

Factors influencing the strengthening of nursing regulatory systems: A comparative study of Lao PDR and Mongolia

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Abstract: Access to high-quality healthcare requires a qualified health workforce supported by a robust regulatory framework, an overarching legal structure governing regulation of health professionals. Its effectiveness depends on how well its regulatory functions are carried out. Implementing these functions requires regulatory systems that provide organizational arrangements for each health profession. This study focuses on the nursing regulatory systems in Lao PDR and Mongolia to identify key factors influencing their strengthening and extract policy insights to inform efforts to strengthen nursing regulation in low- and middle-income countries. A qualitative research design was employed, integrating literature reviews and semi-structured interviews with 24 stakeholders from ministries of health, nursing associations, nursing education institutions, clinical nursing administrators, and development partners. The development stages of the nursing regulatory systems were analyzed using Walt and Gilson's Health Policy Analysis Model and the five progressive stages. While governance, capacity building, and health workforce information systems (HWIS) are recognized as important factors in health workforce regulation, this study demonstrates how they interact across stages of development. Three key factors were identified: *i*) Strengthening governance with nursing engagement in policymaking, *ii*) Capacity building of internal stakeholders through collaboration with external partners, and *iii*) Establishing interoperable HWIS for sustainable regulatory implementation. These factors operate in a cumulative and phased process, reflecting regulatory system maturity. The findings underscore the importance of tailoring regulatory strategies to the context—with early-stage countries focusing on governance and capacity building, and more mature systems advancing toward digital integration and institutional sustainability.

Keywords: nursing regulatory system, governance, capacity building, health workforce information system, Lao PDR, Mongolia

1. Introduction

One of the United Nations' Sustainable Development Goals (1) is to ensure access to high-quality healthcare, which requires that the health workforce has a robust regulatory framework. This framework provides the overarching legal, institutional, and policy structure at the national level to govern health professionals. It safeguards professional standards and patient safety and provides a foundation for achieving universal health coverage (2). Within this framework, regulatory functions are defined. These cover: *i*) laws and regulations, *ii*) school and program accreditation systems, *iii*) competency assessment, *iv*) registration and licensing systems, *v*) tools and data flow for registration and licensing,

vi) scopes of practice, *vii*) continuing professional development, and *viii*) professional misconduct and disciplinary powers (Supplementary Figure S1, <https://www.ghmopen.com/site/supplementaldata.html?ID=122>) (3). Effective implementation of these functions requires regulatory systems that provide organizational and institutional structures necessary for their implementation in each health profession, such as nurses, midwives, or physicians.

Among health professionals, nurses play a pivotal role in healthcare delivery, particularly in regions with physician shortages (4). Effective regulatory systems for nursing professionals are crucial to ensure their competence and professional standards, thereby enabling safe and effective care and ultimately contributing to

improved healthcare quality. In recent years, many low- and middle-income countries (LMICs), including the Association of Southeast Asian Nations (ASEAN) member-states, have sought to strengthen their regulatory systems and the functions they encompass. However, progress has varied significantly, influenced by historical and political contexts, economic conditions, international support, and the involvement of professional associations (3,5). Despite growing interest in health professional regulations, little is known about the development of nursing regulatory systems in non-English-speaking countries (6). This research gap highlights the need to explore how these systems evolve and what factors enable their strengthening.

This study, therefore, focuses on nursing regulatory systems in Lao PDR and Mongolia. It aims to identify key factors that strengthen these nursing regulatory systems, compare their developmental stages, and extract policy insights that may inform regional and international efforts to strengthen nursing regulation in LMICs.

2. Participants and Methods

This study employed a qualitative research design, integrating literature reviews and semi-structured interviews. Lao PDR and Mongolia were selected for comparative analysis based on their differing stages of regulatory development. Researchers' prior engagement in supporting regulatory improvements in both countries also enabled access to key documents and stakeholders for in-depth inquiry.

2.1. Interview guide development

The semi-structured interview guide was developed through a review of policy documents, guidelines, ministerial decrees, academic papers, and reports of Lao PDR and Mongolia published between 1998 and 2022. The adapted regulatory function framework—comprising eight regulatory functions and five developmental stages (3) (Supplementary Table S1, <https://www.ghmopen.com/site/supplementaldata.html?ID=122>)—was first applied to categorize the contents of document review and to objectively assess the progress of each regulatory function (Supplementary Figure S2, <https://www.ghmopen.com/site/supplementaldata.html?ID=122>). Based on the progress in each country, the interview guide was designed by adopting Walt and Gilson's Health Policy Analysis Model (WG model) (7), which encompasses four key dimensions: *i*) Context, referring to the political, economic, social, and technological factors shaping policy decisions; *ii*) Content, outlining the policy's objectives, strategies, and implementation approaches; *iii*) Process, describing the sequence and mechanisms of policy formulation; and *iv*) Actors, representing key stakeholders involved in policy development and implementation.

