

Research Paper

Examining factors driving inequities in water, sanitation, hygiene, and waste management services in healthcare facilities in Ghana: An analysis of routine national data

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ABSTRACT

In Ghana, little is known about the drivers of inequities of basic water, sanitation, and hygiene (WASH) services in healthcare facilities (HCFs). We aim to examine the status and factors driving access to basic WASH services in Ghana. This survey involved an analysis of routine health service data submitted to the District Information Management System 2 (DHIMS 2). Complete data were available for 1,646 HCFs across Ghana for analysis. Coverage of basic Water, Sanitation and hygiene services was 69, 58, and 64%, respectively. About 50% had a WASH-IPC action plan, and 67% had a WASH-IPC manager who is responsible for the day-to-day WASH management. Regional inequities in access to basic WASH services exist, with the newly established regions and those in Northern Ghana being disadvantaged. Significant drivers of basic WASH services were the location of HCF, the level of service delivery, and availability of a trained facility-based assistant WASH manager. WASH services in Ghanaian HCFs have improved, but it is still not up to the standards set by the Sustainable Development Goals for WASH. Universal access to basic WASH services can be attained by mounting targeted WASH interventions and appointing WASH-IPC managers at all levels of the health system.

Key words: Ghana, healthcare-associated infections, healthcare facilities, infection control, sanitation and hygiene, water

HIGHLIGHTS

- Little is known about the status and drivers of inequities in the provision of basic WASH services in Ghana.
- More than half of the HCFs in Ghana have access to basic WASH services.
- Health system factors and the geographic location of the facilities are related to basic WASH services.
- Urgent targeted WASH actions are required at all levels to bridge the inequity gaps in the provision of WASH services towards UHC attainment.

INTRODUCTION

The availability of basic water, sanitation, and hygiene (WASH) services forms the bedrock for infection prevention and control (IPC) practices, patient safety, disease prevention, antimicrobial resistance control, people-centred health services, and motivation and retention of healthcare workers (WHO 2017). The role of WASH in improving the quality of care is therefore critical (WHO 2017; Bouzid *et al.* 2018). Furthermore, WASH is core to the achievement of health-related Sustainable Development Goals (SDGs) (UN 2016) and is the fundamental element within the context of achieving Universal Healthcare Coverage (Yoder 2017). WASH is critical for reducing healthcare-associated infections, associated maternal and child mortality, and development of antimicrobial resistance (Blencowe *et al.* 2011; Benova *et al.* 2014; Graham *et al.* 2016; Rainey & Weinger 2016; Watson *et al.* 2019; WHO/UNICEF 2020; Donde *et al.* 2021). Hence, the lack of WASH services

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in healthcare facilities (HCFs) poses a significant health risk to patients, staff, and the general population (Rainey & Weinger 2016).

Globally, there are gaps in access to basic WASH services in HCFs (WHO 2020). For instance, the 2023 Global Progress Report on WASH in HCFs shows that 857 million and 780 million people do not have basic water and sanitation services, respectively (WHO & UNICEF 2023). The problem of WASH in HCFs is heightened in Sub-Saharan African countries: i.e., 54% of HCFs in Sub-Saharan African countries have no basic water service, 71% have no basic sanitation services, but there is insufficient data on hand-hygiene services (WHO 2020). This situation in the HCFs threatens IPC practices, health security, maternal and child health, dignity and human rights of careseekers, and health-related SDGs (UNICEF & WHO 2019a, 2019b; WHO & UNICEF 2023).

In Ghana, there is limited data about the status of WASH in HCFs, but a recent study by Ashinyo *et al.* (2021a, 2021b) in COVID-19 treatment centres revealed critical gaps in the provision of WASH services. Additionally, a situational analysis of WASH by Wateraid in the Upper East region of Ghana showed that about 24% of the facilities surveyed had an interrupted water supply. Only 48% of the HCFs had toilets; there were also gaps in access to hygiene services (WaterAid n.d.). The problem of inadequate WASH services continued to persist in HCFs because of insufficient funding, lack of political commitment, inadequate monitoring of the progress of WASH indicators, poor intersectoral collaboration, limited staff capacity, and competing interests of stakeholders (UN/GLAAS 2014; Buxton *et al.* 2019; Ashinyo *et al.* 2021a 2021b).

