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Corresponding author:
Adler Archer

adlerarcher@adloris.org

Author Affiliation:
Adloris Foundation.

Infrastructure, trust, and adoption: A scoping review of digital health technology implementation among African health workers

Agyei-Dwarko, F; Baka, PW; Fallah, MP; Harris, L; Thilagarajan, VV; Archer, A.

ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Piloting of the study selection process.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202660068

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 June 2026 and was last updated on 15 June 2026.

INTRODUCTION

Review question / Objective The objective of this scoping review is to map the existing evidence on barriers, facilitators, and contextual factors with particular attention to infrastructure constraints and trust/risk/privacy/security dynamics that influence the adoption and implementation of digital health technology among health workers in African health systems.
Secondary questions address: what digital health technologies have been studied and in which countries; what theoretical frameworks have been applied; and how infrastructure constraints and trust dynamics interact with other adoption determinants.

Background Digital health technologies including mHealth applications, telemedicine platforms, EHR/EMR systems, electronic registries, clinical decision support tools, and health information systems are central to health system strengthening strategies across Africa. Health workers are the primary interface between these tools and care delivery, yet their adoption and sustained use remain variable and incompletely understood.
African health workers operate under intersecting structural pressures: unreliable electricity and connectivity, hardware shortages, variable digital literacy, high workloads, and concerns about data privacy, system security, and the trustworthiness of externally introduced digital tools. These factors are not uniformly distributed across countries, cadres, or settings, and their interactions have not been comprehensively mapped. This review addresses that gap.

Rationale This scoping review follows the framework established by Arksey and O'Malley (1) as enhanced by Levac et al. [2], and will be reported in accordance with the PRISMA extension for Scoping Reviews [3].

REFERENCES

[1] Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. International Journal of Social Research Methodology, 8(1), 19–32.

[2] Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: advancing the methodology. Implementation Science, 5(1), 69.
[3] Tricco, A. C., et al. (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Annals of Internal Medicine, 169(7), 467–473.

METHODS

Strategy of data synthesis Data extraction will be guided by a structured JBI-aligned charting form capturing the following domains across all included sources: study details (author, year, objective, languages, date range of included studies, number of included studies, review design types, countries of origin, and databases searched); population (health worker cadre, geographic setting, facility type, program type, funding source, and policy/system context); intervention (digital health technology type, clinical workflow supported, theoretical or conceptual framework, and infrastructure requirements including connectivity type and device type); comparator (type and description where applicable); and outcomes, including infrastructure barriers (poor connectivity, unreliable electricity, limited device availability, cost, poor interoperability, system downtime, and limited technical support), infrastructure facilitators (reliable connectivity, stable power, adequate device availability, ease of use, leadership support, incentives, and system integration), trust/risk/privacy/security findings, and other adoption barriers and facilitators across workforce, governance, financial, organizational, sociocultural, and usability domains.
Results will be synthesized through three complementary approaches.
First, descriptive statistics will summarize the distribution of sources by year, country, African region, study design, health worker cadre, digital health technology type, and implementation stage, presented in frequency tables and a geographic heat map. Second, thematic analysis will organize barriers and facilitators across eight domains ; infrastructure; trust, risk, privacy, and security; workforce and training; governance and policy; financial and sustainability; organizational; sociocultural; and technical and usability with dedicated analytic attention to infrastructure and trust/security as distinct thematic clusters, examining how these interact with other domains, and presented as a framework diagram. Third, a structured evidence gap map will identify under-researched countries, health worker cadres, digital health technology types, implementation stages, and contextual factors to guide future research and policy investment.

Eligibility criteria Health workers in African countries, including physicians, nurses, midwives, community health workers, allied health professionals, and facility managers involved in care delivery. Studies focused exclusively on patient or community perspectives without health worker adoption or use outcomes will be excluded.
Intervention: Digital health technologies used by health workers, including mHealth applications, telemedicine platforms, EHR/EMR systems, electronic registries, clinical decision support tools, and health information systems for clinical or service delivery workflows. Studies describing digital health tools without reporting adoption, acceptance, or use outcomes or determinants will be excluded.
Context: Any African country; clinical facilities, community health systems, or hybrid service delivery settings. Studies outside Africa, and multi-region studies where Africa-specific health worker results cannot be separated, will be excluded.
Outcome: Evidence addressing adoption, acceptance, uptake, use, sustained use, or implementation outcomes, and reporting facilitators and/or barriers — including infrastructure constraints and/or trust/risk/privacy/security dynamics. Studies centered only on national-level eHealth readiness without linking to health worker implementation determinants will be excluded.
Studies: Quantitative, qualitative, and mixed-methods empirical studies (including implementation evaluations and observational studies) published in peer-reviewed journals from January 1, 2020 to December 31, 2025. Commentaries, editorials, opinion pieces, conference abstracts without full text, protocols without results, and non-empirical narrative pieces will be excluded.
A three-step strategy will be employed. Step 1: A preliminary search of PubMed to harvest keywords and index terms. Step 2: A systematic search across PubMed/MEDLINE, OVID, African Journals Online (AJOL), and African Index Medicus (AIM), supplemented by Google Scholar (first 200 results) and grey literature repositories. Step 3: Reference list scanning, citation tracking, and targeted searching of Africa CDC, WHO AFRO, African Union, GIZ, USAID, and the Digital Health Atlas. Search concepts span: (i) Population/Context — Africa and African country terms combined with health worker cadre terms; (ii) Intervention — digital health, mHealth, EHR/EMR, telemedicine, DHIS2, clinical decision support, health information technology; (iii) Outcome/Focus — adoption,

