SOCIAL HEALTH PROTECTION NETWORK

Strengthening health system financing in the context of COVID-19

A comparison among four Asian countries

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CONTENTS

Abbreviations and acronyms **3**

Executive summary **4**

1. Theoretical framework and research design **7**

1.1. Definition of health financing 7

1.2. Theoretical framework 7

1.3. Background of the case countries 8

2. Overview of the case countries' national health financing systems **10**

2.1. National health service system 10

2.2. National health financing system 15

2.3. National health insurance system 20

3. Health financing and resource mobilization during COVID-19 ..... **29**

3.1. Overall status of resource input 29

3.2. Financing sources 30

3.3. Intergovernmental coordination of financing 31

4. Allocation and purchasing during COVID-19 ..... **32**

4.1. Prioritizing the allocation of funds 32

5. Social health protection and equity during COVID-19 ..... **34**

5.1. COVID-19-related health services 34

5.2. Distribution and priorities for of COVID-19 vaccine 38

5.3. Protection of vulnerable populations 39

6. Sustainability of universal health coverage **40**

6.1. Improve the sustainability of government health financing through multiple measures 40

6.2. Promote public-private partnerships and improve private sector's contribution 41

6.3. Promote innovative service patterns and improve the resource utilization efficiency 42

6.4. Pay attention to vulnerable groups and areas to reduce health inequity 42

6.5. Increase public health investment rationally for both "peacetime" and "wartime" 43

REFERENCES **44**

ABBREVIATIONS AND ACRONYMS

GDP	gross domestic product
GGE	general government expenditure
GGHE	general government health expenditure
HIRA	Health Insurance Review & Assessment
IDS	Integrated Health Delivery System
IP	Integrated Shield Plans
KDCA	Korean Disease Control and Prevention Agency
MOH	Ministry of Health
MOHW	Ministry of Health and Welfare
NGO	nongovernmental organization
NHC	National Health Commission
NHI	National Health Insurance
NHIS	National Health Insurance Service
OOP	out-of-pocket
PCR	polymerase chain reaction
PHPCs	Public Health Preparedness Clinics
PPE	period for protective equipment
PPPs	public-private partnerships
SHI	social health insurance
UHC	universal health coverage
WHO	World Health Organization
WPRO	WHO Regional Office for the Western Pacific

EXECUTIVE SUMMARY

The COVID-19 pandemic has caused a double shock – health and economic. Strengthening health financing systems has been a stressful task, not only for developing countries but also for developed countries. This study attempts to take four Asian countries (China, Singapore, the Republic of Korea and Mongolia) as examples to analyse the impact of the COVID-19 pandemic on their health financing systems and their response.

A team of experts from Fudan University, the Asian Development Bank, the World Health Organization's Regional Office for the Western Pacific and the P4H Coordination Team of the P4H Network adapted a theoretical framework on health financing to the characteristics of Asian countries. Within the framework, the health financing system focuses on four response domains to adapt to the influence of the pandemic: resource mobilization; allocation and purchase of health resources; social health protection and equity; and sustaining progress towards universal health coverage (UHC).

Resource mobilization

In response to COVID-19, governments have mobilized and increased government budgets. The main uses of this funding falls under two categories. The first is direct expenditure for responding to the epidemic, such as testing, treatment, epidemiological investigation and tracking, centralized isolation for citizens and epidemic prevention materials. The second is to stimulate and restore the economy. In other words, the expenses of COVID-19 diagnostic tests, vaccinations and adverse effects following vaccinations are mostly covered by government budgets and health insurance except for voluntary tests. In addition, countries have adopted different policies towards the expenses caused by isolation and quarantine through a combination of public and private financing.

For these four case countries, there were six approaches taken to guarantee or increase the financing budget: 1) reallocate the existing government budget; 2) use funds in the national reserve; 3) issue treasury bonds for pandemic response and special loans; 4) increase health insurance contributions; 5) apply for international aid from international organizations; and 6) request investment and assistance from private institutions and donors.

In addition, given the urgency of responding to COVID-19, governments have taken various measures to enhance intergovernmental coordination. In particular, the officials in charge of budget allocations – are responsible for overseeing, directly implementing or contracting out the delivery of different services. However, central government systems faced challenges when identifying the appropriate agencies to lead the implementation of specific services.

Allocation and purchase

The focus of government spending on COVID-19 is mostly based on the stage of the epidemic, and priority is given to places in urgent need. As the number of confirmed cases changes, countries' priorities vary at different times.

The government health expenditure on COVID-19 is mainly used for testing, isolation, border quarantine, health care, prevention and control, vaccination, personal protective equipment procurement, facility construction, etc. The majority of these governments have been doing their

best to allocate and purchase relevant health resources more efficiently. For example, several countries quickly responded to the pandemic by amending the relevant laws to grant the government the legal rights to change project budget classification, make budget transfers and introduce flexibility in the using public funds. Also, several countries simplified the process of financing, procurement and payment, which greatly shortened the period for protective equipment (PPE), medicines, testing agents and medical equipment to be put into use for COVID-19.

Social health protection and equity

The availability of services related to COVID-19 is an important factor in measuring health equity. Treatment, drugs and other health services related to COVID-19 are all covered by health insurance funds and government budgets in the four case countries. But the four countries applied different payment policies towards the expenses caused by isolation and quarantine. As to the distribution and priority of COVID-19 vaccine, governments determined the priority order of vaccination according to the situation in that country, which included the elderly population, health care workers and other designated people with a high risk of infection.

In addition to covering most of the COVID-19-related costs of basic medical care and vaccines for all citizens, the four case countries were also committed to addressing the unfairness to vulnerable groups, including the elderly, people with underlying diseases, children, teenagers, pregnant women, low-income groups and migrant workers through other means.

Sustainability of universal health coverage

In this study, we summarized several ways in which the case countries continued to progress towards achieving UHC.

First, governments promoted public-private partnerships and worked to improve the private sector's contribution. Public-private partnerships were critical in rapidly mobilizing human resources (e.g. nonclinical care, contact tracing volunteers) and infrastructure (isolation hotels, testing and vaccination sites), increasing the number of medical personnel and hospital beds, and strengthening service delivery. On the other hand, an important question remained as to how public funds could be channelled to engage, finance and regulate the private sector's contributions to the development and delivery of COVID-19-related services and treatment. Private institutions and private donations also played a role in health financing during COVID-19. Companies and citizens made monetary and in-kind donations during the pandemic.

Second, governments promoted innovative service delivery and resource utilization efficiency. When incomes and economies were shrinking, some countries began to reform their service delivery to improve the effective use of existing resources and fill the funding gap to a certain extent. For example, health services restricted the use of in-person non-COVID-19 health care and introduced publicly funded telemedicine for non-COVID-19 care. Health funding efficiency was also increased by improving the performance and quality of health services to avoid wasting resources through non-essential hospitalization, nursing and referrals. The Integrated Health Delivery System (IDS) proposed by the World Health Organization (WHO) has also played an important role during the pandemic.

Third, governments have paid attention to vulnerable groups and areas to reduce health inequity. Health inequities are particularly prominent during pandemics. Gaps in health resources and

geographical, urban and rural differences in access to health services have been greater under the influence of the COVID-19 pandemic. Therefore, countries paid attention to traditionally hard to reach areas and vulnerable groups with a high risk of infection, including the elderly, patients with underlying diseases, teenagers, children and low-income groups. They were prioritized in the allocation of vaccines and exempted from fees and charges. At the same time, many countries paid attention to the newly poor and those who did not necessarily fit into the low-income group but were struggling due to an abrupt or temporary loss of household income.

Fourth, governments have increased public health investment rationally for both peacetime and wartime. Prior to the COVID-19 pandemic, public health was not a priority in the health budgets of many countries. Coupled with annually increasing health expenditures, reduced government investment in health has resulted in a reduction in infectious disease hospitals and beds. The pandemic has tested public health infrastructure and medical capabilities and revealed the limitations.

According to a World Bank report, the COVID-19 pandemic has caused a double shock – health and economic – which has cost millions of lives and triggered a global economic recession surpassing any economic downturn since the Second World War.[1] This situation may continue to affect every region, including Asia, and will inevitably affect countries' health financing systems to varying degrees. For both developed and developing countries, the most urgent task in the next two to three years is to figure out how to strengthen health financing systems and deal with pandemic and post-pandemic predicaments effectively.

Therefore, this study intends to take the examples of four Asian countries to analyse the impact of the COVID-19 pandemic on their health financing systems, their response measures and health equity. By comparing and summarizing the experiences and lessons of different countries, this study aims to provide evidence and policy recommendations for the improvement and strengthening of health financing systems in Asian countries and possibly around the world.

1. THEORETICAL FRAMEWORK AND RESEARCH DESIGN

1.1. Definition of health financing

Health financing is one of the core functions of the health system. It contributes to the progress towards UHC by improving the coverage and provision of health services and protecting people from financial risks and hardship. The main sub-functions of health financing, as stated by WHO, include: 1) revenue-raising, which refers to the source of the fund; 2) pooling of funds, which refers to the accumulation of prepaid funds for some or all of the population; and 3) purchasing of services, which refers to the payment or allocation of resources to health service providers.[2]

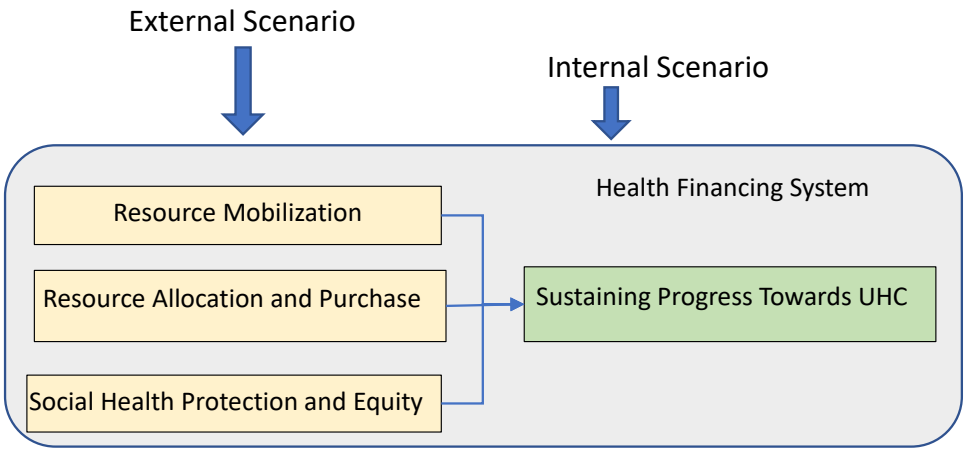
1.2. Theoretical framework

This study draws on the research framework proposed in the *Health Financing Response to the COVID-19 Epidemic* report written by Barasa E. and other scholars from multiple countries.[3] The study framework was adapted to the characteristics of Asian countries by a team of experts from Fudan University, the Asian Development Bank, the World Health Organization's Regional Office for the Western Pacific and the P4H Coordination Team. The final theoretical framework of this study is shown in Figure 1.

The health financing system focuses on four response domains to adapt to the impact of the epidemic. The first domain is resource mobilization, which refers to various approaches taken by governments to mobilize resources to respond to the current and possible future pandemics. The second domain is resource allocation and purchase, which refers to a flexible and efficient pathway for countries to manage the allocation and procurement of health resources. The third is social health protection and equity, which refers to the protection of the population, especially the vulnerable, from health-related economic shocks, to avoid an escalation of inequities. The last domain is sustaining progress towards UHC.

The questionnaire of this study was developed according to the theoretical framework mentioned above.

Figure 1. Theoretical framework



1.3. Background of the case countries

The selection of case countries was mainly based on countries' level of economic development, geographical location, population size and epidemic response status. For this case study, China, Mongolia, Singapore and the Republic of Korea were chosen based on their willingness to be part of the study. The basic national statistics and background of their health financing are briefly introduced below.

Table 1. Basic national conditions of case countries, 2020

Country	Population (thousand)	Population density (persons/km^2)	GDP (gross domestic product) (billion, USD)	GDP per capita (USD)	Country groups by World Bank
China	1 422 350	148.4	14 723	10 500	Upper-middle
Singapore	5 690	8357.6	340	59 797.8	High
Republic of Korea	51 780	527.3	1 631	31 489.1	High
Mongolia	3 280	2.1	13	4 007.3	Lower-middle
East Asia and the Pacific	2 352 000	95.0	26 917	11 499.60	-
Global	7 753 000	58.4	84 705	10 925.70	-

Source: World Bank database (https://databank.worldbank.org/), the latest data in the database were collected. The value of population density was updated in 2018, and GDP and GDP per capita of East Asia and the Pacific were updated respectively by 2019 and 2017, and the values of other indicators were updated in 2020.

