Framework to assess and promote domestic financing for health policy and systems research in Southeast Asia

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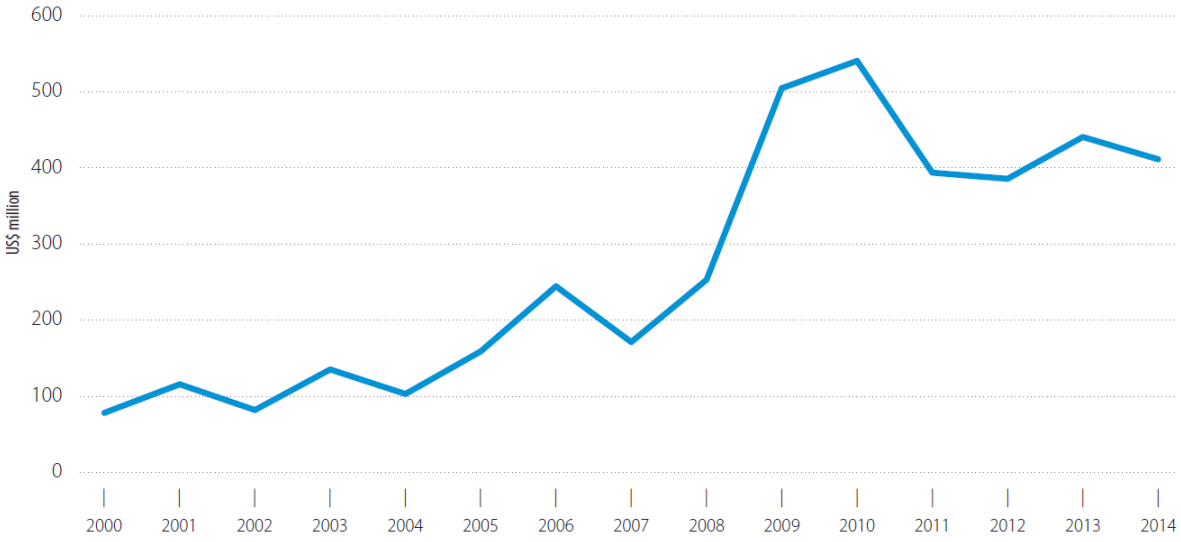
1. Background

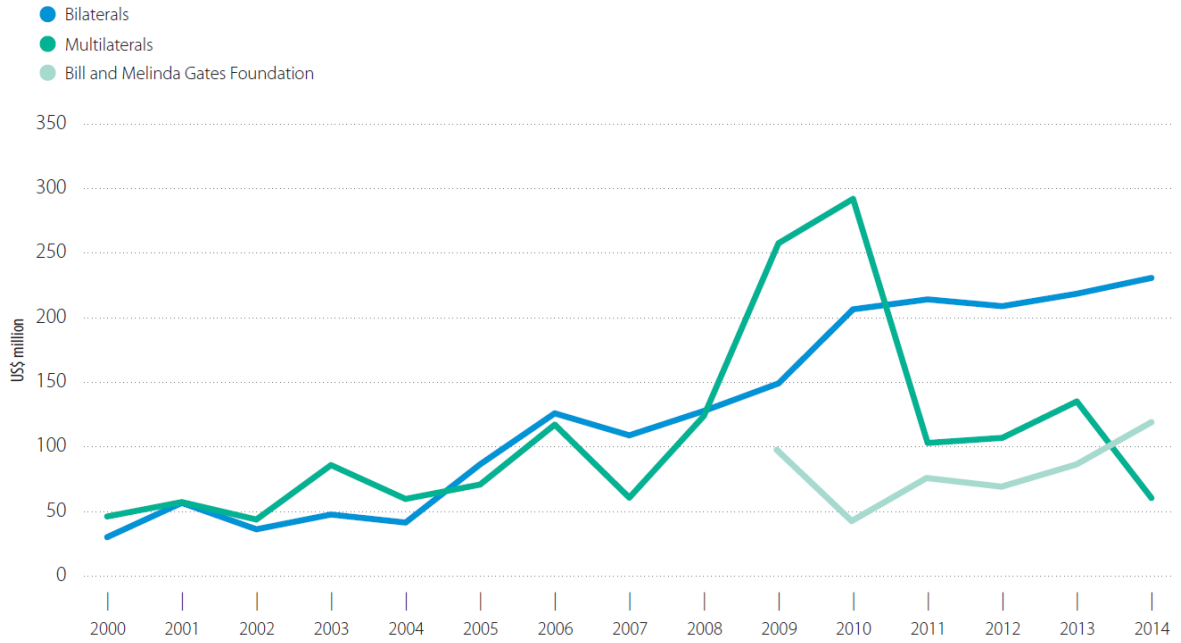
Health policy and systems research (HPSR) investigates the relationship between health policy and systems and determinants of health to improve population health. HPSR is essential to develop health systems that function efficiently and equitably and achieves national health objectives.

Among the health research community, HPSR is perceived as relatively new and evolving field. In fact, the definition of HPSR is not universal but varies widely among health researchers even after approximately thirty years of its initial emergence (Hafner & Shiffman, 2013). One of the definitions for HPSR is provided by Alliance for Health Systems Research (hereafter "the Alliance"). According to the Alliance, HPSR is a field that "seeks to understand and improve how societies organize themselves in achieving collective health goals, and how different actors interact in the policy and implementation processes to contribute to policy outcome" (WHO, 2020). HPSR's value in generating evidence for policy initiatives aimed at informed decision making and strengthening a country's health system has been increasingly recognized, especially among the low- and middle-income countries given relatively higher resource constraints (Koon et al., 2013; Mathur et al., 2021).

One of the enabling factors of HPSR is sufficient, sustained, and designated funding. In low- and middle-income countries (LMICs), the HPSR funding has increased over time largely due to donor support, as presented in Figure 1 and Figure 2. The donor funding for HPSR in LMICs rapidly increased in 2000s, from approximately 80 US million dollars in 2000 to 400 US million dollars in 2014 (Figure 1). Top donors included the United States, the Global Fund, the World Bank, and the Bill and Melinda Gates Foundation (Lamba et al., 2021). However, HSPR still remains underfunded in LMICs compared with other types of health research, such as clinical trials. And only a few countries have earmarked HPSR budgets or designated research institutions for HPSR. According to a recent study, less than 2% of donor funding for global health activity between 2010 and 2014 was allocated to HPSR (Grépin et al., 2017; Kentikelenis et al., 2023).



[Figure 1] Trend in donor funding for HSPR in LMICs between 2000 and 2014 (Source : English & Pourbohloul, 2016)



[Figure 2] Trend in donor funding for HPSR in LMICs between 2000 and 2014 by donor types
(Source : English & Pourbohloul, 2016)

Although limited allocation of donor funding to HPSR is problematic, further concern is raised regarding the source of funding. Given very low overall funding level, international donor funding is certainly beneficial to LMICs. However, domestic funding is fundamental to aligning HPSR priorities with local needs. Additionally, it may increase responsiveness of the HPSR project to local needs and favor strengthening local research capacity. Reliance on international donors also may increase the risk of erratic funding. However, according to a study by Bennet et al. (2008), only 15.2% and 44.2% of total funding for HPSR in low- and middle-income countries, respectively, were funded by the national government in 2008.

Our study aims to develop a framework to assess and promote domestic financing mechanisms for HPSR in Southeast Asia to enhance locally driven and evidence-based policymaking. This study will focus on Thailand and Vietnam, to develop and validate the framework to uncover the challenges and opportunities for domestic funding pathways. Especially, Thailand is one of the very few known countries with an explicit budget and political commitment to government funding for HPSR (Mathur et al., 2021). Our framework will contribute to assessing the potential to improve domestic funding sources by elaborating on opportunities and challenges faced by Health Policy and System Research institutions (HPSRIs). Literature and country cases on funding pathways, facilitators, and barriers for HSPR have been reviewed to develop prototype framework.

First section of this paper outlines the study methods. Our study employed mixed methods, combining a desk review for prototype framework development and field interviews for gathering both qualitative and quantitative information to develop the final framework to assess domestic financing in Southeast Asia. In the second section, as results of the desk review, the states of HPSR, HPSRI, and funding for HPSR in Asia, with particular emphasis on two countries - Vietnam and Thailand – are presented. In the third section, the prototype framework

and the survey to assess domestic funding for HPSR in Southeast Asia are presented. In the fourth section, we present the results of expert interview and surveys. In the fifth section, the final version of framework, incorporating the lessons learned from expert interview and survey, is presented. In the last section, key findings are summarized and implication for application of our framework to other countries in the region is discussed.

