

Digital Governance and Social Inclusion in Primary Healthcare: Lessons from the Use of Artificial Intelligence in Sri Lanka

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Abstract

Digital health and artificial intelligence (AI) are increasingly promoted as tools to improve efficiency, access and continuity of care in health systems. In Sri Lanka, these technologies are being introduced within a health sector that already faces challenges such as workforce pressure, rising service demand, uneven digital infrastructure and persistent rural-urban disparities. Although digital health can strengthen primary healthcare, its benefits are not automatic. Without inclusive governance, AI-enabled and digital services may unintentionally exclude older adults, rural communities, low-income households and disaster-affected populations. This position paper examines how digital governance can promote or limit social inclusion in primary healthcare in Sri Lanka. A structured narrative position paper approach was used, informed by selected peer-reviewed literature, international guidance, national policy documents and reflective observations from primary healthcare practice in rural Sri Lanka. Sources were reviewed using pre-defined thematic criteria related to AI in health, digital governance, primary healthcare, equity, data protection, accountability and social inclusion. The analysis identifies four major areas of concern: unequal access to digital infrastructure, low digital literacy among vulnerable groups, limited public trust in data use, and weak mechanisms for accountability when AI-supported decisions affect care. Ethical concerns were organised using core principles of autonomy, beneficence, non-maleficence, justice, privacy, transparency and accountability. The paper argues that technology alone cannot address healthcare inequality; rather, inclusive governance is required to ensure that digital transformation strengthens social trust and does not create new forms of exclusion. The paper recommends locally validated AI tools, human oversight, multilingual and low-literacy design, community participation, stronger data protection, role-specific training for primary healthcare workers and hybrid service models that preserve non-digital access. Inclusive digital governance should be treated as a public health requirement, not only a technical or administrative concern.

Keywords: artificial intelligence, digital governance, primary healthcare, social inclusion, Sri Lanka

Introduction

Digital technologies have become increasingly important in contemporary healthcare systems. Mobile health applications, electronic health records, telemedicine platforms and AI-supported decision tools are used to improve service ef-

iciency, support clinical work and extend care beyond traditional health facilities. The World Health Organization (WHO) emphasises that digital interventions can contribute to health system strengthening, but only when they are implemented within appropriate health system, ethical and equity safeguards (World Health Organiza-



tion, 2019).

In primary healthcare, digital tools may support appointment systems, continuity of care, follow-up communication, remote consultation, health education, surveillance and clinical decision-making. In Sri Lanka, digital transformation is gaining policy attention through national-level digital health planning and the expansion of health information systems (Ministry of Health Sri Lanka, 2023). These developments are important because primary healthcare services are often the first point of contact for rural, older, low-income and chronically ill patients.

However, digital transformation also creates new questions about fairness, access and accountability. Sri Lanka has experienced recent economic stress, climate-related disasters, public health emergencies and uneven development across districts. These conditions make social inclusion especially important. A digital health service that works well for an educated urban user with a smartphone may be difficult to use for an older adult, a daily wage worker, a person in a remote village or a family affected by floods. Therefore, the governance of digital health and AI must be examined not only from a technical viewpoint but also from an ethical, equity and social cohesion perspective.

Digital governance refers to the policies, institutional arrangements, accountability systems, legal protections and operational practices that guide the design, use and monitoring of digital technologies. In healthcare, this includes data protection, informed consent, transparency, accountability for AI-supported decisions, validation of tools, workforce training, and mechanisms to ensure that people are not excluded because of language, income, location, disability, age or digital literacy (World Health Organization, 2021).

This paper explores the role of digital governance in promoting social inclusion in primary healthcare in Sri Lanka. It examines the opportunities and risks of digital and AI-supported health services, identifies key governance gaps, and proposes practical recommendations for inclusive implementation.