acceptance, uptake, implementation, barriers, facilitators, trust, infrastructure, privacy, security.

Source of evidence screening and selection All citations will be imported into Covidence (Review #715327) and duplicates removed. Two reviewers (Agyei-Dwarko and Baka) will independently screen titles and abstracts, then full texts, against the eligibility criteria. Discrepancies will be resolved by discussion or referral to a third reviewer. A pilot of 50 titles/abstracts will be conducted to achieve at least 80% inter-rater agreement before full screening. Reasons for full-text exclusion will be recorded, and a PRISMA-ScR flow diagram will document the selection process.

Data management All references will be managed in Covidence (Review #715327). Data extraction will use a structured JBI-aligned charting form developed iteratively in Covidence and Microsoft Excel. Two reviewers will independently extract data from the first 10 included sources to pilot and refine the form before full extraction.

Reporting results / Analysis of the evidence Data extraction will capture: study details (author, year, objective, languages, date range, number of included studies, review design, countries, databases searched); population (health worker cadre, geographic setting, facility type, program type, funding source, policy/system context); intervention (technology type, clinical workflow supported, theoretical/conceptual framework, infrastructure requirements including connectivity type and device type); comparator (type and description where applicable); and outcomes (infrastructure barriers ; connectivity, electricity, devices, cost, interoperability, downtime; infrastructure facilitators ;reliable connectivity, stable power, device availability, ease of use, leadership support, incentives; trust/risk/privacy/security findings; and other adoption barriers and facilitators across workforce, governance, financial, organizational, sociocultural, and usability domains).
Results will be synthesized through descriptive statistics on source distribution by year, country, region, study design, health worker cadre, and technology type; thematic analysis of barriers and facilitators with dedicated attention to infrastructure and trust/security as distinct clusters; and a structured evidence gap map identifying under-researched settings, cadres, and technology types.

Presentation of the results Source characteristics will be presented in tabular and graphical formats, including a geographic heat map by African region. A PRISMA-ScR flow diagram will document the search and selection process. Thematic findings on barriers and facilitators with emphasis on infrastructure and trust/security will be illustrated through a framework diagram. Key findings and evidence gaps will be highlighted for policy audiences including Africa CDC and the African Union.

Language restriction Sources published only in the English language will be included.

Country(ies) involved The review encompasses all African Union member states. The review team is based across multiple institutions with connections to Africa CDC and collaborating academic partners.

Keywords Digital health, mHealth, telemedicine, electronic health records, health information systems, health workers, community health workers, adoption, implementation, barriers, facilitators, trust.

Dissemination plans Findings will be disseminated through publication in an open-access peer-reviewed journal and shared with Africa CDC, the African Union, and relevant national ministries of health to inform continental digital health strategy. Presentations at global health and implementation science conferences are anticipated.

Contributions of each author

Author 1 - Freda Agyei-Dwarko - Co-lead reviewer. Search execution, screening, data charting, analysis, writing ,original draft preparation.
Email: ammaagyeiwaad@gmail.com
Author 2 - Paul Baka - Co-lead reviewer. Search design, screening, data charting, analysis, writing , original draft preparation.
Email: paulbaka64@gmail.com
Author 3 - Mosoka Fallah - Senior advisor. Africa CDC policy context, grey literature identification, interpretation of findings. Writing , review and editing.
Author 4 - Leroy Harris - Contributing author. Health information technology in LMIC expert. Writing ,review and editing.
Author 5 - Vedha Viyas Thilagarajan - Contributing author. Protocol registration, methodological guidance. Writing ,review and editing.
Author 6 - Adler Archer - Supervising author. Conceptualization, methodological oversight, project administration, supervision, writing , review and editing.
Email: adlerarcher@adloris.org