THE PREVALENCE OF OPEN DEFECATION IN THE TOLON DISTRICT IN GHANA

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ABSTRACT
Poor sanitation practices are a major health concern for most countries. The prevalence of open defecation is one of the leading factors eroding the gains towards a cleaner environment in most sub-Saharan countries. In Ghana, open defecation is seen to be predominant in rural areas. However, there is limited data on the prevalence of open defecation in these areas. In the absence of sufficient data, one cannot thoroughly assess the successes or failures in the fight against open defecation. Hence, this study aims to determine the prevalence of open defecation in the Tolon District in the Northern part of Ghana. The study employed a quantitative descriptive cross-sectional design, utilizing structured questionnaires to collect data from 132 randomly sampled participants. Data analysis was done descriptively using SPSS software. And results were compared to similar studies elsewhere. The study found that 73.5 % of respondents practised open defecation while 26.% utilised existing facilities such as latrines in their households in the Tolon district**.** There is a relatively higher prevalence of open defecation in the rural part of Ghana, especially in the Northern part of the country. Also, the majority of people do not have access to toilet facilities in rural Ghana. The lack of access to toilet facilities is a major contributory cause of the high prevalence of open defecation in the rural part of Ghana. The study recommends strong sanitation policies and provision of toilet facilities by the Ghanaian government to address the open defecation prevalence in the Tolon District.
Keywords: open defecation, environment, rural, Ghana, sanitation
JEL Code: I10, Y90

1. INTRODUCTION
Poor sanitation is a major public health concern challenging most countries globally. Poor sanitation involves when people in a particular jurisdiction tend to dump liquid and solid waste openly as a way of getting rid of waste (Adamu et al., 2023). For instance, poor sanitation practices may include disposing of waste improperly and open defecation. According to the World Health Organization (2022), poor sanitation practices are responsible for some deadly diseases such as diarrhoea, cholera, typhoid, hepatitis A, dysentery etc. Despite the negative health effects of poor sanitation, 494 million people in the world practice open defecation (WHO, 2022).

Open defecation practice is one of the major poor sanitation practices. Open defecation involves the human practice of defecating outside of an enclosed toilet facility. According to WHO and UNICEF, open defecation involves the practice of defecating in fields, forests, bushes, bodies of water, or other open spaces. Due to the exposed nature of the faecal matter in open defecation, it facilitates the transmission of pathogens that can cause diseases such as diarrheal diseases, which is the second leading contributor to the global burden of disease

(Belay et al., 2022; Buzugbe et al., 2019; Kusumaningtiar et al., 2019). In 2020, more than 5% of the population practised open defecation in 55 countries. According to Belay et al. (2022), open defecation is seen to be practised more in sub-Saharan African (SSA) countries. WHO and UNICEF Joint Monitoring Program (2014) data indicate that nine out of ten people who engage in open defecation live in SSA.

In Ghana, about 17.7% representing more than 5.5 million people practice open defecation according to the 2021 population and housing census. The practice of open defecation in the country varies, but it is high in the northern regions of Ghana and rural areas (Adzawla et al., 2020). WASH Ghana indicates that over 5.7 million Ghanaians engage in open defecation daily. Ghana is classified under countries with 5–25% of the population engaging in open defecation (WHO, 2019) amidst inadequate data on open defecation (Adzawla et al., 2020).

Given the insufficient available data on open defecation in Ghana, most especially in the rural areas of Ghana. This study seeks to determine the prevalence of open defecation in Tolon, a rural District in the Northern Region of Ghana. The findings from this study will provide valuable insight to the policymakers of the country. And give them an outlook on where they should focus in the fight against poor sanitation by way of open defecation. It will also help in closing the widening gap of inadequate data on open defecation in rural Ghana.

Following the introduction, the remaining sections of the paper are organized in the following manner: Section 2 literature review of existing research, section 3 details the specific methodology used in the study, Section 4 deals with the discussion of the results and Section 5 includes the conclusion and policy implications drawn from the study findings.

2. LITERATURE REVIEW

2.1 Theoretical Literature

2.2.1 Theory of change

The Theory of Change is a thorough explanation of how and why the desired change is anticipated to occur in a specific situation (Dhillon & Vaca, 2018). It is particularly concerned with indicating what needs to be done for change initiatives and how they lead to the achievement of desired outcomes. It does this by identifying the desired long-term goals and then working back from these to identify all the conditions that must be in place for the goals to occur. Through this approach, the precise link between activities and the achievement of long-term goals is more fully understood. This leads to better planning, in those activities linked to a detailed understanding of how change happens (Ayaka et.al., 2023). This study employs some portions of the theory of change.

