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**STRATEGIES IN MAINTAINING FINANCIAL SUSTAINABILITY OF  
NATIONAL HEALTH INSURANCE UNDER A SINGLE-PAYER SYSTEM IN  
INDONESIA, TAIWAN, AND CANADA: A COMPARATIVE STUDY**

Arif Budiman

A Capstone Submitted to the Graduate Faculty  
of Georgia State University in Partial Fulfillment  
of the Requirements for the Degree

**MASTER OF PUBLIC HEALTH**

**ATLANTA, GEORGIA**

2020

## Approval Page

Strategies in Maintaining Financial Sustainability of National Health Insurance Under  
A Single-payer System in Indonesia, Taiwan, and Canada: A Comparative Study

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Defense Date: April 15, 2020

## **Author's Statement Page**

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Arif Budiman

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## LIST OF ABBREVIATIONS

BNHI	Bureau of National Health Insurance
CDR	Crude Death Rate
CHT	Canada Health transfer
CIHI	Canadian Institute for Health Information
DJSN	Social National Security Council
GDP	Gross Domestic Product
GNI	Gross National Income
Healthcare BPJS	Social Security Agency for Health
HDI	Human Development Index
HIT	Health Information Technology
Ina-CBG	Indonesian-Case Based Group
JKN	Indonesia's National Health Security (Insurance)
KFN	Pharmaceutical National Committee
LOS	Length of Stay
MOH	Ministry of Health
MSA	Ministry of Social Affair
NCD	Non Communicable Disease
NHI	National Health Insurance
NHIA	National Health Insurance Administration
NHIC	National Health Insurance Committee
OECD	Organization for Economic Co-operation and Development
PCB	Performance Capitation Based
TKMKB	Healthcare Quality and Cost Control Board
Tw-DRG	Taiwan Diagnosis Related Group
UHC	Universal Health Coverage

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## ABSTRACT

Health care is one of the basic human needs and also human rights, which relate directly to determining ones' quality of life. In the past decades, health care advances, demographic shifting, and health-related lifestyle have been influencing the demand and supply of healthcare in every country. Some people have been struggling and sometimes became poor because they should pay for their health care services. Thus, most countries have been developing universal health coverage, which design to protect peoples' financial burden as well as furnishing a better quality of care for its population.

Designing and maintaining a single-payer public healthcare system is complicated and requires multiple cooperation from stakeholders. Indonesia, Taiwan, and Canada are among countries that implemented this particular system. One of the fundamental elements in administering this type of scheme is financial sustainability, which frequently tends to be a problem since it requires commitment from the government as the payer, healthcare facilities as the provider, and also the population as the user.

Lesson learned from the three countries has shown that there are at least three components that ensure the financial sustainability of social health insurance under a single-payer system. First, a sufficient amount of revenue collected to finance health expenditure. Particularly for Indonesia, premium structure and calculation possibly become a significant concern when compared to Taiwan National Health Insurance (NHI). Second, the implementation of adequate prospective payments such as global health and the arrangement of copayment. Third, designed and supporting systems such as innovation through a health information system and the strong commitment from boards or committees explicitly designed to support the performance of NHI.

*Keywords:* Single-payer, financial strategies, Indonesia, Taiwan, Canada

## I. INTRODUCTION

Universal Health Coverage (UHC) in a nation ensures the entire population has access to healthcare services without any financial hardship. According to World Health Organization-WHO (2019), nearly 100 million people are still vulnerable to extreme poverty because they have to pay for their health care services. Thus, many countries take action to develop or maintain their government-administered insurance, or National Health Insurance (NHI), in an attempt toward universal health coverage. To provide UHC, a country needs to strengthen all of the components in the health system which include health service delivery systems, health workforces, health facilities and communication networks, health financing, health technologies, information systems, quality assurance mechanisms and government legislation (WHO, 2019).

Financing structures are the fundamental aspects in providing a sustainable UHC. A resolution released by the United Nations General Assembly in 2012 includes sustainable financing along with comprehensive primary care and social protection as the key components in achieving UHC (Dye, Reeder, & Terry, 2013). Every country has different methods and approaches in financing their health system. Some of the countries have developed proper and sustainable financing techniques, yet some of the others are still looking for better systems.

In terms of purchasing structure for an NHI, usually it comes to two types of financing mechanisms: multi-payer and single-payer systems. In a multi-payer system, more than one entity is responsible for purchasing health care services for its population. In a single-payer system, there is only one entity administering the national health care service claims. Typically, a single-payer system is run by the federal government of a country (Liu & Brook, 2017). Indonesia, Taiwan, and Canada are among those who use a single-payer system in financing its NHI. However, the detailed implementation of the single-payer system varies between them. Each of the health systems has a unique method in administering the single-payer NHI depending on the political structures, population characteristics, and economic power.

While Canada and Taiwan officially established their NHI in 1984 and 1995, respectively, Indonesia only recently developed a UHC under a single-payer system. Since its establishment in 2014, Indonesia has struggled with managing universal coverage for almost 270 million people. Indonesia's NHI program experienced a deficit each year as a result of imbalanced finances; healthcare expenses exceeded the amount of revenue (Yuliyanti & Thabrany, 2018). This imbalance causes problems to healthcare delivery and the sustainability of the program itself. Several studies have elaborated on Indonesia's NHI performance and evaluation in an effort to provide recommendations for overcoming the problems. However, there is little research comparing Indonesian health care with similar single-payer system, such as Taiwan and Canada.

