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Digitizing Community Health Service Delivery in Ghana: From Policy Vision to Practical Implementation

Mohammed Ali[1*]; Zakaria Abotiyire Iddrisu[2]

1st Author MPH, PhD
Orchid ID: 0000-0003-0930-701X.
Head of Programs, Centre for Development Systems and Services
Tamale Office

2nd Author: Orchid ID:0000-0002-2979-0101
Gender and Social Protection Officer
Adventist Development and Relief Agency (ADRA Ghana)

Corresponding Author: Mohammed Ali*

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Abstract: The research investigated the influence of Ghana digital healthcare policy framework on the delivery of grassroots health in an attempt to address lapses within the Ghana Digital Health Strategy (GDHS). It focused on infrastructure support, localization of policies and digital solutions for local health needs. The review examined national documents such as the Ghana Digital Health policy and strategy (2023–2027) and regional/global frameworks.

Drawing on quality review research methods, the study integrated policy analysis, case studies and comparator frameworks to identify how effective current digital health policies are. Lessons from CHPS and EMR Case studies on Community-based Health Planning and Services(CHPS) and electronic medical records(EMR) shed light on implementation challenges. Comparative analysis sought to link findings with wider structure.

Researchers found community health workers encountered problems with spotty phone and internet service, no equipment and privacy concerns. But digital interventions bore positive results: mobile health applications led to higher antenatal care visits, electronic immunization records enhanced data quality and telemedicine cut down on referral times.

In summary, the Digital Health Policy and Strategy (2023–2027) is a fundamental step for strengthening primary care and community services in Ghana. Its success will depend on filling infrastructure, financing and equity gaps, and on training community health workers in the skills they need. Health-system interoperability is fundamental for referral making and patient results. Strong partnerships with Africa CDC, UN and private partners will also ensure integration and sustainability to move the country forward in digital health transformation and community service delivery.

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I. INTRODUCTION

➢ *Global and Continental Context*

Creating digital health is now crucial for health systems transformation and worldwide system-level change in terms of access, efficiency, and equity. Access, efficiency, and equity at all levels and throughout the world. The same is true of digital health care as any advanced enabler to gain universal health coverage (UHC) as well as meeting the Sustainable Development Goals (SDGs)--especially Goal 3 which is about ensuring healthy life styles living environment, WHO told us in 2020. Digital-based health care in low- and middle-income countries (LMICs) is increasingly being used to solve systemic problems of infrastructure deficiencies, labor shortages and access inequities.

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The momentum for digitalization of primary health care (PHC) has picked up in Africa. The African Union's Digital Transformation Strategy for Africa (2020–2030) emphasized health, while Africa CDC promoted innovation and interoperability tools (African Union, 2020; Africa CDC, 2020). On November 19, 2025, Africa CDC summoned the PHC Digitalization Experts Committee (PHC-DEC) in Addis Ababa, Ethiopia. By this important meeting, the African Union Heads of State need to jointly declare their commitment to digitalization of at least 90 % PHC systems during their next term as part of ongoing Africa Health Security and Sovereignty (AHSS) Agenda (Africa CDC, 2025). The urgency cannot be overstated. By 2035, 90% of Africa's primary health care must be digitalized. These are not choices but sovereign investments under the five shifts from the Lusaka Agenda and goals listed in Agenda 2063. This omnipresent sense of urgency is compounded by Africa's double public health problems with communicable and non-communicable diseases, the twin climate imperatives as well as unequal socioeconomic development trends. Rural women, informal laborers and youth who have been displaced from their homes and communities—none of these is easy to reach and yet they are among the most vulnerable persons for digital PHC not succeeding. Only 30% health systems were digitalized and as a country over 90% of necessary products were imported so sovereign, digitally enabled, domestically financed systems are vital for resilience and accountability (Africa CDC, 2025).

Evidence from WHO and the World Bank shows that globally, digitized surveillance can detect outbreaks 7 to 21 days earlier, digital PHC reduces diagnostic delays by 30% to 50% and for every USD 1 spent, respectively, yields USD 6–10 return (World Bank, 2023; WHO, 2020). The fact that Rwanda has successfully digitized more than 90% of its PHCs and has reduced maternal mortality, even though it is a tiny country is a testament to the transformative potential. Similar successes have been witnessed in Egypt, Tunisia, Morocco, Kenya, Ethiopia, Ghana, South Africa, Burkina Faso, Niger and Côte d'Ivoire (Africa CDC, 2025). Challenges still remain however, including data overload, clinician burnout and system downtime. Based on practices of data, we need to build robust data management systems, continuous training and resilience in infrastructure investments to provide continuity of care and system credibility as well as prevent potential crises.