Literature Review

Digital health and AI are now widely discussed as tools for improving access, efficiency and quality of healthcare. AI applications in health may include triage support, diagnostic assistance, risk prediction, patient monitoring, health education, administrative automation and outbreak surveillance (Topol, 2019). However, global guidance repeatedly warns that digital interventions should complement, not replace, functioning health systems (World Health Organization, 2019).

A central issue in digital health is the digital divide. Van Dijk (van Dijk, 2020) explains that digital exclusion is not only about physical access to devices, but also about skills, usage patterns, affordability and meaningful participation. In healthcare, this means that the availability of an app or online platform does not guarantee equal access. Rural residents, older adults, persons with disabilities, low-income groups and people with limited literacy may face layered barriers that reduce their ability to benefit from digital care.

Older adults are particularly vulnerable to digital exclusion. Digital services may require navigation of online forms, passwords, automated messages or mobile applications. Patients with visual impairment, limited hand function, low confidence or fear of technology may become dependent on relatives or health workers. This dependence may affect privacy, autonomy and continuity of care. Therefore, inclusive design and assisted digital pathways are essential in primary healthcare.

Ethical concerns are also central to AI in healthcare. WHO guidance on AI for health identifies six broad ethical principles: protecting autonomy; promoting human well-being, safety and the public interest; ensuring transparency and explainability; fostering responsibility and accountability; ensuring inclusiveness and equity; and promoting responsive and sustainable AI (World Health Organization, 2021). These principles are highly relevant to Sri Lanka because AI systems developed or trained in other settings may not reflect local languages, disease patterns, health-seeking behaviours or rural service realities.

Data governance is another important area. Health data are sensitive, and weak protection can reduce public trust. Sri Lanka's Personal

Data Protection Act, No. 9 of 2022, provides a national legal foundation for regulating personal data processing and establishing a Data Protection Authority (Parliament of Sri Lanka, 2022). However, legal recognition must be translated into practical safeguards at service level, including staff training, clear consent processes, secure systems and patient-friendly explanations.

The Sri Lankan digital health context is developing. The National Digital Health Blueprint sets out a direction for digital transformation and health information systems, including hospital information systems, electronic records and improved interoperability (Ministry of Health Sri Lanka, 2023). However, the social inclusion implications of AI and digital governance in primary healthcare remain insufficiently explored. This paper addresses that gap by linking international guidance with practical observations from primary care settings.

Methodology / Design / Approach

This paper was developed as a structured narrative position paper. It did not involve primary data collection from patients, communities or institutions. Instead, it combined a targeted review of relevant literature and policy documents with reflective observations from primary healthcare practice in rural Sri Lanka. This approach was selected because the purpose of the paper was to develop a reasoned argument on digital governance and social inclusion rather than to estimate prevalence or test a statistical hypothesis.

The review process was structured to improve methodological transparency. Sources were identified from peer-reviewed literature, global guidance documents, national policy documents and selected books relevant to digital society, AI ethics and health equity. Priority was given to documents that discussed AI in healthcare, digital interventions for health system strengthening, primary healthcare, digital exclusion, data governance, accountability and low- and middle-income country contexts. WHO guidance, Sri Lankan digital health policy documents and Sri Lankan data protection legislation were considered particularly relevant because of their direct

policy applicability.

Inclusion criteria were: (1) publications addressing AI, digital health, telemedicine or health information systems; (2) documents discussing ethics, equity, governance, data protection or social inclusion; (3) sources relevant to primary healthcare or health system strengthening; and (4) global, low- and middle-income country, South Asian or Sri Lankan relevance. Exclusion criteria were: (1) purely technical AI papers without health governance relevance; (2) publications unrelated to healthcare; and (3) opinion material without clear relevance to the paper's central argument.

The reflective component was based on professional observations from routine primary healthcare practice. No identifiable patient information, clinical records or direct quotations were used. These observations were used only to contextualise how digital systems may affect patients and healthcare workers in real-world primary care settings, particularly in rural and resource-constrained environments.