2.2. Data collection through semi-structured interviews

Semi-structured interviews were conducted with key stakeholders—11 in Lao PDR and 13 in Mongolia—from each country's Ministry of Health (MoH), nursing associations, nursing education institutions, clinical nursing administrators, and development partners (DPs). Participants were selected using purposive sampling based on their experience and roles relevant to nursing regulatory systems, ensuring comprehensive coverage across diverse stakeholder groups. Maximum variation sampling was employed to capture diverse perspectives across stakeholder groups. During data collection, themes and categories were continuously reviewed, and thematic saturation was considered achieved when no new themes emerged in subsequent interviews. Prior to data collection, ethical approvals were obtained from the National Center for Global Health and Medicine in Japan (NCGM-S-004350-01) and the MoH in Lao PDR (No. 091/NECHR). In Mongolia, approval from the MoH was obtained; however, formal written documentation with an approval number was not provided. Fieldwork was conducted in March 2023 in Lao PDR and in July 2023 in Mongolia. Written informed consent, including permission for audio-recording, was obtained from all participants following a full explanation of the study's objectives, procedures, voluntary participation, and confidentiality measures. Two Japanese researchers and one locally based researcher conducted face-to-face interviews in Lao PDR and Mongolia, using English and Japanese, respectively. Consecutive interpretation (English–Lao and Japanese–Mongolian) was provided by interpreters familiar with local health systems and terminology.

2.3. Data analysis

Data analysis was conducted using MAXQDA24. Two researchers who conducted the interviews jointly coded to ensure credibility and dependability, while coding interpretations were reviewed by other researchers to facilitate confirmability. Any disagreements were resolved through discussion. The interview data were initially coded using a deductive framework according to eight regulatory functions, while governance was identified inductively as an additional cross-cutting category during the analysis. However, during the coding process, several structural issues—such as physician-led policymaking and unclear role delineation between regulatory bodies—emerged repeatedly. These complexities extended beyond the scope of "law and regulation", which primarily refers to formal legal instruments. Therefore, the concept of "governance" was adopted to better capture how regulatory bodies are organized and coordinated in practice, including how they are influenced by professional dynamics. As "governance" emerged as a crucial cross-cutting factor,

it was added as an independent category, expanding the framework to include nine functions, enabling a more comprehensive analysis of their implementation in practice. This refinement aligns with international guidance that emphasizes the importance of governance in ensuring transparency, fairness, and accountability in regulatory frameworks (2). Following this categorization, facilitating factors and challenges were identified for each regulatory function.

To analyze the development of nursing regulatory systems in Lao PDR and Mongolia, the coded data were further synthesized into three higher-level categories: Challenges, Facilitating factors, and Strategies. This classification was based on the structural model of Matsuoka *et al.* (5), originally conceptualized by McCarthy *et al.* (8), applied by Gross *et al.* (9), and later adapted for analysis by Fujita *et al.* (3). The categories were then mapped onto two analytical dimensions. The first consisted of the five progressive stages of regulation, used as an analytical tool: Stage 0, Limited awareness of the importance of regulation in place; Stage 1, Common consensus and development of regulatory functions; Stage 2, Implementation of regulations; Stage 3, Monitoring and evaluation of the implementation; and Stage 4, Sustained comprehensive regulatory system. The second dimension consisted of the four components of the WG model: Context, Content, Process, and Actors. Using this matrix (Figure 1 and Figure 2), we examined these relationships, and provided a structured overview of nursing regulatory system development in both countries. The figures were finalized through iterative discussions within the research group, including members with contextual knowledge of each country,

enhancing credibility and confirmability.

3. Results

3.1. Facilitating factors and challenges in regulatory functions

Key findings of facilitating factors and challenges in the nine regulatory functions are presented narratively and supported by quotes from interviews.

3.2. Governance

In Lao PDR, DPs have supported governance development and contributed to capacity building, particularly by strengthening the role and responsibility of the Health Professional Council (HPC), which operates under the MoH. The HPC oversees multiple professional boards, including those for medicine, dentistry, nursing, and midwifery, with each professional board responsible for technical matters within its respective regulatory functions. However, certain aspects of the roles and responsibilities between the HPC and relevant departments within the MoH remain unclear, limiting coordination and decision-making authority.