2. Study methods

Our study employed mixed methods design. Following in-depth desk reviews to develop the prototype framework, series of interviews with experts in HSPR from Vietnam and Thailand were conducted to assess the states of HSPR, HSPRIs, and domestic financing for HPSR in the region. We aimed to gather both qualitative and quantitative information during the interviews.

Our team visited Vietnam and Thailand from February 2nd to 8th to conduct expert interviews to assess status of domestic financing for HPSR and the prototype framework developed by the team. In total, the team undertook six key informant interviews – two in Vietnam and four in Thailand – with key policy makers, leading academics, and senior researchers in health system and policy. The interviews are conducted face-to-face in sites of the institution that the interviewee is associated with.

The interviewees selected for this study belong to diverse institutions - universities, government agency, research institute, and semi-autonomous research institute, as presented in Table 1. In each interview, the interviewees were asked to comment on the framework and the survey questionnaires, to elaborate on status of HPSR and financing for HPSR in the country.

	Dates	Number of interviewees	Type of HPSRI interviewees were associated with
Vietnam	2023.02.02. ~ 2023.02.03.	2	University and public research institute
Thailand	2023.02.06. ~ 2023.02.08	4	Universities and public research institute

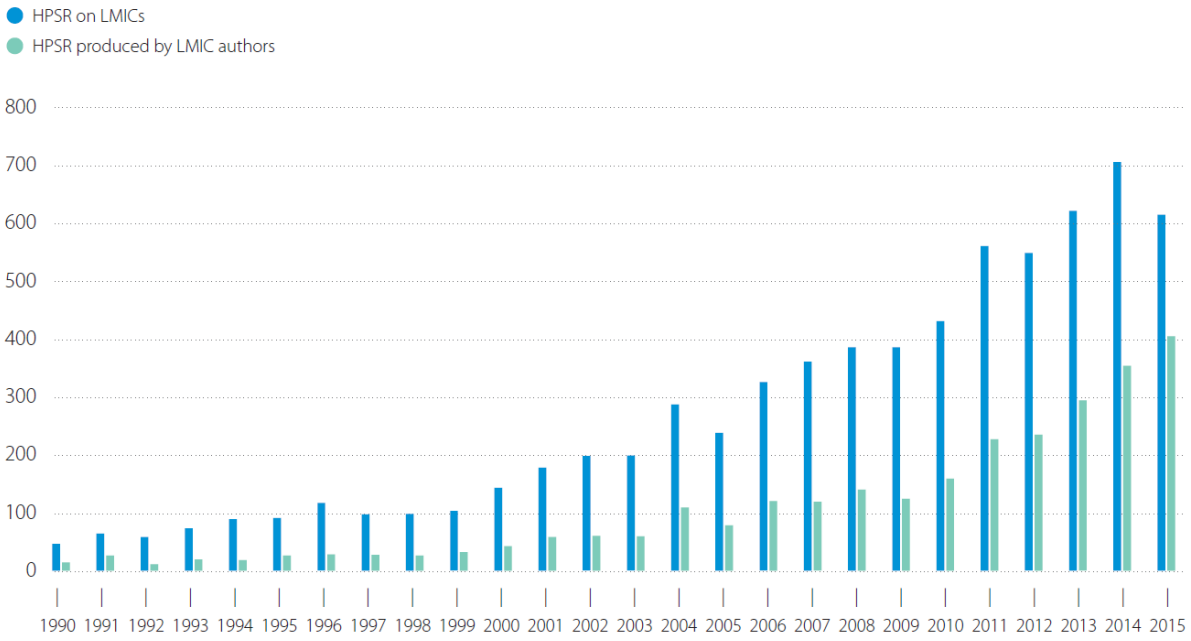
[Table 1] Composition of interview participants from Vietnam and Thailand

Additionally, a survey was distributed among the interview participants and HPSR experts in the region. The survey included 30 questionnaires on the following aspects of funding for HPSR – infrastructure and legislation, funding scale, funding allocation, HPSRIs, and impact of HPSR. The survey design will be discussed in detail in the respective section of the report.

Findings from the interviews and survey were incorporated in the revised and final framework to assess and promote domestic financing for HPSR. Finally, learnings from our study are expected to be disseminated and utilized by HPSRIs and partner organizations in the region to solicit domestic funding and to advocate for public resources.

3. HPSR, HPSRIs, HPSR funding in Asia

Since its emergence, the annual number of HPSR publications increased five-fold between 1990 and 2015 globally. However, the rate of increase was faster for both the production of HPSR on LMICs and HPSR produced by authors in LMICs, as presented in Figure 3 (English & Pourbohloul, 2016). In Figure 3, it is shown that the number of HPSR on LMICs increased from approximately 100 yearly in 1990s to 700 in 2014, which is seven-fold increase. Additionally, the number of HPSR by LMIC authors increased approximately from 10 yearly in 1990s to 400 in 2015, a forty-fold increase.



[Figure 3] Trend in HPSR for LMICs between 1990 and 2015 (Source : English & Pourbohloul, 2016)

There are no studies that systematically analyzed the scope of HPSR in Asia or LMICs. And as indicated by the absence of an universal definition for HPSR, the scope varied widely among the researchers and countries. For example, a recent study suggested that, among Asian countries, while health policy research is present in most countries, healthcare services research is relatively prominent in Singapore and South Korea, and health systems research in relatively prominent in the Philippines and Malaysia (Khor, 021). It is generally accepted among the HPSR community that the scope of HPSR is effectively represented by one or more of the domains of the World Health Organization (WHO)'s six health system building blocks (Decoster et al., WHO, 2010). WHO's health system building blocks was developed as an analytical framework to describe health systems, disaggregating them into six core components – leadership and governance, service delivery, health system financing, health workforce, medical products/vaccines/technologies, and health information system (WHO, 2010). In a recent study that assessed HPSR in LMICs, most researchers indicated that a focus on one building block suffices to classify their research as HPSR (Decoster et al., 2012). Although majority of topics for HPSR in LMICs are represented by the building blocks, there was a large variety, including topics such as social determinants of health, Non-Communicable Diseases, Universal Health Coverage, community participation, health system reforms, and others (Decoster et al., 2012). In our study, we aimed to explicitly discuss any country specific topics of HPSR found in field interviews in Vietnam and Thailand.

In terms of HPSRIs, we can largely classify them into institutions that provide or receive funding for HPSR. Although decision makers and funders for HPSR exist in fragmented or sporadic manner in most Asian countries, the following broad types of institutions are suggested as the main funders of HPSR – 1) central government agencies (i.e. ministry of finance, treasuries or cabinets), 2) health agencies (i.e. policy or research units in a ministry or department of health), and 3) privately funded foundations such as multilateral organizations. Additionally, the following broad categories represented HPSR implementors or HPSR funding recipients in Aisa – 1) government agencies, including health agencies previously discussed, 2) universities or research institutes, and 3) foundation or think-tanks. The evidence generated by these institutions are mainly used by central government agencies when planning national level health policies and strategies (Khor, 2021).

In Southeast Asia, multiple types of institutions were known to conduct HPSR. For 10 countries in Southeast Asia (Bangladesh, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam), approximately 50 HPSRIs were identified[1]. And for Vietnam and Thailand, six HPSRIs were identified in each country.

In Vietnam, two academic institutions (Hanoi School of Public Health and Hanoi Medical University (Institute for preventive medicine and public health)), one research institute (National Institute of Hygiene & Epidemiology), one government agency (Health Strategy and Policy Institute, MOH), and one non-governmental organization (Research and Training Center for Community Development) were identified as HPSRIs. According to a recent study by the Alliance (2021), Vietnam had a national health research budget of over US$ 13 million in total between 2018 to 2020. Approximately 70% and 30% of the budget came from the Ministry of Health and the Ministry of Science and Technology, respectively (WHO, 2021).

