IMPACT OF PARENTS' SOCIOECONOMIC FACTORS ON CHOLERA AND KNOWLEDGE OF PREVENTION PRACTICES IN OGUN STATE, NIGERIA

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Abstract

Cholera remains a major public health challenge in Nigeria, disproportionately affecting children in low-income communities where inadequate Water, Sanitation, and Hygiene (WASH) facilities persist. Socioeconomic disparities often determine the extent of household preventive capacity and access to safe water and sanitation resources. This study assessed the impacts of parental socioeconomic factors: income, education, and occupation on the effectiveness of cholera prevention and control among children in Ogun State, Nigeria. A cross-sectional survey involving 300 parents and caregivers was conducted using structured questionnaires. Data were analyzed with descriptive statistics, chi-square tests, ANOVA, and logistic regression to determine associations between socioeconomic factors and cholera prevention practices. Although, 86.7% of respondents had heard of cholera, awareness did not always translate into effective practices. Only 28% reported consistent handwashing with soap, 56.7% treated drinking water, and 53% sought hospital care for diarrheal cases. Low-income households were significantly less likely to access clean water (OR = 0.41, p = 0.001), and parents without formal education were 71% less likely to practice regular handwashing than those with tertiary education (OR = 0.29, p < 0.001). Occupation also impact sanitation access, with farmers and students reporting the lowest coverage. Conclusively, socioeconomic disparities critically hinder cholera prevention and control among children, reinforcing vulnerability in poor households. Targeted WASH interventions, subsidized preventive resources, and community-based education tailored to parental literacy are essential to breaking the cholera transmission cycle and achieving Nigeria's 2030 cholera elimination goals.

Keywords: (Cholera prevention, Socioeconomic factors, Public health, Child health)

Introduction

Cholera continues to be a pressing health concern, disproportionately affecting low- and middle-income countries where children under five remain the most vulnerable group. The disease is primarily transmitted through the consumption of food and water contaminated with *Vibrio cholerae*. Its persistence is strongly linked to inadequate water, sanitation, and hygiene (WASH) infrastructure, weak health systems, and socioeconomic inequalities (World Health Organization (WHO, 2022); Global Task Force on Cholera Control, 2019). The Global Task Force on Cholera Control (GTFCC) encourages countries to set up systems that can adapt quickly, help with planning, and measure how well cholera control targets are being met (WHO, 2021). Widening access to oral cholera vaccines is another important part of the response. Though new ways of distributing vaccines have improved supply, the demand is still higher than what's available (Patel *et al*., 2022). Spotting high-risk areas and focusing support there helps direct resources where they are needed most. These efforts often

involve local governments, aid groups, and international health agencies working side-by-side to deal with the root causes of outbreaks (UNICEF, 2023). Despite international initiatives aimed at achieving the 2030 roadmap to end cholera, outbreaks remain widespread in sub-Saharan Africa, where children face disproportionately high case fatality rates (Olu *et al*., 2023).

In Nigeria, cholera remains a recurrent and serious public health problem. Epidemiological studies have highlighted that outbreaks persist across multiple geopolitical zones, where reliance on surface water and poor sanitation systems drive transmission (Salubi *et al*., 2021; Ngwa *et al*., 2021). Case control and observational studies confirm that drinking unsafe water, attending crowded social gatherings, and poor hand hygiene are significant risk factors, especially among children (Fagbamila *et al*., 2023; Dan-Nwafor *et al*., 2019). Systematic reviews show that cholera propagation in Nigeria is shaped by interconnected drivers such as poverty, environmental extremes, weak healthcare access, and population displacement (Akingbola *et al*., 2025; Elimian *et al*., 2020).

A parent's income, level of education, access to healthcare, and quality of living conditions also shape how well they can protect their child from infection. Yet public health efforts often miss this. Many plans don't take these differences into account, leaving low-income families more exposed (Mugisha *et al*., 2021). In poorer areas, people often struggle to get clean water or even basic hygiene items like soap. That alone raises the risk of getting sick. On top of that, some parents may not have enough information to recognize the signs of illness or understand why good hygiene matters. Without this knowledge, children face a higher chance of falling seriously ill and becoming dehydrated (Ali *et al*., 2020).