The purpose of this capstone is to describe strategies and management of financial sustainability in NHI under a single-payer system by comparing Indonesia, Taiwan, and Canada's health system profile. This paper also aims to gain lessons from Taiwan and Canada's experience for the future improvement of Indonesia's NHI. Taiwan's NHI is the most comparable to Indonesia's NHI, as opposed to other countries with the same cultural and geographical aspects. Both NHI share several commonalities, such as compulsory social health insurance under a single-payer system, the premium-based revenue collection method, and a similar membership structure. Most importantly, Taiwan has succeeded in addressing its financial problem, for which Indonesia is currently experiencing. The motive of selected Canada as another comparable health system is to discover how a developed country maintains its financial sustainability of universal health coverage under a single-payer system. Canada is the only developed country which considered have completely provide universal coverage for the population (Santerre & Neun, 2012). In addition, Indonesia also has the waiting times issue as Canada has been addressing intensively. Moreover, both Taiwan and Canada have been implementing global budget cap as the solution of controlling increased health spending, as which Indonesia has started piloting the same method.

According to WHO (2019), financing structures and reforms are key elements in strengthening health systems working towards UHC. Thus, learning lessons from countries that have the same financing structures will benefit Indonesia in overcoming the financial hardships in maintaining its NHI. This study also highlights critical components of financial management, such as revenue collection, risk pooling, and purchasing methods. In addition, this study includes non-financial aspects that contribute to strengthening the financial management of each NHIs. This capstone reviews and summarizes data available at the NHI administering agency and the Ministry of Health in respective countries. This study also compiles statistical data from WHO and the World Bank to compare the health outcomes and demographic data for each country. Besides, several reviewed articles, journals, books, and other valid resources are used for a comprehensive analysis of universal health coverage under a single-payer system.

## II. BACKGROUND INFORMATION

### 2.1. Indonesia

Indonesia is the most populous country in Southeast Asia and ranked fourth globally, with a projected 270 million inhabitants in 2020 (United-Nations, 2020). Although Indonesia is the largest country in Southeast Asia, it is not leading in broad sectors of country development, such as the Human Development Index (HDI). Compared with its neighboring countries such as Singapore, Thailand, and Malaysia, HDI in Indonesia is slightly behind. HDI is one of the indicators in measuring the development of a country by calculating several key criteria such as life expectancy, the proper standard of living, and literacy level. HDI ranges from 0 to 1, with 1 as the highest HDI. According to the United Nations Development Programme- UNDP (2019), the HDI for Singapore, Malaysia, Thailand, and Indonesia in 2018 was 0.935, 0.804, 0.765, 0.707, respectively. In comparison, Canada's HDI reached 0.922, and Taiwan's HDI reached 0.911, according to UNDP (2019) and National-Statistics (2020). However, World-Bank (2019b) verified that Indonesia has the highest GDP growth with 5.171% in the last five years compared to Singapore's 3.139%, Malaysia's 4.742%, and Thailand's 4.129% in the same period. Also, a significant difference with GDP growth in Canada with 1.9% and Taiwan with 1.89% (Trading-Economics, 2020).

The significant economic growth in the last half-decade should be motivation for Indonesia to improve its health sector performance. Several health programs, such as *Gerakan Masyarakat Sehat* (a healthy community movement) have been enacted and strengthened by the Ministry of Health (MOH) in order to improve Indonesia's health performance indicators. Life expectancy at birth in Indonesia has increased gradually from 69.81 in 2010 to 71.20 in 2018 (Macrotrends, 2020a). This achievement serves as one of the indicators in reflecting positive health outcomes of Indonesia's effort in improving health care services and overall population health. In addition, even though the crude death rate (CDR) shows a slight incline

between 2017 and 2018, the overall trend in Indonesia shows a decline since 2010.

Comparatively, other Southeast Asian countries such as Singapore, Thailand, and Malaysia have experienced a gradual increase in CDR since 2010 (World-Bank, 2019a). Furthermore, Canada and Taiwan also experienced an increasing trend of CDR in the last ten years (Statista, 2019b; World-Bank, 2019a). Figure 2.1 compares the CDR trend among selected countries.

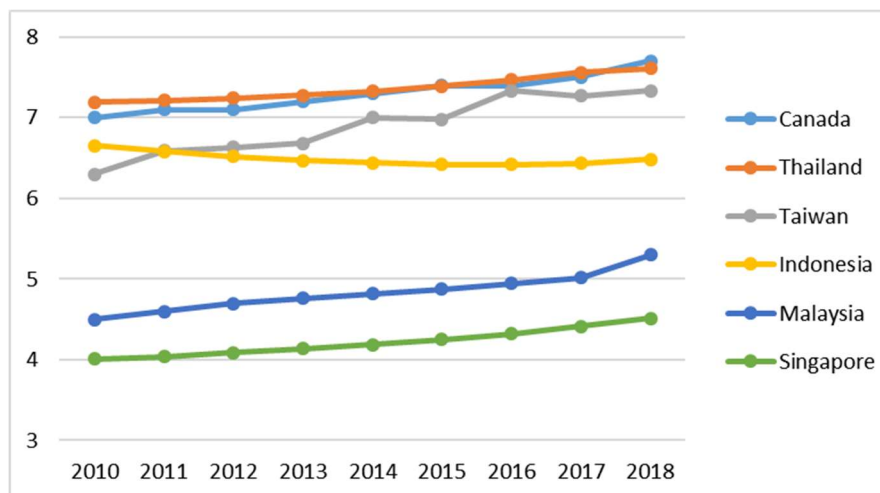


Figure 2.1 Trends of crude death rate in Indonesia compared to selected countries

Source: (Statista, 2019a; World-Bank, 2019a)

While Indonesia is making great strides in improving its health outcomes, as reflected in the declined CDR trends, new challenges emerge as non-communicable diseases (NCD) becomes the leading cause of death in Indonesia. According to Center for Disease Control and Prevention (CDC, 2019), an estimation of 68% of death in the world is related to the NCD, and 75% of deaths are in low- and middle-income countries. Furthermore, the National Institutes of Health (NIH, 2019) emphasized that by 2030, three-quarters of the disease burden in low- and middle-income countries will be dominated by NCDs such as cardiovascular disease, diabetes, and cancer. Stroke, ischemic heart disease, and diabetes mellitus are the top causes of mortality in Indonesia (Table 2.1).



