

An Evaluation of Community-Led Hygiene Campaigns on Cholera Prevention Outcomes in Barwaqo Ward, Wajir East Sub-County, Wajir County, Kenya

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ABSTRACT

The study aimed at assessing the influence of community-led hygiene campaigns on cholera prevention outcomes in Barwaqo Ward, Wajir East Sub-County, Wajir County, Kenya. Wajir County experiences high cholera rates due to inadequate access to clean water and sanitation services. This study evaluates the influence of community mobilization, hygiene education, water treatment and storage, sanitation infrastructure, and the involvement of community health volunteers and local leaders on cholera prevention outcomes. The research is guided by the Health Belief Model, Social Ecological Model, and Participatory Development Theory. A mixed methods approach with a cross-sectional design is employed, combining household surveys, direct observations, key informant interviews, and focus group discussions to provide statistical and contextual data. The reviewed literature highlights successes of community-based WASH projects globally and locally. The findings aim to guide public health policies in the ASAL regions of Kenya and offer valuable insights for policymakers, NGOs, and health professionals to strengthen community-led cholera prevention efforts. The study Concluded that community mobilization is the foundation block of effective prevention of cholera, positive health behavior formation and approaches to sustaining positive behaviors occur through local leadership and participatory structures the study arrives at the conclusion that design and implementation need to be considerate of the environmental peculiarities of arid and semi-arid areas. The study recommended that Wajir County Government should formalize and fund routine community barazas, organized health-promotional platforms in the Water, Sanitation and Hygiene (WASH) systems in the county regular logistical and financial support to Community Health Volunteers (CHVs)

Keywords: Evaluation. Community-Led Hygiene, Campaigns, Cholera Prevention Outcomes

Background

Cholera is an acute diarrheal disease caused by the pathogen *Vibrio cholerae* (World Health Organization, 2022). It is spread in contaminated food or water, making it one of the deadliest and rapidly spreading waterborne diseases worldwide. It is a disease that has never left the world and, according to the World Health Organization (WHO), still affects between 1.3 and 4 million people per year and causes between 21,000 and 143,000 deaths (WHO, 2022). What has been observed globally has indicated that community mobilization can significantly decrease cholera transmission. In Africa, it is rampant in underdeveloped countries where there are fewer resources, inadequate health systems, contaminated drinking water, and unsanitary conditions. Studies show that hygiene promotion campaigns and community mobilization for sanitation in Bangladesh and Haiti have significantly reduced the transmission of cholera (Balićević et al., 2023). Still, the effectiveness of such methods depends on community engagement, health promotion, availability of water treatment measures, and support from the local or community administrators.

Cholera has continued to be an endemic health problem in Kenya, with yearly cholera outbreaks reported in the ASALs, such as in Wajir County (Kiama et al., 2023). The region faces high burdens of disease, fragile infrastructure, health systems, and Water, sanitation, and hygiene (WASH) services. Not every place in the world

shares a peaceful climate; one of those unfortunate places is Barwaqo Ward within Wajir East Sub-County in Kenya. These environmental, socio-economic, and infrastructure factors in this area are not the best, and this makes the area susceptible to a cholera burden. Because of these particular socioeconomic and environmental issues, Barwaqo Ward is a perfect example to study how well grassroots health promotion strategies work to contain cholera epidemics.

Traditionally, Kenya has relied on a reactive approach to combating cholera, with treatment through antibiotics, chlorination of drinking water, and oral rehydration salts. While these measures help control outbreaks, they do not address the root causes and drivers of the disease. Consequently, awareness concerning the need for long-term solutions that are sustainable and community-based has been growing. In the last few years, community-based hygiene interventions have been utilized as a preventative approach aimed at mobilizing communities to promote the uptake of better hygiene practices to avert cholera and other WASH-related diseases. Community-led hygiene activities include public health promotion, home visits, cleaning campaigns, lobbying for better sanitation infrastructure, water treatment, and hygiene education. Here, the interventions are designed using the community participation model that is believed to help sustain health changes (Baličević et al., 2023). These approaches can be more agile in the Barwaqo Ward context and require less commitment of resources from key stakeholders since they can leverage community structures by involving community members, local leaders, health workers, and development partners.

