

Bridging the Gap between Expert Vision and Hospital Practice: A Risk-governed Framework for AI Adoption in Medical Quality Assessment and Hospital Accreditation

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Abstract

Background

Artificial Intelligence (AI) holds transformative potential for enhancing the efficiency and objectivity of hospital accreditation and quality assessment. However, a significant gap exists between expert vision for advanced AI integration and the current, fragmented reality of hospital-level implementation, compounded by unresolved ethical and governance challenges. This study aimed to empirically investigate this implementation gap and develop a pragmatic, risk-governed framework to guide the responsible adoption of AI in medical quality assessment and accreditation processes.

Methods

A mixed-methods, dual-survey design was employed: 1) A Delphi survey to capture expert consensus (n = 27 senior accreditation surveyors and quality management experts); 2) A cross-sectional field survey to assess hospital practice (n = 55 hospitals in China). Surveys covered AI application priorities, adoption barriers, ethical concerns, and implementation pathways. Data were analyzed using Kendall's W coefficient for consensus and descriptive/ cross-tabulation analyses.

Results

A pronounced aspiration-reality gap was identified. Experts prioritized advanced AI functions like intelligent standard interpretation and automated document review (mean scores > 4.1/5), yet hospital adoption of these was low (< 7%). Hospital AI use was primarily confined to basic quality indicator monitoring (30.9%) and risk warning (25.5%). Key barriers included poor data interoperability (27.3%), technical complexity (21.8%), and low algorithm explainability (20.0%). Strong consensus emerged on top ethical risks: data privacy breaches, algorithmic opacity, and ambiguity in accountability. Experts and hospitals converged on a preferred, sequential implementation pathway: Data Foundation → Technology Governance → Application Piloting → Accreditation Integration.

Conclusions

Successful AI integration into accreditation requires closing the implementation gap through a structured, phased approach that prioritizes data standardization, algorithm transparency, and robust ethical governance from the outset. The proposed risk-governed framework provides a scalable, practice-oriented roadmap for policymakers, accreditation bodies, and hospitals to harness AI's benefits while safeguarding against its risks, ultimately enhancing the quality and safety of care.

1. Background

Healthcare systems globally are pursuing digital transformation, with Artificial Intelligence (AI) emerging as a pivotal tool to improve quality, safety, and efficiency^[1]. Hospital accreditation, a cornerstone of external quality assurance, demands consistent, objective evaluation—a process theoretically well-suited to augmentation by AI for tasks ranging from automated compliance checking to predictive risk analytics^[2]. Despite this potential, the integration of AI into routine accreditation practice remains nascent and uneven, creating a disconnect between expert expectations and frontline hospital capabilities—a phenomenon we term the ‘AI Accreditation Implementation Gap’^[3].

Expert discourse and pilot studies envision AI-driven accreditation featuring real-time data analytics, intelligent standard interpretation, and automated report generation^[4]. Conversely, many hospitals struggle with foundational issues like data fragmentation, rendering advanced AI applications impractical^[5]. This gap is exacerbated by significant ethical and governance uncertainties, including concerns over data privacy, algorithmic bias, and ambiguous accountability for AI-driven decisions^[6]. While high-level principles for ethical AI in health have been outlined by bodies like the World Health Organization (WHO)^[7], operational frameworks tailored to the specific context of accreditation are lacking.

This study addresses this critical need. By directly comparing the consensus of accreditation experts with the on-the-ground realities and perceptions of hospitals, we aim to: 1) Quantify the gap in AI adoption priorities and capabilities; 2) Identify shared perceptions of key barriers and ethical risks; and 3) Synthesize these insights into a practical, risk-governed implementation framework. This framework is designed to provide a structured pathway for safely and effectively bridging the chasm between visionary potential and practical, responsible implementation in hospital quality assessment.

2. Methods

2.1 Study design

We employed a convergent, mixed-methods design involving two parallel, structured surveys conducted between January and February 2026. This dual-survey approach enabled triangulation between normative expert perspectives and descriptive hospital practices (See Fig. 1). Ethical approval was obtained from the Ethics Committee of Shenzhen Hospital Accreditation Research Center (SHARC), and all participants provided informed consent. Anonymity and data protection were guaranteed throughout.

2.2 Participants and Data Collection

- **Expert Delphi Survey:** A panel of 27 senior experts was convened, including experienced hospital accreditation surveyors, healthcare quality directors, health informaticians, and health policy researchers. Inclusion criteria mandated a minimum of 5 years of direct experience in accreditation or quality governance. The survey assessed the perceived importance of various AI application modules, ethical risks, and preferred implementation pathways using 5-point Likert scales.