Among the four case countries, China has the largest population size, and its economic level, according to the World Bank's country grouping, is in the upper-middle range. Singapore's GDP per

capita is close to US$ 60 000, which has reached the level of a high-income country, and Singapore's population density is much higher than the average in East Asia and the Pacific. The Republic of Korea is also a high-income country, whose GDP per capita is more than US$ 30 000. Mongolia has a population density much lower than that of other countries. With a per capita GDP of about US$ 4000, it currently belongs to the lower-middle-income group (See Table 1).

Some more background information can help us understand the basic conditions in the four case countries. The current life expectancy in China is about 77 years and the percentage of the population 65 years of age or older is approximately 12%, which is close to the regional average. The health status of the population in Singapore and the Republic of Korea is generally better than the regional average; meanwhile they are experiencing a faster trend of population ageing. The proportions of the elderly population over 65 are 13.35% and 15.79% respectively in Singapore and the Republic of Korea; both figures exceed the regional average. The life expectancy of people in Mongolia is about 70 years, which is lower than the regional average. However, the proportion of the elderly population over 65 in Mongolia is only 4.3% (see Table 2). As COVID-19 poses a high risk to the elderly, countries with a high proportion of elderly are experiencing pressure to protect this vulnerable group.

Table 2. Health status of the population in case countries, 2020

Country	China	Singapore	Republic of Korea	Mongolia	East Asia and the Pacific	Global
Life expectancy (at birth, years)	76.91	83.50	83.23	69.87	76.26	72.74
Under 5 mortality rate (per 1000 live births)	7.90	2.50	3.20	15.60	14.30	37.70
Maternal mortality rate (per 100 000 live births)	29	8	11	45	69	211
Population age 65 and above (of total population, %)	11.97	13.35	15.79	4.31	11.59	9.32

Source: World Bank database (https://databank.worldbank.org/), the latest data in the database were collected. The life expectancy and under 5 mortality rates were updated in 2019. The maternal mortality rate was updated in 2017. And the proportion of the population age 65 and above was updated in 2020.

Table 3. Cumulative confirmed cases and deaths of COVID-19 in case countries (Updated 1 October 2021)

Country	China	Singapore	Republic of Korea	Mongolia	Asia	Global
Confirmed cases	124 729	99 430	316 020	306 603	75 969 014	234 315 923
Confirmed deaths	5 692	103	2 504	1 295	1 128 603	4 792 089
Incidence rate (per million people)	87.69	16 862.02	6 159.61	92 092.83	16 233.87	29 754.53
Crude death rate (per million people)	4	17.47	48.81	388.97	241.17	608.52
Case fatality rate (%)	4.56	0.1	0.79	0.42	1.49	2.04

Incidence rate = total number of cumulative cases / current population (millions).

Crude death rate = cumulative number of deaths / current population (millions).

Case fatality rate = Cumulative number of deaths / Cumulative total number of cases x 100%.

Source: China National Health Commission (http://en.nhc.gov.cn/), Our World in Data database. https://ourworldindata.org/

As for the current COVID-19 situation, at the beginning of October 2021, the incidence rate in China was 87.69 per million people, much lower than the global level of 29 754.53 per million people. However, due to the high case fatality rate during the early Wuhan epidemic, the case fatality rate in China reached 4.56%, which is higher than the global rate of 2.04%. The incidence rate in Singapore is close to the average in Asia, but its case fatality rate is only 0.10%, which is a relatively low level. The crude incidence rate in the Republic of Korea is 6159.61 per million people, which is only equal to the 1/3 of the Asian average, but its case fatality rate is 0.79%. The incidence rate in Mongolia is significantly higher than the average level in Asia and the world, while its case fatality rate is relatively low, only 0.42% (see Table 3).

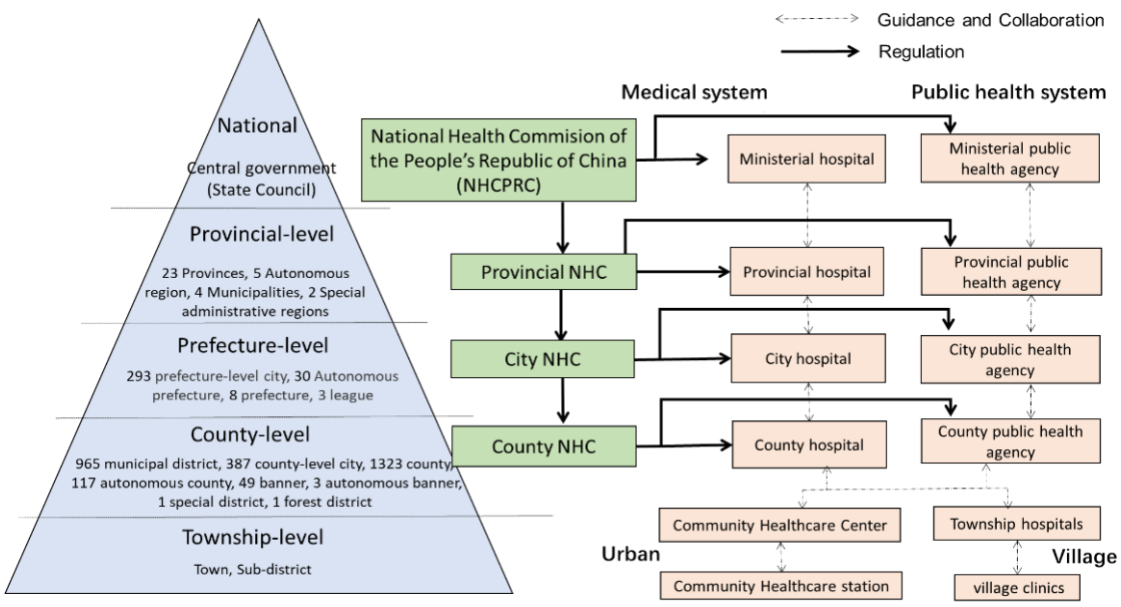
2. OVERVIEW OF THE CASE COUNTRIES' NATIONAL HEALTH FINANCING SYSTEMS

2.1. National health service system

China

A four-level health service system was established in China based on its administrative divisions. At the national level, the National Health Commission (NHC) is a component of the State Council and plays an essential role in the development of health policies, disease prevention and control, public health promotion and management, and the supervision of health institutions and the medical services industry. The NHCs at provincial, municipal (or city) and district (or county) levels are in charge of local health services (see Figure 2).

Figure 2. Organizational hierarchy of the health service system in China



Source: Outline of the National Medical and Health Service System Planning (2015-2020). Reorganized and drawn by the research group.

China's health service system is mainly comprised of hospitals, professional public health institutions, primary health care and other health institutions (see Figure 2). The total number of medical and health care institutions in China reached 1.02 million by the end of 2020, including 35 000 hospitals, 14 000 professional public health institutions and 970 000 primary medical and health care institutions. Health administrative departments at all levels are responsible for regulating hospitals and professional public health institutions. Major kinds of health institutions at all levels share technical guidance and a collaborative relationship.

More than 80% of medical services in China, such as diagnosis and treatment, are provided by public hospitals. And public hospitals at different levels handle specific functions and responsibilities. Ministerial hospitals (public hospitals under the NHC) mainly provide diagnosis, treatment and specialized medical services to patients with rare or severe diseases in cross-provincial regions and accept referrals from lower-level hospitals. Ministerial hospitals are also in charge of medical personnel training, medical research and emergency medical services in public health or other emergencies. Provincial hospitals handle the same responsibilities as ministerial hospitals but mainly in provincial regions.

The main professional public health agencies in China include the Chinese Center for Disease Control and Prevention (CDC), supervisory bodies and maternal and child health and family planning service agencies. These agencies manage public health services at corresponding levels.

In addition, primary health care services in urban and rural areas rely on community health service centres and township hospitals, respectively.

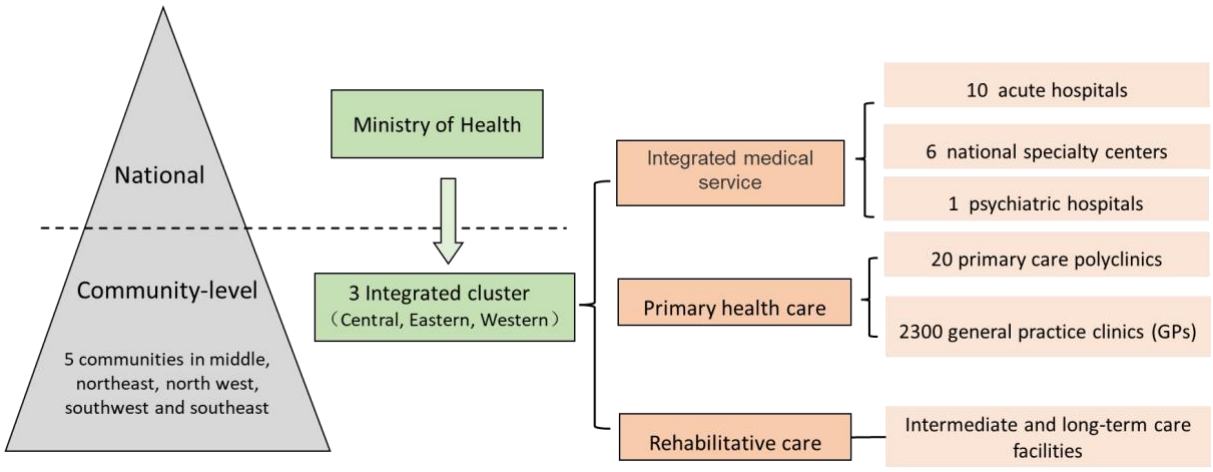
Singapore

Singapore is a city-state with a small territory. It is divided into five communities according to geographical location, and each is under the administration of a community development council. The Ministry of Health (MOH) and its statutory board regulate a public health service network and a private health service network, providing a range of services that comprise the health service system in Singapore (Figure 3).

The public health service network provides subsidized services through 10 acute hospitals, six national specialized centres, one psychiatric hospital, intermediate and long-term care facilities, and 20 primary care polyclinics. The acute hospitals provide multi-disciplinary acute inpatient and specialist outpatient services and 24-hour emergency departments. National specialized centres deliver specialist diagnoses and treatment for cancer, cardiac disease, eye and skin diseases. The intermediate and long-term care facilities provide home-based services for the vulnerable and elderly. In addition, 20 public primary care polyclinics nationwide provide services including medical treatment, preventive health care and health education. The Singapore government has restructured and transformed all acute hospitals and specialty centres into private hospitals under the full authority of the government. In the process, commercial accounting systems with stronger financial discipline and accountability were introduced. This enabled public hospitals to have greater autonomy and flexibility, so that they could respond more quickly to the needs of patients.[4]

Currently, 80% of primary health services in Singapore are provided by the private health service network through 2300 general practice clinics. Private institutions also control approximately 10% of inpatient beds in Singapore. The private and public networks cooperate closely to provide Singaporean citizens with accessible and high-quality health care services.