In the context of this study, Ghana's government initiated a change action to improve toilet accessibility in households and communities through the erection of toilet infrastructure. The aim of the initiative was to reduce open defecation to the barest minimum in Ghana. Although some effort has been made, this study takes interest in determining the prevalence of open defecation in a rural part of Ghana, to ascertain if the change initiative to reduce open defecation by the government is yielding results.

2.2 Empirical Literature

Exum et al. (2020) study evaluated the Swachh Bharat Mission's effectiveness in reducing open defecation in Rajasthan, India. The study used a repeated cross-sectional survey design and data from the Performance Monitoring the Accountability 2020 survey which was conducted between October 2016 and July 2018. The sample size was 20485 households. The study found a significant decrease in open defecation practices in rural Rajasthan households, from 63.3% in October 2016 to 45.8% in July 2018. In urban households, open defecation decreased from 12.6% to 9.4%. despite toilet access, 21.7% of rural and 12.1% of urban households reported at least one member continuing open defecation. Novotný et al. (2018)

study explored latrine adoption constraints and open defecation prevalence in rural Jharkhand, India, focusing on social determinants of sanitation practices. The study employeed a cross-sectional research design, using data collected in 2016 from 499 households. Interviews and observations were conducted in the households covering 2966 individuals. The study found that 85% of households in the study area practiced open defecation.

Yogananth and Bhatnagar (2018) assessed open defecation prevalence in rural south India, identifying factots influencing this practice and understanding reasons behind it despite toilet availability. The study conducted a cross-sectional survey in 251 villages of Dharmapuri district. Adults with toilets were randomly selected from the government register and interviewed and a multiple logistic regression analysis was used to determine the factors associated with open defecation among adults. The study found out that 54.8% of respondents practiced open defecation despite having a household toilet, indicating a significant prevalence of this practice in rural south India.

Another study in India by Thakur et al. (2018) aimed to investigate the public and animal health benefits of the Swachh bharat Mission (Clean India Mission) in India. The authors specifically focused on understanding the impact of the mission on sanitation practices and its implication for public and animal health. The study collected data through repeated cross-sectional households survey in the rural areas of Ranchi district, Jharkhand, India. The study findings indicated that about 61 % of rural residents and 10% of city dwellers lack access to toilets, making them more likely to commit open defecation in their immediate surroundings (Thakur et al., 2018). Bauza et al. (2020) aimed to investigate child faeces management practices and faecal contamination in rural Odisha, India. The study focused on understanding the effectiveness of different child faeces management practices in reducing daecal contamination in and arounf households with children under siz years old. The study utilized a cross-sectional research design with data colleted throuhn household surveys, environmental sample analysis and unstructured observations. The study involved 118 households and 373 environmental samples for 80 child defecation events. The findings indicated that 63.7% of children practices open defecation which are disposed more in open fields (41.6%) than latrine disposal (32.3%).

Busienei et al. (2019) aimed to investigate the relationship between latrine structure, design, conditions and the practice of open defecation in Lodwar Town, Turkana County, Kenya. The study employed a quantitative research approach using a cross-sectional survey of 384 households. The data was collected through structured interviews with household heads and direct observations of latrine condition in Lodwar town. The findings indicated that about 51% of Kenyans practice open defecation. The majority of households dispose of their children's faeces in open spaces, while others use the bush for open defecation and disposal of children's faeces.

Nyoni and Nyoni (2020) aimed to understand patterns and probide insights for potential interventions to address open defecation trends in Madagascar. The study used the box-Jenkins ARIMA approach to analyse open defecation trends in Madagascar. The study collected annual data from 2000 to 2017 and forecasted from 2018 to 2022. The study predicted a decline in open defecation practices from approximately 18.9% to almost 17.7% of the total population. The study by Leshargie et al. (2018) aimed to estimate the pooled prevalence of household latrine utilization and its association with the educational status of household heads in Ethiopia using available studies. The researchers conducted a systematic review and meta-analysis using data from various international databases. Four authors independentl extracted data and STATA 13 software was used for statistical analysis. The study found that the pooled prevalence of latrine utilization in Ethiopia was 50.02%, signifying that 49.98% were involved in open defecation. The study deduced that those with low formal education were more likely to use open defecation than those with higher

education, who were more likely to have latrines in their different households (Leshargie et al., 2018).

