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Review Article

Behavioral Impacts of AI Reliance in Diagnostics: Balancing Automation with Skill Retention

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Abstract:

The COVID-19 pandemic accelerated the adoption of telemedicine and artificial intelligence (AI), transforming healthcare delivery worldwide. These technologies hold promise for improving access, efficiency, and diagnostic accuracy, but their benefits remain unevenly distributed. In many low- and middle-income countries (LMICs), persistent gaps in infrastructure, affordability, literacy, and governance risk turning digital innovation into a driver of health inequities. This paper examines the *digital divide* as a multidimensional health determinant encompassing infrastructure, affordability, human capacity, sociocultural inclusion, and governance. Using illustrative case studies from Africa, South Asia, Latin America, and high-income countries, this study highlights how telehealth and AI can enhance accessibility and enable task-shifting, while also demonstrating how exclusionary design and weak systems may perpetuate disparities. Building on these insights, the paper proposes a multi-sector framework for inclusive digital health, integrating investments in infrastructure, affordable and scalable models, digital literacy, culturally sensitive design, governance reform, sustainable financing, and public–private partnerships. To operationalize this framework, we recommend measurable indicators (e.g., affordability thresholds, literacy benchmarks, governance readiness indices) and propose implementation tools, including a logic model and barrier-to-action checklist. We argue that digital equity must be treated not as a peripheral issue but as a moral imperative for global health justice. Achieving this requires embedding equity into design, financing, and governance from the outset so that telehealth and AI reduce, rather than exacerbate, disparities in healthcare.

Keywords: Telehealth; Artificial Intelligence; Healthcare, Digital Divide; Health Equity; Global Health Policy; Resource-Limited Settings

Introduction

Telehealth and artificial intelligence (AI) are increasingly recognized as transformative technologies in global healthcare delivery. For this paper, the *digital divide* is defined as the inequitable distribution of access to digital infrastructure, affordability of devices and services, digital literacy, and enabling governance structures that determine who can benefit from digital health innovations. The scope of this analysis covers Africa, South Asia, Latin America, and high-income countries (HICs), with a focus on health systems, governance, and cultural factors shaping telehealth and AI adoption in the post-COVID-19 era (2020–2025) [1,2].

This manuscript is structured as a narrative review with policy analysis, synthesizing illustrative evidence from multiple regions to identify equity barriers and propose a comprehensive framework for inclusive digital health. These technologies could make it easier for individuals to seek treatment by enabling remote consultations, digital diagnostics, and algorithm-supported decision-making. They also hold potential to reduce costs and standardize care in resource-limited health systems. The COVID-19 pandemic accelerated their global adoption, demonstrating their value during emergencies while also highlighting persistent inequities in access.

The digital gap includes differences in infrastructure, internet access, device ownership, cost, and digital literacy. It also covers less obvious factors, like cultural obstacles, gender inequalities, language exclusion, and broken governance structures that affect how fairly digital health solutions are used. These gaps could make it harder for telehealth and AI to achieve their goals of improving health equity in many low- and middle-income nations, where the need for new health solutions is highest [3].

Much research shows that telehealth and AI are being used more and more quickly, especially because of the pandemic. However, not many studies look at how to make sure that all people can use these technologies in different, resource-limited settings. The literature frequently stresses technological feasibility or efficiency improvements, while insufficiently addressing the social, cultural, and policy factors that influence fair adoption. This study fills that vacuum by bringing together learning from many areas and industries and suggesting a multi-level strategy framework that includes investments in infrastructure, training people, and changing the way government works.

The analysis is framed by two leading questions: (1) What is the impact of the digital gap on the equitable adoption of telehealth and AI? and (2) What solutions tailored to the circumstances can effectively and sustainably close these gaps? By answering these questions, the report gives us a path for the future of inclusive digital health.

Methods

This paper adopts a narrative review with a policy analysis approach. The objective was to synthesize evidence on how the digital divide shapes the equitable adoption of telehealth and AI across diverse contexts and to propose a multi-sector framework for inclusion.

Search strategy and sources. Evidence was gathered from peer-reviewed articles, systematic and scoping reviews, and policy reports published between 2018 and 2025. Databases consulted included PubMed, Scopus, and Web of Science, complemented by grey literature from organizations such as the World Health Organization (WHO), International Telecommunication Union (ITU), and World Bank. Search terms combined keywords such as *telehealth, artificial intelligence, digital divide, health equity, low- and middle-income countries, governance,* and *policy*.

