



Social Infrastructure and Inclusive Healthcare Access in Rural Healthcare Centres in Akwa Ibom State

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Abstract

Rural healthcare centres across Nigeria continue to contend with problems that reach beyond the health sector itself. In Akwa Ibom State, where several hundred primary health care facilities are spread across thirty-one local government areas, a growing body of evidence suggests that poor roads, unreliable electricity, and inadequate water supply do as much to keep rural dwellers away from care as any shortage of doctors or drugs. This library-based study draws on the Penchansky and Thomas access framework and the World Health Organization's social determinants of health model to examine how social infrastructure shapes inclusive healthcare access in rural Akwa Ibom. Relying entirely on secondary evidence, including national demographic and health survey data, peer-reviewed facility assessments, state and national policy documents, and investigative field reporting, the paper argues that inclusive healthcare access in the state cannot be achieved through health-sector interventions alone. Facility-level assessments show that rural primary health centres lag behind their urban counterparts in essential drugs, functioning equipment, and staffing readiness, while separate field accounts describe centres operating without power, water, or a passable access road. The paper concludes that meaningful progress toward inclusive access will depend on treating road networks, rural electrification, and water supply as health infrastructure in their own right, and it recommends a more deliberate, multisectoral approach to rural health planning in the state, alongside

renewed primary research to update an empirical base that remains thin and, in places, dated.

Keywords: social infrastructure, healthcare access, rural health, primary health care, Akwa Ibom State, Nigeria

1. Introduction

When the World Health Organization convened member states at Alma-Ata in 1978, the resulting declaration set out primary health care as the principal route to health for all, built on the idea that care should be located as close as possible to where people live and work (World Health Organization [WHO], 1978). Nigeria has spent much of the following half-century trying to build a health system around that idea, through the National Health Policy of 1988, its 2004 revision, and the current policy issued in 2016 under the theme of promoting the health of Nigerians to accelerate socio-economic development (Federal Ministry of Health [FMOH], 2016). The 2014 National Health Act gave that ambition legal teeth, and the subsequent Primary Health Care under One Roof reform sought to end the fragmentation that had long weakened service delivery at the ward level by placing PHC governance under a single state agency in each state.

Akwa Ibom State took up that reform later than most. The Akwa Ibom State Primary Healthcare Development Agency was established by state law in 2017 and inaugurated its governing board in September 2018, formally beginning the state's implementation of Primary Healthcare under One Roof. On paper, the state is not short of facilities: recent assessments put the number of government-owned primary health centres at 426, spread fairly evenly across the state's three senatorial districts of Uyo, Ikot Ekpene, and Eket (Nwakile et al., 2024). Yet the presence of a building does not, by itself, guarantee that a rural household can reach it or that the household will find anything useful once it arrives. This is the gap the present paper is concerned with.

The problem this paper addresses is not simply whether Akwa Ibom has enough primary health centres, but whether the wider social environment around those centres allows people to use them. Roads that wash out in the rainy season, electricity supply that many rural centres simply do not have, and water systems that depend on a single borehole liable to fail or be vandalised are not, strictly speaking, health-sector problems. But they shape, in very concrete ways, whether a woman in labour can be attended to at night, whether vaccines can be kept cold, and whether a family several kilometres from the nearest centre will attempt the journey at all. Framing healthcare access in rural Akwa Ibom purely as a matter of health-sector investment therefore risks missing much of what actually determines whether care is inclusive.

This study sets out, first, to establish what is known from existing literature and data about the distribution and functional condition of rural primary health centres in Akwa Ibom State; second, to examine how deficits in social infrastructure, principally roads, electricity, and water, bear on the different dimensions of healthcare access; and third, to

draw out what this synthesis implies for policy and for further research. The paper argues that inclusive access in rural Akwa Ibom is best understood as a joint product of health-sector effort and broader rural development, and that treating the two separately has limited what earlier interventions have been able to achieve. Given the practical constraints on new fieldwork, the study is deliberately designed as a library-based, or desk, research exercise, drawing together secondary sources rather than generating new primary data; the implications of that choice are discussed more fully in the methodology section.