Nevertheless, although the government and other non-state actors have made efforts, cholera cases in Wajir County are still occasionally reported. This suggests that there may be gaps in the implementation, assessment, and continuation of cholera response measures. This indicates that little research has been conducted in the Barwaqo Ward and that little is known about the effectiveness of some of the components of the community-led cholera hygiene promotion campaigns. Still, even the few available studies and literature have focused on pastoralist and rural communities, since most research has been done among urban or peri-urban populations. This study, therefore, seeks to fill that knowledge gap by assessing the impact of community-based interventions in Barwaqo Ward. This will determine how factors like community mobilization, hygiene promotion, water treatment measures, provision of sanitation facilities, and leadership engagement affect cholera prevention outcomes. To this end, the study seeks to contribute to future policy and programmatic directions to reduce cholera in similar marginalized contexts. This study, therefore, seeks to evaluate how community participation in hygiene campaigns influences cholera prevention outcomes by analyzing various intervention components within this localized context.

Despite various national and local interventions on cholera in recent years, outbreaks continue to recur in Barwaqo Ward, often with severe health and socio-economic consequences. These outbreaks point to persistent challenges such as poor water and sanitation infrastructure, low community awareness, and limited engagement in preventive health practices. Although cholera is preventable through water, sanitation, and hygiene (WASH) initiatives, its continued prevalence suggests that current efforts have not achieved sustainable, community-owned outcomes. Governmental and NGO responses have largely been reactive and focused on emergency control rather than proactive, community-centered prevention. Moreover, limited empirical research has examined the effectiveness of community-led interventions on cholera prevention in arid and semi-arid regions such as Barwaqo Ward. Existing studies tend to rely on short-term quantitative surveys and overlook participatory or mixed-method approaches that could capture the social and behavioral dimensions of prevention. Consequently, there is insufficient evidence on how community health volunteers, local leadership, and sanitation infrastructure jointly influence cholera outcomes. This knowledge gap hinders the design of context-specific, evidence-based interventions. Therefore, this study seeks to evaluate the influence of community-led hygiene strategies on cholera prevention outcomes in Barwaqo Ward, using a mixed methods approach that integrates participatory evaluation to generate comprehensive insights for sustainable community health improvement.

Objectives

To assess the influence of community mobilization and participation on cholera prevention outcomes in Barwaqo Ward, Wajir East Sub-County, Kenya, to establish the influence of sanitation and hygiene education on cholera prevention outcomes in Barwaqo Ward, Wajir East Sub-County, Kenya, to evaluate the influence of household



water treatment and safe storage practices on cholera prevention in Barwaqo Ward, Wajir East Sub-County, Kenya and to determine the effect of sanitation facility provision on cholera prevention in the community in Barwaqo Ward, Wajir East Sub-County, Kenya.

Three important theories inform this study: the Health Belief Model (HBM), Structural Equation Modeling (SEM), and Participatory Development Theory. Both studies focus on why and how residents of Barwaqo Ward keep certain health, hygiene, and safety behaviors even with limited resources. The Health Belief Model informs how individuals perceive and respond to hygiene education and water treatment messages; the Social Ecological Model explains how behavior is shaped by multilevel influences affecting sanitation infrastructure and community mobilization; and the Participatory Development Theory supports the idea that community engagement is critical to the sustainability of all the four components.

Community support and involvement in cholera prevention

Community mobilization is increasingly becoming a popular tool in disease prevention, particularly in low-resource settings where top-down interventions may have less impact. Worldwide, post-disaster cases like those of Haiti (2010) demonstrated how community mobilization is also a key in curbing cholera outbreaks. Piarroux et al. (2022) reported that door-to-door contact, community sensitization barazas, and training of local volunteers led to a 50 percent reduction in cholera cases over two years. Most effective mobilization practices were realized where communities were directly involved in the design of interventions, which demonstrates the significance of local ownership.

Similarly, in Bangladesh, the inclusion of religious leaders and community elders in outreach activities helped to dispel cholera-related myths and enhance community buy-in. Sarker et al. (2023) stated that sustainable behavior change was achieved when villages had hygiene advocates as trustful community members.