Inclusion and exclusion criteria. We included studies and reports that (i) examined the adoption of telehealth or AI in healthcare, (ii) explicitly addressed issues of access, equity, or governance, and (iii) provided region-specific insights (Africa, South Asia, Latin America, or high-income countries). Excluded were studies focusing solely on technical performance (e.g., algorithm accuracy) without an equity dimension.

Case selection. Illustrative case studies were drawn purposively from regions where digital health programs had documented successes, persistent barriers, or innovative policy responses. Selection was guided by the diversity of health system contexts rather than representativeness alone.

Synthesis. Themes were derived inductively by comparing evidence across regions. Barriers, enablers, and gaps were analyzed within five domains—infrastructure, affordability, human capacity and literacy, sociocultural context, and governance—which informed the development of the proposed multi-sector framework.

The Digital Divide in Healthcare

People commonly talk about the digital divide in terms of technology infrastructure, such as whether or not areas have broadband internet, stable electricity, and access to digital gadgets. These aspects are essential, but viewing the divide just as infrastructure neglects the intricate social, economic, and political dynamics that ultimately influence access and use. This limited perspective may portray telehealth and AI adoption as merely a question of "building networks," when equality is contingent upon a significantly broader array of elements. This study broadens the notion of the digital divide in healthcare to encompass not just infrastructure but also affordability, human capability, societal barriers, and governance deficiencies that delineate who benefits and who remains marginalized [3,4].

Infrastructure is still the most obvious problem. In a lot of low- and middle-income countries (LMICs), rural and peri-urban areas still don't have dependable internet or energy. This makes it hard for both patients to get telehealth services and for clinicians to provide them. Even when there is coverage, limited bandwidth might make complex AI-based apps unusable.

Affordability is a second way to keep people out. Many families can't use digital health platforms because smartphones, PCs, and data plans are too expensive. For providers, the price of subscribing to AI-enabled software or teleconsultation platforms can be too high, especially in health systems that don't have enough money. So, without government help or low-cost options, telemedicine and AI could only be useful for rich people [5].

Digital literacy and human capacity are both very crucial. Patients need to know how to use teleconsultation tools, interpret digital health information, and trust AI-based recommendations. Health workers need to learn how to use digital tools and how to think critically about what they make so that they don't rely on them too much. If we don't put money into digital literacy, the gap moves from access to useful use [1].

People's utilisation of digital health is also affected by sociocultural barriers. Language barriers, unequal access to technology for men and women, and cultural suspicion of machine-driven care can all make it hard for those who are already on the fringes to seek treatment. For example, women in some places don't have much influence over who can have a mobile phone, and minority groups might use platforms that don't take their language or culture into account.

Lastly, bad rules and poor governance make things worse. People aren't adopting because it's hard to know how to get paid back, the rules aren't always the same, and the rules for protecting data aren't strong enough. Additionally, without purposeful equity-focused policies, digital health programs can sometimes make existing inequities worse instead of fixing them [6].

When you look at all of these factors together, they show that the digital divide in healthcare needs to be thought of as more than just a technological issue. The current discourse is lacking because it only talks about infrastructure, which hides the social, economic, and cultural factors that really make a place inclusive. This study contends that to bridge the divide, it is essential to adopt a comprehensive perspective that encompasses not only the development of networks but also the consideration of affordability, human capability, sociocultural inclusion, and governance reform as interconnected foundations for equitable telehealth and AI implementation. We created a conceptual framework (fig. 1) to show that the digital gap is more than just infrastructure. It shows that there are many different types of hurdles to adopting digital health [7].