Table 2.1 Leading causes of death and its proportion to total deaths in Indonesia, Taiwan and Canada (2012)

Ranks	Indonesia	% of Total Deaths	Taiwan	% of Total Deaths	Canada	% of Total Deaths
1	Stroke	21.2	Cancer	20.7	Cancer	28.0
2	Ischemic heart disease	8.9	Ischemic heart disease	9.2	Ischemic heart disease	18.7
3	Diabetes Mellitus	6.5	Pneumonia	5.7	Stroke	4.8
4	Lower Respiratory Infection	5.2	Stroke	4.9	Accident/road Injury	4.7
5	Tuberculosis	4.3	Diabetes Mellitus	4.0	Chronic lower respiratory	4.6
6	Cirrhosis Hepatis	3.2	Accident/road Injury	2.9	Pneumonia	3.0
7	COPD	3.1	Chronic lower respiratory	2.6	Diabetes Mellitus	2.4
8	Accident/road Injury	2.9	Hypertensive hearth disease	2.5	Alzheimer	2.3
9	Hypertensive hearth disease	2.7	Chronic kidney disease	2.3	Suicide	1.3
10	Chronic kidney disease	2.6	Cirrhosis Hepatis	1.8	Chronic kidney disease	1.3

Source: Pariona (2017), MOHW-Taiwan (2019), Statistics-Canada (2019), Statista (2019a)

According to WHO (2018), 73% of all deaths in Indonesia are caused by NCDs. Stroke (cardiovascular disease) accounts for 21.2% of total deaths in Indonesia, followed by ischemic heart disease and diabetes as the top three NCDs in Indonesia (Pariona, 2017). However, in terms of NCD morbidity, diabetes mellitus is the highest prevalence, with 20 people per 1,000 population, followed by heart disease and stroke with 15 and 10.9 cases per 1,000 population, respectively (Figure 2.2). Based on these two findings, even though the prevalence of stroke is not the highest, yet it is the deadliest disease which leads the causes of all death in Indonesia.

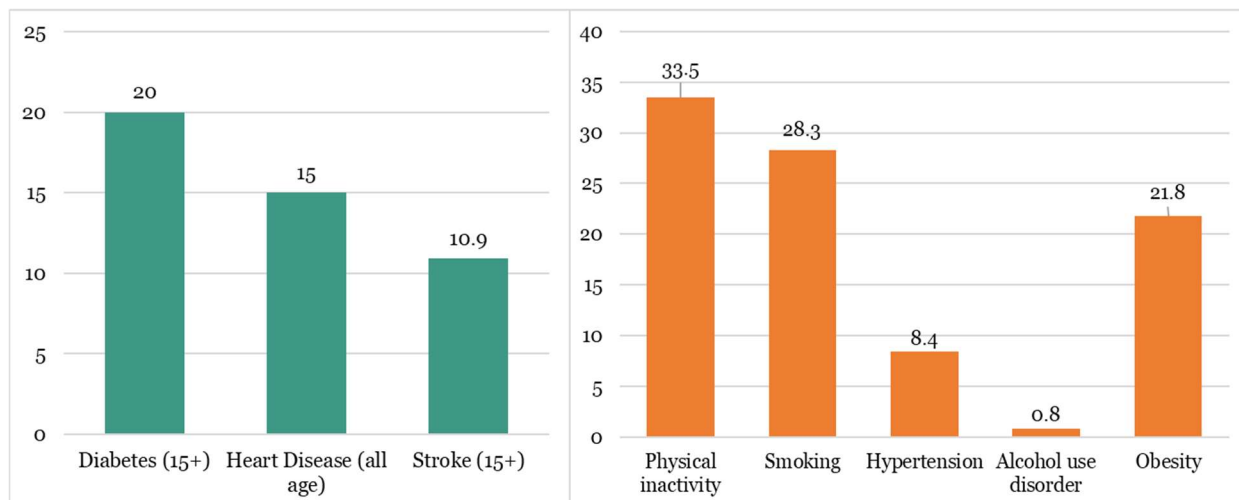


Figure 2.2 Prevalence of NCDs (left) and NCDs major risk factors (right) in Indonesia, 2018

Source: Ministry-of-Health (2019)

Health behaviors are the main factor that strongly related to the incidence of most NCDs (WHO, 2012). These behavioral measures include tobacco use, physical inactivity, unhealthy diet, and the harmful use of alcohol. Moreover, hypertension, hyperlipidemia, and raise blood glucose could also contribute to determining other risk factors of NCDs. Corresponding to Indonesian Basic Health Research by Ministry-of-Health (2019), lack of physical activity tends to be the highest prevalence for NCD risk factors in Indonesia, followed by smoking behavior as which almost 30% of the population are smokers. This condition put Indonesia in a vulnerable risk to all of the NCDs related to physical inactivity and smoking such as diabetes mellitus, ischemic heart disease, and lung cancer. Compared to Taiwan and Canada, Indonesia has the highest tobacco smoking prevalence, with 35.9% of the population. On the other hand, Indonesia is lower than Taiwan and Canada regarding physical inactivity, overweight, and alcohol use disorder. Figure 2.3 depicts and compares the prevalence of NCD's major risk factors in Indonesia, Taiwan and Canada.