- *Ghana's National Context*

Ghana's health system focus on primary and community-level health care meshes well with a quest of African trend of digitization. The Digital Health Policy and Strategy (2023–2027) of the Ghana Health Service (GHS) and Ministry of Health (MoH) treats information and communication technologies (ICTs) as a method to improve outcomes, increase efficiencies; assume a stronger position against new threats (Ghana Health Service, 2023).

This framework also is part of Ghana's commitment to integrating national priorities with global strategies and Africa's digital whole change plan. Traditional community-based health services, such as Community-based Health Planning and Services (CHPS) in Ghana that provide basic care to households outside the reach of formal health facilities, still hold pride of place and ought to be kept sharp.

Digitilization of CHPS operations offers possibilities for collecting data, systematizing referrals, and extending networks between field staff, frontline institutions, and higher-level facilities. Reports highlight that during implementation, questions remain about infrastructure readiness, workforce capacity, and governance (Ghana Ministry of Health, 2014; Adusei et al., 2024). Positioning Ghana's experience within global and African contexts emphasizes the need to align policy vision with practical capabilities, ensuring that digitization strengthens community health systems.

With government policy reform, reshaping to make primary health care in Africa up to date with ICTs will increase the return to AIDS, get better results with fewer inputs and withstand the emergence of health threats (Ghana Health Service, 2023). In this ever-increasing era of pandemic diseases, it's essential that action be quick.

Regionally-based models hold out promise like Rwanda's e-health which cut drug stock-outs on the one hand while advancing digital health initiatives on the other are steps worth taking if only to try and see what we might gain by doing them (World Bank, 2023).Internet access varies today, and some regions are at 20% while national averages are over 50% (DataReportal, 2023).Interim steps for an inclusive digital health care approach include filling infrastructure gaps, workforce preparation and fair dealing from the top down. An important point from the survey is that digitization is necessary for the betterment of general health in communities, and so there is a need to match digital transformation with outcomes in health (Ogundaini & Mlitwa, 2024).

II. METHODOLOGICAL APPROACH: QUALITATIVE SYNTHESIS AND FIELD CASES

This study uses a qualitative review methodology to evaluate Ghana's digital health policy framework and its impact on community health-service delivery. This approach takes into account complex policy environments and problems of implementation. The review incorporates national policy documents, program evaluations, and comparative evidence in order to illustrate how digital health strategies seen in practice (Bowen, 2009; Green & Thorogood, 2018; WHO, 2020; Africa CDC, 2025; Ghana Health Service, 2023). Methods given in detail include:

- *Policy Analysis*

The study examined Ghana's major national policy documents such as the Ghana Digital Health Policy and Strategy (2023–2027), Ministry of Health reports, and Ghana Health Service guidelines in order to identify priorities and objectives for digitalizing community health services. This involved frameworks such as the African Union's Digital Transformation Strategy for Africa (2020–2030) and the

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WHO Global Strategy on Digital Health (2020–2025) (African Union, 2020; Africa CDC, 2025; WHO, 2020).

➢ *Case Studies*

The study analyzed ten initiatives demonstrating Ghana's progress in digitalizing community health service delivery, enabling comparisons among cases. Key cases included mHealth pilots for maternal and child health, electronic medical records, telemedicine platforms for rural areas, community-based surveillance instruments, and immunization registries for eHealth, which provided examples of achievement but also persistent problems (Yin, 2018; Stake, 2006; Gilson, 2012).

➢ *Comparative Continental and Global Contextualization*

Ghana's experience was compared with countries like Rwanda, Kenya, and Ethiopia, highlighting lessons which could be transferred and contexts of contrast. Digitization of its PHC system provides Rwanda an example to follow in effective digital health implementation (Africa CDC, 2025). At the global level, evidence shows a substantial return on investment in primary health-care digitalization by the world's poor countries (World Bank, 2023; WHO, 2020).

➢ *Thematically synthesizing conclusions*

The conclusions were synthesized thematically in order to identify patterns and specific problems. Major themes included readiness of infrastructure, capacity of the workforce, governance, equity and data privacy. Actionable recommendations were made to bridge the divide between policy intention and reality, with a focus on infrastructure investment, workforce training and governance reform as well as equitable strategies for communities (WHO, 2020; Ghana Health Service, 2023).