"This is the biggest challenge we are facing—the HPC's responsibilities are unclear, and we are constrained by limited authority, despite the fact that the endeavor, the tasks, and the functions of the HPC are extensive and critically important." (Interviewee 6, Lao PDR)

In Mongolia, the absence of nursing officials within the MoH has led to physician-led decision-making

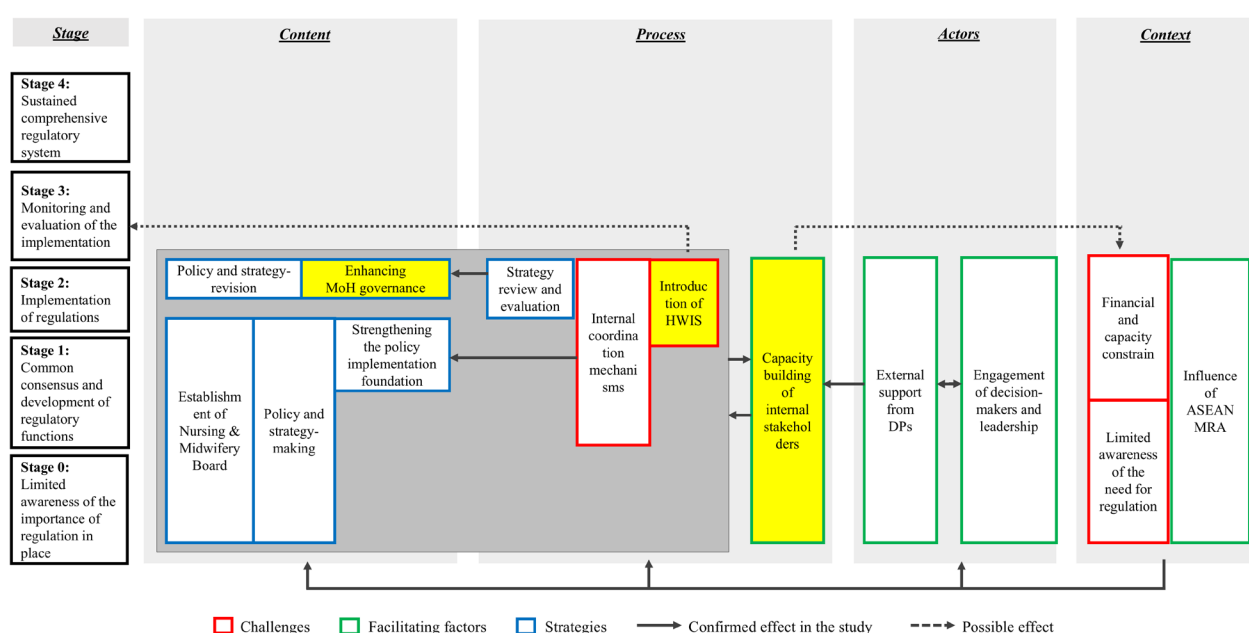


Figure 1. Nursing regulatory system development in Lao PDR: Challenges, facilitating factors, and strategies across stages (2000–2023).

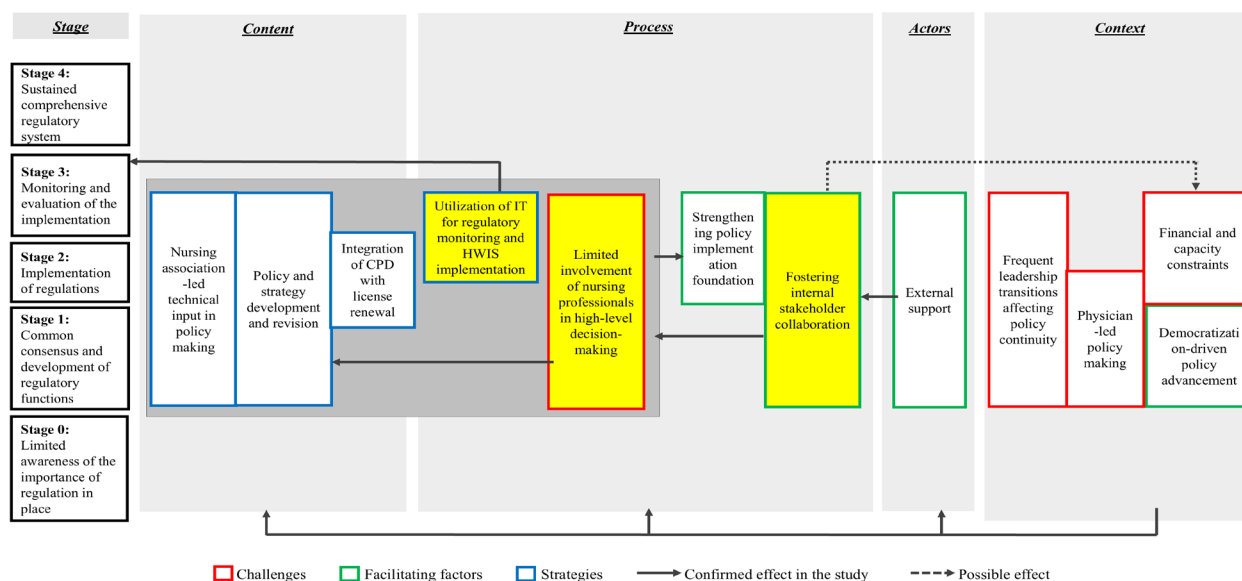


Figure 2. Nursing regulatory system development in Mongolia: Challenges, facilitating factors, and strategies across stages (2000–2023).

regarding nursing professional regulation. The Nursing Association, operating independently of the MoH, provides technical input and participates in expert working groups, although its involvement in formal decision-making processes remains limited.