- **Hospital Field Survey:** A cross-sectional survey was administered to 55 hospitals across China, stratified by tier (e.g., tertiary, secondary), ownership, and region. The questionnaire, completed by hospital quality management directors or chief information officers, captured current AI adoption status, perceived barriers, and support needs.
- The structured questionnaires used in both Delphi expert survey and hospital cross-sectional survey were originally designed exclusively for this research and have not been published in any prior literature. The full English version of the integrated survey questionnaire is uploaded as a supplementary file, and relevant descriptions are marked within the main text.

2.3 Data Analysis

Expert consensus was measured using Kendall's W coefficient of concordance. Items with a mean score ≥ 4.0 and a moderate-to-strong consensus ($W \geq 0.5$) were considered high-priority. Hospital survey data were analyzed using descriptive statistics and cross-tabulation in SPSS 26.0. A structured gap analysis matrix was developed to juxtapose expert priorities ("what should be") against hospital realities ("what is") across four dimensions: AI functions, barriers, ethical risks, and support needs.

3. Results

3.1 The Aspiration-Reality Gap in AI Adoption

Analysis revealed a substantial gap between expert vision and hospital practice. Experts assigned highest priority to advanced, accreditation-specific AI functions such as intelligent interpretation of accreditation standards (Mean = 4.56) and automated review of certification materials (Mean = 4.41). In stark contrast, hospital adoption was predominantly at a basic level: quality indicator monitoring (31.3%) and risk warning systems (25%). The advanced functions experts prioritized were rarely deployed (adoption < 7%) (See Table 1).

Barriers to adoption were clearly identified. Hospitals reported poor data interoperability between systems (27.3% of respondents citing it as a top barrier) and high technical complexity (21.8%) as the most significant impediments. This aligns with expert consensus, which ranked the establishment of unified data interface standards as the most critical first step in implementation (Mean = 4.63).

3.2 Convergence on Ethical Risks and Governance Needs

Despite the gap in adoption, there was strong alignment between experts and hospitals on ethical risks. Both groups identified patient/hospital data privacy leakage (Hospital concern score: 3.60/5), algorithmic bias leading to unfair evaluation (3.58/5), and unclear accountability for AI decision errors (3.56/5) as top concerns. This consensus underscores that ethical governance is not a secondary consideration but a prerequisite for trust and adoption.

Furthermore, hospitals expressed a clear demand for the very governance structures experts advocated. The most requested support conditions were unified data interoperability standards (cited by 76.4% of hospitals), clear ethical and policy guidelines (69.1%), and data security assurance technologies (65.5%).

3.3 A Consensus-Driven Implementation Pathway

Both stakeholder groups converged on a logical, sequential implementation pathway, validating a phased approach (See Fig. 2):

Data Layer: Establish unified data standards and interfaces to solve interoperability.

Technology Layer: Develop transparent, explainable algorithms and ensure robust cybersecurity.

Application Layer: Pilot high-priority modules (e.g., risk warning) in controlled settings before scaling.

Accreditation Layer: Integrate AI as a 'co-pilot' in a 'AI preliminary screening + expert verification' human-in-the-loop model, which was rated as highly reasonable (Mean = 4.48 by experts).

Table 1
Comparison of Expert Priority vs. Hospital Implementation of AI Application Modules

Dimension	Expert Consensus (What AI should do)	Hospital Reality (What AI is doing)	Gap Identified	Governance Implication
Core AI Functions	Intelligent standard interpretation, document automation, multi-source analysis (Mean > 4.1/5)	Mainly quality indicator monitoring (31.3%), risk warning (25%)	Accreditation-level AI rarely used (< 7%)	Start from data layer, then progress upward
Primary Barriers	Need unified data interfaces, transparent algorithms, staged pilots	Data interoperability (27.5%), technical complexity (21.6%), poor explainability (19.6%)	Barriers match expert pathway	Validate phased implementation model
Top Ethical Risks	Privacy, opacity, bias, responsibility ambiguity	Privacy (3.60), accountability (3.58), data control (3.56)	High cross-stakeholder agreement	Ethical governance is prerequisite
Support Needs	Ethical principles, supervision, responsibility division	Data standards, security tech, training, policy guidance	Hospitals request expert-proposed governance	Framework is feasible and demanded
Implementation Logic	Data → Technology → Application → Accreditation	Stuck at data level	"AI accreditation intelligence gap"	Governance-led progression required

4. Discussion

This study empirically delineates the 'AI Accreditation Implementation Gap', demonstrating that the hurdle is not a lack of vision or willingness, but a series of structural and governance bottlenecks. The high degree of convergence between experts and hospitals on the nature of these barriers and risks provides a solid, collaborative foundation for a shared way forward.