Figure 3. Organizational hierarchy of health service system in Singapore



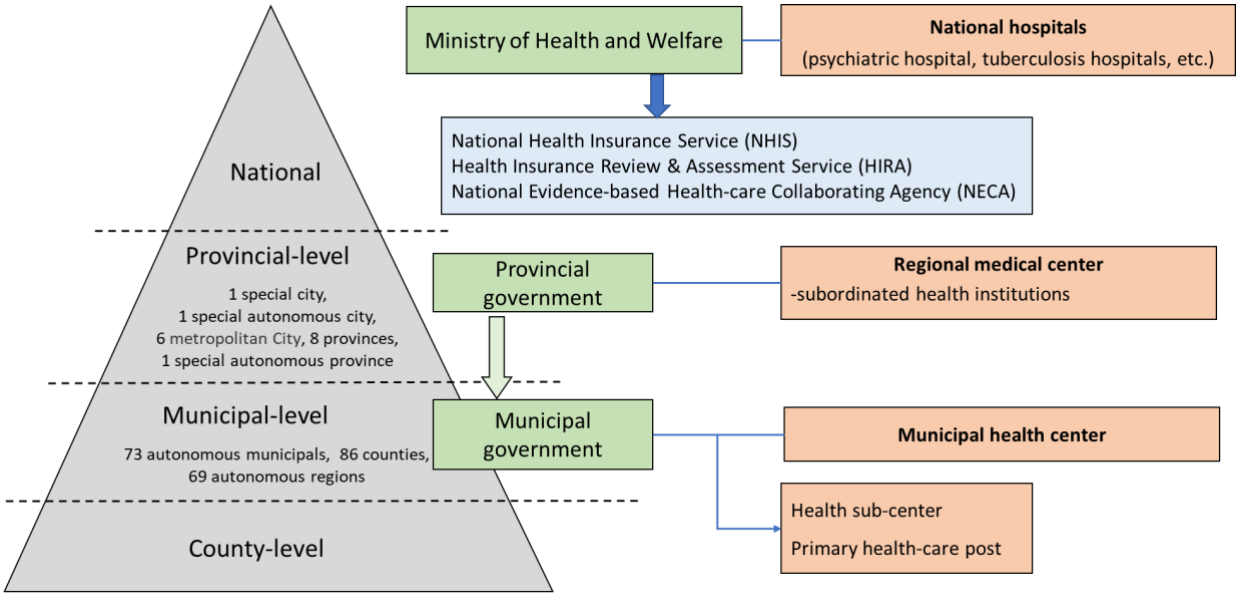
Source: Singapore MOH official website, Singapore country report. Reorganized and drawn by the research group.

Republic of Korea

The Republic of Korea's health system's organizational hierarchy has four levels: national, provincial, municipal, and county (Figure 4).

The Ministry of Health and Welfare (MOHW) plays a central role in regulating the country's health system at the national level. It also directly manages several national hospitals including psychiatric hospitals and tuberculosis hospitals to provide services where private institutions fail to meet patients' needs, and it entrusts the National Health Insurance Service (NHIS) to run the components of national health insurance (NHI) related to management of beneficiaries, collection of contributions and payment to health care providers. The Health Insurance Review & Assessment Service (HIRA) is also a quasi-public entity and is in charge of reviewing health insurance claims and assessing the quality of health services. And the National Evidence-based Healthcare Collaborating Agency is responsible for carrying out health technology assessments and the resulting announcements to provide decision-making evidence for service pricing.

Figure 4. Organizational hierarchy of health service system in the Republic of Korea



Source: Republic of Korea health system review. Reorganized and drawn by the research team.

At the provincial level, the local government authorities are responsible for the regulation of regional medical centres and are allowed to independently plan for the construction of health institutions within regional medical centres. At the municipal level, government authorities are mainly responsible for the management of municipal health centres, which provide various public health services such as prenatal health care, physical examinations and vaccinations. Meanwhile, municipal governments are also directly responsible for planning and managing health care sub-centres, primary health care stations and other medical service institutions at lower levels.

As of 2019, there were 3 799 private non-profit hospitals, accounting for 94.5% of all hospitals in the country, and managing about 90% of inpatient beds in the Republic of Korea.

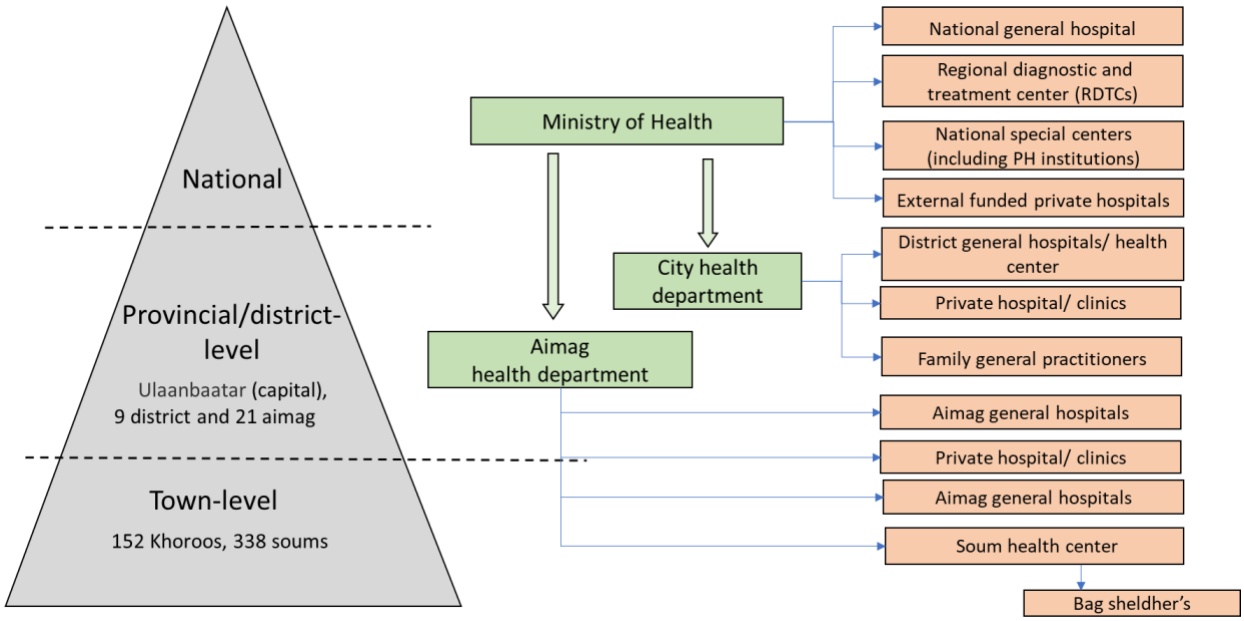
Mongolia

Mongolia has a large territory and extremely low population density, which is a significant challenge health services coverage. Mongolia is divided top-down into national, provincial, district and town levels. The health system at the provincial level consists of the capital city Ulaanbaatar and 21

provinces (aimag), with two separate political systems. Ulaanbaatar is further separated into nine districts and 132 subdistricts (also called khoroo). Twenty-one aimag are divided into 338 soums and 1682 baghs (Figure 5).

At the national level, the MOH is responsible for regulating health service systems at each level, and directly manages four different regional diagnostic and treatment centres located in eastern, western, southern and northern Mongolia. The MOH also regulates the national general hospitals and national specialized centres directly at the national level.

Figure 5. Organizational hierarchy of health service system in Mongolia



Source: Reorganized and drawn by the research group.

At the provincial level, the Ulaanbaatar city health department directly regulates district hospitals and private hospitals. The subordinating District Public Health Center regulates regional general hospitals and all kinds of public and private health institutions. In the 21 aimags, each has one aimag health department responsible for aimag general hospitals and private health institutions. The family health centres and *soum* health centres provide all kinds of home-based and primary health care. The intersoum hospitals provide primary referral services for the neighbouring soum health centres. The centre of zoonotic diseases in each aimag gives instructions to family health centres, soum health centres and intersoum hospitals.

At the town level, family health centres provide all kinds of home-based health care.

In summary, national general hospitals and national specialized centres in Mongolia are in the capital city and regulated by the MOH. As of 2019, there were 2522 health institutions in Mongolia. Within those, there were 1940 private institutions (76.9% of all health institutions), most of which were dental or other specialized outpatient clinics. There were some specialized health institutions that belonged to non-MOH government ministries such as the Ministry of Defense, Ministry of Justice and Ministry of Transportation or corporations such as Erdenet Mining Corporation, which serves its target populations.

2.2. National health financing system

Health financing is consistent with the goal of UHC and varies based on the country's situation. For example, China is dedicated to improving insurance coverage, thus the health insurance system in China has covered more than 95% of the population. Mongolia hopes to increase the proportion of health expenditure in GDP to 5% or above, and at the same time carry out a transformation of health financing, such as linking the payment of health service providers to their performance. Singapore and the Republic of Korea mentioned the need to strengthen the sustainability of health financing (see Table 4).

Table 4. Health financing goals of case countries

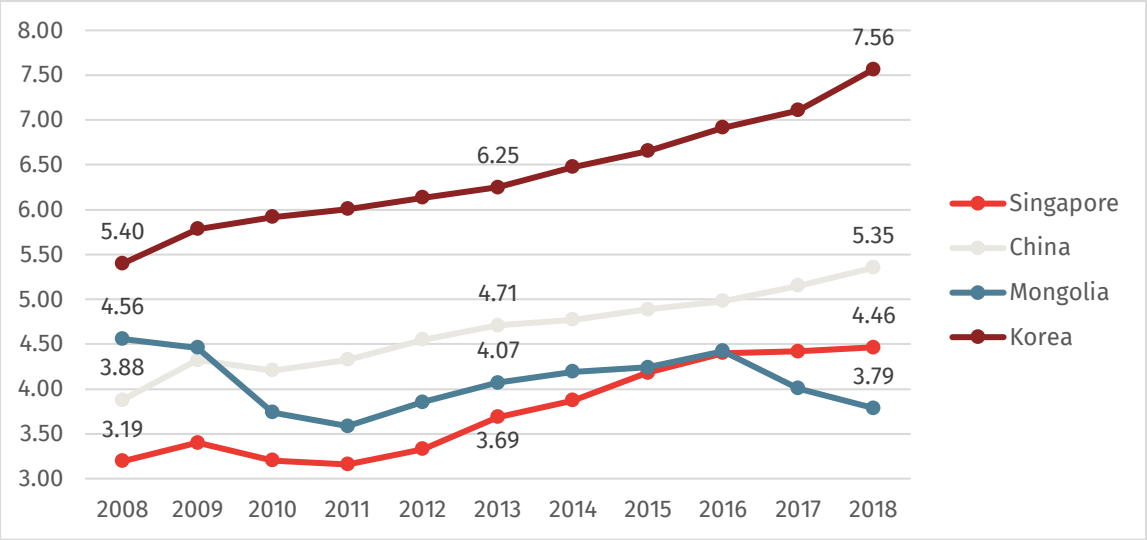
Country	Health financing goals
China	• To establish a universal basic health care system providing safe, effective, convenient and affordable health services to all
Singapore	Sustainability is a key priority of health financing in Singapore, in • going beyond quality to value – emphasizing cost-effectiveness for drugs and treatments and the spirit of copayment to encourage patients and providers to exercise prudence, and introducing innovative payment mechanisms using bundled payments based on a patient's care journey across multiple care settings • going beyond hospital to community – shifting the health care load from acute care hospitals to the community is facilitated by the increasing tie in of private general practitioners to provide subsidized primary care • going beyond health care to health – educating the population on preventive measures, moving upstream to encourage healthier lifestyles for a healthier nation
Republic of Korea	• To provide resources and economic incentives for the operation of health systems • To operate a sustainable system while simultaneously expanding coverage • To improve the health system's performance in terms of equity, efficiency and health outcomes • To play a good role of revenue collection, resource pooling and intervention procurement
Mongolia	• Increase the percentage of general government health expenditure (GGHE) included in general government expenditure (GGE) • Reduce and control out-of-pocket (OOP) ratios • Ensure UHC • Switch the payment method from input-based budget financing of health facilities to a performance-based mechanism • Increase the share of primary health care expenditures • Expand health insurance benefits to services delivered by the primary health institutions • Optimize accountability and financial reporting • Integrate health sector investment planning with health technology assessments, sector priorities and health needs and demand of the population

Source: National reports of case countries.

2.2.1 Current health expenditure

The health expenditure per capita has continued to increase in China, Singapore and the Republic of Korea in recent years. In 2018, the health expenditure per capita in China was US$ 501, and its current health expenditure accounts for 5.35% of GDP; the health expenditure per capita in Singapore is US$ 2824, and its share of GDP reached 4.46%; while in Republic of Korea, the two indicators are respectively US$ 2543 and 7.56% (see Figure 6).