"There are only two officers in the MoH responsible for all health workforce matters. In the past, we had dedicated officers for each area, but now everything is combined, and it's difficult to address each profession properly." (Interviewee 4, Mongolia)

"In the MoH, the members of Nursing Associations are included in expert working groups, such as the ethics committee, new nursing programs, and guidance are being developed. However, currently, there are no nurses in the MoH, so decision-making is physician-led." (Interviewees 5 and 6, Mongolia)

3.3. Law and regulation

ASEAN's influence on Lao PDR accelerated the development of licensing strategies and led to the establishment of the Nursing and Midwifery Board within the HPC. These developments contributed to building the legal and institutional foundation for the nursing regulatory system. However, challenges were observed, including inconsistencies in legal revisions and the limited capacity of board members, which constrained the implementation of regulatory activities.

"There were overlapping parts between existing laws, which became a challenge during the legal revision process. We identified which were conflicting, aligned, or overlapping in order to support the development of a more coherent legal framework." (Interviewee 3, Lao PDR)

"The board members' duties are already full or overloaded, especially those who are working in hospitals. It is also a challenge for us to encourage more participation in the board activities." (Interviewee 4, Lao PDR)

In Mongolia, democratization drove the adoption of international policies and legal reforms with support from DPs, facilitating health law amendments. However, nursing expertise remains underrepresented in policymaking and in the effective implementation of regulatory functions.

"In the early 1990s, after Mongolia's democratization, I worked in the MoH, where we began adopting international health policies, including those from the International Council of Nurses." (Interviewee 9, Mongolia)

"In the MoH, only one nurse was in a policymaking position and eventually left, leaving no nursing officer there. This shows how underrepresented nursing is in policymaking in Mongolia." (Interviewee 3, Mongolia)

3.4. School/program accreditation

In Lao PDR, the MoH introduced a national education accreditation system in 2018, influenced by regional training and study visits facilitated through international cooperation. This enabled initial implementation of a nursing education accreditation system by the MoH departments; however, inconsistent accreditation standards and financial constraints have limited the system's regular evaluation and sustained application.

"In 2018, the MoH introduced a national accreditation system with standardized criteria, and all nursing schools

were encouraged to apply it to improve education quality. Since then, schools have been trying to follow the standard, but implementation is not consistent, and there are limitations in the budget for administration and for teaching and learning activities." (Interviewee 5, Lao PDR)

In Mongolia, the adoption of a credit-based educational system inspired by Western models has contributed to improved educational quality and the international accreditation of nursing programs. However, financial constraints continue to hinder the consistent implementation of accreditation standards.

"After democratization and improved diplomatic relations in the 1990s, we participated in a DP-funded training in the US on improving training curricula. Through this, we understood credit-based training and agreed on its introduction. Discussions and debates were held at multiple levels to implement it." (Interviewee 8, Mongolia)

"Our nursing program is accredited internationally. However, we face challenges like budget limitations, and the preparation process for accreditation can take a long time." (Interviewee 3, Mongolia)

3.5. Competency assessment (national examination)

In Lao PDR, the national examination system was introduced by the HPC, with particularly strong commitment from the nursing and midwifery board and support from DPs. This initiative has contributed to ensuring standardized measures of nursing graduates' competencies and to the capacity development of nursing educators, including those at clinical sites. However, maintaining the quality of the examination and ensuring employment opportunities for successful candidates remain ongoing challenges.

"The national examination has benefited not only candidates who participated in the exam, but also management teams from the MoH, schools, and hospitals. Through this process, we also gained experience in management principles and in developing multiple-choice questions." (Interviewee 1, Lao PDR)

"Many people still think, 'If I pass the national examination, can I get a government position?' This question is always raised. We try hard to explain that after getting the license, they have to find employment by themselves." (Interviewee 4, Lao PDR)

In Mongolia, legal amendments, international training programs, and leadership from nursing associations have facilitated the transition to the digital national examination system. Despite these advancements, concerns remain about maintaining appropriate difficulty levels to ensure fairness and competency validation.

"The exam question sets are created by a group including professors from nursing schools, representatives from the nursing association, nursing managers from major hospitals, and members from the MoH."

(Interviewees 5 and 6, Mongolia)

"Since the new ministerial order was approved in 2015, we've moved to online exams and stopped accepting paper applications. We need to regulate online-based exams, and there are challenges with improving the management system during online exams." (Interviewees 1 and 2, Mongolia)

3.6. Registration and licensing

In Lao PDR, the HPC, in collaboration with other ministries and DPs, established a formal licensing system aimed at ensuring workforce quality. However, challenges persist; limited awareness, particularly in rural areas, and staff and budget shortages constrain the system operation and outreach capacity.