2. Theoretical Framework

Two complementary frameworks anchor the analysis in this paper. The first, and more immediate, is the access framework developed by Penchansky and Thomas (1981), which remains one of the most widely used tools for thinking about what it means for a health system to be genuinely accessible. Penchansky and Thomas describe access not as a single yes-or-no condition but as the degree of fit between a patient's needs and a health system's characteristics, broken into five interacting dimensions: availability, the volume and type of services actually on offer relative to need; accessibility, the physical and geographic relationship between the user and the service; accommodation, how services are organised to suit the practical circumstances of users, including hours of operation; affordability, the relationship between the cost of care and a household's ability to pay; and acceptability, the degree to which the attitudes of providers and the expectations of patients are compatible. A later refinement of the model, proposed by Saurman (2016), argues for adding a sixth dimension, awareness, on the grounds that a service can satisfy all five of the original criteria and still go unused if the people it is meant to serve simply do not know it exists or how to reach it. This addition turns out to matter a great deal for Akwa Ibom, where, as later sections show, community members have in places been unaware of specific funding schemes meant to improve the very facilities they rely on.

The second framework, developed by Solar and Irwin (2010) for the World Health Organization's Commission on Social Determinants of Health, situates access problems within a wider causal structure. The Commission's model distinguishes structural determinants, the socioeconomic and political conditions that decide how resources and opportunities are distributed across a society, from intermediary determinants, the more immediate factors, such as material living conditions, that translate those structural inequalities into differences in health. Physical infrastructure, including roads, electricity, and water supply, sits squarely among the intermediary determinants in this model: it is not itself a health service, but it is the material condition through which broader patterns of rural neglect are converted into poorer health outcomes for rural populations.

Read together, the two frameworks suggest a way of organising the evidence that follows. The Penchansky and Thomas model, extended by Saurman's notion of awareness, supplies the vocabulary for describing what is actually going wrong at the point of care, whether that is a lack of available drugs, an impassable road, a facility that closes at dusk

for want of light, or a community that has never heard of a scheme meant to help it. The Solar and Irwin framework explains why these particular failures cluster so heavily in rural areas: they are the downstream, material expression of a socioeconomic and political context that has historically directed infrastructure investment toward urban centres. The literature reviewed in the next section is organised with this combined lens in mind.

2.1 Literature Review

2.1.1 Primary Health Care Policy and Practice in Nigeria

Nigeria's commitment to primary health care as the foundation of its health system dates, at least in policy terms, to the Alma-Ata Declaration of 1978, which the country adopted along with most of the WHO's membership (WHO, 1978). The National Health Policy of 2016 restates this commitment explicitly, describing its overall goal as strengthening the health system, and particularly its primary care sub-system, to deliver care that is effective, efficient, equitable, accessible, affordable, acceptable, and comprehensive (FMOH, 2016). The Primary Health Care under One Roof reform that followed the National Health Act of 2014 was intended to resolve a long-standing structural weakness in Nigerian PHC delivery, namely the fragmentation of authority over primary facilities among local government health departments, state ministries, and disease-specific vertical programmes. Consolidating this authority under a single State Primary Health Care Development Agency in each state, including Akwa Ibom's own agency established in 2017, was meant to make planning and resource allocation more coherent. Whether that structural reform has translated into better functioning facilities on the ground is a separate question, and one this paper returns to in the discussion.

2.2.2 Rural-Urban Disparities in Healthcare Access across Nigeria

Independent of any single state, the broader Nigerian literature on healthcare access is unambiguous about the scale of the rural-urban divide. Using geospatial modelling of facility locations against population and road-network data, Lawal and Anyiam (2019) found that while the average travel time to the nearest primary health care facility across Nigeria is a little over fourteen minutes, the maximum travel time recorded in their model was close to two hours, with facilities heavily clustered around major urban centres. A more recent comparative study of Nigeria and Zambia found the disparity to be starker still once transport mode is taken into account: city residents typically reach a hospital within minutes, but rural populations relying on walking can face journeys exceeding four hours, with only a small fraction of Nigeria's population living within a fifteen-minute walk of a facility (Fang et al., 2026). Motorised transport narrows this gap considerably where it is available, which is precisely why road quality, rather than facility placement alone, keeps recurring as a determining variable in this literature.