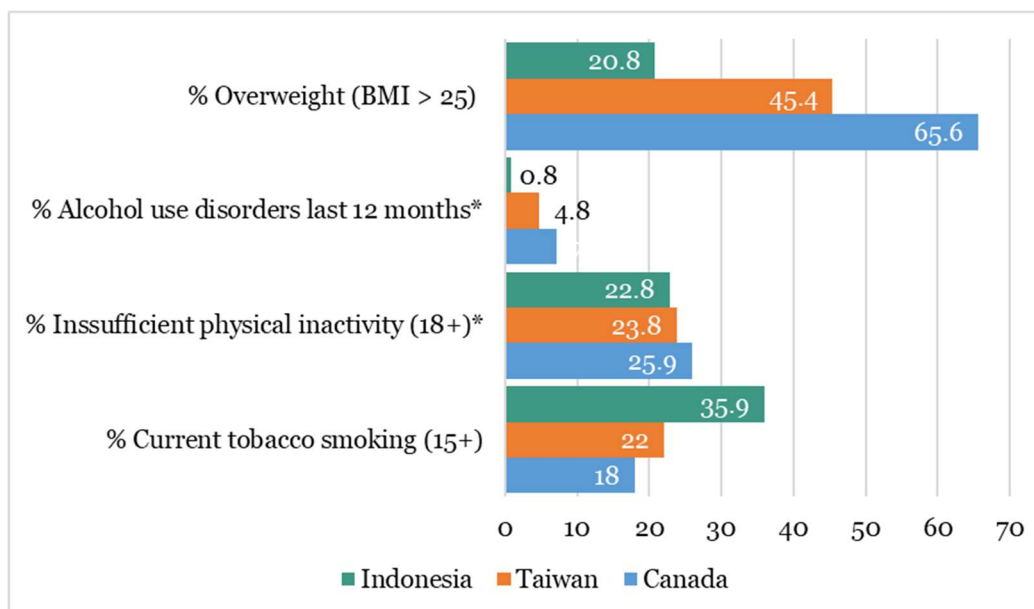


Figure 2.3 NCDs major risk factors prevalence in Indonesia, Taiwan, and Canada (2010)

Source: WHO (2014), Wu (2011), Taiwan's Health Promotion Administration (2017). \*Taiwan's data is combined with China

NCDs are characterized by a chronic, asymptomatic, and progressive disease (Purnamasari, 2018). Usually, people do not realize having NCD until the disease sign and symptoms occur. The increased morbidity of NCDs will be critical and have a serious impact on health expenditure and quality of life in Indonesia. According to the World Health Statistics, as cited by Johnson, Stoskopf, and Shi (2018), approximately 150 million people globally will be experiencing financial hardship due to the costs of chronic disease and disability caused by NCDs. Indonesia's national health system direction ought to focus on an effective screening, treatment, monitoring also financing the health burden of NCD.

## 2.2. Taiwan

Taiwan is located on the southeastern coast of Asia, with approximately 36,000 square kilometers of landmass and 23.6 million population by the end of 2019 (Department-of-Household-Registration, 2020). Taiwan has developed its economy rapidly due to its changes from agriculture to an industrial-based economy (Wu, Majeed, & Kuo, 2010). In 2018, Taiwan

reached a GDP of USD 589.91 billion (Trading-Economics, 2020) and GDP per capita of USD 27,157 in 2019 (Ministry-of-Economics-Affairs, 2020). The government's commitment to developing a better health care system is reflected in national health expenditure (NHE) that increasing steadily. Taiwan's current NHE represents an increase of 3.7% NHE over the previous year (Export.gov, 2015). In comparison with Indonesia and Canada, as portrayed in Table 2.2, Taiwan's health expenditure is in the middle, with 6.4% of its GDP in 2017.

Table 2.2 Demographic and health indicators comparison among Indonesia, Taiwan and Canada

	Indonesia	Taiwan	Canada
<b>Demographic and Economic</b>			
Population (2019)	270,625,568	23,604,265	37,797,496
Area (km square)	1,904,569	36,193	9,984,670
Population density per km square (2019)	149.4	671.4	3.78
Human Development Index	0.707	0.911	0.92
Population below poverty line (%)	10.9	1.5	9.4
GDP (Current US\$) in billion	1,042	589.91	1,713
GDP, per capita (USD) 2018	13,079	27,157	48,130
GNI per capita (USD)	12,670	28,113	47,590
Gini coefficient of income inequality*	0.368	0.336	0.321
Health spending to GDP (%)	3.1	6.4	10.7
Health spending per capita (USD)	301	2,595	4,974
<b>Health indicators and outcomes</b>			
Life expectancy at birth (Years)	71.4	80.2	82.2
Crude birth rate	18.2	8.4	10.5
Infant mortality rate, per 1,000 births	18.9	3.7	4.5
Crude death rate	6.484	7.33	7.7
Leading cause of death	Stroke	Cancer	Cancer
Elderly >65 (% of total pop)	5.86	14.05	17.23

Source: Ministry-of-Economics-Affairs (2020), Department-of-Household-Registration (2020), World-Bank (2019b), CIA (2020), Indexmundi (2019)

The trend of life expectancy from birth in Taiwan is steadily rising from the last five decades and is reaches 80.36 in 2019 (Macrotrends, 2020b). This life expectancy trend turns Taiwan to be an aging society with 14.05% over 65 years of the total population by 2018 -- Ministry of Intern as cited by Liao (2018). The Aging population and NCDs burden become a substantial combination that will influence Taiwan's direction in managing its national health systems.

As a result of the rising standards of living, lifestyle-related health problems have led Taiwanese to NCDs, which replaced infectious or communicable diseases over the decades. Some of NCDs such as cancer and heart disease are among the leading causes of death in Taiwan (Table 2.1). In response to these issues, Taiwan has provided several measures such as evidence-based preventive health services (examinations, screening, smoking cessation) and supports sites' health promotion (Ministry-of-Health-and-Welfare, 2014). According to Taiwan's Health Promotion Administration 2016 data, as cited by Kao (2019), Taiwanese is in the highest prevalence of overweight among other Asian countries. Nevertheless, the prevalence is still below Canada, with over a half (65.6%) of its population being overweight by 2010 (Figure 2.3).

### **2.3. Canada**

Canada is a decentralized federation in the northern part of North America, which consists of ten provinces and three territories (Fried & Gaydos, 2012). The country spreads across 9.9 million square kilometers, makes Canada the second-largest country in the world, after Russia (Becky, 2019). Based on the Statistics-Canada (2020) population of Canada was estimated at 37,797,496 by October 2019, equal to 1/7 of the Indonesian population. Approximately 25 million people or two-thirds of the population reside along the border with the U.S. (Johnson et al., 2018). Canada has 3.78 km<sup>2</sup> population density, a significant difference compared to both Taiwan and Indonesia who have 671.4 and 149.4 people per square

kilometers, respectively. Table 2.2 highlights the detailed demographic of Canada compared to Indonesia and Taiwan.