Delaire et. al (2022) aimed to evaluate the sustainability of open defecation free (OPF) communities in rural Ghana by assessing toilet ownership, usage and open defecation practices in communities that achieved OPF status 3 to 32 months prior to the study. The researchers conducted a cross-sectional study in 109 rural Northern Ghana communities declared ODF between 3 to 32 months prior, collecting data using household surveys. The findings indicates about 75% of communities did not meet Ghana's OPF requirements, 24% no longer owned a toilet while 16% never owned a toiled. The study also indicated 25% of the communities reported practicing open defecation regularly.

Osumanu et al. (2019) aimed to explore the sociocultural and economic factors determining open defecation in the Wa Municipality, Ghana. The study utilized a mied method approach which included administering questionnaires to 367 households that were selected systematically from 21 communities. Additionally, observation and eight key information interviews were conducted and a mixed logit model employed to identify factors that have a significant impact on open defecation. The findings indicated that about 49.8% of households are without toilet facilities in Ghana. The authours noted that open defecation is the most common form of defecating in rural Ghanaian households, followed by using a toilet facility in another house and a public toilet facility. This calls for more work to be done in this regard, especially in the rural part of the country, because they are the most vulnerable groups when it comes to toilet infrastructure.

2.3 Gaps in literature and value addition.

Previous studies have primarily focused on different locations ranging from India in Asia, Kenya in East Africa, Madagascar in the Southeastern coast of Africa and Ethiopia in the Horn of Africa. These studies provided prevalence rates of open defecation in other countries but did not focus on Ghana. Furthermore, though, some studies were conducted in Ghana, they did not focus specifically on Tolon District, a rural area in Northern Ghana. Therefore, this study aimed to fill this that gap by specifically investigating the prevalence of open defecation in the Tolon District in Ghana. By conducting a study on open defecation prevalence, this study aimed to provide a district-specific analysis of open defeacation in the Northern part of Ghana.

3 METHODOLOGY

3.1 Research Design

The study employed a quantitative descriptive cross-sectional design to recruit residents within the Tolon District of Ghana. According to Bloomfield and Fisher (2019), a quantitative research method can be seen as collecting and analysis of numerical data to understand a phenomenon (Olise et al., 2023). Quantitative research produces objective data that can be communicated through statistics and numbers. It also enabled the study to generalize results from a larger sample population by the way of generating numerical data (Mohajan, 2020). The quantitative descriptive cross-sectional design allowed the study to use data to make statistical inferences about the population of interest or to compare subgroups within a population (Andow et al., 2023).

3.2 Study population and Sample size

The study population comprised residents' males and females who are 18 years and above and have stayed in the district for at least three months. The estimated population for the study were 310 community members.

The study employed the below formulae for calculating the sample size.

$$N = z^2 (pq) \div e^2$$

Where: n = Minimum sample size,

P = the proportion of the population which has the variable of interest.

Q = the proportion of the population without the actual variable of interest. Calculated as: (1 - P)

Z is the confidence interval set at 95% and E is the sampling error.

E = margin of error

With the above formulae and a 5% unresponsive rate, the required sample size was 132.

3.3 Sampling Technique

The study employed a probability random sampling technique to select respondents. The technique ensured that there was no bias in the sampling of respondents. And that respondents were randomly selected without personal bias by the researcher.

3.4 Inclusion/Exclusion Criteria

The study included residents who are currently staying in the district and have stayed in the district for more than 3 months. Also, the resident included in the study must be above 18 years and willing to partake in the study.

The study excluded residents who were below 18 years and those who have been at the district for not less than three months. Also, inhabitants who were severely sick, deaf and dumb and those who had not agreed to participate in the study were excluded.

3.5 Data Collection Instrument and procedures

The study deployed a well-structured questionnaire to assemble data from respondents. The questionnaire was written in English Languauge. Participants who could not read and write the English Language were assisted by a trainined personnel fluent in their local language. The personnel verbally conveyed the content of the questionnaire to these participants, and their verbal resposes used to fill out the questionnaire. For participants who were able to read, the questionnaire was given to them to answer by themselves

3.6 Data analysis

Descriptive analysis was utilized in this study to analyze the prevalence of open defecation. Descriptive statistical data such as frequencies expressed in percentages were used to analyze the data collected. Data collected were analyzed using, SPSS version 26. Data was then presented in a table and chart for discussion.