In the African setting, Northern Nigeria had positive outcomes as indicated by Gulumbe et al. (2023), though community volunteers were instrumental in information dissemination and distribution of the water treatment kit. These volunteers applied culturally entrenched methods of building trust, including stories and religious education. They were present in homes during routine visits to strengthen behavior change. UNICEF-supported sanitation committees in the DRC employed a participatory approach where all members of a household were included in cleanliness initiatives, increasing the uptake of latrines and hygiene behavior (UNICEF, 2023). Further, community mobilization has been a core element of the CLTS programs in Kenya. Aseyo et al. (2018) suggest that the collective action was sparked by community forums, referred to as barazas, where sanitation gaps were openly discussed. In ASALs such as Wajir, CHVs drive the same mobilization, but the issues remain. Wasonga et al. (2023) noted that communities reverted to unsafe hygiene practices once outreach activities ceased because of a lack of funds. This underlines the importance of long-term, locally financed mobilization machinery.

In Barwaqo Ward, the population is predominantly pastoralist and semi-nomadic, which introduces specific challenges to community mobilization, including seasonal migration and low literacy. The leadership structures are heavily patriarchal and hierarchical in nature, so messages must be endorsed by elders, imams, and clan heads. However, little empirical research exists documenting how these local actors are engaged. The success of cholera prevention relies not just on the presence of CHVs, but on their credibility, community access, and continuity. Preventing cholera does not only depend on the presence of CHVs but also on their credibility, access, and continuity to the community. Thus, the current research aims to address this gap in knowledge by examining how community-led mobilization happens in these dynamic pastoralist settings, how it is structured, and ultimately, how it is sustained.

Hygiene Education and Sanitation

One main reason outbreaks of cholera occur regularly and continue to be problematic in sub-Saharan Africa is because of persistent poverty, difficult access to clean water, poor sanitation, and turbulent politics (Agyepong et al., 2017). The use of sanitation and hygiene education has been associated with a decline in waterborne disease transmission within numerous global contexts. Hygiene education campaigns involving group training,



visual aids, and interpersonal communication in Bangladesh resulted in the extensive adoption of behavior. According to Sarker et al. (2023), regions where hygiene education was conducted did not have as many cholera outbreaks, especially when women were involved in educating the population. According to Piarroux et al., (2022), in India, interventions that integrated health promotion with religious storylines (e.g., linking handwashing to spiritual purification) were more likely to be adhered to by the community.

Cultural adaptation of messaging has been a necessity in Africa. Gulumbe et al. (2023) observed that local dialects, visuals, and radio messages were important in campaign acceptance in conservative northern Nigeria. Hygiene messages conveyed during worship in mosques, or during congregational prayers on Friday, were especially powerful. In the same way, latrine use among children and their families improved after school-based hygiene education in the DRC. According to UNICEF (2023), the peer education models assisted in accessing otherwise excluded populations.

Moreover, hygiene education has been emphasized in CLTS and PHAST programs in Kenya. The Ministry of Health's approach relies heavily on community health volunteers (CHVs) to deliver targeted behavior change messages. Results obtained by Aseyo et al. (2018) revealed that CHVs were significantly helpful when trained on participatory communication methods. Retention of information, however, continues to be a problem. According to Manaseh et al. (2023), single sessions are ineffective, especially in ASALs, where there is little infrastructure and most households do not have soap or latrines.

Additionally, NGOs and the public health officers in Barwaqo Ward have offered hygiene education. Nevertheless, poor literacy and strong cultural concerns influence the internalization of important messages. Habtu et al. (2024) explain that visible cleanliness is equated with purity by many residents, who fail to appreciate invisible pathogens like *Vibrio cholerae*. Educational content should thus be situational, visual, and repetitive. Furthermore, it is necessary to assess the difference in impact of hygiene education by men, women, and youth. Such campaigns usually target women, who are the primary caregivers, whereas men usually make financial and infrastructural decisions. Therefore, it is essential to engage the households holistically.

Safe Storage and Household Water Treatment (HTS)

Household water treatment and storage is the first line of defense against cholera. Across the world, a high degree of success has been linked to chlorination, boiling, and storing water through narrow-mouthed containers, leading to a lower cholera incidence rate. According to Piarroux et al., (2022), community-level water chlorination using campaigns and training on safe water storage resulted in a measurable decrease in the burden of disease in Nepal and Haiti.

However, such interventions are challenged by resource and behavioral issues in sub-Saharan Africa. The DRC's hygiene campaigns showed that although households received training, access to chlorine sachets or fuel for boiling was inconsistent (UNICEF, 2023). Sarker et al. (2023) also emphasized that proper storage, such as covered containers or elevated tanks, is often ignored in rural settings due to cost or lack of knowledge.