Based on World Bank income groups, Canada is classified as a high-income country. In 2018, the GDP reached USD 1,713 billion and ranked the tenth highest GDP in the world. Canada has a GDP per capita of USD 48,130, which is the twenty-sixth highest in the world (World-Bank, 2019c). Most of Canada's national income comes from oil and gas, energy, manufacturing, and tourism (Page, 2020). Among the Organization for Economic Co-operation and Development (OECD) countries, Canada has the 8th largest health spending compared to GDP, with a 10.7% total health expenditure in 2018 (OECD, 2020). Health spending reflects the entire consumption of healthcare services and goods in a country, including personal health care and collective services under Canada's health system. Figure 2.4 shows how Canada's health spending compares to Indonesia and Taiwan.

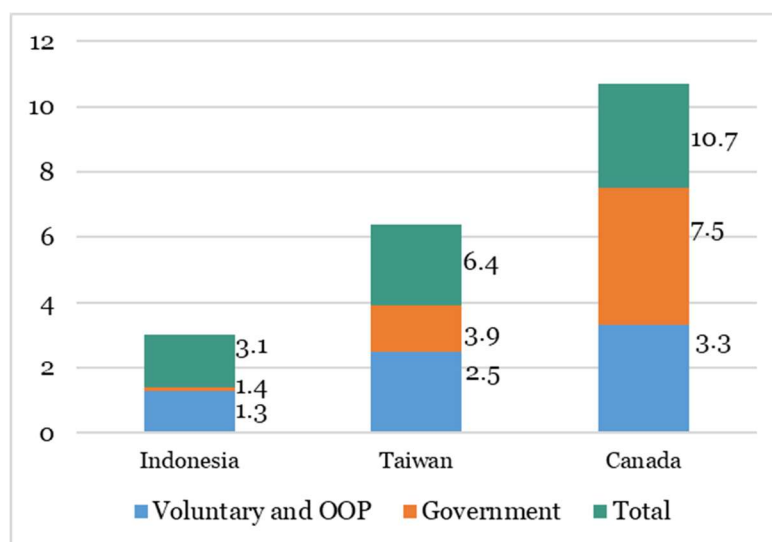


Figure 2.4 Health spending of GDP in Indonesia, Taiwan and Canada

Source: OECD (2020), Export.gov (2015)

In terms of the population health outcomes, Canada is significantly above Indonesia and slightly higher than Taiwan. According to CIA (2020), Canada's estimated life expectancy at birth in 2020 is 83.4 years (85.9 years for females and 81.1 for males). This overall life

expectancy has increased from 2011, which was, on average, 81.4 years (78.8 for males and 84.1 for females). On the other hand, in the same year, Indonesia's life expectancy was 71.4 years, and Taiwan was 80.2 years. However, among the OECD subgroup of 17 countries, Canada has almost the highest infant mortality rates with 4.5 infant deaths per 1,000 live births in 2017, only superseding the United States with 5.8 infant deaths (OECD, 2019a).

Similar to Indonesia and Taiwan, Canada's leading causes of death are chronic and non-communicable diseases. Out of the top ten leading causes of death in Canada, malignant neoplasm (cancer) was responsible for 38.8% of deaths, as shown in Table 2.1 (Statistics-Canada, 2019). This trend has been consistent between 2013 to 2018. Another growing health problem in Canada is obesity. A study conducted by Statistic Canada shows the overweight and obesity rate of Canadians 18 and older increased from 61.9% in 2015 to 63.1% in 2018. Even a 2014 NCD global status report from WHO (2014) mentioned that approximately 65.6% of Canadians are overweight by 2010 (Figure 2.3). According to Corbitt (2020), research shows that obesity puts people at a higher risk of developing colon, breast, uterus, pancreas, or kidney cancer. The elevated prevalence of obesity might be contributed to high rates of mortality due to cancer in Canada.

### III. NATIONAL HEALTH INSURANCE

The third United Nation's Sustainable Development Goal (SDG) goal aims to ensure healthy lives and promote wellbeing for all at all ages (WHO, 2020b). This universal goal forces countries to commit and put the maximum effort in developing and maintaining their national health insurance scheme to ensure equal accessibility and proper healthcare quality. Each country has its approach and methods in creating a system that can financially sustain and deliver better health outcomes for the population. This chapter will elaborate on overview of health system reform and government-run health insurance profiles of Indonesia, Taiwan, and Canada.

#### 3.1. Definition

There are various terms of use when referring and discussing government-run health insurance. National health insurance, public health insurance, social health insurance, single-payer system, and universal (health) coverage system are among the terms which often used interchangeably. However, there is no consensus on which terms used to describe national health care. Indonesia and Taiwan often used "national health insurance" in referring to their national health financing system. In contrast, Canada virtually does not have a federal (national) government-run health insurance since the provincial and territorial government mainly administer the system (Glied, Black, Lauerman, & Snowden, 2019). However, Canada is often chosen as the model when it comes to discussing a single-payer national health insurance system.

It is essential to distinguish national health insurance, universal health coverage, and a single-payer system since these terms are often used interchangeably but are different. According to Liu and Brook (2017), national health insurance is a health system program that allows the governments (usually federal or national government) to provide mandatory health insurance to all or parts of the population. Universal coverage or universal health coverage is the



condition or goal in which the entire population of a country covered under government-administering health insurance. A single-payer system is a standard financing method used in national health insurance, which only one entity (government) that collects funds and pays for the health care service on behalf of the entire population.