While studies done by Ashinyo *et al.* and Wateraid provide valuable insights into WASH in Ghanaian HCFs, their findings do not give a clear national picture of the availability of WASH in HCFs in Ghana, especially the variability of these services across the 16 different regions of Ghana. Additionally, a critical appraisal of the studies done by Ashinyo *et al.* (2021a 2021b) and WaterAid (n.d.) showed they did not report their findings according to the Joint Monitoring Programme (JMP) WASH service ladders. The JMP on WASH produces WASH indicators that can be compared internationally; their reporting format is critical in monitoring the progress towards the achievement of WASH-related SDGs (UNICEF & WHO 2019b).

Our objectives for this study were to (1) assess the status of WASH in HCFs in Ghana, and (2) examine drivers of basic WASH services in HCFs. This study is crucial as it will help reveal Ghana's progress in attaining WASH-related SDGs. Achieving the WASH-related SDGs is crucial for population health, Universal Health Coverage, and strengthening the health systems in Ghana.

METHODOLOGY

The study was carried out in Ghana using the District Health Information Management System 2 (DHIMS 2) 2021 WASH data. The secondary data utilised in this study were cross-sectional in nature. These data are reported quarterly by HCFs, and are fed into the national WASH database. The data used in this study were for the last quarter of 2021.

DHIMS 2 was developed and deployed by the Ghana Health Service with technical support from the University of Oslo. It is a free and open access software with unique passwords given to managers and other focal persons to report and access data for informed decision-making. The DHIMS 2 is crucial for collating and analysing routine service data for health managers' decision-making at different levels. DHIMS 2 is implemented across all public health facilities in the 16 regions of Ghana (Figure 1).

The data for WASH in HCFs are collected at the facility level using standardised forms for entry into the DHIMS 2 platform quarterly by trained health information officers. We aggregated the extracted raw data to depict national-level WASH status in HCFs. The data were also segregated by facility type, both hospitals and non-hospitals (Community-based Health Planning and Services (CHPS), Health centres, Maternity homes, Clinics, Polyclinics, and Hospitals), and by the 16 regions of Ghana to depict the status of WASH at different levels of care and by regions.

STUDY VARIABLES MEASUREMENT

The outcomes variables for the study were water, sanitation, hygiene, and waste management. The outcome variables were measured according to the JMP service ladders for monitoring of WASH in HCFs (WHO 2020) (Table 1).

DATA ANALYSIS

The study involved the extraction and analysis of routine WASH-IPC data, which were reported to DHIMS 2 in 2021. The extracted data were cleaned and exported to STATA statistical software for further analysis. The extracted data were analysed



Figure 1 | Map of Ghana depicting the location of the regions (ModernGhana 2019).

using descriptive statistics such as frequencies and percentages for categorical variables. These numerical summaries (frequencies and percentages) were reported for 2021, representing the current state of WASH in HCFs in Ghana.

We recoded the availability of basic water, sanitation, hygiene, and waste management services into binary outcome variables. HCFs were considered to have basic access if they met all indicators for the JMP basic service level (as defined in Table 1). Facilities that did not meet all basic access indicators (i.e., limited or no service) were aggregated into a less-than basic access category (WHO 2020). To know the drivers of basic water, sanitation, hygiene, and waste management services, a stepwise removal of non-significant variables, with the significance of removal set at 0.20 was implemented to arrive at the final variables used in the final models. The potential predictor variables were region of the HCF, level of HCF, availability of the WASH-IPC action plan, availability of a WASH-IPC manager, availability of an assistant WASH-IPC manager, and training for the WASH-IPC manager. It is worth noting that the predictor variables considered for this analysis were those available to the researchers as part of the tool used in reporting WASH-IPC data to DHIMS 2. All analyses were considered statistically significant at p values less than 0.05. The results were reported using odds ratios with their respective confidence intervals and p values.

RESULTS

Characteristics of the HCFs and WASH-IPC structures in Ghana

Complete data were available for 1,646 facilities. The majority (17%) of the facilities were from the Central region of Ghana, followed by the Northern region (12%) and the Greater Accra region (10%). Half (50%) of the facilities had WASH-IPC action plans, 67% of the facilities had WASH-IPC managers, but toilets for disabled persons were lacking in the majority (56%) of the facilities. In Ghana, 58% of the HCFs had basic sanitation services, 64% had basic hygiene services, 69% had basic water services, and less than half (44%) had basic waste management services (Table 2).