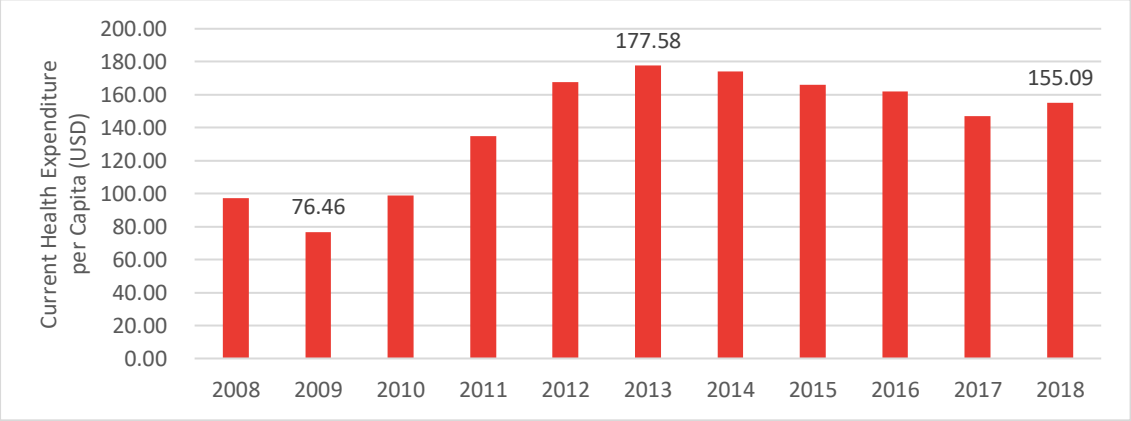
Figure 6. Current health expenditure as a percentage of GDP in four countries (2008–2018)



Source ： WHO Global Health Expenditure Database.

The current health expenditure as a percentage of GDP in Mongolia is 3.75%, the lowest among the four case countries. Meanwhile, its current health expenditure per capita decreased from US$ 177.58 in 2013 to US$ 155.09 in 2018 (see Figure 7).

Figure 7. Current health expenditure per capita in Mongolia (2008–2018)

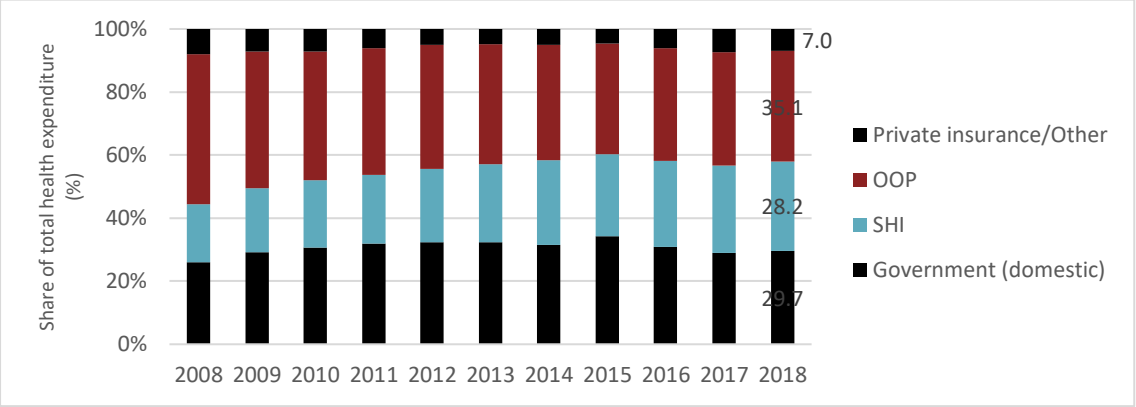


Source: WHO Global Health Expenditure Database.

2.2.2 Source of health financing

In China, the share of the current health expenditure in 2018 from OOP payment was 35.10%, while social health insurance (SHI) and the government respectively accounted for 28.20% and 29.70%. From 2008 to 2018, the SHI expenditure showed an apparent increase, while the OOP expenditure showed a decreasing trend, and government expenditure continued to fluctuate around 30% (see Figure 8).

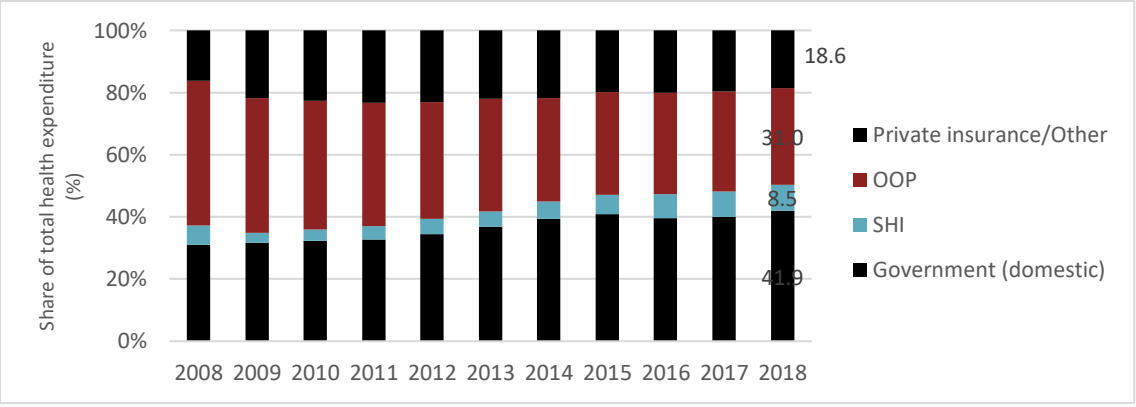
Figure 8. Components of total health expenditure in China (2008–2018)



Source: WHO Global Health Expenditure Database.

Government expenditure and OOP payments play an essential role in Singapore's health financing system. In 2018, government expenditure covered about 41.9% and OOP expenditure accounted for 31.0% of Singapore's total health financing. In the past 10 years, the government increased its share of health expenditure while the OOP expenditure decreased, and these two proportions have been relatively stable since 2015 (see Figure 9).

Figure 9. Components of total health expenditure in Singapore (2008–2018)

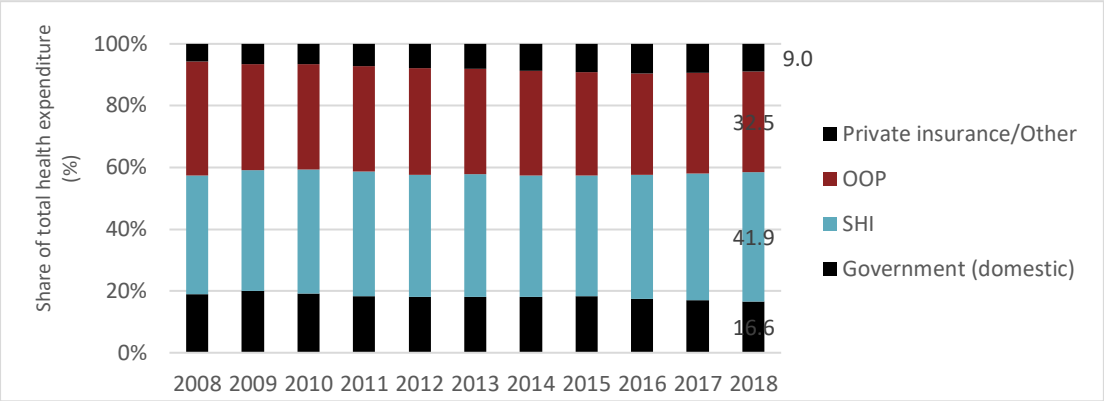


Source: WHO Global Health Expenditure Database.

Health expenditure in the Republic of Korea mainly comes from OOP payments and social health expenditure. SHI accounted for 41.9% of the total health expenditure in 2018, and OOP payments accounted for 38.9%. The percentage covered by the government was 16.6%. Over the past 10 years,

the proportion of various components in health expenditure has remained relatively stable (see Figure 10).

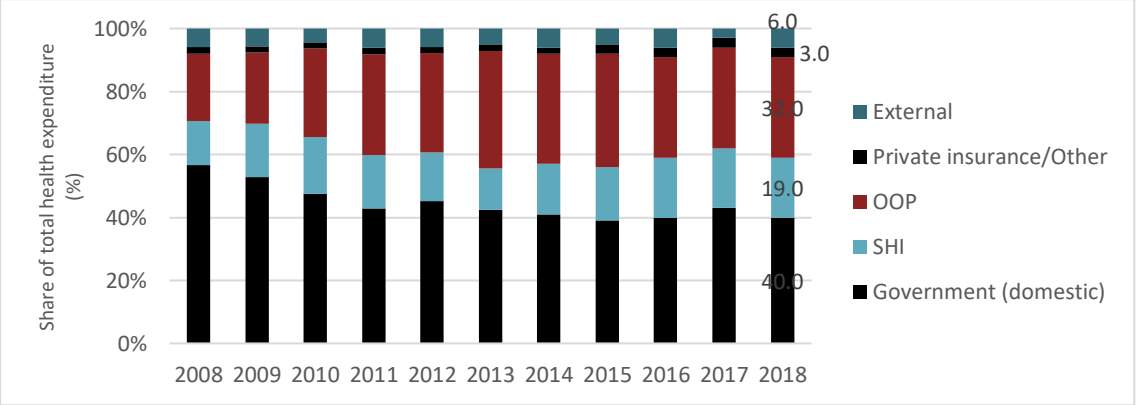
Figure 10. Components of total health expenditure in the Republic of Korea (2008–2018)



Source: Source: WHO Global Health Expenditure Database.

The main sources of health financing in Mongolia are the government and OOP payments. In 2018, the government covered 40% of health expenditure, and the OOP payments accounted for 32%. Unlike the three other case study countries, 6% of Mongolia's health expenditure was from external assistance. From 2008, the proportion covered by government expenditure decreased, while the proportion of OOP payments increased. However, the proportions of various financing sources have remained relatively stable (see Figure 11).

Figure 11. Components of total health expenditure in Mongolia (2008–2018)



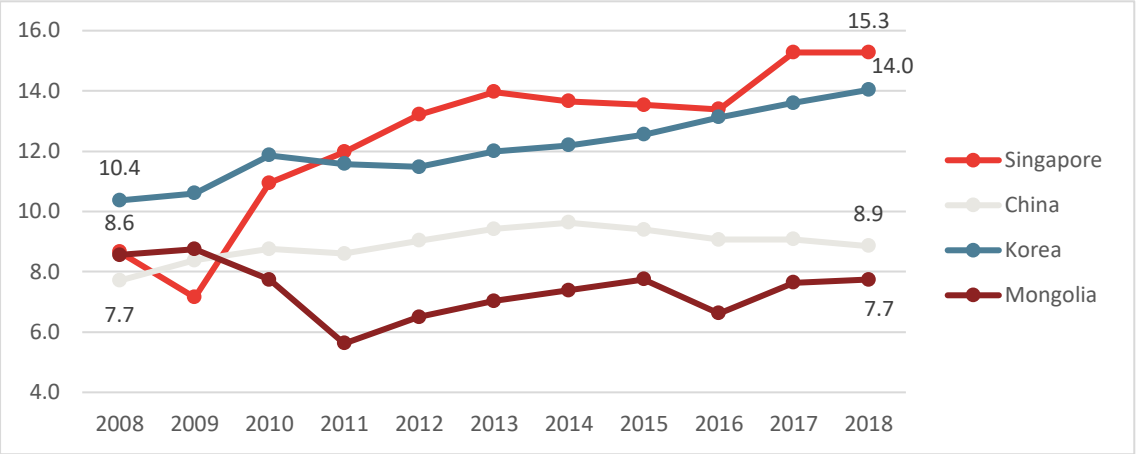
Source: WHO Global Health Expenditure Database.

2.2.3 Government health expenditure

In 2018, Singapore's general government health expenditure (GGHE) accounted for 15.3% of the GGE, which was the highest among the four countries, followed by Republic of Korea at 14.0%, China at 8.9% and 7.7% in Mongolia. Over the past 10 years, there have been significant increases in this number in both Singapore and the Republic of Korea, indicating the government's increasing

investment in health annually. In China, the percentage rose slightly; on the contrary, in Mongolia, it decreased slightly (see Figure 12).

Figure 12. General government health expenditure as a percentage of GGE in four case study countries



Source: WHO Global Health Expenditure Database.

2.2.4 Government expenditure on public health

The proportion of government expenditure on public health of the general government health expenditure (GGHE) in China, Mongolia and the Republic of Korea is nearly the same. In 2020, the government expenditure on public health in those three countries accounted for 20.18%, 18.23% and 15.53% respectively. And the proportion has remained above 12% since 2011 in all three. The proportion in Singapore was 5.47% in 2020 (Table 5).