## **3.2. Universal Coverage Health Insurance in Indonesia, Taiwan and Canada**

### **3.2.1. History and Organization**

#### ***Indonesia***

Long before the enactment of a universal coverage system, health financing and insurance in Indonesia are fragmented. Back in the 1960s, out-of-pocket payment prone to be the most common payment method, followed by employer-funded insurance. In 1968, G.A Siwabessy, a former minister of health, establish the forming of *Badan Penyelenggara Dana Pemeliharaan Kesehatan* (BPDPK), an agency designed to administer health care and financing of the government employee along with their dependents (HealthcareBPJS, 2018). Considering the benefit of the program, in 1984, BPDPK was expanded to *Perum Husada Bhakti* (PHB), an independent entity out of the jurisdiction under the MOH. Additional coverage in PHB includes the retirement of civil servants, the retirement of military forces, veterans, and all of their families.

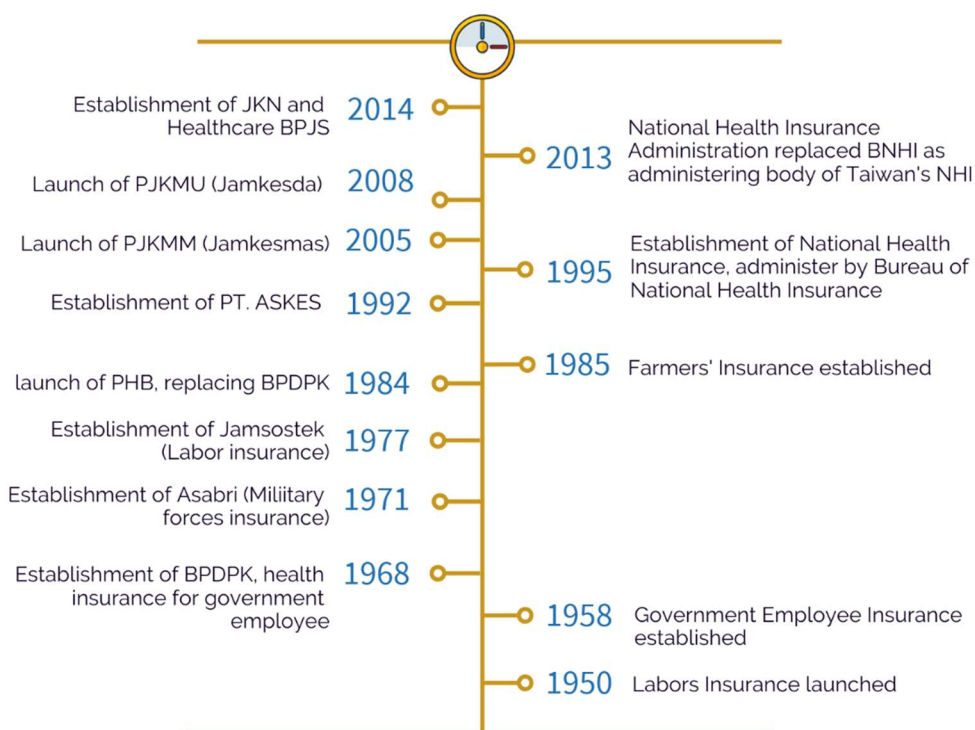
Significant changes take place in 1992 when *PT. Asuransi Kesehatan* (Askes) replaced PHB. Besides social insurance offered in PHB, Askes started to provide private insurance for government-owned enterprises and other private corporations. In 2005, Askes also furnished *Program Jaminan Kesehatan Masyarakat Miskin* (PJKMM), also known as Jamkesmas, a healthcare plan designated for the poor, which is fully funded by the government. When the program started, it has already covered 60 million of the impoverished population. The goal universal coverage was increasingly visible when Askes, in 2008, provide *Program Jaminan Kesehatan Masyarakat Umum* (PJKMU), also known as Jamkesda, another health care

financing program dedicated to the rest of uninsured (mostly the poor and almost poor) which is not covered by any social insurance.

PT. Askes covered almost 100 million of the population at the end of 2013, making it the strongest candidate for taking over Indonesia's NHI. Other competitors were (1) Jamsostek who administer private employee's pension scheme, occupational injuries and life insurance, and (2) Taspen who manages the same domain for government employee. Considering the experience and resources among these three agencies, the parliament and the government decided PT. Askes to be the administrator for Jaminan Kesehatan Nasional (JKN, national health insurance scheme). In 2014, through Law Number 24 Year 2004, the Government of Indonesia (GoI) announced that PT. Askes transformed to Badan Penyelenggara Jaminan Sosial Kesehatan (Healthcare BPJS, social security administering body for health) integrated the health plan of Askes, Asabri (military and police), Jamsostek (private employee), Jamkesmas, and Jamkesda to provide and responsible of the entire population. GoI designed the program to be a single-payer compulsory social health insurance to ensure the UHC and strengthen the financing power of the program.

### ***Taiwan***

Similar to Indonesia, Taiwan also had a fragmented health financing system before it began its NHI in 1995. There are at least three former social health insurance schemes (Chi, 2017). Firstly, Labors insurance, which launched in 1950 to cover private employees. Then, eight years later, Taiwan established public employee insurance in 1958, covering government employees. Both the Labors and government employee's insurance coverage was only 16% by 1980. In response to the low coverage, Taiwan established Farmers' insurance in 1985, dedicated to the farmers within the country who has shaped the national economy back then (Chiang, 1997). However, those three health plans are still far from the more extensive and massive coverage of the Taiwan population.



