

Telemedicine Adoption in Low-Resource Settings: Barriers Beyond Infrastructure

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Article Info	ABSTRACT
Article type: Letter to Editor	Telemedicine adoption in low-resource settings (LRS) has accelerated since the COVID-19 pandemic, accompanied by substantial investment in digital health infrastructure. However, persistent low uptake across sub-Saharan Africa, South and Southeast Asia, and rural middle-income regions suggests that connectivity and hardware access alone are insufficient. This letter argues that non-infrastructure barriers including digital health literacy deficits among patients and providers, cultural preferences for face-to-face care and mistrust of virtual consultations, regulatory and policy gaps around licensure, liability, and data privacy, and socioeconomic and gender-based inequities in technology access are critical and often overlooked determinants of telemedicine uptake. Addressing these barriers requires a multi-dimensional policy framework that integrates digital literacy training, culturally adapted platforms, national regulatory structures, and targeted financial support for underserved populations. Keywords: Telemedicine; Low-resource settings; Health equity; Digital health policy
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Dear Editor,

The COVID-19 pandemic has led to a rapid expansion of telemedicine internationally and has led to a significant increase in investment in digital health infrastructure in resource-limited settings (LRS), defined in this paper as having limited health budgets, inadequate human resources, and low technical capacity including sub-Saharan Africa, South and Southeast Asia, and rural areas of middle-income countries (1). While internet access and equipment availability remain fundamental requirements, this letter argues that these factors alone are not enough, and that challenges beyond infrastructure, including weak digital skills, lack of cultural trust, legal shortcomings, and socioeconomic gaps play a major role in the continued low uptake of these technologies. By reviewing recent findings in these areas, we present a multifaceted approach that takes policymaking and research beyond the confines of purely infrastructure-oriented approaches.

Evidence clearly shows that unstable communication infrastructure, inadequate access to hardware, and erratic power supply seriously hamper the implementation of telemedicine in resource-poor settings (2). This has led policymakers and research funding agencies to focus their attention primarily on addressing these technological shortcomings. However, findings from local studies in sub-Saharan Africa, South Asia, and Latin America show that even after significant improvements in communication infrastructure, the uptake of telemedicine services remains low (3), suggesting that factors influencing the adoption of this technology go beyond stable internet access.

One of the barriers that is often underestimated is digital health literacy, both among patients and healthcare providers. In many rural areas, a large segment of the population, especially the elderly, rural residents, and those with limited academic education, lack the basic skills to navigate digital health platforms (4). Healthcare workers which many of them have not been trained properly in the field of

telemedicine, face similar challenges (5). Without planned education and empowerment for both patients and providers, telemedicine initiatives are likely to fail or face low effectiveness even with sufficient funding.

The next dimension that is largely absent from the telemedicine discourse is trust-related and cultural factors. In many LRS communities, dominant cultural values prioritize face-to-face doctor-patient interactions, and from the perspective of patients, virtual visits may lack sufficient credibility or the necessary relational quality (6). Uncertainties regarding diagnostic accuracy, lack of direct physical examination, and professional physician responsiveness may significantly undermine confidence in virtual care systems. Communication limitations, language barriers, and the lack of culturally appropriate digital tools significantly reduce the use and acceptance of telemedicine among target populations. Confronting these problems requires community-level exchange and collaborative development with relevant domestic groups, not the forced use of imported technologies.

Deficiencies in regulations and policies constitute another major obstacle. The lack of clear legal frameworks creates a sense of insecurity and confusion for the healthcare team and patients. In many of low- and middle-income countries, challenges such as international licensing, clinical accountability, payment mechanisms, and protection of personal data and privacy issues still have no clear answers (7). When there are no coordinated national strategies for telehealth, health systems lack the structural framework needed to sustain and expand digital health programs beyond pilot projects.

Finally, socioeconomic and gender dimensions merit explicit recognition. Even where infrastructure is available, recurring costs of mobile data and device maintenance can render telemedicine inaccessible for the poorest households (8). The gender digital divide compounds this inequity: women in many LRS face disproportionate barriers to technology ownership

rooted in social norms, economic dependency, and restricted mobility (9). Telemedicine, if not deliberately designed with equity in mind, risks widening existing health disparities rather than narrowing them.

In conclusion, meaningful telemedicine adoption in LRS requires a multi-dimensional framework addressing digital literacy, cultural acceptability, regulatory readiness, and socioeconomic equity alongside infrastructure. Practical priorities include integrating digital health literacy into community health worker training, developing linguistically and culturally adapted platforms, establishing national regulatory frameworks, and implementing targeted subsidies for underserved populations (10).

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There is no conflict of interest between authors.

Authors' contributions

A.P. is the single author of the manuscript.

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