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## Partnership for Health System Sustainability and Resilience

TAIWAN

# Sustainability and Resilience in the Taiwanese Health System

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with preface by Chang-Chuan Chan



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# Preface



An integrated health system consists of both personal healthcare and other important elements of public health, or nonpersonal health, which connects individuals with their communities and the environment. The health system in Taiwan is supported by both public and private institutions. Taiwan's Ministry of Health and Welfare (MOHW) and 22 health bureaus at the city and county levels are the main administrators of personal healthcare in Taiwan. Governmental health protection and promotion programs in communities, covering infectious and chronic disease control, pandemic response, vaccination, disease screening, and smoking cessation, are routinely executed to promote population health. In addition, broader areas of public health, namely occupational, environmental, and animal health, are regulated by the Ministry of Labor, Ministry of Environment, and Ministry of Agriculture, respectively.

Taiwan's mandatory single-payer National Health Insurance (NHI) program has been the main system of personal care since 1995 and covers medical consultations and treatments by virtually all medical professionals, clinics, and hospitals for nearly all of Taiwan's residents. It is administered by the National Health Insurance Bureau under the MOHW. NHI covers comprehensive health services including outpatient visits, inpatient care, dental care, traditional Chinese medicine, renal dialysis, and prescription drugs for Taiwan's citizens and residents.

In Taiwan's health system, the government is the most important player because it has a mandate to oversee the entire health system. Accordingly, a review of Taiwan's health system needs to focus on the NHI, given that it is the de facto healthcare system. However, we should not overlook the importance of nonpersonal care in population health, as illustrated by the worldwide tragedy of the COVID-19 pandemic and the continued threat of global warming.

The COVID-19 pandemic is one of the greatest tragedies of our time, changing the world and every one of us. Taiwan has registered over 10 million cases and over 20,000 deaths by COVID-19 since 2020. Life expectancy in Taiwan decreased consecutively in 2021 and 2022 due to high rates of COVID-19 morbidity and mortality among older people and those with comorbidities, such as noncommunicable diseases (NCDs). Although the NHI has been successful in providing generous and accessible medical service, it has not fully addressed the challenges of NCDs, quality of care, shortages of doctors and nurses, issues in transparency and governance, and low national investment in health before the pandemic. These preexisting issues with Taiwan's NHI, or even Taiwan's health system broadly, have been exacerbated by the COVID-19 pandemic. Thus, it is time to review the NHI to make Taiwan's health system more resilient to future public health crises. The lessons from the COVID-19 pandemic show that Taiwan's health system needs to become more resilient to control disease spread and save lives in the current pandemic as well as future pandemics.

In this report commissioned by the Partnership for Health System Sustainability and Resilience (PHSSR), Tsai et al. provide insightful perspectives of challenges and solutions for Taiwan's health system to achieve sustainability and resilience. Based on the common PHSSR framework that draws from the World Health Organization's building-block approach to health systems, this report identifies needed reforms across seven domains of the health system: population health, environmental sustainability, workforce, medicines and technology, service delivery, health system financing, and health system governance. It also makes needed policy recommendations to fill gaps in Taiwan's health system, such as establishing a policy coordination unit under the Executive Yuan, increasing financial and human resources, and promoting patient-centered care. The core purpose of NHI reforms in Taiwan is to provide more effective and better-quality care with reasonable

payments to professionals and affordable costs to society, while maintaining the equity of universal healthcare across socioeconomic and geographic differences.

Reforming NHI is even more urgent than before in Taiwan, as population aging, the climate crisis, digital evolution, and the pandemic are ongoing both locally and globally. The call for governmental commitments, more resources, and more attention to people from this report reflects that the scope of healthcare in modern society is larger than the medical practice by healthcare providers; health system reform is indeed a social and political process in a democratic society.

The current state of NHI described in this report must be supplemented with a historical perspective of the system's evolution. The launch of NHI in 1995 was timed just before Taiwan's first democratic presidential election in 1996. In every election in Taiwan over the 30 years since then, patchwork remedies for NHI have been on the political agenda, meant to address problems of ever-growing coverage of medications, diagnoses, and treatments; fights over the global budget; the expansion of privately owned medical centers, and the implementation of co-payments and out-of-pocket payments.

The 2024 presidential election was the first time two of the three candidates were physicians, and they both campaigned to invest 8% of gross domestic product in health expenditure, bringing health system reform to the forefront of the policy debate. The prominence of public health in Taiwan's recent policy discussion provides the legitimacy needed for bold reforms that can address the NHI's challenges in the 21st century. This report is a timely publication to promote social dialogue and future policy discussion on health system reform in Taiwan.

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# Abbreviations



CAPRI	Center for Asia-Pacific Resilience and Innovation
CDC	Centers for Disease Control
CECC	Central Epidemic Command Center
CT	Computed tomography
CWB	Central Weather Bureau
EUA	Emergency Use Authorization
GDP	Gross domestic product
HTA	Health Technology Assessment
IHR	International Health Regulations
JEE	Joint-External Evaluation
MOHW	Ministry of Health and Welfare
NCD	Noncommunicable diseases
NHE	National health expenditure
NHI	National Health Insurance
NHIA	National Health Insurance Administration
NHRI	National Health Research Institutes
PBRS	Pharmaceutical Benefit and Reimbursement Scheme
PHSSR	Partnership for Health System Sustainability and Resilience
TCPI	Taiwan Clinical Performance Indicator
TFDA	Taiwan Food and Drug Administration
TMAL	Taiwan Medical Alliance for Labor Justice and Patient Safety

# Executive summary



Overall, Taiwan's health system is designed to feature wide coverage, high affordability, high efficiency, and effective budget control. Taiwan's National Health Insurance (NHI) system, a single-payer health system administered by the National Health Insurance Administration (NHIA), is a high-performance model compared with those of other countries, exemplified by universal health coverage and increasing life expectancy. The system has served as the foundation for Taiwan to weather public health emergencies. Taiwan's ability to learn from past experiences and its pursuit of digitalization in healthcare service administration enabled its swift response to the COVID-19 crisis in 2020, which was extolled by international society.

Despite these strengths, structural challenges to the resilience of the health system remain; the NHI has become inefficient in adapting to the changing demographics and aging society. In subsequent waves of the pandemic, Taiwan's health system produced suboptimal results, demonstrated by the increasing death toll and the reversal from increasing to decreasing life expectancy over the past two years. This reflects structural deficiencies that restrict Taiwan's potential to provide its population with sustainable, high-quality care in the long term.

As part of the Partnership for Health System Sustainability and Resilience (PHSSR), this report contributes to an international research effort to enhance global health and facilitate regional dialogue by using a research framework originally developed by the London School of Economics and further adapted for the Asia-Pacific region by the Center for Asia-Pacific Resilience and Innovation (CAPRI), the Asia-Pacific research hub of PHSSR. This report reviews the strengths and weaknesses of the health system through a lens of sustainability and resilience, as well as draws lessons from the COVID-19 pandemic, to provide recommendations for improvement across seven domains: population health, environmental sustainability, workforce, medicines and technology, service delivery, financing, and governance.

## Overview of Taiwan's health system by domain

### Domain 1: Population health

Taiwan has made remarkable progress in improving population health, with an average life expectancy of 79.84 years – one of the highest in the world. Yet, Taiwan faces challenges from an aging population and a rising incidence of chronic diseases, which have caused increased mortality and stressed healthcare resources. The COVID-19 pandemic underscored Taiwan's health inequities; most people affected were older adults (i.e., aged 65 years or older), those with preexisting conditions, and people in indigenous communities with limited healthcare access. Although Taiwan's rapid pandemic response helped contain COVID-19 in its initial stages, subsequent waves diverted resources from non-COVID-19 healthcare needs. This resulted in rising excess mortality, reflecting broader health system issues for long-term population health.

### Domain 2: Environmental sustainability

Climate change in Taiwan has caused temperature increases, altered precipitation patterns, and increased the frequency of extreme weather events. This has impacted health in terms of increased heat-related illnesses, respiratory issues, and infectious diseases. Although Taiwan has initiated greater efforts to combat climate change, the healthcare sector's response has been slow. Hospitals contribute significantly to greenhouse gas emissions, necessitating policy monitoring and eco-friendly practices. The COVID-19 pandemic reminded people that the One Health approach should be emphasized when facing the threat of zoonotic diseases. Taiwan has strengthened its infectious disease reporting system across animal health and environmental surveillance, but challenges, such as limited interagency collaboration, remain.

### Domain 3: Health system workforce

Taiwan's healthcare system faces workforce challenges. In particular, nurses experience high risk, high stress, low pay, and long hours, leading to a declining practice rate. Limited funding for hospitals affects hiring, resulting in overworked staff and high turnover. Meanwhile, physicians are unevenly distributed between rural and urban areas, which creates inequitable care across communities. During the COVID-19 pandemic, the government provided financial support and subsidies to maintain the health workforce, but long-term cost concerns persist. Short-term funding does not resolve chronic underinvestment in talent. Enrollment in nursing programs has also dropped significantly, which may cause future workforce challenges.

### Domain 4: Medicines and technology

Taiwan's adoption of new medicines and technologies in its healthcare system involves two processes: market review by the Taiwan Food and Drug Administration and inclusion in the NHI payment list by the NHIA. Despite adherence to international standards, the adoption of new medicines and technologies is hampered by NHI budget constraints, insufficient investment, and insufficient review capacity, thereby affecting patient access to breakthrough drugs and treatments. Hesitancy over the use of generic drugs limits treatment to the more expensive and limited supply of name-brand drugs. Vaccine shortages during the COVID-19 pandemic highlighted the weaknesses of the Taiwanese health system regarding timely access to essential drugs and technology. Although Taiwan developed a domestic COVID-19 vaccine, its approval process raised transparency concerns. Nevertheless, traditional Chinese medicine was effective in treating mild COVID-19, showcasing Taiwan's strength in integrating traditional with Western medicine.

### Domain 5: Health service delivery

Taiwan's healthcare service delivery is marked by high accessibility and efficiency but faces challenges of limited healthcare resources such as acute care beds and advanced medical equipment. The private sector dominates healthcare, and public hospitals must be self-sustaining; this fosters competitiveness but hinders integration in service delivery. The health system struggles with chronic disease management and provides lower quality of care for chronic conditions. The COVID-19 pandemic caused delays in medical care and revealed challenges in resource coordination, especially for older people, who accounted for 80% of COVID-19 deaths. Many had underlying chronic conditions, which required integrated care and prevention. The fragmented nature of care delivery contributes to gaps in managing chronic diseases.

### Domain 6: Health system financing

Financing is essential for sustaining healthcare delivery. A major issue in Taiwan's health system is underinvestment in long-term health outcomes; short-term spending is viewed as a cost rather than an investment. This hesitancy toward investment limits innovation. Taiwan's global budget payment system effectively controls the cost of healthcare. However, the fixed budgets do not allow for adjustments to meet evolving healthcare needs or technological advancements over time, limiting institutions' ability to invest in the future. This financing system incentivizes quantity over quality of healthcare supply and hinders collaboration, leading to fragmented care. Underinvestment has also affected pandemic readiness, necessitating ad hoc budgets for COVID-19 relief. Moreover, Taiwan lacks long-term care insurance, relying on immediate government spending. Efforts to strengthen postpandemic resilience must include significant budget allocation to ensure sustainable health system financing.

## Domain 7: Health system governance

Taiwan's healthcare system is highly accessible and ranks well globally but lacks clear long-term goals. Facing global geopolitical and climate risks, Taiwan must develop a more creative and inclusive approach for health system governance. Balancing different health system values, such as economic development and equity, is challenging but necessary. Transparency issues and debates over prioritization of different social values has somewhat eroded public confidence in the health system. Nevertheless, there is a growing consensus on the need for a proper legal framework to govern health decisions. A democratic process is crucial for long-term health system sustainability.

### Critical gaps in Taiwan's health system

Taiwan's experiences during the COVID-19 pandemic demonstrated the overall resilience of its health system but exposed the following critical structural challenges that threaten its sustainability. First, lack of strategic planning on national health and inadequate interministerial coordination lead to a health system that favors short-term needs over long-term planning for future success. Second, workforce shortages and burnout among healthcare professionals has resulted from insufficient financial and operational investment in health system capacity. Finally, ineffective coordination among different components in the health system results in fragmented care services across specialty areas and a dearth of patient-centered healthcare.

### Policy recommendations

To overcome the aforementioned challenges, this report proposes the following major policy recommendations aimed at transforming Taiwan's health system across the seven domains into a sustainable system that benefits the population and demonstrates greater resilience in preparing for future public health crises.

First, the Ministry of Health and Welfare (MOHW) and the National Health Research Institutes (NHRI), the public think tank supervised by the MOHW, should streamline data collection and interpretation across different components of the health system to produce regular analysis and provide recommendations to update the national health strategy. The Executive Yuan should establish an independent unit responsible for leading subsequent policy coordination.

Second, additional financial and human resources should be allocated to the health system to provide necessary incentives for healthcare workers and build capacity to meet the increasing healthcare demands. Such investments include salary subsidies and training programs for healthcare workers.

Third, the MOHW should lead a multipronged approach at an operational level to facilitate coordinated, patient-centered care. This includes building a well-being-oriented healthcare data platform, enhancing alliances across healthcare institutions for scalable service and encouraging payment innovation for patient-centered healthcare.

To implement these recommendations, the government must not only develop a sustainable scheme to finance the NHI and allocate budget for additional institutional setup but also actively engage public communication channels to explain the cost-benefit calculation behind such schemes to wider society. The government must take a forward-thinking approach toward healthcare expenditure as an investment in the long-term resilience of society.

For Taiwanese society, consensus is crucial for the health system's strategic goal of managing population health instead of managing patients. This requires targeted engagement with the public and education campaigns on preventive health and healthy lifestyles.