Our findings emphasize that data interoperability is the non-negotiable foundation. Without standardized, high-quality data flows, advanced AI is untenable. This echoes global calls for investing in health data infrastructure as a prerequisite for digital health^[8]. Secondly, algorithmic transparency and explainability are prerequisites for trust in high-stakes accreditation contexts. The rejection of "black-box" models is consistent with the broader move towards responsible AI that demands auditability and understanding^[9].

Finally, ethical governance must be proactive, not reactive. The shared high concern over privacy, bias, and accountability underscores that governance frameworks must be co-designed and implemented in tandem with the technology itself^[10].

The proposed risk-governed, phased framework directly addresses these insights. Its sequential nature—starting with governance and data foundations—mitigates the risk of expensive, failed technology projects and builds institutional capacity progressively^[11]. The endorsed “human-in-the-loop” model for the accreditation layer ensures AI augments, rather than replaces, expert judgment, preserving human oversight for complex, contextual decisions^[12]. This approach aligns with and operationalizes recent WHO guidance on regulating AI for health, translating principles into a concrete pathway for the accreditation domain^[13].

Our framework’s emphasis on staged progression also helps manage the “AI paradox” in healthcare: the tension between rapid innovation and the imperative of safety^[14]. By embedding risk governance at each phase, it allows for incremental scaling of benefits while systematically containing risks.

4.1 Limitations and Future Research

This study has limitations. The hospital sample, while diverse, is from a single country, and regulatory environments may influence generalizability. The data are cross-sectional, capturing perceptions and status at one point in time. Future research should validate the framework through longitudinal pilot implementations in diverse health systems and measure its impact on accreditation efficiency, cost, and, ultimately, quality of care outcomes.

5. Conclusions

Bridging the gap between the expert vision for AI and hospital practice in accreditation is both necessary and achievable. The path forward is not merely technological but fundamentally organizational and governance-led. This study provides an empirically derived, risk-governed framework that prioritizes data foundations, algorithmic transparency, and ethical guardrails. By adopting this structured, phased approach, accreditation bodies, policymakers, and hospital leaders can collaboratively steer the responsible integration of AI. This will harness its power to enhance the objectivity, efficiency, and predictive capability of quality assessment systems, ultimately fostering a more robust, learning-driven, and safer global healthcare ecosystem.

Abbreviations

1.AI

Artificial Intelligence

2.WHO

World Health Organization

Declarations

Ethics approval and consent to participate

This study was conducted in full accordance with relevant regulations and internationally recognized guidelines for health services research. No human clinical experiments, tissue samples, or individually identifiable personal health data were involved in this study.

Per the ethical management rules of the Shenzhen Hospital Accreditation Research Center (SHARC), all questionnaire research projects should obtain ethical clearance from the institutional ethics committee before launching field investigation. The study was approved by the Ethics Committee of SHARC.

All invited experts and hospital completed written informed consent prior to participating in the survey. The consent document clarified that all institutional information provided would be kept confidential and only aggregated statistical results would be used for academic analysis.

All survey-related procedures were carried out in strict compliance with institutional ethical governance requirements and relevant research norms for health management studies.

Consent for publication

Not applicable. This manuscript does not contain any individual person's data in any form (e.g., individual details, images, or videos).

Availability of data and materials

The datasets generated and/or analysed during the current study are not publicly available due to containing sensitive institutional information and confidentiality agreements with participating hospitals. However, aggregated data supporting the findings of this study are available from the corresponding author, Li Xuan, upon reasonable request and with the permission of the Shenzhen Hospital Accreditation Research Center.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

LX and HHM conceived and designed the study, coordinated data collection, performed the statistical analysis, and drafted the manuscript. CCW contributed to the literature review and interpretation of

results. LXD and LZY supervised the methodological framework and critically revised the manuscript for important intellectual content. All authors read and approved the final manuscript.

