SUMMARY OF PRE-CONFERENCE SESSION BUILDING REGIONAL CAPACITY IN INFECTIOUS DISEASE MODELLING: SHARED INSIGHTS, CHALLENGES, OPPORTUNITIES

5 NOVEMBER 2024, 09:00 AM – 12:30 PM AT MILLENIUM HILTON, BANGKOK, THAILAND

PREPARED BY: HEALTH INTERVENTION AND TECHNOLOGY ASSESSMENT PROGRAM (HITAP) FOUNDATION

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Acknowledgements

This report has been prepared by Lapad Pongcharoenyong, Natcha Kongkam, and Panchanok Muenkaew, and reviewed by Saudamini Dabak from the Health Intervention and Technology Assessment Program (HITAP) Foundation. We thank Manit Sittimart and Saranyu Laemlak for their inputs and support throughout the development of this session. We would like to also extend our appreciation to all speakers, participants, and facilitators for their valuable insightful contributions, which enriched the discussions and outcomes.

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Abbreviation

ASEAN	Association of Southeast Asian Nations
BMGF	Bill & Melinda Gates Foundation
CEPI	Coalition for Epidemic Preparedness Innovations
COVID-19	Coronavirus disease 2019
ECR	Early Career Researcher
GS LEARN	Global South Leaders in Epidemic Analytics and Response Network
HITAP	Health and Intervention Technology Assessment Program
HIV	Human immunodeficiency virus
IDM	Infectious Disease Modelling
MIDSEA	Modelling Infectious Diseases in Southeast Asia
NGOs	Non-governmental organisations
RSV	Respiratory syncytial virus

Session Overview and Key Discussion Highlights

About the session

The pre-conference session on "Building Regional Capacity in Infectious Disease Modelling: Shared Insights, Challenges, and Opportunities" was held on 5 November 2024, at Millenium Hilton Bangkok, Thailand, alongside the Infectious Disease Modelling (IDM) Conference 2024. The aims of this session were to 1) explore and understand the landscape of infectious disease modelling in Southeast Asia in terms of current practices, capacity, available resources, and challenges; 2) identify opportunities for multilateral collaboration within key areas where regional strategies and capacity building in infectious disease modelling can be strengthened; 3) share knowledge and experiences among participants; and 4) understand regional needs for strengthening capacity and developing leaders in modelling for regional and global policy.

The session included an overview of the Global South Leaders in Epidemic Analytics and Response Network (GS LEARN) initiative, followed by an introduction of the Modelling Infectious Diseases in Southeast Asia (MIDSEA) network. A presentation was then made on a study on the situation analysis of infectious disease modelling in Thailand. In the second half of the session, participants engaged in a World Café discussion on key questions related to challenges and capacity building for infectious disease modelling in the region. This session convened 17 participants and speakers from 10 institutions across different regions.

This report is a summary of the proceedings of the session, with the agenda and list of participants in the Appendix.

Global South (GS) LEARN Initiative

Dr. Christinah Mukandavire from Coalition for Epidemic Preparedness Innovation (CEPI) began the session by introducing the GS LEARN initiative. She outlined its goals and objectives, which are to develop leaders in epidemic analytics and response in the Global South by strengthening and leveraging their technical capacity in infectious disease modelling and enhancing interdisciplinary collaboration within and across regions through partnerships.

Figure 1 *Dr. Christinah Mukandavire introduced the GS LEARN initiative.*

A brief overview of the network operational model was presented, including the roles of different key players within the network (Figure 2). She also stated the expected impacts and examples of success metrics, as part of the strategic planning and future direction. She also highlighted the CEPI and BMGF launched a call for proposals in September 2024 to identify implementing partners for the GS LEARN initiative. This call closes on 15 January 2025.