**Table 1: Policy recommendations by domain**

<b>DOMAIN 1 POPULATION HEALTH</b>	
1A	Review Taiwan's long-term population health and disease burden data for strategic policy planning
1B	Improve access to healthcare through various measures, especially digital health technologies
1C	Promote awareness and health education among society on health management and disease prevention
<b>DOMAIN 2 ENVIRONMENTAL SUSTAINABILITY</b>	
2A	Conduct educational campaigns to raise awareness in the health sector on the importance of reducing carbon emissions
2B	Monitor the impact of climate change, specifically greenhouse gas emissions, on health
2C	Collaborate across ministries and at an international level to promote and regularly evaluate the implementation of a One Health approach
<b>DOMAIN 3 HEALTH SYSTEM WORKFORCE</b>	
3A	Collect and assess workplace data to guide regular policy review
3B	Review workload of and incentives provided to healthcare professionals and provide regular support
3C	Foster discussion on potential solutions to unequal distribution of healthcare professionals
3D	Explore options to fill in employment gaps, including hiring foreign-trained healthcare professionals
3E	Explore implementing additional regulatory adjustments, including allowing licensed healthcare professionals to perform specific medical procedures during emergencies
<b>DOMAIN 4 MEDICINES AND TECHNOLOGY</b>	
4A	Forge international collaboration to enhance capabilities for the development and approval of new drugs and technologies
4B	Engage public communication on adoption of new technologies and generic drugs
4C	Stipulate the transparency of expert review committees by law to enhance public trust in their decisions

**Table 1 (continued): Policy recommendations by domain**

<b>DOMAIN 5 HEALTH SERVICE DELIVERY</b>	
<b>5A</b>	Improve the integration of service delivery between healthcare institutions
<b>5B</b>	Adopt a patient-centered approach with workforce training and support across different healthcare providers
<b>5C</b>	Establish a comprehensive quality monitoring framework to evaluate long-term health outcomes of patients

<b>DOMAIN 6 HEALTH SYSTEM FINANCING</b>	
<b>6A</b>	Conduct public education campaigns to shift the public view of health spending to a long-term investment by prioritizing preventive measures, early detection, and coordinated healthcare service
<b>6B</b>	Collaborate across sectors to determine the appropriate approach to increase health financing
<b>6C</b>	Set up an independent commission responsible for a cost-effectiveness assessment and systematic evaluation of short-term as well as long-term outcomes of the financial strategy

<b>DOMAIN 7 HEALTH SYSTEM GOVERNANCE</b>	
<b>7A</b>	Develop a national, government-wide, long-term plan to guide the development of the health system via broad social dialogue
<b>7B</b>	Invest in capacity building for government officers to better equip them for future challenges
<b>7C</b>	Improve coordination across different levels of care and specialties between health and social care providers with a focus on primary care
<b>7D</b>	Enhance the role of primary care as the main point of accountability and leverage big data analysis and information technology to facilitate coordination with specialty providers
<b>7E</b>	Develop a priority investment framework and transparency mechanism for crisis scenarios

# Introduction





Taiwan's health system is designed to feature wide coverage, high affordability, high efficiency, and effective budget control. National Health Insurance (NHI), a single-payer health system administered by the National Health Insurance Administration (NHIA), is a high-performance model compared with those of other countries, exemplified by universal health coverage and increasing life expectancy. The system has served as the foundation for Taiwan to weather public health emergencies. Taiwan's ability to learn from past experiences and its pursuit of digitalization in healthcare service administration enabled its swift response to the COVID-19 crisis in 2020, which was extolled by international society.<sup>1</sup>

Despite these strengths, structural challenges to the resilience of the health system remain. The NHI has become inefficient amidst Taiwan's changing demographics. In subsequent waves of the pandemic, Taiwan's health system produced suboptimal results, demonstrated by the increasing mortality and decreasing life expectancy over the past two years. These structural deficiencies restrict Taiwan's potential to provide its population with sustainable, high-quality care in the long term.

As part of the global PHSSR, this report examines the health system of Taiwan from a broad perspective by using a research framework and definitions of "health system sustainability" and "health system resilience" developed by the London School of Economics for PHSSR (Table 1). In this framework, PHSSR adopts the definition of "health system" promulgated by the World Health Organization's *World Health Report 2000*: "all the activities whose primary purpose is to promote, restore, or maintain health."<sup>2</sup>

**Table 2: Definitions of health system sustainability and resilience in the PHSSR framework**

<b>Health system sustainability</b>	A health system's ability to maintain and improve population health by continually delivering the key functions of providing services, generating resources, financing, and stewardship, incorporating principles of financial fairness, equity in access, responsiveness and efficiency of care, and doing so in an environmentally sustainable manner.
<b>Health system resilience</b>	A health system's ability to prepare for, absorb, adapt to, learn, transform, and recover from crises born of short-term shocks and accumulated everyday stresses in order to minimize their negative impact on population health and disruption caused to health services.

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The PHSSR framework consists of the following seven domains, moving from the contextual and locally based to the key components of the health system and finally to the national landscape that shapes and finances health policy:

1. Population health
2. Environmental sustainability
3. Health system workforce
4. Medicines and technology
5. Health service delivery
6. Health system financing
7. Health system governance

This report offers an overview of Taiwan's healthcare system and presents policy recommendations aimed at enhancing its sustainability and resilience through strategic planning, capacity building, and cross-domain collaboration. Prioritizing patient-centered care is crucial for Taiwan's forward-looking healthcare reform, as are fostering broader social dialogue and increasing transparency in policymaking.

1. DOMAIN 1  
**Population  
health**

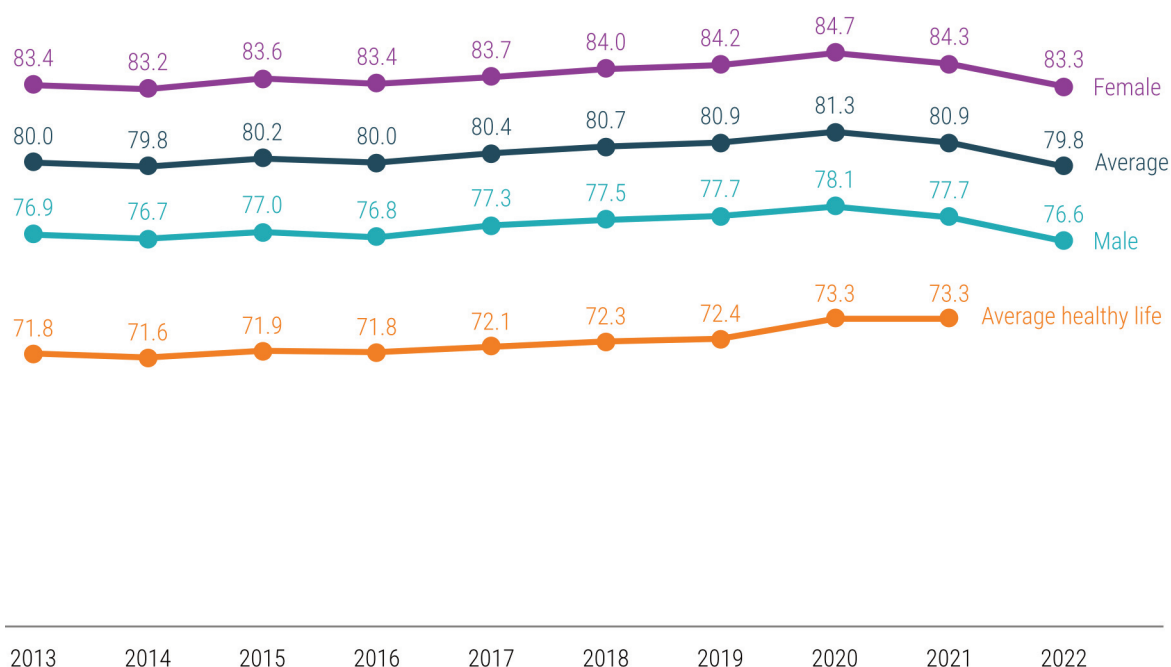


Over the past few decades, Taiwan has made remarkable progress in improving population health, yet today it faces challenges from an aging population and rising chronic diseases. The COVID-19 pandemic underscored health inequities in Taiwan. Although Taiwan’s rapid pandemic response helped contain COVID-19 in its initial stages, subsequent waves diverted resources from non-COVID-19 healthcare needs. This section provides an overview of population health status in Taiwan and discusses the major challenges it is facing.

## 1.1 Aging society and chronic disease

According to information provided by Taiwan’s Ministry of the Interior, the average life expectancy in Taiwan has grown over the past 10 years until 2021, when it fell for two consecutive years largely due to the pandemic (Figure 1). In 2022, the average life expectancy in Taiwan was 79.84 years (76.6 for men and 83.2 for women),<sup>3</sup> which is among the highest in the world.

**Figure 1: Ten-year average life expectancy trend chart in Taiwan**



Source: “Abridged life table in Republic of China Area,” Ministry of the Interior, R.O.C. (Taiwan), accessed February 29, 2024, [www.moi.gov.tw/english/cl.aspx?n=7780](http://www.moi.gov.tw/english/cl.aspx?n=7780)

However, this achievement presents new challenges associated with an aging population. In July 2023, older adults (aged  $\geq 65$  years) accounted for 17.96% of Taiwan’s population. By 2025, this figure is predicted to cross the 20% threshold, making Taiwan’s a super-aged society.<sup>4</sup> Taiwan’s population pyramid has gradually transformed from expansive to stationary (Figure 2) and is predicted to become constrictive with a narrow base by 2065. This aging population will increase the epidemiological and health challenges,<sup>5</sup> including the rise of chronic disease and demand for long-term care services. Understanding the impact of these demographic shifts is crucial for assessing the sustainability and resilience of Taiwan’s health system.

Figure 2: Taiwan population pyramid, 2023 and 2065



Source: "Population by specific age group," National Development Council, R.O.C. (Taiwan), accessed December 31, 2023, [https://pop-proj.ndc.gov.tw/main\\_en/Custom\\_Detail\\_Search.aspx?n=175&t=1](https://pop-proj.ndc.gov.tw/main_en/Custom_Detail_Search.aspx?n=175&t=1).

In Taiwan, chronic noncommunicable diseases (NCDs) account for a significant proportion of mortality and morbidity, particularly for older adults. According to the Ministry of Health and Welfare (MOHW), NCDs, including cardiovascular diseases, cancer, chronic respiratory diseases, and diabetes, are responsible for nearly 80% of deaths in Taiwan.<sup>6</sup> These diseases also substantially impact the individuals' quality of life. Moreover, 92.4% of older adults have at least one chronic disease, and 56.6% have three or more.<sup>7</sup> Consequently, healthy life expectancy – defined as the number of years individuals can expect to live in good health without the burden of illness or disability – after age 65 is only 7.56 years, which is less than the 2019 average in Organisation for Economic Co-operation and Development (OECD) countries of 9.8 for women and 9.7 for men.<sup>8</sup>

The growing burden of chronic diseases in Taiwan also puts significant pressure on healthcare resources. In 2020, the top three conditions causing the highest healthcare expenditure were acute renal failure and chronic kidney disease (8%), diabetes (5.2%), and hypertension-related conditions

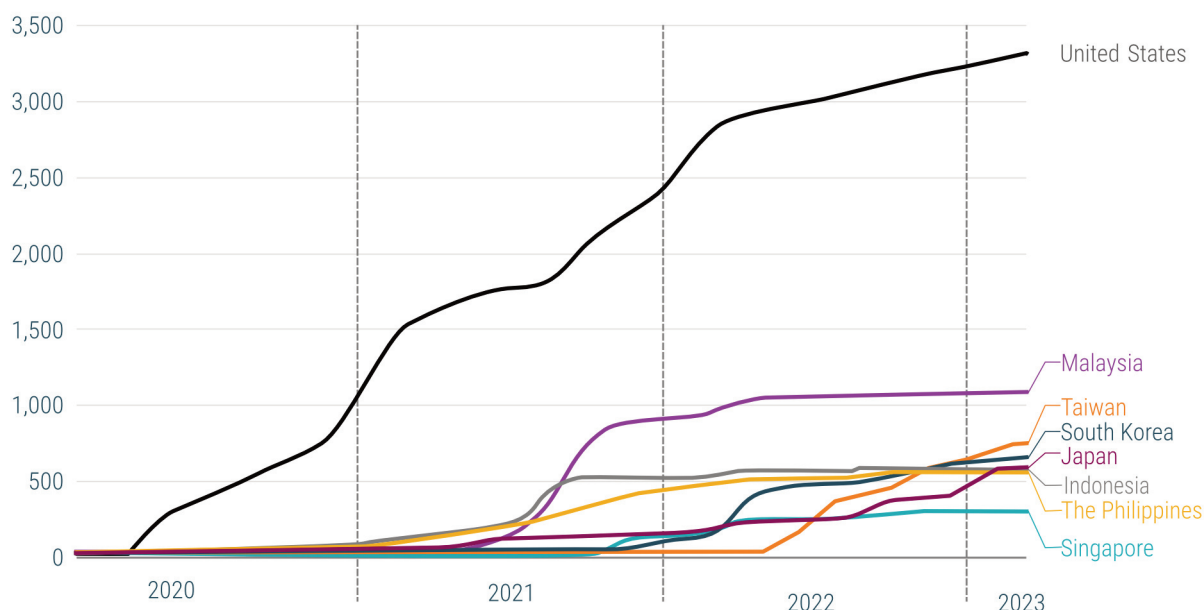
(3.5%).<sup>9</sup> Additionally, the healthcare expenditure growth rate in Taiwan was 5.2% in 2020, outpacing the growth rate of the gross domestic product (GDP) of 4.4%.<sup>10</sup> Healthcare spending is growing faster than overall economic growth, further emphasizing the need for targeted policies and strategies to address the financial implications of the growing chronic disease burden. Despite overall improvement in average population health, progress in advancing population health has slowed in recent years compared with neighboring countries Japan, Korea, Singapore, and China.<sup>11</sup> The average life expectancy was higher in Taiwan than in South Korea in the 1990s but has been lower since 2004, and infant mortality rate in Taiwan has been higher than that in Japan and South Korea over the past two decades.<sup>12</sup>

Persistent gaps exist in health inequity and inequality within Taiwan, disproportionately affecting certain regions and vulnerable populations. Geographically, rural areas often face limited access to healthcare services, including primary care facilities and specialist providers. This disparity in healthcare resources can result in delayed diagnosis, inadequate treatment, and poorer health outcomes for residents in these areas. For example, life expectancy in 2022 in Taitung County, the least populated county on the main island of Taiwan, was 76.46 years, over 7 years fewer than that in the capital city of Taipei, at 83.75 years.<sup>13</sup> Additionally, minority groups, including indigenous populations and migrant workers, encounter unique barriers to healthcare access, such as language barriers, cultural differences, and socioeconomic disadvantages. These challenges contribute to reduced healthcare utilization, limited preventive care, and increased health risks among these populations. For example, life expectancy among the indigenous population was 73.92 years in 2021, nearly 7 years below the national average.<sup>14</sup>

## 1.2 Responding to COVID-19

Compared with other countries, Taiwan was not as fatally affected by the COVID-19 pandemic until the second half of 2022, when Taiwan's cumulative COVID-19 death per million people started rising (Figure 3). In April 2023, Taiwan recorded more than 10.22 million cases and over 19,000 deaths due to COVID-19.<sup>15</sup> Although this number was lower than that of other countries, the pandemic had significant impacts on the health and well-being of the Taiwanese population.

**Figure 3: Cumulative confirmed COVID-19 deaths per million people**



Source: Hannah Ritchie et al., "Coronavirus Pandemic (COVID-19)," Our World in Data, accessed September 1, 2023, <https://ourworldindata.org/coronavirus>.

Taiwan's experience with COVID-19 over the last three years may be viewed in three distinct phases. Because Taiwan had learned effective strategies for containing emerging infectious diseases from the 2003 SARS outbreak, it performed well in the first wave of the pandemic relative to other countries. The Taiwanese government amended the Communicable Disease Control Act in 2004 based on its prior experience with the SARS outbreak, enabling the establishment of the Central Epidemic Command Center (CECC) upon the first confirmation of a COVID-19 case in Taiwan on January 20, 2020.<sup>16</sup> Another tool that helped Taiwan respond to the pandemic is its advanced infectious disease reporting system. Based on the Communicable Disease Control Act, Taiwan implemented a comprehensive web-based surveillance, reporting, and statistical system to provide timely information for infectious disease control. Combined with the NHI dataset, this surveillance and reporting system served as fundamental infrastructure for fighting the COVID-19 pandemic. However, systematic interpretation and integrated review of health data from other relevant sources, including but not limited to surveys and administrative databases, is not conducted regularly.

Through strategies such as interdepartmental coordination orchestrated by the CECC and public health mandates such as mask wearing, digital contact tracing, quarantine management, and border control, Taiwan successfully protected its population from the first wave of the COVID-19 outbreak and slowed subsequent local transmission. This allowed Taiwanese inhabitants to move domestically without restriction and to avoid national lockdown throughout 2020, highlighted by its record of 253 consecutive days without locally acquired cases.<sup>17</sup> This outbreak control mitigated negative economic impacts; at a rate of 3.11% real GDP growth in 2020, Taiwan outperformed its Asian neighbours Japan, Singapore, and Hong Kong, all of which suffered economic decline.<sup>18</sup> However, public dissatisfaction rose during subsequent waves of the COVID-19 pandemic.