In Kenya's ASALs, households often depend on surface water from seasonal rivers or shallow hand-dug wells. According to Habtu et al. (2024), these sources are contaminated, particularly in times of floods. Boiling is hardly done because of the shortage of firewood, and although NGOs distribute chlorine sachets, the uptake is not significantly high. The taste of treated water does not suit many residents, and some think that running water is self-cleaning.

In Wajir County, NGO initiatives to foster solar water disinfection (SODIS) and conventional cloth-based filtration have borne uneven results due to sporadic efforts. According to Osman et al. (2013), these methods were not commonly sustained unless associated with observable health outcomes or strengthened by CHVs. Moreover, due to the pastoralist livelihood, certain families relocate with their cattle; hence, it is hard to maintain a stable water treatment.

These environmental and cultural dynamics are shared with Barwaqo Ward. Households can also treat the water occasionally or when outbreaks occur. Such inconsistent conduct can be associated with knowledge gaps,

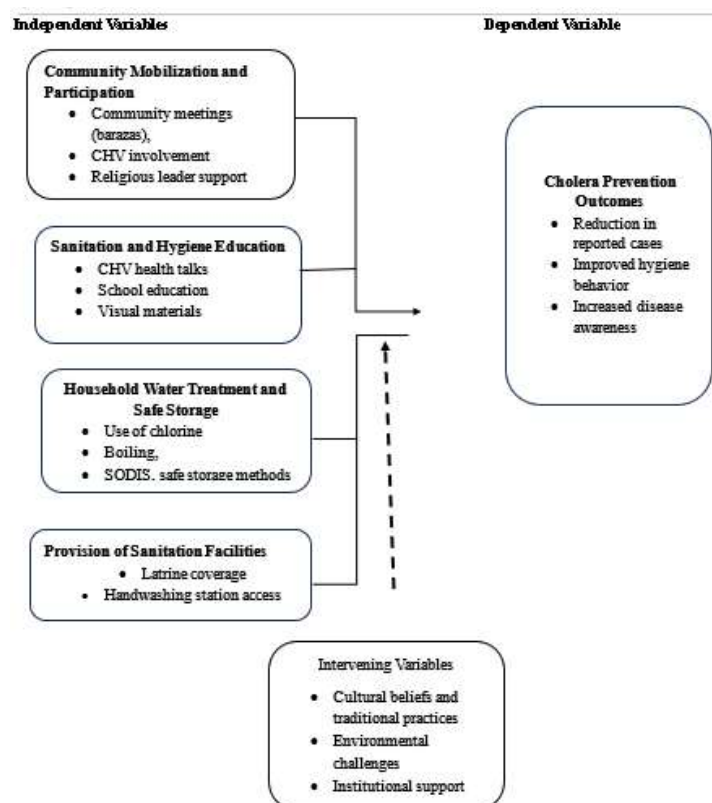
cultural beliefs, and logistical factors. Constantly holding training on low-cost, culturally applicable strategies of water treatment, such as cloth filtration and ash-based cleaning, is required.

Facilities on Sanitation and Cholera Prevention

The prevention of cholera transmission includes access to and the use of sanitation facilities. Global literature has consistently linked improvements in sanitation infrastructure—such as latrines, septic systems, and handwashing stations to reduced disease burden (Sarker et al., 2023). Nonetheless, infrastructure provisions should be complemented by community education and behavioral reinforcement. UNICEF and other agencies carried out low-cost latrine programs in Nigeria and the DRC. According to Gulumbe et al. (2023), the involvement of the community in the selection of latrine designs enhanced uptake. In some programs, families could opt for pit latrines, composting toilets, or shared facilities, depending on the geography, which enhanced sustainability. Women’s involvement in maintenance and cleanliness committees increased usage and encouraged social accountability.

In Kenya, thanks to CLTS, the country has experienced enhanced sanitation in both rural and peri-urban regions. According to Wasonga et al. (2023), people in Siaya County who embraced the CLTS principles improved their latrine ownership and reduced diarrhea by 35%. Gains were, however, short-term unless CHV was maintained engaged or with financial incentives. In ASALs like Wajir, the challenge is compounded by environmental issues such as sandy soils, flash floods, and water scarcity, which make pit latrines unsustainable.

