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SANITATION FACILITIES AND BARRIERS TO SAFE HYGIENE PRACTICES ACROSS URBAN, SEMI-URBAN AND RURAL SETTLEMENTS OF UYO CAPITAL CITY, AKWA IBOM STATE, NIGERIA

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Abstract

Background: *Access to adequate sanitation facilities is central to eliminating open defecation. However, the relationship between facility access, settlement type, and open defecation practice remains poorly documented in urban Nigeria.*

Purpose: *This study examined access to sanitation facilities and the barriers to adopting safe hygiene practices across the urban, semi-urban, and rural zones of Uyo Capital City, Akwa Ibom State, Nigeria.*

Methods: *A cross-sectional survey was conducted among 345 respondents from 384 questionnaires administered, representing an 89.84% retrieval rate. Data were analyzed using descriptive statistics, Chi-square tests, and binary logistic regression.*

Results:
Although 98.26% of respondents reported having access to a toilet facility of some kind, 55.36% admitted to having practiced open defecation at least once. The most common locations were bushes (n = 100) and farmland (n = 58). The primary reasons cited were lack of access to functional toilets (36.81%) and poor facility condition (27.25%). Open defecation was significantly associated with type of toilet facility ($\chi^2 = 49.37$, $p < 0.001$). Counter-intuitively, prevalence was higher in urban (18.55%) and semi-urban (20.87%) zones than in rural areas (15.94%). Logistic regression showed that the odds of practicing open defecation increased by approximately 9.1% with each shift from rural to semi-urban to urban settlement. The most frequently cited barriers to adopting safe hygiene practices were lack of space (70.72%) and poverty (84.06%), followed by cultural/traditional factors (53.62%) and construction/maintenance cost (39.13%).

Conclusion and Recommendation:
The study concludes that facility access alone does not eliminate open defecation where facilities are shared, poorly maintained, or physically inaccessible. It recommends settlement-specific sanitation investments, with priority attention to congested urban and semi-urban neighborhoods.

Keywords: Sanitation access; open defecation; urban-rural comparison; barriers; hygiene facilities

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INTRODUCTION

Access to safe, private and functional sanitation facilities is widely regarded as a precondition for eliminating open defecation, and forms the core of Sustainable Development Goal target 6.2 (FMWR, 2021). Globally, an estimated

1.2 billion people gained access to safely managed sanitation between 2015 and 2024, yet 3.4 billion people still lacked such access as of 2024, and 1.5 billion lacked even basic sanitation. Open defecation typically persists most strongly where access to private, secure toilet facilities is poor, particularly in low-income and informal settlements, and in public spaces such as schools, markets and parks that lack functioning restrooms (Makhfudli *et al.,* 2017; Muhammad *et al*., 2022; Inah *et al*., 2023). However, access to a sanitation facility does not automatically translate into consistent use. Facilities that are shared among multiple households, poorly maintained, distant, or otherwise inconvenient may be bypassed in favour of open defecation, particularly during emergencies or when the household's usual facility is filled or damaged. Understanding how access, facility type and settlement context (urban, semi-urban or rural) interact with open defecation practice is therefore essential to designing effective sanitation interventions. This study examines that relationship for Uyo Capital City, Akwa Ibom State, where approximately 56% of residents have access to basic sanitation services yet open defecation persists (FMWR, 2021).

This distinction between access and use is increasingly recognised in the global WASH monitoring architecture itself. The WHO/UNICEF Joint Monitoring Programme's sanitation service ladder – distinguishing open defecation from unimproved, limited, basic and safely managed sanitation – was specifically designed to move national and sub-national monitoring beyond a simple binary of "has facility" versus "has no facility", in recognition that facility type, sharing arrangements and hygienic condition all mediate whether nominal access delivers genuine protection from the health risks associated with unsafe excreta disposal. Nigeria's own National Outcome Routine Mapping (WASHNORM) exercise adopts this ladder at the state level, yet city-level studies capable of examining how facility type and condition interact with actual open defecation practice, rather than facility presence alone, remain comparatively rare, particularly for Nigeria's southern state capitals. This study addresses that gap for Uyo Capital City. National and state-level data provide important context for facility access patterns in Akwa Ibom State.