"The development of the licensing system started with MoH's initiative, supported by DPs, with contributions from the government. Key participants joined ASEAN meetings and brought back ideas for establishing a registration and licensing system. DPs have provided continuous support from the beginning." (Interviewee 1, Lao PDR)

"The main challenge lies in coordination between central and provincial levels, especially in maintaining contact with recent graduates. In some cases, they can't be reached because they remain in remote areas. Only four staff handle all tasks, and the workload is excessive." (Interviewees 7 and 8, Lao PDR)

In Mongolia, a nursing licensing system was introduced post-democratization, incorporating license renewal requirements linked to continuing professional development (CPD) to maintain professional standards. However, the lack of an e-application system complicates the renewal process in remote areas, and several CPD requirements, such as courses on the nursing process, are impractical to implement in actual nursing practice because of heavy workloads.

"After the system went digital, nurses working in rural areas often can't access the internet easily, causing delays in application. Right now, we're still using both paper and electronic systems, but the plan is to eventually go 100% digital. It will take some time." (Interviewees 1 and 2, Mongolia)

"Many CPD programs repeatedly focus on topics like the nursing process, but in actual practice, it is difficult to apply. Due to high workloads—such as caring for 40 to 60 patients per shift—nurses often find it challenging to implement these concepts in their daily routines." (Interviewee 3, Mongolia)

3.7. Tools and data flow of registration and licensing

In Lao PDR, several MoH departments and the HPC have discussed developing a Health Workforce Information System (HWIS), with support from DPs. However, fragmented workforce management information systems

operated by multiple ministries, including the MoH, limited interoperability, and the lack of available data on private sector workers continue to hinder progress.

"We supported the discussions on HWIS, but things are still fragmented. Different departments are using different tools, and there's no unified platform in place yet." (Interviewee 3, Lao PDR)

"Linking databases is challenging because we lack data from the private sector and budget for IT development. The system is managed by the other Ministry, and without additional resources, we can't record full license data, especially for private sector workers." (Interviewee 2, Lao PDR)

Mongolia facilitates the development of the HWIS through legal revisions and collaboration with private companies. The database has been actively used for workforce tracking, research, and reporting, and is linked with educational institutions, the national registration center, and social insurance systems. These linkages enable automated registration, identity verification, and employment tracking. Nevertheless, technical and financial constraints and misalignment between system design and practical needs remain concerns.

"The Ministerial Order approved in 2018 regulating the creation of an internet-based program, data entry, updates, and use of the system. The system development began in 2018 in collaboration with a private company. However, it has required multiple updates and adjustments to improve usability and meet practical needs." (Interviewee 7, Mongolia)

"The database is nationwide and works with local agencies. It's linked with medical education institutions, the national registration center, and social insurance departments. This linkage allows automatic graduate registration, verification of information by ID number, and easy tracking of employment through social insurance data." (Interviewees 1 and 2, Mongolia)

3.8. Scope of practice

In Lao PDR, the scope of practice (SOP) has been defined and implemented; however, because it was originally designed for hospital settings, its application to the primary health care level is limited by differences in available resources and target populations. Revisions are also needed to ensure better alignment with current clinical practices.

"The SOP shows us what outcomes to expect and what quality indicators to follow for each nursing task. We also use it to teach clinical teachers and students, especially through the model ward approach. But in rural areas, it's still hard to put them into practice because of limited resources." (Interviewees 9, 10, and 11, Lao PDR)

In Mongolia, national healthcare legislation was amended in 2016 to formally recognize independent nursing services, and a model job description for

nurses has since been issued through ministerial orders, serving the role of the SOP. DPs have also supported advancement of nursing practice through the creation of core competencies, clinical ladders, and curriculum improvements. However, a clearly defined SOP has not been developed, and a common understanding of how to apply nursing job descriptions remains insufficient, making it difficult to operationalize job descriptions that reflect nurses' specialties and experience levels.

"I worked very hard to have 'independent nursing services' included as a provision in the Health Law, the Law on Health Service." (Interviewee 9, Mongolia)

"When I became the head nurse in 2016, I created detailed job descriptions for nurses based on their experience levels, which I thought was in line with a Ministerial Order. But later, a new hospital director said it didn't comply with national regulations. So, we had to go back to the old system where all nurses had the same job description, regardless of experience." (Interviewee 13, Mongolia)

3.9. CPD

In Lao PDR, the CPD system has been developed through collaboration among MoH departments, the HPC, and the support of DPs. However, challenges persist, including unclear governance structures, insufficient capacity for implementation, and the development of a clearly defined and widely recognized system for tracking participation and linking it to license renewal.

