

# IMPROVING PRIORITY ANTIBIOTIC ACCESS IN THAILAND AND REGIONAL COORDINATED PROCUREMENT MECHANISMS

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PREPARED BY HEALTH INTERVENTION AND TECHNOLOGY ASSESSMENT  
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## Abbreviations

Abbreviations	Full form
AMC	Antimicrobial Consumption
AMR	Antimicrobial Resistance
APIs	Active Pharmaceutical Ingredients
ASEAN	Association of Southeast Asian Nations
CMSB	Central Medical Stores Depot
CRAB	Carbapenem-resistant <i>Acinetobacter baumannii</i>
DID	Defined Daily Doses per 1,000 Inhabitants per Day
EML	Essential Medicines List
GARDP	Global Antibiotic Research and Development Partnership
GF	Global Fund
GMP	Good Manufacturing Practice
GSDP	Good Storage and Distribution Practices
HITAP	Health Intervention and Technology Assessment Program Foundation
HIV	Human Immunodeficiency Virus
ICER	Incremental Cost Effectiveness Ratio
ICH SRA	International Council for Harmonization Stringent Regulatory Authority criteria
LMICs	Lower Middle-Income Countries
MHP	access to Medicines and Health Products Division
MOH	Ministry of Health
MSWG	Market Shaping Working Group
NGOs	Non-Governmental Organizations
NEML	National Essential Medicines List
NLEM	National List of Essential Medicines
NPRA	National Pharmaceutical Regulatory Agency
NSAC	National Surveillance on Antimicrobial Consumption
NSAU	National Surveillance on Antimicrobial Utilisation
PD	Peritoneal Dialysis
PPWG	ASEAN Pharmaceutical Product Working Group
PQ	Prequalification
RRMS	ASEAN Regional Reserve of Medical Supplies
SRA	Stringent Regulatory Authority
TB	Tuberculosis
TSRI	Thailand Science, Research and Innovation
PHC	Primary Health Care
UHC	Universal Health Coverage
UN	United Nations
UNDP	United Nations Development Programme

<b>Abbreviations</b>	<b>Full form</b>
USD	United States Dollar
UTI	Urinary Tract Infection
WHO	World Health Organization

## Acknowledgments

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We would like to express our sincere thanks to Dr. Suwit Wibulpolprasert of the Ministry of Public Health, Thailand, for delivering the opening remarks. We extend our heartfelt appreciation to all participants from Thailand, Bangladesh, Lao PDR, Maldives, Malaysia, Sri Lanka, and representatives from WHO for their active engagement, valuable insights, and expert contributions without which the meeting would not have been possible.

The findings, interpretations, and conclusions presented in this report do not necessarily reflect the views of the funding or participating organizations.

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## Executive Summary

Access to effective antibiotics remains a significant global challenge, particularly in low- and middle-income countries (LMICs), where limited availability and high costs hinder timely treatment of bacterial infections. SECURE, a joint initiative of the World Health Organization (WHO) and Global Antibiotic Research and Development Partnership (GARDP), aims to support countries in improving antibiotic access while ensuring appropriate use. As part of this effort, GARDP and the Health Intervention and Technology Assessment Program Foundation (HITAP), in collaboration with the WHO hosted a stakeholder meeting to understand current access challenges and identify priority antibiotics in Thailand and other countries, explore suitable market-shaping interventions, notably coordinated procurement, and foster multi-stakeholder collaboration for long-term implementation.

The first day of the meeting focused on identifying antibiotics that were both priorities from a public health perspective and faced access barriers using SECURE’s prioritization criteria, supplemented by country-specific insights. Participants also explored potential market-shaping interventions particularly in procurement and supply chain management, financing mechanisms, and product introduction, to improve antibiotic access. The second day centered on discussing coordinated procurement, with countries sharing experiences and assessing the feasibility of its application at regional and sub-regional levels by assessing its strengths, weaknesses, opportunities, and threats (SWOT).

Arising from the discussions, HITAP will conduct an in-depth assessment of nitrofurantoin SR in Thailand in collaboration with GARDP, while also exploring the potential for regional coordinated procurement. Countries and participants are encouraged to express interest in upcoming SECURE initiatives or the antibiotic market-shaping working group by informing WHO and GARDP. HITAP will also integrate stakeholder feedback into the ongoing coordinated procurement study, and continue engagement to refine insights and share findings, with the aim of strengthening regional access to essential antibiotics through collaborative procurement strategies.

Overall, this report summarizes the key presentations, activities, discussions, conclusions and outlines potential next steps to improve access to priority antibiotics at both national and regional levels. Supporting documents, including the agenda, participants list, and preparatory materials, are included in the Appendices.

## Background

Antibiotics are essential for combating bacterial infections. However, access to effective antibiotics is a major challenge worldwide: newer antibiotics are often not registered widely and face barriers to access including high costs. Many low- and middle-income countries face shortages of life-saving antibiotics, including both older medicines and newer, more specialized ones. And even when it is available, the price of antibiotics can be prohibitive, especially for individuals and healthcare systems in resource-limited settings.

There are a number of interventions that may improve access to antibiotics. For example, one feasible way of mitigating these access challenges is through coordinated procurement. Coordinated procurement refers to collaborative initiatives in which multiple buyers consolidate or align their purchasing activities to enhance procurement efficiency and leverage collective bargaining power. In the context of health commodities, this type of procurement could offer potential benefits such as lower prices, enhanced efficiency, strengthened quality control enforcement, and increased supply chain resilience with a win-win scenario for both governments and companies. Governments benefit by securing the best possible prices for products, while companies can reduce marketing costs and gain access to larger, more predictable markets through agreements with participating countries. However, several barriers hinder its implementation, including different regulatory standards and treatment guidelines, import and customs restrictions and obligations to support local industries.

SECURE is an initiative which aims to work with countries to pioneer new approaches to ensuring antibiotic access while ensuring appropriate use. SECURE is a partnership between the World Health Organization (WHO) and Global Antibiotic Research and Development Partnership (GARDP) and is seeking a range of partners to work together and particularly, will require close collaboration with the Ministries of Health to co-design interventions that are most relevant to individual country contexts. The Health Intervention and Technology Assessment Program Foundation (HITAP) is a research organization in Thailand and conducts Health Technology Assessment (HTA) and Health Service Research, and collaborates with national and international partners to support the use of evidence in decisions for health. HITAP has been exploring the topic of AMR and the role of coordinated procurement in the context of HTA.

In this context, GARDP via the SECURE initiative and HITAP, together with the WHO, organized a stakeholder meeting to explore the existing access challenges experienced in Thailand and other countries in the region, identify mechanisms to address these access

challenges both for the country as well as at the regional level, including through ASEAN mechanisms and structures. This report summarizes the proceedings of this meeting with supporting documents in the appendix.

## Summary of proceedings

### Introduction and overview of meeting

**Mr. Jean Michel Piedagnel** welcomed all participants. Opening remarks were provided by **Dr. Suwit Wibulpolprasert**, Chair of the Sub-Committee for the Development of the National List of Essential Medicines (NLEM), Thailand. He highlighted that the challenge of antibiotics in Thailand was around irrational use and encouraged the participants to explore the role of coordinated procurement in the region. **Dr. Bassim Zayed, Regional Advisor for antimicrobial resistance**, WHO Southeast Asia Regional Office (WHO SEARO) highlighted the importance of the discussion and outlined the objectives of the meeting.

The objectives of the meeting were to understand current challenges related to access and identify priority antibiotics in Thailand and other countries in the region; outline the SECURE initiative; explore market shaping interventions most suited to improve access to these antibiotics; identify key stakeholders for implementation of these interventions and to foster collaboration for long-term engagement. The expected outcomes were to identify priority antibiotics for access in Thailand, which was the country of focus for the first day of the meeting, have an increased understanding of access barriers to identified priority antibiotics related to market characteristics and potential sets of interventions for identified priority antibiotics in Thailand and to have a team of stakeholders or “SECURE working group” to develop the interventions further. While the first day of the meeting focused on Thailand, representatives from other countries discussed these issues in their context and facilitated an exchange of experiences. On the second day of the meeting, the main objectives were to share the proposed approach for a study on regional collaboration on coordinated procurement and seek input from participants. A mix of presentations and group discussions was used to facilitate engagement. The agenda for the meeting is provided in Appendix 1 and the list of participants in Appendix 2.

## Identifying priority antibiotics with access challenges

Representatives from countries presented on priority antibiotics and the associated access challenges in their respective contexts. A summary of key findings in the Thai context were shared with participants ahead of the meeting (available upon request). A survey was conducted during the session to learn about priority antibiotics and challenges from participants (see Appendix 3). The presentations were followed by a group discussion; In this section, the key points from the presentations and discussion are combined and organized by country or sub-region.

### Thailand

**Dr. Aye Nandar Myint of HITAP** delivered a presentation on the landscape of antibiotic use and resistance in Thailand. Antibiotics are indispensable for treating bacterial infections; however, global access to effective antibiotics is a significant challenge, exacerbated by the increasing prevalence of antimicrobial resistance (AMR).



*Dr. Aye Nandar Myint of HITAP presenting an overview of antibiotic use and resistance in Thailand*

The presentation highlighted the critical impact of AMR in Thailand, noting that 10,800 deaths are directly attributable to AMR, while 43,900 are associated with it. Globally, in 2019, 4.95 million deaths were linked to drug-resistant infections, with AMR directly causing 1.27 million fatalities<sup>1</sup>.

In response to this growing concern, Thailand has implemented various initiatives to address AMR, including the National Strategic Plan on AMR, the Rational Drug Use policy, and the regular review and update of NLEM.

Despite these efforts, challenges persist. Notably, there is a lack of explicit linkage between AMR and Universal Health Coverage (UHC) at the national policy level. Furthermore, at the

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<sup>1</sup> University of Oxford and the Institute for Health Metrics and Evaluation. 2023. The burden of antimicrobial resistance in Thailand. Available at: <https://www.healthdata.org/research-analysis/health-topics/antimicrobial-resistance-amr>.

implementation level, there is a greater reliance on imported medicines compared to those from local manufacturers.

To inform public health needs for reserve antibiotics and to address associated access challenges in Thailand, HITAP conducted a targeted literature review focusing on four key areas, as outlined below:

Focus Area	Purpose
1. Epidemiology and Public Health Trends	To examine the public needs and trends of antimicrobial infections in Thailand
2. Priority Antibiotics	To identify and classify reserve/critical antibiotics in the Thai context
3. Access Challenges	To explore barriers limiting access to antibiotics
4. Price and Affordability	To explore the reference prices of priority antibiotics in Thailand

### Trends in Drug-Resistant Bacteria in Thailand

According to the recent Thailand One Health Report<sup>2</sup>, a notable increase in the detection of several drug-resistant bacteria was observed between 2017 and 2022. Specifically, carbapenem-resistant *Acinetobacter baumannii* (CRAB) rose from 69.8% to 77.5%, carbapenem-resistant *Escherichia coli* increased from 2.4% to 5.4%, and carbapenem-resistant *Klebsiella pneumoniae* saw an increase from 10.1% to 18.9%. Conversely, the isolation rates of 3rd-generation cephalosporin-resistant *E. coli* and methicillin-resistant *Staphylococcus aureus* decreased during the same period.