3.7 Methodological Rigor

The study utilized a quantitative research method that incorporated credibility, transferability and dependability. The validity of the study was ensured by the researcher by their careful selection of the research design and methodology that was the most appropriate (Sovacool et al., 2018). All of the respondents to this study answered the same questionnaire, which produced results that were comparable when applied to other groups of participants who had similar characteristics (Guest et al., 2017). Hence, due to how thoroughly the setting, methodology, and participant characteristics have been described, the findings of this study can be applied to similar situations.

4 RESULTS AND DISCUSSION

4.1 Socio-demographic characteristics of participants

In this study, a total of 132 study participants from the Tolon District were recruited and assigned questionnaires. The study produced a 100% response rate. About 24.24% of the respondents were between 18 to 32 years, 43.18% of the participants were between the ages of 31 and 40 years, whilst 32.58% of the respondents were above 41 years. 53.79% of the respondents were males and their female counterparts contribute to 46.21% of the study participants. The majority of the study respondents (91.67%) were married. Also, 83.33% of the study population had no formal education. 82.58% belonged to the Islamic Religion

while 14.39% were Christians. The majority of respondents (96.97 %) were living in rural areas with the majority (73.48%) into farming, while the remainder were into trading (15.15%) and artisanship (11.36%). Table 4.1 below shows the socio-demographic characteristics of the respondent.

Figure 4.1 indicates the prevalence of open defecation among respondents in the Tolon District of the Northern Region. The results showed that 73.5% of the participants practised open defecation in the district. The remaining 26.5% resorted to either public or household toilet facilities.

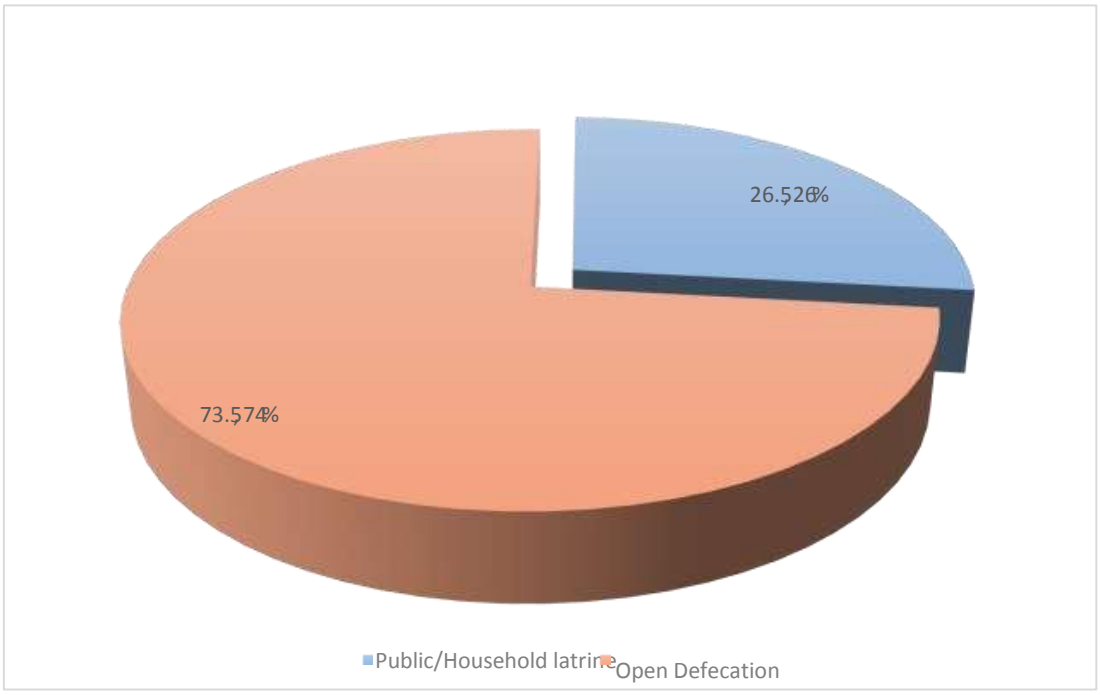

Figure 4.1 prevalence of open defecation in Tolon district
Source: Author's field study (2024)