Table 1 | JMP service ladders for monitoring of WASH in HCFs

	Water	Sanitation	Hygiene	Waste management
Basic service	Water is available from an improved source on the premises	Improved sanitation facilities are usable, with at least one toilet dedicated for staff, at least one sex-separated toilet with menstrual hygiene facilities, and at least one toilet accessible for people with limited mobility	Functional hand-hygiene facilities (with water and soap and/or alcohol-based hand rub) are available at points of care, and within 5 m of toilets	Waste is safely segregated into at least three bins, and sharps and infectious waste are treated and disposed of safely
Limited service	An improved water source is within 500 m of the premises, but not all requirements for basic services are met	At least one improved sanitation facility is available, but not all requirements for basic services are met	Functional hand-hygiene facilities are available either at points of care or toilets but not both	There is limited separation and/or treatment and disposal of sharps and infectious waste, but not all requirements for basic services are met
No service	Water is taken from unprotected dug wells or springs, or surface water sources; or an improved source that is more than 500 m from the premises; or there is no water source	Toilet facilities are unimproved (e.g. pit latrines without a slab or platform, hanging latrines, bucket latrines) or there are no toilets	No functional hand-hygiene facilities are available either at points of care or toilets	There are no separate bins for sharps or infectious waste, and sharps and/or infectious waste are not treated/disposed of safely

Table 2 | Descriptive statistics of HCFs, and WASH-IPC structures

Variable	Number of HCFs	Percent (%)
Region (location of HCF)		
Ahafo	37	2.25
Ashanti	56	3.40
Bono	24	1.46
Bono East	92	5.59
Central	278	16.89
Eastern	80	4.86
Greater Accra	172	10.45
Northeast	44	2.67
Northern	192	11.66
Oti	29	1.76
Savannah	87	5.29
Upper East	58	3.52
Upper West	118	7.17
Volta	124	7.53
Western	148	8.99
Western North	107	6.50
Level of HCF		
CHPS	860	52.25
Clinic	141	8.57
Health centre	295	17.92
Polyclinic	43	2.61
Maternity home	25	1.52
Hospital	282	17.13
Availability of IPC-WASH action plan		
No	732	50.14
Yes	728	49.86
Availability of WASH-IPC manager		
No	496	33.09
Yes	1,003	66.91
Availability of WASH-IPC assistant manager		
No	749	50.23
Yes	742	49.77
Availability of toilet facility for disabled persons		
No	1,101	75.31
Yes	361	24.69
WASH-IPC manager trained		
No	401	39.17
Yes	602	60.83
Assistant WASH-IPC manager trained		
No	413	55.72
Yes	329	44.28

(Continued.)

Table 2 | Continued

Variable	Number of HCFs	Percent (%)
Type of sanitation service		
No service	107	8.01
Limited service	447	33.48
Basic service	781	58.50
Type of hygiene service		
No service	42	2.96
Limited service	463	32.58
Basic service	916	64.46
Type of waste management service		
No service	186	13.50
Limited service	586	42.53
Basic service	606	43.98
Type of water service		
No service	111	8.39
Limited service	302	22.83
Basic service	910	68.78

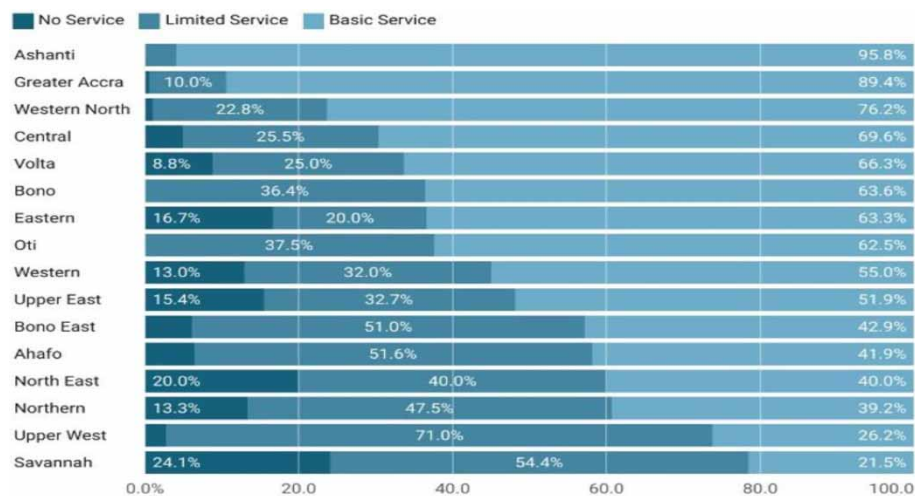
Note: Some cells may not add up due to missing values.