Table 5. Government expenditure on public health as % of general government health expenditure (GGHE)

Country	Share of general government health expenditure (GGHE) (%)									
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
China	17.38	15.21	14.56	12.91	12.97	12.86	13.05	13.05	13.27	20.18
Singapore	3.18	4.81	3.28	2.42	1.86	2.00	2.37	2.40	2.37	5.47
Mongolia	18.77	21.34	23.11	18.37	19.77	18.20	18.41	14.20	14.46	15.53
Republic of Korea	13.33	13.98	15.06	14.97	18.40	16.62	19.18	16.72	16.98	18.23

Note: Since the data sources for each country are different, the scope of "government expenditure on public health" is not uniform. China's data include the prevention and control of major infectious diseases and noncommunicable diseases, health surveillance, public health emergencies response, health workers trainings and health education programmes, etc. Singapore's data before FY2020, only cover expenditures classified under the Health Promotion Programme allocated to the Health Promotion Board and do not include funding for other health promotions or preventive programmes allocated to other government agencies. After FY2020, data include the funding to the Health Promotion Board and other preventive health services previously classified under the MOH Headquarters Programme and Services Programme. Mongolian data include primary health care services, vaccination programmes, surveillance and research and zoonotic disease related

expenditures. The Republic of Korea's data were picked up from the OECD database. So, the definition of "government expenditure on public health" includes information, education and counselling programmes, immunization programmes, early disease detection programmes, health condition monitoring programmes, epidemiological surveillance and risk and disease control programmes and preparing for disaster and emergency response programmes in accordance with the OECD guidelines.

Source: Financial yearbook of China (2011–2019), Statistical Bulletin of China's Health Development (2020). OECD database, Ministry of Finance Singapore – Singapore Budget, MOH Mongolia (unpublished, internal data).

However, it cannot be ignored that this proportion largely depends on the definition of government expenditure on public health. For example, we use the expenditure on health promotion programmes in Singapore to represent Singapore's government public health expenditures, which suggests that some expenditures on disease screening and chronic disease management programmes are excluded. Part of the costs are usually allocated to health institutions through a service programme by the government directly, and it is difficult to distinguish and extract the corresponding costs. Therefore, these data can only reflect a general profile of the government's investment in public health.

2.3. National health insurance system

Mandatory NHI plays an important role in the health financing system.

2.3.1 China

The health insurance system in China comprises a basic health insurance scheme and its expansions. The basic scheme includes health insurance for urban employees and rural and urban residents. Critical illness insurance programmes, social medical mutual aid programmes and commercial medical programmes serve as supplements to the basic health insurance scheme (Table 6).

2.3.2 Singapore

Health care in Singapore is supported by a mixed-financing system based on collective responsibility and includes three Ms: Medisheld Life, Medisave, Medifund, as well as government subsidies. Meanwhile, patients requiring long-term care and the low-income population can respectively benefit from the Careshield Life programme and the Community Health Assist Scheme), both subsidized by the government (Table 7). Therefore, Singapore's health insurance system integrates four financing patterns, including compulsory NHI, national medical savings accounts, government aid funds and government subsidies. It encourages risk and cost pooling at the household level and provide citizens with financial protection for various health services. Currently, 21.6% of the population in Singapore—all foreign workers—is not covered by the three Ms scheme. The health expenses of these workers are mainly covered by private insurance their employers offer.

2.3.3 Republic of Korea

The national health insurance system in the Republic of Korea consists of NHI, long-term care insurance and the Medical Aid Program, which covers the whole population. The Republic of Korea's MOHW leads the policy-making procedures for the health insurance system. NHI is responsible for the reimbursement of health services for most citizens and is operated by the NHIS, commissioned

by MOHW. The HIRA is responsible for the review of claims and assessment of health services. A Long-term Care Insurance Programme mainly targets the elderly above age 65 or people with geriatric diseases. Until now, 97% of the population in the Republic of Korea is covered by NHI, and the rest is mainly the low-income population, which is covered by the Medical Aid Program.

The national Medical Aid Program is a government-subsidized health insurance scheme for low-income groups. Its copayment or OOP payment ratio is relatively low. One programme benefit, shown under the Medical Aid Program in Table 8, is free hospitalization in general hospitals. In addition, the outpatient deductible is 1500 KRW. The excess part of the outpatient expenses can be reimbursed by 50% (more than 20 000 KRW within 30 days) or in full (more than 50 000 KRW within 30 days). The government also provides subsidy programmes for disadvantaged groups such as those living in poverty (see Table 8).

Table 6. Health insurance system in China

Insurance Scheme	Type	Coverage	Source	Benefits	Features
Health insurance for urban employees	Basic health insurance	Urban employers and employees	Premiums paid by employers and employees (employers contribute: 6% of monthly wages; employees contribute: 2% of monthly wages)	Reimbursement of hospitalization expenses and outpatient expenses for special diseases, some frequently occurring diseases and common diseases through the pooling insurance fund Part of OOP expenses for outpatient care and hospitalization can be reimbursed through individual accounts	The local government determines whether to include township enterprises and their employees and urban self-employed households. The employee's individual account can be used to pay the expenses of their family members
Health insurance for urban and rural residents including new rural cooperative health insurance）	Basic health insurance	All urban and rural residents, except those covered by *basic health insurance for urban employees*	Individual premiums and government subsidies (ratio is about 1:2)	Reimbursement of hospitalization and outpatient medical expenses (including outpatient medical expenses for (1) common diseases and frequently occurring diseases in primary medical institutions, (2) some chronic diseases and special diseases mainly treated in relatively high-cost outpatient clinics)	Migrant workers and flexible employees participate in the *basic health insurance for employees* according to the law, but those who are struggling financially can participate in the *health insurance for urban and rural residents* according to local regulations.
Critical illness insurance programme	An expansion of the basic health insurance system	Participants in basic health insurance	A certain proportion of the basic health insurance fund	Reimbursement of high medical expenses of urban and rural residents protects families from "catastrophic health expenditure"[+]	The actual payment ratio of insurance compensation increases with medical expenses. The ratio may change to meet special needs from people in difficulty.

Insurance Scheme		Type	Coverage	Source	Benefits	Features
Supplemen-tary health insurance	Commercial insurance	A supplement to the basic health insurance system	Voluntary insurance	Premiums paid by employers and employees	Outpatient medical expenses and inpatient medical expenses due to illness and accidental injury	-
	Social mutual aid			Social donations, government budget and individual payments	All types of medical expenses	-
	Community health insurance			Individual payments	A portion of medical expenses in designated hospitals	-

[+] "Catastrophic health expenditure": as defined by WHO. https://www.who.int/data/gho/data/indicators/indicator-details/GHO/households-with-out-of-pocket-payments-greater-than-40-of-capacity-to-pay-for-health-care-(food-housing-and-utilities-approach---developed-by-who-europe)-(-)

Source: The State Council of the People's Republic of China. Collected and reorganized by the research group.

Table 7. Health insurance system in Singapore

Scheme	Type	Source	Target Population	Benefits	Features
Medishield Life	Compulsory national health insurance	Premiums paid by participants through Medisave; any amount exceeding withdrawal limits from Medisave for additional private insurance components is paid in cash; premium subsidies available from government	Singapore citizens and permanent residents	Lifelong protection against large hospital bills and selected costly outpatient treatments	Premiums increase with the age of the holder. Policyholders can voluntarily choose whether to opt in to Integrated Shield Plans (IP) (private insurance) that provide expanded coverage (e.g. upgraded hospital wards, choice of private hospitals).
Medisave	National medical savings scheme	Contribution (savings) from income of individuals as employees and self-employed, and their employers	Singapore citizens and permanent residents	Covers the health care expenses of holders and their family members	Patients can use their family members' Medisave, allowing income and risk pooling at the household level.
Medifund	Government aid funds	Interest from an endowment fund		Safety net for individuals with financial difficulties to pay for their medical bills after Medishield Life and Medisave options are exhausted	Given to patients based on means testing
CareShield Life	Government subsidies	Premiums paid by participants through Medisave	Populations requiring long-term care (such as those who are severely disabled)	Basic financial support for long-term care services	

Scheme	Type	Source	Target Population	Benefits	Features
Community Health Assist Scheme	Government subsidies	Government tax revenue	Patients receiving care at the primary care level (for common illnesses, chronic conditions and selected dental care)	Subsidies for medical and dental care at private GPs and dental clinics	Higher subsidies for low-income groups

Source: National report of Singapore. Collected and reorganized by the research group.

Table 8. Health insurance system in the Republic of Korea

Scheme	Source	Target Population	Benefits	Features
NHI	Premium paid by employers and employees (contribution rate: about 6.46% of monthly average wages)	All residents in the Republic of Korea (including registered foreigners) The contribution rates vary between employees and self-employees. The unemployed are treated as dependents of the insured and receive NHI benefits.	Health care services benefits: provided by health care institutions in the case of diseases, injuries, etc., including diagnosis, tests, medical materials, treatments, surgeries, preventive care, rehabilitation, hospitalization, nursing, transportation, physical examination and cancer screening programmes Benefits in cash: reimbursement for the expenses of health care services for some unavoidable conditions	Reduced premium rates for the insured with disadvantages in geographical distance, age, physical condition The following groups may be exempted from premiums: people who work abroad and do not have any relatives in the Republic of Korea, people in jail or serving in the military Veterans generally do not participate in NHI.
Long-Term Care Insurance Programme	Premiums and government subsidies	Those age 65 and above Patients with geriatric diseases younger than 65 years old	Long-term care equipment, services and cash subsidies for people who meet the criteria	
Medical Aid Program	Government subsidies	Those who are incapacitated, patients with rare diseases and severe diseases, and recipients of facilities according to the National Basic Livelihood Security Act Victims, people with merit to the country, refugees according to other relative laws	Covered people are exempt from premiums, and only have to pay a lower deductible for medical services, the excess will get partially or fully reimbursement according to the standard. Free public health services including cancer screening programmes, etc.	Copayment and reimbursement standards vary. The drug copayment ratio will be increased to 3% when a recipient visits a medical institution with a level higher than the need for the severity of the disease.

Scheme	Source	Target Population	Benefits	Features
Other government subsidy programmes	Government budget	People who meet the criteria	-	Basic Livelihood Security Program, disability pensions, old age pension

Source: Korea NHIS, Korea National Pension Service, Korea MOHW. Collected and reorganized by the research team.

2.3.4 Mongolia

The health insurance system in Mongolia is mainly financed by the government budget and SHI. The government budget covers public health services, including maternal and child health care, infectious disease prevention and treatment and emergency care, as well as a portion of outpatient and inpatient services provided by some primary health care institutions. SHI mainly covers the expenses of health services in higher-level institutions, such as the expenses of hospitalization in provincial hospitals (see Table 9).

The current SHI scheme in Mongolia is mandatory and covers a large population. The Mongolian Citizens' Health Insurance Law divides citizens into nine categories, formulates different premium payment policies, and requires them to participate in insurance. Table 7 shows an overview of the SHI scheme in Mongolia.

Table 9. Health insurance system in Mongolia

Scheme	Social Health Insurance
Population	**The compulsory insured population as defined by law:** employees of business entities, institutions and organizations, owners of business entities and sole proprietors, children under 16 (general secondary school; students under 18), students at professional schools, citizens for whom their pension is the only income, mothers (fathers) taking care of their babies under the age of two (twins under the age of three); persons on regular military service; herders; citizens who receive social assistance; convicts serving their sentence Voluntary insured population: foreigners
Source	Premiums, national and regional government budget
Premium rate	Employee: the contribution rate is set as a percentage of monthly salary (currently 4%), and both employers and employees share SHI contributions equally. Students, herders and others (such as the self-employed and the unemployed): the premium contribution rate is equal to 1% of monthly reported income, and they need to pay insurance contributions for at least 12 consecutive months. Others such as children under 16 years old, pensioners and disabled people: exempted from premiums There is an upper threshold on contributions to be paid equal to 10 times the minimum wage level.
Benefits	Service fee covered by SHI: **Expenses in public institutions**: outpatient essential drugs, outpatient diagnosis and tests, hospitalization **Expenses in private institutions:** hospitalization, inpatient admission for traditional medicine, inpatient admission for rehabilitative care, inpatient admission for palliative care **Service fee not covered by SHI:** outpatient care, day care, diagnostic tests, drugs and a portion of inpatient payments in private institutions
Features	The government can provide insurance subsidies through the Human Development Fund to expand the coverage of SHI.