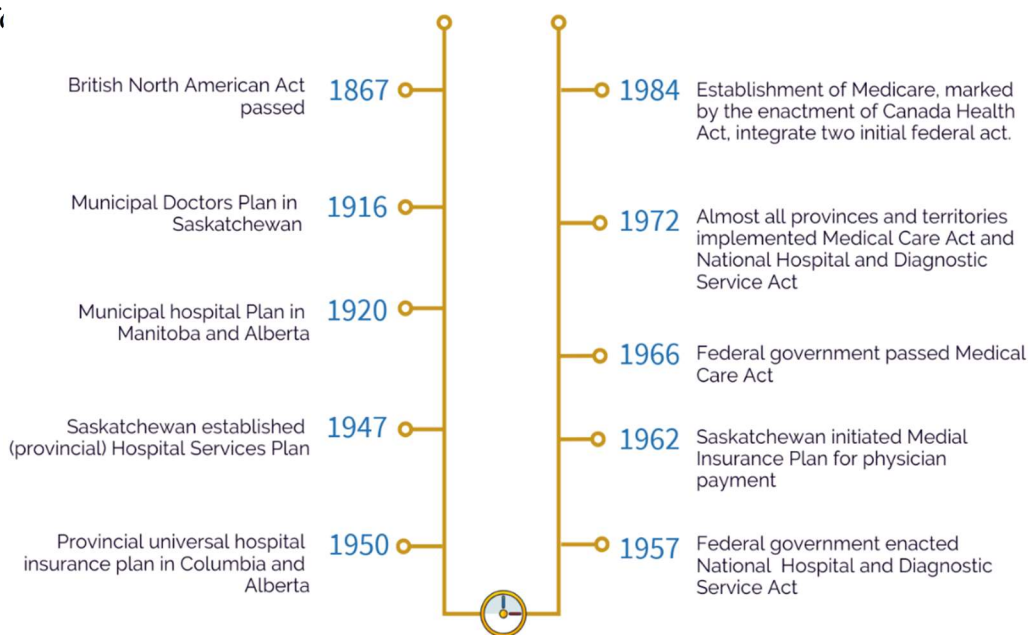
**Figure 3.1 Historical milestones of National Health Insurance in Indonesia and Taiwan**

*Source: HealthcareBPJS (2018), Chi (2017)*

In order to have a comprehensive social insurance system with better coverage and single management, Taiwan merged the three insurance programs into a single-payer system called NHI. The merger marked the establishment of the Bureau of National Health Insurance (BNHI) on March 1, 1995, under the Executive Yuan administration. Taiwan's NHI was designated to provide equal access to a better quality of health care, to control health care costs, and promote efficient use of health care resources (Chiang, 1997). Thus, the program is designated to be mandatory for all citizens in Taiwan, ensuring optimum access and strengthening the financing foundation. Based on NHIA (2016), following a government reorganization plan in 2013, BNHI was repositioned and renamed as the National Health Insurance Administration (NHIA).

## Canada

Canada's health system is strongly influenced by its political and governmental structure. As a decentralized federation, the responsibilities in taking care of the health system are largely in the hand of the provincial and territorial governments. Thus, a variety of specific coverage will occur in different provinces or territories. Historically, the Canadian health system began in 1867 when the British North American Act passed to organize the responsibility of federal and provincial governments in managing marine hospitals, hospitals, asylum, and charitable institutions (Government-of-Canada, 2019). In order to ensure health care service in its rural areas, in 1916, Saskatchewan established the Municipal Doctors Plans which allowed local authorities to paid physicians, replaced patient's direct payment for the services obtained (Johnson et al., 2018). Subsequently, Manitoba and Alberta implemented a similar municipal plan for the hospital in the 1920s. In 1947, Saskatchewan marked the first near-universal coverage in Canada by providing Hospital Services Plan (Martin et al., 2018). Followed by British Columbia and Alberta, who also initiated a provincial universal hospital insurance plan in 1949, and 1950, respectively. Figure 3.2 highlights the major milestones of Canadian health care ref



**Figure 3.2 Historical milestones of universal health coverage in Canada**

Source: Johnson et al. (2018), Government-of-Canada (2019)

As a response to the emerging provincial hospital insurance, the federal government enacted the National Hospital and Diagnostic Service Act in 1957, providing fifty-fifty funding between federal and provincial to each regional hospital expenditure. Eight years later, almost all of the provinces establish their hospital insurance plan. In 1962, again, Saskatchewan initiated Medical Insurance Plan for physicians' services, followed by a strike from doctors in the province for almost a month passed (Government-of-Canada, 2019). The federal government passed the Medical Care Act in 1966 to provide federal funding as the National Hospital and Diagnostic Service Act mechanism for universal physician payment. This new arrangement of medical insurance, along with federal cost-sharing, was implemented in most of the provinces from 1965 until 1972, such as British Columbia, Newfoundland, Nova Scotia, Manitoba, Alberta, Ontario, Quebec, Prince Edward Island, New Brunswick, Northwest Territories, and Yukon.

A fundamental phase in Canada's health system occurred in 1984, as the Canada Health Act, further known as Medicare, passed to harmonize provinces' and territories' universal health care under National Hospital and Diagnostic Service Act and Medical Care Act. This law sets fundamental criteria on portability, accessibility, universality, comprehensiveness, public administration for all provinces and territories. Specific health care management and delivery could vary in each province/territory, depending on their preference. However, to be eligible to receive federal contribution through Canada Health Transfer, provinces and territories should meet those five criteria and conditions (Martin et al., 2018). Canada Health Transfer (CHT) is the payment program from the federal government to support the health financing of the provinces and territories. CHT reflects federal government contribution in encouraging the national health system of Canada. This financing method, which involved federal and province contribution for the population, is similar with the financing method for Medicaid in the U.S. When the federal government through CMS allocate funding to support each state Medicaid program.

### 3.2.2. Coverage and Benefit

One of the common characteristics in NHI under a single-payer system is the health coverage dedicated to the entire population with a uniform benefit package of health care services. The scope and breadth of the benefit also take a role in the strategies of financial sustainability. This section will highlight the accomplishment of universal coverage to the population and various health care benefits among each public health insurance scheme.

In terms of the number of population covered, Indonesia's JKN is the largest single-payer system in the world, with 223 million members in February 2020 (HealthcareBPJS, 2020). Since the implementation in 2014, this program gained massive attention from the population, which reflects in the average membership growth of 6% each year. By 2018, there are 9 of 37 provinces and 209 cities in Indonesia that have reached universal coverage (Healthcare-BPJS, 2019). However, the initial goal for reaching 95% coverage of the entire population in 2019, as reflected in Law Number 40 Year 2004, was slightly delayed since the total coverage was only 82% of the Indonesian population by the end of 2019 (Figure 3.3).