Regional access to basic water, sanitation, hygiene, and waste management services

The segregation of the data by regions indicates major inequalities in access to WASH services. High coverage of basic sanitation services was observed in the Ashanti region (96%), Greater Accra region (89%), and Western North region (76%) (Figure 2). High coverage of basic hygiene services was observed in the Ashanti region (94%), and Bono (91%) (Figure 3). Only 5% of HCFs in the Northeast Region have basic waste management services, and 27% of HCFs in the Western region have no hygiene service (Figure 4). In the Northeast region, only 20% of HCFs have basic water services, and 24% of HCFs in the Savannah region have basic water services (Figure 5).

Drivers of access to basic sanitation and hygiene services in HCFs in Ghana

Access to basic sanitation was more likely in hospitals (OR = 12.40; 95% CI: 6.77, 22.73) and clinics (OR = 2.19; 95% CI: 1.30, 3.71) than in CHPS compounds (Table 3). We observed higher access to basic sanitation services among facilities

**Figure 2** | Types of sanitation services by regions in Ghana.

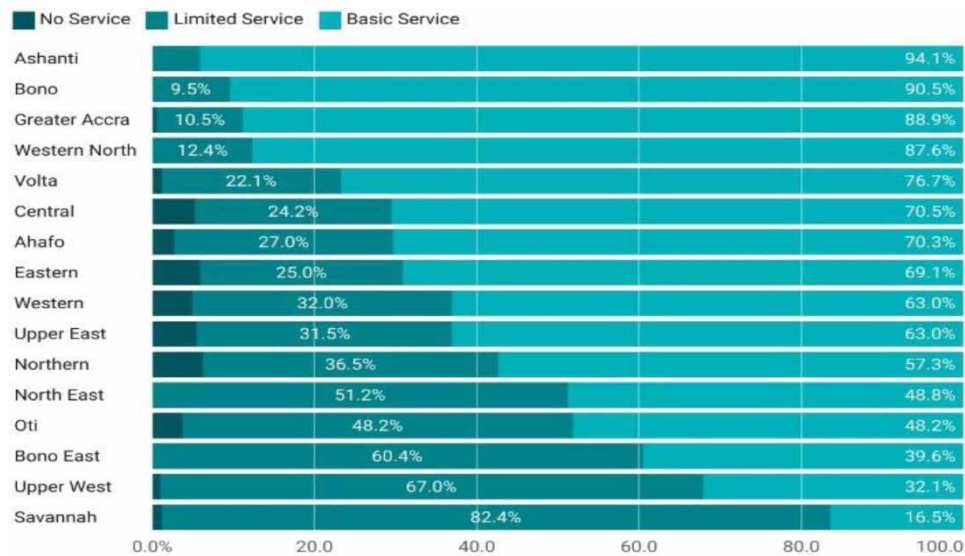


Figure 3 | Types of hygiene services by regions in Ghana.