The analysis followed a thematic approach. Evidence and observations were organised under five analytical domains: access and infrastructure, digital literacy, trust and data protection, AI accountability, and inclusive governance. These domains were then interpreted using public health ethics principles and WHO guidance on AI governance.

Results and Discussion

Digital access and infrastructure

The first major concern is unequal access to digital infrastructure. Many digital health services depend on stable internet connectivity, smartphones, data affordability and digital platforms that are easy to use. In rural Sri Lanka, these requirements cannot be assumed. Some households share one mobile phone among several family members, while others may have intermittent internet access or limited ability to pay for mobile data. As a result, digital appointments, teleconsultations and app-based follow-up systems may benefit some patients while excluding others.

This issue shows why digital health cannot be

Table 1: Summary of the structured position paper approach

Component	Description
Paper type	Structured narrative position paper
Evidence base	Peer-reviewed literature, WHO guidance, Sri Lankan policy documents, data protection legislation and selected academic books
Practical input	Reflective observations from primary healthcare practice in rural Sri Lanka; no patient identifiers or direct patient data were used
Main analytical domains	Access and infrastructure; digital literacy; trust and data protection; AI accountability; inclusive governance
Purpose	To develop a context-specific argument and recommendations for inclusive digital governance in Sri Lankan primary healthcare

treated as a neutral service delivery method. A digital service may reduce travel time for one patient but create a new barrier for another. Therefore, primary healthcare services should maintain hybrid pathways, where digital options are available but non-digital access remains protected.

Digital literacy and assisted access

Low digital literacy emerged as a key inclusion challenge. Older adults, people with limited formal education and patients unfamiliar with online systems may struggle to use digital health platforms. Even when family members assist them, privacy and autonomy may be compromised. For example, a patient may avoid discussing sensitive health concerns if a younger family member must operate the device or read messages on their behalf.

An inclusive model should therefore include assisted digital access. Primary healthcare workers, community health volunteers or trained support staff can help patients use digital systems while respecting confidentiality. Interfaces should be available in Sinhala, Tamil and English, and should use simple language, voice support where possible and low-literacy design principles.

Trust, data protection and accountability

Trust is central to digital health adoption. Patients may hesitate to share personal health information through digital systems if they do not understand where their data are stored, who can access them and how they may be used. Sri Lanka's Personal Data Protection Act provides an important legal foundation, but the practical implementation of data protection must be visible

at primary care level (Parliament of Sri Lanka, 2022).

Clear communication is essential. Patients should be informed in simple language when digital tools are used, what data are collected, how confidentiality is protected and whether information may be shared across institutions. Consent should not be reduced to a technical checkbox. In primary healthcare, consent must be meaningful, culturally appropriate and understandable.

Artificial intelligence, bias and clinical responsibility

AI-supported tools are often presented as objective and efficient, but they may reproduce the limitations of the data used to build them. If an AI tool is trained mainly on urban, hospital-based or high-resource populations, its recommendations may be less reliable for rural patients or those with different socioeconomic and health profiles. This creates a risk of algorithmic bias and unequal quality of care.

A major governance question is responsibility. If an AI-assisted tool provides an inaccurate triage recommendation or overlooks a risk factor, patients and providers need clear accountability pathways. Human oversight should remain central in primary healthcare. AI should support clinical judgement, not replace professional responsibility. Local validation is also essential before AI tools are used widely in Sri Lankan primary care settings.