The 2018 Nigerian National Demographic and Health Survey estimated that 23.1% of households in Akwa Ibom State practised open defecation, while the 2021 WASHNORM report placed the figure at 11%, against a national average of 23% (FMWR, 2021). The same report documented Akwa Ibom State's sanitation service ladder as follows: primary/basic hygiene service (12% of the state population, against 28% nationally), limited hygiene service (16%, against 11% nationally), safely managed hygiene service (44%, against 18% nationally), and unimproved hygiene service (17%, against 20% nationally), indicating that, while the state outperforms the national average on safely managed access, it has simultaneously experienced a documented regression, with the proportion of residents lacking adequate access rising from 11% to 17%, and the open-defecating proportion rising from 4% to 11%, between 2019 and 2021 (FMWR, 2021). The report attributes part of this regression to inadequate WASH-sector budgetary allocation and weak release of approved funds over the preceding years.

This service-ladder classification, developed under the WHO/UNICEF Joint Monitoring Programme, distinguishes facilities not merely by presence but by hygienic separation of waste from human contact and by whether they are shared between households: a “safely managed” facility is an improved facility not shared with other households, whose waste is safely disposed of in situ or transported and treated off-site; a “basic” facility is an improved but shared facility; a “limited” facility is an unimproved facility; and “open defecation” refers to disposal of human faeces in fields, forests, bushes, open bodies of water, or other open spaces. This framework is directly relevant to the present study’s findings on facility sharing, since a shared facility, even if structurally identical to a private one, is classified differently precisely because shared use introduces the collective-action and maintenance dynamics examined in Section 8.8. Understood this way, a household that reports “access” to a shared flush toilet in this study’s survey may, under the stricter JMP definition, sit in the “limited” rather than “safely managed” category, a distinction that helps explain why this study’s facility-access figure (98.26%) sits well above the proportion of households who reported never resorting to open defecation. Beyond flush toilets and pit latrines, some coastal and hard-to-reach communities in Akwa Ibom State rely on a practice locally known as “wrap and throw” – defecating into a disposable bag or wrapper for later disposal, reflecting the influence of difficult terrain on facility choice in low-lying, flood-prone areas (Udonquak, 2021). Within Uyo itself, insufficient water supply has been identified as a specific constraint on the effective use of existing public sanitary facilities; for example, unreliable water supply has been linked to the underperformance of public conveniences at high-footfall public spaces such as Ibom Plaza in the state capital (Udonquak, 2021).

A substantial literature identifies the structural barriers that prevent households from accessing or consistently using improved sanitation facilities even where these are nominally available. Bello et al. (2025) grouped these barriers into cultural factors (taboos against confined defecation, beliefs that children’s faeces are harmless, continuation of ancestral custom, restrictions on girls’ latrine use during menstruation) and socio-economic determinants (availability of water and sanitation supplies, ability to afford personal latrines, and lack of funds and labour for construction), alongside broader factors such as weak community social capacity, limited media availability, poor hygienic conditions in public restrooms, low community educational attainment, and inadequate safety or convenience of public latrines. This account is broadly corroborated by Olagbemide and Oluropo (2025), Makhfudli et al. (2017), Busienei et al. (2019), Inah et al. (2023) and Muhammad et al. (2022), whose combined findings point to education, wealth status, environmental factors (access to hygiene services, waste management and seasonality), cultural values and lifestyle, religiosity, access to appropriate technology, and weak institutional support as recurring determinants of open defecation across diverse settings.

Seasonal variation has also been documented as a determinant of facility use: Inah et al. (2023) found open defecation more common in the dry season than the rainy season, attributing this to restricted movement during heavy rainfall,