III. FINDINGS

➢ *Policy Vision: Ghana's Digital Health Framework*

The Ghana Digital Health Policy and Strategy (2023–2027) seeks to improve delivery of community health services using digital technologies. Key priorities include making information systems interoperable, introducing electronic medical records, delivering telemedicine and constructing platforms for mobile health in order to promote healthier outcomes for mothers, children and basic care patients as well (Ghana Health Service, 2023). This vision is consistent with continental frameworks. They include the African Union Digital Transformation Strategy for Africa (2020-2030) and WHO Digital Health Global Strategy (2020-2025) (African Union, 2020; WHO, 2020). Aid from UN agencies as well as private sector actors is necessary for implementation, with UNICEF, UNFPA and UNDP all driving forward the digital innovations and management (UNDP, 2021). Government backing comes in the form of resources and associations. Organizations such as the World Bank or USAID lend support when it comes to EMRs (electronic medical records) and MHIs (mobile health initiatives) (Johns Hopkins Bloomberg School of Public Health, 2025). For this ambitious vision to be realized, successful implementation at the community level is essential.

➢ *Practical Realities: Implementation Challenges*

Ghana's digital health policy is largely still in the making and will face implementation challenges at the grassroots level. Yet major infrastructure gaps exist. Broadband penetration was reported at 68.3% in 2024, but less than 40% of the rural population has access to it (Warwick University, 2024). Unreliable power supply and not enough devices to go round also hold back progress. For example, less than 35% of Community Health Workers (CHWs) possess Smartphones (Azalekor, 2024). A key issue is human resource readiness. A mere 42 percent of health care providers feel confident in using electronic health systems effectively and confidently (Alhassan, et al., 2025). The decentralized health system presents governance challenges. This impinges on fragmentation and restricts inter-operability of health information systems (EMR) (Achampong, 2022). Amongst the enduring problems are rural women with even less access to phones, and issues to do with privacy and data (Warwick University, 2024; Alhassan et al., 2025). Though difficulties remain, an opening exists for solar-powered stations, greater digital literacy and links with private sector partners.

➢ *Policy and Practice Integration: Opportunities and Innovations*

Despite the current challenges, Ghana has opportunities to align digital health policy with practice. With over 68% national penetration rates for mobile health (mHealth) programs, it is possible at low cost to provide both health information and regular consultations (Warwick University, 2024). Telemedicine has through its services extended care; electronic immunization registries improved by 30% in accuracy for data found on CHPS compounds (UNICEF Ghana, 2025). The Africa CDC is developing frameworks for interoperable health systems, digital surveillance, and professional training with its PHC Digitalization Agenda (2025). Digital tools enable UNICEF to care for mothers and children, and promote telehealth for sexual and reproductive health for the UNFPA. UNDP provides governance and supports rural areas ' air-conditioning infrastructure, etc., making a focus on primary health care. Public-private collaborations and donor support are also important. The scalability of innovations such as Rwanda 's drone delivery and the mHealth platforms in Kenya; not to mention the Government 's leadership and community involvement through India Ayushman Bharat Digital Mission (Agarwal et al., 2021) are all things about which to learn more. For example, AI (artificial intelligence) and big data analytics could be applied in medical human resources. By building on the resources and directions presented by Africa CDC, the UN system, private partners, US aid programs etc., Ghana will succeed in both formulating its digital health policy and developing community health services.

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Table 1. Case Examples of Digitization of Community Health Service in Ghana

Challenge	Case Example (CHS/PHC)	Opportunities
Limited broadband penetration (rural <40%) (Warwick University, 2024)	Telemedicine in Bongo District: CHWs faced poor rural connectivity, limiting maternal health referrals.	Community Wi-Fi hubs and rural broadband expansion
Unreliable electricity (avg. 230 hrs outages annually in North East and Upper West Regions)	CHPS compounds in Upper West Region suspend digital records during outages, reverting to paper registers (Johns Hopkins Bloomberg School of Public Health, 2025).	Solar-powered PHC hubs; Electronic immunization registries improved data accuracy by 30%
	CHPS compounds in North East Region faced with poor connectivity and electricity reliability (Amp Health, 2024)	Telemedicine for specialist access;CHWs bridging rural-urban gaps with digital counseling
Limited device availability (<35% CHWs with smartphones/tablets) (Azalekor, 2024)	At Yorogo CHPS in Upper East, nurses only recently transitioned from paper to tablets for client registration, highlighting device scarcity (UNICEF, 2025)	Affordable device procurement schemes
Low digital literacy (42% confidence in e-health systems) (Alhassan et al., 2025)	In Buzulungu CHPS, staff initially struggled with digital registration systems until targeted training improved confidence (UNICEF, 2025)	Targeted digital literacy and training programs
Fragmented EMR systems (Achampong, 2022; Johns Hopkins Bloomberg School of Public Health, 2025)	EMR pilots in Greater Accra and Ashanti operated on separate platforms, preventing data sharing across districts (Achampong, 2022)	Interoperable systems and standardized protocols
National rollout of unified EMR standards across CHS and PHC facilities	CHWs in Northern Region reported household visit loads exceeding 1,200 families, limiting time for digital reporting (GNA, 2025)	Task-shifting supported by digital triage tools
Gender and equity gaps (women 25% less likely to own phones) (Warwick University, 2024)	Rural women in Wa East reported exclusion from maternal health SMS reminders due to lack of phone ownership (DPI Africa, 2024)	Women-centered digital literacy and device access programs
Data privacy concerns (61% patients worried about misuse) (Alhassan et al., 2025)	A 2025 survey found patients in Tamale hesitant to share health data digitally, citing fear of misuse (Alhassan et al., 2025)	National health data protection frameworks