Despite early preparation efforts, Taiwan was left vulnerable to the continuously evolving virus by a relatively inflexible medical procurement strategy, which led to a delay in available medical products such as vaccines and test kits. This contributed to a sharp increase in confirmed cases (>14,000) and deaths (>700) from the Alpha variant from May to July 2021.<sup>19</sup> Although these numbers are lower than in other countries, the ensuing panic shocked the health system and overall society.<sup>20</sup>

Along with its COVID-19 vaccination campaign, Taiwan shifted its policy of maintaining zero COVID-19 cases to a policy of zero severe COVID-19 cases in April 2022 amid the Omicron wave.<sup>21</sup> Yet, as some experts have argued, an insufficient vaccination rate among the older population combined with insufficient coordination between the primary healthcare system and government agencies sharply increased the number of confirmed cases and deaths from May 2022.<sup>22</sup> By the end of May 2022, only 74% of Taiwanese people over 75 had received two doses of a vaccine.<sup>23</sup> For comparison, over 90% of Japanese people over 65 had received two doses by October 2021.<sup>24</sup> The 7-day rolling average of daily COVID-19 deaths peaked in Taiwan on June 11, 2022 at 192.14. Taiwan also recorded 657 COVID-19 deaths per million people on January 12, 2023. This was higher than contemporary rates of its neighbors South Korea, Japan, and Singapore.<sup>25</sup>

### 1.3 COVID-19 exacerbated inequity

The pandemic further highlighted health inequity in Taiwan. Among COVID-19-related deaths in 2022, 86.3% were older adults, many of whom had preexisting comorbidities, such as cancer, cardiovascular diseases, or respiratory conditions.<sup>26</sup> This demographic profile underscores the critical underlying population health issues that COVID-19 has exposed, particularly the rising burden of chronic diseases. Addressing these underlying health challenges becomes crucial for protecting the population from future infectious disease outbreaks and advancing population health in the long term.

In mid-2022, amidst the Omicron outbreak in Taiwan, Nan'ao Township in Yilan County and Xiulin Township in Hualien County, both indigenous communities, had the highest percentages of COVID-19-positive cases.<sup>27</sup> These communities face challenges such as limited healthcare resources, poor healthcare access, inadequate household facilities (such as a lack of independent bathrooms), and

a higher proportion of vulnerable individuals such as older people and children, all of which not only increase the risk of disease and injury but also make these communities more susceptible to viral invasion and increase the complexity of disease prevention and control measures. They also have a significantly higher rate of obesity and metabolic syndrome than the general population.<sup>28</sup> Given these health disparities, equitable access to healthcare services, resources, and preventive measures must be ensured to improve the health of vulnerable populations and protect them against the adverse impacts of infectious diseases such as COVID-19.

## 1.4 Health crisis preparedness and the “crowding out” effect

Swift and proactive measures implemented by the Taiwanese government at the beginning of the COVID-19 pandemic, such as early detection, contact tracing, strict quarantine protocols, and effective communication strategies, contained the outbreak and minimized its impact on public health. Excess mortality – the difference between deaths during the pandemic and the expected number of deaths in absence of a pandemic – provides a more comprehensive understanding of COVID-19’s impact on population health. According to a cross-country comparative analysis published by *The Economist*, Taiwan demonstrated a relatively low excess mortality during the early phases of COVID-19 in 2020 and 2021, but excess mortality increased mid-2022.<sup>29</sup> The total number of deaths increased by 12.8%: from 184,457 in 2021 to 208,129 in 2022. The crude mortality rate in 2022 also rose to 8.92 from 7.86, reflecting a 9.48% rise in the standardized mortality rate.<sup>30</sup> COVID-19 was the third leading cause of death for Taiwanese people in 2022, resulting in 14,667 deaths, mainly older people.<sup>31</sup>

The excess deaths may be a result of under-diagnosed COVID-19 cases, but they also reflect the broader impact of the pandemic on the healthcare system. The strain caused by COVID-19 led to a “crowding out” effect, meaning the focus on managing the pandemic diverted resources and attention from non-COVID-19 healthcare needs. Based on Health Promotion Administration estimates, the number of screenings for the four major cancers (breast, colorectal, cervical, and oral) in 2021 was 23.4% lower than that in 2019, before the pandemic.<sup>32</sup> This indicates neglect in other specialized types of care during a pandemic period. Although the COVID-19 pandemic demonstrated Taiwan’s general ability to plan quickly in a health crisis, it also highlighted a failure to ensure continued services to its most vulnerable communities.

## 1.5 Recommendations

### RECOMMENDATION 1A

#### **Review Taiwan’s long-term population health and disease burden data for strategic policy planning**

Although data related to different aspects of population health have been separately collected, systematic interpretation and integrated review is lacking. The MOHW should regularly review Taiwan’s long-term population health and disease burden data to obtain insights into the factors driving population health trends and accordingly develop targeted interventions.

### RECOMMENDATION 1B

#### **Improve access to healthcare through various measures, especially digital health technologies**

Addressing health inequity and inequality is a critical aspect of building a resilient health system. Targeted policies and interventions such as the adoption of digital health technologies are needed to improve access to quality healthcare services, enhance health literacy, and provide culturally competent care to marginalized communities. Prioritizing equity and actively reducing disparities through the use of technology that can reach previously underserved regions and demographics will help create a more inclusive health system that ensures equal health opportunities for all citizens.



## RECOMMENDATION 1C

### **Promote awareness and health education among society on health management and disease prevention**

Building a sustainable and resilient health system in Taiwan requires a multifaceted approach that addresses the underlying population health challenges and promotes health education and awareness among the population. The MOHW, together with other relevant governmental departments, educational institutions, and private sectors, should jointly promote a healthy lifestyle featuring preventive measures to manage individual health, which would benefit the population health in the long term.

2. DOMAIN 2

# Environmental sustainability



Although climate change has a large impact on population health, the healthcare sector response to climate threats has been slow in Taiwan. Hospitals contribute significantly to greenhouse gas emissions, necessitating policy monitoring and the adoption of more eco-friendly practices. This section discusses the interconnection between environment and population health in Taiwan, as well as efforts by the healthcare industry in pursuing the One Health approach to combat climate change and address the threat of zoonotic diseases.

## 2.1 Effect of climate change in Taiwan

Climate change has increased the frequency and intensity of natural disasters, floods, and droughts, leading to heavy losses worldwide. Taiwan is particularly affected by changes in temperature, changing precipitation patterns, and the increased frequency of extreme weather events.<sup>33</sup> Although studies on the impact of climate change on health are relatively common and comprehensive, the health sector's awareness and response to the threats outlined by these studies are slow and insufficient.

Taiwan's average annual temperature has risen by 1.6°C in the last 110 years, and the average annual temperature in the past 2 years has been the highest in 100 years.<sup>34</sup> Seasons in Taiwan have also changed significantly; from 1957 to 2006, summer has increased by 27.8 days, but winter has decreased by 29.7 days.<sup>35</sup> In addition, from 1994 to 2013, sea level in Taiwan rose by an average of 3.4 mm per year.<sup>36</sup> The dry and wet seasons have become more distinct, and the number of extreme heavy rain days has increased; however, the total annual rainfall has remained unchanged. There has also been an increased frequency of extreme high temperatures. The number of consecutive dry days per year has also increased by 5.3 days over the past 110 years, which indicates an increasing probability of drought.<sup>37</sup>

These climate change impacts in Taiwan have increased the incidence of heat stroke and respiratory and cardiovascular diseases as well as elevated the risk of infectious diseases, such as dengue and water- and food-borne diseases due to droughts and floods.<sup>38</sup> Concurrently, the number of heat injuries increased from 1,487 in 2011 to 2,763 in 2020 – an increase of 85.8% within 10 years.<sup>39</sup> In the last 5 years, dengue fever has been confirmed further north in Taiwan than previously recorded; this presents a heightened challenge to infectious disease control.<sup>40</sup>

## 2.2 Government planning and response to climate change

To respond to the global call for sustainable development, Taiwan established its National Council for Sustainable Development in 1997 and further published Taiwan's Pathway to Net-Zero Emission in 2050 in 2022 to provide a pathway to achieve net-zero emissions by 2050. Based on the plan, the Climate Change Act was legislated in 2023 to provide the legal foundation for the policy.

The government agency responsible for implementing climate change policy is the Ministry of Environment. Because responding to climate change requires cooperation from all departments, the MOHW also has corresponding policies. Although studies on the impact of climate change on health are quite advanced, action by the health sector to respond to the threat is relatively slow and insufficient. In 2010, the MOHW started to promote the policy of "green and environmentally friendly hospitals," which focused on carbon emission reduction by promoting good practices in hospitals. Under the policy, 128 hospitals followed energy-saving and carbon reduction protocols as proposed by the international organization Health Care Without Harm, achieving a total reduction of nearly 0.2 million tons of carbon emissions in 2018.<sup>41</sup> Still, greenhouse gas emissions from medical institutions in Taiwan accounts for approximately 4.6% of the country's total emissions, exceeding the global average (4.4%).<sup>42</sup> The three top sources of electricity consumption in hospitals are air conditioning equipment (59.41%), lighting equipment (13.26%) and elevator equipment (5.63%). The high proportion of greenhouse gas emissions by hospitals in Taiwan demonstrates the urgent need

for advanced policy monitoring of greenhouse emissions from the health sector and for helping hospitals adopt more environmentally friendly plans.

The MOHW published the white paper “Policy to Respond to the Health Threats of Climate Change” in 2018 to set a strategy to respond to the health threat posed by climate change in Taiwan.<sup>43</sup> In response to the threat of heat injuries, the MOHW introduced the “Caring for Vulnerable Groups in Extreme Climates” project to provide an early warning system for extreme hot and cold weather through the Central Weather Bureau (CWB).<sup>44</sup> In addition to this technological platform, the project also introduced public education and training courses for professionals to raise awareness and provide solutions for vulnerable groups such as the elderly population and children under extreme weather.

### 2.3 One Health and international collaboration

The COVID-19 pandemic has reminded people of the importance of animal health and the interface between humans and the environment. The One Health approach that emphasizes multisector collaboration to optimize the health of people, animals, and the environment has been perceived as crucial in building population health along with environmental resilience.<sup>45</sup>

Taiwan collaborates with international stakeholders to enhance its capacity for environmental resilience, especially in relation to infectious disease control. For example, the International Health Regulations (IHR) 2005 require countries to develop minimal core emerging infectious disease control capacity for strengthening global health security.<sup>46</sup> Besides the self-reporting approach required by IHR 2005, the Joint-External Evaluation (JEE) approach was introduced to facilitate countries’ effort to control infectious disease.<sup>47</sup> In addition to conducting its own self-evaluation regularly, Taiwan voluntarily conducted the JEE with the help of Johns Hopkins Center for Health Security in 2016. As one of the first to conduct the JEE, Taiwan obtained high rankings in most of categories specified by the evaluation framework, demonstrating existing or sustainable capacity; however, Taiwan needs to improve its performance in food safety, biosafety, biosecurity, medical countermeasures, and personnel deployment.<sup>48</sup>

One of the main challenges Taiwan faced according to the JEE report is a lack of opportunity to participate in international programs similar to those provided by the World Health Organization, which support IHR capabilities due to Taiwan’s unique international political status. Other weaknesses of Taiwan’s health system include insufficient interagency and cross-sectoral collaboration (especially across the human public health, animal health, and food inspection sectors at the local and national levels), personnel constraints, and budget constraints.

Recognizing the importance of cross-sector collaboration for managing zoonotic diseases, Taiwan Centers for Disease Control (CDC) collaborated with the Bureau of Animal and Plant Health Inspection and Quarantine and Animal Health Research Institute under the Council of Agriculture to form the Interministerial Risk Assessment Mission for Zoonotic Diseases in 2022.<sup>49</sup> The impact of this new mission is yet to be assessed.

Taiwan also noted the importance of antimicrobial resistance in its “2025 White Paper on Health and Welfare Policy” published in 2016.<sup>50</sup> Under the plan, the Taiwan CDC implemented the following initiatives in addition to enforcing appropriate antimicrobial use: the National Antimicrobial Stewardship Program, hospital accreditation and infection control inspections related to antimicrobial stewardship, interventions focusing on coordinated infection control, and multichannel surveillance on multidrug-resistant organisms.<sup>51</sup> These efforts represented high awareness of future health threats posed by environmental factors and a willingness to prepare for these challenges within governmental sectors.

## 2.4 Recommendations

### RECOMMENDATION 2A

#### **Conduct educational campaigns to raise awareness in the health sector on the importance of reducing carbon emissions**

Given the lack of overall awareness on the importance of reducing carbon emissions and environmental strategies in the health sector, the MOHW must raise awareness among the population and healthcare professionals. Carbon emission reduction policies should be promoted among the public.

### RECOMMENDATION 2B

#### **Monitor the impact of climate change, specifically greenhouse gas emissions, on health**

The MOHW could continuously monitor the impact of climate change on health, especially from the perspective of temperature change, extreme weather events, and infectious disease control through existing data-collecting mechanisms. Moreover, the MOHW should collaborate with the Ministry of Environment to conduct more studies and monitor greenhouse gas emissions from the health sector, including hospitals, health facilities, and other health-related activities. Based on findings from such studies, evidence-based policy for reducing carbon emissions contributed by the health sector should be planned and executed.

### RECOMMENDATION 2C

#### **Collaborate across ministries and at an international level to promote and regularly evaluate the implementation of a One Health approach**

The One Health approach for infectious disease control policy should be strengthened and monitored with existing tools, multisectoral collaboration between the MOHW and Ministry of Agriculture based on the concept of One Health should be promoted, and the effectiveness of this collaboration should be monitored regularly. Taiwan also needs to enhance collaboration with international stakeholders like WHO or other international networks for infectious disease control to strengthen the capacity of disease monitoring.

3. DOMAIN 3  
**Workforce**

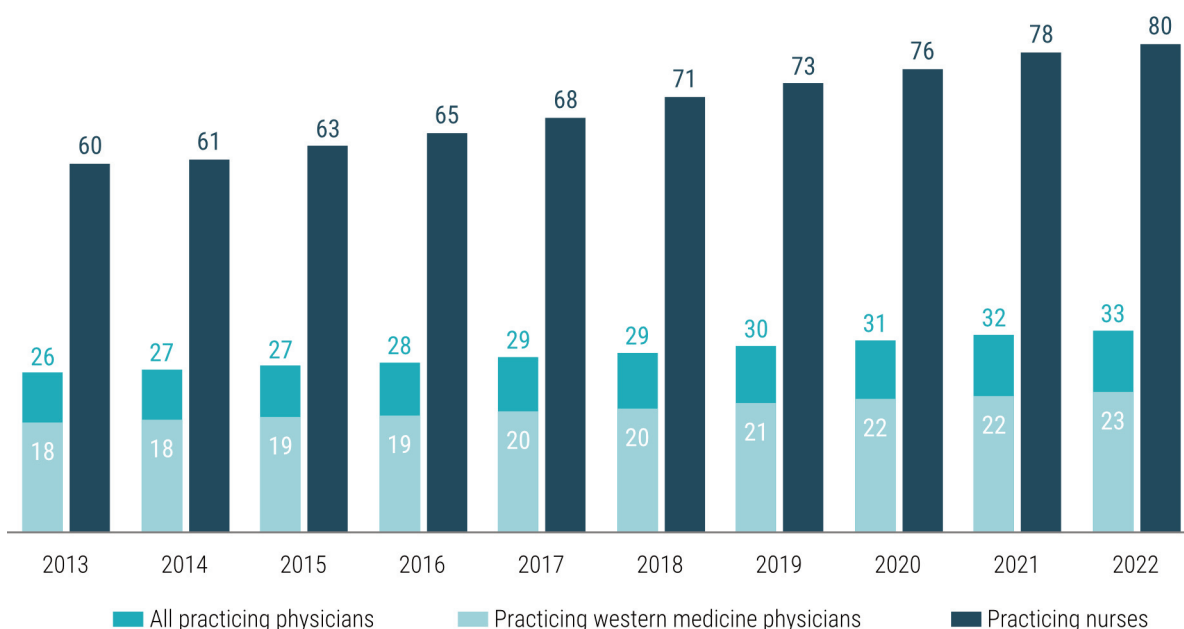


Taiwan's healthcare system faces workforce challenges. Limited funding and an uneven distribution of healthcare professionals results in labor shortage and inequitable care across communities. During the COVID-19 pandemic, the government provided short-term financial support through subsidies to maintain the health workforce, but long-term cost concerns persist. This section discusses the aforementioned challenges and critically examines the effectiveness of government responses.