"We are preparing guidelines for the CPD system, but the roles of each party are not yet clearly identified. MoH is mainly responsible for producing and upgrading health personnel skills, while HPC focuses on continuing professional development and requires score records for license extension." (Interviewee 1, Lao PDR)

"Each hospital and school organizes their own seminars and trainings, but there's no clear system for recording participation or linking it to licensing renewal. Nurses don't fully understand what counts or how it helps them maintain their license." (Interviewee 5, Lao PDR)

In Mongolia, license renewal requirements were introduced in the early 2000s and later served as the foundation for developing the current CPD system. This system has been strengthened through collaboration among ministries, the development of a competency-based CPD curriculum with support from DPs, and the introduction of online training initiatives. However, inconsistencies among training providers and limited internet access in rural areas continue to hinder broader participation.

"When we started CPD, there were different institutions, each providing CPD training. There wasn't a unified program, and the coordination between them was weak. Therefore, now, the Health Development Center

is responsible for CPD, and we are working with the DPs to develop competency-based curricula for nurses." (Interviewee 8, Mongolia)

3.10. Professional misconduct and disciplinary powers

The nursing and midwifery board in Lao PDR has established a code of ethics; however, discussions within the HPC on how to operationalize it have only just begun. Meanwhile, a system for responding to patient complaints has been developed at the hospital level; however, a national nursing regulatory system to integrate such mechanisms has not yet been established.

"The code of ethics for professional conduct is weak, and it's unclear whether cases are about ethics or service issues. We need clearer rules and stronger regulations to handle complaints, suspend or cancel licenses, and manage cases." (Interviewee 1, Lao PDR)

"We assign a misconduct monitor, like the hospital director or ward head. If a complaint arises, the person is asked for clarification and corrective action. Repeated issues are escalated, and the person may be moved to another division." (Interviewees 9, 10, and 11, Lao PDR)

In Mongolia, the development of the Nursing Ethics Code with the support of DPs has contributed to strengthening professional accountability. Ethics training programs have also been introduced. However, challenges remain in ensuring ethical nursing practice, particularly due to limited legal literacy among nurses and insufficient measures for protecting patients in cases of misconduct or errors.

"In 2022, with DPs support, we created a Nursing Ethics Regulation and developed training on five ethical principles and patient care, provided as credit-based training. We're working with politicians, advisors, and legal NGOs to improve legal frameworks and plan staged training on nursing law in rural areas." (Interviewee 10, Mongolia)

"Nurses in Mongolia don't have enough knowledge to handle medical errors or protect themselves and patients when mistakes happen. I always tell my students and nurses, 'Without legal knowledge, you can't protect yourself or your patients in critical situations'" (Interviewee 3, Mongolia)

3.11. Developmental stages of the nursing regulatory systems

Figures 1 and 2 present the Challenges, Facilitating factors, and Strategies identified across the nine regulatory functions, synthesized into higher-level categories. They also provide an integrated view of the development of nursing regulatory systems in Lao PDR and Mongolia. The figures also show the interrelated context, actors, processes, and content and depict the progression from 2000 to 2023.

Lao PDR's nursing regulatory system has progressed

from Stage 0 through Stage 1 and 2 and is now advancing toward Stage 3 (Figure 1). Governance development has centered on the "Establishment of the Nursing and Midwifery Board" under the HPC. This was accompanied by efforts toward "Strengthening of the policy implementation foundation". However, challenges remain, particularly with respect to "Internal coordination mechanisms", as well as broader issues such as initially "Limited awareness of the need for regulation" and ongoing "Financial and capacity constraints", which are expected to be gradually alleviated through strengthened "Capacity building of internal stakeholders".

Among the actors, "External support from DPs" has played a pivotal role by catalyzing the "Engagement of decision-makers and leadership", as well as supporting "Capacity building of internal stakeholders". As internal capacity expanded, it contributed to iterative cycles of content formulation, such as "Policy and strategy making" and to implementation processes. "Strategy reviews and evaluations" have also contributed to "Enhancing MoH governance" and "Policy and Strategy revision".

Despite this progress, the "Introduction of HWIS" remains a key challenge. Discussions have begun among the MoH departments and the HPC, but fragmented systems and limited interoperability hinder progress. Moving further into Stage 3 will require strengthening the HWIS, where monitoring and evaluation functions may be implemented through the HWIS.

Additionally, the influence of the "ASEAN Mutual Recognition Agreements (MRA)" (10) has served as a facilitating contextual factor, shaping the development of actors, content, and processes across the system.

Mongolia's nursing regulatory system has progressed through Stage 1 and 2 to reach Stage 3 and is now advancing toward Stage 4 (Figure 2). Governance remains a central challenge. In particular, the "Limited involvement of nursing professionals in high-level decision-making" continues to represent a critical barrier, compounded by "Physician-led policy making" and "Frequent leadership transitions affecting policy continuity".