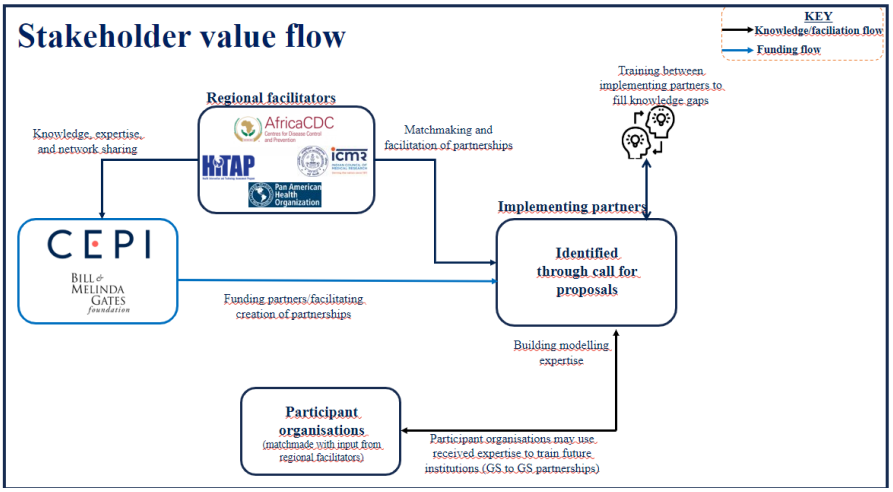

Figure 2 *Structure and key roles in the network*
(source: presentation by Dr. Christinah Mukandavire)

During the open discussion, Dr. Christinah Mukandavire provided further clarification on how the GS LEARN was initiated. A scoping review was conducted to assess gaps in infectious disease modelling capacity. The review underscored the necessity of cultivating Global South leaders to advise governments during outbreaks and the importance of fostering sustainable partnerships.

The discussion also touched on key considerations for network activities. A participant emphasised the importance of early engagement with policymakers to facilitate collaborations during future pandemics. To address this, potential training activities were identified, including those focused on utilising modelling outputs and enhancing communication between modelers and policymakers. Another participant noted that disease focus may vary regionally, with prioritisation determined by local health challenges. CEPI emphasised flexibility in disease selection, aligning with the interests of institutions delivering work to meet GS LEARN objectives. CEPI is working with Regional facilitators – PAHO, ICMR, HITAP, and Africa CDC - to identify suitable partners with expertise in selected disease areas. Additionally, training exercises should be adaptable to accommodate diverse interests.

Two key challenges were identified during the discussion. Language barriers were recognised as a key challenge to inclusivity. One participant suggested making training materials as open as possible. To address this challenge, CEPI will collaborate with regional facilitators and applicants to identify suitable partners. Another concern was the use of real-world data for training purposes. In response, CEPI explained that for project-based activities or on-the-job training, participants can use their own project data. While obtaining realistic data can be challenging for training programmes, CEPI suggested generating or stimulating data for this type of training where real-world data is unavailable.

Infectious Disease Modelling Landscape in Southeast Asian Region: Case Study of MIDSEA Network

Dr. Wirichada began the presentation by introducing the MIDSEA network, established in 2022 with funding from the Temasek Foundation. Its primary goal is to create a collaborative platform for modellers across Southeast Asia to interact, share best practices, and showcase ongoing projects, while also attracting young researchers to the field. The network is actively seeking representatives from countries such as Malaysia and Myanmar.

Figure 3 *Dr. Wirichada Pan-Ngum participated in a group discission after sharing her experience as part of the MIDSEA network*

Key Activities of the network include:

1. **Monthly Webinars and Annual Scientific Talks**: These events serve to inspire researchers and practitioners in the field as well as to discuss the latest advancements and challenges in modelling.
2. **Soft Skills Training**: This helps modellers improve communication and collaboration skills, particularly in policy-driven environments.
3. **Ownership-Fostering Initiatives**: Members are encouraged to host events such as training programmes, policy dialogues, and regional symposiums.
4. **Summer School for Modelling**: A training program aimed at bridging the knowledge gap for young researchers.
5. **Early Career Researcher (ECR) Group and Mentor Matchmaking**: Connecting early career researchers with experienced mentors for guidance and support.

Dr. Wirichada also highlighted key regional challenges, including human capital shortages, lack of sustainable career paths, untapped demand for modelling, leadership and harmonisation issues among experts, data and technique challenges, and difficulties in engaging policymakers and the public effectively. A key suggestion is to demonstrate the value and impact of modelling on policymaking to build demand.

The discussion further explored challenges in collaborating with expert institutions, such as a lack of collaboration culture, time and financial constraints, language barriers, and gaps in institutional knowledge, grant writing and management skills. Suggested solutions include showcasing successful modelling case studies to highlight the benefits for policy development and better identifying the demand for modelling across the Association of Southeast Asian Nations (ASEAN) countries to tailor efforts to regional needs.