Multidimensional Digital Divide in Healthcare

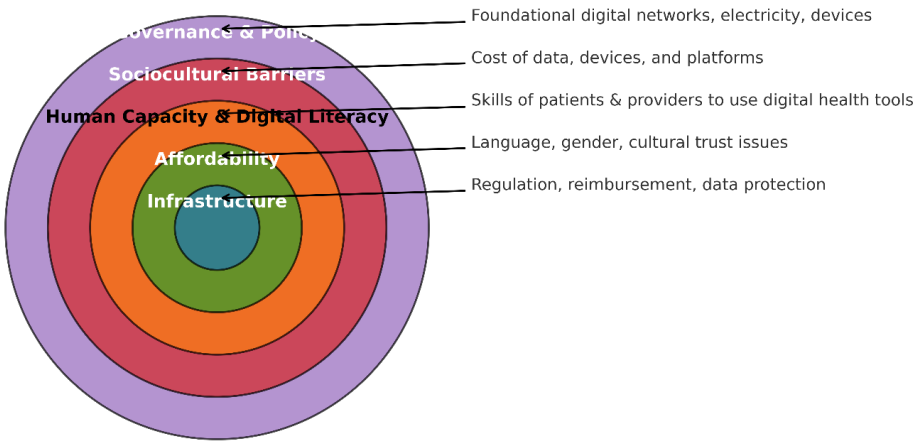

Figure 1. Multidimensional Layers of the Digital Divide in Healthcare. This figure depicts the digital divide as a layered construct encompassing five interrelated domains. At the core lies infrastructure (internet connectivity, electricity, devices), which provides the foundation for digital health access. Surrounding this are issues of affordability (costs of devices, data plans, and platforms) and human capacity and digital literacy (skills of patients and providers to effectively use telehealth and AI tools). The outer layers highlight sociocultural barriers, including language, gender inequities, and cultural trust, as well as governance and policy, which encompass regulation, reimbursement mechanisms, and data protection frameworks. Together, these dimensions underscore that bridging the digital divide requires comprehensive strategies that address structural, social, and regulatory determinants of inclusion.

Impact of Telehealth and AI in Resource-Limited Settings

The use of telemedicine and AI in places with few resources has made people both hopeful and cautious. A lot of the current conversation is about technical performance, such as speed, accuracy, and the ability to grow. Although these measurements are significant, they fail to encompass the entire range of repercussions. This article transcends the dichotomy of "benefits versus risks" by examining how telehealth and AI transform behavioural dynamics, professional practice, and structural equity within vulnerable health systems[8].

These technologies offer substantial opportunities. Telehealth platforms make it easier for people in rural areas to get care by connecting them with specialists in cities. This breaks down geographic boundaries that have made it hard to get care in the past. AI-powered diagnostic solutions can cut costs by making laboratory work easier, giving frontline workers automated decision aids, and making specialised information more accessible. This makes things more affordable in health systems that are already stretched thin and don't have enough staff. Task-shifting is also significant. This is when digital tools let nurses and community health professionals do tasks that doctors usually do. AI-based malaria tests in rural sub-Saharan Africa are a very good example. Portable gadgets that use image-recognition algorithms can look at blood smears in a matter of minutes. This means that doctors don't have to rely as much on busy lab specialists, and treatment decisions may be made faster. These new ideas show how AI can help doctors diagnose patients in locations where there aren't enough doctors. But they also show that structural problems, like unreliable electricity, expensive maintenance costs, and the need for continual training, could make sustainability harder to achieve [1,8].

There are also a lot of risks that come with this change. Telehealth and AI could make things worse for people who don't have access to the internet, are illiterate, or don't have enough money. As people become more reliant on outside technology, local capacity can suffer. This makes health systems less stable when systems fail, equipment breaks, or commercial vendors pull out. Also, women, the elderly, and those who speak different languages are more likely to be left out when platforms are made without taking culture, gender, or multilingual interfaces into account. These dynamics affect trust, professional autonomy, and long-term resilience in addition to access. They also affect how healthcare staff and patients use digital systems.

The significant deficiency in contemporary research is the lack of comparison evaluations of equality results among low- and middle-income countries (LMICs). Although case reports record individual successes or failures, there is a scarcity of research that systematically assesses how digital health interventions spread benefits and hazards across various populations. To make sure that telemedicine and AI don't make health inequities worse, it's important to understand how they affect diverse groups of people in different ways. This study redefines digital health as both an innovation challenge and a justice issue in global health by connecting technological advancements to behavioural and systemic equitable results [9,10].

Case Studies / Illustrative Examples

To synthesize insights across regions, we compared the key equity barriers, successful approaches, and persistent gaps identified in Africa, South Asia, Latin America, and high-income countries (Table 1)."