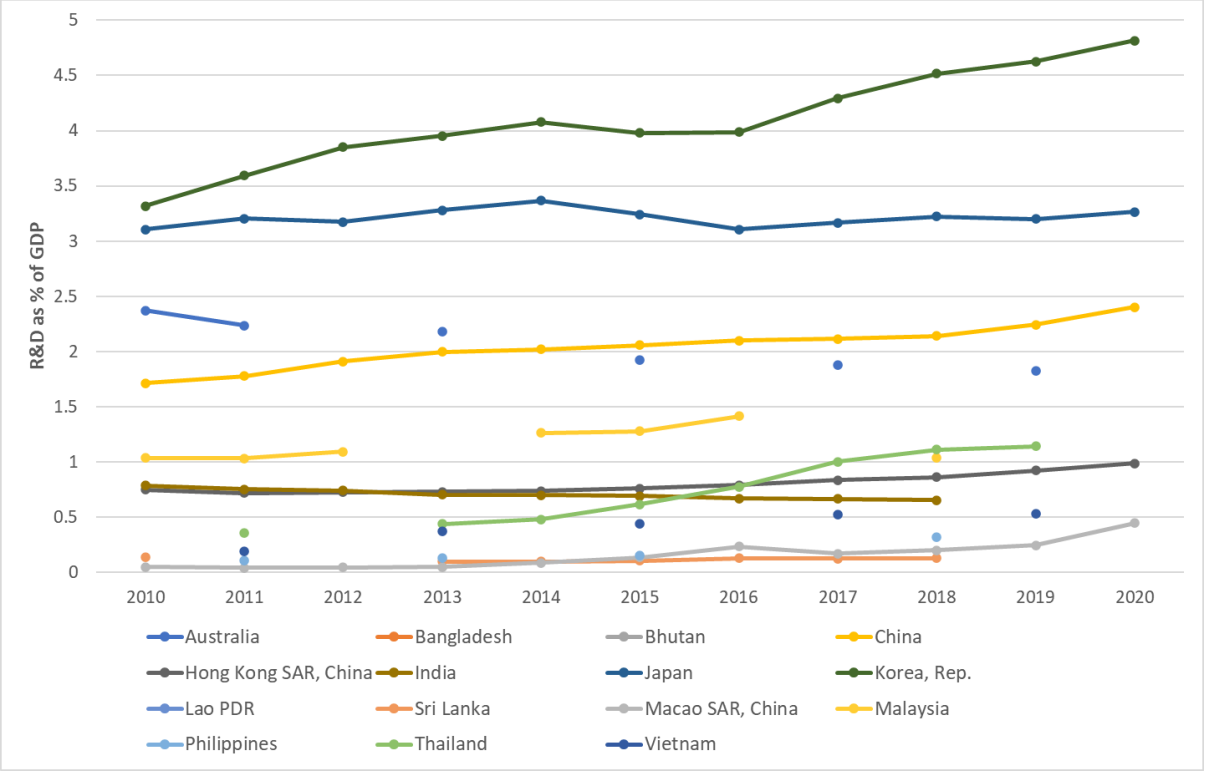
In Thailand, two academic institutions (Mahidol University (Faculty of Public Health) and Chulalongkorn University), one research institute (Health Systems Research Institute), two semi-autonomous research institutes (International Health Policy Program, IHPP and Health Intervention and Technology Assessment Program, HITAP), and one government agency (National Institute of Health Thailand) were identified as HPSRIs. And Thailand had well-established institutional structure for guiding HPSR. In Thailand, the Health Systems Research Institute was established in 1992 in accordance with the HSRI Act. Later the International Health Policy Program (IHPP) and the Health Intervention and Technology Assessment Program (HITAP) were established in 2001 and 2007, respectively. The HSRI granted US$12 million and US$13 million in 2018 and 2019, respectively, for HPSR (Mathur et al., 2021). Thailand is also the only LMIC with well-established domestic funding for HPSR in the region. Among the annual HPSR budget in Thailand, approximately 70% and 30% are from domestic sources and international donors, respectively (Mathur et al., 2021).

However, research environment and funding for HPSR are still relatively deprived in Asia. Recently, the Alliance commissioned six studies to examine the states of HPSR in each of the six WHO regions (Lambe et al., 2021; Lin et al., 2021). Together, these studies revealed several factors that undermine the value and development of HPSR in Asia and globally (Becerra-Posada et al., 2021; Gotsadze et al., 2021; Khor et al., 2021; Mathur et al., 2021;

[1] List provided by Health Systems Strengthening Accelerator based on its study conducted in 2019~2020.

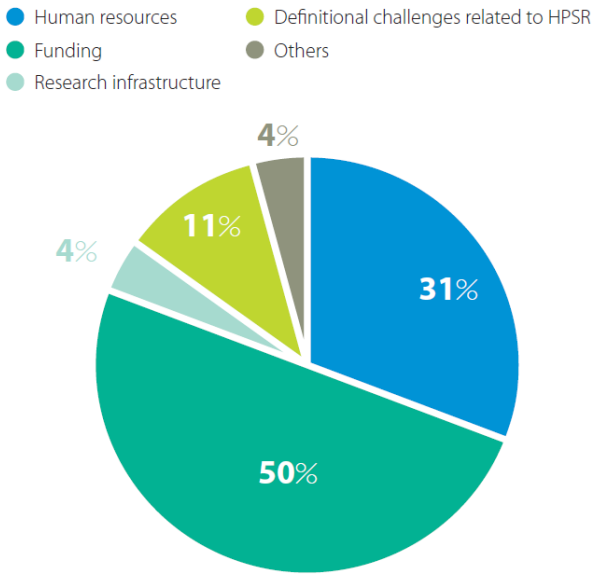
Rabbat et al., 2021; Uneke et al., 2021). First, national governments around the world highly prioritize biomedical and clinical research over HPSR. Second, there was "over-medicalization" of health research, with particular emphasis on disease and treatment-oriented healthcare (i.e., cutting-edge drug and healthcare technology), compared with health promotion and prevention. Third, there is great challenge to quantitatively identify HPSR funding, largely because of the lack of data, heterogenous definitions of HPSR, and absence of designated funding (Lin et al., 2021). For example, if a government funds a public research institution that conducts both clinical research and HSPR and research-specific data on funding is not available, which is very common, it is very unlikely that we can disaggregate the HPSR funding. Even when research-specific data is available, researchers may disagree on the classification of the research (HPSR vs. clinical research) because of heterogeneity in the definition of HPSR. With these issues in mind, we discuss the current state of HPSR in some of Asian countries in the next paragraph.

In general, there was an absence of publicly available data on funding allocations for HPSR in Asian countries, and majority of funding for health research was allocated to either biomedical or clinical research (Khor, 2021; Mathur et al., 2021). In Asia, although government financial accounts and data from multilateral organization such as World Bank Group provide some information on level of research and development (R&D) funding by category, including health, data on further disaggregated category (i.e. HPSR) is not publicly available (Khor, 2021; Mathur et al., 2021). For example, R&D spendings as percentage of GDP were approximately 4.5% in the Republic of Korea, 1% in Thailand, and 0.5% in Vietnam in 2019, as presented in Figure 4. Among the countries in Asia and Pacific, it ranged between approximately 0% and 5% between 2010 and 2020, according to World Bank Group data. HPSR experts interviewed in the forementioned studies suggested several explanations for absence of disaggregated data for HPSR – 1) HPSR funding is not yet significant enough or does not exist to be a separate budget category, 2) HPSR may be a small component of bigger clinical or public health research projects that are categorized in their respective budget categories. Both situations make isolation of HPSR-specific budget difficult. Our study investigated these issues further by gathering both qualitative and quantitative information from the HPSR expert interviews in Vietnam and Thailand.



[Figure 4] Proportion of R&D spending among the GDP in select Asian countries
(Source : The graph was constructed by the authors, based on UNESCO Institute for Statistics (UIS). UIS.Stat Bulk Data Download Service. Accessed October 24, 2022. apiportal.uis.unesco.org/bdds.)