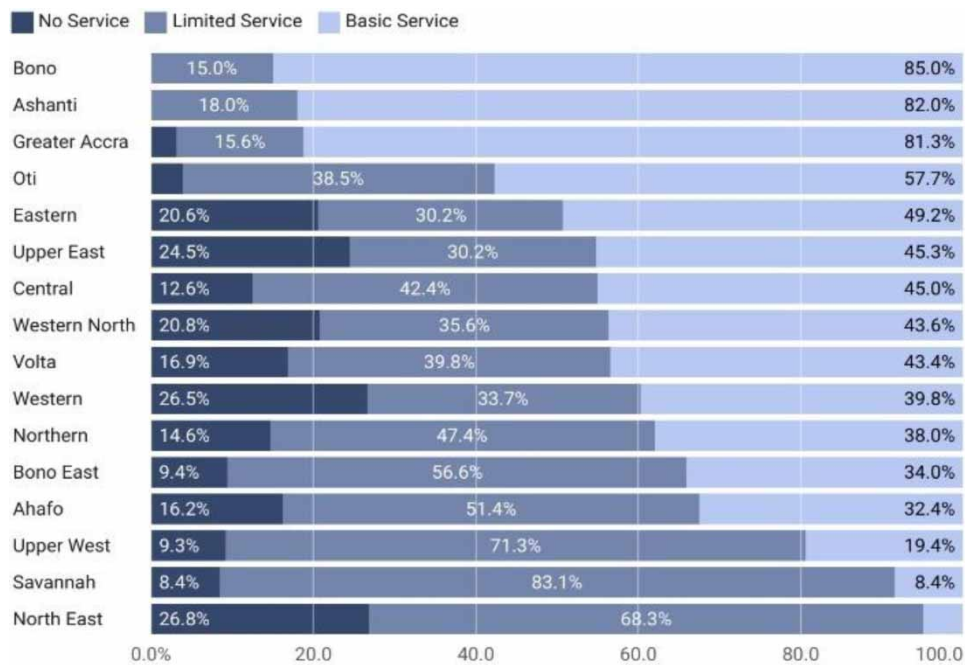


Figure 4 | Types of waste management services by regions in Ghana.

that have an assistant WASH-IPC manager (OR = 1.90; 95% CI: 1.41, 2.58) compared with facilities that do not have an assistant WASH-IPC manager (Table 3).

Our analysis also showed the presence of a trained assistant WASH-IPC manager (OR = 0.36; 95% CI: 0.21, 0.62) seems to have resulted in an increased likelihood of having basic hygiene services (Table 3).

Drivers of basic waste management and water services in HCFs

Facilities located in Bono (OR = 5.33; 95% CI: 1.43, 19.94) and the Greater Region (OR = 3.73; 95% CI: 2.23, 6.25) were more likely to have access to basic waste management services compared with facilities located in the Ahafo region (Table 4). Additional drivers of basic waste management services were a clinic, health centre, and hospital (Table 4).

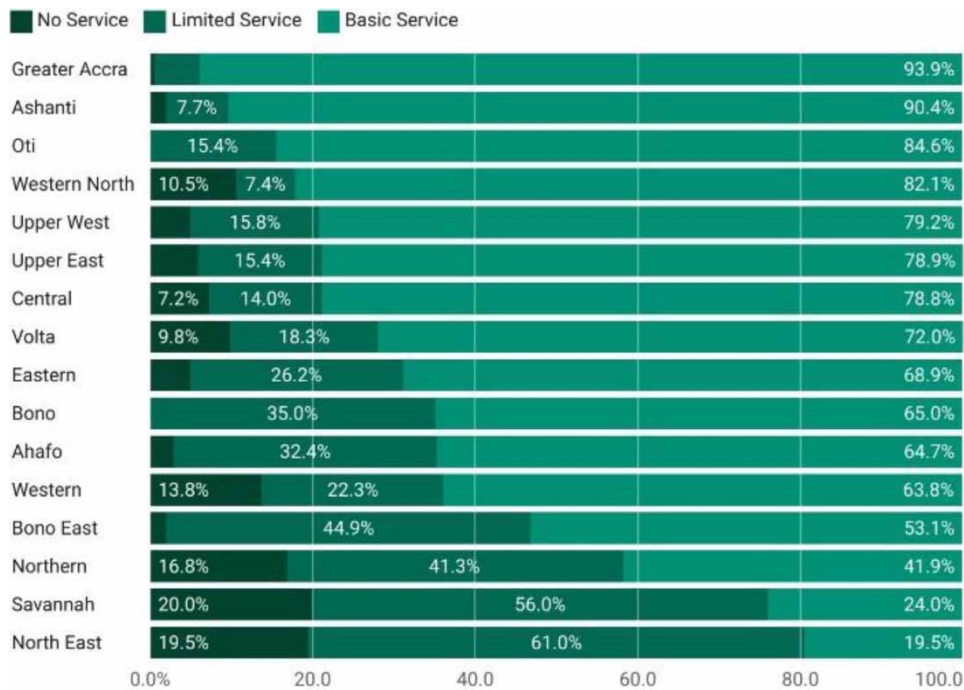


Figure 5 | Types of water services by regions in Ghana.