Table 1. Comparative Analysis of Equity Barriers and Responses Across Regions

Region	Key Barriers	Successful Approaches	Remaining Gaps
Africa	Limited internet/electricity, high device/data costs, weak infrastructure	Mobile health (mHealth) via SMS for maternal/child health; AI malaria diagnostics with smartphones	Sustainability issues (power outages, high costs); poorest households excluded[11]
South Asia	Rural–urban disparities, gender inequities in phone ownership, and low digital literacy	Low-bandwidth teleconsultation platforms; AI triage systems; community health worker integration	Persistent gender gap; literacy barriers limit women and older adults[12]
Latin America	Remote geography (Amazon/Andes), fragmented governance, uneven reimbursement	Large-scale public–private telehealth partnerships; AI-assisted diagnostics in underserved communities	Regulatory inconsistency; rural/Indigenous communities remain underserved[13]
High-Income	Affordability gaps, digital literacy in older adults, and language exclusion	Telehealth integration into mainstream health systems; multilingual/migrant-focused digital platforms	Persistent rural gaps; older adults and low-income groups underrepresented[14]

This table summarizes key barriers, successful approaches, and remaining gaps in the adoption of telehealth and AI across Africa, South Asia, Latin America, and high-income countries. Examples and evidence are drawn from recent reviews and regional studies, including Gilano et al. (2024), Cuadros et al. (2025), Qoseem et al. (2024), Eslami Jahromi & Ayatollahi (2022), Aldosari et al. (2023), Camacho-Leon et al. (2022), Daniela Chueke (2023), Shi et al. (2024), and Money et al. (2024).

Looking at case studies from different areas can help us understand both the good and bad sides of digital health. Innovative projects in Africa, South Asia, Latin America, and even high-income countries show that there are still unfair situations. One major flaw in the current literature is that these cases are generally isolated, which makes it hard to learn more general principles. This research combines them to show patterns that can help people around the world adopt telehealth and AI in a fair way.

Africa. Mobile health (mHealth) platforms are now a big part of providing care to areas of sub-Saharan Africa that don't get enough of it. For example, programs that help mothers and children stay healthy send SMS messages to remind them of appointments and teach them about health. There are other tests going on using AI-powered tools, such as malaria diagnostic platforms that let community health workers use smartphone-based microscopy to find infections. These projects show how mobile penetration can be used to get around deficiencies in infrastructure. But they also show problems with sustainability, such as power outages, slow internet speeds, and expenses that are still too high for the poorest households [15].

South Asia. Low-bandwidth teleconsultation systems have helped fill gaps in the number of medical specialists in India, Pakistan, and Bangladesh, especially in rural areas. AI-powered triage systems are also employed to help hospitals that are too full keep track of their patients. Adding community health workers to digital platforms has been a key aspect in their success since it has made them culturally acceptable and built trust with patients. Still, differences between men and women in phone ownership and computer literacy make it harder for women to get care, and women make up a large part of the patients who don't get care. The area shows both how useful task-shifting with technology can be and how it may make current disparities worse [1,16].

Latin America. Brazil and Colombia, for example, have used large-scale telemedicine programs to reach people living in the Amazon and Andes mountains. Public-private collaborations have been very important in making more connections and offering AI-assisted diagnostic services. These programs have made it easier for people to get help, but they also show how hard it is

to govern. Different rules and regulations for paying for care make access uneven. For example, richer metropolitan patients often have better access than rural or Indigenous groups.

For high-income countries, it may be surprising, but digital disparities still exist in places with advanced technology. Older persons, low-income groups, and people living in rural areas in the United States still don't use telehealth as much as they should because of cost and lack of computer literacy. In other parts of Europe, migrant populations also risk exclusion when platforms don't support several languages. These examples show that the digital gap is not just a problem in LMICs; it is a problem for everyone [17].

When you look at all of these situations together, you can see a pattern: digital tools can make things easier and more accessible, but their advantages aren't always shared equally unless fairness is built in from the start. This study advocates for a transition from analysing case studies in isolation to recognising common structural challenges—such as affordability, literacy, governance, and cultural inclusivity—that must be tackled to promote global health equity through telehealth and AI. We plotted differences in internet access, device ownership, and digital literacy by region to show how digital health preparation is not equal across the country (Figure 2) [18].