Studies focused specifically on road infrastructure make the mechanism explicit. Research from Kabba-Bunu Local Government Area in Kogi State found a consistent pattern of declining facility utilisation as the distance and difficulty of the road journey to

a health facility increased, and recommended the construction of motorable roads as a direct intervention to improve healthcare delivery (Gbadamosi & Olorunfemi, 2016). A parallel study of wetland communities in Delta State, a Niger Delta context with strong physical similarities to parts of Akwa Ibom, identified road infrastructure as a major determinant of healthcare accessibility, arguing that the near-total absence of roads in some riverine communities effectively marginalises them from the formal health system altogether (Obi, 2022). Comparable findings from Nsukka Local Government Area in Enugu State connect the persistence of poor rural outcomes to the concentration of infrastructure and trained personnel in urban areas, with rural facilities frequently unable to offer the full range of services expected of them (Nnadi et al., 2024).

2.2.3 The State of Rural Healthcare Centres in Akwa Ibom State

Akwa Ibom-specific evidence, though not extensive, is more substantial than might be expected and spans over a decade. An early appraisal of government efforts under the state's primary health care policy found that the state had made visible investment in building and renovating health centres, even as significant gaps in funding, staffing, and service delivery remained (Ibok & Akpan, 2013). Writing on governance rather than infrastructure specifically, Eno (2010) traced many of the same delivery problems in the state's primary health system back to weak governance structures and funding constraints that limited what facility-level improvements could achieve on their own. A separate evaluation of the state's rural road and bridge network found these to be strongly associated with broader socio-economic development outcomes across Akwa Ibom's local government areas, a finding this paper treats as an early, if indirect, indication that the same transport deficits limiting rural commerce and mobility in the state are also likely to bear on healthcare access specifically (Ibok & Daniel, 2013).

Rural electrification in the state has received similar academic attention. A survey-based study of Mkpato Enin Local Government Area, covering 410 respondents across three of the area's four clans, examined government approaches to rural electrification as an index of development and argued that electrification efforts in the state need to be judged against a broader standard of development that improves living standards, ensures mass participation, and is self-sustaining rather than treated as an end in itself (Udoh, 2017). While the study does not address health facilities directly, it reinforces the pattern already visible in the road-infrastructure literature: that basic utilities in rural Akwa Ibom are tracked and evaluated as development infrastructure in their own right, independent of any single sector's use of them.

The most detailed facility-level data available comes from two cross-sectional assessments a decade apart. An assessment of eighteen facilities drawn from the state's three senatorial zones examined human resources and physical infrastructure against national minimum PHC standards and found meaningful shortfalls in both areas relative to what the standards required (Akwaowo et al., 2020). More recently, Nwakile et al. (2024) surveyed 214 primary health centres randomly sampled from the state's full complement

of 426 government-owned facilities, applying the WHO's service availability and readiness assessment tool to hypertension and diabetes care. Their results showed a consistent urban advantage: urban facilities were considerably more likely than rural ones to have essential drugs, functioning laboratory equipment, and an overall readiness to manage these conditions, with the availability of a drug-revolving fund and adequate staff numbers emerging as the strongest predictors of readiness (Nwakile et al., 2024).

An investigative field report published by the International Centre for Investigative Reporting in November 2022 adds a level of granular, facility-by-facility detail that the survey-based studies do not capture (Umo, 2022). Visiting primary health centres across five local government areas, including Uyo, Ikot Ekpene, Ikono, Oron, and Ikot Abasi, the report documented centres where boreholes had been vandalised and not replaced for lack of funds, forcing staff to fetch water from neighbouring communities; centres with no electricity connection at all, where health workers delivered babies at night by lantern or torchlight; and at least one centre operating out of a borrowed primary-school classroom because its own building remained tied up in a community land dispute. The report also found that, of the 461 primary health centres the state's own agency counted at the time, only 231 had been selected to benefit from the federal Basic Health Care Provision Fund, and that some facilities that had received the fund were unable to access it because of banking conditions they could not meet. In several instances, community health workers reported that they were simply unaware such a fund existed, an awareness gap consistent with Saurman's (2016) extension of the Penchansky and Thomas framework.