Source: Mongolia health system review, national report of Mongolia. Collected and reorganized by the research team.

In 2010, because the government had reduced insurance subsidies for some groups, SHI covered only 82.6% of the population. To change this situation, the Mongolian government provided a one-time subsidy for the uninsured groups, which greatly increased the population covered by SHI. In 2017, SHI coverage reached 95.6%. Currently, Mongolia's SHI scheme covers the expense of hospitalizations in most health institutions. However, due to the increasing number of private health

institutions in recent years and inadequate supervision of private institutions by the national government, the efficiency of the health system in Mongolia has been reduced.

3. HEALTH FINANCING AND RESOURCE MOBILIZATION DURING COVID-19

3.1. Overall status of resource input

In response to COVID-19, governments have actively mobilized immense resources and increased government budgets. The main uses of these funds include two categories. The first is direct expenditure for responding to the epidemic, such as testing, treatment, epidemiological investigation and tracking, centralized isolation for citizens and epidemic prevention materials. The second is for stimulating and restoring the economy (see Table 10).

To combat the social and economic impact of COVID-19, Singapore invested S$ 97.3 billion (approximately US$ 72.7 billion) over several budgets in 2020. More than 85% of the budget was used for financial support to eligible individuals, families and enterprises. And the government set aside S$ 13.8 billion (approximately US$ 10.3 billion) to implement the prevention and containment of COVID-19, including management of COVID-19 patients, strengthening test and contact tracing capabilities, securing critical medical and emergency supplies, setting up quarantine operations and building new dormitories, and management of the COVID-19 outbreak in the foreign worker dormitories.

As of January 2020, the Republic of Korea's initial budget for infectious disease response was KRW 19.2 billion. To respond to COVID-19, the Republic of Korea increased the COVID-19 budget to KRW 8.13 trillion (approximately US$ 7 billion) through supplementary budgets, reserve funds and budget resolution transfers as of December 2020. The budget was spent on financial support for citizens, compensation for health care institutions, infection prevention and promotion, self-quarantine and treatment, border screening, diagnosis and research.

In 2020, Mongolia planned to spend MNT 8.2 trillion (approximately US$ 2.9 billion, equalling 22% of Mongolia's GDP) for a package of COVID-19 expenditures, including protecting citizens' health, supporting citizens and businesses and stimulating the economy. According to Mongolia's MOH statistics, the Mongolia's direct health care expenditure in response to COVID-19 in 2020 was MNT 115.6 billion (approximately US$ 40 million), excluding expenditure from donations.

China's COVID-19 budget does not have clear statistics. But all levels of government have appropriated more than ¥ 400 billion (approximately US$ 62 billion) in response to COVID-19, including subsidies for the treatment of patients, temporary wage subsidies for health workers, essential supplies, research, financial support for resuming production and work, and the COVID-19-related work of the General Administration of Customs, among others.

Table 10. Government investment of four countries in response to COVID-19 in 2020

Country	Total GDP (billion US dollars)	General government health expenditure (GGHE) (billion US dollars)	Government investment in response to COVID-19	
			Total (billion US dollars)	General government health expenditure (GGHE) (%)
China	14 722.73	340.29	62.0	18.22
Singapore	340.00	12.35	10.3	83.40
Republic of Korea	1 630.53	85.27	7.0	8.21
Mongolia	13.14	0.35	0.04	11.43

Data source: Country report; "Statistical Bulletin of China's Health Development in 2020"; OECD database; "Health indicator 2020" of Mongolia; Ministry of Finance of Singapore "Budget 2020".

3.2. Financing sources

3.2.1 Reallocate the existing government budget

All countries adjusted their existing government budget arrangements. For example, the Ministry of Finance of China required local finance departments to secure funding for the COVID-19 response by utilizing existing funds through every means possible. At the same time, the central government introduced a policy to gradually increase the retention ratio of local fiscal funds to support the "three guarantees" of the local government: basic livelihood, wages and operations. Sixty-three per cent of Mongolia's health expenditure in response to COVID-19 in 2020 was reallocated from the government health budget. Singapore has passed several Supplementary Supply and Budget Adjustments Acts, allowing the government to reallocate budget funds from areas with reduced spending (e.g. development projects stalled during the pandemic). In the Republic of Korea, some existing projects were put on hold to reduce health care investments other than COVID-19.

3.2.2 Utilize national reserve

The national reserve is a significant source in alleviating the shortage of funds. For example, Singapore has always attached importance to the accumulation of its national reserve, which has been drawn down only once, during the 2007–2008 global financial crisis. A strong national reserve ensured that Singapore wouldn't incur huge debts during the pandemic. Singapore withdrew SGD 42.7 billion from the national reserve in 2020. In 2021, it plans to withdraw another SGD 11 billion of the national reserve for the COVID-19 Resilience Package. A total of SGD 53.7 billion (approximately US$ 40.1 billion) of the national reserve will be withdrawn over the years 2020 and 2021. In Mongolia, 9.9% (MNT 12.2 billion, approximately US$ 4.27 million) of the health sector's expenditure on COVID-19 in 2020 came from the national reserve. In the Republic of Korea, KRW 1.14 trillion (approximately US$ 1 billion, 14.0% of the total) of the COVID-19 budget in 2020 came from the national reserve.

3.2.3 Increase bonds and loans

In order to ensure the budget, the countries also issued treasury bonds and loans. For example, China increased its fiscal deficit rate to over 3.6% in 2020, issued treasury bonds for the COVID-19 response, as well as local government special bonds. Mongolia issued government bonds, and the government's foreign loan financing increased 2.4 times from the previous year. The Republic of Korea issued national bonds and loans for small and medium sized enterprise restructuring funds. At the time of writing, Singapore also plans to issue new bonds in 2021 to meet the long-term financial needs of investing in major infrastructure.

3.2.4 Increase health insurance contribution

The Republic of Korea provided additional funds from the NHI in response to COVID-19. Mongolia used the emergency fund for health insurance. The cost of hospitalization and vaccination for patients in China was mainly covered by the health insurance fund, supplemented by government subsidies.

3.2.5 Receive international aid

In addition to the above-mentioned domestic financing schemes, some low- and middle-income countries also benefited from financial assistance from international partners. Mongolia's external donors provided funds in the form of soft loans and grants. For example, the government received more than US$ 100 million in loans from the Asian Development Bank for the supply of drugs, medical equipment, medical tests, overtime payment for medical staff, and child allowances.

3.2.6 Private financing

In addition, private institutions and private donations also played a role in health financing during COVID-19.

Companies and citizens made donations in monetary and non-monetary forms during the COVID-19 pandemic. Taking Mongolia as an example, an audit report from 2020 on citizens' donations showed a total of MNT 4.1 million (US$ 1 500). Some big companies provided funding for the establishment of PCR laboratories in some provinces. And some companies insured their employees against COVID-19 and covered the cost of vaccination. The donations were initially spent as indicated by donors and reported on various public websites.

Private enterprises also contributed to the production of infection prevention products and medical equipment and the development of testing agents and pharmaceuticals. For example, early in the COVID-19 pandemic, private companies in China and the Republic of Korea expanded the production of personal protective equipment, such as face masks, upon government request. And they also began to manufacture essential medical equipment, such as ventilators, to alleviate the shortage of medical supplies and treatment equipment needed for COVID-19. At the same time, the government of the Republic of Korea supported the development and production of COVID-19 testing agents and therapeutic drugs by private companies.

3.3. Intergovernmental coordination of financing

Health financing involves resource mobilization and cooperation across different levels and different agencies. In consideration of the urgency in responding to COVID-19, governments took various measures to enhance intergovernmental coordination. In particular, the officials in charge of budget allocations are responsible for overseeing, directly implementing or contracting out the delivery of each function. Moreover, central government systems face challenges when identifying the appropriate agencies to lead the implementation of specific functions.[5]

During the outbreak, China's central government increased its contribution to GGHE to ease the financial pressure on local governments. Before the epidemic, local governments covered 99% of the total health expenditure. At the beginning of the epidemic, the central government allocated a comprehensive financial subsidy to Hubei Province without designating a specific purpose. During the epidemic, the central government increased health expenditure to support local governments, cover the health care of patients with COVID-19, and procure medical supplies and assistance for families in need. A direct allocation mechanism was established, allowing 95% of the fiscal transfers from the central government to be distributed directly at the grass-roots levels of cities and counties in just 20 days. At the same time, China established leading groups and working groups at the

national level to coordinate across departments and quickly distribute the additional 2 trillion yuan in funds to the cities and counties.

Mongolia, the Republic of Korea and Singapore established cross-departmental working groups in response to COVID-19 to promote efficient coordination across different ministries and agencies, including health financing. The Republic of Korea's Central Disaster and Safety Countermeasure Headquarters (CDSCHQ), led by the prime minister, coordinates the COVID-19 response. CDSCHQ consists of the Central Disaster Management Headquarters at MOHW, the Central Disease Control Headquarters (CDCHQ) at the Korean Disease Control and Prevention Agency (KDCA), and the Pan-government Countermeasures Support Headquarters at the Ministry of the Interior and Safety. In addition, the Local Disaster and Safety Management Headquarters from each local government nationwide participated. Mongolia established the State Emergency Commission, which is directed by the deputy prime minister and consists of members of relevant government ministries, heads of agencies and NGOs like the Mongolian Red Cross. Each organization carries out its activities within the allocated health budget. Singapore also established a multi-ministry taskforce co-led by the ministers for health, finance and trade and industry, which allowed coordination between ministries to collectively assess spending needs to inform budgeting requirements. The taskforce also provides a platform for coordination and communication between governmental agencies for a whole-of-government approach between the private sector and the public.

4. ALLOCATION AND PURCHASING DURING COVID-19

4.1. Prioritizing the allocation of funds

The GGHE on COVID-19 was mainly used for testing, isolation, border quarantine, health care, prevention and control, vaccination, personal protective equipment procurement and facility construction. However, the classification of COVID-19 expenditures varied from country to country. And some countries lack categorized statistics on COVID-19 expenditures. It is difficult, then, to compare the four countries.

The focus of government spending on COVID-19 was mostly based on the stage of the epidemic, and priority was given to places in urgent need. As the number of confirmed cases changed, countries' priorities varied at different times. For example, in the early stage of the epidemic in Mongolia, most of the funds were used for procurement (e.g. PPE, equipment and testing). For health expenditure related to COVID-19 in Mongolia, the top three categories in 2020 were PPE, testing and the establishment of laboratories, while the top three in 2021 were testing, overtime payment and PPE. The same is true in choosing whether to prioritize prevention or prioritize medical services for COVID-19 patients. For example, during the initial phase of COVID-19, there was a small number of COVID-19 patients, and the focus was on infection prevention. After a large-scale outbreak, however, the focus shifted to promptly treat severely ill patients and reduce fatalities.

4.2 Adjusting mechanisms for purchasing and payment

Due to the regulatory policies of public funds, budget transfers in some countries are more difficult, and budgets need to be adjusted by amending laws. For example, Mongolia passed COVID-19-related legislation in April 2020. This law enables the government to change project budget classification within the approved budget so that the COVID-19 budget can be used relatively flexibly during the epidemic. Singapore also passed a similar act for budget adjustments.

During the epidemic, all countries simplified the process of financing, procurement and payment, which greatly shortened the waiting period for COVID-19 protective equipment, medicines, testing

agents and medical equipment. In China, the Ministry of Finance simplified the process of procurement and payment mechanism for epidemic prevention products.

The Republic of Korea simplified the contract-payment process and shortened the period for diagnostic test agents to be listed from the conventional 140 days to 10 days. In the second outbreak, the period required to provide health care institutions with equipment to treat severely ill patients was shortened through direct appointments, and financial compensations were paid to health care institutions in advance through cost estimation, instead of regular post-payment.

In Singapore, government agencies use emergency procurement procedures to contract suppliers directly or engage them through limited tenders to quickly obtain goods and services, including medical supplies, to support operations during the pandemic. In its regular news updates and media replies, the government has been forthcoming in assuring its due diligence for such emergency procurement procedures aligned with international standards outlined in the World Trade Organization's Agreement on Government Procurement. In its replies and updates to the media and public, the Singapore government maintained transparency in how it used government budget for COVID-19; transparency included publishing details of awarded contracts on the government procurement website.