### Treatment Options and Challenges for Resistant Bacteria

For the treatment of CRAB, the preferred option is sulbactam-durlobactam in combination with a carbapenem (e.g., imipenem-cilastatin or meropenem). Alternative regimens include a high-dose of ampicillin-sulbactam alongside an additional agent such as polymyxin B, minocycline, tigecycline, or cefiderocol. Among these ‘Reserve’ antibiotics, minocycline and tigecycline are registered in Thailand but are not included in the NLEM. cefiderocol, however, is neither registered nor is it listed in the NLEM.

Common treatment options for carbapenem-resistant Enterobacterales (which include *E. coli* and *K. pneumoniae*) encompass nitrofurantoin (for urinary tract infections),

<sup>2</sup> Health Policy and Systems Research on Antimicrobial Resistance (HPSR-AMR) Network. Highlights Thailand One Health Report 2022: Antimicrobial Consumption and Antimicrobial Resistance. Nonthaburi: International Health Policy Program, 2025.

trimethoprim/sulfamethoxazole, ciprofloxacin, and levofloxacin. Alternative therapeutic agents include single-dose aminoglycosides (for urinary tract infections), fosfomycin (specifically for *E. coli*), colistin, ceftazidime-avibactam, meropenem-vaborbactam, imipenem-cilastatin-relebactam, and cefiderocol. In instances where beta-lactam antibiotics prove ineffective, tigecycline or eravacycline are recommended. Regarding the ‘Reserve’ antibiotics recommended for these infections, ceftazidime-avibactam, colistin, and intravenous fosfomycin are currently included in the NLEM. Conversely, cefiderocol, meropenem-vaborbactam and imipenem-cilastatin-relebactam are not registered in Thailand and consequently are not listed in the NLEM.

The factors contributing to the overuse of broad-spectrum antibiotics and the ineffective use of antibiotics against specific pathogens were further elaborated. Beyond the price of narrow-spectrum antibiotics, these factors include a scarcity of local clinical practice guidelines and inadequate consideration of patients' prior antibiotic usage history before hospital admission.

Following Dr. Nandar's presentation, **Ms. Kakanang Tosanguan, from the National Drug Policy Division of the Food and Drug Administration**, provided an overview of strategies for enhancing antibiotic access in Thailand and the detailed objectives of the National Drug Policy and the National Strategic Plan on Antimicrobial Resistance (AMR). A key aim of these national frameworks is to significantly reduce antimicrobial consumption by 30% in humans and 50% in animals. This target is to be achieved through the regulation of antimicrobial distribution and the implementation of robust antimicrobial stewardship programs across human health, agriculture, and animal sectors.



*Ms. Kakanang Tosanguan of the National Drug Policy Division, Thai FDA, presenting an overview of strategies for antibiotic access in Thailand*

Regarding access to essential medicines, Ms. Kakanang Tosanguan underscored the challenges that frequently lead to shortages of essential medicines, including life-threatening medications, antidotes, and antivenoms. The key challenges contributing to

drug shortages revolve around pricing. New medicines are often expensive, and some narrow-spectrum generic medicines can be more costly than their broad-spectrum counterparts. Additionally, there's a particular shortage of paediatric medications. These challenges often stem from factors such as limited market share, low profit margins, unpredictable demand, market monopolies or oligopolies, and insufficient clinical data to support regulatory submissions.

To mitigate some of these hurdles, Thailand has adopted several measures. These include expediting regulatory registration through "fast track" processes, exempting drug registration fees, permitting the submission of dossiers for well-established orphan medicines as generic medicines, streamlining Good Manufacturing Practice (GMP) clearance, and exempting import duties for certain imported medicines.

Furthermore, dedicated sub-committees are mandated to select medicines for two distinct lists: the Essential Drug Shortages List, which as of 2024 comprises 93 items, and the NLEM. Essential drug shortages are identified based on criteria such as being on the essential drug list, lacking alternatives, treating rare diseases, or having low consumption with shortages. These drugs qualify for fast-track registration, exemption from registration fees and import duty, unlike those on the NLEM. Details regarding the operational procedures of these subcommittees are provided below:

## Mechanisms for Drug Access

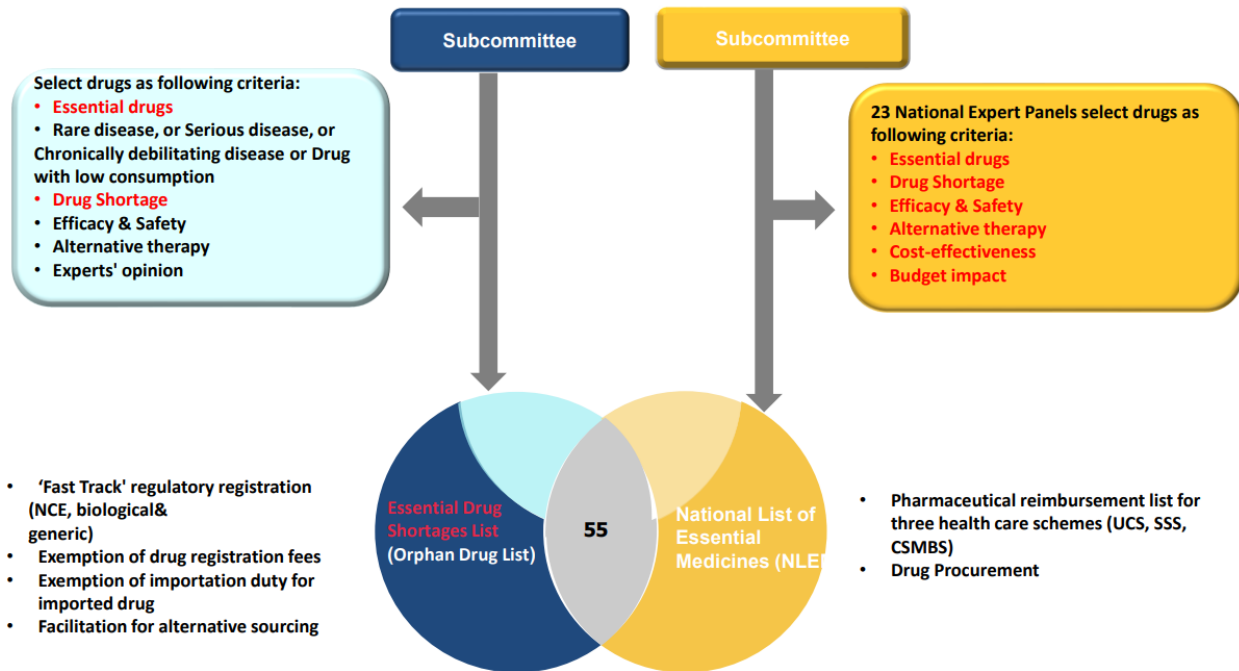


Figure 1. Mechanisms for Drug Access in Thailand (from Ms. Kakanang Tosanguan presentation slides)

### Antibiotic Consumption and Regulatory Insights

Ms. Kakanang Tosanguan further detailed Thailand's antibiotic consumption in 2023 which had been analysed using the WHO AWaRE classification. According to the analysis, only 0.04% of the total antimicrobial consumption (AMC) fell into the 'Reserve' category, while 'Watch' antibiotics accounted for 7.83%, and 'Access' antibiotics represented 21.26%. About a quarter (25.99%) of the consumption was not categorized using the AWaRe framework.

1. Artesunate injection\*
2. Aztreonam injection
3. Benzathine benzylpenicillin (Penicillin G benzathine) injection\*
4. Capreomycin injection
5. Cidofovir injection\*
6. 5-Fluorocytosine oral form\*
7. Foscarnet injection
8. Ganciclovir eye gel
9. Ivermectin oral form, injection\*
10. Isoniazid + Rifapentine oral form\*
11. Natamycin eye preparation
12. Pentamidine isethionate injection\*
13. Protionamide oral form\*
14. Pyrimethamine tablet\*
15. Rifampicin dispersible tablet or syrup\*
16. Rifampicin + Isoniazid oral form for pediatric use\*
17. Rifapentine oral form\*
18. Spectinomycin hydrochloride injection

Figure 2. Infection-related drugs included in the “Essential Drug Shortages List” in Thailand (from Ms. Kakanang Tosanguan presentation slides)

### Medicine Importation and Shortages

The Medicine Regulation Division's report indicated that the import value of anti-infectives for systemic use reached 68 billion baht (approximately 2.1 billion USD), a figure four times greater than the value of local production. The **Essential Drug Shortages List** includes various medicines (Figure 2.), highlighting critical gaps in availability.

The presentation was concluded by introducing a valuable resource: the official website of the National Drug Information system (<https://ndi.fda.moph.go.th/>). This platform serves as a comprehensive source for interested parties seeking information on medicines available in Thailand.

Following the presentation, participants engaged in a group discussion on the criteria for prioritizing antibiotics, with the aim of developing a list of priority access-challenged antibiotics. In general, Thai participants observed that overuse of antibiotics remains a key challenge in the country alongside lack of access. Nevertheless, key access barriers include the limited number of manufacturers and weak price regulations, which contribute to the underuse of some essential antibiotics. Participants from Thailand proposed several additional criteria to guide the prioritization of antibiotics for inclusion in the SECURE pipeline, as follows:

- Proven effectiveness against prevailing bacterial strains with high resistance rates.
- No adverse consequences from inclusion in the National List of Essential Medicines (NLEM) (e.g., oral carbapenems).
- Availability from an adequate number of suppliers (more than one) or local production capacity (e.g., erythromycin, gentamicin, kanamycin, rifampicin, ethambutol).

Participants noted that most antibiotics in Thailand are not produced domestically, and that procurement guidelines are somewhat insufficient. For instance, Thailand currently lacks a supplier for alternative gonorrhoea treatments (i.e., spectinomycin) which is used in the

event of ceftriaxone-resistant cases. On the other hand, aminoglycosides such as gentamicin are available, but are only recommended for use in cases of allergy to ceftriaxone.

It was also highlighted that newer antibiotics used for urinary tract infections (UTIs) and gonorrhoea are costly. Moreover, certain antibiotics are restricted for use in specific diseases—for example, some medicines used for leprosy cannot be reimbursed for tuberculosis.

## Discussion

Following the group discussions on antibiotic prioritisation, the session continues with a moderated discussion on the challenges in accessing antibiotics. The key points raised during the discussion are summarized below:

- **Government Pharmaceutical Organization (GPO) mandate and challenges** – The GPO is mandated to provide essential medicines to the Thai population. It sources active pharmaceutical ingredients (APIs) and attempts to formulate generic medicines, particularly those not produced domestically. However, maintaining competitive prices for antibiotics remains a challenge. For certain drugs, API availability is limited to only two to three months. A major constraint in producing APIs is that Thailand cannot match the lower production costs achieved by manufacturers in India and China.
- **Low consumption of spectinomycin and limited market incentives** – The consumption of spectinomycin in Thailand is low, resulting in minimal incentives for importers. In response, a representative from the Department of Disease Control requested support from the GPO and proposed that the Thai FDA list spectinomycin as an essential drug. Another key issue raised was that pharmaceutical companies often show little interest in registering their antibiotics in Thailand, particularly those effective against multidrug-resistant *Acinetobacter baumannii* and carbapenem-resistant *Enterobacteriaceae*.
- **Reimbursement, pricing, and misuse** – Current reimbursement and pricing mechanisms appear to have little impact on the selection and availability of antibiotics in the public health system. This may be an area for further examination. Furthermore, the most pressing concern identified was the overuse and misuse of antibiotics, especially ‘reserve’ drugs such as, colistin, and fosfomycin, which are reimbursable through the Universal Care system in Thailand.