4.2 Discussions

Findings from the study indicate a prevalence rate of 73.5% of open defecation among respondents of the Tolon District of Northern Ghana. The prevalence of open defecation in this study compared to other reports from different studies indicate a relatively higher prevalence rate. For instance, Yogananth and Bhatnagar (2018) indicate 54.8% of open defecation prevalence in India suggesting a relatively lower prevalence compared to the current study. Again, another study reported a lower prevalence of 56% of open defecation in rural households (Novotný et al., 2018), which demonstrate the prevalence rate of 73.5% in this study is higher. Similarly, another study reported a prevalence of 61% (Thakur et al., 2018) which is still lower than the prevalence rate this study has established. In Kenya, studies by Okullo et al. (2017) indicate a prevalence of about 53% of open defecation in rural households. In Madagascar, a prevalence rate of 47% of open defecation according to Nyoni and Nyoni (2020), is relatively lower than the prevalent rate this study measured. Ajemu et al., (2020) revealed a 56% prevalence rate of open defecation in rural households in Ethiopia.

Consequently, it can be said that the prevalence rate of open defecation in Tolonteristic district is relatively high compared to similar studies. Although the prevalence rate in other studies is not to the barest minimum, they are relatively better than the rate in Tolon district.

The possible reason for the difference in the prevalence rate can be complex. it ranges from socio-economic factors to cultural and behavioural factors (Makhfudli et al., 2017; Adhikari & Ghimire, 2020). For instance, in countries that have better prevalence rates, even though some approved source or a proper place for defecation exists, it may not be adequate to meet the demand of the local people. For example, India's high population put much pressure on the existing toilet facilities, especially in areas where they share a common toilet facility. The increased pressure on this facility generates long queues for which one's inability to wait for his or her turn may result in seeking alternative defecating options such as open defecation. Also, others may directly opt for open defecation based on the perceived long queues at those public toilet facilities. Similarly, other factors that could be accounted for the relatively lower prevalence rate in rural areas among sister African countries compared to that of this study could be that these countries have intensified public education on the need to cease open defecation. And, some efforts have been made to provide appropriate facilities in these jurisdictions, especially in rural areas.

In the case of Tolon district of Northern Ghana, where about 26.5% used toilet facilities, the others are likely to resort to open defecation as confirmed in this study. Also, it can be deduced that the Tolon district, which has at least three hundred inhabitants, do not have enough appropriate toilet facility. This is one of the main factors that contributed to the high prevalence of open defecation in the district. It should be noted that, the passage of solid human excreta (defecation) is a normal physiological functioning of the body and that humans as a matter of necessity must excrete. And as such, when there are no designated facilities to use, one may resort to open defecation. if this practice continues for some time without any proper intervention, the prevalence of open defecation in Ghana will worsen as observed in this study.

5. CONCLUSION AND POLICY RECOMMENDATIONS

Given what has been discussed, the study concludes that there is a relatively higher prevalence of open in the rural part of Ghana, especially in the Northern part of the country. Also, the majority of people living in rural areas do not have access to toilet facilities, which is a major cause of the high prevalence of open defecation in the Tolon district. The study recommends that stakeholders such as the government and non-governmental bodies take a serious look at addressing this menace before it worsens via strong sanitation policies while providing infrastructure support. Also, as part of the current government's initiative to expand access to toilet facilities into households and communities, the study recommends that the Northern part of Ghana should be focused more, because of the significantly higher prevalence in these parts of the country.

This study is limited by its reliance on descriptive analysis and exclusion of modern statistical techniques may have constrined the extent of data interpretation. Future studies should focus on addressing this limitation to improve the accuracy and relevance of data on open defecation practices in the Tolon District. Future studies should also investigate the underlying causes of this prevalence in open defecation in Tolon District.

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Appendix

Table 4. 1 Socio-demographic charac of respondents

Characteristics	Category	Frequency [N=132]	Percentage
Age (years)		**37.94±10.02**	
	18-30	32	24.24
	31-40	57	43.18
	41+	43	32.58
Sex			
	Male	71	53.79
	Female	61	46.21
Marital Status			
	Married	121	91.67
	Single	9	6.82
	Co-Habiting	2	1.52
Educational Status			
	No Formal Education	110	83.33
	Basic Education	21	15.91
	Secondary Education	1	0.76
Religious Affiliation			
	Christian	19	14.39
	Islamic	109	82.58
	Traditional	4	3.03
Residency			
	Rural	128	96.97
	Peri-Urban	4	3.03
Occupation			
	Farming	97	73.48
	Trading	20	15.15
	Artisan	15	11.36