Although sustained and designated funding is the most important determinant of HPSR in any country, there are several other barriers and facilitators of HPSR as well. Based on survey of HPSRIs, the Alliance suggested that the most serious constraint to HPSR production in LIMCs is funding, followed by human resources, classification challenges related to HPSR, research infrastructure and others, as presented in Figure 5 (WHO, 2017). More specifically, a study by Mathur et al (2021) presented barriers and facilitators of HPSR funding by the government in Asian countries. In this study, the following barriers to domestic funding are suggested – limited scientific community engaged in HPSR, insufficient capacity development in HPSR, limited calls for proposals for HPSR, and HPSR not being aligned with the priorities of health agencies. Additionally, the following facilitators of domestic funding are suggested – advanced capacity building programs for HPSR, data platforms to be utilized by researchers, intersectoral (health and non-health) implementation of HPSR, and a health policy document with a vision to implement HPSR in a sustained, prioritized, and health-for-all policies managers. These findings are incorporated in constructing the framework and field interview questionnaires in our study to qualitatively assess barriers and facilitators of HPSR in Southeast Asia.



[Figure 5] Most serious constraints to HPSR production inf LMIC (Source: WHO, 2017)

4. Prototype framework and survey to assess domestic financing for HPSR

Based on our desk review, the prototype framework and survey questionnaires were developed to assess domestic financing for HPSR in Southeast Asia. It is designed to be utilized by policymakers and academic experts to examine key stakeholders including funders and funding recipients, allocation of the fund, outcomes of HPSR, bottlenecks, and others along the funding process for HPSR. It may help HPSRIs acquire domestic financing in a timely manner and therefore encourage locally driven and evidence-based policymaking. The prototype framework and questionnaires are revised, incorporating the lessons learned from consultation with experts in Thailand and Vietnam, and presented in the next section of this report. In the following sub-sections, the prototype framework and questionnaires are discussed in detail.

4.1 Prototype framework

Figure 6 presents the prototype framework to assess domestic financing for HPSR. Items in this conceptual framework consisted of four key aspects of financing for HPSR - **research themes, stakeholders, performance or outcomes of HPSR, and core value -** and their sub-components. Each is discussed in detail in the following.

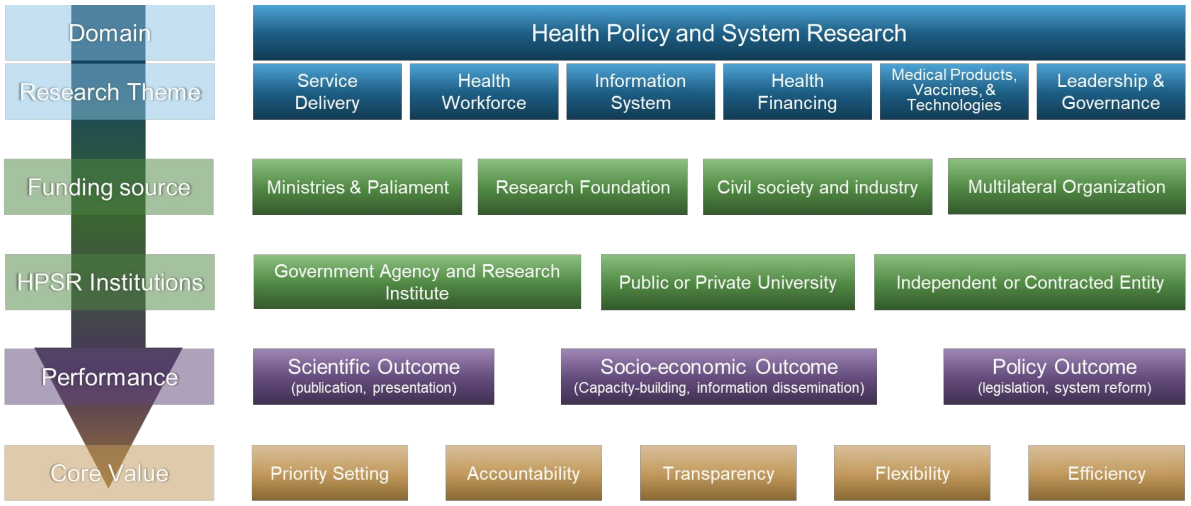
Frist, the research theme indicates scope or areas of HPSR in the country of interest. In this category, we identified six representative topics of HPSR – service delivery, health workforce, information system, health system financing, medical products/vaccines/technologies, and leadership and governance. These items are selected to be representative of the most common HPSR topics, in accordance with the six components of WHO's health system building blocks that are previously discussed. Although the majority of topics in HPSR in Southeast Asia are expected to be represented by the items in our framework, a wide range of country-specific research topics are expected to be discovered during the field interviews. Therefore, we tried to elaborate such findings in this report as well.

Second, we can distinguish two types of HPSR institutions by whether an institution provides or receives funding. Therefore, we grouped the stakeholders of HPSR into funder and funding recipient based on the funding direction. In some cases, a HPSRI can be both the funder and the funding recipient and HPSR implementor. Although HPSRIs exist in fragmented manner in most countries in Southeast Asia, these institutions can be classified into a few types of institutions (i.e., government agency, research unit in an agency, academic institution, and others). In the framework, we presented more specific and representative institution types for both the funders and funding recipients to allow ease of identification by the framework user. For funders, we identified government ministries/parliament, research foundation, civil society and industry, and multilateral organizations. Ministries and parliament include government agencies and research units that receive and channel government budgets under relevant acts. Although we expect these government agencies are central or federal government units in the region, it is possible that local level government units provide HPSR funding, as HPSR and relevant infrastructure mature in the future. Additionally, a country may also establish a separate institution that manages and channels government R&D funding, in a form of research foundation or a designated institution responsible for R&D funding in specific area of research, such as health. HPSR funding also may come from civil society, industry, and multilateral organizations. Although funding from local civil society and industry are clearly domestic in nature, funding from a multinational organization such as WHO can be regarded as domestic funding if it is funded in combination with funding from national government or other domestic

institutions. Therefore, it is necessary to examine whether fundings from national and multilateral organization are provided in combination to assess a case of multilateral organization funded project. For the funding recipients or the HPSR implementors, we identified government agency and (public and private) research institutes, public and private university, and independent research institutions. In LMICs, HPSR is often implemented by relevant government agency or a research institute within government ministry that receive funding in accordance with the government's policy priorities. Additionally, universities and independent research institutions are also prominent funding recipients, although they tend to be less dominant HPSR implementors in LMICs.

Third, in terms of performance or outcome measure for HPSR, we identified the following three indicators – scientific, socio-economic, and policy outcomes. Scientific outcome represents the tangible results of HPSR – academic journal publications, research reports, and others. The HPSR results can be also presented in a form of presentation. In fact, many of HPSR or all scientific research are not published in a form of journal publication. On the other hand, socio-economic outcome represents the intangible outcomes that are derived from HPSR results. For example, HPSR results can be used as scientific evidence base to design an education program for health systems workforce (an example of capacity building) or disseminated to the general public to improve their public health knowledge or encourage healthy behaviors of the public (examples of information dissemination and public campaign). Lastly, results of HPSR are often associated or used as evidence for legislative or health system reforms.

Fourth, we identified a few important values that the process of funding for HPSR is expected to realize – priority setting, accountability, transparency, flexibility, efficiency. Priority setting refers to how funding for HPSR is aligned with national or local government's goals in health. Accountability indicates that funding is allocated to HSPRIs in pre-determined and systematic way with a designated institution overseeing the funding process, including monitoring the use of fund. Transparency indicates that funding is allocated in open and clear manner, throughout different phases of HPSR. Lastly, flexibility and efficiency indicate the degree in which funding for HPSR takes into account the changes in the context of the research and is associated with outcomes of HPSR, respectively.



[Figure 6] Prototype framework to assess domestic financing for HPSR in Southeast Asia

4.2 Survey design

The items of prototype conceptual framework is reflected in the survey questionnaires that are developed to assess HPSR environment in Southeast Asia both quantitatively and qualitatively. The survey is designed to identify financing structure, understand the differences in stakeholders' priorities, bridge financing misalignment, and develop strategies to strengthen domestic funding for health policy and systems research. We also distributed the survey questionnaires to our interviewees and HPSR experts in the region to receive their feedback. Following the field interviews, the conceptual framework and survey questionnaires are revised, incorporating lessons learned from the interviews. The survey consists of two sections. Section A is designed to collect information on the overall structure and scale of funding HPSR to identify data gaps and basic typology. And Section B consists of qualitative questions to assess how funding sources, researchers, and research themes serve the core value and improve performance of domestic financing for HPSR.

Section A.