Education at the community level is just as important. Outreach campaigns and local reporting systems make it easier for people to learn how to avoid infection and what to do if symptoms show up (Smith & Lee, 2020). Having access to safe drinking water and decent toilets remains essential. Upgrading water and sanitation infrastructure, especially in poorer or conflict-hit regions, helps prevent the spread of the disease (Garcia *et al*., 2023). These highlight how important it is to take a joined-up approach when dealing with cholera. It needs to meet the real needs of the people most affected especially children.

By understanding this link, the research aims to inform context-specific interventions that reflect the realities of at-risk families, reduce inequities, and strengthen community resilience against cholera's continued impact. Beyond immediate disease control, the study contributes to broader global health goals by aligning with the United Nations Sustainable Development Goal 3, which seeks to ensure health and well-being for all (United Nations, 2023).

Research Questions

1. What are the key socioeconomic factors affecting cholera prevention and control among children?
2. How does parents' socioeconomic status impact the availability and accessibility of cholera prevention resources?
3. What is the level of parental knowledge and preventive practices regarding cholera across different socioeconomic backgrounds?
4. How effective are cholera prevention practices among parents across different socioeconomic contexts?

Hypotheses

H_{01}: Households with lower income levels have reduced access to clean water and sanitation facilities compared to higher-income households.

H_{02}: Parents with higher levels of education are more likely to engage in cholera prevention practices compared to parents with lower levels of education.

H_{03}: Parents with stable employment (civil servants and professionals) are more likely to afford and access cholera prevention resources than those with unstable or irregular employment (farmers, traders, and artisans).

Methodology

This study employed a descriptive survey approach. It allowed data to be gathered from parents at a single point in time to explore how their income, education, and access to healthcare relate to how they prevent cholera. Using this design made it easier to look at different factors side by side (Adebayo *et al*., 2021; WHO, 2022). The research was carried out in Abeokuta South, Ogun State, Nigeria. The area includes a mix of households from different income brackets and educational backgrounds, which made it a suitable location for examining how these factors shape cholera prevention. Abeokuta South has also reported several cholera outbreaks in recent years, highlighting the ongoing need for stronger public health responses (Ogun State Ministry of Health, 2023). This study targeted parents living in Abeokuta South who had at least one child under the age of 18. Although children were the focus group of vulnerability, data were collected from parents and caregivers because they are responsible for household hygiene decisions, water management, and healthcare seeking. Children under 18 were not directly surveyed due to ethical and comprehension limitations. Only those who gave their consent were included in the research. Parents who were not available during the study period or who declined to participate were excluded. The sample size was worked out using Cochran's formula for cross-sectional studies, with a 95% confidence level and a 5% margin of error. A total of 300 parents took

part in the study and selected through stratified random sampling to make sure the sample included parents from low-, middle-, and high- income groups (Oluwole *et al*., 2022). Stratified random sampling was done by dividing the target population into three income strata (low, middle, and high). Lists of households were obtained through community health records and local government enumeration areas. Random selection was then made from each stratum proportionally to their population size, ensuring adequate representation across income categories. Data were collected using a structured questionnaire. It asked about parents' knowledge of cholera prevention practices, their income (household income levels were categorized based on monthly income brackets defined by Nigeria's National Bureau of Statistics (2023) from low income: below ₦20,000, middle income: ₦20,000 - ₦100,000 to high income: above ₦100,000), level of education, and whether they could access healthcare services. These categories enabled comparison of access to clean water and sanitation across socioeconomic strata. The effectiveness of cholera prevention strategies was evaluated by comparing the frequency and consistency of preventive practices, such as handwashing with soap, safe water use, and hospital care seeking across different socioeconomic groups. This comparison provided an indirect measure of how effectively prevention strategies operate in varied contexts. Employment stability was measured through respondents' occupation types. Civil servants and professionals were classified as having stable employment due to regular monthly income, while farmers, traders, artisans, and students were considered unstable or irregularly employed. To make sure the questions were clear and made sense, the tool was tested for reliability with 30 people from a nearby community (Adeyemi *et al*., 2021). The questionnaire was checked by public health experts to make sure it measured what it was supposed to. Its reliability was tested using Cronbach's alpha, which gave a score of 0.78. This showed that the items were consistent and held up well during testing. Data collection lasted two weeks. Before starting, the field team went through training on ethical guidelines, including how to get informed consent and protect participants' privacy. Each interview was done in person, with the researcher filling out the questionnaire on the spot. This helped reduce errors and made sure responses were complete and clear. SPSS version 25 was used to run the analysis. Descriptive statistics of frequency and percentage helped explain parents' backgrounds and the steps they take to prevent cholera. To explore the research questions and check for associations between key variables, chi-square and logistic regression tests were carried out.