Table 2: Ethical concerns and governance responses for AI-supported primary healthcare

Ethical principle	Risk in digital or AI-based care	Recommended governance response
Autonomy	Patients may not know when AI or digital systems influence care decisions.	Provide clear patient information, meaningful consent and the option to request human explanation.
Beneficence	Digital tools may be introduced for efficiency without clear patient benefit.	Evaluate whether tools improve access, safety, continuity and quality of primary care.
Non-maleficence	AI errors, unsafe advice or poor-quality data may harm patients.	Require validation, clinical oversight, incident reporting and regular monitoring.
Justice and equity	Rural, older, low-income or low-literacy groups may be excluded.	Maintain hybrid services, multilingual interfaces, assisted access and equity audits.
Privacy and confidentiality	Health data may be misused, shared without understanding or poorly protected.	Apply data protection standards, secure systems, staff training and patient-friendly explanations.
Transparency and explainability	Patients and clinicians may not understand how AI outputs are produced.	Use explainable tools where possible and avoid opaque systems for high-risk decisions.
Accountability	Responsibility may be unclear when AI-supported decisions go wrong.	Define responsibilities for developers, institutions, clinicians and regulators.

Ethical framework for inclusive AI in primary healthcare

Critical analysis: technology is not automatically inclusive

The central argument of this paper is that digital transformation does not automatically produce social inclusion. A technology can be innovative and still be exclusionary if it is designed for the average connected user rather than for the most vulnerable patient. In Sri Lankan primary healthcare, digital governance should therefore begin with the question: who may be left out?

A purely technical approach may focus on platform development, speed and efficiency. A public health approach must also consider affordability, language, disability, trust, community acceptance and the capacity of health workers. For example, telemedicine may reduce travel for patients in remote areas, but only if internet access is reliable, privacy is possible at home and the patient can communicate effectively through the platform. Similarly, AI decision support may assist clinicians, but only if it is locally validated and used within clear accountability structures.

Digital governance should also recognise the rela-

tionship between health services and social cohesion. If digital systems are perceived as unfair, confusing or unsafe, they may reduce trust in health institutions. Conversely, if digital tools are introduced with community participation, transparency and respect for vulnerable groups, they may strengthen trust and improve continuity of care.

Recommendations for inclusive digital governance

Conclusion and Contributions

This position paper argues that digital governance is essential for ensuring that digital health and AI contribute to social inclusion in Sri Lankan primary healthcare. Digital tools can improve access, continuity and efficiency, but these benefits are not distributed equally unless governance systems deliberately protect vulnerable groups.

The analysis shows that rural communities, older adults, low-income households and people with limited digital literacy may be excluded when digital systems are introduced without attention to infrastructure, affordability, language, trust and

Table 3: Practical recommendations for Sri Lankan primary healthcare

Governance area	Recommended action
Policy and regulation	Develop clear guidance for AI use in primary healthcare, including validation, risk classification, monitoring and accountability.
Equity protection	Conduct equity impact assessments before introducing digital tools, especially for rural, elderly, low-income and low-literacy groups.
Service design	Maintain hybrid service models so patients can access care through both digital and non-digital routes.
Language and literacy	Provide Sinhala, Tamil and English interfaces using simple language, visual guidance and assisted access options.
Workforce capacity	Train primary healthcare workers on digital tools, data protection, AI limitations, consent and patient communication.
Data governance	Strengthen practical implementation of privacy safeguards, cybersecurity, consent processes and institutional accountability.
Community engagement	Include patients, community leaders and frontline workers in planning, testing and monitoring digital health systems.

assisted access. AI also introduces additional concerns related to bias, explainability, clinical responsibility and accountability.

The main contribution of this paper is its context-specific framing of digital governance as a public health and social inclusion issue. It moves beyond a technology-centred discussion and highlights the need for ethical, transparent and locally responsive implementation. For Sri Lanka, inclusive digital governance should include human oversight, local validation of AI tools, multilingual and low-literacy design, strong data protection, workforce training, community participation and hybrid service delivery.

If digital health and AI are governed with these principles, they can strengthen primary healthcare and support public trust. If they are introduced without adequate safeguards, they may create new forms of exclusion. Therefore, policymakers and health leaders should treat inclusive digital governance as a core requirement for fair and socially cohesive healthcare.

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