Section A of our survey includes questionnaires on the following topics - infrastructure and legislation, funding scale, and funding allocation. Each question asks for a short form answer (e.g., number, name, yes or no). The respondents are asked to mark *not applicable* if you find the question irrelevant or inappropriate, and mark *not accessible* if you have insufficient information to answer.

1) Infrastructure and legislation

1. Which ministry is responsible for research and development in the health sector?
2. Which organizations play a role in funding health policy and system research (HPSR)?
3. What is the extent to which government is involved in the priority and process of funding (including the private source) allocation and execution for HPSR?
4. Which laws govern R&D in the health sector?
5. Which laws govern domestic financing for HPSR?
6. To which database or statistics can you refer for domestic financing for HPSR?

2) Funding scale

7. Domestic R&D funding/expenditure on health as a percentage of GDP (%)
8. Domestic funding/expenditure on HPSR as a percentage of GDP (%)
9. Number of health policy and systems researchers (in full-time equivalent)

10. Official development assistance for medical research/basic health sectors and ODA for HPSR, respectively (in USD)

3) Funding Allocation

11. Assuming that the total HPSR fund for the past three years is 100%, what is the percentage of each funding source.

Ministries and Parliament ..... ( )

Research Foundation ..... ( )

Civil Society and Industry ..... ( )

International Organization ..... ( )

12. Assuming that the total HPSR fund for the past three years is 100%, what is the percentage of the fund allocated to each type of HPSR institution below.

Research institute ..... ( )

Public or private university ..... ( )

Independent or contracted researcher ..... ( )

Other entities ..... ( )

13. Assuming that the total HPSR fund for the past three years is 100%, what is the percentage of the budget allocated to each research theme below.

Health financing ..... ( )

Health workforce ..... ( )

Medical products, vaccines, and technologies .. ( )

Service delivery ..... ( )

Leadership and governance ..... ( )

Information system ..... ( )

Others (please specify) ..... ( )

Section B.

Section B of our survey includes questions on the HPSRI's performance regarding domestic financing for HPSR. The respondents are asked to use a 5-point scale to indicate the extent that you agree with each statement, from Strongly Disagree(1) to Strongly Agree(5) for questionnaires Q14~Q19. Additionally, Q20~Q30 are open-ended questionnaires that respondents are expected to describe in their terms. The respondents are asked to mark *not applicable* if you find the question irrelevant or inappropriate.

4) Funders' fund allocation

14. Funds are allocated to HPSR themes to achieve the goals of national-level health policy.
15. Funds are allocated to HPSR themes to investigate or discover local priorities and needs.
16. Funds are allocated to HPSR institutions according to performance.
17. The fund allocation is transparent, and its decision process is institutionalized.
18. Funds for HPSR are allocated flexibly, taking into account the change in context and policy environment.
19. The overall process of priority-setting and fund allocation is accountable.

5) Research institution

20. Describe the relative share of domestic funding source in your institution.
21. Describe major bottlenecks in terms of funding for HPSR in your country.
22. Describe the sufficiency of the funding for HPSR in your country.
23. HPSR Institutions are given autonomy in research process.
24. HPSR Institutions are expected to be accountable for research outcomes.

6) Impact of HPSR

25. Describe overall assessment of the monitoring and evaluation system for HPSR.
26. Please describe how reasonable the criteria and measures of HPSR outcomes are
27. Past and present HPSR contributes to knowledge generation (e.g., publications).
28. Past and present HPSR contributes to capacity building of policymakers, researchers, and practitioners.
29. Past and present HPSR contributes to information dissemination to the public (you can add some examples)
30. Past and present HPSR contributes to evidence-based decision- and policy- making (you can add some examples)

5. Expert interview and survey findings

Several common agenda were proposed for all six field interviews in Vietnam and Thailand. First, interviewees were asked to evaluate and give comments on the prototype conceptual framework and the survey design. Additionally, they were asked to respond to the survey electronically. Second, interviewees were asked to elaborate research environment for HPSR in each country. More specifically, we aimed to examine institutional arrangements (i.e., which or what type of HPSRIs exist and dominate HPSR in the country), operation of a HPSRI (i.e. funding, autonomy, staffing, and others), policy or system reforms relevant to HPSR, and others. Third, we tried to gather detailed information on domestic funding (i.e. absolute and relative size compare to other health research funding, distribution, managing agency, values of funding including priority setting, accountability, transparency, flexibility, and efficiency). For funding amount, we tried to collect both qualitative and quantitative information because such information is often not available to researchers outside of the finance department or is not available at all for multiple reasons (i.e. issue of funding category classification). Fourth, barriers and facilitators of domestic funding for HPSR were examined. In the following sections, interview and survey findings are summarized by each agenda.

5.1 Findings on conceptual framework and survey design

In general, the interviewees regarded the conceptual framework and survey questionnaires comprehensive to assess the states of domestic funding for HPSR in Southeast Asia. However, as our team expected, some interviewees found quantitative questions on funding difficult to answer, either because data on HPSR are non-existent, fragmented, not distinguishable from other health R&D budget (i.e., clinical studies), and not available to the public outside of the responsible government department or the domestic funding level itself is very low to generate any budget data (i.e. to have a separate or 'stand-alone' budget item). And one interviewee pointed out the lack of definitional information for HPSR and HPSRI in the survey. The interviewee pointed out that *"Be specific on what is health policy and systems research – also provide some examples. Same for health policy and services institutions"*. This response is well aligned with the results of our desk review that indicated multidisciplinary and multidimensional nature of the field, making classification of HPSR and its funding very difficult. However, such nature of HPSR also means that research can be classified as either a HPSR or non-HPSR depending on researchers. Therefore, we opted not to add any information on the definition of HPSR in our framework and survey. Instead, we advise users of the framework to provide country or region-specific general guidelines or information that can help respondents to distinguish (components of) HPSR from other types of health research such as clinical studies.

5.2 Findings on HPSR environment, including institutional roles, legislative environment, and relevant policy reforms

In both Vietnam and Thailand, a few public institutions were responsible for majority of HPSR and received majority of domestic funding for HPSR. In Thailand, a few public institutions for HPSR were relatively well-established through respective legislative reforms implemented by the government. In Vietnam, the Health Strategy and Policy Institute (HSPI) of the Ministry of Health was the main HPSR implementor. In both countries, HPSRs are

mainly implemented by public institutions, instead of universities and other types of research institutions. Country specific findings are discussed in detail in the following.

In Vietnam, the HSPI, which is a government research unit established in the Vietnamese Ministry of Health, was the major HPSR implementor and the primary recipient of both international domestic funding for HPSR. There were several other HPSRIs, including universities and non-governmental organizations in the country but their role in HPSR was relatively limited. The respondents suggested that HPSR is often implemented to support legislation and there is a lack of high quality and independent HPSR evidence. Another respondent suggested that time given to a HPSR by a public funder is too short to produce more meaningful results. And it is indicated that academic institutions, such as a university that does not receive government funding, and public research institutions may exercise different levels of autonomy in research. In terms of the key legislation and agency responsible for R&D in HPSR, respondents suggested the following - the Ministry of Health, Ministry of Science and Technology, and the Law on Science and Technology. Regarding the core values of HPSR financing, one respondent indicated that domestic funding in Vietnam is allocated transparently and in accordance with performance and local priorities but also suggested its relative lack of full consideration of national-level health priorities.

In Thailand, it was notable that the government was actively engaged in reforming HPSR environment by creating multiple government agencies that implement and provide funding for HPSR through respective legislative reforms. Following establishment of Health Systems Research Institute (HSRI) in 1992, International Health Policy Program (IHPP), Health Intervention and Technology Assessment Program, and Thailand Science Research and Innovation (TSRI) were established in 2001, 2007, and 2019, respectively. These institutions were established based on respective legal foundation, illustrating an excellent example of government-led efforts to improve, institutionalize, and systematize HPSR and its funding in a LMIC. Among these institutions, IHPP is considered as the major HPSR implementor, whereas recently established TSRI is responsible for the distribution of research funds in the country. Additionally, government agencies such as Thailand Center of Excellence for Life Sciences and National Research Council play important roles in funding health research in general. Currently, TSRI is the primary R&D funding body in the county, providing HPSR funding for HSRI, IHPP, universities, and others.