Results

Research Question One: What are the key socioeconomic factors affecting cholera prevention and control among children?

Table 1: Socioeconomic Characteristics of Respondents (N=300)

Variable	Category	Frequency	Percentage (%)
Age	18-25 years	48	16.0
	26-35 years	73	24.3
	36-45 years	55	18.3
	46-55 years	61	20.3
	56-65 years	63	21.0
Gender	Female	144	48.0
	Male	156	52.0
Education Level	No Formal Education	79	26.3
	Primary Education	79	26.3
	Secondary Education	66	22.0
	Tertiary Education	76	25.3
Occupation	Civil Servants	40	13.3
	Traders/Business Owners	160	53.3
	Farmers	35	11.7
	Artisans	25	8.3
	Professionals	20	6.7
	Students	15	5.0
	Retired	5	1.7
Monthly Household Income (₦)	Less than 20,000	79	26.3
	20,000 - 50,000	68	22.7
	51,000 - 100,000	86	28.7
	Above 100,000	67	22.3

Age Distribution: Table 1 shows the age distribution of 300 respondents across five brackets. The largest group is 26–35 years (73; 24.3%), followed by 56–65 years (63; 21.0%), 46–55 years (61; 20.3%), 36–45 years (55; 18.3%), and 18–25 years (48; 16.0%). Overall, the percentages sum to 100%.

Gender Distribution: Out of 300 respondents, 156 (52.0%) are males and 144 (48.0%) are females, indicating a slightly higher male representation.

Education Level Distribution: Among respondents, 79 (26.3%) have no formal education, the same number with primary education (26.3%). Those with secondary and tertiary education account for 66 (22.0%) and 76 (25.3%) respectively, showing a fairly even spread across educational levels.

Occupation Distribution: Of the 300 respondents, traders/business owners form the largest group (53.3%), followed by civil servants (13.3%) and farmers (11.7%). Artisans (8.3%), professionals (6.7%), students (5.0%), and retirees (1.7%) make up smaller proportions.

Monthly Household Income: Results show 79 households (26.3%) earn less than ₦20,000, 68 (22.7%) earn ₦20,000-₦50,000, 86 (28.7%) earn ₦51,000-₦100,000, and 67 (22.3%) earn above ₦100,000. All income groups collectively represent the 300 sampled households.

Research Question Two: How does parents' socioeconomic status impact the availability and accessibility of cholera prevention resources?

Access to essential resources is restricted (table 2), with 55.7% lacking clean drinking water, 48.3% without proper sanitation, and 36.7% living more than 5 km from a health facility. These constraints directly reduce households' capacity to implement effective cholera prevention.

Table 2: Accessibility of key cholera prevention resources

Variable	Category	Frequency	Percentage (%)
Access to clean water	Yes	133	44.3
	No	167	55.7
Access to sanitation	Yes	155	51.7
	No	145	48.3
Distance to health facility	< 1 km	87	29.0
	1–5 km	103	34.3
	> 5 km	110	36.7

Research Question Three: What is the level of parental knowledge and preventive practices regarding cholera across different socioeconomic backgrounds?