The time for health care providers in Mongolia to obtain government compensations was also shortened. Upon submission of invoices to health insurance at the beginning of each month, health care providers immediately received 70% by advance payment and the remaining 30% was paid towards the end of the same month based on performance.

4.3 Adjusting the use of existing resources

Actually, most central governments have kept their strategy adaptable to the evolving situation of the pandemic domestically and globally in order to adjust their responses accordingly. In Singapore, 30 to 70 quarantine or Stay-Home-Notice hotels can be activated or stood down to meet infection dips and spikes through the pandemic. Personnel is shared across ministries and agencies, such as the contact tracing centre organized by the MOH and operated by personnel from the police, army and independent contractors.

In China, many hotels were designated as isolation points and gymnasiums were transformed into mobile cabin hospitals. Many hospitals reformed the less-used separate spaces into fever clinics or pre-examination clinics.

In addition, Singapore promoted public-private partnerships (PPPs) through government purchases of services, which made full use of the resources of private medical institutions to jointly respond to COVID-19. Public Health Preparedness Clinics (PHPCs) comprise an extensive primary care network of all polyclinics and 900 to 1000 general practitioners (GPs) in Singapore. During the epidemic, PHPCs were activated and performed tests, provided care and other outpatient services to patients with respiratory symptoms. The government pays the PHPCs at a flat rate between SGD 50 to SGD 60 per patient visit, in addition to a one-time grant of up to SGD 11 200 to defray costs for their operations. For patients treated in a private hospital, the government uses the same payment mechanism as in public hospitals, that is, paying the same fees to these private hospitals through government subsidies, Medshield Life and IP.

5. SOCIAL HEALTH PROTECTION AND EQUITY DURING COVID-19

5.1. COVID-19-related health services

The availability of services related to COVID-19 is an important factor in measuring health equity. Treatment, drugs and other health services related to COVID-19 are all covered by health insurance funds and government budgets in the four case countries (see Table 11).

These four countries have relatively consistent plans for covering the expense of COVID-19 diagnostic testing. The expenses are mostly covered by the government budget or health insurance except for voluntary tests.

The expenses of vaccination and immunization are mostly covered by government budgets. Singapore has built up the Vaccine Injury Financial Assistance Programme to cover the expenses caused by adverse effects following vaccinations. And in May 2021, the Republic of Korea announced that the government would provide compensation up to KRW 10 million (approximately US$ 8 544) for any adverse effects following a COVID-19 vaccination, even if the evidence is insufficient.[6]

Table 11. The payment scheme of COVID-19-related services in case countries

Service	China	Mongolia	Republic of Korea	Singapore
Outpatient	Full refund from government after individual payment	Health insurance contingency fund	National health insurance	Individual (subsidized by government at PHPCs and polyclinics)
Inpatient hospitalization	SHI and government subsidies	Health insurance contingency fund and government subsidies	National health insurance	Government
Diagnostic testing	Government mostly (except voluntary tests)	Health insurance contingency fund and government (except voluntary tests)	National health insurance	Government mostly (except voluntary tests)
Vaccination	Government	Government	Government	Government (except for Sinovac taken for nonmedical reasons)
Adverse effects following vaccination		Government	Government subsidies	Injury financial assistance (government special fund) / three Ms
Isolation and quarantine	Government / Individual	Government / individual	National health insurance	Individual / Government

Source: National reports of four case countries; this is for the majority of the local citizens. Collected and reorganized by the research team.

In addition, the four countries developed different payment policies for the expenses caused by isolation and quarantine. The Chinese government covers the costs of quarantining for close contacts of all confirmed cases. Those who are quarantined due to non-personal reasons (such as work) are paid by the corresponding department, while the expenses of quarantine caused by personal reasons (such as travel) are paid by the individuals themselves.

In Mongolia, the costs of isolation and quarantine of suspected cases and close contacts of confirmed cases are paid by the government and related departments, including the National Center for Infectious Diseases and the National Center for Animal-borne Diseases. In addition, the government also bears the cost of quarantine and isolation for Mongolian citizens who are repatriated by evacuation flights, except for the daily meal cost (US$ 18 per day) paid by the citizen.

The Republic of Korea covers all citizens' isolation and quarantine expenses through the government budget and NHI fund. And the Singapore government pays the cost of isolation and quarantine from contact with suspected or confirmed cases, except for travellers within 14 days of their entry into Singapore. During those 14 days, Singapore citizens and permanent residents are able to tap into the three Ms financing scheme or private insurance, and work visa and other long-term visa holders (including international students) are covered by employer-purchased or private health insurance to cover health care expenses arising from COVID-19 infections.

In the case of foreign residents, the payment policies of the four case countries are also different. For example, foreigners who live in China and have already participated in the Chinese SHI are funded for COVID-19-related services through health insurance schemes. Those who are not participating in China’s SHI need to pay the expenses on their own.

Foreigners holding a work visa in Singapore are entitled to nearly the same payment policies as Singapore citizens. However, foreigners who come to Singapore for a short-term visit need to pay for most expenses except for diagnostic tests to facilitate the test and trace process. Vaccination is also available for free to short-term visa holders who have been in Singapore for an extended period from August 2021. Therefore, Singapore asks visitors who apply for a short-term visa to buy private insurance to cover the expenses of COVID-19–related medical treatment and hospitalization.

The KDCA is responsible for patients’ OOP payments. However, those excluded from the isolation treatment subsidy programme need to pay the OOP payment directly to the health care institution (see Table 12–Table 15).

Table 12. Types of COVID-19-related health services available in Singapore

Health services	Singapore citizens and permanent residents	Foreign residents	
		Long-term visa holder	Short-term visitor
Outpatient treatment	Individual (subsidized by the government at PHPCs and polyclinics)	Individual (eligible pass holders pay a subsidized rate at PHPCs and polyclinics)	Individual
Inpatient hospitalization	Government	Government	Private insurance/ individual
Test	Government mostly (except voluntary tests)	Government mostly (except voluntary tests)	Government mostly (except voluntary tests)
Vaccination	Government (except for Sinovac taken for nonmedical reasons)	Government (except for Sinovac taken for nonmedical reasons)	Beginning on 18 August 2021, short-term pass holders who have been in Singapore for an extended period are eligible to receive free vaccinations
Adverse effects following vaccination	Government (through Vaccine Injury Financial Assistance) / three Ms	Government (through Vaccine Injury Financial Assistance)/private insurance/employer or individual	Private insurance[+] / individual
For travellers within 14 days of return to Singapore			
Inpatient Hospitalization	3 Ms / private insurance / individual	Private insurance[$] / employer / individual	Private insurance[+] / individual
COVID-19 test	Individual	Employer[$]/individual	Individual
Stay-Home-Notice (Quarantine)			

[+]Starting from 31 January 2021, short-term visitors will need travel insurance for COVID-19-related medical treatment and hospitalization costs in Singapore, with a minimum coverage of S$ 30 000 for their entire stay in Singapore.

[$] Employers have to purchase insurance to cover at least S$ 10 000 medical expenses to cover work permit workers who fall sick within 14 days of arrival in Singapore and cover the cost of test, transport and Stay-Home-Notice for their entry into Singapore.

Source: Collected and reorganized by the research team.

Table 13. Sources of health financing for COVID-19-related services in the Republic of Korea

Health services	Republic of Korea citizens	Foreign residents
Treatment	NHI; Government supplementary inputs	KDCA (Except those excluded from the isolation treatment subsidy programme need to pay the OOP payment)
Vaccination	Government	
Test	NHI	
Stay-home isolation	NHI	

Source: Collected and reorganized by the research team.

Table 14. Sources of health financing for COVID-19-related services in China

Health service	Chinese citizens	Long-term resident foreigners		Short-term visitors
		with social health insurance	Without social health insurance	
Nucleic acid Testing	Government mostly (except voluntary tests)	Government mostly (except voluntary tests)	Government mostly (except voluntary tests)	Government mostly (except voluntary tests)
Vaccination	SHI and government subsidies	SHI and government subsidies	Individual	Individual
Outpatient treatment	Full refund from government after individual payment (cash/insurance account / individual)	SHI / individual	Private insurance / individual	Private insurance / individual
Inpatient hospitalization	SHI schemes and government subsidies			
Isolation and quarantine	Close contacts of confirmed cases: government Persons quarantined for business reasons: employers Persons quarantined for international travel: individual	Individual	Individual	Individual

Source: Collected and reorganized by the research team.

Table 15. Sources of health financing for COVID-19-related services in Mongolia

Health services	Mongolian citizens		Foreigners
Treatment	Health insurance contingency fund and government subsidies		Government subsidies
Vaccination	Government*		Government
Test	Health insurance contingency fund and government/individual (voluntary tests)		Private health insurance / individual
Isolation and quarantine	Suspected cases, close contacts of confirmed cases	Mongolian citizens repatriated by evacuation flights	Foreigners repatriated by evacuation flight, paid by individuals

Health services	Mongolian citizens	Foreigners
	Government (except for the daily meal cost paid by the citizen individually)	

* The government awarded US$ 18 (MNT 50 000) to those who received two doses of the vaccine.

Source: Collected and reorganized by the research team.

5.2. Distribution and priorities for of COVID-19 vaccine

Governments determine the priority order for vaccination according to the situation in each country. For example, the Republic of Korea government gave priority to the elderly population and their health care workers due to the high proportion of elders in the population. The governments of China, Singapore and Mongolia designated people with a high risk of infection as the highest priority for vaccination (Table 16).

Table 16. Vaccination priority in four case countries

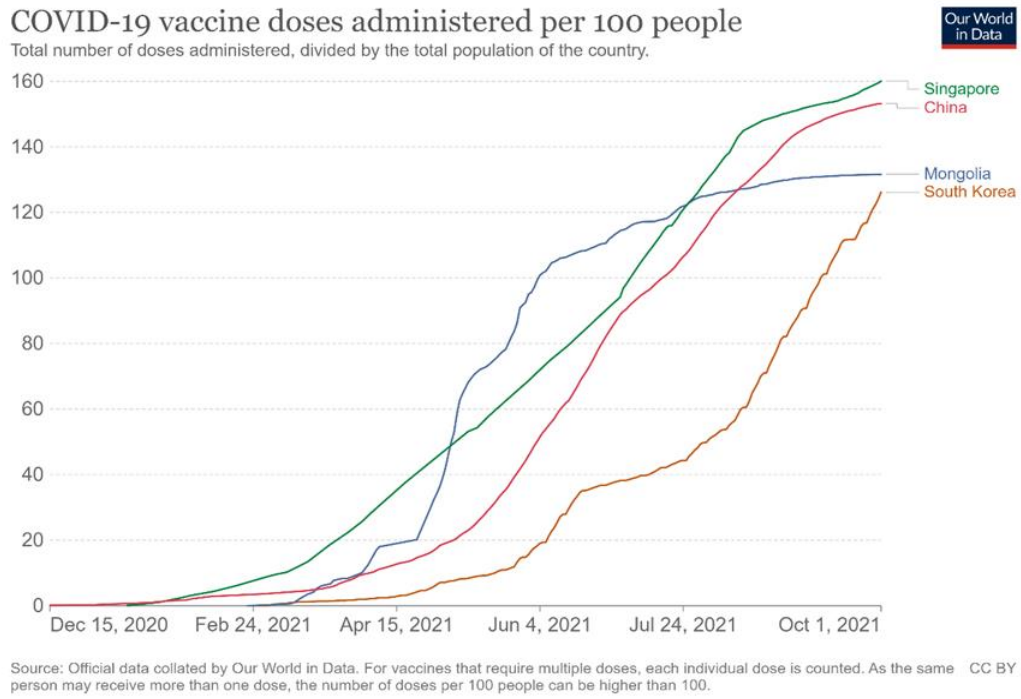
Order	China	Singapore	Republic of Korea	Mongolia
1	People working in cold chain logistics, port quarantine, ship piloting, health care and public health, fresh markets, public transport and other groups at high risk of infection	People with high risk of infection, such as health care workers and workers on the frontier of fighting COVID-19 nationwide, and nursing home staff and residents	A) Residents and workers in elderly nursing health care institutions B) Workers in elder care centres C) People aged 65 and above D) Adults with chronic diseases E) People aged between 50 and 64	Health care workers, emergency service institutions, national emergency regulatory agencies and national police agencies
2	Adults	People who are most vulnerable to severe disease and complications if they fall ill with COVID-19, including the elderly and persons with medical comorbidities, and others such as active taxi and private hire care drivers	A) Employees at medical institutions that treat COVID-19 patients B) Health workers at high risk of infection C) Acute-aid personnel D) Workers in medical institutions and pharmacies E) Soldiers, police, fire fighters and other social workers	High-risk populations such as the elderly, patients with multiple comorbidities, other populations
3	Children aged 12–17 years old	Other citizens including dormitory residents	A) Residents and workers in nursing facilities not for elders B) Employees in education or care facilities for children and adolescents C) People aged 18-49	Vaccination in the rural area started May in 2021

Order	China	Singapore	Republic of Korea	Mongolia
4	-	-	Children and adolescents	Pregnant women and breastfeeding mothers voluntarily
5	-	-	-	Children aged 16-17
6	-	-	-	Children between 12 and 15 get vaccination voluntarily

Source: Collected and reorganized by the research team.