Simultaneously, "External support" has played a crucial role in "Fostering internal stakeholder collaboration". As internal capacity has grown, iterative cycles of policy formulation and implementation were enabled, as evidenced by "Policy and strategy development and revision", "Integration of CPD with license renewal", and "Nursing association-led technical input in policymaking".

"Utilization of IT for regulatory monitoring and HWIS implementation" is notable for its influence on monitoring and evaluation. While "Financial and capacity constraints" continue to hinder the sustainability of regulatory functions, the "Strengthening of the policy implementation foundation" and the "Fostering of internal stakeholder collaboration" are expected to

gradually mitigate some of these constraints.

Within the broader context, "Democratization-driven policy advancement" has shaped the overall development path of Mongolia's nursing regulatory system.

4. Discussion

This study's analysis of facilitators and challenges provided considerable insights into the dynamics of nursing regulatory systems. Across both Lao PDR and Mongolia, three key influencing factors were identified: *i*) Strengthening governance with nursing engagement in policymaking, *ii*) Capacity building of internal stakeholders through collaboration with external partners, and *iii*) Establishing an interoperable HWIS for sustainable regulatory implementation. These factors are interrelated, with each reinforcing the others to form a cumulative and logical process. Taken together, they illustrate how nursing regulatory functions can be progressively strengthened in resource-limited settings and contribute to the maturity and resilience of nursing regulatory systems. A comparative analysis of nursing regulatory system development in both countries is presented in Table 1.

4.1. Strengthening governance with nursing engagement in policymaking

A comprehensive literature review highlights variation in the legal entities responsible for registering and regulating health practitioners across countries (6). In Mongolia, a government-led regulatory body collaborates with professional associations to incorporate technical expertise. However, the absence of a government chief nursing officer limits the integration

of nursing perspectives into key regulatory functions, such as defining the SOP and developing the code of ethics. The findings are consistent with a previous report that identified the lack of a chief nursing officer and a dedicated regulatory council as major barriers to stronger nursing leadership in Mongolia (11).

Similar governance challenges are reported in Kenya and Uganda, where decentralized regulation structures, limited nursing representation, and physician-led policymaking have constrained the development of inclusive regulatory systems (12). In Lao PDR, a multi-professional-led approach has been increasingly strengthened in recent years, partly in response to the requirements of the ASEAN MRA. The nursing board operates under a single health professional council, overseen by the government. However, clearly delineating responsibilities between the council and relevant government departments remains a challenge. This issue is compounded when members of regulatory bodies also serve as service providers, because their limited time and resources can compromise regulatory quality and increase the risk of dysfunction (13). Therefore, establishing a mechanism that facilitates effective interplay between formally authorized bodies and the technical expertise of nursing professionals is essential for achieving sustainable and effective regulation (14).

While both countries face challenges in integrating nursing expertise into governance structures, the nature of these challenges reflects distinct historical trajectories: in Mongolia, despite the political opening created by democratization in the early 1990s, decision-making within the MoH has remained physician-dominated in the absence of dedicated nursing officers. In Lao PDR, the institutionalization of a

Table 1. Comparative analysis of nursing regulatory system development between Lao PDR and Mongolia

	Lao PDR	Mongolia	Comparative Analysis
Strengthening governance with nursing engagement in policymaking	Multi-professional-led approach; Nursing and Midwifery Board established under the HPC, yet unclear role delineation between regulatory bodies remains a challenge	Government-led regulatory body collaborates with nursing association; absence of government chief nursing officer limits integration of nursing perspectives	Both face challenges in integrating nursing expertise into governance structures; differ in historical trajectories
Capacity building of internal stakeholders through collaboration with external partners	External driven process; ASEAN MRA served as critical external driver accelerating domestic engagement and direct capacity building of the Nursing and Midwifery board by development partners	Internally driven maturation; ownership fostered through the proactive leadership of the nursing association in providing technical and regulatory input, in collaboration with external partners	External support catalyzed engagement of decision-makers and leadership in both, creating conditions for domestic ownership
Establishing an interoperable HWIS for regulatory implementation	Fragmented systems reflect earlier stage of regulatory development; sustainable regulatory foundation needed before effective HWIS	Demonstrates how HWIS enhances regulatory governance once foundational systems established; advanced HWIS enabled by integrated CPD and licensing systems	HWIS development reflects broader differences in regulatory maturity

multi-professional council structure, driven in part by ASEAN MRA obligations, has established the Nursing and Midwifery Board under the HPC as a body of technical expertise; however, the delineation of responsibilities among regulatory bodies remains unclear. These contrasting trajectories suggest that context-sensitive strategies—addressing both political will and institutional clarity—are needed to strengthen nursing engagement in governance processes.