Situational Analysis of Infectious Disease Modelling (IDM) in Thailand

The situational analysis of Infectious Disease Modelling (IDM) in Thailand, presented by Saudamini and Panchanok, provided key insights into the IDM landscape, lessons from the COVID-19 pandemic, and strategies to strengthen health security. Additionally, it highlighted Thailand's progress in IDM while addressing existing gaps, presenting opportunities for regional collaboration to build a robust framework for infectious disease preparedness.

Figure 4 *Saudamini Dabak (left) and Panchanok Muenkaew (right), Health and Intervention Technology Assessment Program (HITAP) Foundation, delivered a presentation on a case study from Thailand*

The presentation was summarised as follow:

Key findings:

- **Priority Diseases**: COVID-19, HIV, RSV, and influenza, etc. were identified as focus areas for IDM efforts.
- **Common Research Needs:** IDM is used to estimate affected populations, develop resource mobilization strategies, and implement safety measures.
- **Model Usage:** Compartmental models are the most commonly applied.
- **Key Stakeholders:** Policymakers, NGOs, private sectors, and academic institutions utilize IDM for decision-making and teaching purposes.

Strengths

- **Data and Surveillance:** Thailand has well-established surveillance systems and diverse data repositories.

- **High-Level Support:** Strong backing from policymakers and engagement with international experts.
- **Collaboration:** Active involvement in international research consortia and cross-disciplinary academia, including contributions from physics and mathematics departments.
- **Capacity Strengthening:** Progress in areas such as animal health and stakeholder engagement.

Challenges

- **Fragmentation:** A lack of cohesive coordination among stakeholders.
- **Data Limitations:** Issues with accessibility, availability, and quality.
- **Communication Gaps:** Insufficient dialogue between modelers and evidence users across sectors.
- **Funding Constraints:** Limited long-term funding and career incentives in IDM.

Recommendations

1. Strengthen communication and coordination among stakeholders.
2. Improve data infrastructure for better accessibility and quality.
3. Secure sustainable funding mechanisms and promote IDM career development.
4. Foster regional and international collaborations to build capacity and share best practices.

The discussion emphasised the need to bridge the gap between the demand for infectious disease modelling (policy needs) and the supply of trained modelers to ensure relevance and sustainability. Participants highlighted the importance of including policymakers and public health officers in training programmes to align modelling efforts with regional priorities. Challenges in grant applications were also discussed, with concerns about institutional biases favouring applicants from high-income countries. It was suggested that improved support mechanisms could enhance the quality and competitiveness of applications from the Global South.

Retention of talent emerged as a critical issue, with calls for creating sustainable career pathways within institutions to prevent brain drain and maintain a skilled workforce. Additionally, effective communication between modelers and policymakers was seen as essential for translating complex outputs into actionable insights. The need for fostering local ownership of initiatives, leveraging existing networks, and promoting leadership development in the region was also emphasised. These efforts were recognised as vital for building a robust, self-sufficient framework for infectious disease in Southeast Asia.

World Café Session and Discussion

One of the session highlights was a world café designed to offer a free platform for participants to discuss key challenges and explore collaborative opportunities related to modelling for policy, which will inform the approach to strengthen regional capacity in infectious disease modelling as part of the GS LEARN initiative. The session was attended by all participant and speakers and was moderated by the HITAP team.

The participants were asked to discuss three questions:

1. **What are the challenges in modelling for research and policymaking?**
2. **What enablers and strategies should we consider to sustain and leverage modelling networks?**
3. **What would you consider as indicators for success in modelling work and networks, and how can they be measured?**

Following each discussion, participants were requested to record key points on notepads, which were then placed on designated flipcharts corresponding to specific questions. Moderators were assigned to each flipchart to categorise and group similar points. Once all three discussion rounds were concluded, the HITAP moderators presented the key points discussed to the floor.

Table 1 Summary of discussion points for Question 1: What are the challenges in modelling for research and policymaking?

Themes	**Responses**
Communication	• Communication gap between modelers and policymakers. • Understanding modelling terminology and language. • Unclear strategy of policymakers. • Lack of communication of needs from policymakers to modelers. • Translation of understanding. • Engaging governments formally with modelling groups. • Transparency in communicating modelling results and processes to the public and policymakers to build trust.
Operationalisation	• Operationalisation of modelling (applicable to implementation). • Timing. • Transparency.
Resources and Infrastructure	• Readiness to react to situations.