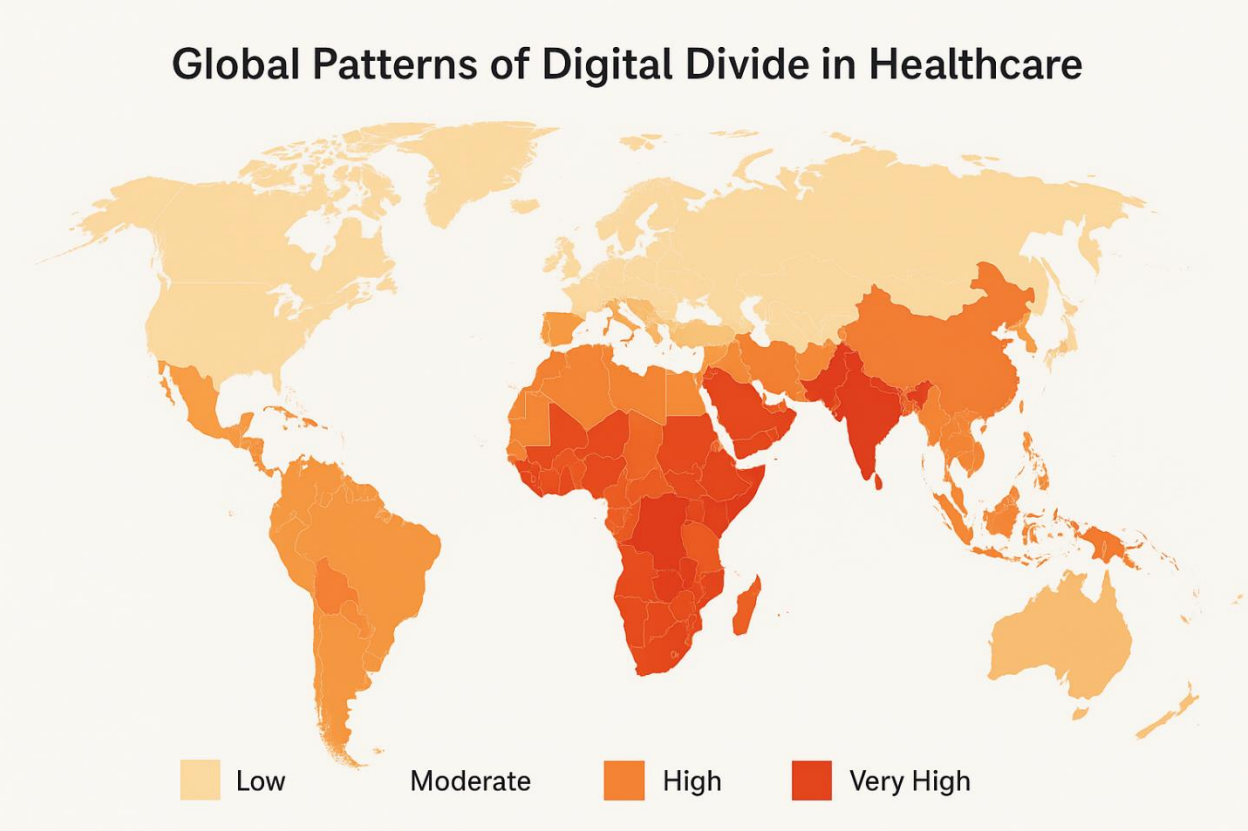

Figure 2. Global Patterns of the Digital Divide in Healthcare. *This thematic world map depicts global patterns of the digital divide in healthcare. Regions are shaded from low (light) to very high (dark) levels of disparity, reflecting differences in internet connectivity, device ownership, and digital literacy. The map highlights that inequities are not confined to low- and middle-income countries but also persist in high-income settings, underscoring the universality of digital exclusion as a health determinant.*

Strategies for Bridging the Digital Divide

Bridging the digital divide in telehealth and AI requires more than piecemeal interventions. Existing approaches often focus narrowly on infrastructure or short-term funding, resulting in fragmented outcomes and unequal access. To move beyond this, we propose a comprehensive, multi-level strategy framework that integrates infrastructure, affordability, literacy, culture, governance, financing, and partnerships into a cohesive roadmap. This framework draws lessons not only from health but also from aviation safety, education technology, and financial inclusion, where systems-level safeguards have been essential for equitable innovation.

Building on these findings, we developed a comprehensive multi-sectoral framework to guide inclusive adoption of telehealth and AI in resource-limited settings Figure 3 [19].