- Dependence on imports** – Thailand remains heavily reliant on the importation of drugs and vaccines. The limited API stock of two to three months is insufficient to ensure consistent supply.

The session ended with urging meeting participants to develop more robust strategies to secure access to essential medicines, not only within their respective countries but also across the region.

### Experiences from countries

International participants subsequently presented their insights and experiences regarding antibiotic access and priority pathogens within their respective jurisdictions. **Dr. Rahela Ambaras Khan, Head of Pharmacotherapy at Kuala Lumpur Hospital**, operating under the Ministry of Health (MOH) in Malaysia, delivered an overview of Malaysia's antibiotic prioritization process.



*Dr. Rahela Ambaras Khan, Head of Pharmacotherapy at Kuala Lumpur Hospital, providing an overview of the antibiotic prioritization process in Malaysia*

Dr. Rahela Ambaras Khan commenced her presentation by outlining the mechanisms governing access to medicines in Malaysia. The National Pharmaceutical Regulatory Agency (NPRA) is vested with the authority to grant marketing authorization for pharmaceutical products. For registered medicines to be accessible within MOH facilities and other public institutions, they must either be formally listed in the national formulary or receive special approval to be dispensed to patients. Similarly, unregistered

medicines can also be made available through a special exemption process. The six distinct pathways for medicine registration in Malaysia are shown in Figure 3 below:



Figure 3. Medicine Registration Pathways in Malaysia (from Dr. Rahela Ambaras Khan presentation slides)

Presentation also highlighted data on antibiotic availability and utilization in Malaysia. According to the National Surveillance on Antimicrobial Consumption (NSAC), overall consumption increased from 11.17 Defined Daily Doses (DID) in 2022 to 24.49 DID in 2023. Analysing this trend using the WHO AWaRe classification, it was observed that the consumption of 'Access' antibiotics decreased from 72.8% in 2022 to 46.6% in 2023. This reduction in 'Access' antibiotic use was concurrently coupled with a notable increase in the consumption of 'Watch' antibiotics, rising from 27.1% to 53.2% over the same period. 'Reserve' antibiotic consumption remained minimal, registering 0.07% in 2022 and 0.03% in 2023.

In parallel, data from the National Surveillance on Antimicrobial Utilization (NSAU) indicated a positive development: antimicrobial use in Intensive Care Units (ICUs) across both public and private hospitals in 2024 decreased by 29% compared to 2020 levels. Furthermore, the recorded rate of infections attributable to common drug-resistant bacteria also showed a decline from 2023 to 2024.

The subsequent segment of the presentation Khan focused on the persistent challenges associated with antibiotic access in Malaysia, which are shown in Figure 4 below:



Figure 4. Challenges associated with antibiotic access in Malaysia (from Dr. Rahela Ambaras Khan presentation slides)

Considering issues of access and inclusion in the National Essential Medicines List (NEML), there were two specific antibiotics chosen as a proof of concept for the SECURE initiative from the presentation. These antibiotics serve to illustrate different facets of access challenges:

1. **Ceftazidime/avibactam:** This antibiotic falls into the 'Reserve' category according to the WHO AWaRe classification, indicating its critical importance for treating multi-drug resistant infections. Although it is registered in the country, a significant challenge associated with this antibiotic is its high cost.
2. **Nitrofurantoin SR:** Classified as an 'Access' category antibiotic. Nitrofurantoin (without SR) is generally considered an older antimicrobial. The primary challenge highlighted for this particular formulation is its susceptibility to shortages due to QID (four times daily) dosing leads to shortages by increasing the total demand for medication compared to less frequent dosing schedules in SR formulation (which is twice daily dosing), often resulting in faster depletion of available stock.

These examples aim to demonstrate how the SECURE initiative can address both the high cost of newer, critical 'Reserve' antibiotics and the supply chain vulnerabilities of essential, older 'Access' category medicines.

International participants also engaged in a group discussion, aimed at developing a list of priority access-challenged antibiotics in their respective settings.



*Ms. Konnie Bellingham sharing antibiotic access challenges in Lao PDR*

One group, composed primarily of representatives from Southeast Asia identified significant barriers to accessing priority antibiotics, drawing on specific examples from Lao PDR and Malaysia. In both countries, a major challenge is the high cost of newer, critical antibiotics such as vancomycin, ceftazidime–avibactam, and cefiderocol. This challenge is further compounded by the absence of accurate data for forecasting usage, as well as the difficulty in quantifying indirect costs

associated with complications and antimicrobial resistance.

The discussion also underscored weaknesses in pharmaceutical registration and procurement systems. In **Lao PDR**, procurement is conducted through direct negotiation; however, the lack of registration for certain antibiotics, such as vancomycin, and the exclusion of nitrofurantoin from the Essential Medicines List (EML) limit their availability. In **Malaysia**, the procurement system, which operates through national concession agreements and tenders, still faces difficulties in securing unregistered and high-cost antibiotics, including cefiderocol and cefotolazone–tazobactam. The Table below summarizes the priority antibiotics in Lao PDR and Malaysia and their corresponding access barriers:

Priority Antibiotics and Corresponding Access Barriers	
Lao PDR	Malaysia
<ul style="list-style-type: none"> <li>• Vancomycin – lack of registration</li> <li>• Nitrofurantoin – lack of registration and non-inclusion in the EML</li> </ul>	<ul style="list-style-type: none"> <li>• Ceftazidime Avibactam - high cost</li> <li>• Nitrofurantoin SR – issues with registration and low volume</li> <li>• Ceftolazone-Tazobactam - high cost</li> <li>• Cefiderocol - high cost and lack of registration</li> <li>• Aztreonam - lack of registration</li> </ul>

Additionally, the group highlighted systemic challenges such as limited knowledge and awareness among healthcare professionals and the general public, the absence of clearly defined national priorities for specific antibiotics, and the lack of local manufacturing capacity and production incentives. Collectively, these factors hinder timely and equitable access to essential antimicrobial agents.

Another group composed of participants from the South Asian countries, emphasized that while the EML generally serves as the basis for antibiotic selection, national contexts vary considerably.



*Ms. S. M. Sabrina Yesmin sharing the antibiotic access challenges in Bangladesh*

In **Bangladesh**, the EML in the country is currently under revision, and public procurement is largely based on the Primary Health Care (PHC) list, which consists mainly of ‘Access’ antibiotics. However, antibiotics are not prescribed in alignment with the WHO AWaRe classification. Instead, procurement decisions are demand-driven rather than strategically classified. This fragmented procurement system, conducted through various agencies such as hospital surveys and the

Central Medical Stores Depot (CMSD), often responds to immediate needs rather than long-term priorities. Participants stressed the need for a shift from reactive to proactive procurement, with an emphasis on quality assurance, demand forecasting, and proper storage conditions. Limited diagnostic access, underdeveloped stewardship programs, the prevalence of substandard antibiotics, and inadequate storage practices were also identified as recurring challenges. The representative from Bangladesh concluded that government policy and procurement systems require stronger integration and structural reform.

In **Sri Lanka**, the EML has not been recently updated since 2022, and the procurement list has remained fixed for several years. This list includes 862 molecules prioritized for procurement, with a centralized system in place to ensure quality and compliance. Strong post-marketing surveillance and adverse drug reaction monitoring are implemented, and the government actively prioritizes local manufacturers—currently 27 identified—for long-term sustainability.

In **Maldives**, all registered products (over 3,000 medicines) are reimbursed, and there are no specific criteria for registering antibiotics. The country lacks a dedicated quality control mechanism and is entirely dependent on imports, with limited supply chain infrastructure. Challenges include rising costs, short shelf-life of medicines, and poor storage conditions exacerbated by the tropical climate. While government healthcare is supported by insurance, regulatory enforcement and monitoring remain limited.

Overall, representatives from countries in South Asia proposed a set of considerations to be taken into account for prioritizing antibiotics, including:

- Resistance patterns.
- Registration status, recognizing that EML does not entail public procurement or social health insurance reimbursement list.
- Consumption and usage data.
- Clinical practice considerations and stewardship program implementation.
- Market availability.
- Quality assurance, including post-market surveillance and pharmacovigilance.

Antibiotic prioritization in countries like Bangladesh and the Maldives requires systemic reform, stronger stewardship, and better regulatory practices. Key recommendations from the South Asian participants include:

1. Align procurement and prescribing with the AWaRe classification.
2. Establish robust AMC and AMR surveillance mechanisms.
3. Improve coordination between regulatory and procurement bodies.
4. Enhance diagnostic capabilities and infrastructure.
5. Prioritize local manufacturing with quality assurance protocols.
6. Implement proactive procurement strategies and post-market surveillance.

The participants emphasized that without addressing these foundational issues, antibiotic prioritization will remain fragmented, increasing the risk of resistance and public health threats.

Furthermore, the participants identified common barriers to antibiotic access, such as delays in registration, low demand (often below the minimum order quantity), non-compliance with Good Storage and Distribution Practices (GSDP) during transport and

handling, which leads to poor quality of the product, and a prevailing preference for branded products, which are more costly.

## Survey

Following the group discussion on the prioritization of access-challenged antibiotics, participants were requested to fill out the SECURE proof-of-concept survey. The survey was designed to elicit individual feedback. It aimed to identify which specific antibiotics have access challenges in each participant's country and to pinpoint the specific barriers contributing to these challenges. The comprehensive results of this survey are available in Appendix 3.

Of the 23 participants (excluding HITAP, GARDP, and WHO), 19 completed the survey. Respondents from Southeast Asia (Thailand, Malaysia, and Lao PDR) generally indicated that the following antibiotics face significant access challenges despite their importance in treating bacterial infections: ceftazidime–avibactam, intravenous fosfomycin, and nitrofurantoin. Most respondents attributed barriers to accessing ‘Reserve’ antibiotics to high costs, difficulties in sourcing products nationally, lack of product registration, and supply chain constraints. Regarding ‘Watch’ antibiotics, respondents from Thailand reported no perceived access barriers. For ‘Access’ antibiotics, however, the main challenges identified were the lack of diagnostics to guide appropriate use and the inability of suppliers to meet national demand.


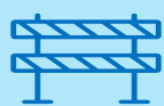

## Designing interventions for increasing access to priority antibiotics

The afternoon session of the first day began with a presentation by Dr. Alexandra Cameron, from the Antimicrobial Resistance Department of the WHO, titled “*SECURE Initiative and Opportunities to Improve Antibiotic Access in Thailand.*” Dr. Cameron outlined the mission, guiding principles, and key work areas of the **SECURE initiative**, which include:

1. Optimizing antibiotic portfolios
2. Creating efficiencies and supply security
3. Enhancing information transparency
4. Steward antibiotic delivery and access

The SECURE framework for designing access interventions was also introduced, and it is followed through a three-step process as shown in Figure 5 below.