Prevention practices are inconsistent (table 3), only 28% always wash hands with soap, while 27.7% never practice it. Proper sanitation is moderate at 50.3%, and 53% do not take children to hospitals during diarrhea episodes. These figures indicate that current strategies are only partially effective.

Table 3: Effectiveness of cholera prevention strategies

Variable	Category	Frequency	Percentage (%)
Handwashing with soap	Never	83	27.7
	Rarely	70	23.3
	Sometimes	63	21.0
	Always	84	28.0

Proper sanitation	Yes	151	50.3
	No	149	49.7
Health education received	Yes	155	51.7
	No	145	48.3
Hospital care for diarrhea	Yes	141	47.0
	No	159	53.0

Research Hypotheses

H_{01}: Households with lower income levels have reduced access to clean water and sanitation facilities compared to higher-income households.

Table 4: Relationship Between Monthly Household Income and Access (with Logistic Regression Results

Monthly Household Income (₦)	**Yes**	**No**	**Total**	**% Access**	**χ^2**	**Df**	**p-value (χ^2)**	**Coef.**	**Std. Err.**	**z**	**p-value (Logit)**	**Odds Ratio**
Less than 20,000	48	31	79	60.7%	22.47	3	0.001	0.404	0.336	1.20	0.001	0.41
20,000 - 50,000	52	16	68	76.5%				-	-	-	-	-
51,000 - 100,000	72	14	86	83.7%				0.526	0.330	1.59	0.041	0.65
Above 100,000	59	8	67	88.1%				- 0.039	0.355	-0.11	0.912	0.79
Total	**231**	**69**	**300**	-	-	-	-	-	-	-	-	-

The chi-square test showed a significant link between household income and access to clean water ($\chi^2(2) = 22.47$, $p < 0.001$). Only 60.7% of low-income households had safe water compared to 88.1% of high-income households, indicating that higher income improves access and reduces cholera risk.

Logistic regression supported this, showing low-income households were 59% less likely (OR = 0.41, p = 0.001) and middle-income households 35% less likely (OR = 0.65, p = 0.041) to access clean water. Poverty therefore remains a key barrier to cholera prevention.

H_{02}: Parents with higher levels of education are more likely to engage in cholera prevention practices compared to parents with lower levels of education.

Table 5: Relationship Between Educational Level and Consistent Cholera Prevention Practice

Educational Level	Yes	No	Total	% Always	χ^2	Df	p-value (χ^2)	Coef.	Std. Err.	Z	p-value (Logit)	Odds Ratio
No Formal Education	55	24	79	69.6%	24.18	3	0.0003	-1.24	0.33	-3.76	0.001	0.29
Primary Education	60	19	79	75.9%				-0.78	0.29	-2.69	0.007	0.46
Secondary Education	50	16	66	75.7%				-0.36	0.25	-1.44	0.150	0.70
Tertiary Education	69	7	76	90.7%				-	-	-	-	-
Total	**234**	**66**	**300**	-	-	-	-	-	-	-	-	-

The chi-square test revealed a significant link between parental education and handwashing behaviour ($\chi^2(3) = 24.18$, $p < 0.001$). Consistent handwashing was lowest among parents with no formal education (69.6%) and highest among those with tertiary education (90.7%), showing education's strong influence on hygiene.

Logistic regression confirmed this: parents with no formal education were 71% less likely (OR = 0.29, $p < 0.001$) and those with primary education 54% less likely (OR = 0.46, $p = 0.007$) to practice consistent handwashing than tertiary-educated parents. Secondary education showed a lower likelihood (OR = 0.70, $p = 0.150$), but not significantly.

H_{03}: Parents with stable employment (civil servants and professionals) are more likely to afford and access cholera prevention resources than those with unstable or irregular employment (farmers, traders, and artisans).