### 3.1 Poor work environment for medical professionals

Taiwan boasts a quality education system for training healthcare professionals but lacks a sufficient health workforce, especially nurses. In 2022, there were 33 practicing physicians per 10,000 population, with 22.8 per 10,000 population being Western medicine physicians. This was a 27% increase compared with figures in 2013. Taiwan had 79.9 practicing nurses per 10,000 population by 2022, representing a 32% increase from 10 years prior (Figure 4).<sup>52</sup> Still, the number of healthcare professionals as a proportion of the population in Taiwan is below the average of OECD countries (Table 2).<sup>53</sup> Understaffing makes the health system vulnerable. High turnover among early-career nurses may also result in a future lack of experienced professionals.

Figure 4: Number of healthcare professionals per 10,000 population, 2013–2022



Source: “表4-3 醫療設施-醫事人力 [Table 4-3 healthcare facilities – healthcare workforce]”, Department of Statistics, Taiwan MOHW, September 21, 2023, <https://dep.mohw.gov.tw/DOS/lp-5083-113.html>

Table 2: Average number of nurses and physicians per 1,000 population in Taiwan, high-income Asia-Pacific countries, and OECD countries

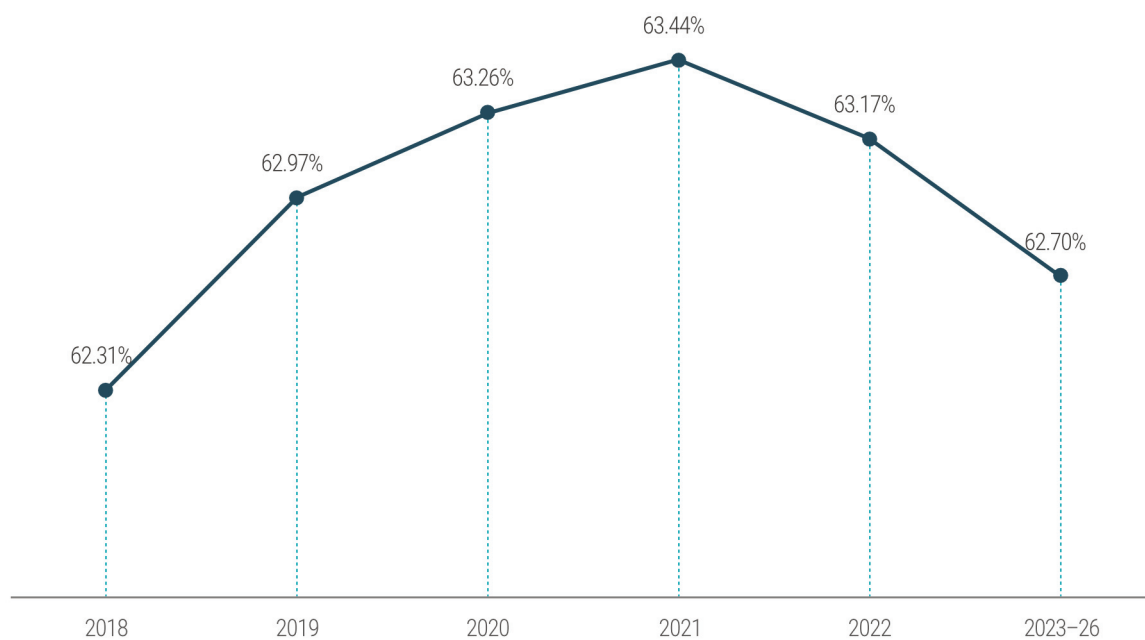
	OECD	High-income Asia-Pacific countries	Taiwan
Nurses	9.6	8.1	8.0
Western physicians	3.6	2.6	2.3

Source: “表4-3 醫療設施-醫事人力 [Table 4-3 healthcare facilities – healthcare workforce]”, Department of Statistics, Taiwan MOHW, September 21, 2023, <https://dep.mohw.gov.tw/DOS/lp-5083-113.html>

Nurses in Taiwan experience high risk, high stress, and long hours in the work environment,<sup>54</sup> with over 74% of the nurses working 40–60 hours per week.<sup>55</sup> Attending physicians work an average of 69.1 hours per week.<sup>56</sup> Although labor regulations restrict working hours, there is a lack of enforcement in the healthcare sector. A key factor contributing to healthcare's poor work environment is low pay due to limited NHI funding for hospitals. At an average annual salary of approximately US\$21,700 in 2022, nurses are underpaid compared with the average professional worker in Taiwan.<sup>57</sup> Although the MOHW implemented several special projects to solve this problem, nursing shortage has worsened since COVID-19. According to the 2023 data, the practice rate of licensed nurses in Taiwan has been dropping over the past two years and is now around 60% (Figure 5). Thus, the main challenge seems to be not a lack of trained healthcare professionals but retaining staff; indeed, the turnover rate of nurses has reached nearly 12% in recent years.<sup>58</sup>

The nurse–patient ratio reflects the safe staffing of healthcare professionals and the quality of healthcare provided. The average whole-day nurse–patient ratio for medical centers in Taiwan is 1:9, decreasing to 1:12 for regional hospitals and 1:15 for district hospitals.<sup>59</sup> However, this does not reflect the actual working conditions of nurses taking night shift, who usually need to take care of more patients with higher stress, thereby potentially impairing the quality of care. The stakeholders in Taiwan's healthcare system have been discussing nurse–patient ratios, and nurses have demanded legally defined nurse–patient ratios in three shifts. However, no consensus has been reached on the ideal arrangements: opinions vary among hospitals at different levels, and the government decision on this matter is still pending.<sup>60</sup>

**Figure 5: Total practice rate of nurses in the past 5 years**<sup>61</sup>



Note: Practice rate = Total number of nurses practicing as a percentage of the total number of nurses certified (excluding number of non-practicing certified nurses over 65 years old).

Source: “近五年護理人員總執業率 [Total practice rate of nurse practitioners in the past five years],” Department of Nursing and Health Care, Taiwan MOHW, July 17, 2023, <https://nurse.mohw.gov.tw/cp-72-480-68118-2.html>.



### 3.2 Limited health financing

Due to cost considerations, hospitals typically hire a limited number of medical staff. This scarcity contributes to long work hours and overburdened staff. In 2007, the average work hours per week for attending physicians and resident physicians were 87 and 112 hours, respectively.<sup>62</sup> Under the 2017 campaign of the Taiwan Medical Alliance for Labor Justice and Patient Safety, the MOHW issued restrictions of 320 hours per 4 weeks for resident physicians.<sup>63</sup> This regulation effectively reduced the working hours of resident physicians for improving the working conditions, thus addressing the shortage of resident physicians in hospitals. However, NHI's limited health budget restricts further improvements.<sup>64</sup> Hospitals intend to raise revenue by providing service through market mechanisms, including the doctor visiting fee. However, the NHIA banned revenue-increasing approaches like these out of concern for healthcare access for vulnerable populations.<sup>65</sup> Limited in their creative problem-solving ability by government financial policies and resident physician hour restrictions, hospitals continue to overwork other medical staff. This leads to high turnover, especially among nurses.<sup>66</sup>

In addition to poor working conditions, a feeling of disrespect in the work setting is an issue contributing to the shortage of healthcare professionals other than physicians. Health services are based on teamwork of all healthcare professionals, but the culture of exclusive respect for doctors excessively concentrates resources on doctors, and makes other medical staff feel disrespected. The MOHW regularly monitors and plans for the long-term needs of medical workforce for the population, but mainly focuses on physicians. In addition, it is perceived that some hospitals and clinics often favor doctors, and the salary and working conditions of the doctors are the most important concern of the institution. This leads to the neglect of needs and salaries for the rest of the healthcare workforce, particularly nurses.<sup>67</sup> Coupled with the similar lack of respect from patients, nurses often encounter unequal treatment and a disrespectful atmosphere, which further complicates the goal of sustaining a healthy workforce culture.<sup>68</sup>

### 3.3 Uneven distribution of physicians and shortage of specialty practitioners

In addition to a poor work environment, a shortage and unequal distribution of physicians endangers the long-term health system sustainability of Taiwan. Physicians are unevenly distributed across departments and between rural and urban areas.<sup>69</sup> A 2022 analysis by the MOHW revealed an increase in the number of traditional Chinese medicine and dental practices, whereas specialties such as pediatrics, obstetrics, and gynecology have declined due to a declining birth rate and the anticipated future demand shrink.<sup>70</sup> As of 2020, 244 townships in Taiwan had fewer than 10 physicians per 10,000 people – lower than the required skilled healthcare professionals density of 23 set by the WHO.<sup>71</sup>

### 3.4 Government financing and effect of COVID-19 on the health workforce

To maintain the health workforce during COVID-19, the MOHW not only provided financial support via the NHI budget based on previous performance to secure the regular salary of healthcare professionals, but also used the reserve fund to provide hospitals with special epidemic prevention subsidies. The MOHW subsidized the salaries of healthcare professionals working on infection control personnel, special coordinators, nursing assistants and cleaning staff related to COVID-19 care.<sup>72</sup> Despite Taiwan's hospital capacity peak during the COVID-19 pandemic in 2021, hospitals successfully maintained the majority of their health workforce with the help of subsidies from the MOHW for healthcare professionals. Although these staff remained in the hospitals post-COVID-19, there is growing concern about the retention of staff long-term.

Hospitals still fail to hire enough professionals due to cost concerns. Due to a healthcare system close to capacity prior to the pandemic, Taiwan faced a high COVID-19 case-fatality rate.<sup>73</sup> Moreover, nursing shortage worsened during and after the pandemic, with the vacancy rate of nursing staff

rising from 4.5% in 2019 to 6.5% in 2022.<sup>74</sup> Hospitals do not seem to have sufficient buffer to meet surge capacity during future crises; short-term funding does not fully resolve the issue of chronic underinvestment in Taiwan.

In 2022, of the total number of nurses in Taiwan, 64.4% practiced in hospitals, 15.4% in clinics, and 8.6% in long-term care institutions; the remaining were practicing in schools, community organizations, and other places.<sup>75</sup> The number of first-time practicing nurses in 2022 was 7,527, down nearly 1,000 from 8,447 in 2021. The average seniority of practicing nurses increased to 14 years in the same year, the longest on record in the past 10 years, revealing a lack of newcomers.<sup>76</sup> Moreover, the enrollment rate of nursing departments in universities across the country dropped after the COVID-19 pandemic. Of first-year nursing freshmen at 29 universities across Taiwan in 2022, only 14 schools had a registration rate higher than 80%, meaning that over half of the nursing departments seriously under-enrolled students.<sup>77</sup> This trend of under-enrollment could grow in the future.

Despite overall workforce resilience issues in Taiwan's health system, there was positive progress demonstrated during the COVID-19 pandemic. The Taiwan CDC hired public health experts to facilitate contact tracing and case management during the COVID-19 pandemic. As the government became aware of the need for public healthcare professionals during the COVID-19 pandemic, the Public Health Specialists Act planned during SARS in 2003 was finally passed by the Legislative Yuan in 2020.<sup>78</sup> As legally certified healthcare professionals, public health specialists are expected to build a public health professional service system for promoting public's health. This practice enhanced workforce preparation and health system sustainability and resilience.

## 3.5 Recommendations

### RECOMMENDATION 3A

#### **Collect and assess workplace data to guide regular policy review**

There is no regular and accurate data collection on actual working hours and salaries of doctors, nurses, and other healthcare professionals. The MOHW and the Ministry of Labor should work together on data collection and assessment, as well as conduct a regular review of regulations and policy guidance to better plan and manage the healthcare workforce.

### RECOMMENDATION 3B

#### **Review workload of and incentives provided to healthcare professionals and provide regular support**

Beyond providing economic incentives, there should be additional policies protecting nurses and other healthcare professionals such as restricting the working hours of healthcare professionals with labor inspection, reviewing workloads and work demands of healthcare professionals regularly, promoting employee participation in work plans, and providing programs to support healthcare professionals' mental health to improve their work conditions. There are also opportunities to address the heavy workload of health service providers by using digital health. For example, adopting life sign monitoring technologies might be a way to reduce the workload of healthcare professionals.

### RECOMMENDATION 3C

#### **Foster discussion on potential solutions to unequal distribution of healthcare professionals**

The unequal distribution of healthcare professionals across departments and regions should be addressed by beginning discussions on possible solutions, such as providing long-term salary protections and improving working conditions to not only support healthcare professionals working in remote areas.

### RECOMMENDATION 3D

#### **Explore options to fill in employment gaps, including hiring foreign-trained healthcare professionals**

Policy discussion on preparing for a persistent shortage of qualified healthcare staff is needed as the long-term shortage of healthcare professionals is foreseeable. For example, increasing salaries for healthcare workers or accepting foreign-trained physicians to fill the gap with careful evaluation could be discussed as a potential solution.

### RECOMMENDATION 3E

#### **Explore implementing additional regulatory adjustments, including allowing licensed healthcare professionals to perform specific medical procedures during emergencies**

There is a need to explore options to enhance the healthcare workforce during crises. For example, during emergencies, licensed healthcare professionals other than physicians and nurses could be allowed to perform certain medical procedures that are typically restricted to performance by only physicians and nurses.

4. DOMAIN 4  
Medicine  
and  
technology



Although Taiwan's process for adopting new medicines and technologies adheres to international standards, delays affect patient access to breakthrough drugs and treatments. Furthermore, inadequate public communication from the government over expert consultation processes causes transparency concerns and fosters public doubt in new medicines and technologies. This section discusses relevant issues, including Taiwan's vaccine access during the COVID-19 pandemic.

#### 4.1 Digitalization of healthcare in Taiwan

Taiwan has made significant progress in digitizing healthcare. In 2004, Taiwan adopted smart integrated circuit card technology that facilitates the digitalization of patient's healthcare records. This NHI card contains records of patient's medical visits, drug prescriptions and allergies, catastrophic diseases, consent for organ donation, consent to palliative care, as well as consent to a do-not-resuscitate order.<sup>79</sup> This card and health provider reimbursement claims enable the government to gather comprehensive health data on the population.