## Identifying priority antibiotics – SECURE selection criteria

Need	Market characteristics	
		
Public health priority	Access barriers	Potential impact
<ol style="list-style-type: none"> <li>1. Aligns with the 2023 EML and the AWaRE classification* <b>and</b></li> <li>2. WHO critical pathogen and needed to treat hospitalized infections <b>OR</b></li> <li>3. Paediatrics &lt;5yrs (PADO/NNS) <b>OR</b></li> <li>4. Other high public health needs</li> </ol>	<ul style="list-style-type: none"> <li>• On patent</li> <li>• Registered</li> <li>• Shortages</li> <li>• Price</li> <li>• Acceptability</li> <li>• Suppliers (FPP and API)</li> <li>• Quality</li> <li>• Low volume/demand</li> </ul>	<ul style="list-style-type: none"> <li>• Aligns to findings of economic and impact assessment</li> <li>• Identified SECURE interventions can impact relevant access barriers</li> </ul>

\*ACCESS: Broad-spectrum, low-resistance profile; WATCH: Broad-spectrum, high resistance potential; RESERVE: last-resort for priority pathogens/MDR infections; + pooling potential is related to Reserve products where pooling is considered to be high-impact

secure 72

Figure 2. SECURE selection criteria on identifying priority antibiotics (from Dr. Alexandra Cameron presentation slides)

A case study on **ceftazidime-avibactam** in India was shared, where the patent expired in January 2023 following its initial market entry by Pfizer in 2019. The off-patent status led to the entry of multiple generic versions at roughly half the price of the innovator product. However, none of the 11 formulation manufacturers in India are currently approved by a Stringent Regulatory Authority (SRA) or WHO Prequalification (PQ), despite some companies having the capacity to produce other SRA-approved cephalosporin formulations and active pharmaceutical ingredients (APIs). In this context, potential interventions for increasing access to this antibiotic were proposed, including strategic sourcing from generic manufacturers willing to pursue quality assurance and registration in LMICs; policy updates, such as inclusion on national essential medicines lists (NEMs) and treatment guidelines; and evaluation of quality.

Following the presentation, participants raised questions about the availability of antibiotics in low-income countries as a criteria for inclusion in the WHO list of essential medicines (EML). It was emphasized that while the EML plays an important role in identifying antibiotics that should be available, it must be operationalized through coordinated implementation measures to ensure access.

The next discussion point focused on WHO’s potential role in facilitating regulatory registration through mechanisms such as WHO PQ. It was noted that while WHO plays an important role in strengthening regulatory systems and facilitating product registration through collaborative procedures, national registration is ultimately the responsibility of the manufacturer. The need for continued advocacy and stakeholders’ engagement to hold manufacturers accountable was emphasized by participants.



*Photo taken during the discussions, with virtual participation of Dr. Alexandra Cameron from WHO*

It was further discussed that access barriers vary depending on factors such as the number of suppliers, demand levels, and pricing structures, requiring tailored interventions in different contexts. For example, cefiderocol, manufactured by Shionogi & Co., Ltd., is covered under a voluntary licensing agreement with GARDP to enhance access, as the company itself is not actively supplying to LMICs.

The discussion concluded with the recognition that, although the process of improving access is complex, incremental and coordinated efforts can significantly improve the accessibility and availability of priority antibiotics.

### World cafe discussion on designing interventions for improving access to priority antibiotics

The second half of the afternoon session continued with a World Café, during which participants rotated across three key thematic stations focused on market-shaping interventions to improve antibiotic access. The discussions revolved around priority antibiotics such as ceftazidime-avibactam, nitrofurantoin SR, and spectinomycin, and focused on the following topics:

1. **Procurement and Supply Chain Issues**
2. **Financing Mechanisms**
3. **Product Introduction and Uptake**

Summaries of the key points and insights from each topic are presented below:

## 1. Procurement and Supply Chain Issues

The procurement discussion focused on challenges and strategies related to improving access to low-demand, low-volume antibiotics such as nitrofurantoin SR, ceftazidime-avibactam, and spectinomycin that were identified from the morning group discussion.

### Product-Specific Highlights:

- **Nitrofurantoin SR:** Not currently registered in Malaysia or Thailand; its price is significantly higher than that of broad-spectrum antibiotics.
- **Ceftazidime-avibactam:** Registered in Sri Lanka but not in Lao PDR.
- **Spectinomycin:** Not registered in Thailand, and the discomfort during injection discourages use by both prescribers and patients.

Key Procurement Challenges and Strategies:

**Market Entry for Low-Demand Products:** When industry shows limited interest, governments may need to take the lead.

- Example: In Brunei Darussalam, the government oversees importation and procurement, using a reliance mechanism based on regulatory approvals from Singapore and Malaysia to ensure product quality.

**Regulatory Flexibility:** Countries such as Sri Lanka, Lao PDR, Malaysia, and Thailand allow special import pathways or waivers for unregistered products based on public health needs.

- WHO prequalification is often a pre-requisite for fast-track or reliance pathways.
- Previously, International Council for Harmonisation Stringent Regulatory Authority criteria (ICH SRA) were used; however, WHO now uses maturity levels. Countries like Malaysia also rely on Pharmaceutical Inspection Co-operation Scheme (PIC/S) member countries.

**Sustainability Issues:** Even when regulatory barriers are addressed, low demand can lead to continued limited access and high prices. Demand generation was highlighted as a critical area of focus.

### Alternative Procurement Models:

While pooled procurement was discussed, participants noted limited success to date. Joint price negotiations and coordinated/informed procurement were proposed as viable alternatives to centralized contracting models.

Echoing discussions from the morning, country perspectives highlighted similar challenges in accessing older ‘Access antibiotics’ such as Nitrofurantoin SR, which remains unregistered in Thailand, Lao PDR, and Malaysia. Limited diagnostics and suppliers’ inability to meet country-level demand hinder availability.

### **Economic and Practical Considerations:**

Narrow-spectrum antibiotics (e.g., Nitrofurantoin SR) often cost more than broad-spectrum ones. In many cases, their use also requires diagnostic testing to guide targeted treatment, which further increases the overall cost compared to the more commonly used syndromic approach with broad-spectrum antibiotics. This poses significant challenges particularly in LMICs with limited diagnostic or laboratory capacity. On the other hand,



*Photo taken during the World cafe discussion*

broad-spectrum ‘Reserve’ antibiotics such as Ceftazidime–avibactam face significant access challenges due to high costs.

Overall, while the long-term costs of AMR are assumed to be much higher, there is limited evidence and data from LMICs, highlighting a critical data gap that needs to be addressed.

### *2. Financing Mechanisms*

Participants discussed the role of **HTA**, particularly cost-effectiveness analysis, in informing pricing negotiations for antibiotic procurement. Technical discussions also highlighted the need to adjust or re-evaluate the incremental cost-effectiveness ratio (ICER) to better align with the context. The importance of a **forecasting model** was emphasized to support planning for the transition to new antibiotics. Suggestions included convening an expert panel to define use cases and estimate potential volumes.

Regarding strategies to support financial mechanisms, participants proposed options such as **managed entry agreements** or **risk-sharing arrangements**, **supplier guarantees**, and **bundled negotiations**—tailored to whether the market for a particular antibiotic is considered attractive or unattractive.

Discussions also highlighted the potential of using Nitrofurantoin SR as a pathfinder product for SECURE in Thailand, alongside real-world implementation studies to generate evidence through the approaches recommended in this session.

### 3. Product introduction and uptake

To support effective introduction, uptake, and optimal use of antibiotics, participants emphasized the need for a comprehensive and multi-faceted approach. Key strategies discussed are presented in the table below:

<p><b>Awareness and Advocacy:</b></p> <p>Raising awareness among policymakers, civil society, healthcare workers, and even pharmaceutical organizations was identified as crucial to promote responsible use and ensure uptake for new antibiotic products.</p>	<p><b>Updating Treatment Guidelines:</b></p> <p>Revising both national and local treatment guidelines to reflect current evidence and contextual needs such as empirical versus targeted use was considered a foundational step to guide appropriate prescribing practices.</p>
<p><b>Strategies to Promote Availability and Uptake:</b></p> <p>Participants highlighted the importance of aligning system-level components, including</p> <ul style="list-style-type: none"> <li>i) procurement and forecasting mechanisms to estimate required quantities,</li> <li>ii) accelerated or fast-track registration processes, and</li> <li>iii) streamlined market authorization procedures.</li> </ul> <p>These updates aim to remove delays and enable timely access to the antibiotics needed.</p>	<p><b>Monitoring and Evaluation (M&amp;E):</b></p> <p>Robust M&amp;E systems were seen as essential for ensuring quality, assessing market dynamics, and evaluating cost-effectiveness. Findings from M&amp;E should then inform ongoing system improvements and policy adaptations.</p>

### Country Experiences:

- A participant from Bangladesh shared efforts to expand vaccine coverage with price negotiation and improve supply chain management.

- A participant from Malaysia also shared the HIV drug rollout as a model, highlighting policy updates, fast-track registration, budget allocation, enhanced reporting, and restricting prescribing to consultants to ensure appropriate use.

### **Barriers Identified:**

Challenges to product introduction and uptake included long registration timeframes, weak stakeholder coordination, and the lack of tailored approaches for antimicrobials compared to other medicines. One suggestion was to consider classifying antimicrobials similarly to controlled substances to allow for stricter regulation and oversight, supporting responsible use and minimizing misuse.

### **Summary and next steps from Day 1 discussions**

Overall, the first day concluded with reflections on the importance of having a coordinated strategy to improve antibiotic prioritization, demand forecasting, and establish clear pathways to guide implementation. This was reinforced by access challenges for priority antibiotics such as Nitrofurantoin SR and Ceftazidime–Avibactam, underscoring the value of coordinated action.

As next steps, HITAP will undertake a deeper assessment of Nitrofurantoin SR in Thailand context, in collaboration with GARDP, to advance evidence generation for improving antibiotic access. The team will also explore the potential for regional pooled procurement as part of this collaboration, drawing on insights from the ongoing study as described in the next session. In addition, countries and participants are encouraged to indicate their interest to participate in upcoming SECURE initiatives and/or participation in the antibiotic market-shaping working group by informing WHO and GARDP.

### **Examining regional collaboration on coordinated procurement**

The second day focused on exploring regional collaboration on coordinated procurement and the HITAP team presented the proposed study titled “Examining coordinated procurement mechanisms and related regulatory policies for healthcare products in ASEAN: case studies and lesson learned”. Inputs on the study were sought from participants, followed by country interventions on current practices and future opportunities, and a group discussion structured around identifying strengths, weaknesses, opportunities and threats (SWOT).

### *Introduction and study overview*

Achieving universal access to essential healthcare products remains a key challenge in LMICs, where disparities in access, affordability, and quality persist despite national efforts. Coordinated procurement mechanisms, where multiple buyers collaborate to improve efficiency and bargaining power, have emerged as a promising strategy to enhance equitable access to essential medicines. A study, being conducted by HITAP with support from WHO, is investigating coordinated procurement efforts within ASEAN, focusing on case studies to analyse implementation, regulatory frameworks, and key challenges to regional collaboration.

The objectives of the study are to examine key aspects of coordinated procurement and the related regulatory processes for healthcare products across ASEAN countries; identify challenges that hinder effective procurement in the region, with a particular focus on cross-country coordination efforts; and strengthen regional collaboration moving forward. The findings aim to inform future strategies to advance regional cooperation and support progress toward UHC, enshrined in the Sustainable Development Goals.

### *Methodology*

This study will employ a targeted literature review methodology to explore coordinated procurement mechanisms and related regulatory policies for healthcare products across the ASEAN region. The study will focus on a wide range of healthcare products, with particular emphasis on medicines. It will also analyse financial arrangements, stakeholder roles, regulatory challenges, and enabling or constraining factors affecting regional procurement. The geographical scope includes all ten ASEAN member states-Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam as well as Timor Leste, as applicable. Data sources will include both peer-reviewed literature from databases such as PubMed, Scopus, and Web of Science, and grey literature such as government reports, policy documents, and publications from international organizations like WHO, the World Bank, and ADB. Additional materials will include case studies and “lessons learned” reports that provide insight into practical experiences and regional collaboration efforts in healthcare procurement.