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Figures

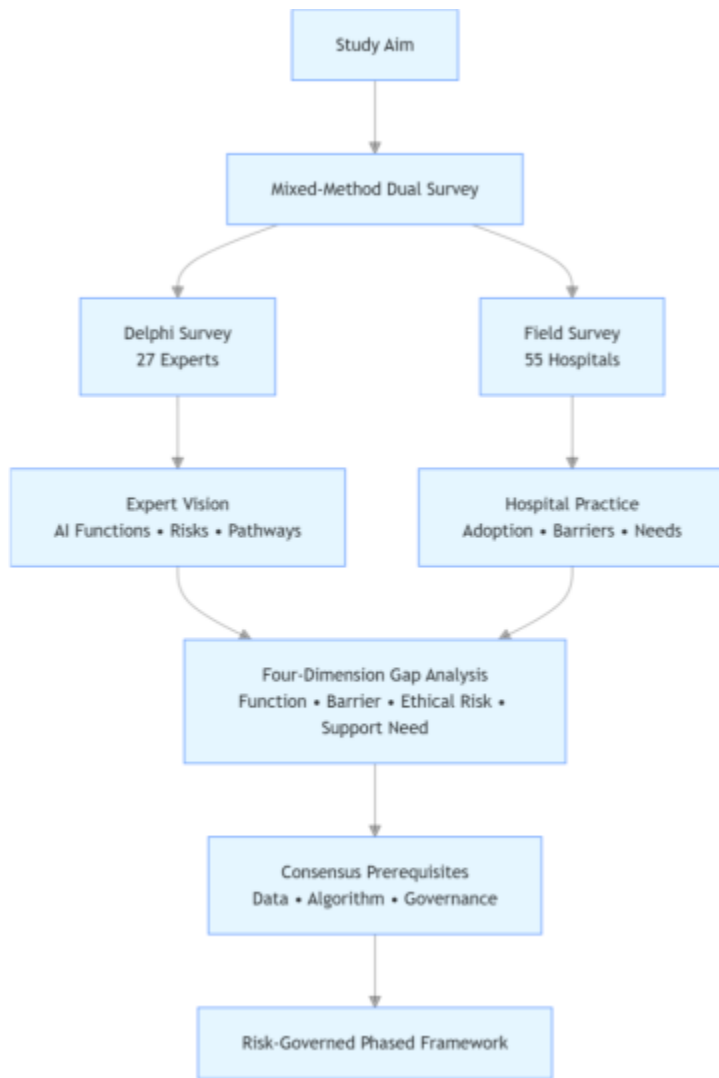


Figure 1

Research Design and Analytical Framework

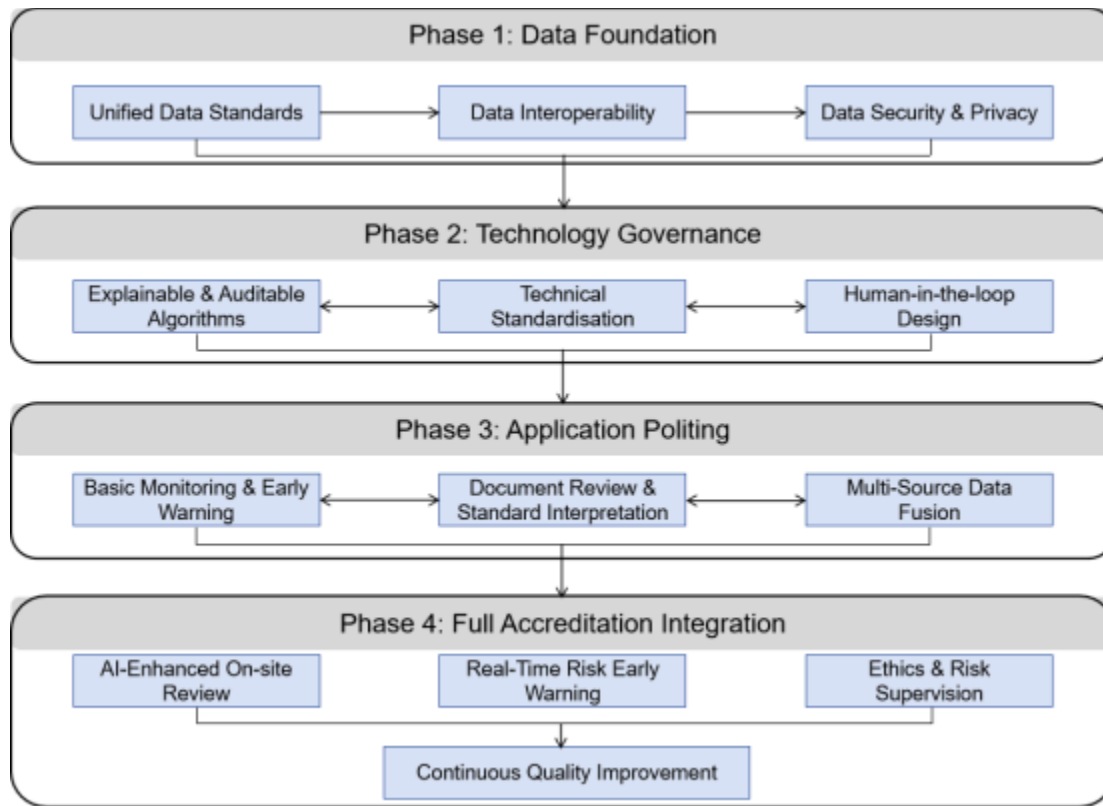


Figure 2

Risk-Governed Phased Implementation Framework for AI in Hospital Accreditation

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Questionnaire1DelphiExpertQuestionnaire.pdf](#)
- [Questionnaire2HospitalPractitionerQuestionnaire.pdf](#)