which compels households without facility access to resort to alternative disposal methods such as bagging waste for later disposal rather than travelling to defecate in the open. More broadly, facilities that are non-existent, vandalised, abandoned or deteriorated compound the shortage created by population growth outpacing WASH infrastructure development, a shortfall further worsened by inadequate funding, limited private-sector participation in WASH service delivery, and weak coordination among WASH stakeholders (Unwana-abasi, 2024; Mara, 2017). Distance and safety considerations further complicate the relationship between nominal access and actual use, particularly for public and shared facilities located away from the household compound. Where a facility is physically distant, poorly lit, or perceived as unsafe to reach or use, especially after dark, households may judge the risk or inconvenience of using it to outweigh the benefit relative to a nearby open space, even where the facility itself is in reasonable physical condition. This dynamic is distinct from, but compounds, the affordability and space constraints already discussed, and underscores why facility "access" in survey data should be interpreted as a necessary but not sufficient condition for consistent, safe use. Comparative evidence from other Nigerian and sub-Saharan African settings reinforces the multi-dimensional nature of these barriers. Studies conducted in rural Kenya and among Ghanaian rural women alike found that facility-related barriers rarely operate in isolation, but instead compound with household wealth status, educational attainment, occupation and place of residence to jointly determine sanitation outcomes (Busienei *et al*., 2019; Appiah-Effah *et al.,* 2024), a pattern broadly consistent with the interacting barrier categories, space, poverty, culture and cost, identified for Uyo Capital City in the present study.

This study draws primarily on the Health Belief Model (Rosenstock, 1966), which is particularly well suited to explaining facility-access barriers: the model's construct of "perceived barriers" directly captures the cost, space, water-supply and maintenance constraints identified in the literature above, while its construct of "perceived benefits" helps explain why households with nominal facility access may nonetheless continue to practise open defecation where the facility itself is perceived as unsafe, distant, or otherwise inferior to the alternative. The Social Cognitive Theory (Bandura, 1986) additionally accounts for the role of shared or community facilities identified in this study's findings, since collective use and maintenance of shared sanitation infrastructure is inherently a socially mediated behaviour shaped by observation of, and coordination with, neighbouring households (Tumwebaze and Mosler, 2014). Comparable empirical work reinforces the access–barrier distinction central to this study. Akpabio *et al.* (2015) documented substantial gaps between nominal sanitation coverage statistics and actual safely managed access across Nigerian states, cautioning against relying on facility-presence counts alone as a proxy for eliminated open defecation. Within Akwa Ibom State specifically, up to 12% of households in urban Uyo have been found to defecate outside despite facility presence in the wider housing stock, while approximately 26% of households in the state's coastal regions defecate directly into open water bodies, reflecting

the compounding effect of difficult terrain on facility viability in hard-to-reach communities.

These figures are broadly consistent with the present study's finding that facility access, while high, does not eliminate the practice, and that settlement-specific and terrain-specific factors mediate the relationship between access and use. The reviewed literature indicates that facility access is necessary but not sufficient for eliminating open defecation: facility type, sharing arrangements, water supply reliability, and physical and financial capacity to maintain a facility all mediate whether nominal access translates into consistent use. This underscores the importance of examining not merely whether households report having a toilet, but the type, condition, and circumstances of use of that facility, the specific focus of the present study.

Municipal and environmental assessments in Uyo consistently report infrastructural gaps, inefficient waste management systems and inadequate water, sanitation and hygiene (WASH) services, creating conditions in which unsafe sanitation habits can persist (WASHNORM, 2021). High rates of public urination have been documented among adults in Uyo, attributed largely to the scarcity or poor condition of public toilets (Ekanem, 2025). Yet there remains limited empirical evidence on how facility type, sharing arrangements and settlement context specifically relate to open defecation practice within the city, and whether the conventional assumption that rural areas, with typically lower infrastructure investment, bear the greatest burden of open defecation holds in Uyo's particular urban-rural gradient.

This gap constrains the design of settlement-appropriate sanitation interventions, which will be addressed through evaluation of the quality, availability and type of sanitation facilities used by households and examination of their relationship with open defecation practice, including variation across urban, semi-urban and rural settlement types; and identification of the principal barriers to accessing and adoption of safe hygiene practices among residents of the study area.

MATERIALS AND METHODS

Study Area

Uyo Capital City, Akwa Ibom State, lies between latitudes 4° 58′ N and 5° 04′ N and longitudes 7° 51′ E and 8° 01′ E in Nigeria's south-south geopolitical zone, covering approximately 214.31 km², and is bordered by Ikono, Itu and Ibiono Ibom LGAs to the north, Uruan LGA to the east, Abak LGA to the west, and Ibesikpo Asutan and Nsit Ibom LGAs to the south (Ekpenyong *et al*., 2020). See Figure 1.