2.2.4 Social Infrastructure as a Determinant of Healthcare Access

This literature supports treating social infrastructure, specifically roads, electricity, and water, as a determinant of healthcare access in its own right, rather than as background context to a purely health-sector story. Within the Solar and Irwin (2010) framework, these are intermediary determinants: material circumstances through which the state's broader pattern of rural underinvestment is converted into concrete disadvantages for people trying to reach or use a health facility. Within the Penchansky and Thomas (1981) framework, the same deficits map fairly directly onto specific dimensions of access. Poor roads are principally an accessibility problem, lengthening and complicating the physical journey to care, as the Kogi and Delta State studies both demonstrate (Gbadamosi & Olorunfemi, 2016; Obi, 2022). The absence of electricity is more properly an accommodation problem: it restricts when and how a facility can safely operate, as illustrated by the night deliveries performed by lantern in the Akwa Ibom facilities documented by Umo (2022). Unreliable water supply cuts across both accommodation and the basic functional readiness that Nwakile et al. (2024) measured, since a facility without water struggles to maintain sanitary conditions regardless of how well it is otherwise staffed or equipped. The awareness gaps around the BHCPF, meanwhile, sit outside the original five dimensions altogether and are better understood through Saurman's (2016) sixth dimension, underscoring that

infrastructure and information deficits in rural Akwa Ibom often compound one another rather than operating in isolation.

Sanitation infrastructure specifically has also been examined within Akwa Ibom's own riverine communities. A survey of approximately 400 respondents across twelve riverine local government areas found that the near-absence of sanitation infrastructure and the prevalence of open defecation carried direct public health implications through air and water pollution and recommended closer monitoring of waterways as a public health measure (Udoh, 2024). This finding sits alongside Obi's (2022) account of Delta State's wetland communities as further evidence that riverine and wetland terrain compounds the material determinants of health identified by Solar and Irwin (2010): where roads limit physical accessibility, contaminated water and inadequate sanitation directly undermine population health independent of whether a facility can be reached at all.

3. Methodology

This study adopts a library-based, or desk, research design, relying entirely on secondary sources rather than new primary data collection. This choice reflects both practical constraints and the nature of the question being asked, which is as much about synthesising and interpreting an existing but scattered evidence base as about generating new measurements. Four categories of source were drawn upon. The first is peer-reviewed empirical literature specific to Akwa Ibom State, including facility-level assessments of PHC resources and readiness published between 2010 and 2024. The second is the broader Nigerian and international literature on rural healthcare access, used comparatively to situate Akwa Ibom's experience within patterns documented elsewhere in the country, particularly in other Niger Delta states such as Delta. The third is national survey and policy data, principally the 2023 to 2024 Nigeria Demographic and Health Survey Key Indicators Report (National Population Commission [NPC], Federal Ministry of Health and Social Welfare & ICF, 2024) and the Federal Ministry of Health's National Health Policy (2016), used to benchmark national indicators against which the state-specific evidence can be read. The fourth is investigative field journalism, specifically the ICIR's 2022 report on Akwa Ibom's primary health centres, included on the grounds that its facility-by-facility documentation captures operational detail, such as the specific ways in which the absence of electricity or water affects day-to-day service delivery, that is largely absent from the published academic literature.

Sources were located through targeted searches of academic databases and repositories, government and development-partner websites, and news archives and were selected for relevance to rural primary health care access, social infrastructure, or Akwa Ibom State specifically. The material was then organised thematically around the Penchansky and Thomas (1981) access dimensions, as extended by Saurman (2016), with the Solar and Irwin (2010) social determinants framework used to interpret why the identified deficits cluster the way they do.

The limitations of this approach are worth stating plainly. A library-based design cannot verify, update, or reconcile figures reported in different sources at different times; the paper therefore notes, rather than resolves, the discrepancy between counts of 425, 426, and 461 primary health centres appearing across sources published between 2020 and 2024, which most plausibly reflects genuine change in facility numbers over time rather than error. The Akwa Ibom-specific peer-reviewed literature, while more substantial than initially expected, remains comparatively thin and unevenly dated, with several of the most detailed accounts of specific facility conditions coming from a single 2022 journalistic investigation rather than from academic research. As such, the synthesis presented here should be read as a structured account of what the existing record shows and as a basis for identifying priorities for future primary research, rather than as a substitute for such research.