### *Analytical framework*

The analytical framework on understanding the key aspects of coordinated procurement mechanisms in ASEAN is shown in Figure 6 below. The study provides an overview of the strategic and policy context for coordinated procurement in ASEAN, highlighting key regional

frameworks such as the ASEAN Regional Reserve of Medical Supplies (RRMS) and the ASEAN Pharmaceutical Product Working Group (PPWG). The study will adopt a classification framework for coordinated procurement mechanisms based on Nemzoff et al. (2021), adapted to reflect ASEAN-specific practices and applied to a broad range of healthcare products, with particular focus on medicines. Key areas of analysis include stakeholder mapping of national and regional actors involved in procurement, exploration of financial and economic arrangements such as the COVID-19 Response Fund, and in-depth assessment of regulatory challenges including harmonization and cross-border alignment. Additional factors such as procurement infrastructure, political leadership, and operational readiness will also be considered. Case studies, for example, Initiative for Coordinated Antidotes Procurement in Southeast Asia (iCAPS)- will be included to draw lessons learned, which will inform region-specific recommendations developed collaboratively with stakeholders to support future coordinated procurement efforts in ASEAN.

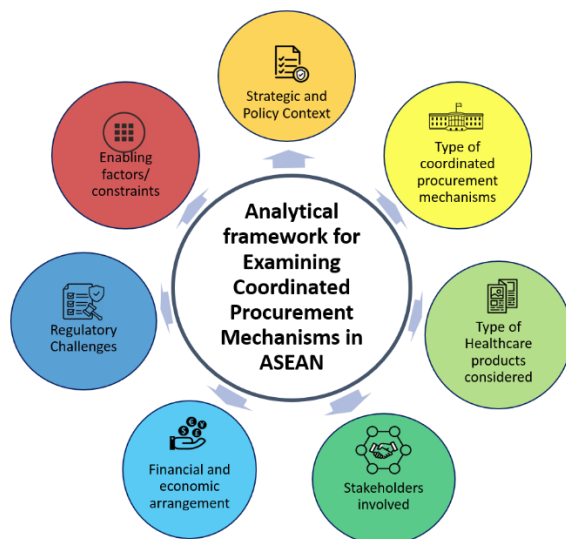


Figure 3. Analytical framework on understanding the key aspects of coordinated procurement mechanisms in ASEAN

### Stakeholder perspectives and insights

Stakeholders shared experiences and perspectives on coordinated procurement efforts highlighting significant opportunities and challenges for advancing coordinated procurement mechanisms.

Recommendations highlighted several critical considerations for strengthening regional collaboration. It was suggested that the study further explore regulatory requirements, such as labelling standards for medicines, as part of its assessment of barriers to coordinated procurement. Variations in labelling regulations across ASEAN countries can hinder cross-border distribution and delay access to essential medicines. Therefore, an in-depth analysis of regulatory harmonization efforts should be undertaken.



*Dr. Uhjin Kim sharing the perspectives and insights on the proposed study*

Past assessment of regional pooled procurement and emergency stockpiling for certain products conducted by an international organization revealed that legal and procedural barriers persist. One major challenge is the variation in procurement laws and systems across countries—each with different procurement cycles, timelines, and requirements such as competitive bidding—making regional alignment difficult. Furthermore, complex issues related to payment systems and currency pose additional barriers. Stakeholders emphasized that the benefits of pooled procurement are not uniform across all antimicrobial products. Criteria such as type of health product and its benefit of pooled procurement should be discussed. For example, high-cost, low-volume products benefit more from pooling compared to low cost, multi-sources generic antibiotics.

The stakeholder from Bangladesh shared experiences on ‘prioritizing antibiotics based on the national antibiotic consumption’, highlighting regulatory developments and utilization of AMR data for policy reform.

Then, the discussion highlighted the importance and complexity of centralized procurement, particularly in relation to national systems and regulatory alignment. Shared experiences on procurement planning practices, including the preparation of quantity forecasts for the following year based on national Essential Medicines Lists (EMLs), should be examined. Monitoring antimicrobial



*Dr. Bounxou Keohavong sharing the perspectives and insights on the proposed study*

use, particularly through practices that track consumption data and access patterns, such as the proportion of antibiotics used-e.g., 80% from the WHO Access group and 20% from other categories were discussed.

The stakeholder from Malaysia recommended having a consultation with manufacturers regarding their perspectives and the feasibility of coordinated procurement.



*Mr. Ahmed Mirza Shakeeb sharing the perspectives and insights on the proposed study*

In contexts with limited purchasing volume, leveraging support from UN agencies like UNDP and WHO was highlighted. Challenges were in demand forecasting and stock visibility despite successful COVID-19 procurement models. There was also a suggestion regarding competitive bidding based on the price and delivery of the products.

The importance of the type of products, type of responsible agencies, and integrating real-world insights like grey literature, including private sector interviews, into the study were recommended. Political dynamics, agency roles, and medicine access limitations, particularly for WHO Watch and Reserve medicines were emphasized. It is suggested to include an international pooled procurement study of Peritoneal Dialysis (PD) conducted by HITAP to understand challenges faced by public and private sectors.



*Dr. Yot Teerawattananon sharing the perspectives and insights on the proposed study*



*Dr. Dedunu Dias sharing the perspectives and insights on the proposed study*

Procurement strategies were discussed based on disease burden and treatment guidelines including 1) identifying list of pathogens for the country and region 2) identifying the molecules to treat infections 3) conducting assessments like cost effective analysis 4) determining misuse of antibiotics. Encouraging local manufacturers to supply low volume products for uninterrupted supply was emphasized and noted that regional pooled procurement may benefit from high-cost, low-volume products. It

would be important to consider exchange rate differences as well as risks when entering into such arrangements. Impact of donor funding shifts (e.g., Global Fund (GF) withdrawal from Tuberculosis programs) were also emphasized in the discussion.

Recommendations from across countries included forming dedicated procurement agencies, negotiating with manufacturers for price reductions, aligning across countries on essential medicine lists, improving national data systems on consumption and AMR, and co-developing regional strategies tailored to specific product types. For the HITAP study, interviewing stakeholders across sectors and including case-based evidence will be essential for informing practical, context-sensitive recommendations.

## Discussion on the application of coordinated procurement

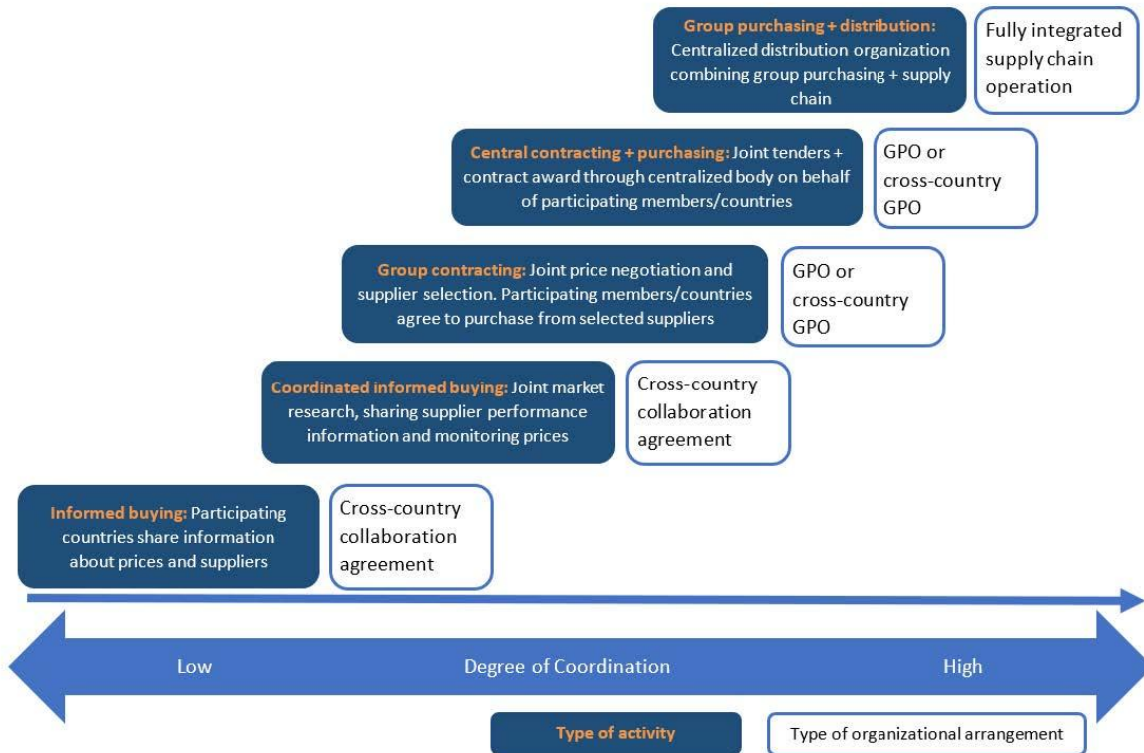


Figure 4. Different pooling activities and types of organizational agreements (Source: Nemzoff, Cassandra, Kalipso Chalkidou, and Mead Over. 2019. *Aggregating Demand for Pharmaceuticals is Appealing, but Pooling Is Not a Panacea*. Center for Global Development.)

### Summary of SWOT (Strengths, Weaknesses, Opportunities, and Threats) for coordinated procurement in ASEAN

During the discussion on the application of coordinated procurement mechanisms in the region, stakeholders were asked to identify one type of coordinated mechanism based on the types of organizational arrangements shown in Figure 7. The central contracting and purchasing arrangement as the reference model for further discussion, which was structured using a SWOT analysis. Participants were divided into four groups and asked to reflect on key elements, including organizational arrangements, stakeholder involvement, regulatory frameworks, and financial and economic considerations. The key points for each area are provided below;

**Group discussion highlights: Key strengths of central contracting and purchasing**

- Price negotiation
- Supply Security
- Harmonization of regulatory standards
- Alignment of procurement systems
- Equitable distribution
- Improving system integration and policy coherence

**Strengths:** Centralized contracting was recognized as a potentially impactful and sustainable approach, particularly in terms of price negotiation and supply security. While it is not the easiest to implement, participants noted that with central contracting and purchasing ability to foster harmonization of regulatory standards, align procurement systems, and ensure equitable distribution of essential health commodities. The mechanism was also seen as a catalyst for improving non-price elements, such as system integration and policy coherence. High-level political commitment, particularly from ministries, was deemed

essential to strengthen negotiation power. However, stakeholders acknowledged that engaging the private sector through this mechanism would be challenging. The procurement of low-volume products from international suppliers could also be perceived as competition by local manufacturers. Organizations such as GARDP and PAHO were mentioned as potential catalysts for taking on external roles in the system, and participants highlighted the availability of capital to support initial implementation.

**Group Discussion Highlights: Weaknesses of central contracting and purchasing**

Diversity procurement systems	Varied Regulatory capacities across countries	Complexity in regulatory harmonization
Different funding/ financial mechanisms	Quality concerns	National sovereignty concerns

**Weakness:** Despite these strengths, weaknesses were identified. The diversity of procurement systems and regulatory capacities across countries presents a major challenge. As a more practical starting point, stakeholders proposed initiating group contracting and using tested models to gradually transition toward central contracting. Regulatory harmonization remains

complex, and additional barriers include bureaucratic inefficiencies, rigid stock management systems, and poor coordination in stockpiling and distribution, especially

during shortages. Practical issues such as delays with donor-funded medicines were also highlighted. Participants noted the difficulties faced by countries transitioning from donor-funded procurement to domestic funding, particularly regarding the purchase of WHO-pre-qualified products. These transitions often lead to reduced quality oversight, as national procurement systems do not always prioritize quality. Other challenges included currency fluctuations, administrative costs, limited legal adaptability, and concerns over national sovereignty.