Our interviewees from Thailand also expressed mixed reflections on these organizational developments. One respondent elaborated the changes as follows – *"30 years ago, research funding was affluent but not efficient. So departments under the MoH and senior technocrats worked together to organize the granting and funding process and system. The government implemented legislative reforms to establish HSRI along with two organizations. TSRI was set up a few years ago, originally providing R&D funds from MoF. The organization began controlling the overall budget from ministries, distributing to sectoral funding agencies including HSRI"*. Despite such accomplishment, one respondent pointed out the problem of fragmentation in research funding – *"Government reforms that created multiple granting agencies, which created fragmentation"*. One respondent also indicated an increase in the role of a HPSRI with increased funding – *"The rapid growth in government funding that a HPSRI managed expanded its organizational role and its dependency on the government to some extent"*.

In both countries, the government agency or department (i.e. Ministry of Health and Ministry

of Science and Technology in Vietnam, TSRI in Thailand) were mainly responsible for prioritization of funding for HPSR.

5.3 Findings on Domestic funding for HPSR, including barriers and facilitators

Generally, all respondents indicated a lack of knowledge on the amount of domestic funding for HPSR because of funding for HSPR being very small to have a stand-alone budget, difficulty in classifying HPSR funding due to multiple sources of funding and HPSR being a small part of overall health funding, and no database of funding for HPSR being publicly available. Additionally, budget for HPSR was sa negligible proportion of overall R&D budget compared to that of medical/clinical research. One respondent suggested that *"Only the government officer in charge of financing flow may answer the absolute and relative amount of domestic funding for HPSR"*. Because of previously explained reasons, our team expects pinpointing specific statistics on amount of HPSR funding may not be feasible and provides very little information on overall states of funding for HPSR in a country. Such quantitative information is expected to be of value only when combined with both qualitative and quantitative information on the rest of the HPSR environment. In terms of research workforce, while no respondents had knowledge of the numbers of HPSR researchers, all indicated the size of HPSR workforce has been steadily growing in the country. In the following, we presented country specific key findings.

In Vietnam, the main funder for HPSR was multilateral organizations such as WHO but a respondent indicated that as the country's national income increases, funding opportunity from multilateral organization decreased, indicating double burden of negligible domestic funding and decreasing international funding for HPSR. Respondents also noted the negative effect of recent COVID-19 epidemic on health research that is not clinical studies such as research on vaccines. One interviewee suggested that funding opportunities for HPSR decreased during the pandemic, indicating further disadvantage of HPSR compared with clinical and biomedical research during public health emergencies. Main funder of domestic funding for health research in Vietnam was the Ministry of Health. However, it is suggested that the level of domestic funding for HPSR is low.

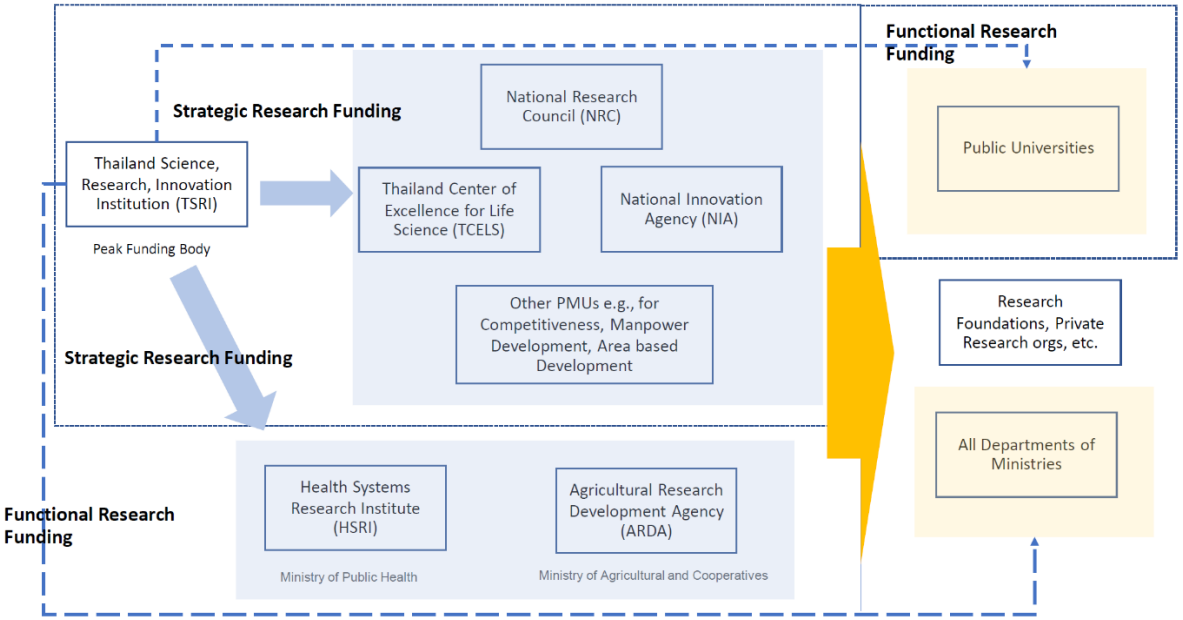
Depending on types of an institution, funding source and regulations related to funding were different. One respondent indicated that public HPSRI is mainly funded by government funding, whereas universities relatively rely on international funding. As a result, HPSR by public HPSRI is subject to tighter funding regulations (i.e. use of research fund) and is largely associated with producing outcomes in relatively short time to generate evidence for public policy. Another issue associated with domestic funding was timeliness of funding. One interviewee indicated that currently budget allocation is often delayed and not timely (i.e. budget allocation is made towards end of a HPSR). Lastly, domestically funded HPSR project experience was reported to be associated with professional requirements for promotion in some cases (i.e. professors or researchers in universities).

In Thailand, relatively more information, both qualitative and quantitative, on domestic funding was available. The main research funder, TSRI, receives yearly R&D budget and allocates two types of research funds – "strategic funding" that is targeted fund for prioritized research and "functional funding" that focuses on operational research and capacity building, as represented in Figure 7. Health sector R&D and its funding are governed by legislations

such as Health System Research Institution Act, Thailand Research Innovation Utilization with High Impact (TRIUP) Act, and Thailand Science Research and Innovation Act. Among the government agencies, TSRI and HSRI are responsible for setting priorities for HPSR together. In 2022, HSRI's R&D funding amounted to 800 million Baht, which is approximately 23 million U.S. dollars and estimated to be around 0.0051% of Thai GDP in the same year. However, majority of this fund was reportedly allocated to genomics research. In fact, one interviewee speculated that funding for HPSR is approximately 1/100 of funding for clinical studies. Only limited information on allocation of domestic funding for different themes of HPSR existed, with one interviewee indicating that funding within a public HSPRI was mainly distributed to research in medical products and technologies, health financing, healthcare service delivery, and information systems.

By institutions, our interviewees indicated that public HPSRIs such as IHPP received majority of government funding for HPSR and universities and private research institutions receive funding from wider range of sources including international donors. For example, one interviewee from academia indicated that approximately 50%, 40%, 10%, and 1% of research fund came from government ministry, research foundation & civil society, industry, and international donors, respectively, representing higher variety of funding. Additionally, this indicates higher rate of domestic funding for HPSR in Thailand compared with Vietnam.

Domestic funding for these public institutions is considered a relatively sustained and predictable source of financing but is also reported to be related with some rigidity in fund distribution, relatively stricter regulations, and short-term research aimed at producing evidence for legislation. Additionally, one interviewee reported that receiving international donor funding is sometimes tied with limited roles for domestic researchers in the local research project that is often led by international researchers from donor countries. In this case, the research project may not be as responsive to local needs as when entirely led by local researchers. In terms of HPSR workforce, interviewees indicated that no systematic data on health policy and systems researchers exists.



