

# Sharing Artificial Intelligence (AI) Data in Healthcare—Challenges and Enablers in Low- and Middle-income countries (LMICs). A systematic review and case study.



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## INTRODUCTION

AI is playing a transformative role in the health sector by enhancing the availability, quality and reliability of services. Health systems in LMICs can greatly benefit from AI interventions in various use cases such as diagnostics, treatment, healthcare management, and public health monitoring. Unfortunately, significant obstacles exist towards effective data sharing for developing and deploying AI.

## OBJECTIVES

- To identify barriers and enablers to data sharing for AI in healthcare in LMICs.
- To test the relevance of these barriers and enablers in a local context— a case study of Thailand.

## METHODS

First, a systematic literature search was performed using PubMed, SCOPUS, Embase, Web of Science, and ACM (Association for Computing Machinery) to identify barriers and enablers to data sharing for AI in LMICs. These were classified according to a pre-defined framework with factors fitting into seven domains: 1) Technical, 2) Motivational, 3) Economic, 4) Political, Legal and Policy, 5) Ethical, 6) Social, and 7) Organisational and Managerial.

Second, the local relevance of barriers and enablers was tested through stakeholder interviews with 15 academic experts, technology developers, regulators, policymakers, and healthcare providers from Thailand.

## RESULTS

The systematic search identified 2471 records, of which 22 met the eligibility criteria, mostly from Africa (n=12, 55%) and Asia (n=6, 27%). Across the seven domains associated with data sharing for AI in LMICs, 29 unique factors were identified. These factors can significantly influence the ability of healthcare organisations to share data and limit the implementation of AI solutions in health systems.

The most relevant factors identified were technical/infrastructural, policy-based or motivational and the most important challenges were unreliable internet connectivity, lack of equipment, poor staff and management motivation, uneven resource distribution, and ethical concerns. Possible enablers included improving IT infrastructure, enhancing funding, introducing user-friendly software, and incentivising healthcare organisations and personnel to share data for AI-related tools.

## FACTORS ASSOCIATED WITH SHARING OF HEALTHCARE DATA USING AI TOOLS.



## CASE STUDY: THAILAND

In Thailand, inconsistent data systems, limited staff time, low health data literacy, complex and unclear policies and cybersecurity issues were important data-sharing challenges. Stakeholders pointed to a lack of software standardisation within the same organisation and continued reliance on manual data management and/or paper-based electronic health record systems (EHRs). Enablers included improving and clarifying current policies and introducing interoperable and standardised data formats.

## KEY RECOMMENDATIONS

Building a conducive digital ecosystem —having shared data input platforms for health facilities to ensure data uniformity and compatibility.

Developing pre-defined templates, easy-to-understand consent forms, and standardised guidelines for data sharing, intellectual property rights, and compensation for data breach victims.

Conducting a Public Private Dialogue (PPD) to enhance mutual trust among public and private sectors and jointly improve the data-sharing climate in AI through an institutionalised process.

## EXAMPLES OF PRACTICE

Singapore's National Electronic Health Record (NEHR).  
Singapore's Advisory Guidelines for Key Concepts on PDPA.  
Philippines' Data Privacy Act.  
The Dutch AI Coalition (NL AIC)

## CONCLUSION

AI has the potential for LMICs to leapfrog health inequalities and deficiencies in health systems. Our review identified significant barriers to sharing data for AI according to a comprehensive framework. In a localised case study, most barriers from the systematic review were relevant to the Thai context. In Thailand, data architecture, inconsistent data standards, complex and unclear policies, uneven distribution of financial resources across institutions, and confidentiality breaches were reported as important barriers to data sharing for AI. Together, our results provide insight into the challenges LMICs' health systems face regarding data sharing for AI.

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