In 2013, the NHIA further integrated cloud technology into the healthcare system, constructing the "NHI MediCloud System" that allows doctors to pull patients' medical care records from the cloud to reduce therapeutic duplications.<sup>80</sup> Furthermore, doctors can view patients' medical images uploaded by other healthcare providers, increasing the efficiency of medical resources utilization.<sup>81</sup>

To increase the convenience of medical record inquiry among the public, Taiwan launched the cloud-based personal healthcare information platform "My Health Bank" in 2014. It stores the medical data, medication records, test and examination results, and vaccination records, all of which are easily accessible from a mobile app. The mobile app is aimed to facilitate individual users to control and manage their health directly.<sup>82</sup> The efforts of digitalization in personal health service continued with the "Virtual NHI Card" that launched in 2019 as a pilot program and now fully implemented in three major fields of healthcare services: home healthcare, telemedicine, and video consultations.<sup>83</sup> Innovations such as these improve the healthcare experience by leveraging technology (see Case Study 1).

Some effective digital public health measures were enacted during COVID-19:

1. Linking of individuals' travel histories by the Ministry of the Interior National Immigration Agency with individuals' NHI cards to alert hospitals and clinics for early detection
2. Contact tracing and case investigation management
3. Contact list generation
4. Health monitoring
5. Quarantine measures

Remote consultations or teleconsultations were also adopted during the COVID-19 pandemic. Taiwan's pre-COVID-19 promotion of telemedicine in rural areas lacking sufficient healthcare capacity was expanded during COVID-19, particularly for patients in quarantine. Taiwan's strong global reputation in the information technology industry presents an opportunity for further use of technology in battling epidemics.

#### 4.2 Challenges for developing new medicines and technologies in Taiwan

The market access to new medicines and technologies in Taiwan's health system, both domestically developed and imported, includes two processes: prior market review by the Taiwan Food and Drug Administration (TFDA) and review of marketed products included in NHI's payment list by the NHIA. Taiwan follows international standards to regulate the approval process across all stages of product development: research and development, clinical trial, and final approval.

The key challenges of developing new medicines and technologies in Taiwan include the small market size, insufficient investment in relevant industries, and insufficient talent for market access procedures and approaches. Breakthrough drugs and technologies not yet approved in other advanced countries experience significant delays when undergoing market approval for the first time in Taiwan, reducing incentives for the domestic development of new medicines and technologies.<sup>84</sup> Therefore, most new medicines and technologies used in Taiwan, especially patented drugs, are imported from other countries.<sup>85</sup>

The lag between different steps of market access procedures, combined with delayed reimbursement and insufficient reimbursement coverage of innovative technologies, leads to limited availability of the newest technologies developed in Taiwan; these technologies are most immediately available to patients who self-pay, leading to inequitable access for the most vulnerable segments of the population.

### 4.3 Delayed process for new medicines and technology adoption in Taiwan

Challenges in adopting new medicines and technologies include delayed market approval, delayed reimbursement, and insufficient reimbursement coverage.<sup>86</sup> Furthermore, capacity constraints hamper the premarket review and reimbursement process for new drugs and technologies in Taiwan, necessitating sustainable investment in human resources and training.<sup>87</sup> More transparency and trackability for the drug review and reimbursement processes are required for better clinical decision-making.<sup>88</sup>

In March 2023, the average time for a new drug from submission to reimbursement was 505 days. For oncology drugs, this average was as high as 783 days. Moreover, the new drug approval rate in Taiwan was 67% and the effective rate (i.e., obtaining approval of the Pharmaceutical Benefit and Reimbursement Scheme [PBRS] Joint Committee and having been accepted by the manufacturer) was 53%.<sup>89</sup>

Several policies were announced in 2001 to liberalize medical production registration in Taiwan and facilitate public access to new drugs, leading to a reduced submission lag of 553 days for certain applications.<sup>90</sup> The TFDA issued a new mechanism for reducing the review timeline for selected drugs from 360 days to 240 days in 2022 in response to this issue.<sup>91</sup> Furthermore, new policy measures to take effect in January 2024 allows “parallel review” of new drugs by both TFDA and NHIA at the same time, reducing the general time needed for review and NHI coverage of new drugs from 2 years to 1 year, though the direct effectiveness of such a mechanism has yet to be evaluated.<sup>92</sup> Because most people relies on the NHI for healthcare services, the NHI’s budget is also a major factor in determining the adoption of new drugs and technologies in Taiwan, which is detailed in the next section.

### 4.4 Financial reimbursement and drug prices

NHI’s reimbursement coverage review involves a health technology assessment (HTA), a review by an Expert Advisory Meeting, and a discussion by a PBRS Joint Committee. The HTA is conducted by the Center for Drug Evaluation, a foundation established by the MOHW in 1998 to enhance the quality and efficiency of drug and medical device evaluation. This process is often finished within 42 calendar days, though limited capacity in terms of workforce and expertise remains a challenge. A recent partnership was signed between the NHIA and the National Institute for Health and Care Excellence in the UK to enhance collaboration on information exchange and personnel training related to HTA with international partners.<sup>93</sup> The NHIA established a designated office in January 2024 with additional budget and workforce to accelerate HTA review.<sup>94</sup>

The reimbursement of any new drug also requires the assessment and approval of the other two aforementioned meetings. The Expert Advisory Meeting undertakes the preliminary assessment,

whereas the PBRS Joint Committee is the final decision maker. Due to the involvement of various different stakeholders in the new drug evaluation process, the PBRS Joint Committee is the most challenging process for the reimbursement coverage decision. Mainly due to the increasing financial burden of an aging society to the NHI system, the decision of the PBRS Joint Committee is not necessarily based on the scientific merit of a new drug, but more on its social significance. Because the price of innovative patent drugs and technologies is often prohibitively high, the main difficulty presented in this stage is a balance between financial capacity, population-wide equality, and the right of access to medicine for patients. Such a balance is usually linked to a debate regarding the fundamental principle of NHI as a social insurance or social assistance system.

To address these challenges, the NHIA proposed the establishment of a new drug fund totaling US\$300 million to support the development and clinical trial of new drugs and reduce costs for patients in the pre-NHI reimbursement phase. This fund would operate independently from NHI's existing global budget.<sup>95</sup> Although indicative of progress, details about the price-setting mechanism and how pharmaceutical companies should contribute to the fund remain to be discussed.

Further exacerbating the issue of approval is a public concern with generic drugs. As the financial burden in the NHI system is increasing, the reimbursement price of drugs is gradually decreasing. Consequently, several brand-name drugs have been withdrawn from the Taiwanese market.<sup>96</sup> Although generic drugs produced by domestic pharmaceutical companies with market approval from TFDA can replace high-priced brand-name drugs, skepticism exists on the quality of generic drugs due to the self-regulated nature of aftermarket review and inspection.<sup>97</sup>

#### 4.5 Vaccine access and international collaboration during COVID-19

The failure of vaccine procurement during the COVID-19 pandemic was a problem in Taiwan. As the end-game approach for pandemic control, vaccine procurement was considered important. However, despite attempted preparation early on in the COVID-19 pandemic through border control and other public health measures in 2020, Taiwan still experienced a shortage of vaccines for the general population. Demand for vaccine increased since the first domestic outbreak in May 2021. The delay of vaccine stockpile resulted from an inflexible response strategy while the virus evolved.<sup>98</sup> Such a delay and vaccine shortage at a critical moment resulted in public panic and shook trust in the health system and overall society.

The policy introduced to procure COVID-19 vaccines included investing in domestic COVID-19 vaccine development and buying vaccines from international markets. Ultimately, countries including the US, Japan, the Czech Republic, Poland, and Lithuania donated doses to Taiwan. These examples of “vaccine diplomacy” represent reciprocal goodwill toward Taiwan after the island donated face masks and other protective equipment to these and other countries in 2020.<sup>99</sup>

Regarding the development of COVID-19 vaccines domestically, policy approaches such as subsidies and advanced market purchase agreement led the Taiwanese government to foster initial collaboration with three vaccine companies; however, only one passed the phase II clinical trial. Through closed-door expert committee discussion, the one domestic COVID-19 vaccine was approved via Emergency Use Authorization (EUA) by the MOHW in July 2021 using data only from phase II clinical trials. There was no outbreak in Taiwan during the trial design period, so the seroconversion rate was used as a proxy evaluation item for virus protection. Lack of transparency into the EUA review process sowed doubt into the appropriateness of such an approach and further decreased public trust in the TFDA and expert review committee.<sup>100</sup> The closed-door nature of these discussions also made it difficult for the public to discern the details of expert opinions, further sowing public doubt into the credibility of government decision-making.

The approval of vaccines, especially for emergency use during public health crisis, requires expertise and professional judgment. These decisions have a significant impact on public health. In such cases, collaboration and consultation across government, experts, and society is crucial for effective

policy development. Transparent decision-making, expert consultation, and active engagement with the public are essential to ensure accountability and trust in the government. Public trust and buy-in serve the foundation for successful policy implementation. Establishing a clear legal framework would amend the current dearth of public trust and facilitate the proper balance between necessary public disclosure and privacy protections, such as the identification of experts consulted, publication of discussion records, and so on.<sup>101</sup>

## 4.6 Traditional Chinese medicine development responding to COVID-19

Aside from vaccine decision-making controversy, NRICM101, a traditional Chinese medicine developed by the National Institute of Chinese Medicine in Taiwan to target COVID-19, was granted EUA in 2020 and freely provided to patients with COVID-19. Scientifically proven to be effective in treating mild COVID-19 cases, NRICM101 was used by 160 million people in Taiwan.<sup>102</sup> This demonstrates the advanced capacity of traditional Chinese medicine in Taiwan.

## 4.7 Recommendations

### RECOMMENDATION 4A

#### **Forge international collaboration to enhance capabilities for the development and approval of new drugs and technologies**

There is an urgent need to enhance the capacity in developing and adopting new medicines and technologies in Taiwan's health system. Additional investment in infrastructure and training of professionals through international collaboration is highly recommended. Beyond sending staff to attend international conferences in the short term, the MOHW should consider designing a regular, year-long, overseas training program for staff to strengthen its system capacity.

Given Taiwan's difficulty with early procurement of vaccines, discussions on creative alternatives are recommended. In addition to collaborating with international society and fostering good relationships, Taiwan can learn from the example of Israel's working with a vaccine company to develop new, necessary technologies based on social consensus.<sup>103</sup>

### RECOMMENDATION 4B

#### **Engage public communication on adoption of new technologies and generic drugs**

Policy approaches in improving the delay of adopting new technologies should be discussed via broader societal discussion, since social impact is highly dependent on the value judgment of the whole population. The MOHW should create a platform for regular public communication to reach a social consensus on this issue. Specifically, comparisons of pros and cons of different policy options must be clearly communicated to the public. Flexible policy combining both patent and generic drugs to manage cost-effectiveness should be based on evidence-based review of aftermarket monitors of drugs on the reimbursement list.

### RECOMMENDATION 4C

#### **Stipulate the transparency of expert review committees by law to enhance public trust in their decisions**

The legal framework is the basis upon which democracies conduct governance. The transparency mechanism and accountability of expert committees should be stipulated by the Administrative Procedure Act to enhance public trust in the resolutions of expert meetings, both in regular and emerging settings.



CASE STUDY 1

# Balancing digital technology usage for public health and human rights



In the early days of the COVID-19 pandemic, Taiwan achieved remarkable pandemic control, largely due to swift and comprehensive contact tracing, facilitated by the digitalized NHI system.<sup>104</sup> This system served as the main infrastructure for the government to implement public health policies and respond to the COVID-19 pandemic.

The implementation of this system involved coordinated efforts by the CECC, which facilitated interdepartmental cooperation.<sup>105</sup> In addition to stringent border control measures, the government integrated individuals' NHI card data with their travel histories stored in the Ministry of the Interior National Immigration Agency database. This seamless integration allowed hospitals and clinics to receive real-time alerts when individuals potentially at risk of COVID-19 sought medical services.<sup>106</sup> Throughout the contact tracing process, case investigators had access to records of patient movements, which were obtained from police and telecommunication companies, as well as data from the household registration system (Figure 6).<sup>107</sup> Additionally, the CECC established a smartphone-based system to track the real-time locations of individuals in quarantine, immediately notifying local authorities if anyone deviated from their designated location or turned off their phone.<sup>108</sup>

These disease control measures entailed active surveillance of not only individuals' health data but also their locations and mobile data. Ongoing societal discourse on the balance between individual rights and the utilization of technology for public health was critical for the passage of such measures. Discussion of legal readiness by Taiwan's public health authorities also played a pivotal role in the successful implementation of these measures.

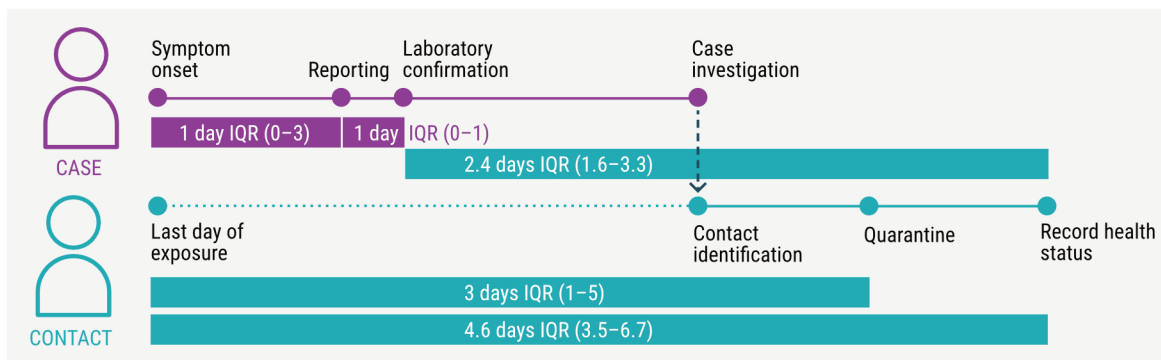
The amendment of Communicable Disease Control Act in 2004 after the SARS outbreak underwent thoughtful deliberation in parliament and provided a broad overarching legal framework for the government to execute various measures for preventing and containing infectious diseases. The Act outlined the establishment, structure, and functions of a cross-sector epidemic command center, while also regulating the authorization of administrative agencies to take essential actions for disease control.

Since 2012, ongoing legal disputes have emerged between human rights organizations and representatives from the medical and academic sectors regarding the boundaries of public use of individual health data, exemplified by the NHIA's utilization of the National Health Insurance Research Database for public research.<sup>109</sup> This contentious debate was ultimately settled by a constitutional court ruling in August 2022, which deemed the NHIA's approach partly unconstitutional, mandating legal amendments to establish an independent monitoring system for data use.<sup>110</sup> Despite these disagreements, the discourse fostered a societal consensus on the adoption of digital technology and approval of personal data to combat the COVID-19 pandemic.