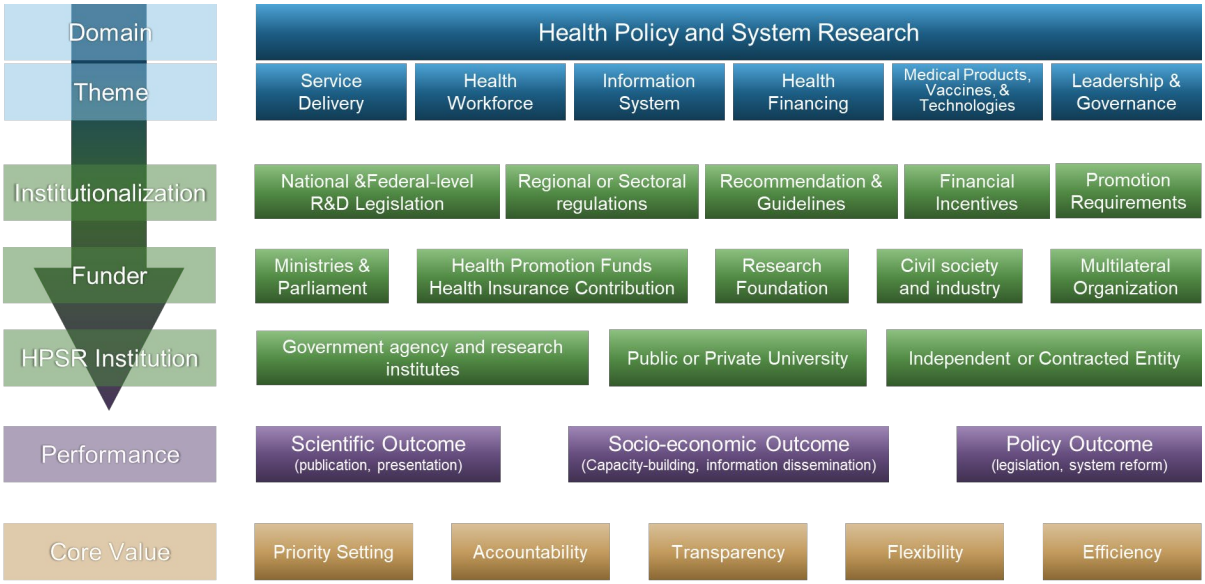
[Figure 7] Overview of domestic funding mechanism for HPSR in Thailand (Source : provided by an interviewee from Thailand)

Additionally, we also acquired a survey response from a Chinese expert in HPSR but the state of domestic funding for HPSR was very similar to what we observed in Vietnam and Thailand – no publicly available data on overall funding level and fragmentation of funding sources). However, the respondent from China indicated that different levels of government (both national and local) authorities may engage in priority setting of R&D in health sector and funding for HPSR projects.

In terms of barriers and facilitators of funding, a few common findings emerged from both countries. First, the respondents commonly indicated that the level of funding is low, not sustained for long-term, and duplicated and fragmented. For example, an interviewee indicated that although many HPSR need to be implemented in over multiple years or phases, most domestic funding is given for a short period of time and researchers have to re-negotiate after each funding period for an extension. Additionally, rigidity in use of (public) funding was also suggested as a barrier in that regulations set by domestic funder are often bureaucratic and do not reflect the research environment, sometimes affecting timeliness of the research. Second, complicated and often non-universal definition of HPSR was also raised as a barrier to effectively organize and channel funding for HPSRIs because such multidimensional nature of the research makes it difficult to formulate a defined and separate budget for institutions that are designated as HSPRIs.

6. Final framework and survey to assess domestic financing for HPSR

Following expert interviews and survey, we revised the prototype conceptual framework and survey questionnaires as follows. First, "Institutionalization" item was added to the framework. During field interview with HPSR experts, our team was able to identify an important aspect of funding for HPSR in the region, which was related to regulations, legislations, requirements, and others that impact the initiation and the shape HPSR evolves. These items were represented by "Institutionalization" in the framework. Second, survey questionnaires were revised to reflect the changes in assessment items in the framework. Five questions related to "Institutionalization" are added – questions regarding incentive and requirement for implementing HPSR in the country, such as HPSR being a requirement for job promotion. Additionally, one qualitative question on the researcher's experience of HPSR being transformed into policies was added. Lastly, format of answers for questions regarding core values of the funding was modified to include 5 indicators from "strongly disagree" to "strongly agree". The final versions of the conceptual framework and the survey are presented below.



[Figure 8] Final framework to assess domestic financing for HPSR in Southeast Asia

A survey to assess the key aspects of domestic funding for HPSR

Section A.

Section A includes questionnaires on the following topics - infrastructure and legislation, funding scale, and funding allocation. Each question asks for a short form answer (e.g., number, name, yes or no). The respondents are asked to mark *not applicable* if you find the question irrelevant or inappropriate, and mark *not accessible* if you have insufficient information to answer.

1) Infrastructure and legislation

1. Which ministry is responsible for research and development in the health sector?
   .....( )
2. Which organizations play a role in funding health policy and system research (HPSR)?
   .....( )
3. What is the extent to which government is involved in the priority and process of funding (including the private source) allocation and execution for HPSR?
   .....( )
4. Which laws govern R&D in the health sector?
   .....( )
5. Which laws govern domestic financing for HPSR?
   .....( )
6. To which database or statistics can you refer for domestic financing for HPSR?
   .....( )

2) Funding scale

7. Domestic R&D funding/expenditure on health as a percentage of GDP (%)
   .....( )
8. Domestic funding/expenditure on HPSR as a percentage of GDP (%)
   .....( )
9. Number of health policy and systems researchers (in full-time equivalent)
   .....( )
10. Official development assistance for medical research/basic health sectors and ODA for HPSR, respectively (in USD)
    .....( )

3) Funding Allocation

11. Assuming that the total HPSR fund for the past three years is 100%, what is the percentage of each funding source.

Ministries and Parliament ..... ( )

Research Foundation ..... ( )

Civil Society and Industry ..... ( )

International Organization ..... ( )

12. Assuming that the total HPSR fund for the past three years is 100%, what is the percentage of the fund allocated to each type of HPSR institution below.

Research institute ..... ( )

Public or private university ..... ( )

Independent or contracted researcher ..... ( )

Other entities ..... ( )

13. Assuming that the total HPSR fund for the past three years is 100%, what is the percentage of the budget allocated to each research theme below.

Health financing ..... ( )

Health workforce ..... ( )

Medical products, vaccines, and technologies .. ( )

Service delivery ..... ( )

Leadership and governance ..... ( )

Information system ..... ( )

Others (please specify) ..... ( )

Section B.

Section B of our survey includes questions on the HPSRI's performance regarding domestic financing for HPSR. The respondents are asked to use a 5-point scale to indicate the extent that they agree with each statement, from Strongly Disagree(1) to Strongly Agree(5), or to describe in their own terms for open-ended questionnaires. The respondents are asked to mark *not applicable* if you find the question irrelevant or inappropriate.

4) Funders' fund allocation

14. Funds are allocated to HPSR themes to achieve the goals of national-level health policy.

①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

15. Funds are allocated to HPSR themes to investigate or discover local priorities and needs.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

16. Funds are allocated to HPSR institutions according to performance.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

17. The fund allocation is transparent, and its decision process is institutionalized.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

18. Funds for HPSR are allocated flexibly, taking into account the change in context and policy environment.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

19. The overall process of priority-setting and fund allocation is accountable.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

5) Research institution

20. Describe the relative share of domestic funding source in your institution.

21. Describe major bottlenecks in terms of funding for HPSR in your country.

22. Describe the sufficiency of the funding for HPSR in your country.

23. HPSR Institutions have publication requirements for (tenure-track) faculty promotion.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

24. HPSR Institutions have grant requirements for (tenure-track) faculty promotion.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

25. HPSR Institutions have teaching/lecturing requirements for (tenure-track) faculty promotion.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

26. HPSR Institutions provide financial incentives for publication performance.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

27. HPSR Institutions provide financial incentives for teaching/lecturing performance.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

28. HPSR Institutions are given autonomy in research process.
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

29. HPSR Institutions are expected to be accountable for research outcomes.
① strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

6) Impact of HPSR

30. Describe overall assessment of the monitoring and evaluation system for HPSR.

31. Please describe how reasonable the criteria and measures of HPSR outcomes are

32. Past and present HPSR contributes to knowledge generation (e.g., publications).
①strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

33. Past and present HPSR contributes to capacity building of policymakers, researchers, and practitioners.
① strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

34. Past and present HPSR contributes to information dissemination to the public.
① strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

35. Past and present HPSR contributes to evidence-based decision- and policy-making.
① strongly disagree ②disagree ③neutral ④agree ⑤strongly agree

36. Please share your experience regarding HPSR contributing to knowledge generation and policymaking

7. Conclusion and discussion

Development of a conceptual framework, which incorporates the key aspects of real-world research environment, is essential to systematically assess the current state of a research field such as HPSR. In our study, we aimed to develop a conceptual framework and respective survey to assess the state of HPSR and its domestic funding in Southeast Asia by conducting both desk research and field interviews. The final conceptual framework developed in our study incorporated six key aspects of domestic funding for HSPR to be assessed – theme, institutionalization, funder, HPSRI (funding recipients), performance, and core values. Additionally, sub-components of each aspect were presented. The survey consisted of 36 questions to systematically assess states of the items in the framework in Southeast Asia.

