 bacterial pathogens, 104 protozoan cysts and oocysts, and 20-104 helminth eggs, resulting in the loss of at least 100,000 children of under five years due to diarrhoea, with 90% of cases directly linked to unsafe water and poor sanitation. Evidently, one of the adverse effects of open defecation is water and food pollution by faecal material through run-off input into drinking water sources, and pests and rodents which transfer disease-causing organisms into food. These disease-causing organisms are associated with diarrhoea, typhoid fever, cholera, giardiasis, infantile paralysis (poliomyelitis), etc. (Eja, 2003). Therefore, open defecation poses a significant threat to the environment and human health, safety and dignity, especially for women, girls and children (Desai *et al*., 2015; Abubakar, 2018).

3.2 Effect of open defecation on the safety and dignity of women

Saleem *et al*. (2019), in their systematic review of published literature related to implication of open defecation that goes beyond the scope of addressing health outcomes by also investigating social outcomes associated with open defecation, found that apart from health impact, open defecation increased the risk of women between 13 and 50 years to sexual exploitation, threat to women's privacy and dignity and psychosocial stressors linked to open defecation particularly in low income communities that practise open defecation. Cookey *et al*. (2008) report that in the coastal communities of the Niger Delta region of Nigeria, there are issues of a lack of privacy and distance from the living area of the people. It has also been reported that open defecation poses a significant threat to the environment and human health, safety and dignity for women, girls and children in sub-Saharan Africa and Asia (Desai *et al*., 2015; Abubakar, 2018). Lack of privacy of women associated with open defecation has been discussed by O'Connell (2014) who noted that it is important for people, especially women, to avoid being seen exposing body parts. Further, improved privacy is a key reason for latrine construction for about 45% of latrine owners in Bihar, Kenya and Cambodia; 56% in Rajasthan; and up to 90% in Meghalaya (O'Connell, 2014). In a qualitative research, this has been confirmed from a latrine owner in East Java who agrees that their body parts have to be protected if they have their own toilets (O'Connell, 2014). The notion of shame, embarrassment and humiliation has been reported (O'Connell, 2014). In Kenya, about 89% of households have accepted shame associated with not having a latrine; in Rajasthan (66%) and Bihar (56%), the reason for women to build a latrine is the notion of "feeling embarrassed to be seen uncovered (O'Connell, 2014). In Meghalaya, women particularly feel a sense of humiliation by female open defecation (O'Connell, 2014).

3.3 Socio-economic status

Many communities in sub-Saharan Africa and Asia rarely have access to sanitation facilities either because of government neglect, or because they are not economically viable as to own latrines, and therefore defecate in the open (Abubakar, 2017; Ngwu, 2017). The effect of socio-economic factor that influences open defecation is great. Socio-economic factor in a community brings about inability or ability to own sanitation facilities or lack of education which is important in the elimination of OD (Galan, *et al*., 2013; Desai *et al*., 2015; Park *et al*., 2016). Open defecation is known to have socio-economic and health impacts on national development. For instance, Nigeria loses about N455 billions of her GDP annually to poor sanitation and a third of that cost to open defecation (NewsBank, 2019). O'Connell (2014) observed a positive relationship between a household's socio-economic status and its position on the sanitation ladder. Improved latrine owners were observed to be wealthier and more educated in Rajasthan (O'Connell, 2014).

4. Interventions aimed at eliminating open defecation

Abubakar (2018) states that identifying the factors that influence open defecation is among the vital components of any intervention programme towards tackling OD, and this includes understanding the causes of OD. Also, the understanding helps to identify the drivers and barriers to sanitation facilities utilization (Sara & Graham, 2014; O'Reilly *et al*., 2017). Therefore, several governments, stakeholders and WHO/UNICEF (Desai *et al*., 2015; UNICEF/WHO, 2015) have initiated some interventions, especially as health, dignity and privacy for women, girls and children are human rights

(Abubakar, 2018), due to the failure of Millennium Development Goals (MDGs) which was targeted at improved sanitation that was not met after 15 years, resulting in 2.5 billion people not having access to improved sanitation. It was again highlighted as a key issue in the Sustainable Development Goals (SDGs) (Abubakar, 2018).

There are other forms of interventions to eliminate OD which focus on sensitization and provision of latrines for rural communities but little has been achieved. For instance, in 2014, Indian government initiated the SWACHH BHARAT MISSION (SBM) to eliminate OD by 2019, focusing on increase in the number of households that have latrines and increase in the number of household members using latrines, besides subsidizing building latrines at 80% for those who wanted to build latrines (O'Reilly *et al*., 2017). Even then, 67% of rural households and 13% of urban households defecate in the open (Coffey *et al*., 2014). In Nigeria, National roadmap to eliminate open defecation in 2025 was set up at national level, as well as Water Supply and Sanitation Agency (RUWASA) at state level (Abubakar, 2018) to help recognize the adverse effects of poor sanitation and open defecation; and design a programme to become open defecation free. These intervention initiatives have not yielded full results. Coffey *et al*. (2014) reports that India has seen decades of government spending on latrine construction and sustained economic growth, but rural open defecation has remained stubbornly high.

The government of Indonesia has adopted community approach to total sanitation (CATS) programme to reduce OD, but the outcomes are not seen to be sustainable (Odagiri *et al*., 2017). The failure of this programme was as a result of weak social norms, a lack of all year round water access and economic inequalities (Odagiri *et al*., 2017).

The Water and Sanitation Programme (WSP) of the World Bank, using the conceptual framework of SANIFOAM (Sanitation Focus, Opportunity, Ability, Motivation) has initiated studies since 2006 to develop behaviour change communication (BCC) to sanitation in Cambodia, India, Indonesia, Kenya, Malawi, Peru, Tanzania and Uganda (O'Connell, 2014). This study was aimed at understanding barriers and drivers of improved sanitation and monitor progress of the effectiveness of the behaviour change programme (Devine, 2009). The study also identified access to and availability of functioning latrines, sanitation products and services besides emotional, social and physical drivers which include shame and embarrassment associated with open defecation, as well as perceptions of improved social status, privacy and convenience associated with latrine ownership and use (O'Connell, 2014). This is one of world's efforts by the World Bank to help reduce open defecation.

During a two-day media dialogue on "clean Up Nigeria: Use the Toilet Campaign to End OD" held in Ibadan, Nigeria, UNICEF sanitation specialist said that Nigeria needs not less than two million toilets annually between 2019 and 2025 to achieve the target of universal poor sanitation, and that Nigeria's current delivery of improved toilet was approximately 160,000 per year (NewsBank, 2019). In this sensitization intervention, participants were further told that Nigeria was studying the strategy being implemented by India to get over 550 million of her population out of open defecation; also it was unfortunate that only 13 local governments out of the 774 local governments had been free from open defecation in the country (NewsBank, 2019). Unfortunately, the outcomes of nearly all the intervention programmes appear to be very slow.

5. Conclusion

Asian and sub-Saharan African countries are seen to be bedeviled by open defecation prevalence, promoted by factors such as complete or partial lack of sanitation facilities, remoteness, demographic and geographic factors, socio-economic inequalities, social norms and behavioural patterns. The consequences of this OD prevalence are acute and chronic gastro-intestinal diseases, death of millions of under 5 years old children and stunting of children, shame, embarrassment and loss of dignity and privacy of women and girls in the community. International organizations such as WHO/UNICEF, governments and stakeholders have initiated several intervention programmes to eliminate open defecation, yet little has been achieved. Governments of OD prevalent countries need to do more.

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