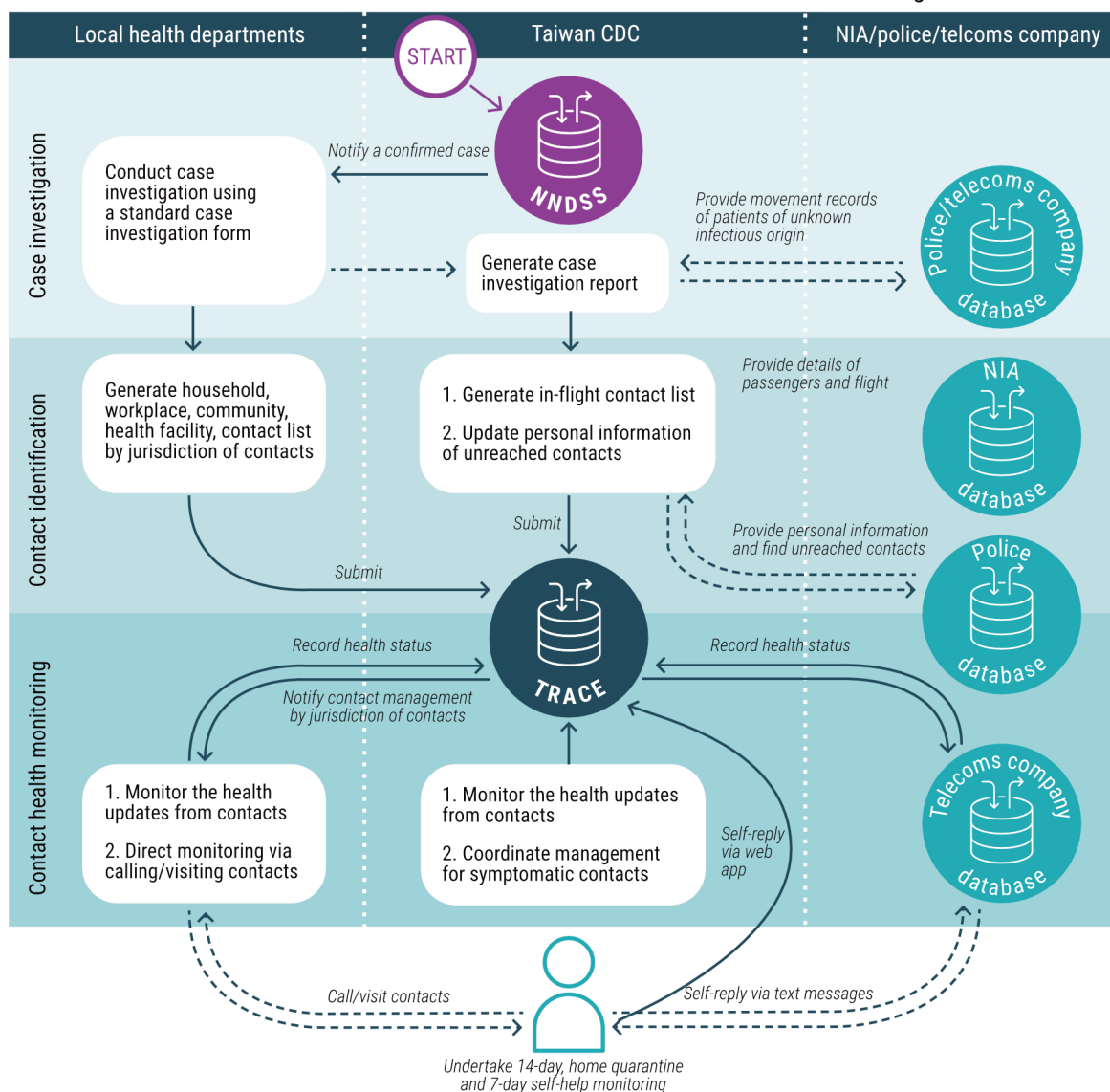
Taiwan's experience in navigating the delicate balance between leveraging technology for public health and safeguarding individual rights amid the COVID-19 pandemic underscores the imperative of transparency in policymaking. Moreover, Taiwan's experiences emphasize the significance of precrisis legal frameworks. This legal preparedness, characterized by the prioritization of conflicting values, should be thoroughly deliberated and fortified with supporting measures in advance of a crisis. The lessons learned from the COVID-19 pandemic will undoubtedly equip Taiwan to prepare for future public health emergencies while also serving as a valuable reference for other nations facing similar challenges.

Figure 6: The digital contact tracing process for COVID-19 in Taiwan

A. Timeline from symptom onset to contact follow-up



B. Information flowchart from case confirmation to contact health status monitoring



Dashed line = information flow via emails/text messages/calls  
 NNDSS = The National Notifiable Diseases Surveillance System; NIA= National immigration agency  
 IQR = interquartile range and median time between steps from the last day of exposure to contact quarantine and the start of health status reporting

Adapted from: Shu-Wan Jian et al., "Contact Tracing with Digital Assistance in Taiwan's COVID-19 Outbreak Response," *International Journal of Infectious Diseases* 101 (December 2020): 348-52

5. DOMAIN 5  
**Service  
delivery**



Taiwan's healthcare service delivery is marked by high accessibility and efficiency but faces challenges of limited healthcare resources. Taiwan's healthcare market is characterized by great competitiveness but lacks integrated service delivery, which undermines effective chronic disease management. This section examines fragmentation in the healthcare sector in Taiwan and discusses the impact of COVID-19 pandemic on health service delivery.

## 5.1 Taiwan's service delivery compared with global community

Taiwan's healthcare system delivers accessible and high-quality care to its population. With high accessibility to a comprehensive range of healthcare services under the NHI, Taiwan's health service delivery system exhibits unique characteristics and faces specific challenges.

The medical care structure in Taiwan comprises four tiers based on healthcare service capacity: medical centers, regional hospitals, district hospitals, and clinics. Institutions in each tier are expected to fulfill distinct functions in healthcare service delivery. Clinics and district hospitals are primarily responsible for monitoring and treating stable, chronic diseases, whereas regional hospitals and medical centers focus on teaching, research, and providing care for emergency cases and challenging diseases. Although Taiwan has a bidirectional referral system in which patients can be referred between higher and lower tiers with co-payment incentives for patients to seek care at lower tiers first, patients can access any level of healthcare and specialists directly without a referral.

In terms of outpatient visits, the number of physician visits per person per year was 13.2 in 2019, an increase from 12.9 in 2018. This figure is lower than in neighboring countries such as South Korea, but higher than in Western countries, such as Canada, Germany, the Netherlands, and Sweden. Moreover, the average length of hospital stay is only 8.4 days, significantly lower than in Japan (27.3 days) and South Korea (18 days).<sup>111</sup> These statistics reflect the efficiency and effectiveness of the Taiwanese health service delivery system in providing timely and accessible care.

However, healthcare supply is limited. In 2019, the number of acute care beds per 1,000 people was 3.5 in Taiwan, lower than that in Japan (7.7) and South Korea (7.1). Similarly, the number of computed tomography scanners and magnetic resonance imaging machines per million people is also considerably lower than that in South Korea.<sup>112</sup>

## 5.2 Competitive market and collaboration with the private sector

The majority of healthcare services in Taiwan are provided by the private sector (Table 3). In 2022, Taiwan had 23,578 medical institutions, 2% of which were hospitals. Over the past two decades, the number of hospitals has decreased by 19%. 83% of the 480 hospitals are privately owned,<sup>113</sup> indicating a very marketized and competitive healthcare delivery system. In fact, public hospitals have been facing increasing financial constraints as the central government continues to cut the budget and request them to finance their own operations and be self-sustaining.

**Table 3: Number of public and nonpublic medical institutions in Taiwan, 2018–2022**

	Public		Nonpublic	
	Hospitals	Clinics	Hospitals	Clinics
2018	81	429	402	21,904
2019	82	428	398	22,084
2020	82	426	397	22,227
2021	81	423	397	22,377
2022	82	421	398	22,677

Source: "Statistics of Medical Care Institution & Hospital Utilization 2022," Taiwan MOHW, July 25, 2023, [www.mohw.gov.tw/cp-6614-75351-2.html](http://www.mohw.gov.tw/cp-6614-75351-2.html).

The emphasis on operational efficiency and high level of competition among healthcare institutions in Taiwan has brought certain benefits in terms of patient access to care. This is evident in relatively short waiting lists for procedures and the ability to access and consult specialists in a timely manner. However, this competitive environment has also resulted in fragmentation and lack of integration in service delivery. The primary contributing factor is excessive specialization and segmentation within medical disciplines, creating challenges in the integration of various specialties beyond the scope of family medicine. Furthermore, driven by the payment system, the competition predominantly focuses on volume metrics, such as patient visits or procedures performed, over patient outcomes and population health. Particularly concerning is the management of chronic disease, where the long-term health trajectory of patients becomes paramount.

Since the establishment of the NHI in 1995, the development of healthcare institutions in Taiwan has exhibited a polarized distribution. While the number of medical centers and clinics continues to rise, that of local community hospitals has decreased. According to the NHIA, the total number of contracted healthcare institutions rose from 15,000 in 1995 to 29,000 in 2021, with the number of medical centers nearly doubling from 13 to 25 and that of clinics increasing by over 3,000.<sup>114</sup> In contrast, the number of local community hospitals decreased from 568 to 363 (Table 4). Local community hospitals are often dispersed throughout communities, particularly in remote or underserved areas, and their quantity significantly impacts the access and quality of care of local residents.

**Table 4: Number of medical institutions in Taiwan, 1995–2021**

	Medical Centers	Local Community Hospitals	Clinics
1995	13	568	6,912
...	...	...	...
2014	26	367	9,847
2015	26	370	9,883
2016	26	367	9,908
2017	26	364	10,011
2018	26	363	10,095
2019	25	366	10,166
2020	25	364	10,206
2021	25	363	10,282

Source: “84年到110年時間數列統計 [Time-series statistics, 1995–2021]”, NHIA, Taiwan MOHW, November 11, 2022, [www.nhi.gov.tw/Content\\_List.aspx?n=3FE770CE58C9594D&topn=23C660CAACAA159D](http://www.nhi.gov.tw/Content_List.aspx?n=3FE770CE58C9594D&topn=23C660CAACAA159D).

### 5.3 Shortcomings of chronic disease management in Taiwan

Taiwan’s healthcare system has been recognized for its accessibility and efficiency, but it was not well designed to manage chronic diseases. The healthcare delivery system in Taiwan was initially structured to handle acute conditions. However, with demographic changes, the system has not fully adapted to adequately address the different needs of chronic disease management. One key example of this is the lower quality of care for chronic conditions compared with acute conditions in Taiwan. The Global Burden of Disease 2016 “Healthcare Access and Quality” study ranked Taiwan

34th in quality of care among other advanced economies.<sup>115</sup> It highlighted that while Taiwan excels in providing quality care for acute conditions, there is room for improvement for chronic disease management, particularly for diabetes and chronic kidney disease. This disparity underscores the need for the healthcare system to enhance its capabilities in effectively managing and treating chronic conditions to ensure the long-term well-being of the population.

In Taiwan, the assessment of care quality often relies on the Taiwan Clinical Performance Indicator (TCPI), which is a set of indicators used to measure the quality of clinical care in inpatient, mental care, and long-term care institutions. Yet, the TCPI focuses on short-term aspects of care processes, rather than a more comprehensive and patient-centered approach that considers long-term health and well-being.

## 5.4 Impact of COVID-19 on healthcare delivery

During the COVID-19 pandemic, the impact on healthcare delivery in Taiwan revealed delays in seeking medical care for certain diseases. The MOHW typically monitors emergency department wait times through a centralized system but lacks mechanisms for regulating general and specialized ward capacities. If this issue is not addressed, it could lead to further delayed medical care.

Among the approximately 19,000 deaths attributed to COVID-19 in Taiwan, approximately 80% were among older individuals. The high mortality rate among older people during the pandemic is likely to be driven by challenges in resource coordination and allocation, and the presence of underlying chronic conditions. Bed and resource allocation issues resulted in many patients being unable to isolate themselves promptly, contributing significantly to the rapid spread of the virus. Additionally, many older individuals were forced to stay at home or were not able to receive appropriate care due to the lack of available hospital beds.

Among the COVID-19 deaths caused by infection or complications from vaccination, at least half of the individuals had preexisting chronic conditions, such as hypertension, diabetes, and cardiovascular diseases. These chronic illnesses serve as significant risk factors for COVID-19 mortality. Therefore, strengthening integrated care for individuals with multiple chronic conditions, providing quality long-term care environments, and enhancing seniors' awareness of health and disease prevention are crucial for elderly healthcare and even pandemic preparedness.

The COVID-19 pandemic has exposed gaps in chronic disease management within the current healthcare system. The challenges in addressing the quality of care for chronic diseases in Taiwan's healthcare system are multifaceted. One factor is the fragmented nature of care delivery, with limited integration and coordination among healthcare providers and specialties. This fragmentation can lead to gaps in care and suboptimal management of chronic conditions.

## 5.5 Recommendations

### RECOMMENDATION 5A

#### **Improve the integration of service delivery between healthcare institutions**

With the data silos, the existing healthcare system is hardly scalable. It is crucial to improve the integration of service delivery by forming alliances among healthcare institutions and the application of smart healthcare technologies. Integration should not merely aim to expand individual hospital systems but should focus on vertical and horizontal integration to form alliances that facilitate patient referrals and collaboration among different levels of healthcare providers. By leveraging the expertise of larger hospitals and fostering collaboration with primary care clinics, the overall quality of care can be elevated. Additionally, the adoption of advanced technologies in smart healthcare can reduce costs and facilitate data integration and analysis.

## RECOMMENDATION 5B

### **Adopt a patient-centered approach with workforce training and support across different healthcare providers**

To improve chronic disease management, the MOHW needs to facilitate a patient-centered approach to care that shifts from treating individual conditions to health management. This entails implementing a cycle of care that focuses on the comprehensive needs of patients with chronic conditions. Integrated care model, coupled with health information standardization and sharing across healthcare institutions, including by expanding types of data available in the NHI MediCloud system, and payment innovations that reward care coordination and quality (e.g., performance-based incentives, per capita payments) could ensure seamless coordination among different healthcare providers involved in the care continuum. Effectively managing chronic conditions requires a well-trained and supported healthcare workforce (see Domain 3). Therefore, healthcare professionals may need additional training and resources to address the complex and evolving needs of patients with chronic diseases effectively.

## RECOMMENDATION 5C

### **Establish a comprehensive quality monitoring framework to evaluate long-term health outcomes of patients**

The establishment of a comprehensive quality monitoring framework by the MOHW is essential. Such a framework should consider not only the quality of acute care but also the long-term health outcomes of patients. By incorporating outcome measures, the quality of care can be assessed based on prevention or early detection of illness, the effectiveness of treatment, prevention of complications, and the overall well-being of patients. This approach encourages a more holistic perspective on healthcare delivery, emphasizing the importance of both acute and chronic disease management. In addition, the Health Promotion Administration is responsible for disseminating health literacy to the public and should use community-based approach to integrate health concepts into their lives (see Case Study 2).



CASE STUDY 2  
**Enhancing  
community  
healthcare  
capacity**



Communities serve as the bedrock for disease prevention, healthcare provision, and crisis response. During a community outbreak, it is essential to establish accessible screening stations near infection hotspots and conduct mass rapid testing for neighborhoods. Taipei's response to its first major community-based COVID-19 outbreak in May 2021 highlights the need to strengthen community healthcare capacity within the broader healthcare system. This experience provided valuable insights not only for managing infectious diseases during public health crises but also for reinforcing the long-term healthcare system.

Until May 2021, Taiwan had effectively contained the COVID-19 pandemic through rigorous border screening measures. However, an outbreak occurred in Taipei city when clusters of cases were traced back to teahouses in Wanhua District. Wanhua, once a red-light district, is now an old urban area with many socioeconomically disadvantaged residents. The teahouses in this district are characterized by poorly ventilated spaces. Customers to these places might not be willing to self-report their visits due to fear of social shaming and stigma. These socioeconomic factors presented a significant challenge due to difficulties in contact tracing for a largely unvaccinated population.