Facilities located in the Northeast region (OR = 0.13; 95% CI: 0.05,0.31), Savannah region (OR = 0.12; 95% CI: 0.05, 0.29), and the Upper West Region (OR = 0.55; 95% CI: 0.32, 0.96) were disadvantaged in terms of access to basic water services compared with facilities in the Ahafo region (Table 4).

DISCUSSION

In this study, we evaluated the status of WASH services and drivers of basic WASH services in Ghanaian HCFs. The analysis revealed that only 69% of the HCFs had access to basic water services, meaning water is available from an improved source in 69% of the HCFs (UNICEF & WHO 2019b). This finding is higher than that of the global progress report on WASH in HCFs, 2020 (WHO & UNICEF 2020), as well as in studies conducted in Uganda (Kayiwa *et al.* 2020) and in six Eastern African countries (Guo *et al.* 2017). The availability of basic water services in most of the HCFs may be an indication of deliberate investment by the government of Ghana and development partners in the WASH sector, especially as part of the preparedness and response to the COVID-19 pandemic. Even though more than half of the facilities had basic water services, access rates remain lower than the SDG targets of universal access to water services in HCFs.

Basic water coverage was higher than that of basic sanitation coverage where a little over half of the HCFs had access to basic sanitation services. Among the WASH domains, HCFs always perform better in the water domain compared with the sanitation domain (Mulogo *et al.* 2018; Berihun *et al.* 2022). The reason for this is unclear, but the perception of the fact that water is very crucial to life may account for this trend, meaning players in the WASH sector may be prioritising water coverage compared with sanitation. The low sanitation coverage found in this study is worrying, as this could have negative repercussions on the quality of healthcare and the likelihood of healthcare-associated infections among healthcare workers, patients, and the surrounding communities. Basic hygiene services were also available in over 60% of the HCFs, meaning more than half of the HCFs had a 'functional hand-hygiene facility (with water and soap and/or alcohol-based hand rub) at their premises' (WHO 2020). Our finding is a little bit higher than a study conducted in Uganda, where access to basic hygiene services was 57% (Kayiwa *et al.* 2020).

More worrying was the finding on basic waste management services, where coverage was unacceptably low (44%), meaning only a few of the facilities had their 'waste safely segregated into at least three bins, and sharps and infectious waste are treated and disposed of safely' (WHO 2020). The appalling state of WASH services in the HCFs will have several negative

Table 3 | Drivers of basic sanitation and hygiene services in HCFs in Ghana

Variables	Basic sanitation services		Basic hygiene services	
	OR (95% CI)	p Value	OR (95% CI)	p Value
Region				
Ahafo	Ref			
Bono	2.55 (0.86, 7.60)	0.092	3.36 (0.71, 15.81)	0.126
Bono East			0.22 (0.11, 0.46)	0.000
Central	4.34 (2.94, 6.42)	0.000		
Eastern	2.55 (1.31, 4.96)	0.006		
Greater Accra	10.73 (5.59, 20.62)	0.000	3.25 (1.68, 6.28)	0.000
Northeast			0.38 (0.19, 0.77)	0.007
Northern			0.55 (0.36, 0.82)	0.004
Oti			0.16 (0.06, 0.43)	0.000
Savannah	0.45 (0.24, 0.84)	0.013	0.08 (0.04, 0.16)	0.000
Upper East	2.03 (1.05, 3.94)	0.036		
Upper West			0.25 (0.15, 0.41)	0.000
Volta	3.23 (1.79, 5.83)	0.000	1.71 (0.90, 3.25)	0.099
Western	2.08 (1.25, 3.47)	0.005	0.65 (0.39, 1.08)	0.098
Western North	5.07 (2.90, 8.88)	0.000	3.18 (1.64, 6.19)	0.001
Type of HCF				
CHPS	Ref			
Clinic	2.19 (1.30, 3.71)	0.003	2.27 (1.31, 3.95)	0.004
Health centre			1.28 (0.92, 1.79)	0.146
Polyclinic	3.32 (1.05, 10.51)	0.041		
Hospital	12.40 (6.77, 22.73)	0.000	12.61 (6.54, 24.32)	0.000
Availability of asst. IPC manager	1.90 (1.41, 2.58)	0.000	0.36 (0.21, 0.62)	0.000
WASH-IPC manager trained			1.38 (0.94, 2.02)	0.103
Assistant WASH-IPC manager trained			3.35 (1.92, 5.85)	0.000