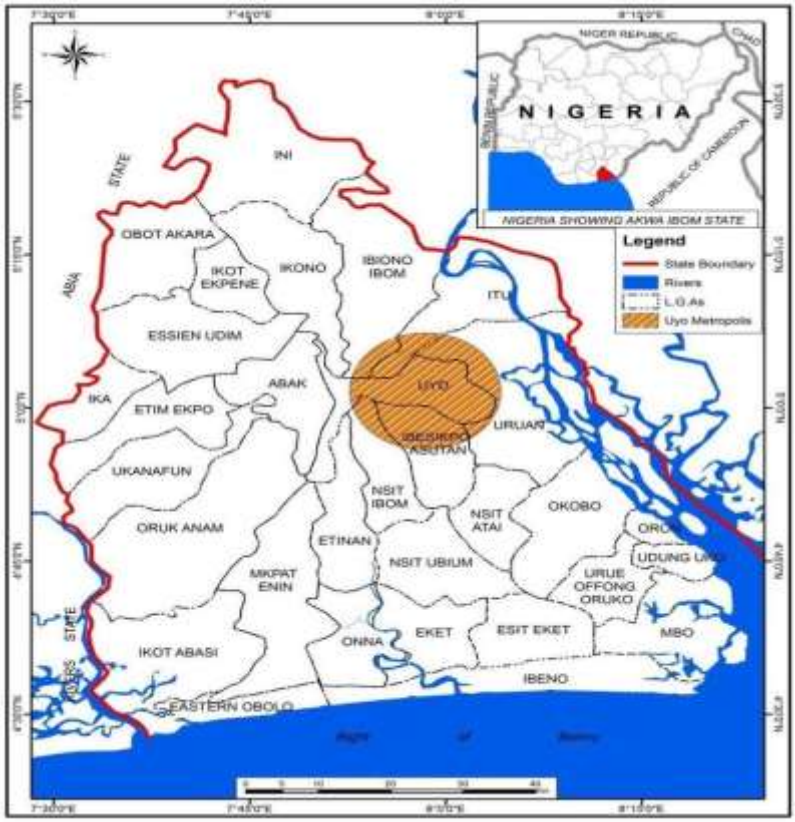

Figure 1. Akwa Ibom State showing study area
Source: Authors Compilation (2026)

Residents of Uyo Capital City are engaged mainly in trading, civil service, artisanal work, agriculture and, increasingly, tourism and hospitality services (Akwa Ibom State Ministry of Commerce, 2019). As state capital, Uyo hosts a concentration of public infrastructure – government secretariats, the University of Uyo, Heritage Polytechnic, markets, motor parks and healthcare facilities, that generates significant transient and daytime population beyond its resident population, placing additional demand on public sanitation facilities at these high-footfall locations beyond what resident-population planning figures alone would suggest. Water supply in the city is provided through a combination of the Akwa Ibom Water Company Limited's piped network, which reaches a comparatively small share of the population directly, and private boreholes and wells, with implications for the reliability of water-dependent sanitation technologies such as flush toilets, particularly in areas without consistent piped or borehole water access (FMWR, 2021). Responsibility for sanitation service delivery in Uyo Capital City is distributed across several institutions, including the Akwa Ibom State Ministry of Water Resources and Sanitation, the Akwa Ibom State Rural Water Supply and Sanitation Agency, and, for solid and liquid waste management more broadly, the Akwa Ibom State Environmental Protection and Waste Management Agency.

Materials and Methods

A cross-sectional survey design was used, combining structured questionnaires with a

qualitative focus group discussion and observational checklist assessment of sanitation facilities. The target sample size of 384 was determined using the Taro Yamane/Cochran-type formula for large populations at a 95% confidence level and 5% margin of error, appropriate given Uyo Capital City's population size of approximately 1.3 million, and was subsequently allocated proportionately across the urban, semi-urban and rural zones based on their estimated relative population shares. Of 384 questionnaires administered across the urban (120), semi-urban (144) and rural (120) zones, 345 (89.84%) were retrieved, 100 urban (28.99%), 141 semi-urban (40.87%) and 104 rural (30.14%). Stratified and systematic random sampling, with quotas by residential zone, ensured broadly representative coverage of each settlement type, while systematic selection of households (every nth household along each sampled street or enumeration area) within each zone reduced the risk of clustering bias toward more accessible or visible households.