The key findings from desk research and field interview and surveys are as follows. In Southeast Asia, despite significant increase in the number of HPSR especially in 2000s, majority of funding came from international donors and the increase in domestic funding for HPSR was limited. With the exception of Thailland, domestic funding for HPSR remained very low and stagnant and policies to systematically encourage HPSR and its funding were not implemented. In Thailand, following government-led health system reform from 1990s, including establishment of institutions designated for HPSR-specific funding management and HPSR implementation, the role of domestic institutions in HPSR significantly increased and its funding allocation has become more systematic, although criticism of some duplication and fragmentation remains. However, it is believed that this shortfall is almost universal in all countries, including high income countries, because it largely originates from the fact that HPSR is not universally defined and such variety of definition leads to difficulty in classification of funding. And such difficulty in classifying the budget for HPSR is reflected in the lack of HPSR-specific funding data in most countries. This problem is also associated with the fact that HPSR is under-funded relative to other areas of health research such as clinical and biomedical studies and funding for HPSR is often small part of overall clinical research funding.

In terms of HPSRIs, majority of HPSR in Southeast Asian countries was implemented by public institutions and government agencies. These institutions enjoyed relatively sustained and abundant domestic funding originated from government budget, compared with other types HPSRIs, such as university and private research institutions. However, some rigidities in the use of public funding and limitations in implementing long-term and fully autonomous research exist for these public institutions because they are often required to quickly produce evidence base for policy, system, and legislative reforms for the government. Additionally, public research institutions being the major HPSR funding recipients reinforces their status as the dominant HPSR implementor because research grants are often associated with access to key health data in the country. For example, while a public research institute continues to dominate a HPSR that is highly prioritized, other types of HPSRI such as universities may experience difficulty in accessing key health data and therefore sometimes fail to actively participate in and lead policy discussions. As the overall size of domestic funding increases in a country, a funding allocation mechanism that ensures diverse distribution of funding to different types of HPSRIs may be needed to ensure relatively autonomous, independent, and diverse HPSR results.

Despite some limitations, our team found the recent development in HPSR and its funding in Southeast Asian region remarkable and that other countries can draw important lessons from

it. For example, through establishing several public health institutes and funding bodies that are supported by respective legislative reforms, Thailand established a HPSR environment that is striving and consisted of public research institutions, R&D funding bodies, universities, and private research institutions in a relatively short period of time. And the conceptual framework and survey developed in our study were able to assess current state of HPSR and its funding along with limitations and barriers of funding in Thailand to present strength and weakness of the system to be reflected and revised in the long-term process of developing HPSR in the country.

For those who utilize our framework and survey to assess the funding for HPSR in a country, we encourage the following. First, it is encouraged to provide working definition of HPSR to respondents to capture more accurate picture of state of funding for HPSR in the context of the country. Multidisciplinary and multidimensionality of HPSR are reflected in variety and vagueness of its definition and are directly related to difficulty in pinpointing and disaggregating the funding for HPSR. Working definition of HPSR may be extra helpful where clinical and biomedical research dominate health research, as in most countries. Second, the framework as survey design may be modified and revised in accordance with the region or country of investigation. Although the key research themes of HPSR may be similar across countries, HPSR environment including funders and HPSR implementors may be significantly different for countries with different health system and government budgeting system. Therefore, the framework and survey may be revised to reflect country specific HPSR environment. Third, quantitative information on funding (i.e. amount of domestic funding) alone does not suffice to provide the overall picture of a country's HPSR environment. Instead, both quantitative and qualitative information on mechanisms of funding, allocation across HPSR themes and health research areas, composition of HPSRIs in the country, performance of funding in terms of key values for HPSR, and many others should be assessed as well.

Appendix

1	Bangladesh	BRAC University (James P Grant School of Public Health)	Academic Institution
2	Bangladesh	BRAC	Non-governmental Organization
3	Bangladesh	International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)	Research Institute
4	Bangladesh	Measure Evaluation, Bangladesh	Non-governmental organization
5	Bangladesh	National Institute of Population Research and Training (NIPORT)	Research Institute
6	Bangladesh	Data International	Consulting Firm
7	Bangladesh	Institute of Epidemiology, Disease Control and Research	Government Agency
8	Bangladesh	Bangabandhu Sheikh Mujib Medical University (BSMMU)	Academic Institution
9	Bangladesh	National Insititute of Preventive Medicine (NIPSOM)	Academic Institution
10	Bangladesh	Power and Participation Research Centre	Non-governmental Organization
11	Bangladesh	Institute of Health Economics, University of Dhaka	Academic Institution
12	Cambodia	KHANA Center for Population Health Research	Consulting Firm
13	Cambodia	Cambodia Development Resource Institute (CDRI)	Research Institute
14	Cambodia	National Institute of Public Health (NIPH)	Government Agency
15	Indonesia	SMERU Research Institute	Research Institute
16	Indonesia	Center for Health Policy and Management, University of Gadjah Mada	Research Institute
17	Indonesia	University of Gadjah Mada	Academic Institution
18	Indonesia	Center for Health Economics and Policy Studies (CHEPS)	Research Institute
19	Indonesia	University of Indonesia (Health Policy Network (HPN)	Research Institute
20	Laos	Lao Tropical and Public Health Institute	Research Institute
21	Malaysia	University of Malaya, School of Preventive Medicine	Academic Institution
22	Malaysia	Institute for Medical Research	Government Agency
23	Malaysia	National University of Malaysia (UKM), Health Scieneces	Academic Institution
24	Malaysia	Institute for Health Systems Research, Ministry of Health	Government Agency
25	Myanmar	University of Public Health	Academic Institution
26	Myanmar	The International Association of National Public Health Institutes	Non-governmental Organization
27	Myanmar	Department of Medical Research, Burnet Institute	Research Institute
28	Philippines	Health Research Division, Health Policy Development and Planning Bureau, DOH	Government Agency
29	Philippines	Philippine Institute for Development Studies	Government Agency
30	Philippines	Health Policy Development Program, UPecon Foundation	Non-governmental Organization

31	Philippines	Health Policy Development and Planning Bureau, DOH	Government Agency
32	Philippines	Alliances for Improving Health Outcomes (AIHO)	Consulting Firm
33	Philippines	The Pharmaceutical and Healthcare Association of the Philippines (PHAP)	Non-governmental Organization
34	Philippines	The Philippine Council for Health Research and Development (PCHRD)	Government Agency
35	Philippines	University of Manila, Department of Health Policy and Administration	Academic Institution
36	Philippines	Ateneo Center for Research and Innovation	Research Institute
37	Singapore	Singapore National University, Saw Swee Hock School of Public Health	Academic Institution
38	Singapore	Singapore General Hospital, Reaserch and Innovation Center	Hospital
39	Singapore	SingHealth	Research Institute
40	Thailand	International Health Policy Program (IHPP)	Semi-autonomous Research Institute
41	Thailand	Mahidol University, Faculty of Public Health	Academic Institution
42	Thailand	Health Intervention and Technology Assessment Program (HITAP)	Semi-autonomous Research Institute
43	Thailand	Health Systems Research Institute	Research Institute
44	Thailand	Chulalongkorn University	Academic Institution
45	Thailand	National Institute of Health Thailand	Government Agency
46	Vietnam	Research and Training Center for Community Development	Non-governmental Organization
47	Vietnam	Health Strategy and Policy Institute, MOH	Government Agency
48	Vietnam	Hanoi school of Public Health	Academic Institution
49	Vietnam	Hanoi Medical University, Institute for preventive medicine and public health	Academic Institution
50	Vietnam	National Institute of Hygiene & Epidemiology	Research Institute

[Table A1] List of HPSRIs in Southeast Asian countries

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