Note: Some variables are missing due to stepwise deletion of non-significant variables at *p* value less than 0.20.

repercussions on the quality of health service delivery, particularly care for mothers and new-borns in Ghana. For instance, some scholars elsewhere have found an association between suboptimal WASH services and the likelihood of maternal mortality (Benova *et al.* 2014). Indeed, elsewhere in Tanzania, early exit of the facility after delivery was linked to a lack of water for post-delivery bathing (McMahon *et al.* 2014). Lastly, patient disaffection with health services and women's reluctance to seek maternity care are linked to poor provision of WASH services in HCFs (Bouziid *et al.* 2018). This growing evidence about the role of WASH services in maternal and child healthcare calls for deliberate actions by the government of Ghana and development partners to work to address gaps in access to WASH services in HCFs.

The Greater Accra and Ashanti regions have been consistently ranked as the regions with the highest coverage of basic WASH services, to the neglect of the other regions, especially the recently created regions by the government of Ghana. These two regions might have been overprioritised for basic WASH services because they are the most developed and populous regions in Ghana and were also the two notable epicentres of the COVID-19 outbreak in Ghana that saw more investment. While this is encouraging in these two regions, we call on the government of Ghana and development partners to work to address the inequalities in regional access to basic WASH services in HCFs. More attention is needed in the recently created regions and those regions from Northern Ghana. This is crucial to attaining universal access to WASH services in Ghanaian HCFs.

We fitted a logistic model to determine the association between potential drivers of access to basic WASH services in the HCFs. The model revealed the geographical location of the HCF, level of service delivery of the HCF, and the

Table 4 | Drivers of basic waste management and water services in HCFs in Ghana

Variables	Basic waste management services		Basic water services	
	OR (95% CI)	p Value	OR (95% CI)	p Value
Region				
Ahafo	Ref			
Ashanti				
Bono	5.33 (1.43, 19.94)	0.013		
Bono East	0.58 (0.28, 1.19)	0.139		
Central			2.77 (1.76, 4.37)	0.000
Eastern				
Greater Accra	3.73 (2.23, 6.25)	0.000	5.78 (2.65, 12.61)	0.000
Northeast	0.05 (0.01, 0.24)	0.000	0.13 (0.05, 0.31)	0.000
Northern			0.44 (0.27, 0.71)	0.001
Oti			3.21 (0.98, 10.48)	0.054
Savannah	0.12 (0.05, 0.29)	0.000	0.23 (0.12, 0.45)	0.000
Upper East			3.13 (1.41, 6.97)	0.005
Upper West	0.55 (0.32, 0.96)	0.034	3.64 (2.03, 6.53)	0.000
Volta			1.98 (1.04, 3.75)	0.037
Western				
Western North			2.79 (1.45, 5.36)	0.002
Type of HCF				
CHPS	Ref			
Clinic	3.70 (2.27, 6.05)	0.000	3.26 (1.81, 5.88)	0.000
Health centre	1.52 (1.08, 2.16)	0.018	2.94 (2.00, 4.31)	0.000
Polyclinic	1.92 (0.82, 4.51)	0.134	2.73 (0.92, 8.07)	0.070
Hospital	14.17 (8.83, 22.73)	0.000	11.88 (6.47, 21.81)	0.000
Availability of:				
WASH-IPC action plan	1.39 (0.98, 1.99)	0.068		
WASH-IPC focal person	0.66 (0.45, 0.96)	0.032	1.40 (0.93, 2.11)	0.111
Assistant WASH-IPC focal person			0.29 (0.93, 2.11)	0.000
Assistant trained IPC-WASH focal person	2.01 (1.38, 2.92)	0.000	3.19 (1.79, 5.66)	0.000