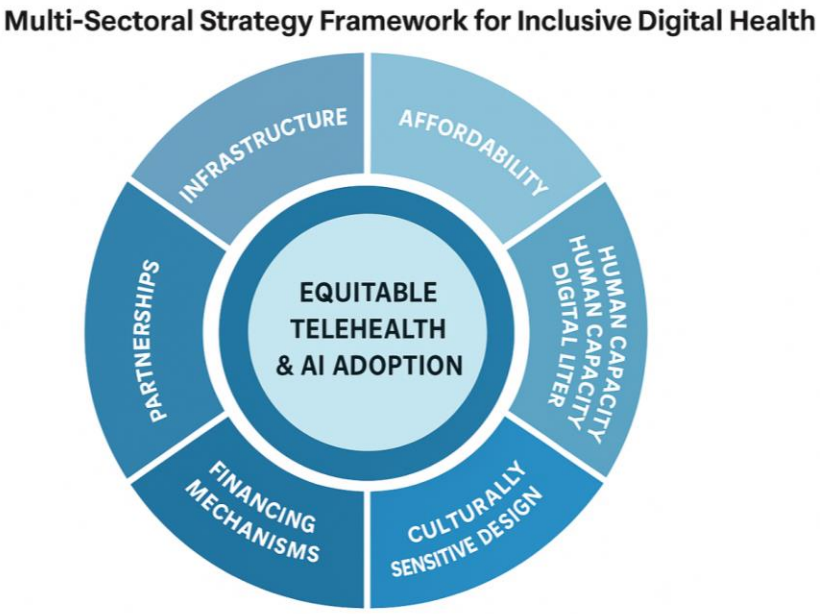

Figure 3. Multi-Sectoral Strategy Framework for Inclusive Digital Health. *This framework illustrates the interconnected strategies required to bridge the digital divide in healthcare. At the core lies equitable telehealth and AI adoption, surrounded by seven interdependent domains: infrastructure, affordability, human capacity and digital literacy, culturally sensitive design, governance and regulation, financing mechanisms, and public–private partnerships. The layered wheel design emphasizes that progress requires integrated, multi-level interventions rather than isolated fixes, reframing digital inclusion as a systemic health determinant.*

Investing in infrastructure. A fair telehealth and AI system needs a strong digital infrastructure. For a lot of low- and middle-income nations (LMICs), this includes bringing internet and mobile service to rural regions, investing in solar-powered or battery-powered alternatives for electricity, and building community digital hubs. Aviation safety lessons show how important redundancy is: just like planes have backup systems to keep them from crashing, digital health systems need to have backup means to connect to avoid service interruptions. Pilot projects in East Africa that used both satellite internet and local Wi-Fi show how blended infrastructure models can keep things running smoothly in tough situations [20].

Models that are affordable and can grow. Even when infrastructure is in place, costs are still a big problem. Telehealth consultations, mobile data contracts, and AI platforms need to be cheap or free for people who are at risk. Financial inclusion programs offer valuable comparisons, as microfinance and tiered payment systems have broadened access to banking services. In health, similar methods, like teleconsultation apps with low data usage or insurance plans that include telehealth services, can make access more equal. SMS-based health advice platforms in Bangladesh highlight how low-cost ways can help people who don't have cellphones or wifi.

The ability of people and their digital literacy. To make sure that meaningful use happens, both patients and providers need to invest in their skills. To keep diagnostic autonomy, it is important to teach health personnel how to think critically about AI outputs instead of just accepting them as they are. Basic digital literacy training can help patients feel less scared and suspicious of new technologies [21]. Education technology offers a paradigm: interactive, localised e-learning modules have effectively enhanced literacy among adults in resource-limited environments. In the same way, simulation-based retraining, which is widespread in aviation, might be used for doctors and nurses. They would need to practise manual diagnosis without AI help regularly to keep their basic skills sharp.

Design that is culturally aware and focused on people. Digital platforms should be made with users in mind, not merely for them. Adoption is made harder by cultural scepticism of decisions made by machines, gender inequality in mobile phone ownership, and language barriers. Community-led design in educational technology demonstrates that customising platforms to

align with local languages, cultural norms, and gender dynamics promotes continued usage. For telehealth, this could include adding visual assistance for those with limited literacy, making sure that the interface works in more than one language, or adding elements that keep women's privacy safe in patriarchal settings [22].

Rules and laws for governing. A common problem is that regulatory systems are broken apart. To keep patients safe and hold providers accountable, there has to be a unified framework for cross-border teleconsultation, reimbursement, and data privacy. Aviation has taught us how important it is for countries to have the same rules, which makes travel safe across borders. Global health organisations may also help define minimum guidelines for how to utilise AI ethically, and then national governments could change them to fit their own needs. Including fairness in regulations, like requiring physicians to take skill-maintenance courses regularly or making sure that platforms are easy to use, would protect against differences caused by technology [23].