Zone	Administered	Retrieved	% of retrieved sample
Urban	120	100	28.99
Semi-urban	144	141	40.87
Rural	120	104	30.14
Total	384	345	100.00

The questionnaire captured the type of toilet facility used, facility-sharing arrangements, frequency and location of open defecation episodes, and respondents' stated reasons for practising open defecation, alongside a checklist assessment of public sanitation facility condition. Data were analysed using descriptive statistics, the Pearson chi-square test of independence, and binary logistic regression, with the rural zone used as the reference category for settlement comparisons ($\text{logit}(p) = \beta_0 + \beta_1(\text{semi-urban}) + \beta_2(\text{urban})$). Statistical significance was set at $p < 0.05$, and a 95% confidence interval was applied throughout.

The focus group discussion followed established qualitative research practice for group size, composition and facilitation (Krueger and Casey, 2014), with nine participants drawn from across the study's residential zones to capture a range of settlement-specific perspectives on facility access and use within a single, moderated session, allowing follow-up probing on themes – such as the circumstances precipitating specific open defecation episodes – that structured questionnaire items could not capture in comparable depth.

RESULTS AND DISCUSSION

Access to and Type of Sanitation Facility

Of the 345 respondents, 339 (98.26%) reported having access to some form of toilet facility. Flush toilets were the most commonly used facility (76.81%), followed by pit latrines (21.45%), while only 1.74% reported relying on open defecation as their primary sanitation method. However, more than half of respondents (55.65%) shared their toilet facility with other households, a practice more common in semi-urban and rural areas, compared with 44.35% who did not share facilities.

Facility type	Frequency	%
Flush toilet	265	76.81
Pit latrine	74	21.45
Open defecation (primary method)	6	1.74

Facility types also varied by settlement zone: flush toilets predominate in the urban zone, reflecting greater access to piped or borehole water and formal housing stock, while pit latrines remained more common in the semi-urban and rural zones, where water-supply reliability and construction cost considerations favour simpler technologies.

Zone	Flush toilet (%)	Pit latrine (%)	Open defecation as primary method (%)
Urban	88	11	1
Semi-urban	78	20	2
Rural	64	34	2

This distribution is broadly consistent with the national and state sanitation service ladder, under which access to safely managed, water-dependent facilities is generally concentrated in more urbanised areas (FMWR, 2021), yet the settlement-type comparison discussed in Section 8.3 shows that this technological advantage in the urban zone did not translate into a correspondingly lower rate of open defecation practice.

Open Defecation Despite Facility Access

Despite this high reported access, 191 respondents (55.36%) admitted to having defecated in the open at least once, most commonly in bushes (100 cases), farmland (58 cases), gutters (17 cases) and water bodies (12 cases). When asked why, 36.81% cited lack of access to a functional toilet and 27.25% cited the poor condition of existing facilities, while 8.70% cited economic constraints and 4.06% cited cultural or traditional practice. The chi-square test confirmed a highly significant association between type of sanitation facility and open defecation practice ($X^2 = 49.37$, $df = 1$, $p < 0.001$). Most episodes were irregular or emergency-driven rather than habitual: 49.57% of respondents said they resorted to open defecation only while travelling or in an emergency, and just 8.99% did so regularly.

Settlement-Type Comparison

Contrary to the common assumption that open defecation is predominantly a rural phenomenon, this study found it to be somewhat more prevalent in urban (18.55% of the total sample; 64.0% of urban respondents) and semi-urban (20.87% of the total sample; 51.1% of semi-urban respondents) zones than in rural areas (15.94% of the total sample; 52.9% of rural respondents).

Settlement	Practising OD (%)	Not practising OD (%)
Rural (reference)	52.9	47.1
Semi-urban	51.1	48.9
Urban	64.0	36.0

Logistic regression, $\log(p/(1-p)) = -0.637 + 0.087 \times$ settlement (rural = 0, semi-urban = 1, urban = 2), produced predicted probabilities of 0.345 (rural), 0.365 (semi-urban) and 0.386 (urban), with an odds ratio of approximately 1.091, meaning the odds of practising open defecation rose by about 9.1% with each step up the rural-to-urban gradient. This finding departs from the pattern reported in several other contexts, where open defecation is typically concentrated in rural areas because of weaker infrastructure investment and enforcement (Belay et al., 2022; WHO, 2017), but is consistent with the observation that urbanisation in Uyo has outpaced the expansion of sanitation infrastructure, concentrating pressure on congested urban and semi-urban neighbourhoods around markets, schools and transport hubs where public facilities are scarce or poorly maintained.