4. Discussion and Integration

Read against national benchmarks, the scale of what is at stake in rural Akwa Ibom becomes clearer. The most recent Nigeria Demographic and Health Survey reports that antenatal care coverage nationally stands at 63 percent and that only 46 percent of births nationwide are attended by a skilled provider (National Population Commission et al., 2024). These are national averages, pulled upward by better-resourced urban and southern facilities; given the documented gap between urban and rural facility readiness within Akwa Ibom itself (Nwakile et al., 2024) and the operational deficits recorded across several of the state's rural centres (Umo, 2022), its rural areas would reasonably be expected to sit at or below these national figures, though the library-based nature of this study means that claim cannot be confirmed with state-disaggregated data drawn directly from the survey itself.

The more striking pattern to emerge from this synthesis, however, is how consistently social infrastructure deficits appear not as a separate problem running alongside health-sector shortfalls, but as the mechanism through which those shortfalls become disabling. A well-stocked drug cabinet is of limited use if the facility holding it has no reliable way to keep vaccines and certain medicines cold. A trained midwife is of limited use to a woman in obstructed labour at night if the facility has no electricity and no realistic prospect of a safe emergency referral over an unpaved road. The Nwakile et al. (2024) finding that urban Akwa Ibom facilities substantially outperform rural ones on drug availability and equipment readiness is best read alongside the ICIR's (Umo, 2022) documentation of specific rural facilities operating without power or water: the survey identifies the size of the gap, and the field report shows, in granular terms, what produces it.

This synthesis also surfaces a tension between the institutional narrative surrounding Akwa Ibom's primary health system and the evidence produced independently of that narrative. Official communications from the state's primary health care agency have, in recent years, emphasised digitalisation, equipment provision, and steady progress under the Primary Healthcare Under One Roof reform. The evidence reviewed here does not

contradict the existence of such investment, and indeed some of the facility accounts documented by Umo (2022) describe real improvements following disbursement of the federal Basic Health Care Provision Fund. But the same evidence, particularly the urban-rural readiness gap documented by Nwakile et al. (2024) and the facility-level deficits recorded by Umo (2022), suggests that progress has been partial and unevenly distributed, concentrated in facilities that happened to be selected for funding or that sit closer to passable roads and existing power infrastructure, rather than reaching the rural facilities most in need. The gap between institutional narrative and documented ground condition is not unique to Akwa Ibom, but it is a gap the state's own data, where available, does not fully close.

5. Conclusion and Recommendations

This paper set out to examine how social infrastructure shapes inclusive healthcare access in rural primary health centres in Akwa Ibom State, using a library-based synthesis of existing literature, survey data, policy documents, and field reporting. The evidence reviewed supports a central conclusion: healthcare access in rural Akwa Ibom is not reducible to the number or even the staffing of primary health centres but depends heavily on the roads, electricity, and water infrastructure surrounding those centres, which determine whether facilities can function as intended and whether the populations they are meant to serve can reach them at all. Viewed through the Penchansky and Thomas (1981) access framework, social infrastructure deficits in the state bear most directly on accessibility and accommodation, while Saurman's (2016) awareness dimension captures a further, compounding problem around whether rural communities even know what support, such as the Basic Health Care Provision Fund, is available to them. The Solar and Irwin (2010) social determinants framework helps explain why these deficits fall so unevenly on rural areas: they are the material expression of a longer pattern of underinvestment that health-sector policy alone cannot correct.

Several implications follow. First, planning for primary health care in Akwa Ibom would benefit from closer coordination between the health ministry and the agencies responsible for rural roads, electrification, and water supply so that facility upgrades and surrounding infrastructure investment are sequenced together rather than treated as unrelated budget lines. Second, before further facility construction is prioritised, there is a reasonable case for directing available resources toward electrifying and connecting to reliable water supply the more than four hundred primary health centres the state already operates, given how much of the documented dysfunction traces back to these two deficits specifically. Third, the administrative barriers to Basic Health Care Provision Fund access identified in the 2022 field investigation, including banking conditions some facilities could not meet, warrant direct administrative attention independent of the funding level itself. Fourth, closing the awareness gap documented among some community health workers and residents would require a deliberate communication effort, not merely the existence of a funding scheme. Finally, and most fundamentally, the relatively thin and

unevenly dated state of the Akwa Ibom-specific empirical literature, most of it now several years old, points to a clear need for updated primary research, including household-level and facility-level fieldwork, to verify and extend the picture this library-based synthesis has been able to assemble from existing sources.

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