Ways to get money. Funding models that work over the long term are important. When experimental projects are funded by donors, they often don't last long. Public funding should be supplemented by novel mechanisms, such as health bonds, insurance coverage for digital services, and cross-subsidization from customers with higher incomes. The financial inclusion industry shows how tiered payment systems can keep services going while reaching more people. Rwanda's community-based health insurance plan, which pays for some digital services, is a good example of how to finance equity on a large scale [24].

Partnerships between the public and private sectors. Collaborative approaches are also very important for growth and long-term success. Governments set the rules and make sure that the public is held accountable, while tech corporations are good at AI and platform design. Working with local NGOs makes sure that people are culturally aware and involved at the grassroots level. Vaccination campaigns are a good example of how cross-sectoral coordination can help reach a lot of people. In Latin America, public-private partnerships have already brought telehealth infrastructure to remote areas, showing how powerful shared responsibility can be [25].

These initiatives show that closing the digital divide needs a system-level, multi-sectoral approach. The new thing about this approach is that it brings together all the many activities into a single plan, connecting investments in infrastructure to social, cultural, and governance issues. This method offers a paradigm for sustainable and fair digital health adoption by incorporating lessons from other fields, such as aviation's attention on redundancy, education's emphasis on user-centred design, and finance's advances in affordability. The key point is that equity can't be added after the fact; it has to be included in the design, funding, and rules for telehealth and AI from the start [3].

Operationalizing and Measuring the Digital Divide

The digital gap is frequently articulated conceptually; nonetheless, its conversion into quantifiable metrics is crucial for assessment and policy implementation. A useful monitoring system should include both process and outcome measurements from several different areas:

- Infrastructure: the number of homes with dependable internet access, the average bandwidth per person, and the percentage of health institutions with steady electricity and working digital platforms.
- Affordability: the percentage of household income spent on mobile data and devices, and the percentage of the population that can get free digital health services [26].
- Digital literacy and capacity: the percentage of adults who know how to utilise teleconsultation platforms and the percentage of healthcare staff who have been trained to use telehealth and AI tools [21].
- Sociocultural inclusion: the difference in mobile phone ownership between men and women; the number of digital platforms that are available in more than one local language; and how happy the community is with the platforms' cultural appropriateness [27].
- Governance and readiness: the WHO Digital Health Readiness Index shows how well a country is prepared for digital health; there are national telehealth reimbursement rules, and there are laws to protect data.

Stratifiers, including gender, age, where you live (rural or urban), financial level, and minority or Indigenous status, should be used to keep an eye on equity. Over time, implementers can use a dashboard approach to keep track of indicators every year to see how things are doing and where there are gaps [28].

Countries should go beyond vague promises of fairness by adding concrete indicators to digital health frameworks. This way, they can hold people accountable through data-driven monitoring.

Framework Validation and Implementation Guidance

The multi-sector framework put forward in this research presents a systematic approach for inclusive digital health; nonetheless, its legitimacy relies on validation and pragmatic direction for execution. Three complementary strategies are proposed:

1. Building a logic model. A logic model can connect behaviours, outputs, and outcomes to make the causal pathways of equity-focused digital health clearer. For instance:

- Things to do: invest in rural connectivity, pay for data costs, and train community health workers [29].

Outputs: more teleconsultation platforms available, more people able to use technology, and better standards for how to run things.

Outcomes: fair use of telehealth, a smaller gender gap in access, and better health outcomes for groups that are often left out.

2. Agreement among experts and testing. Delphi panels, roundtables, or regional expert meetings that look at the face validity of the framework can all be used to validate it. Pilot studies in chosen LMIC contexts could evaluate feasibility, cultural pertinence, and sustainability before expansion[30].
3. A list of things to do for implementation. A simple checklist can help decision-makers figure out what actions, people, and resources are in their way. For instance:

- Barrier: limited connectivity → Action: use blended infrastructure (satellite + Wi-Fi) → Actors: ministries of ICT and telecom businesses; Resources: universal service funds; Time frame: 2 to 3 years.
- Barrier: high data costs; Action: subsidised data bundles for health platforms; Actors: regulators and telecom carriers; Resources: cross-subsidization; Timeline: right away to a short time from now.
- The framework can be both a theoretical contribution and a practical instrument for governments, donors, and practitioners who want to close the digital gap. This is because it combines a logic model with consensus-building and an executable checklist.