Public Facility Condition

Observational checklist assessment of a subset of public and shared sanitation facilities across the three zones found considerable variation in condition: facilities in the urban zone, while more numerous, were frequently heavily used and inconsistently maintained, particularly around markets and motor parks, consistent with respondent reports that water-supply unreliability undermines the effective use of otherwise available public conveniences in high-footfall areas of the city (Udonquak, 2021). Semi-urban facilities showed the most mixed picture, ranging from well-maintained private household facilities to poorly maintained shared or communal facilities, while rural facilities, though less numerous overall, were more likely to be simple pit latrines under direct single-household control and correspondingly more consistently maintained despite their more basic construction. Water supply reliability emerged repeatedly as a cross-cutting theme linking facility type, zone and condition. Flush-toilet facilities, predominant in the urban zone, are inherently more vulnerable to service interruption than simpler pit-latrine technologies, since they depend on a continuous or at least regularly available water supply to function hygienically; where piped or borehole water access is interrupted, a documented challenge at high-footfall public locations such as Ibom Plaza (Udonquak, 2021), flush facilities can rapidly become unusable, potentially explaining why urban respondents, despite disproportionately relying on the technically more “improved” flush-toilet category, did not show correspondingly lower rates of open defecation practice relative to the semi-urban and rural zones, where simpler, less water-dependent pit-latrine technology predominates.

Barriers to Adopting Safe Hygiene Practices

Beyond facility access itself, several structural barriers to adopting safe hygiene practices were identified. Poverty was the most commonly cited barrier (84.06%, later summarised

as 86.06% in the consolidated barriers table), followed by lack of space for toilet construction (70.72%), cultural and traditional factors (53.62%), and the cost of constructing and maintaining toilets (39.13%). When these barriers were considered in combination, poverty accounted for 34% of cumulative barriers cited, lack of space for 28%, culture and custom for 22%, and construction/maintenance cost for 16%.

Barrier	Individual % citing as barrier	Combined weight (%)
Lack of adequate space	70.72	34.0
Poverty	84.06	28.0
Culture and tradition	53.62	22.0
Construction/maintenance cost	39.13	16.0

These findings suggest that, in Uyo Capital City, the barrier to safe hygiene practice is only partly about the presence or absence of a toilet: lack of physical space for construction, the cost of building or repairing facilities, and shared-facility arrangements that discourage regular maintenance all compound the effects of poverty. Qualitative evidence from the focus group discussion reinforced this: participants described resorting to open defecation specifically when an existing toilet became filled, and the household could not immediately afford a replacement, rather than because they viewed the practice as acceptable.

Variation in Barriers by Settlement Zone

Disaggregating the barrier data by settlement zone shows that lack of space was the dominant barrier cited in the urban zone, reflecting the compact plot sizes and dense housing typical of central Uyo neighbourhoods; poverty and construction cost were more evenly weighted across the semi-urban and rural zones, where households more often own their plots but have lower average incomes with which to fund construction; and cultural and traditional factors, while present across all three zones, were most frequently cited in the rural zone, consistent with this study's companion analysis of the stronger cultural attribution of open defecation in less urbanised settings.

Barrier	Urban (%)	Semi-urban (%)	Rural (%)
Lack of space	46	31	23
Poverty	27	36	37
Culture and tradition	18	29	53
Construction/maintenance cost	22	39	39

This zone-specific patterning reinforces the case, developed further in Section 8.8, for

differentiated rather than uniform sanitation investment across the city's settlement types: interventions premised on land availability (such as conventional pit-latrine subsidies) are likely to be most effective in the rural zone, while urban interventions require compact or shared-facility technologies that do not depend on generous plot sizes.