**Opportunities:** Opportunities for strengthening coordinated procurement were also discussed. Shared risk, policy harmonization, and mechanisms such as centralized payment and shared stockpiling strategies were seen as entry points for improving regional collaboration. Geopolitical shifts could allow new actors, including ASEAN, to play a more significant role. Participants emphasized the importance of expanding partnerships with donors, NGOs, philanthropic organizations, and leveraging financial instruments like revolving funds and emergency reserves. Most notably, country-led initiatives to mobilize domestic resources were seen as essential, particularly for addressing pressing issues such as antimicrobial resistance. A notable example from Sri Lanka demonstrated how countries with limited purchasing power could request global procurement entities (e.g., Global Fund) to manage purchases on their behalf, using domestic funds. This model could help ensure quality and affordability even for small-volume countries.

**Group discussion highlights:  
Opportunities of Central contracting  
and purchasing**

- Shared risk and policy harmonization
- Centralized payment mechanisms
- Shared stockpiling strategies
- Strengthened regional collaboration
- Use of financial tools (revolving funds, emergency reserves)

**Group discussion highlights: Threats of central contracting and purchasing**

- Concerns around transparency, governance, and regulatory fragmentation
- Resistance from national agencies and ministries, providers and manufacturers
- Country heterogeneity, both in legal frameworks and procurement priorities

**Threats:** Nevertheless, a number of threats were identified that could undermine regional coordinated procurement efforts. Concerns around transparency, governance, and regulatory fragmentation were prominent. Resistance from national regulatory agencies, procurement committees, ministries of finance, and service providers could hinder implementation. Manufacturers might also resist participation due to reduced pricing power and market control. Varied levels of post-marketing surveillance and regulatory standards across countries were seen as barriers to

ensuring consistent quality. In addition, differing economic conditions, reliance on donor support, and the potential for reductions in external funding threaten the sustainability of pooled procurement. Country heterogeneity, both in legal frameworks and procurement priorities, further complicates alignment and long-term viability.



*Dr. Rahela Ambaras Khan (Ministry of Health, Malaysia) and Dr. Bassim Zayed (World Health Organization South-East Asia Regional Office) discussed SWOT analysis for coordinated procurement.*

**Next steps from Day 2 discussions**

On the topic of a regional coordinated procurement mechanism, discussions revealed notable variations in regulatory frameworks and in the availability of quality-assured priority antibiotics. The HITAP team will incorporate feedback received from stakeholders for the study on coordinated procurement. Stakeholders expressed support for both the value and

methodological approach of the coordinated procurement study. Moving forward, the study team will continue to engage stakeholders to gather further insights and share findings, to strengthen regional access to essential health products through collaborative procurement strategies.

## Conclusion

In summary, this two-day meeting highlighted critical issues surrounding the irrational use of antibiotics, market structure, registration and supply chain challenges, surveillance gaps, and cost considerations, all of which play a role in improving access to antibiotics. The SECURE initiative was presented as a targeted approach to address these issues, identifying tailored interventions for different types of antibiotics.

To advance this work and foster long-term collaboration, SECURE is launching a Market Shaping Working Group (MSWG) to implement targeted interventions that address inefficiencies in the antibiotics market. The MSWG will center its work around market intelligence sharing, strategic sourcing, and coordinated procurement, aiming to strengthen coordination among countries and support cross-regional collaboration. For future collaborations, the group requested expressions of interest from participating countries and also share the plan on including other South Asian countries such as India and Nepal in SECURE initiative.

## Appendix

### 1. Agenda

#### Objectives

Building on ongoing efforts to develop key intervention areas for SECURE, this meeting will focus on core market shaping activities and partnerships related to a proof-of-concept within Thailand and will:

- Outline SECURE’s key objectives and interventions.
- Understand current challenges related to access and identify priority antibiotics in Thailand.
- Explore market shaping interventions most suited to improve access to these antibiotics;
- Identify key stakeholders for implementation of these interventions and to foster collaboration for long-term engagement.

In addition, the meeting will explore the potential for regional collaboration on pooled procurement and seek inputs on a proposed study on the topic.

#### Expected Outcomes

- Priority antibiotics for access in Thailand identified
- Increased understanding of access barriers to identified priority antibiotics related to market characteristics in Thailand
- Potential sets of interventions for identified priority antibiotics in Thailand
- A core team of stakeholders or “SECURE working group” to develop the interventions further.
- Inputs for study on regional collaboration on pooled procurement

#### Language

This meeting will be conducted in both Thai and English. An interpreter (English to Thai and vice versa) will be available on 7 July 2025.

**Date:** 7-8 July 2025

**Location:** Millenium Hilton Bangkok, Level M, Thonburi Ballroom

#### Agenda

**Chairperson:** Aye Nandar Myint

Master of Ceremonies (MC): Dr. Shiela Marie Selisana

Time	Agenda items	Responsible person(s)
<b>Day 1</b>		
8.30-9.00 (30 mins)	Registration	
9.00-9.05 (5 mins)	Welcome and announcements	Mr. Jean Michel Piedagnel, GARDP
9.05-9.10 (5 mins)	Opening Remarks	Dr. Suwit Wibulpolprasert, Ministry of Public Health, Thailand ( <b>Virtual</b> )
9.10-9.15 (5 min)	Objectives of the meeting	Dr. Bassim Zayed, WHO SEARO
9.15-9.30 (15 mins)	Introductions	Facilitator: Dr. Shiela Marie Selisana, HITAP
<b>Part I: Overview of antibiotic access in Thailand and identifying priority antibiotics with access challenges</b>		
9.30-9.50 (20 mins)	Overview of antibiotic use and resistance in Thailand <ul style="list-style-type: none"> <li>• Epidemiological need</li> <li>• Priority antibiotics</li> <li>• Access challenges</li> </ul>	Dr. Aye Nandar Myint, HITAP  Ms. Kakanang Tosanguan, Food and Drug Administration, Thailand
9.50-10.10 (20 mins)	Discussion on antibiotics access challenges	Moderator: Dr. Yot Teerawattananon, HITAP
10.10-10.30 (20 mins)	Summary of antibiotic prioritization process in Malaysia	Dr. Rahela Ambaras Khan, Ministry of Health, Malaysia
10.30-10.45 (15 mins)	Short survey on priority antibiotics and access challenges	All participants  Facilitator: HITAP
10.45-10.50 (5 mins)	Group Photo Session	

<b>Time</b>	<b>Agenda items</b>	<b>Responsible person(s)</b>
10.50-11.05 (15 mins)	Break	
11.05-12.05 (60 mins)	<p>Group discussion: Identifying priority antibiotics and access-challenges in respective countries</p> <ul style="list-style-type: none"> <li>• List of currently available antibiotics</li> <li>• Criteria to prioritise antibiotics</li> <li>• Access challenges</li> </ul>	<p>Main Facilitator:</p> <p>Dr. Shiela Marie Selisana, HITAP</p> <p>(Guiding questions were shared in advance with the participants)</p>
12.05 – 12.35 (30 mins)	Report back	
12.35-13.45 (70 min)	Lunch	
<b>Part II: Designing interventions for increasing access to priority antibiotics</b>		
13.45-14.15 (30 mins)	<p>SECURE initiative overview and opportunity to improve access in Thailand and countries present.</p> <p>Q&amp;A</p>	<p>Dr. Alexandra Cameron, WHO <b>(Virtual)</b></p> <p>Dr. Jennifer Cohn, GARDP</p>
14.15-15.30 (75 mins)	World Café: Designing interventions for the priority antibiotics:	<p>Facilitators:</p> <p>Dr. Jennifer Cohn, GARDP</p> <p>Dr. Uhjin Kim, WHO SEARO</p> <p>Dr. Bassim Zayed, WHO SEARO</p>
15.30-15.45 (15 mins)	Break	
15.45 – 16:15 (30 mins)	Reporting on group work	All participants

<b>Time</b>	<b>Agenda items</b>	<b>Responsible person(s)</b>
16.15-16.25 (10 mins)	Summary and next steps	Facilitators: Ms. Saudamini Dabak, HITAP
16.25-16.30 (5 mins)	Closing	Dr. Yot Teerawattananon, HITAP
<b>Day 2</b>		
<b>Part III: Examining regional collaboration on coordinated procurement</b>		
8.30-9.00 (30 mins)	Registration	
9.00-9.05 (5 mins)	Welcome and announcements	Dr. Uhjin Kim, WHO SEARO
9.05-9.15 (10 mins)	Recap of Day 1 discussion	Dr. Shiela Marie Selisana, HITAP
9.15-9.45 (30 mins)	Introduction to coordinated procurement and overview of proposed study on key aspects of coordinated procurement and related regulatory challenges	Dr. Aye Nandar Myint, HITAP Dr. Zin Nwe Win, HITAP
9.45-10.55 (70 mins)	Perspectives on proposed study: <ul style="list-style-type: none"> <li>• Feedback on the framework</li> <li>• Experiences with coordinated procurement (if applicable) or any suggestions</li> </ul>	Representatives (5-7 mins)
10.55-11.10 (15 mins)	Break	

Time	Agenda items	Responsible person(s)
11.10-11.20 (10 mins)	Initiatives on increasing access to paediatric antibiotics, including through coordinated procurement	Dr. Martina Penazatto, WHO <b>(Virtual)</b>
11.20-12.20 (60 mins)	Discussion on application of coordinated procurement for the region & summary and next steps	Facilitators: Ms. Saudamini Dabak, HITAP and Ms. Lapad Pongcharoenyong, HITAP
12.20-12.30 (10 mins)	Closing	Dr. Yot Teerawattananon, HITAP
<b>End of meeting</b>		

## 2. List of participants

*Participants for this two-day meeting have been listed alphabetically, by day, organized by participants from Thailand, internationally (for Day 1), and those joining virtually. Participants from HITAP, who will be joining on both days, have been listed at the end.*

**7 July 2025, 09.00 – 16.30 hrs**

NO.	Name-Surname	Organization
<b>Participants from Thailand</b>		
1	Dr. Direk Limmathurotsakul	Mahidol Oxford Tropical Medicine Research Unit
2	Mr. Harald Sprenger	Pharmaceutical Research and Manufacturers Association
3	Dr. Inthira Suya	Access and Delivery Partnership, United Nations Development Programme
4	Ms. Onsiri Srikun	Government Pharmaceutical Organization
5	Mr. Jiraboon Tosanguan	European Association for Business and Commerce
6	Dr. Jirawat Bupphanharun	Chulabhorn Hospital

