

Technology for Preventative and Inclusive Healthcare

Khyati Eda and Nana Akua Gyaaba Dickson

Executive Summary

Digital health has rapidly emerged as a cornerstone of modern healthcare delivery, offering scalable solutions for diagnosis, monitoring, and long-term disease management. Yet, despite its promise, the populations who stand to benefit most from digital health innovations, i.e., those living in poverty, marginalization, displacement, or geographic isolation, are often those least able to access or adopt these tools. Across global contexts, hard-to-reach populations continue to experience a persistent gap between the availability of digital health interventions and their actual use.

This brief draws from two in-depth case studies: one examining digital health for hypertension and diabetes management in Ghana, and the other analyzing digital mental health tools for refugee populations in Canada. Although these settings differ significantly, the research reveals strikingly similar structural barriers related to digital literacy, affordability, cultural alignment, trust, and regulatory clarity.

Together, these findings form a synthesized framework with relevance for national health policymakers seeking to advance equitable digital health adoption at scale. The brief, therefore, provides a cross-context analysis that translates local insights into global guidance for Ministries of Health and national digital health regulators.



Big-Picture Value: Why Digital Health for Hard-to-Reach Populations Matters

Digital health, when designed and implemented with equity in mind, offers one of the most powerful levers for enhancing healthcare access among underserved communities worldwide. In both Ghana and Canada, evidence suggests that digital tools can significantly improve early diagnosis, treatment adherence, mental health support, and continuity of care. For patients living with chronic conditions like diabetes, and trauma-related mental illness, digital monitoring and remote care can reduce travel costs, ease pressure on overburdened health systems, and create new channels for preventive care.

However, the global significance of this topic lies not simply in the technological potential but in the socio-structural realities that shape adoption. Hard-to-reach populations often face intersecting barriers, including economic constraints, linguistic limitations, low digital literacy, stigma, cultural beliefs, and mistrust of institutions, which undermine the effectiveness of even the most advanced tools. These factors, present in both rural Ghanaian communities and refugee settings in Canada, point to a common truth: achieving meaningful impact requires more than just the deployment of technology. It requires systems that deeply understand the lived experiences of users and respond to them in culturally grounded, financially accessible, and structurally coherent ways.

Globally, Ministries of Health increasingly recognize that digital health can accelerate progress toward universal health coverage and support commitments. Yet without addressing adoption barriers, countries risk creating solutions that widen disparities instead of reducing them. The Ghana–Canada synthesis thus offers a rare dual-lens perspective that captures the human, infrastructural, and policy dimensions necessary for the equitable scale-up of digital health.



Cross-Context Insights

The Ghana Context

In Ghana, digital tools for managing hypertension and type 2 diabetes are still in early stages of adoption, particularly within peri-urban and underserved communities. While patients generally recognize the importance of monitoring, many have limited awareness of available technologies or lack the confidence to use them independently. Affordability remains a significant barrier, as households often have to choose between essential items like food and non-essential items like batteries or test strips. Cultural beliefs also shape behaviour, with some patients perceiving frequent monitoring as potentially harmful. These dynamics unfold within a health system where digital infrastructure is uneven and standardized protocols for chronic disease monitoring are limited.

The Canada Context

Among refugees in Canada, digital mental health tools hold strong potential to address trauma, PTSD, and depression. However, many digital services are not originally designed with refugees in mind, resulting in cultural mismatches, limited linguistic accessibility, and persistent mistrust linked to past experiences of surveillance or displacement. While Canada's digital health ecosystem is more mature, regulatory ambiguity, particularly around Software-as-a-Medical-Device, creates uncertainty for innovators seeking to develop tailored solutions. Funding for community-based digital mental health interventions also remains inconsistent, limiting continuity of care for vulnerable populations.

Synthesis Across Settings

Despite vast differences in geography and disease focus, both countries illustrate that digital health adoption is fundamentally shaped by socio-cultural and economic realities. In both Ghanaian and Canadian contexts, trusted intermediaries—community health workers, interpreters, diaspora clinicians, caregivers, and frontline nurses—play a critical role in bridging the gap between technology and user adoption. Similarly, both systems require stronger regulatory direction, sustainable financing models, and mechanisms for long-term evaluation to move beyond pilot-based approaches. These parallels form the basis for the integrated solutions framework that follows.



Solutions for Inclusive and Scalable Digital Health

A People-Centred, Co-Design Approach

The first and most essential solution is to institutionalize co-design processes that meaningfully involve the communities the technologies intend to serve. For Ghana, this means engaging patients, caregivers, market women, and CSHPS nurses throughout the design and rollout of digital monitoring tools. For Canada, it includes the participation of refugees, interpreters, settlement agencies, and trauma-informed clinicians. Co-design ensures that solutions reflect the cultural, linguistic, and emotional realities of users, and it is a core determinant of trust and adoption across both sites.