Qualitative Perspectives from the Focus Group Discussion

The focus group discussion held in March 2025 provided qualitative texture that helps interpret the quantitative access and barrier findings reported above. Participants generally regarded open defecation as unacceptable in principle, citing its health and environmental consequences, and identified areas around markets, parks and educational institutions as particularly affected within the city. At the same time, participants were candid that specific circumstances, travel away from home, emergencies, or the poor condition of an available toilet, led even residents who owned a functioning home facility to defecate in the open on occasion, echoing this study's quantitative finding that most open defecation episodes are irregular and circumstance-driven rather than habitual. Several participants specifically described episodes in which their household's existing toilet became filled or unusable, and financial constraints delayed its repair or replacement, direct qualitative corroboration of this study's quantitative finding that facility breakdown, rather than facility absence, is a leading proximate trigger of open defecation in Uyo Capital City.

Participants also emphasised that continued public sensitisation, combined with improved access to affordable sanitation facilities and stronger household economic circumstances, would be central to reducing the practice – a view consistent with this study's conclusion that facility-access statistics alone provide an incomplete picture of the intervention needed.

Facility Sharing and Collective Maintenance

The finding that more than half of respondents (55.65%) shared their toilet facility with other households warrants closer attention, since shared-facility arrangements introduce a distinct set of behavioural dynamics not present in single-household facility ownership. Where a facility serves multiple households, responsibility for cleaning, maintenance and eventual desludging or repair is distributed across users who may have differing levels of investment in its upkeep, creating a collective-action problem in which any individual household has limited incentive to invest in maintenance if the benefit is shared among all users regardless of contribution (Tumwebaze and Mosler, 2014). This dynamic offers a plausible explanation for why, despite widespread reported facility access, a substantial share of respondents nonetheless reported resorting to open defecation when their facility became filled, damaged or otherwise unusable – a shared facility that no single household feels fully responsible for maintaining may deteriorate more rapidly, and be repaired more slowly, than a facility under sole household control. This has a direct bearing on the settlement-zone pattern identified in Section 8.3: semi-urban and urban neighbourhoods, where shared-facility arrangements were most common in this study's sample, also recorded the highest rates of open defecation, consistent with the hypothesis that collective-action failures around

shared facility maintenance contribute to the counter-intuitive urban–rural gradient identified in this study. Addressing this dynamic is likely to require not merely technical facility upgrades but also clearly assigned maintenance responsibility and, where appropriate, small user-fee or rota-based maintenance schemes of the kind that have shown promise in comparable urban informal-settlement contexts elsewhere (Tumwebaze and Mosler, 2014).

Synthesis and Implications for Policy and Practice

The pattern of findings in this study maps closely onto the Health Belief Model's barrier–benefit framework. Perceived barriers, lack of space, poverty, and construction and maintenance costs emerge clearly as the dominant factors preventing households from converting nominal facility access into consistent, safe use, regardless of whether households correctly perceive their own susceptibility to sanitation-related illness. This suggests that, as in the companion analysis of socio-cultural and economic determinants, awareness-based messaging alone is unlikely to close the gap between reported facility access (98.26%) and the much lower proportion of households who never resort to open defecation (44.64%). Instead, the Health Belief Model points toward interventions that directly reduce structural barriers, through subsidy, technical redesign, or shared-facility management support, as the more promising lever for translating Uyo's comparatively high facility-access rate into a correspondingly low open defecation rate. These findings carry several practical implications. First, the near-universal reported facility access (98.26%) combined with high rates of occasional open defecation (55.36%) demonstrates that access-focused metrics alone, the primary indicator tracked in most national and state WASH monitoring frameworks, substantially understate the scale of the practice, since they do not capture facility condition, sharing arrangements, or the frequency with which households actually resort to alternatives. Sanitation monitoring in Uyo Capital City would benefit from supplementing access indicators with facility functionality and use-frequency indicators. Second, the finding that open defecation is more prevalent in urban and semi-urban zones than in rural areas directly challenges the implicit targeting logic of several existing interventions, including the donor-supported Niger Delta Support Programme, which concentrated investment in predominantly rural pilot local government areas and suggests that future investment should not assume that urban status is a reliable proxy for adequate sanitation access. Third, because lack of space and construction/maintenance cost together accounted for half of all cited barriers, technical solutions that reduce the physical and financial footprint of facility construction, such as compact pour-flush systems, container-based sanitation, or shared facilities with clear, incentivised maintenance arrangements are likely to be more readily adopted in Uyo's land-constrained urban and semi-urban neighbourhoods than conventional pit-latrine construction alone.