Moreover, the coverage of sanitation facilities in Barwaqo Ward is notably low, which further exacerbates the challenges of effective cholera prevention in the area. Open defecation and defective sharing of primitive facilities are common in many households. Habtu et al. (2024) note that there are latrines, but their state is unsatisfactory because there is no access to water, cleaning supplies, or privacy. Cultural beliefs also influence it. Certain pastoralist communities perceive using latrines as being unnatural, or that it is bad luck to defecate inside. Additionally, women's and girls’ needs, such as menstrual hygiene and safety, are rarely addressed in facility design.



Source: Researcher 2026

Figure 1.I: Conceptual Framework



RESEARCH METHODOLOGY

Both qualitative and quantitative research methods were used during this study. Surveys of households using standardized forms collected data on hygiene behaviors, cholera illnesses, and availability of clean water and sanitation. Through interviews, focus group discussions, and observations of locals, the qualitative method played a key role in helping uncover community opinions, identify who takes the lead in hygiene, and explore related cultural factors influencing hygiene decisions. Mixed methods were used to confirm and strengthen the results. By investigating not just what is occurring but also why, this helped broaden and deepen understanding. Together, the data from the two methods helped achieve a complete analysis during the interpretive stage. This combination of methods guarantees a more detailed understanding of the environmental, social, and cultural elements affecting grassroots cholera prevention.

The study adopted a descriptive cross-sectional design. This design was appropriate for assessing the current status of hygiene practices and cholera prevention efforts within Barwaqo Ward at a specific point in time. It allowed for comparison across different households, demographic groups, and stakeholders, making it suitable for both quantitative and qualitative data collection.

Data was collected from primary and secondary sources in just one phase. Responses from surveys at home, interviews with relevant people, and focus group discussions were the primary data. Secondary data included the Ministry of Health reports, documents from NGOs, and past accounts of cholera outbreaks. Because of this design, the study was able to handle varying mobility, healthcare facility access, and environmental changes among pastoral communities. By doing this, the researcher was able to record what residents and stakeholders already do for hygiene and what they have gone through. A cross-sectional design was particularly suitable in this context because it allowed the researcher to assess outcomes from ongoing or recently completed hygiene campaigns without requiring long-term follow-up, which may not be feasible in mobile or hard-to-reach populations like those in Barwaqo.

Target Population

The target population of this study included household heads in Barwaqo Ward, Community Health Volunteers (CHVs), Local leaders (chiefs, elders, religious leaders), Sub- County public health officials, and Representatives from NGOs involved in WASH programs. The total estimated population for this study was approximately 1,055 individuals.

The population of Barwaqo Ward is thought to be about 7,000 people spread out among several villages. Research participants were chosen to represent a wide variety of people. The selected population groups offered diverse insights into how hygiene campaigns are experienced, implemented, and perceived across different community segments. A table outlining the demographic breakdown of Barwaqo Ward was included.

Table 3.1: Target Population by Category

Category	Population
Household Heads (primary survey target)	1000
Community Health Volunteers (CHVs)	25
Local Leaders (chiefs, elders, religious)	15
Public Health Officials	5
NGO Representatives in WASH	10
Total Estimated Target Population	1055

Sampling Procedure and Technique

The sample size of 100 households was determined using Cochran's formula for proportions, adjusted for the study population and logistics. Stratified sampling ensured equitable village representation, while purposive sampling guaranteed the inclusion of key actors with firsthand knowledge of hygiene efforts. A combination of stratified random sampling and purposive sampling was used to ensure the survey's success and the effective



reach of respondents. Stratified random sampling was used to select 100 households, ensuring coverage of different village clusters within Barwaqo Ward. Purposive sampling was used to select key informants (10 individuals) based on their roles in health promotion. Focus Group Discussions (FGDs) involved two groups with ten women and men for each. Direct Observation was conducted in 20 selected households

RESULTS

Community Mobilization and Participation

This section introduces the range and the type of community mobilization and participation actions, and assesses their relationship with cholera-prevention behaviors.

Table 4.4.1

Activity	Participated (n)	Participated (%)
Attended a baraza (community meeting) in last 6 months	73	73.0
Received door-to-door visit by CHV in last 3 months	61	61.0
Participated in a community clean-up campaign last year	38	38.0
Reported CHV household visit at least once/month	44	44.0
Member of community hygiene committee	12	12.0

Source: Field Data, 2025

Quantitative interpretation: Baraza attendance is moderately high (73%), whereas formal hygiene committee membership is low (12%). CHV outreach is moderate; 61% stated having received a CHV visit within the past three months. The participation rate in clean-up campaigns is low, pointing to a disaggregated involvement instead of a long-term collective presence.