<b>NO.</b>	<b>Name-Surname</b>	<b>Organization</b>
7	Ms. Kakanang Tosanguan	Food and Drug Administration
8	Dr. Nakorn Premsri	National Vaccine Institute
9	Mr. Napatr Kunachitpimol	European Association for Business and Commerce
10	Ms. Nongtanya Sooksapsee	Private Hospital Association of Thailand
11	Ms. Nuchaporn Srichantapong	International Health Policy Foundation
12	Ms. Nuntiya Somjetanakul	Food and Drug Administration
13	Mr. Panu Wijagkanalan	Private Hospital Association of Thailand
14	Assoc. Prof. Pinyo Rattanaumpawan	Infectious Disease Association of Thailand
15	Mr. Ranai Sairuk	National Health Security Office
16	Dr. Rossaphorn Kittiyaowamarn	Department of Disease Control, Ministry of Public Health
17	Dr. Suwit Wibulpolprasert ( <i>virtual</i> )	Ministry of Public Health
<b>International Participants</b>		
18	Mr. Ahmed Mirza Shakeeb	Ministry of Health, Maldives
19	Dr. Alexandra Cameron ( <i>virtual</i> )	World Health Organization
20	Ms. Baralee Meesukh	Drugs for Neglected Diseases Initiative
21	Dr. Bassim Zayed	World Health Organization South-East Asia Regional Office
22	Dr. Bounxou Keohavong	Ministry of Health, Lao PDR

<b>NO.</b>	<b>Name-Surname</b>	<b>Organization</b>
23	Dr. Dedunu Dias	Ministry of Health, Sri Lanka
24	Mr. Jean Michel Piedagnel	Global Antibiotic Research & Development Partnership
25	Dr. Jennifer Cohn	Global Antibiotic Research & Development Partnership
26	Ms. Konnie Bellingham	Lao Oxford Mahosot Hospital Welcome Trust Research Unit
27	Dr. Nur Sufiza Binti Ahmad	Ministry of Health, Malaysia
28	Dr. Rahela Ambaras Khan	Ministry of Health, Malaysia
29	Ms. S. M. Sabrina Yesmin	Directorate General of Drug Administration, Bangladesh
30	Mr. Tilakbabu Ramanaidu	Drugs for Neglected Diseases Initiative Southeast Asia office
31	Dr. Uhjin Kim	World Health Organization South-East Asia Regional Office
<b>Participants from HITAP</b>		
32	Dr. Arpaporn Sutipatanasomboon	Health Intervention and Technology Assessment Program Foundation (HITAP)
33	Dr. Aye Nandar Myint	Health Intervention and Technology Assessment Program Foundation (HITAP)
34	Ms. Honey Oo	Health Intervention and Technology Assessment Program Foundation (HITAP)
35	Ms. Lapad Pongcharoenyong	Health Intervention and Technology Assessment Program Foundation (HITAP)

<b>NO.</b>	<b>Name-Surname</b>	<b>Organization</b>
36	Mr. Manit Sittimart	Health Intervention and Technology Assessment Program Foundation (HITAP)
37	Ms. Onwara Doungprecha	Health Intervention and Technology Assessment Program Foundation (HITAP)
38	Ms. Piyaphat Srisoontornpanich	Health Intervention and Technology Assessment Program Foundation (HITAP)
39	Dr. Rhiannon Lee Murray	Health Intervention and Technology Assessment Program Foundation (HITAP)
40	Ms. Saudamini Dabak	Health Intervention and Technology Assessment Program Foundation (HITAP)
41	Ms. Sarinya Sakthongjeen	Health Intervention and Technology Assessment Program Foundation (HITAP)
42	Dr. Shiela Marie Selisana	Health Intervention and Technology Assessment Program Foundation (HITAP)
43	Ms. Siriyada Kitbamrung	Health Intervention and Technology Assessment Program Foundation (HITAP)
44	Mr. Teerapol Phoosongchan	Health Intervention and Technology Assessment Program Foundation (HITAP)
45	Mr. Wittawat Chatchawanpreecha	Health Intervention and Technology Assessment Program Foundation (HITAP)
46	Dr. Yot Teerawattananon	Health Intervention and Technology Assessment Program Foundation (HITAP)
47	Dr. Zin Nwe Win	Health Intervention and Technology Assessment Program Foundation (HITAP)

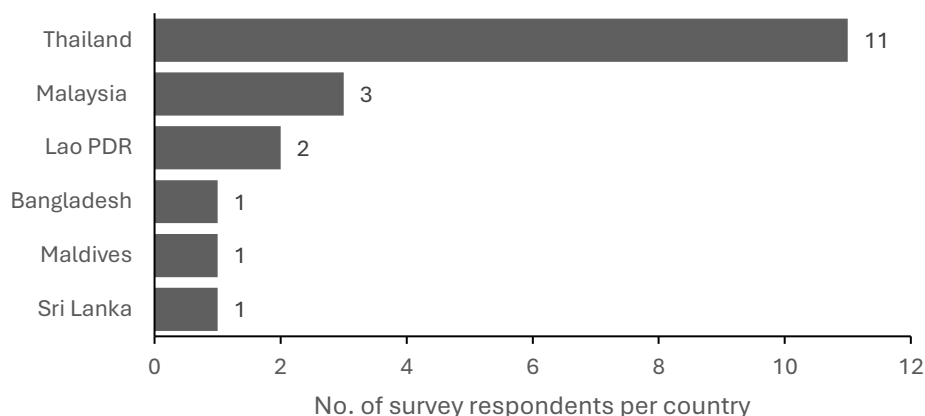
**8 July 2025, 09.00 – 12.30 hrs.**

NO.	Name-Surname	Organization
<b>Participant from Thailand</b>		
1	Dr. Inthira Suya	Access and Delivery Partnership, United Nations Development Programme
<b>International Participants</b>		
2	Mr. Ahmed Mirza Shakeeb	Ministry of Health, Maldives
3	Dr. Alexandra Cameron <i>(virtual)</i>	World Health Organization
4	Dr. Bassim Zayed	World Health Organization South-East Asia Regional Office
5	Dr. Bounxou Keohavong	Ministry of Health, Lao PDR
6	Dr. Dedunu Dias	Ministry of Health, Sri Lanka
7	Mr. Jean Michel Piedagnel	Global Antibiotic Research & Development Partnership
8	Dr. Jennifer Cohn	Global Antibiotic Research & Development Partnership
9	Ms. Konnie Bellingham	Lao Oxford Mahosot Hospital Wellcome Trust Research Unit
10	Dr. Martina Penazzato <i>(virtual)</i>	World Health Organization
11	Dr. Nur Sufiza Binti Ahmad	Ministry of Health, Malaysia
12	Dr. Rahela Ambaras Khan	Ministry of Health, Malaysia

<b>NO.</b>	<b>Name-Surname</b>	<b>Organization</b>
13	Ms. S. M. Sabrina Yesmin	Assistant Director, Directorate General of Drug Administration, Bangladesh
14	Mr. Fernando Pascual Martinez	Global Antibiotic Research & Development Partnership
15	Mr. Tilakbabu Ramanaidu	Drugs for Neglected Diseases Initiative Southeast Asia office
16	Dr. Uhjin Kim	World Health Organization South-East Asia Regional Office
<b>Participants from HITAP</b>		
17	Dr. Arpaporn Sutipatanasomboon	Health Intervention and Technology Assessment Program Foundation (HITAP)
18	Dr. Aye Nandar Myint	Health Intervention and Technology Assessment Program Foundation (HITAP)
19	Ms. Honey Oo	Health Intervention and Technology Assessment Program Foundation (HITAP)
20	Ms. Lapad Pongcharoenyong	Health Intervention and Technology Assessment Program Foundation (HITAP)
21	Mr. Manit Sittimart	Health Intervention and Technology Assessment Program Foundation (HITAP)
22	Ms. Onwara Doungprecha	Health Intervention and Technology Assessment Program Foundation (HITAP)
23	Ms. Piyaphat Srisoontornpanich	Health Intervention and Technology Assessment Program Foundation (HITAP)
24	Dr. Rhiannon Lee Murray	Health Intervention and Technology Assessment Program Foundation (HITAP)

<b>NO.</b>	<b>Name-Surname</b>	<b>Organization</b>
25	Ms. Saudamini Dabak	Health Intervention and Technology Assessment Program Foundation (HITAP)
26	Ms. Sarinya Sakthongjeen	Health Intervention and Technology Assessment Program Foundation (HITAP)
27	Dr. Shiela Marie Selisana	Health Intervention and Technology Assessment Program Foundation (HITAP)
28	Mr. Teerapol Phoosongchan	Health Intervention and Technology Assessment Program Foundation (HITAP)
29	Dr. Teerawat Wiwatpanit	Health Intervention and Technology Assessment Program Foundation (HITAP)
30	Mr. Wittawat Chatchawanpreecha	Health Intervention and Technology Assessment Program Foundation (HITAP)
31	Dr. Yot Teerawattananon	Health Intervention and Technology Assessment Program Foundation (HITAP)
32	Dr. Zin Nwe Win	Health Intervention and Technology Assessment Program Foundation (HITAP)

### 3. SECURE proof-of-concept survey results



Only 19 of 23 participants (excluding HITAP, GARDP, and WHO) completed the SECURE proof-of-concept feedback survey.

#### South Asia

To provide further context for the survey findings, a summary of responses from countries Bangladesh, Maldives, and Sri Lanka, who represent their respective Ministries of Health, are provided (one response per country).

Antibiotics that are important for treating bacterial infections and face significant access challenges (up to 5 answers)	Bangladesh	Maldives	Sri Lanka
Ceftazidime- avibactam (Reserve)			✓
Cefiderocol (Reserve)			
Ceftolozane-tazobactam (Reserve)			
Fosfomycin IV (Reserve)			
Meropenem (Watch)			✓
Azithromycin (Watch)	✓	✓	
Vancomycin (Watch)		✓	✓
Benzathine penicillin G (BPG) (Access)	✓	✓	
Gentamicin (Access)			
Nitrofurantoin (Access)			
Amoxicillin (Access)	✓	✓	
Amikacin (Access)			✓
Amoxicillin-clavulanic acid (Access)			✓

Antibiotics that are important for treating bacterial infections and face significant access challenges (up to 5 answers)	Bangladesh	Maldives	Sri Lanka
Additional answer/s:	Cefixime (oral), ceftriaxone (parenteral)	No answer	Imipenem- cilastatin

The key challenges impeding access to antibiotics in South Asia, as identified in the survey, are summarized in the table below:

Country	Access barriers of 'Reserve' antibiotics						
	High cost	Limited availability in the public sector	Challenges sourcing product nationally	Product is not registered in country	Supply chain issues including, suppliers unable to meet need	Limited uptake and demand by patients or clinicians	Lack of diagnostics to guide use
Bangladesh							✓
Maldives	✓	✓	✓				
Sri Lanka	✓	✓	✓	✓	✓		
Country	Access barriers of 'Watch' antibiotics						
	High cost	Limited availability in the public sector	Challenges sourcing product nationally	Product is not registered in country	Supply chain issues including, suppliers unable to meet need	Limited uptake and demand by patients or clinicians	Lack of diagnostics to guide use
Bangladesh	✓						✓
Maldives		✓	✓			✓	
Sri Lanka		✓	✓		✓		
Country	Access barriers of 'Access' antibiotics						
	High cost	Limited availability in the public sector	Challenges sourcing product nationally	Product is not registered in country	Supply chain issues including, suppliers unable to meet need	Limited uptake and demand by patients or clinicians	Lack of diagnostics to guide use
Bangladesh					✓		✓
Maldives		✓	✓			✓	
Sri Lanka			✓		✓		

The respondent from Bangladesh noted that there are barriers to accessing appropriate pediatric formulations of cefixime. On the other hand, respondent from Sri Lanka noted that supply chain issues constitute many challenges in ensuring access to required antimicrobials.