IV. DISCUSSION

The study aim was to analyze how Ghana's Digital Health Policy and Strategy (2023–2027) is translated into practice at community and primary health care (PHC) levels whilst illuminating opportunities and challenges. Although the policy has created and articulates a vision for interoperability, telemedicine, and mobile health platforms to support digital health (Ghana Health Service, 2023), the realities of implementation show persistent infrastructure gaps, limited device availability, low digital literacy, and fragmentation of governance. These struggles mirror evidence from different low- and middle-income countries (LMICs), where the uptake of digital health frequently demonstrates issues of infrastructure and workforce preparedness (Agarwal et al., 2021).

Comparison with other LMICs suggests discrepancies and also lessons. Rwanda's drone delivery system has decreased supply chain delays in rural PHC clinics (Reach Alliance, 2020), and mHealth maternal health platforms in Kenya led to significant increases in maternal outcomes (Nation Media Group, 2025). Ghana's experience is unique in that limited access to connectivity and electricity is more significant, especially in rural areas (Warwick University, 2024). That said, Africa CDC's PHC Digitalization Agenda (Africa CDC, 2025) and UNICEF's digital monitoring tools for maternal and child health (UNICEF, 2025): both offer platforms for developing and integrating equity- and data system-based policies into implementation. Unlike other recent studies focusing exclusively on policy vision (WHO, 2020; African Union, 2020), these findings illustrate the value of converging the two with context-specific interventions (e.g., solar-powered hubs), interoperable EMR solutions, and women-centered digital literacy initiatives.

The research situates Ghana's implementation of digital health in both national and international contexts while anchoring the analysis in community-level realities, thus enabling a greater understanding of potential operationalization of digitalization in primary health care. This viewpoint contributes to the ongoing debate on digital health in LMICs and provides actionable recommendations for scaling sustainable PHC digitalization in Ghana.

It is also important to note that existing literature and methodology may not reflect the most recent implementation impacts in the local communities. Differences in regional reporting also complicate the translation of results from Ghana's unique health system to other parts of the country. To overcome these limitations, a variety of approaches were utilized:

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triangulating evidence obtained from both government policy documents, peer-reviewed studies, and case studies, including from UN agencies and Africa CDC, and comparative literature analysis with other LMICs to situate Ghana's experiences. Such measures have served to bolster the strength of conclusions and have mitigated exposure to the risk of data gaps or uneven coverage.

V. CONCLUSION

This study underscores that Ghana's Digital Health Policy and Strategy (2023-2027) is very pertinent for conveying primary care and community health services. Key to the success will be improving among other tasks such as fixing key issues in equipment and financing challenges; and building the capacity of community health workers (CHWs) in digital technology as well as providing them toolkit for doing so. Health system interoperability is necessary for improving the quality of referrals and outcomes for patients. This relies on strong partnerships with Africa CDC, UN agencies and the private sector. Digitalisation is best seen as a process of transformation; it brings resilience and equity in health service provision that can be trusted. By aligning policy with practical realities, Ghana can ensure that digital health is at the heart of community health delivery, making health accessible, efficient and inclusive for all.

RECOMMENDATIONS

Improve Ghana's digital health policy by increasing rural broadband through the Ministry of Communications and telecoms. Set up solar-powered mini-grids with funds from the Ministry of Energy as well as outside donors. Add digital literacy to training for CHWs so that their skill and outlook are increased, and this should happen under the guidance of the District Health Directorates and the Africa CDC. Establish national EMR standards, coordinate more closely between the Ministry of Health, GHS, and NITA. Equitable legal protection for women literacy and device plans needs the work of UNICEF, UNFPA and telecom providers. Büffalos build by making new laws on data privacy Combine with public campaigns.

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