These findings can usefully be set against published state and national indicators. The 2021 WASHNORM report placed Akwa Ibom State's open defecation rate at 11%, below the national average of 23%, and its safely managed sanitation access at 44%, well above the 18% national average, suggesting comparatively strong

aggregate performance (FMWR, 2021). Set against this, the present study's finding that 55.36% of Uyo Capital City respondents had practised open defecation at least once – more than five times the state's official headline rate – illustrates the gap between official indicators, which typically measure a household's primary or habitual sanitation method, and the fuller picture of occasional, circumstance-driven practice captured by this study's more granular survey items. This gap is itself informative: it suggests that Akwa Ibom State's comparatively favourable official statistics may understate the true scale of residents' exposure to open defecation, particularly in its capital city, and that monitoring frameworks reliant solely on primary-method indicators risk masking the kind of facility-access and facility-condition problems identified in this study. The finding that open defecation was more prevalent in Uyo's urban and semi-urban zones than in its rural zone also complicates the frequent framing of open defecation as chiefly a rural and coastal-community problem in Akwa Ibom State – a framing reflected, for instance, in the concentration of donor-supported interventions in predominantly rural pilot local government areas under the Niger Delta Support Programme. While rural and coastal communities undoubtedly face acute, terrain-specific sanitation challenges of their own, as documented in the "wrap and throw" practice reported in coastal areas, the present findings indicate that Uyo's own urban core should not be assumed immune to the practice on the basis of its urban status alone.

Taken as a whole, the pattern of results reported in this study – high nominal access, high occasional practice, an urban-weighted prevalence gradient, and a barrier profile dominated by space, poverty and cost rather than culture alone – paints a picture of a sanitation transition that is technologically advanced but institutionally and financially incomplete. Uyo Capital City has, in large part, already adopted improved sanitation technology at the household level; what remains unresolved is the maintenance, affordability and shared-responsibility infrastructure required to keep that technology consistently functional under the pressures of rapid urban growth.

In this respect, the sanitation challenge facing Uyo Capital City differs meaningfully from the more commonly studied challenge of first-generation facility construction in low-access rural settings: it is, in large part, a second-generation challenge of sustaining and maintaining an already substantially built sanitation stock under conditions of rapid population growth, land constraint and shared use. Recognising this distinction is important because the policy toolkit appropriate to closing a facility-construction gap – subsidised latrine-building programmes, for instance – is not automatically the correct toolkit for closing a facility-maintenance gap, which instead calls for interventions targeted at repair capacity, water-supply reliability and clearly assigned responsibility for shared infrastructure, as reflected in the recommendations that follow.

This distinction between a construction gap and a maintenance gap also has resource-mobilisation implications: donor and government funding models built around one-off latrine-construction targets may be poorly matched to a context, such as Uyo Capital City, where the more binding constraint is the recurrent cost of keeping already-built facilities functional, suggesting a need

for financing mechanisms explicitly designed around ongoing maintenance rather than construction alone.

CONCLUSION

This study has shown that near-universal reported access to a sanitation facility in Uyo Capital City (98.26%) does not equate to elimination of open defecation, which more than half of respondents admitted to practising at least occasionally, mainly during emergencies or when their usual facility was unavailable or in poor condition. Open defecation was significantly more common in urban and semi-urban zones than in rural areas, contrary to patterns typically reported elsewhere, reflecting the pace of urbanisation outstripping sanitation infrastructure investment. Poverty, lack of space and the cost of construction and maintenance, rather than facility access alone, emerged as the dominant barriers to safe hygiene practice. The collective-action dynamics surrounding shared-facility maintenance, identified through both the survey and the observational checklist, offer a plausible mechanism linking the study's two central findings: high nominal access alongside high occasional-practice rates. Where a majority of households share facilities with limited individually assigned maintenance responsibility, and where urban and semi-urban land constraints push households toward such shared arrangements more than rural households, the resulting maintenance gap helps explain why Uyo's urban core, despite superior nominal infrastructure relative to its rural periphery recorded higher rates of open defecation practice in this study. The study recommended prioritising sanitation investments in Uyo's congested urban zones, markets, schools, motor parks, and university areas, not just rural sites. Support space-constrained households with compact or shared facilities, backed by repair, desludging, and reliable water supply to prevent breakdowns. Expand monitoring beyond access to track functionality and use and formalise maintenance agreements through local WASH committees to sustain shared facilities.

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