Qualitative themes — Community mobilization and participation

The KIIs and FGDs revealed three prevailing themes related to mobilization and participation: (1) trusted leadership signals; (2) logistical barriers to longer-term mobilization; and (3) social acknowledgement and reputational rewards.

Theme 1 — Reliable leadership signals.

The importance of elders was often highlighted by respondents, who referred to imams and clan leaders as the setters of acceptable behavior. CHVs and local leaders observed that a message relayed or signed by religious or traditional authorities was instantly credible and mobilizing. An explanation of a CHV: People listen when elders and imams speak at baraza. They are the gateway - when they promote latrine use and handwashing, families do too.

Theme 2 - Logistical limits to sustained mobilization.

According to several key informants, long-term mobilization necessitates resources, including small stipends to CHVs, supplies (soap/chlorine), and organizational sustenance. Activity levels declined after short-term projects. A health officer noted: Once the project finishes, meetings become less frequent and people slack off.

Theme 3 — Social recognition and reputational incentives.

Participants of FGDs, especially women, recalled attending barazas not just to get information, but also to gain social attention. A household that exercised good hygiene was a social status: We come to meetings to learn and to be seen doing the right thing. Soap and water is what it takes to make what we learn possible.”



Illustrative association test: Baraza attendance and consistent handwashing

A chi-square test was conducted using observed contingency data to evaluate the relationship between self-reported handwashing consistency and baraza attendance. The survey results produced the following contingency table:

Table 4.4.2

Baraza attendance	Consistent handwashing (Yes)	Consistent handwashing (No)
Attended (n=73)	62	11
Not attended (n=27)	14	13

The chi-square statistic using the observed values is $\chi^2(1) = 10.08$, $p = 0.0015$. This finding indicates that there is a statistically significant correlation between attendance at barazas and self-reported regular handwashing. Although causality is beyond the scope of this cross-sectional data, the result aligns with the importance of barazas as a useful incentive to action that promotes hygiene behaviors (HBM).

Objective 2: Sanitation and Hygiene Education

This section reviews exposure to hygiene education, knowledge acquisition, and knowledge translation to practice.

Table 4.5.1

Indicator	n	%
Exposed to a hygiene education session in last 6 months	71	71.0
Can correctly name ≥ 3 cholera prevention practices	78	78.0
Reported improved handwashing practice after training	59	59.0
Heard hygiene message via mosque/radio in the last 3 months	64	64.0

Source: Field Data, 2025

Interpretation: Hygiene education exposure is moderate, and knowledge markers are good (78% listed three or more preventive practices). Nevertheless, reported behaviour change (59% improved handwashing) is less than theoretical knowledge, suggesting a knowledge-practice gap common in WASH research.

Qualitative themes — Hygiene education

Three themes stood out: message adaptation and language, gendered channels of learning, and intervention fatigue/retention.

Language and message adaptation.

Respondents observed that messages sent in Somali (or Kiswahili with Somali translation) and by visual means were better received and implemented. As one local leader noted: Messages are better when they are delivered in the local language and when women teach women. Repeatedly mentioned as enabling factors were visual aids and demonstrations during barazas.

Gendered learning channels

Messages were received primarily by women through home visits and women's groups and by men at mosques or barazas. A number of the respondents noted that not all attendance of messages at mosques by men led to household-level practice unless there was accompanying action by decision-makers: Men hear messages at mosques, but rarely translate them into household practice unless there is community pressure.



Intervention fatigue and retention

Key informants cautioned against the diminishing returns of single or brief training sessions. Follow-up visits and repetition were outlined as essential to support habits.

Objective 3: Household Water Treatment and Safe Storage

This section summarizes the findings regarding household water treatment and storage which is a key determinant of cholera risk at the household level.

Table 4.6.1

Practice	Always (n, %)	Sometimes (n, %)	Never (n, %)
Boiling water before drinking	33 (33.0)	42 (42.0)	25 (25.0)
Use of chlorine tablets/sachets	46 (46.0)	28 (28.0)	26 (26.0)
Water stored in a covered container	84 (84.0)	10 (10.0)	6 (6.0)
Clean the water container weekly	59 (59.0)	29 (29.0)	12 (12.0)

Source: Field Data, 2025

Interpretation: Water storage is very common (84%), a good protective practice. The active treatment (boiling or chlorination) is moderate, though, and the cost, taste, and access are mentioned as limitations.