Applied Solutions in the Ghanaian Context

Ghana requires structured co-design cycles involving 4–5 sessions with patients living with hypertension or diabetes, caregivers, CHPS nurses, and market queens in peri-urban hubs such as Accra, Takoradi, Cape Coast, and Kumasi. Sessions should focus on simplifying device use, addressing fear-based beliefs, and mapping daily routines that shape monitoring habits. A 3–9 month co-design phase would require approximately GHS 150,000–200,000, covering facilitation, translation, community mobilization, and prototype development in partnership with the GHS NCD Unit.

Applied Solutions in the Canadian Context

Canada requires structured co-design cycles, such as 6–8 facilitated sessions with refugees, interpreters, and clinicians, supported by Community Advisory Boards of trusted community members. There is also a need for early regulatory steps, including rapid privacy reviews and pre-assessments aligned with Health Canada's SaMD pathways. Overall, these activities could require CAD 60,000–80,000 to cover community compensation and consultation during the first 3–9 months.

Culturally and Linguistically Responsive Platforms

Digital health tools must be adapted to meet the linguistic and cultural preferences of the target populations. In Ghana, this demands interfaces that accommodate low literacy levels, favour audio-based or USSD formats, and reflect local languages such as Twi, Ga, Ewe, and Fante. In Canada, mental health content must reduce reliance on Western diagnostic labels and provide multilingual interfaces that reflect the diversity of refugee communities. The design principle that unifies both contexts is simple: solutions must communicate in ways users understand and find culturally safe.

Applied Solutions in the Ghanaian Context

Digital platforms should prioritize USSD and WhatsApp-based features, supported by audio instructions and icon-based interfaces in Twi, Fante, Ga, and Ewe. Content should avoid language that reinforces misconceptions and instead use familiar metaphors aligned with trading and household routines. Developing and testing multilingual content and interfaces could cost GHS 80,000–120,000, including voice recording and iterative user testing across low-end devices.

Applied Solutions in the Canadian Context

Digital platforms should prioritize low-literacy, audio-first features, supported by multilingual interfaces in languages commonly spoken among refugee communities. Content should avoid Western clinical terminology that may feel stigmatizing or unfamiliar, instead favouring everyday language and culturally resonant metaphors. Developing and testing culturally safe, multilingual content and interfaces could cost CAD 65,000–110,000, including professional translation, voice recording, and iterative pilot-stage feedback across diverse refugee groups.

Strengthening Trust Through Human Intermediaries

Trust emerged as a decisive factor in the adoption of digital health tools in both countries. Ministries of Health can strengthen uptake by integrating “phygital” approaches, i.e., hybrid models that combine digital tools with in-person support. Community health workers in Ghana and settlement provider organizations in Canada are uniquely positioned to facilitate onboarding, explain privacy protections, and normalize the use of digital health in their communities. Institutionalizing these actors within the digital health delivery chain significantly increases user confidence and reduces early abandonment.

Applied Solutions in the Ghanaian Context

Trust can be strengthened by deploying a small network of Digital Health Navigators drawn from CHPS staff, national service personnel, and respected market women. Navigators would lead onboarding, community demonstrations, and home-based support. Implementing this model across four pilot regions would require GHS 250,000–300,000 annually to cover stipends, training, transport, and device kits.

Applied Solutions in the Canadian Context

To operationalize trust, Ministries can formalize hybrid intake procedures (in-person + digital), train hospital and refugee workers as digital navigators, and embed monthly rapid feedback loops during pilots. This deployment, training, evaluation, and IT support could require CAD 150k–400k.



Clear Regulatory Pathways and National Integration

Regulatory clarity is crucial for creating safe and scalable digital health ecosystems. Ghana's health system would benefit from standardized protocols for chronic disease monitoring, device quality assurance, and interoperability across digital platforms. Canada, on the other hand, must refine its Software-as-a-Medical-Device (SaMD) frameworks and harmonize requirements across provinces. In both contexts, Ministries of Health need to establish clear, innovation-friendly guidelines that protect users while enabling responsible experimentation and scale.

Applied Solutions in the Ghanaian Context

Ghana would benefit from a formal NCD Digital Monitoring Protocol outlining device standards, approved digital platforms, and integration with DHIMS2. A rapid-review mechanism within the FDA/GHS could provide early safety and privacy guidance for innovators within 4–6 weeks. Developing the protocol and building regulatory capacity would cost GHS 400,000–600,000 over the course of a year.

Applied Solutions in the Canadian Context

A national Digital Mental Health Regulatory Playbook should be developed to outline SaMD classification pathways, privacy and transparency benchmarks, and requirements for provincial interoperability. Developing this playbook and strengthening regulatory capacity would cost approximately CAD 350,000–550,000 over 12 months, depending on consultation depth and interoperability testing needs.