Table 6: Relationship Between Occupation and Access to Sanitation Facilities

Occupation	Access = Yes	Access = No	Total	% with Access	χ^2	Df	P-value (χ^2)	Coef.	Std. Error	z-value	P-value (Logit)	Odds Ratio
Civil Servants	34	6	40	85.0%	18.42	6	0.005	-	-	-	-	-
Traders/Business Owners	114	46	160	71.3%				-0.32	0.18	-1.78	0.075	0.73
Farmers	22	13	35	62.9%				-0.58	0.21	-2.76	0.006	0.56

Artisans	16	9	25	64.0 %				-0.44	0.22	-2.00	0.045	0.64
Professionals	17	3	20	85.0 %				+0.27	0.19	+1.42	0.155	1.31
Students	8	7	15	53.3 %				-0.71	0.25	-2.84	0.005	0.49
Retired	3	2	5	60.0 %				-0.39	0.27	-1.44	0.150	0.68
Total	**214**	**86**	**300**	-	-	-	-	-	-	-	-	-

The chi-square test showed a significant association between parents' occupation and access to sanitation ($\chi^2(6) = 18.42$, $p = 0.005$), indicating that access varies by job type. Civil servants and professionals had higher access rates than farmers, artisans, and students, reflecting the influence of job stability and income.

Regression analysis confirmed this: farmers (OR = 0.56, p = 0.006), students (OR = 0.49, p = 0.005), and artisans (OR = 0.64, p = 0.045) were significantly less likely than civil servants to have adequate sanitation. Professionals (OR = 1.31, p = 0.155) had slightly better, but non-significant, access, while traders (OR = 0.73) and retirees (OR = 0.68) showed lower, non-significant access levels.

Discussion of Findings

Income and Access to Cholera Prevention Resources

The study found that while households with higher income reported better access to clean drinking water (88.1% in high-income families vs. 60.7% in low-income families), statistical tests showed mixed significance. The chi-square test confirmed differences in water access across income groups ($\chi^2(3) = 22.47$, $p < 0.001$), and regression analysis indicated that low-income households were 59% less likely to access clean water than their high-income counterparts (OR = 0.41, p = 0.001).

These findings are consistent with studies in Nigeria and other cholera-prone regions, which report that poor households depend disproportionately on unsafe water sources such as open wells and rivers (Salubi *et al*., 2021). Azeez *et al*. (2023) similarly noted that low-income families face structural disadvantages, including poor municipal water supply and high costs of private alternatives. Globally, Chevalier *et al*. (2013) observed that higher income enhances household resilience through better living conditions and reduced reliance on unsafe sources. The World Health Organization (2022) emphasizes that sustainable cholera prevention requires tackling inequalities in water and sanitation (WASH) infrastructure. Thus, this study confirms that poverty remains a structural driver of cholera vulnerability.

Education and Cholera Prevention Practices

The findings revealed that only 69.6% of parents with no formal education practiced consistent handwashing, compared to 90.7% of those with tertiary education. Chi-square analysis confirmed a significant association ($\chi^2(3) = 24.18$, $p < 0.001$), while regression analysis indicated that parents with no formal education were 71% less likely to practice consistent handwashing (OR = 0.29, $p < 0.001$). This supports prior studies showing that education enhances cholera prevention knowledge and practices. Davis-Kean (2020) found that educated parents create healthier home environments by promoting hygiene, safe food handling, and vaccination. Similar findings in Ghana and Kenya reveal that maternal education significantly improves household adherence to water treatment and safe waste disposal (Davies-Teye *et al*., 2015; Ochieng *et al*., 2021). UNICEF (2024) highlights that education not only builds awareness but also equips parents with decision-making skills to adopt protective behaviors. However, Mwangi *et al*. (2023) caution that knowledge alone is insufficient if structural barriers (such as lack of water or soap) persist. This explains why some educated households may still struggle to practice consistent handwashing, pointing to the need for both education and infrastructural support.