Themes	Responses
	• Knowledge of situation. • IT and computer infrastructure. • Decision pipeline. • Availability of data. • Quality data.
System-wide factors	• Context. • Sustainability to ensure ongoing positions for modelers. • Trust. • Policy environment.
Modelling Capacity	• Number of modellers. • Turnover of technical and policymaker personnel. • Insufficient capacity among data generators.
Modelling Literacy	• Limited understanding of modelling by policymakers and local communities. • Limited understanding within the modelling community of the policymaking environment they aim to engage in.
Data Literacy	• Modellers' limited knowledge of how to collect, share, and utilise data for decision-making.
Incentives	• Lack of incentives for data generation.

Additional discussion points following the activity

The discussion focused on improving the capacity of modellers and enhancing communication with model users to drive the uptake of models. Participants highlighted the need to improve modelling literacy among policymakers and translate complex models into accessible formats for both policymakers and the public. Collaboration with policymakers on modelling projects fosters mutual learning and trust. Modellers should also familiarise themselves with local contexts and policymaking processes to design relevant models.

Addressing staff turnover through institutionalising modelling within decision-making processes is crucial for continuity. Identifying local champions within the decision-making pipeline can help scale up modelling initiatives. The compartmentalisation of modelling can be problematic, as it limits cross-sector collaboration necessary for data-driven and context-specific decision-making.

Transparency in modelling, including clear communication of models' assumptions and uncertainties, is essential for trust. Formal government engagement is needed to

access data and influence policies. Data sharing across countries is often hindered by siloed work, but incentives for sharing and improved data surveillance can help. Strengthening institutional data generation, ensuring interoperability, and including context in data are necessary for more effective modelling. Lastly, improving health service surveillance is critical for enhancing the reliability of health models.

Table 2 Summary of discussion points for Question 2: What enablers and strategies should we consider to sustain and leverage modelling networks?

Themes	**Responses**
Funding and Career Growth	• Incentives • Financial • Clear career paths and sustained funding for positions • More modelling projects co-funded by government
Network	• A network approach (inter- and cross-regional) can improve sharing of knowledge/expertise
Communication	• Open sharing • Effective communication
Data Infrastructure	• Use of global supercomputer in emergency • Streamlined data access
Training	• Soft skill training • Additional training and support for students • Finding and fostering transformational leaders
High-level	• Value • Trust • Governance

Additional discussion points following the activity

The group recapped the previously discussed points related to enablers and strategies for sustainable networks, including incentives for data generators while managing data surveillance risk. They also explored the potential value of confidentiality arrangements between governments and modelers to support evidence-informed decision-making, even when dealing with non-publicly available data.

Participants further emphasised the importance of fostering sustainable partnerships through collaborative projects among diverse teams. One participant noted that while small-scale collaborative efforts, such as joint proposal development, can initiate partnerships, they may not always progress to full-scale research collaborations. Developing collaborative research proposals for smaller-scale projects with seed funding

can increase the likelihood of securing grants and serve as a starting point for future collaborations. Additional support for grant applicants, such as grant writing and administrative assistance, is also crucial.

Table 3 Summary of discussion points for Question 3: What would you consider as indicators for success in modelling work and networks, and how can they be measured?

Themes	Responses
Quantitative Indicators	• Number of conducted training sessions and publications. • Increased average tenure of modelers in relevant institutions. • Growth in south-south collaborations, measured through publications led by Global South institutions. • Timeliness of modelling outputs and inclusion in grant-making best practices. • Demand for models from decision-makers, model reuse, and the promotion of diversity and interdisciplinarity.
Qualitative Indicators	• Documentation of model use through case studies and integration into decision-making pathways.

Additional discussion points following the activity

The discussions highlighted significant challenges and opportunities in infectious disease modelling. A primary issue is the reluctance to share data due to political, ethical, or quality concerns. To address this, participants suggested the use of synthetic or simulated datasets to provide realistic training scenarios while ensuring data confidentiality. Capacity building emerged as a critical need, emphasising hands-on, practical training using real-world or simulated data, supported by mentorship and regional collaboration to foster skill retention and long-term partnerships. However, sustainability remains a challenge due to institutional constraints, such as limited funding and career pathways for modelers.