A Learning Health System Approach

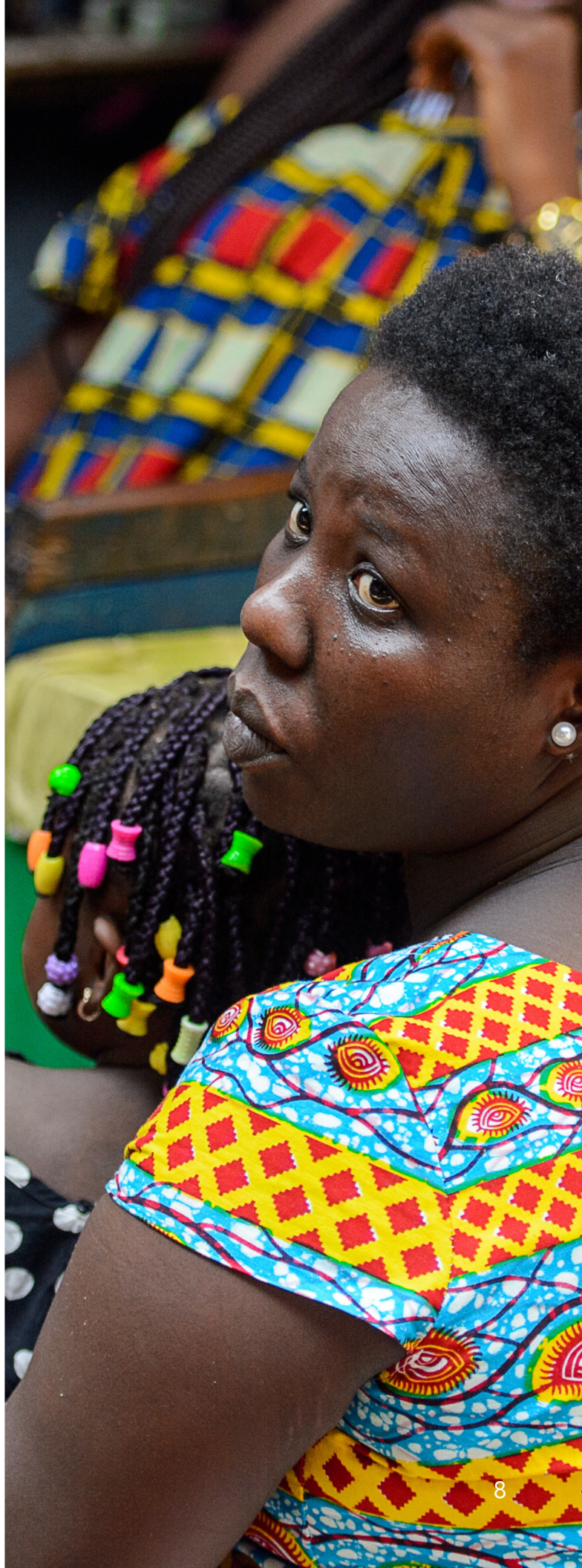
Finally, both countries require robust evaluation frameworks that measure adoption, equity, patient safety, and clinical outcomes. Digital health interventions evolve rapidly, and national systems must establish mechanisms for continuous improvement, including periodic reviews, user feedback loops, and data-driven redesign. Long-term evaluation not only strengthens accountability but also ensures that digital health delivers meaningful, measurable benefits to hard-to-reach populations.

Applied Solutions in the Ghanaian Context

A national Digital Health Learning Collaborative, including the GHS NCD Unit, academic partners, and CHPS leadership, should oversee quarterly data reviews and rapid improvements to platforms. Maintaining dashboards, follow-up interviews, and biannual learning sessions would cost approximately GHS 200,000–300,000 annually.

Applied Solutions in the Canadian Context

Canada should establish a National Digital Mental Health Learning Collaborative that brings together Health Canada, PHAC, provincial virtual-care units, academic partners, and refugee-serving organizations to guide continuous evaluation and improvement. The Collaborative would oversee structured monitoring during 9–18-month pilots, including quarterly reviews of uptake, equity indicators, trust and safety metrics, and clinical relevance across diverse newcomer groups. Maintaining dashboards and running feedback sessions would cost approximately CAD 250,000–400,000 annually.



Conclusion

Hard-to-reach populations represent one of the most critical frontiers for digital health innovation. The Ghana and Canada case studies demonstrate that while technology has the potential to transform lives, its impact ultimately depends on human-centred, culturally aligned, and systemically supported implementation. By adopting a comprehensive framework that prioritizes co-design, trust, accessibility, regulatory clarity, and continuous learning, national Ministries of Health can build digital health systems that not only reach underserved populations but also empower them.





This work builds on the 2024-25 Reach research reports, "[Digital Health and Inequality: Technology's Role in Ghana's fight against Diabetes and Hypertension](#)," by Valerie Maame Abena Ackon, Nana Akua Gyaaba Dickson, Hilary Nana Ama Kwofie, Charlton Mandaza, Theodora Aryee, Disraeli Asante-Darko, and Albert Bensusan, and "[Technology and Trauma: Digital Mental Health Innovations for Refugees in Canada](#)," by Jemila Abdulai, Meerab Anwar, Khyati Eda, Nellie Wambui Kamau, Beverley M. Essue. Reach also acknowledges all the impactful partners, community members, and mentors involved in the research.

As part of the "Pathways from Evidence to Action" series, inspired by the African Center for Equitable Development (ACED), the Reach Alliance challenged researchers to identify connections, address gaps, and develop recommendations grounded in their findings. The series comprises thirteen briefing notes developing solutions for urgent climate, public health, and economic challenges and engages practitioners and policymakers in advancing pathways to implementation.