To prevent widespread viral transmission within the community, the Taipei City Government swiftly allocated resources and personnel to establish rapid screening stations in Wanhua District. Although regional and district hospitals are distributed across the district, they risked being overwhelmed by crowds seeking COVID-19 testing. Local clinics, albeit the most accessible primary care service providers, lacked necessary quarantine facilities, increasing the risk of cross-infection. To meet the demand for rapid and safe testing in the community, in addition to establishing testing centers within hospitals, the city government inaugurated Taiwan's first community-based rapid testing station in Bopiliao Historic Block on May 1.<sup>116</sup>

The Bopiliao testing site was strategically positioned near the epicenter of the infections, supported by hospital systems including Taipei City Hospital, Taipei Renji Hospital, and National Taiwan University Hospital Beihu Branch. Collaboratively, social workers, the police department, the Environmental Protection Administration, and the Public Transport Department played pivotal roles in setting up and providing services at the site. This station offered rapid screening, polymerase chain reaction testing, immediate isolation, and follow-up medical care upon detecting a positive case.<sup>117</sup>

Over 36 days from May 14 to June 18, the Bopiliao testing station administered tests to 8,532 individuals, ultimately identifying 419 confirmed cases.<sup>118</sup> The successful operation of this rapid screening station curtailed the spread of COVID-19 in Wanhua District.<sup>119</sup> The lessons and experiences gained at the Bopiliao testing station quickly became a model for other cities in Taiwan.<sup>120</sup>

The establishment of a community-based testing site in Wanhua District exemplifies the extension of healthcare capacity from hospitals into local communities. This strategic move proved indispensable during the public health emergency, facilitating access to testing sites in infection hotspots and alleviating the burden on hospitals, thereby preserving their capacity for emergency services. This approach not only conserved hospital resources but also reduced the risk of cross-infection between the community and healthcare facilities.

However, the smooth implementation of community-based testing facilities hinges on adequate preparation in terms of personnel, resources, and coordination among hospitals, government agencies, and social workers. When the Bopiliao testing station first opened, healthcare workers operated onsite without clear guidelines or proper facilities, such as positive pressure testing booths. This led to inefficiencies in testing and increased the risk of infection. Although these issues were swiftly addressed, healthcare professionals acknowledge that early planning and preparedness during nonemergency times are essential to streamline emergency responses.<sup>121</sup>

Beyond the immediate implications of pandemic response, the spotlight on community involvement for pandemic control in Wanhua District has far-reaching implications for healthcare system

strengthening. In the long term, establishing an integrated healthcare network that connects local clinics with regional hospitals is imperative to address both the daily provision of primary care, particularly for chronic disease management, and crisis response during public health emergencies. In situations where this cannot be achieved due to resource constraints, the Wanhua experience of expanding healthcare capacity from regional and district hospitals into local communities with coordination among government agencies proved to be a practical approach for addressing the infectious disease control at the community level.

6. DOMAIN 6  
**Financing**

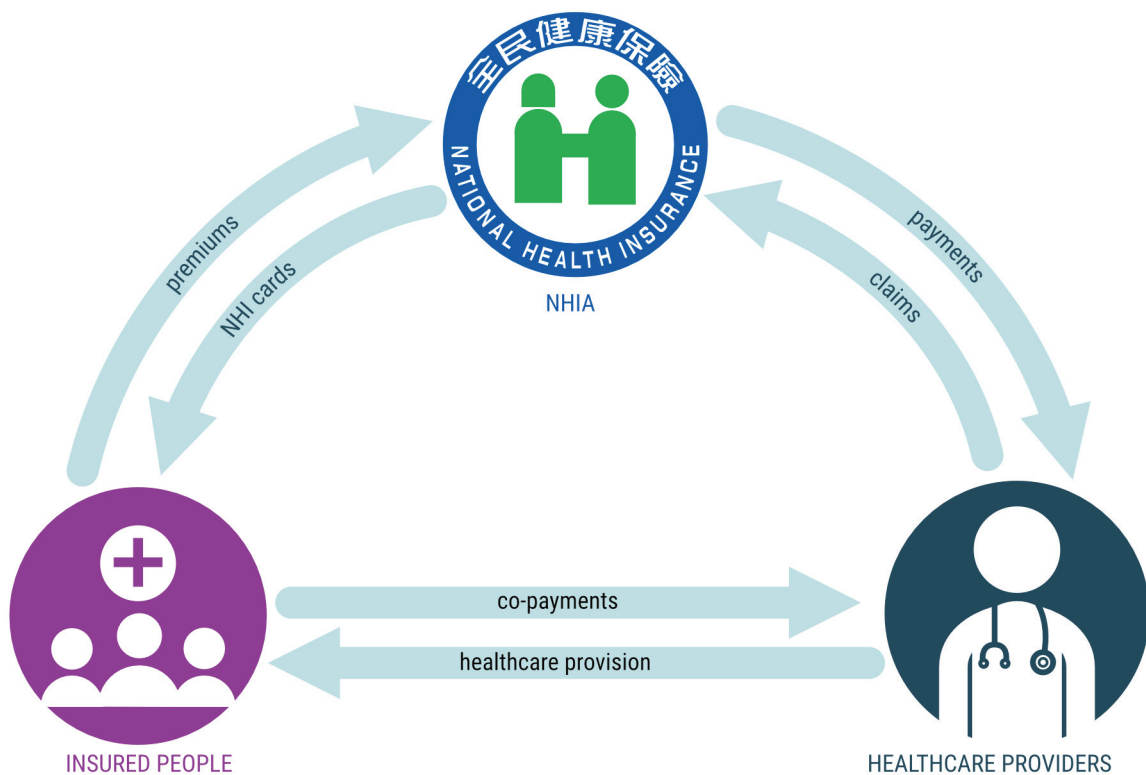


A major issue in Taiwan's health system is underinvestment in long-term health outcomes. Taiwan's global budget payment system effectively controls the cost of healthcare but struggles to meet evolving healthcare needs over time. This section discusses how the current healthcare financing model of Taiwan contributes to fragmented care, underinvestment in future-oriented technology, and the neglect of long-term preventive care.

### 6.1 Taiwan's healthcare investment compared with other Asia-Pacific countries

The health financing system in Taiwan plays a critical role in sustaining and ensuring the resilience of the healthcare delivery system. Thanks to the National Health Insurance Act passed in 1995, over 99% of the population is insured.<sup>122</sup> The act mandated public insurance to cover practically all medical services in a single-payer insurance model through a central public healthcare agency (Figure 7).<sup>123</sup> NHI premiums are collected from the insured, their employers, and the government, which comprise 89% of NHI revenue.<sup>124</sup> Low sharing costs and high accessibility to health services have led to high satisfaction with the NHI system – 91% in 2022.<sup>125</sup> However, challenges must be addressed to enhance the system's effectiveness and responsiveness, particularly in the context of protracted public health crises such as the COVID-19 pandemic. One major challenge is underinvestment in healthcare as a percentage of GDP.

Figure 7: Framework of the National Health Insurance system



Adapted from: Po-Chang Lee, "Introduction to the National Health Insurance of Taiwan," in *Digital Health Care in Taiwan*, ed. Po-Chang Lee, Joyce Tsung-His Wang, Tzu-Yu Chen, and Chia-hui Peng (Cham: Springer Cham, 2022), 1–15, [https://link.springer.com/chapter/10.1007/978-3-031-05160-9\\_1](https://link.springer.com/chapter/10.1007/978-3-031-05160-9_1)

In 2021, Taiwan's health expenditure accounted for 6.1% of GDP, which is lower than that of other Asian countries, such as Japan (11.3%) and South Korea (9.3%).<sup>126</sup> The national health expenditure (NHE) increased by 7.7% to NT\$1.4 trillion in 2021 – a rate less than the annual nominal GDP growth of 9.2% that year.<sup>127</sup> When categorized by final use, individual healthcare expenditure comprised 85.7% of the NHE in 2021. The NHE mainly comes from households (46.2%), followed by the government (29.9%) and businesses and nonprofits (23.0%). Private insurance accounts for a mere 0.9% of the NHE.<sup>128</sup>

## 6.2 Global budget payment system and fragmented care coordination

For the past two decades, the global budget payment system in Taiwan has been a key feature of how financial resources are distributed across healthcare providers. By design, the global budget system sets a hard cap on the total available health resources for the entire sector, and individual healthcare institutions receive payments based on their share of service volume provided. The system has demonstrated advantages of cost control and high administrative efficiency.<sup>129</sup>

While the global budget payment system has helped control healthcare costs, it has several drawbacks. Unlike budget systems in other countries where there are fixed budgets for individual institutions, the Taiwanese global budget system sets sectoral budgets but the share of resources allocated to individual institutions is determined by competition.<sup>130</sup> This creates unintentional market incentives to prioritize quantity over quality of care, fostering competition rather than promoting collaboration and integration across healthcare providers.<sup>131</sup> Healthcare institutions are compelled to maximize patient and procedure volume to ensure financial stability. This emphasis on quantity leads to a myopic focus on meeting volume targets rather than delivering patient-centric, high-quality care. Institutions also compete for patients, which can lead to duplication of services, inefficient resource allocation, and fragmented care. Collaboration across different healthcare providers, such as hospitals, clinics, and community health centers, is hindered due to financial constraints. This lack of integration disrupts the continuity of care and causes suboptimal patient outcomes. It also discourages innovation and efficiency, which require investment in new technologies or care delivery models.

The global budget payment system further exacerbates excessive specialization in service delivery. Providers may focus on specific services or procedures that are financially advantageous, leading to a fragmented healthcare system. This specialization limits access to comprehensive, integrated care, particularly for patients with complex or chronic conditions requiring multidisciplinary care.

Notably, the fixed budget may not adequately meet the evolving healthcare needs of the population. The fixed budget, arbitrarily set at 3%–5% of GDP,<sup>132</sup> fails to accommodate the increasing demand for healthcare services and advancements in medical technology. Consequently, healthcare institutions often face financial constraints, limiting their ability to invest in the infrastructure, equipment, and human resources necessary to deliver high-quality care.

## 6.3 Government financial assistance during COVID-19

Underinvestment in health has compromised the capacity of the Taiwanese health system to respond effectively to public health crises such as COVID-19. It has limited resources for investments in areas such as diagnostic capacity, intensive care units, isolation wards, and R&D for new drugs and vaccines. Consequently, the surge in demand during COVID-19 necessitated ad hoc special budgets to address resource gaps.

During the COVID-19 pandemic, Taiwan swiftly enacted the Special Act for Prevention, Relief, and Revitalization Measures for Severe Pneumonia with Novel Pathogens in 2020. This act added four different budgets, amounting to NT\$160 billion, all through national debts. The MOHW also allocated

NT\$29.4 billion to strengthen epidemic prevention, testing capacity, consultation hotlines, community screening stations, vaccination programs, patient isolation and treatment, and medication procurement.<sup>133</sup> Yet, the short-term funding did not fully resolve issues resulting from chronic underinvestment, particularly in talent, infrastructure, processes, and new drugs and vaccines, which take years to develop.

To further strengthen the economy and social resilience after the pandemic, the Special Act for Strengthening Post-Pandemic Economic and Social Resilience and Sharing Economic Achievements with the People was passed in February 2023; according to this act, NT\$380 billion will be allocated to stabilize the cost of living and alleviate individual financial burden by implementing a universal cash distribution program of NT\$6,000 per person.<sup>134</sup> Since May 1, 2023, COVID-19 prevention measures have been gradually relaxed, as the Taiwan CDC downgraded the classification of COVID-19 to a Category 4, indicating a known communicable disease or syndrome that requires monitoring and prevention.<sup>135</sup> The CECC was dissolved, and the MOHW established a cross-agency meeting to continue COVID-19 preparedness and response work.

## 6.4 Lack of government investment in preventive and long-term care

Inadequate government investment is also evident in preventive medicine and long-term care. Without adequate funding and attention given to preventive medicine, the health system becomes reactive rather than proactive. This reactive approach not only places a greater burden on limited healthcare resources but also compromises the overall effectiveness of Taiwan's response to future pandemics. Taiwan currently lacks long-term care insurance, relying on government spending of NT\$60 billion annually to support long-term care services.<sup>136</sup> The creation of a comprehensive long-term care insurance system and diversifying sources of financing, such as through a social insurance scheme, to increase overall resources and shield the system from changes in political agendas, will be vital to ensure sustainable financing for long-term care needs.

## 6.5 Recommendations

### RECOMMENDATION 6A

#### **Conduct public education campaigns to shift the public view of health spending to a long-term investment by prioritizing preventive measures, early detection, and coordinated healthcare service**

It is crucial to address underinvestment in Taiwan's health system to encourage efficiency and innovation, incentivize patient-centric, coordinated care, and create a long-term care system. In addition to increasing government spending, the MOHW must take action to transform societal perceptions of health spending, enabling people to view it as a worthwhile investment in the long-term health and well-being of society. Policymakers and the public alike should recognize that investing in preventive healthcare and health service coordination will benefit community population health and reduce the long-term financial burden of chronic disease management, including expenses like extended hospitalization. This mindset shift will require comprehensive education and awareness campaigns targeting policymakers, healthcare professionals, and the public. Such cultural and communication policy will augment the likelihood of sustainable, long-term increased government spending by creating a public desire for increased healthcare spending from the legislators they elect.

## RECOMMENDATION 6B

### **Collaborate across sectors to determine the appropriate approach to increase health financing**

To ensure inclusivity and foster consensus, it is imperative for MOHW to take a cross-sectional approach and involve a wide range of stakeholders to explore different options for increasing health financing in Taiwan. Options range from increasing health premiums and expanding public budgets to encouraging private insurance. Transparent and evidence-based dialogues across government, experts, the private sector, and the public that evaluate the advantages, disadvantages, and tradeoffs associated with each financing option are critical to ensure the long-term sustainability of such a financing system, bolstered by public consensus.

## RECOMMENDATION 6C

### **Set up an independent commission responsible for a cost-effectiveness assessment and systematic evaluation of short-term as well as long-term outcomes of the financial strategy**

Given its limited resources, the MOHW should take care to properly balance short-term and long-term needs. For instance, while meeting the urgent needs of a containing infectious disease outbreak is important, investing resources to address health system capacity building is equally important. To achieve this, we recommend establishing a systematic approach for resource allocation. This requires creating an independent body or commission responsible for conducting rigorous scientific assessments. The evaluations will guide health investment decisions based on criteria such as cost-effectiveness, health outcomes, and societal priorities. Regular reviews assessing these factors will ensure that investments are targeted at interventions and programs that maximize value and population health benefits. Moreover, implementing mechanisms for monitoring and evaluating the impact and efficiency of health financing strategies will enable ongoing optimization of resource allocation. The Center for Health Policy and Technology Assessment, established in late 2023, is a promising initiative that aims to provide systematic assessment data for policy recommendations.<sup>137</sup>

Continual monitoring and evaluation of these policies is imperative for the sustainability of the recommended system. Establishing a robust monitoring and evaluation framework will enable the MOHW to assess the impact of health financing policies and interventions. The Executive Yuan should update health financing strategies based on regular policy reviews that assess empirical evidence as well as feedback from stakeholders across departments and ministries. This will ensure policy relevance and effectiveness over time, facilitate accountability, and encourage the ongoing improvement of financing Taiwan's health system.



7. DOMAIN 7

# Governance



Taiwan's healthcare system is highly accessible and ranks well globally, but its progress is hindered by a lack of clear long-term goals and strategic planning. Balancing different values, such as economic development and equity, is challenging but necessary. This section discusses the governance challenges in Taiwan's health system and highlights the growing societal consensus on the need for a well-defined legal framework to govern health decisions.