Integrating modelling outputs into policy and decision-making processes was also a focus. Policymakers require training to interpret and apply modelling insights effectively, while improved communication between modelers and decisionmakers is essential to ensure the relevance of models in addressing policy questions. Collaborative regional hubs were proposed as a solution to bridge gaps and align modelling efforts with policy needs. Additionally, interdisciplinary collaboration was identified as a key driver of innovation, with partnerships between Global South and North institutions to prioritize equity, skill transfer,

and sustainability. The role of regional facilitators in matchmaking institutions and fostering collaborative training programmes was recognised as pivotal in building a robust framework for modelling and its application in public health policy.

Figure 5 *Participants engaged in the group discussion*

Conclusion

The session provided a platform for valuable exchanges on how to strengthen infectious disease modelling capacity in the region and aligned efforts to address both current and future health challenges that reflect the needs of local settings. The discussions reinforced the importance of establishing communication, fostering interdisciplinary collaboration, integrating modelling insights into decision-making, and prioritising regional and global partnerships for sustained progress in the field.

In conclusion, the session successfully laid the groundwork for future collaborations under the GS LEARN initiatives, underscoring the importance of continuous dialogue, capacity building, and strategic partnerships to advance infectious disease modelling for better health outcomes in Southeast Asia and beyond.

Appendices

Appendix 1: Session Agenda

Time	Particular	Person(s) responsible
9:00 – 9:15	Welcome and introduction to the session	Natcha Kongkam & Lapad Pongcharoenyong, HITAP
9:15 – 9:45	Global South (GS) LEARN initiative: Introduction to the GS LEARN initiative	Christinah Mukandavire, CEPI
9:45 – 10:05	Presentation on landscape of Southeast Asian region: Existing capacity, resources, and challenges to address moving forward	Prof. Wirichada Pan-ngum, MIDSEA
10:05 – 10:20	Situational analysis of Infectious Disease Modelling (IDM): Presentation of a case study from Thailand	Panchanok Muenkaew & Saudamini Dabak, HITAP
10:20-10:40	Break	
10:40 – 12:00	World Café (60 mins) Topics to be discussed at each table are: 1) What are the challenges in modelling for research and policymaking? 2) What enablers and strategies should we consider sustaining and leveraging modelling networks? 3) What would you consider as indicators for success in modelling work and networks, and how can they be measured? Participants to be divided into three groups and rotated to contribute to all the above focus topics (20 mins each). There will be table hosts for each topic who will guide the discussion and summarise the key points for each successive round. (20 mins each)	All participants Facilitator: HITAP staff Materials: Facilitator sheet Flipcharts/post-its/pens
12:00 – 12:30	Closing • Summary • Next steps on the GS LEARN initiative	HITAP & CEPI

Appendix 2: Participant List

No.	Name	Surname	Organisation
Participants			
1	Catherine	Eisenhauer	Epicentre, Médecins Sans Frontières (MSF)
2	Julia	Fitzner	WHO Collaboratory
3	Dina	Saulo	WHO Collaboratory
4	Noriko	Kitamura	The National Institute of Infectious Diseases
5	Suphanat	Wongsanuphat	Department of Disease Control, Ministry of Health, Thailand
6	Wirichada	Pan Ngum	Mahidol-Oxford Tropical Medicine Research Unit, Mahidol University
7	Sheetal	Silal	Immunization and Vaccines related Implementation Research Advisory Committee (IVIR-AC)
8	Mark	Peterson	Bill & Melinda Gates Foundation
9	Cliff	Ker	Bill & Melinda Gates Foundation
10	Inthira	Suya	United Nations Development Programme
Organisers			
11	Arminder	Deol	Coalition for Epidemic Preparedness Innovations
12	Christinah	Mukandavire	Coalition for Epidemic Preparedness Innovations
13	Helen	Wallis	Coalition for Epidemic Preparedness Innovations
14	Saudamini	Dabak	Health and Intervention Technology Assessment Program (HITAP) Foundation
15	Panchanok	Muenkaew	Health and Intervention Technology Assessment Program (HITAP) Foundation
16	Lapad	Pongcharoenyong	Health and Intervention Technology Assessment Program (HITAP) Foundation
17	Natcha	Kongkam	Health and Intervention Technology Assessment Program (HITAP) Foundation