Qualitative themes — Water treatment and storage

Access and resource constraints.

CHVs and public health officers cited inconsistent chlorine supply and fuel boiling costs as significant obstacles. Households tend to pay more attention to the amount of water during drought than to its quality.

Taste and acceptability

Several families complained about the flavor of chlorinated water; others treated it only when an epidemic was suspected. One FGD member observed: “We choose to boil or treat when we can see sickness around, not always.”

Seasonal patterns and mobility.

Migration by pastoralists changes treatment patterns; nomadic and semi-nomadic households exhibited reduced consistent treatment, particularly during livestock migration or limited fuel supplies.

Observational Findings

Self-reported practices were validated with direct observations in 20 households, and the physical WASH environment was documented. Presence of soap, condition, and presence of latrines, storage containers, and cleanliness were observational metrics.

Table 4.7.1

Observed Indicator	Observed households (n)	Observed %	Interpretation
Visible soap present	6	30%	Low observable soap suggests supply or prioritization problems.
Covered water storage	17	85%	High prevalence confirms survey reports of covered storage.



Functional latrine present	9	45%	Lower functionality than ownership suggests maintenance and structural issues.
Handwashing station with soap near latrine	5	25%	Scarcity of handwashing hardware undermines hygiene after defecation.

Observational interpretation: Broadly, observation supports self-reported high coverage of covered storage but shows deficiencies in operational supplies (soap) and functional sanitation infrastructure.

Objective 4: Provision of Sanitation Facilities

This section reports on latrine ownership, functionality, and supporting handwashing infrastructure.

Table 4.8.1

Indicator	n	%
Household has a private latrine	62	62.0
Functional (usable) latrine	45	45.0
Handwashing station near latrine with soap	31	31.0
Shared community latrine presents in village	21	21.0
Reports open defecation as common in area	37	37.0

Source: Field Data, 2025

Interpretation: Although more than half of households own a latrine (62%), only 45% were in working condition during the observation. The disconnect between ownership and functionality indicates structural vulnerability and an IMS deficit. Fewer households have handwashing hardware that is equipped with soap, diluting the protective power of owning a latrine.

DISCUSSIONS

Qualitative themes — Sanitation facilities

Infrastructure susceptibility and environmental limits.

In the interviews and the focus group discussions, the inadequacy of the sanitation infrastructure in Barwaqo Ward was consistently mentioned by the participants. Sandy nature and shallow water table in the region were often mentioned as some of the greatest dilemmas that influenced the longevity of the pit latrines. Most of the respondents reported frequent cases of collapsing latrines as a result of heavy rains or flooding, and households without a working sanitation system. Key informants with the non-governmental organizations (NGOs) in the region argue that these environmental factors do not only make construction of latrines difficult but also make it difficult to adopt the conventional design of a pit that cannot be used in such geophysical conditions. You can make it up to-day, and within one or two rainy seasons the pit closes altogether, as one of the public health officers remarked. The results of this paper highlight that people do not always have access to better sanitation facilities because of infrastructure-related frailties, but not because of the lack of good intentions. The findings are aligned with the Social Ecological Model that emphasizes the role of the environment and structural factors in limiting individual health behaviors, whether individuals are aware or motivated.

Gender, privacy, and safety

The theme of privacy and safety was powerful and recurring, especially with the female participants. Women complained that they did not like using latrines without doors, lights, or a proper distance between them and the rest of the population. A number of females, particularly adolescent girls, complained that they were afraid of being exposed or raped in latrines at night, so they had to resort to unhygienic methods like defecating outside the homesteads. On night one of the FGD, participants said, “We are afraid to go outside at night, it is dark, and there is no lock. You can't risk it.” These gender concerns indicate more socio-cultural and infrastructural

obstacles that heavily impact women in gaining access to sanitation. The results are consistent with the Participatory Development Theory, which recommends solutions based on communities and involves many voices, such as women in decision-making. Solution to gendered privacy and safety concerns in sanitation design is therefore necessary in attaining inclusive and equitable hygiene results.