### Lao PDR and Malaysia

The survey responses from two participants in Lao PDR and three participants in Malaysia are aggregated and summarized in the table below:

Antibiotics that are important for treating bacterial infections and face significant access challenges	Lao PDR (2 respondents)	Malaysia (3 respondents)
Ceftazidime- avibactam	✓	✓
Cefiderocol	✓	✓
Ceftolozane-tazobactam	✓	✓
Fosfomycin IV	✓	✓
Meropenem		
Azithromycin		✓
Vancomycin	✓	
Benzathine penicillin G		
Gentamicin		
Nitrofurantoin	✓	✓
Amoxicillin		
Amikacin		
Amoxicillin- clavulanic acid	✓	
Additional answer/s:	Ceftazidime; There should be monitoring of gentamicin and vancomycin	Nitrofurantoin SR, Aztreonam IV

The two respondents from Lao PDR both agreed these antibiotics are important and access-challenged: ceftazidime-avibactam, cefiderocol, and vancomycin. On the other hand, three respondents from Malaysia all agreed that ceftazidime-avibactam, cefiderocol, ceftolozane-tazobactam, and nitrofurantoin are important and have access challenges.

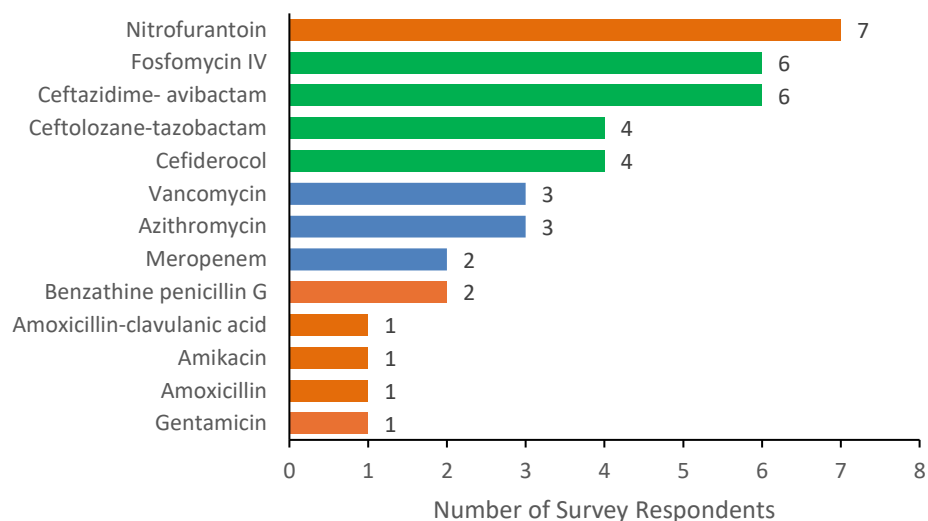
The key challenges impeding access to antibiotics in Lao PDR and Malaysia, as identified by the survey, are aggregated and summarized in the table below:

Country	Access barriers of 'Reserve' antibiotics						
	High cost	Limited availability in the public sector	Challenges sourcing product nationally	Product is not registered in country	Supply chain issues including, suppliers unable to meet need	Limited uptake and demand by patients or clinicians	Lack of diagnostics to guide use
Lao PDR (n = 2)	✓	✓	✓	✓	✓		✓
Malaysia (n = 3)	✓		✓	✓	✓	✓	✓
	Access barriers of 'Watch' antibiotics						
	High cost	Limited availability in the public sector	Challenges sourcing product nationally	Product is not registered in country	Supply chain issues including, suppliers unable to meet need	Limited uptake and demand by patients or clinicians	Lack of diagnostics to guide use
Lao PDR (n = 2)	✓	✓	✓	✓	✓		✓
Malaysia (n = 3)	✓		✓	✓	✓		✓
	Access barriers of 'Access' antibiotics						
	High cost	Limited availability in the public sector	Challenges sourcing product nationally	Product is not registered in country	Supply chain issues including, suppliers unable to meet need	Limited uptake and demand by patients or clinicians	Lack of diagnostics to guide use
Lao PDR (n = 2)	✓	✓	✓	✓	✓		✓
Malaysia (n = 3)			✓	✓	✓		✓

The respondents from Lao PDR noted that first line antibiotics are appropriate for treatment use in their country, but there are barriers to accessing appropriate pediatric formulations of vancomycin. Challenges related to proper storage (e.g. refrigeration) of pediatric suspensions persist in rural areas as well. The respondents from Malaysia noted that there are barriers to accessing appropriate pediatric formulations of the following antibiotics: ampicillin/sulbactam syrup, gentamicin, and some antibiotics need to be in oral form.

## Thailand

Survey responses from Thailand are summarized below:



### Appendix Figure 1. Number of survey respondents who identified specific antibiotics as both crucial for treating bacterial infections and facing substantial access challenges.

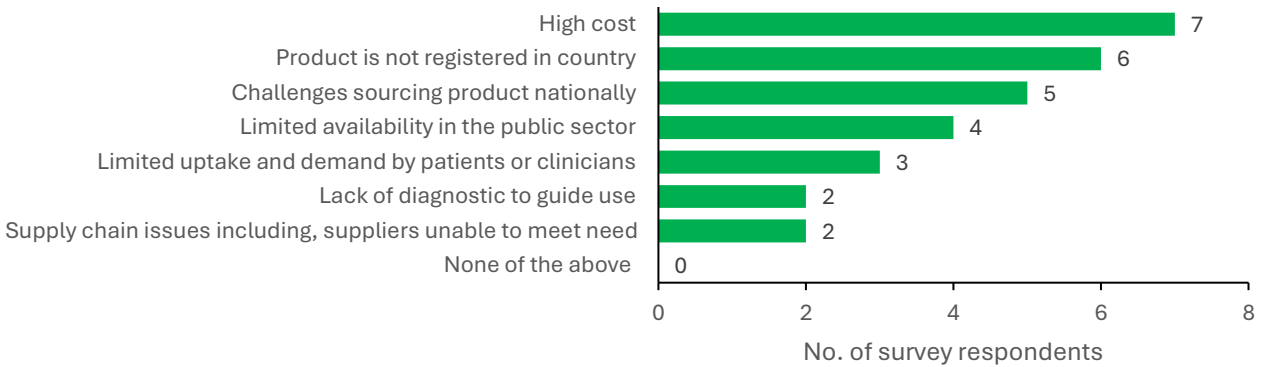
Respondents had the option to select up to five antibiotics. Orange bars denote 'Access' antibiotics, green bars represent 'Reserve' antibiotics, and blue bars indicate 'Watch' antibiotics.

#### Key Antibiotics with Access Challenges in Thailand

A majority of Thai respondents (7 out of 11, or 64%) identified **nitrofurantoin** as the top antibiotic among 13 selected with considerable access challenges despite its importance in treating bacterial infections. This was closely followed by **intravenous fosfomycin** and **ceftazidime-avibactam**, each noted by 6 out of 11 respondents (55%).

Furthermore, three respondents cited spectinomycin as another essential antibiotic experiencing access difficulties. Colistin and tigecycline were each mentioned by two respondents in this context, while individual respondents highlighted linezolid, aztreonam, piperacillin/tazobactam, and drugs specifically for multidrug and extensively drug-resistant tuberculosis (M/XDR-TB) as similarly challenged but vital.

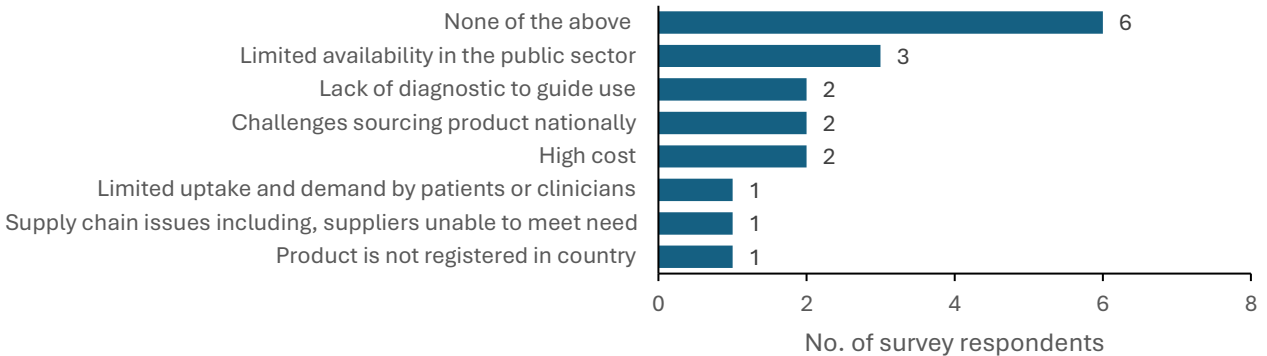
### Access Barriers of 'Reserve' antibiotics



**Appendix Figure 2. Access barriers of ‘Reserve’ antibiotics.** Respondents can have multiple answers.

Majority of the respondents state that high cost (7 of 11, 64%) and absence of registered products (6 of 11, 55%) are the main barriers for accessing reserve antibiotics.

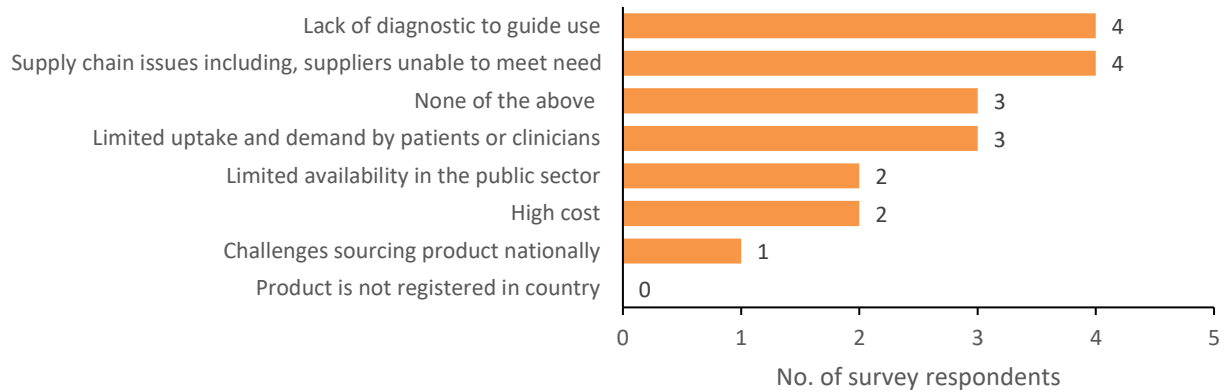
### Access Barriers of 'Watch' antibiotics



**Appendix Figure 3. Access barriers of ‘Watch’ antibiotics.** Respondents can have multiple answers.

Fifty-five percent of the respondents (6 of 11) believed that there were no access issues for ‘Watch’ antibiotics in Thailand, while only three believe that ‘Watch’ antibiotics have limited availability in the public sector. On the other hand, 36% of respondents (4 of 11) believed that there was a lack of diagnostics to guide the use of ‘Access’ antibiotics and that these categories of antibiotics often have supply chain issues where suppliers are not able to meet the demand.

### Access Barriers of 'Access' antibiotics



**Appendix Figure 4. Access barriers of ‘Access’ antibiotics.** Respondents can have multiple answers.

Thai respondents highlighted that there are access barriers for pediatric formulations of the following antibiotics: gentamicin, amikacin, and rifampicin. One respondent mentioned that the FDA process to get the new drug is complicated and long, and that there is a stringent regulatory restriction in the production of antibiotics.