Occupation and Access to Sanitation

The analysis demonstrated that occupation strongly influenced sanitation access ($\chi^2(6) = 18.42$, $p = 0.005$). Civil Servants and Professionals had the highest access rates (85%), while Farmers (62.9%), Artisans (64.0%), and Students (53.3%) were significantly disadvantaged. Regression analysis confirmed these disparities, showing that Farmers (OR = 0.56, $p = 0.006$), Students (OR = 0.49, $p = 0.005$), and Artisans (OR = 0.64, $p = 0.045$) were less likely to access sanitation compared to Civil Servants. These results highlight the role of employment stability and occupational class in shaping access to resources. Charnley *et al*. (2022) observed that households in informal and unstable occupations are disproportionately exposed to environmental risks due to weaker infrastructure and reduced income security. Olu *et al*. (2023) noted that chronic cholera persistence in African countries is linked to poor socioeconomic development, weak resilience, and unstable livelihoods. Similarly, Johnson and Adeyemi (2022) emphasized that formal employment provides steady income, which enables households to invest in sanitation and health services. This study therefore reinforces that stable occupations such as civil service and professional work offer protective advantages, while vulnerable groups like students and farmers remain at elevated risk.

Knowledge and Effectiveness of Current Prevention Strategies

Beyond socioeconomic status, the study revealed inconsistencies in the adoption of prevention strategies. Only 28% of respondents always practiced handwashing, while 50.3% reported vaccine uptake and 47% sought hospital care during diarrheal episodes. Moreover, only 48% of respondents

had ever heard of cholera, and many held misconceptions about its causes and prevention. These findings align with Eze *et al*. (2022), who reported that less than half of Nigerian parents correctly identified unsafe water as a major cholera cause. Nsenga (2020) and Ngingo *et al*. (2023) similarly noted that misinformation, poor hygiene practices, and weak health education programs fuel cholera outbreaks in Africa. Elimian *et al*. (2024) further stressed that fragmented knowledge reduces the effectiveness of national prevention strategies. This underscores the importance of health education campaigns tailored to different socioeconomic contexts, ensuring that messages reach disadvantaged groups.

The findings of this study highlight that cholera prevention is shaped not only by individual behavior but also by structural inequalities. Income disparities restrict access to clean water, educational gaps hinder hygiene practices, and occupational instability reduces access to sanitation. These results align with the Global Task Force on Cholera Control's 2030 roadmap, which emphasizes that cholera elimination requires multisectoral approaches, combining infrastructure, health education, vaccination, and poverty reduction (Global Task Force on Cholera Control, 2019; WHO, 2022). In practical terms, this suggests that interventions must go beyond awareness campaigns to address the deeper socioeconomic constraints families face. Improving WASH infrastructure, subsidizing preventive tools, and targeting vulnerable occupational groups with tailored interventions can strengthen community resilience. Addressing these inequities will not only reduce cholera outbreaks but also advance global health goals, particularly Sustainable Development Goal 3 on health and well-being for all.

Conclusion

This study examined how parents' socioeconomic factors affect cholera prevention and control among children in Abeokuta South, Ogun State. Findings show that income, education, and occupation strongly influence household vulnerability. Low-income families had less access to clean water, poorly educated parents practiced handwashing less consistently, and those in unstable jobs had limited sanitation access. Despite moderate awareness, misconceptions about cholera persist, showing that knowledge alone is insufficient without resources to act on it. Cholera thus reflects deeper social and economic inequalities. Effective control requires integrated strategies that reduce poverty, expand education, improve WASH infrastructure, and promote equitable healthcare access. By linking parental socioeconomic status to children's cholera risk, this study supports global efforts toward the GTFCC 2030 roadmap and SDG 3 on health and well-being. Addressing socioeconomic disparities remains vital to ending recurrent outbreaks and achieving cholera-free communities.

Recommendations

- Public health programmes should focus on providing safe and affordable water solutions, such as water filters or purification tablets, to families in lower-income brackets. This would directly address their reliance on riskier water sources.
- To address economic vulnerability, governments or NGOs should consider subsidizing or distributing essential hygiene products like soap, hand sanitizer, and water treatment agents to ensure that all families, regardless of income, can afford and practice basic hygiene.
- Launching community-based campaigns that focus on the importance of regular handwashing with soap and water can improve hygiene practices across all socioeconomic levels.

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