4.2. Capacity building of internal stakeholders through collaboration with external partners

The development of regulatory systems often begins with the capacity building of internal stakeholders supported by external partners. However, effective initiation and long-term sustainability require collaboration and coordination among both internal and external stakeholders. For example, in Cambodia, coordinated efforts between domestic actors and development partners strengthened internal capacity and collectively influenced health policy formulation (5). A similar pattern has been observed in East Africa, where capacity-building programs for nursing and midwifery associations have enhanced leadership and increased engagement in regulatory processes (15).

In Lao PDR and Mongolia, early external support has likewise evolved into stronger domestic ownership, fostered by collaborative processes. However, the nature of this engagement differed between the two countries. In Lao PDR, the ASEAN MRA served as a critical external driver, accelerating domestic engagement and capacity development through regional obligations while development partners contributed to strengthening the capacity of the Nursing and Midwifery board. In contrast, Mongolia's progress reflected a more internally driven process, shaped by the nursing association's proactive leadership in providing technical input to regulatory processes—a difference that may reflect variations in regional integration pressures and the relative maturity of professional organizations in each country. In both countries, external support not only built technical capacity but also catalyzed the engagement of decision-makers and leadership, creating conditions for domestic ownership to take hold. This trajectory illustrates a capacity-building cycle in which institutional development is initially supported through collaboration and subsequently sustained by empowered internal actors. Rather than relying solely on externally driven models, future efforts in LMICs should prioritize strengthening internal capacity and developing collaborative governance mechanisms to ensure sustainable and effective regulation (16). Furthermore, stewardship capacity follows a pyramid model, in which individual, organizational, institutional, and system-level capacities reinforce one another to support effective governance (17).

4.3. Establishing an interoperable HWIS for sustainable regulatory implementation

In this study, a HWIS refers to a system that manages registration and licensing information, including national examinations, as well as CPD and workforce deployment. These functions are essential to implementing nursing regulatory systems and ensuring accountability.

While both nations recognize a robust HWIS as essential for sustainable regulatory implementation, the findings reveal marked disparities in HWIS development between Lao PDR and Mongolia, reflecting broader differences in regulatory maturity. This mirrors a common challenge in LMICs: a fragmented HWIS in which separate, non-integrated platforms are used for different healthcare functions (18). Mongolia demonstrates how a HWIS can enhance regulatory governance once foundational systems are established, while Lao PDR needs to first develop a more sustainable regulatory system to enable effective interoperability and use of the HWIS. This contrast suggests that HWIS development is not merely a technical challenge but is contingent on the broader maturity of the regulatory system: Mongolia's more advanced HWIS has been enabled by an established regulatory function, including integrated CPD and licensing systems, whereas Lao PDR's fragmented systems reflect the earlier stage of its overall regulatory development.

Effective interoperability requires more than technical infrastructure. It depends on regulatory maturity, cross-institutional coordination, and sufficient human resource capacity. Recent *State of the World's Nursing* reports emphasize that, despite improvements in data reporting, most member states still do not consistently report key health labor market indicators, such as inflows, outflows, and vacancies (19). As regulatory systems mature, HWISs play a transformative role in managing health workforce information and guiding evidence-based policymaking (20). A robust HWIS is therefore foundational to workforce governance, enabling monitoring, planning, and accountability in health system strengthening (21).

While governance, capacity building, and HWIS have each been recognized as important factors in health workforce regulation, this study demonstrates how these factors interact dynamically and cumulatively across different stages of nursing regulatory development. By comparing Mongolia, where regulatory development is more advanced, with Lao PDR, which remains at an earlier stage, this study identifies stage-specific challenges and facilitating factors, as well as mechanisms through which more advanced stages may inform regulatory development in earlier-stage countries. This comparative and stage-based approach provides a practical framework for policymakers and external partners seeking to strengthen nursing regulatory systems in LMICs.

5. Limitations

The authors of this study were involved in developing nursing regulations in Lao PDR and Mongolia, which may have introduced bias in data collection and interpretation, particularly in how interview questions were framed and how findings were interpreted. To mitigate this, joint coding by multiple researchers was employed, and coding interpretations were reviewed to ensure credibility and dependability. In addition, research collaborators from Mongolia and Lao PDR served as critical friends, providing independent review of interpretation of findings. Despite the limitation, the strength of this study is that it allowed a deeper understanding of the background of policy decisions and perspectives of those involved, as well as a more detailed analysis.

6. Conclusions

This study identified three key factors that influence strengthening of nursing regulatory systems in LMICs: *i)* Strengthening governance with nursing engagement in policymaking, *ii)* Capacity building of internal stakeholders through collaboration with external partners, and *iii)* Establishing an interoperable HWIS for sustainable regulatory implementation. These factors interact in a cumulative and phased process, reflecting each country's stage of regulatory system development. The findings underscore the importance of tailoring regulatory strategies to the context—with early-stage countries focusing on governance and capacity building, and more mature systems advancing toward digital integration and institutional sustainability. These insights offer a practical roadmap for policymakers and external partners to strengthen resilient and responsive nursing regulatory systems in LMICs.

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