Policy Levers and Sequencing for Inclusive Digital Health

Governments need clear policy levers and a clear sense of sequencing for digital health efforts to go from vision to practice. Several useful tools can speed up the adoption of inclusivity:

- Governance and regulation of Set up codes for teleconsultations and digital diagnostics that will let people get their money back [31].
- Set minimal criteria for data protection to protect patient privacy and develop trust.
- Create cross-border licensing agreements (like those in the African Union or EU) to make sure that specialists can reach more people while still being held accountable [32].
- Ways to get money
- Provide fair data-cost subsidies to at-risk groups, paid for either universal service funds or telecom taxes.
- Add teleconsultations and remote monitoring to universal health coverage (UHC) benefit packages to cover more digital health services.
- Test out health impact bonds and mixed finance plans to keep programs going when donor money ends.
- Help with sequencing
- In places with few resources, the top three things to do right away should be to (i) improve infrastructure (connectivity, electricity), (ii) make things more affordable by giving out subsidies, and (iii) teach both providers and patients how to use technology.
- In places with middle- and high-income levels, parallel efforts can help: (i) harmonise regulations across regions, (ii) include telehealth in UHC plans, and (iii) create better governance mechanisms for AI ethics and accountability.

Policymakers can make sure that telehealth and AI become lasting parts of fair health systems instead of broken pilot projects by combining short-term measures for affordability and access with long-term reforms in governance and financing.

Ethical and Equity Considerations

The quick use of telemedicine and AI has overtaken the creation of ethical guidelines that operate in many different parts of the world. In high-income countries (HICs), discussions about the ethics of digital health have mostly focused on data privacy, liability, and following the rules. These issues are highly important, yet they are only a small part of the total picture. In low- and middle-income countries (LMICs), the ethical landscape is shaped by extra problems, like

weak governance systems, not enough legal protections, and a higher risk of marginalisation for vulnerable groups [33].

One of the most crucial things is keeping data private. Many LMICs lack robust data protection laws, resulting in the potential misuse of patients' sensitive health information. When cloud-based platforms are stored outside of a country's boundaries, it is extremely tough to hold people responsible. Along with privacy, algorithmic bias is another issue. AI technologies that are largely trained on data from HIC populations can misclassify diseases or miss unusual disorders among groups that aren't well represented, which would keep inequality in diagnosis and treatment going [34].

It's also important to consider the risk of leaving out groups that are more likely to be hurt, like women, people who reside in rural regions, older people, and individuals who speak a language other than English. Platforms that don't take into account things like cultural norms, literacy levels, or linguistic variety may make structural disparities worse without meaning to. To address these deficiencies, we must transition from universalist frameworks of ethics to context-sensitive approaches that prioritise inclusivity [35].

This paper's novelty is in reconceptualising digital equity not merely as a marginal concern but as a moral imperative for global health justice. Ethical frameworks must clearly integrate equity, ensuring that digital health interventions reduce disparities rather than exacerbate them. To retain trust and make sure that healthcare systems stay strong, it's crucial to make sure that fairness, openness, and inclusion are part of every phase, from making datasets to putting ideas into action.

Future Directions

The next phase of digital health in resource-limited settings must prioritize sustainability, inclusion, and long-term impact. Emerging connectivity solutions, such as satellite internet and community-owned networks, can expand access beyond the limitations of traditional infrastructure. Equally important is the development of AI systems trained on locally representative datasets to reduce algorithmic bias and improve diagnostic relevance for diverse populations [1,36].

Integrating telehealth within universal health coverage (UHC) frameworks is essential to ensure digital services are not treated as temporary add-ons but as integral components of equitable health systems. To date, most evidence comes from short-term pilot projects, leaving critical knowledge gaps on sustainability, workforce skills retention, and system resilience. Future research must therefore prioritize longitudinal studies to monitor equity outcomes over time and assess whether telehealth and AI narrow or widen disparities [10].

Taken together, these priorities call for deliberate investment in connectivity, context-specific AI training, and integration into health financing schemes. By embedding digital health into long-term policy and evaluation structures, countries can ensure that innovation translates into durable and equitable health gains [37].

Conclusion

This research emphasises that the comprehensive integration of telehealth and AI is contingent upon tackling the digital gap as a fundamental health determinant, rather than a secondary issue. It emphasises that fairness must be embedded into digital health from the start by suggesting a multi-level architecture that includes infrastructure, affordability, literacy, culture, governance, financing, and collaborations. This agenda is based on ethical principles, including protecting privacy, minimising bias, and putting vulnerable populations first. To close the digital divide, we need concerted policy action, long-term funding, and global cooperation. This will make sure that digital health improvements make healthcare systems more efficient, fair, and resilient.

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