Note: Some variables are missing due to stepwise deletion of non-significant variables at *p* value less than 0.20.

availability of assistant WASH-IPC manager and a trained assistant WASH-IPC manager, which were significant drivers of basic WASH services. We observed higher access to basic WASH services among facilities that have a trained assistant WASH-IPC manager compared with facilities that do not have a trained assistant WASH-IPC. This is consistent with published literature from 14 low- and middle-income countries where the presence of WASH-IPC focal persons resulted in better WASH services (Kmentt *et al.* 2021). This finding reinforced the need for facilities to appoint WASH-IPC managers to facilitate WASH services at all levels of care as part of governance arrangements for WASH systems. Perhaps the WASH-IPC managers may highlight gaps in WASH services in their facilities and establish the appropriate quality improvement interventions in the HCFs for improvement. This may be the possible explanation for why there is an association between the presence of a WASH-IPC manager and the likelihood of having basic WASH services. While the presence of WASH-IPC structures such as a WASH-IPC action plan, a trained WASH-IPC manager, and an assistant WASH-IPC manager was beneficial to the availability of WASH services, these structures were notably lacking in CHPS, health centres, and, more importantly, where women go for childbirth (maternity homes). Indeed, the logistic regression

revealed that lower facilities were disadvantaged in terms of access to basic WASH services. Therefore, WASH sector interventions by players should prioritise the lower-level HCFs to bridge the inequity gaps.

STRENGTHS AND LIMITATIONS

This paper is very crucial for WASH in HCFs. It is the largest-ever WASH status report in Ghanaian HCFs. Additionally, this paper has revealed potential drivers of WASH services in Ghanaian HCFs, which is worthy of note for WASH sector players in Ghana and beyond. The main limitation is that we utilised routine health service data. Hence, we could not independently verify the reported data. However, we do not doubt the competencies of the healthcare workers to report data that will truly depict the status of WASH in HCFs. Furthermore, we utilised secondary data in the analysis, hence, we could not amend or add variables we deemed necessary.

CONCLUSION AND RECOMMENDATIONS

WASH form the bedrock for recommended IPC practices, healthcare worker safety, patient safety, people-centred services, and the overall quality of healthcare. Ghana has made significant progress in attaining universal access to basic WASH services in HCFs, but this progress is not without deficiencies. These deficiencies pose an immediate health risk to healthcare workers, patients, their families, and the surrounding communities. Overall, more than half of the HCFs in Ghana have basic WASH services, but less than half have basic waste management services. The potential drivers of basic WASH services in Ghanaian facilities are geographic location of the HCF, level of service delivery of the HCF, and the availability of an assistant WASH-IPC manager and a trained assistant WASH-IPC manager. There are inequalities in access to basic WASH services regionally and at different facility levels. The analysis also revealed significant gaps in WASH-IPC structures in Ghanaian HCFs with WASH-IPC structures notably lacking in CHPS compounds, health centres, and, more importantly, where women go for childbirth (maternity homes).

The findings of this study have implications for WASH sector policies and programming in Ghana: (1) urgent WASH actions are required at the national, regional, and HCFs levels to help improve WASH conditions in HCFs. This is crucial in scaling up WASH coverage in Ghanaian HCFs, thereby minimising the risk of healthcare-associated infections and their associated costs, (2) urgent intentional policy actions are needed to prioritise investments in WASH-deprived HCFs and regions in Ghana, (3) there is a need for training and capacity building of personnel on WASH in HCFs coupled with the allocation of sufficient resources to WASH activities to enable the healthcare workers to operate and maintain WASH facilities, and (4) this study further recommends that the building of new HCFs should fully incorporate WASH services. This recommendation is crucial in the building of WASH impoverished facilities like CHPS, health centres, and maternity homes in Ghana.

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ETHICS STATEMENT

The study is an analysis of secondary data. Additionally, the study did not include any patient-level data; hence, no ethics approval or patient consent was required.

DATA AVAILABILITY STATEMENT

Data cannot be made publicly available; readers should contact the corresponding author for details.

CONFLICT OF INTEREST

The authors declare there is no conflict.

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