In terms of population vaccination rate, Singapore had the highest cumulative vaccination rate at the beginning of October 2021; the average number of vaccinations per 100 people was 160 doses, followed by China, Mongolia and the Republic of Korea (Figure 13). Note that Mongolia's vaccine procurement was jointly paid for by the government, ADB concessional loans, the COVAX project and UNICEF. And Mongolia began to provide cash rewards (MNT 50 000, approximately US$ 18) to citizens receiving two doses of the vaccine and to allow them to use resorts, tourist bases, saunas and restaurants, to encourage vaccination and expand vaccination coverage.

Figure 13. Vaccination allocation in four case countries (per 100 people)



Source: Our World in Data database. All data were updated on 1 October 2021.

5.3. Protection of vulnerable populations

In addition to covering most of the COVID-19-related costs of basic medical care and vaccines for all citizens, the four case countries were also committed to addressing health equity of vulnerable groups, including the elderly, people with underlying diseases, children, teenagers, pregnant women and low-income groups through other means.

The Republic of Korea had specific plans for isolation and treatment for people with a high infection risk and special needs, and temporarily reduced 30%-50% of health insurance premiums for people with financial difficulties. In Mongolia, the high-risk population, including children, pregnant women, people with underlying diseases and the elderly, can get hospitalization free of charge, and the population with government-subsidized health insurance can be exempted from paying the OOP portion of health insurance, approximately 15%-25% of the total cost. Singapore introduced various measures to protect vulnerable groups, such as programmes to reach out to frail seniors who live alone to inform them about COVID-19 precautionary measures. The government sent mobile vaccination teams to the elderly and homebound people who cannot travel for vaccination and provided essentials such as masks and hand sanitizers to everyone, especially low-income groups, for free.

However, the pandemic has also highlighted the disadvantages and inequities of certain groups in terms of access to health care services. For example, migrant workers in Singapore make up 5.6% of the total population but disproportionately represent 86.9% of confirmed cases in Singapore. Many migrant workers live in densely packed rooms, and barriers to health care have been reported. To respond to the outbreaks in the migrant worker community, Singapore rapidly channelled resources to the dormitories, including setting up testing, isolation facilities and medical posts for the workers. The dormitories were locked down, and some were gazetted as isolation zones. Regular tests were performed, and those infected and close contacts were isolated. These measures largely managed to allay the infections. In addition, governmental and nongovernmental organizations have stepped up to provide mental health support to migrant workers who suffer from fatigue and mental health issues arising from quarantine and restrictions.

6. SUSTAINABILITY OF UNIVERSAL HEALTH COVERAGE

As stated in a World Bank report, to deliver the levels of health spending necessary to respond to the health crisis, the health and finance system must work together on a three-pronged agenda, coordinating across all levels of government: increasing government funding for health, expanding fiscal space and improving the equity and efficiency of health spending[7]

We summarized the main experiences and lessons of health financing in the four case countries during the COVID-19 pandemic. We hope these conclusions will provide some references and suggestions for other countries looking to improve their financing plans, establish a flexible health financing system, and move towards UHC.

6.1. Improve the sustainability of government health financing through multiple measures

To deal with the uncertainty of health financing during the pandemic and continue to improve the public health system, multiple measures should be taken to ensure a stable source of health financing and increase health investment, according to the national conditions of the country.

Developed countries mainly improve their financing capacity in response to public health emergencies by increasing the contribution from the national reserve, the contribution of the insurance fund and taxing revenue. During the COVID-19 pandemic, countries increased their public health expenditures, including a higher investment in fundamental facilities and health workers in public sectors. In the meantime, governments provided subsidies to reduce the pressure caused by the epidemic on people's lives, work and medical treatment.

Meanwhile, some countries began to take a long-term look at how to deal with the influence imposed by the pandemic on health financing. Many non-urgent health services have been deferred due to prioritizing both COVID-19 care (e.g. postponing elective surgeries) and individuals forgoing

care for fear of infection. As patients begin to address delayed concerns, strains on systems will increase, even as the pressure from COVID-19 declines. From the service perspective, therefore, the need for expenditures will remain high even as revenues decline substantially. To tackle the increasing health expenditure in the long-term, the Singapore government announced a plan before the pandemic to expand the fiscal space by increasing the Goods and Service Tax from 7% to 9%. The increase is scheduled to take place between 2022 and 2025. An SGD 6 billion package has been budgeted to defray the Goods and Service Tax increase on most households, especially the lower-income Singaporeans.

For low- or middle-income countries, foreign aid is still important support when they face emergencies. For instance, to ensure additional resources, the UN Health Team has held several meetings, inviting representatives from foreign embassies, UN agencies, international organizations and diplomatic missions in Mongolia to report on its current situation. And the increased expenditure on public health-related activities during the pandemic in Mongolia is also funded by international projects and programmes.

Compared to developed countries, lower-income countries are more in need of increased investment in public health to improve public health education, train medical personnel, improve infrastructure, strengthen public health systems and increase the ability to prevent, control and treat COVID-19 and other infectious diseases. Therefore, developed countries and international organizations should encourage international assistance to help less-developed countries strengthen their ability to provide primary health care and face infectious diseases. As stated earlier, continuous surveillance of the effectiveness of health financing policies and reforms of financing schemes, timely identification of the problem, and improvement are indispensable for the sustainability of financing and the achievement of UHC.

In addition, debt relief is an important approach to help low-income countries respond to the pandemic. China, the world's largest official creditor, has exempted some African countries from interest-free loan debts due at the end of 2020, which account for 5% of all Chinese loans. At the same time, China has responded to the Debt Service Suspension Initiative, proposed by the World Bank and the International Monetary Fund, to suspend debt repayments from 73 developing countries until at least the end of December 2021.

6.2. Promote public-private partnerships and improve private sector's contribution

Good PPPs are critical for the response to health emergencies, especially in countries with a high proportion of private institutions in their health system, such as the Republic of Korea and Singapore. The cooperation with private partners contributes to rapidly mobilizing human resources (e.g. nonclinical care, contact tracing volunteers.) and infrastructure (isolation hotels, testing and vaccination sites), increasing the number of medical personnel and hospital beds, and strengthening service capabilities. On the other hand, a critical question arises related to how public funds could be channelled and used to engage, finance and regulate the private sector's contributions to the development and delivery of COVID-19-related services and therapeutics.

To encourage the participation of private groups, both the Republic of Korea and Singapore have provided financial support to private health institutions during the pandemic, but the process differs slightly in form. The Republic of Korea paid a one-time loss compensation, while Singapore applied a combination of a one-time grant and a fee-for-service mechanism. Singapore activated a primary care network called the PHPCs based on PPPs and provided COVID-19 patients treated in private hospitals with the same payment mechanism as patients in public hospitals. In fact, even for a country with mostly public hospitals, such as China, the public-private partnership should also be promoted through social medical institutions and health resources to make up for the resource gap in response to major emergencies.

6.3. Promote innovative service patterns and improve the resource utilization efficiency

Countries' incomes and economies shrunk as a result of COVID-19 and the available funds were limited. In the case of reduced resources, countries are reforming their service patterns to improve the effective use of existing resources and fill up the funding gap to a certain extent.

For example, the pandemic has restricted the use of non-COVID-19 health care to some extent, while introducing telemedicine to provide an alternative solution. The government of Singapore expanded insurance coverage to cover teleconsultation provided by over 731 public and private health care institutions for 20 chronic conditions. The Republic of Korea invested in the construction of a telemedicine system, and its NHI fund paid KRW 28.2 billion (approximately US$ 24.09 million) for telemedicine.

In addition, the development of telemedicine can help residents in remote areas access diagnosis and treatment without barriers. For instance, since large hospitals and specialized professional services in Mongolia are concentrated in its capital city Ulaanbaatar, under the strict quarantine regulations patients from rural areas with severe conditions died at traffic checkpoints due to an inability to receive specialized professional services in the capital. If Mongolia can promote telemedicine, the accessibility of health services for rural patients will be improved.

Another way of increasing the health funding efficiency is to improve the performance and quality of health services to avoid wasting resources. For example, Mongolia's health sector funding is mostly spent on inpatient care, where the absence of clear admission guidelines and criteria have led to many inappropriate hospital admissions and related costs. Having these resources consumed by non-essential hospitalization, nursing and referral could have been avoided.

The Chinese government urged public hospitals to improve efficiency by incorporating operational efficiency into performance appraisal. Meanwhile, China continues to implement the Healthy China Initiative to promote the shift from building a disease-centred health system to building a health-centred health system, which aims to achieve higher health performance at a lower cost.

The IDS proposed by WHO has also played an important role during the pandemic. Especially for areas where primary care is relatively weak, the promotion of hierarchical diagnosis and treatment supported by IDS can help patients with actual needs to receive timely treatment, while avoiding runs on medical resources that may lead to further social panic.

6.4. Pay attention to vulnerable groups and areas to reduce health inequity

Health inequities are particularly prominent during a pandemic. The outbreak among Singapore immigrant workers is a typical example. Although there is a well-established health insurance system in Singapore, some workers faced financial barriers to care, including insufficient knowledge of health coverage for work and non-work-related injuries. And most of the sporadic outbreaks in China have also been concentrated in rural and border areas. Many countries have similar situations. With limited health resources, the regional and urban-rural differences in access to health services have been increased under the influence of the COVID-19 pandemic.

During the pandemic, most countries paid attention to traditionally vulnerable groups with a high risk of infection, including the elderly, patients with underlying diseases, teenagers, children, low-income groups and migrant workers. They were prioritized in the allocation of vaccines, or exempted from medical expenses, etc. At the same time, many countries paid attention to the newly poor and those who did not necessarily fit in the low-income group but were possibly struggling due to abrupt or temporary loss of household income. The government would help them cope with the negative impact of the pandemic through subsidies and assistance. But health and social agencies still need to be vigilant to ensure the system is robust enough to support them.

However, there is still a lack of necessary assistance to address the health inequality between regions or between urban and rural areas. On the one hand, the local capacities in some areas are inherently very limited. On the other hand, the pandemic has affected the original external assistance in these areas and made their situation even worse. The allocation of vaccines in Africa is a typical example. Therefore, we call for more global attention towards and investment in these less-developed countries. In this way, we could reduce global health inequities, and accelerate the realization of UHC.

6.5. Increase public health investment rationally for both “peacetime" and “wartime”

In many developed countries, since there have been fewer pandemics in recent years, public health is not a priority in their peacetime budgets. Coupled with annually increasing health expenditures, developed countries are actively reducing investments in health, such as decreasing the number of facilities for infectious disease hospitals and beds. The pandemic has tested the public health infrastructure and medical capabilities of all countries and highlighted the limitations. In the Republic of Korea, three laws related to the COVID-19 response were revised to further increase investment in public health institutions and ensure enough medical institutions and personnel to deal with the pandemic.

In view of the normalization of the COVID-19 pandemic and the continuous emergence of various new infectious diseases, all countries are recommended to establish health resource allocation and reserve schemes for both peacetime and wartime. For example, establishing a dynamic inventory strategy cannot only meet the resource demand in wartime, but also avoid wastage of resources caused by overstocking. Regarding the reserve of public health personnel, Japan’s experience in establishing a team of epidemic prevention personnel can be used for reference. The team is composed of volunteers who have undergone short-term professional training and can be used to assist in public health education in peacetime. And in wartime, the team can cooperate with professionals to conduct epidemiological investigations and assist in the implementation of isolation measures.

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