## 7.1 Governance structure of health system in Taiwan

The MOHW is responsible for Taiwan's health and social welfare. The ministry houses several institutions to support Taiwan's health system (Figure 8).<sup>138</sup> Taiwan established the National Health Insurance Bureau to introduce the NHI system in 1995 to serve as the fundamental infrastructure for delivering health services to the Taiwanese population. In 1996, the NHRI was established as an autonomous public research organization and national think tank under the supervision of the MOHW (then the Department of Health under the Executive Yuan) to enhance medical research and improve national healthcare.<sup>139</sup>

## 7.2 Lack of national long-term plan leads to suboptimal health indicators

Taiwan's health system is considered world class for its high accessibility, equity, and acceptable quality of care. In July 2023, Taiwan was ranked 1st among over 90 countries in the Numbeo Health Care Index for a fifth consecutive year.<sup>140</sup> However, Taiwan's healthcare outcomes fell behind top-tier nations in recent years, as reflected in its life expectancy lagging that of South Korea and Japan.

From the perspective of health system governance, a fundamental issue is a lack of clear, national, government-wide, long-term goals and plans for the health system to guide the direction of healthcare-related policies and evaluate performance. Discussions focusing only on cost considerations overlook the potential development of a sustainable national health system. The highly specialized nature of Taiwan's modern health systems has created silos, compromising the quality and continuity of healthcare services which should be anchored on primary care that supports "first-contact, accessible, continuous, comprehensive, and coordinated person-focused care."<sup>141</sup> This lack of long-term direction leads to a dearth of good indicators that could be used to continually measure the effectiveness of policy implementation. The NHRI, as a national public health think tank, is expected to contribute to the strategic planning of the MOHW. However, its research team previously comprised mainly specialized scientists focused on laboratory-based biomedical research, and its projects have been more academic than policy focused. Its cutting-edge, scientific output needs to be transferred into healthcare policy formulation.<sup>142</sup> For example, the National Center for Geriatrics and Welfare Research established in 2020 by the NHRI in collaboration with National Taiwan University as a national policy research center is expected to develop policies that meet the needs of a super-aging society, but broader and more comprehensive strategic policy planning is warranted.<sup>143</sup>

## 7.3 Competing priorities affect healthcare

Highly dependent on international trade, Taiwan cannot avoid the increasing risks caused by the tense global and regional environment. Geopolitics, a changing global market, climate change, and uncertainties surrounding new technologies like artificial intelligence require the government to take a more creative, inclusive, and sustainable approach to respond to risks in a timely manner. However, the current system and organizational culture emphasizes the preservation of the status quo on the basis that it is less risky, rather than advocating for improvement paired with appropriate risk management. Such an outdated system and way of thinking is an inadequate approach and further limits creative learning opportunities to prepare Taiwan for future challenges.

**Figure 8: Structure of the Ministry of Health and Welfare**



Note: \*The establishment of Bureau of National Pension has been put on hold; pursuant to the Organic Act for Ministry of Health and Welfare, affairs relating to the national pension may be entrusted to relevant agencies (organization) for implementation.

Source: "2023 Taiwan Health and Welfare Report," Taiwan MOHW, accessed April 4, 2024 [www.mohw.gov.tw/cp-137-76468-2.html](http://www.mohw.gov.tw/cp-137-76468-2.html).

Health decision-making involves complex considerations of different values such as economic development, equality, efficiency, protection of human rights, and ethical concerns. The unclear balance between which values should be prioritized in the health system renders policymaking difficult. For example, the private sector plays an important role in developing new medicines and technologies to support the needs of the health system. While public–private partnership opportunities to develop creative solutions in healthcare exist, limited action has been taken by officials to forge such partnerships with the private sector due to concern of being perceived as transferring benefits to for-profit companies.

## 7.4 Creating a health governance legal framework with competing values

Given its frequent interactions with China, Taiwan was expected to be one of the worst-hit countries when COVID-19 began to spread. However, previous experience with the SARS epidemic in 2003 made Taiwan highly conscious of the potential spread of pathogens from China. Its rapid response with interdepartmental coordination and prompt public health measures introduced by the CECC successfully protected Taiwan from the first wave of COVID-19. This successful first response reflected not only the high quality of healthcare professionals but also the resilience and capacity of Taiwan's health system to learn from previous experience with emerging infectious diseases. However, delayed preparation for subsequent waves of COVID-19 pandemic revealed factors of the system's sustainability issues.

Given that research suggests COVID-19 will evolve to be a flu-like endemic disease, control tactics should shift from containment to active vaccine preparations; this is an example of evidence-based policy. However, the government's response was slow, which led to delays in preparing health supplies such as vaccines. Exacerbated by insufficient integration and coordination of health services across different levels, this delay further contributed to Taiwan's ineffective response to the 2021 and 2022 waves of COVID-19. Taiwan's COVID-19 case–fatality rates in 2020, 2021, and 2022 were 0.88%, 4.96%, and 0.15%, respectively. Although lower than the global average and the averages of other high-income nations, cumulative COVID-19 deaths per million in Taiwan reached 496.36 by October 2022, higher than those of neighboring Asian countries including Vietnam (442.76), Japan (368.57), and Singapore (300.90).<sup>144</sup>

The lack of decision-making transparency by expert committees and incongruence on the proper balance between COVID-19 control and other societal values – such as the right to vote in elections during quarantine – further threatened the public credibility of the TFDA and expert review committee's processes. This led to overall distrust in the government and chaotic social debates.<sup>145</sup>

Despite these challenges, the Communicable Disease Control Act amended after SARS in 2003 reflects Taiwan's understanding of the need for a legal framework to guide governmental action during health crises in a democracy. At the time, the principle of legal certainty was challenged by the Control Yuan out of concern over unclear authorization of agencies to conduct public health measures that might endanger individual rights. This vigorous debate at both the public and governmental levels reflects a gradual acknowledgment of the need for a legal framework to guide decision-making in the health sector during crises.

## 7.5 Recommendations

### RECOMMENDATION 7A

#### **Develop a national, government-wide, long-term plan to guide the development of the health system via broad social dialogue**

The MOHW must take accountability and develop national, government-wide, long-term goals and plans for Taiwan's health system through broad social dialogue to guide the direction of the healthcare system. The NHRI can review its capacity and consider prioritizing relevant research

programs to produce policy-relevant strategic input for the MOHW. Policy effectiveness should then be carefully and continually monitored with appropriate indicators in accordance with the MOHW's goals.

Health policy involves different values; the government must lead public discussion on the balance between different values before setting such goals; this will ensure that selected values align with all citizens, rather than a select few in government. Transparent and well-informed social dialogue among all stakeholders is crucial to properly balance values. The MOHW can consider creating a credible platform for regular social communication on the balance of different values in different settings, such as crises like COVID-19 or chronic challenges in the health system. This communication must also be based on clear evidence weighing the pros and cons of different policy options.

When informed by credible scientific evidence, decision-making is more effective in protecting people's health. This is evident from policies during the COVID-19 pandemic that caused societal unrest, revealing the need for a mechanism for evidence to shape decisions both before, during, and after public health crises as the cornerstone of a sustainable health system. Notably, scientific evidence evolves over time and may present conflicting information. This makes it even more crucial for the government to communicate evidence-informed policy with transparency and timeliness, particularly during an outbreak.

#### RECOMMENDATION 7B

##### **Invest in capacity building for government officers to better equip them for future challenges**

The government could invest in capacity building for government officers through approaches like providing multidisciplinary courses or year-long overseas training to better equip them for future challenges requiring skills beyond their current training. Moreover, a more creative and inclusive working environment should be promoted with sufficient support to encourage new, innovative policy approaches in health.

#### RECOMMENDATION 7C

##### **Improve coordination across different levels of care and specialties between health and social care providers with a focus on primary care**

Improving coordination is critical to building a more sustainable health system. The MOHW should facilitate the coordination of care at different levels, specialties, and providers through continual discussion and arrangement.

#### RECOMMENDATION 7D

##### **Enhance the role of primary care as the main point of accountability and leverage big data analysis and information technology to facilitate coordination with specialty providers**

Enhancing the role of primary care as the core point of accountability for all an individual's needs is critical to enable coordinated care in Taiwan's highly specialized healthcare system. The MOHW should develop mechanisms that allow for the nimble use of funding resources across preventive, curative, and social care to support integrated care delivery.

Adoption of big data and information technology may facilitate this coordination. For example, the patient management system used by a general provider could communicate with that of a specialty care provider and alert them if certain treatment is needed.

## RECOMMENDATION 7E

### **Develop a priority investment framework and transparency mechanism for crisis scenarios**

As identified by the OECD, further investment in health systems is urgently needed to prepare societies for future shocks. Like all investments, it is essential to develop a mechanism to systematically deploy resources wisely. Recommended areas for prioritized investment include critical capabilities, such as emergency supply stockpiles and essential workers, growth areas delivering future value and health benefits, as informed by scientific evidence and the long-term health needs of the population, and data use to inform better decision-making, surveillance, and research.

The government should also stipulate by law a transparency mechanism to demand accountability for policy decisions by expert committees. This will enhance public trust in government, particularly in times of crisis when trust is essential to improve population health and prevent further outbreaks. The creation of a regulatory framework and guidelines by the MOHW, including both emergency response and mid- to long-term strategies to address the lasting effects of the pandemic, will also enhance public health system resilience.

# 8. Reflections and conclusions



Taiwan's health system was designed to feature wide coverage, high affordability, high efficiency, and effective budget control. The single-payer health system administered by the NHIA is regarded as a high-performance model compared with other countries. Taiwan's ability to learn from past experiences and its pursuit of digitalization in healthcare service administration enabled its swift response to the COVID-19 crisis in 2020, which was extolled by international society.

However, as Taiwan becomes a super-aged society, changing demographics have exposed structural challenges in the health system, as exposed in subsequent waves of the pandemic. These challenges restrict Taiwan's potential to provide the population with sustainable, high-quality care. Moreover, the government is limited by its short-sighted view of healthcare expenditure as a burdensome cost, rather than a forward-thinking perspective on healthcare expenditure as an investment in long-term societal resilience. Despite recognition of the need for more investment in the health system, a lack of a clear, shared vision limits impact. As this report has demonstrated, the domains of the health system are interconnected. To improve the long-term sustainability and resilience of Taiwan's health system, a holistic set of policies addressing the domains as a network is necessary.

## Critical gaps in the health system

This report identifies the following gaps in Taiwan's health system that must be addressed:

**Lack of strategic planning** on national health at the highest level of government, inadequate interministry coordination, and siloed data collection and interpretation lead to a health system that is fragmented across different specialty areas and favors short-term needs over long-term planning for future success. Population aging, chronic noncommunicable diseases, and the threat of climate change pose challenges to sustainable development across sectors (Domains 1 and 2). A gap in coordination within departments of the MOHW and across ministries leads to a lack of data accessibility, which is necessary to monitor factors such as equitable service delivery to rural and indigenous communities as well as greenhouse gas emissions related to the environmental determinants of health (Domains 2, 5, and 7).

**Lack of investment**, both financially and operationally, in health system capacity has led to shortages and burnout among healthcare professionals. This is closely related to the bottleneck at the institutional level described above. Insufficient investment leads to a deficient workforce, lack of capacity to conduct specialized work, and inability to pursue coordination at higher levels of governance in the health system (Domains 3 and 6). NHI budget constraints and a limited number of experts lead to a slow pace of reimbursement approval for new medicines (Domains 4 and 6). Inadequate funding for salaries leads to constant staff shortages and overworking among nurses, which creates an unsustainable work environment. Nursing shortages restrict the provision of quality healthcare services, particularly affecting vulnerable groups such as indigenous and rural communities, who are the first to be impacted by budget and staffing cuts (Domains 1 and 3). Inadequate staffing during demand surges, as demonstrated by subsequent waves of the COVID-19 pandemic, redirects available resources away from preventive care to fill immediate needs, which risks the neglect of NCD treatment and of future challenges posed by an aging society (Domains 1 and 5). Ultimately, lack of investment in the healthcare workforce leads to misplaced service delivery and poorer population health outcomes.

**Lack of patient-centered coordination** at the operational level has made the healthcare system to prioritize quantity of services over quality of care. Easily accessible and highly specialized healthcare results in the excessive use of medical resources (Domains 4 and 5). The market incentives produced by the global budget and fee-for-service payments that dominate the NHI foster competition for patients among healthcare institutions, inducing a tendency of overtreatment and further fragmenting the healthcare system (Domains 5 and 6). This results in inefficient and suboptimal healthcare service performance. Therefore, the quality of patient care, especially chronic



disease management, which involves long-term services across multiple stakeholders in the healthcare system, remains lower than expected.

## What's next: Engaging the public to initiate future-oriented reform

To address the gaps identified above, this report proposes the following actions for the government of Taiwan to build a more resilient health system:

**Evidence-informed governance of the healthcare system should be strengthened.** Specifically, the NHRI should streamline data collection and interpretation across different domains of the health system, emphasizing both the quantity and quality of care (Domains 1 and 5). The MOHW should initiate open dialogues among stakeholders to forge consensus on a national health strategy that balances short-term priorities with long-term goals (Domains 6 and 7). To implement public health policies accordingly, the Executive Yuan should establish an independent unit responsible for coordinating the MOHW, Ministry of Labor, Ministry of Environment, and other governmental agencies (Domains 1, 2, and 7).

**Additional financial and human resources should be allocated to relevant stakeholders** in the health system to provide necessary incentives and capacity to meet increasing healthcare demand. For example, healthcare workers could receive salary subsidies in a timely and transparent manner during periods of surging demand (Domain 3). Additional training programs, including overseas exchange, can be introduced to healthcare professionals at the NHIA to increase the review capacity and speed of reimbursement approvals (Domain 4). Increasing healthcare capacity with adequate resources at the community level is important not only to address primary care needs but also to meet surging demand in a crisis, as demonstrated in Wanhua District, Taipei, during the pandemic (Case Study 2).

**A multipronged strategy should be implemented to improve patient-centered care** at an operational level. The NHI MediCloud System can be improved as an integrated personal healthcare platform that consolidates individual data on health status (Domain 4). Healthcare service providers should deepen horizontal and vertical integration in health data by sharing processes and service coordination (Domain 5). A more innovative payment scheme that is tied to healthcare quality can also be developed to facilitate effective, patient-centric treatment (Domain 6).

Each policy initiative would require additional financial resources from the national budget. In the long term, the government must not only develop a sustainable scheme to finance the NHI but also actively explain the cost–benefit calculation behind such schemes to society. Transparency, expert consultation, and public engagement in health policymaking is crucial to maintain public trust in government, as demonstrated by the utilization of technology in addressing the public health crisis in Taiwan (Case Study 1). Discussions and experts calling for a revamp of the current health system have been increasing. Enhancing transparency in the policymaking consultation process can increase public buy-in, thereby increasing the likelihood of successful policy implementation. The window of opportunity is now to engage in systematic public communication. The government must work with the experts, the private sector, and civil society to shift the health system's priority of managing patients to managing population health. This will require targeted public engagement and education campaigns on preventive health and a healthy lifestyle across society.

By implementing these policy recommendations, Taiwan can transform its health system into a sustainable, equitable, and efficient model to optimize population health outcomes. This will enable the country to proactively address challenges posed by future shocks and uncertainties. Through commitment to building a resilient health system, Taiwan can safeguard the well-being and health of all its citizens for generations to come.

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