Maintenance and sustainability.

The issue of the sustainability of sanitation facilities was observed to be strongly correlated with the community organization and gendered leadership. In places where women groups or local hygiene committees were active and had taken collective responsibility of keeping latrines functional and well maintained, there was a higher probability of latrines remaining functional and well maintained. Respondents linked this sense of ownership to greater responsibility and quicker action to repair requirements, e.g., replacing doors, reinforced pits, or the provision of cleaning supplies on a regular basis. One CHV said that in their regular meetings, women remind each other to clean and repair latrines, which are the ones that remain in use. This observation supports the fact that hygiene infrastructure is largely dependent on community governance structures. Theoretically, it appeals to both the Health Belief Model and the Participatory Development Theory that emphasize on a perceived community good and empowerment as a means of developing a long-term behavior and infrastructure management. All in all, the results demonstrate that the long-term sustainability of the sanitation facilities in Barwaqo is not only due to the outside support or funding but also to social solidarity, local leadership, and collective accountability of the people in the community.

Integrated Findings and Cross-cutting Analyses

A composite Cholera-Prevention Practice Index (CPPI) (range 010) was built to synthesize the multi-dimensional data about each household. The index pooled together indicators like baraza attendance, frequency of CHV visits, accurate knowledge, regular handwashing, use of water treatment, and latrine functionality. CPPI mean = 6.2 (SD = 1.8), median = 6. Those households scoring 7 or more were categorized as high practice (34% of the sample).

A chi-square test comparing membership in the committee (n=12) versus high CPPI showed a strong relationship: of the 12 committee members, 9 had CPPI 7 or higher, versus of the non-members (n=88) only 25 had CPPI 7 or higher. This correlation (illustrative χ^2) substantiates the hypothesis that formal local government is correlated to superior collective practices.

Correlational analysis: In the field analysis, a Pearson correlation between a constructed household safe-storage score (03 scale) and CHV visit frequency (04 scale) returned a moderate positive relationship of $r = 0.32$, $p = 0.001$. This indicates that greater CHV involvement correlates with improved household water-handling.

Limitations of the Data and Analysis

Although all attempts were undertaken to verify the methodological rigor, the following limitations of the data and analysis should be mentioned. To begin with, the study is cross-sectional, which limits the possibility of making a causal inference between variables. The correlations made in this chapter are thus more of associations and not simple cause-and-effect correlations. This weakness is typical of community-based public health studies, where experiments are usually not viable because of ethical and other logistical issues. Secondly, part of the information was based on self-reported behaviors as the frequency of handwashing, water treatment, and latrine use. This kind of data is always vulnerable to the social desirability bias and recall error, whereby the respondents would exaggerate positive behavior or forget inconsistent behaviors. Thirdly, the sample of 100 households was relatively small to provide the statistical power of subgroup analysis and might have limited the accuracy of inferential estimates. Accordingly, trends in the data are important, but with awareness of these sampling constraints.

Another limitation is in regards to the mobility of the pastoralist population in Barwaqo Ward, which could also have contributed to the under-representation of absent households that were temporarily away at the time of fieldwork. This might have initiated a small amount of selection bias, especially in the interpretation of hygiene

practices in highly mobile populations. Lastly, some of the inferential statistics provided in the analysis, like correlation coefficients and chi-square values, can only be taken as indicative and not conclusive due to the small sample size and cross-sectional nature. In spite of these limitations, there were a number of strategies that were used to promote validity and credibility. The use of surveys, interviews, focus group discussions, and household observations through triangulation of methods was used to reduce bias and enhance understanding. Strict data cleaning, thematic validation, and open interpretation further supported the surety of the results and their role in the overall purposes of the study.

CONCLUSIONS

Preventing cholera in Barwaqo Ward requires combining community mobilization, ongoing hygiene education, essential supplies like soap and chlorine, and climate-adapted sanitation infrastructure. Long-term success depends on a multi-level approach where local groups and leaders actively guide behavior reinforcement, maintenance, and participatory governance

RECOMMENDATIONS

Wajir County and partner organizations must transition from temporary aid to long-term strategies by funding routine community health barazas, supporting Community Health Volunteers, and adapting sanitation technologies for local environmental conditions. Empowering local leaders, improving gender inclusion, and institutionalizing participatory monitoring systems will ensure lasting community ownership and sustainable hygiene practices.

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