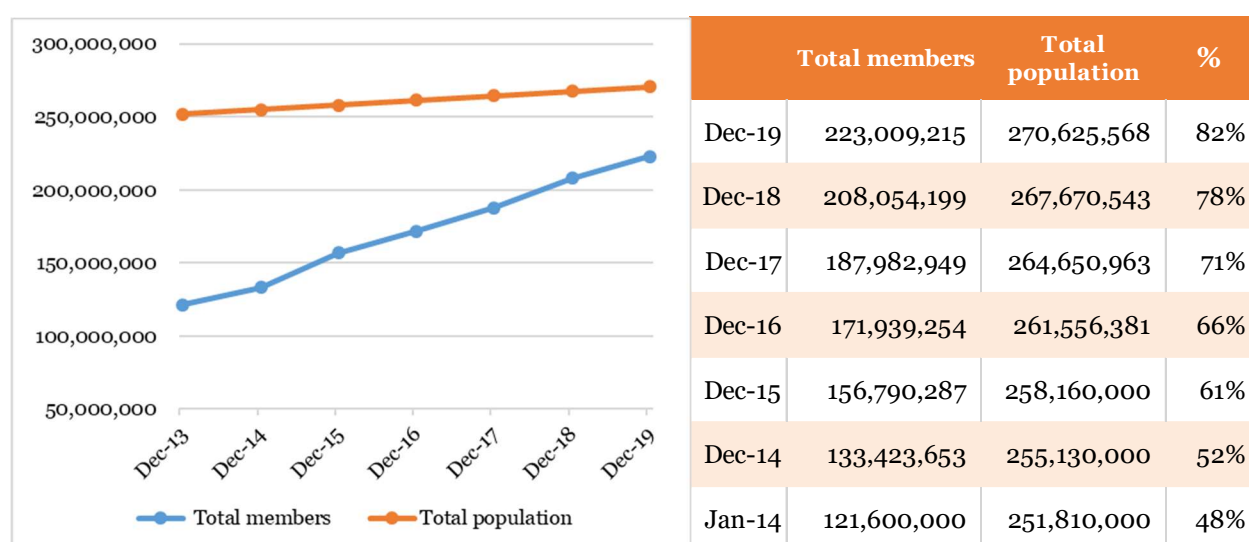


Figure 3.3 Indonesia's JKN membership towards universal coverage

Source: HealthcareBPJS (2016), HealthcareBPJS (2019b), WPR (2020)

Based on Law number 24 year 2011, the membership of this program is compulsory for all of the Indonesian citizens, including immigrants who already live at least six months in Indonesia. Mandatory participation aimed to ensure equal access for all and support the financing scheme. There are two main membership categories of JKN: non-contributory members registered as *Penerima Bantuan Iuran* (PBI) and contributory members (non-PBI). PBI consists of those who are identified as poor and near-poor classified by the Ministry of Social Affairs (MSA). Non-PBI members consist of *Pekerja Penerima Upah* (PPU), *Pekerja Bukan Penerima Upah* (PBPU, non-formal workers, or self-employed), and *Bukan Pekerja* (BP, non-workers). PPU consists of formal workers, which include government employees, private employees, military, and police. PBPU or non-formal workers include anyone with self-employed occupation (OECD, 2019b). These classifications are carried out based on the premium and contribution collection methods.

JKN offers a comprehensive benefits package for the population with minimal user fees or co-payments (Mahendradhata et al., 2017). The broad medical benefit consists of primary care and secondary or tertiary care. The primary care service level includes promotive and preventive service, general physician consultation, basic medical treatment, drugs and prescription, basic diagnostic laboratory, and inpatient care. These services are provided in *Puskesmas* (community health center), private clinic, general practitioner office, and dentist offices. Secondary or tertiary care services are furnished by the hospital level from type C hospital (lowest specialty) until type A hospital (highest specialty). Secondary and tertiary care includes all of the services offered at primary care level with the specific specialty (e.g., internist, cardiologist, neurologist), medical, rehabilitative treatment, blood supply, intensive and non-intensive inpatient care (Healthcare-BPJS, 2019).

Taiwan's NHI program is a compulsory social health insurance scheme. Identical to Indonesian, all of the Taiwan citizen regardless of age, gender or employment status must enroll

in this lifetime health insurance (NHIA, 2019a). Compared to Indonesia, which started the program with the coverage of 48% of population coverage in 2014, Taiwan's effort to achieve universal coverage is somehow more effortless. NHIA started the program in 1995, with the coverage of 90.3% of the population. By the end of 2018, according to NHI Annual Statistical Report (2019b), there were 23,948 thousand beneficiaries of the program. Interestingly, this number of NHI participant accounted for 101.5% of the population, exceeding the total population of 23,589 thousand in the same period, based on the Ministry of Interior data (National-Statistic, 2019).

Canada has reached its universal health coverage since each of the provinces and territories ensures the health benefit for its population by implementing the Canada Health Act as the culminated provision of the initial regulations. Medicare in Canada almost cover 97% of the population with the 3% remaining covered solely by the federal government such as the service for First Nation and Inuit descent, veterans, members of the armed forces and Royal Canadian Mounted Police (Johnson et al., 2018). Unlike Indonesia and Taiwan, which require people to enroll individually for the program, Canadians do not have to register to able to receive the benefits. The right to receive healthcare benefit is based on the residency in each of the provinces.

Medicare program in Canada provides first-dollar coverage, and the medical benefit level is limitless throughout an individual lifetime (Santerre & Neun, 2012). First-dollar coverage emphasis that there are no deductibles or copayment imposed on Canadian for any services they obtained. This mechanism is similar to NHI provision in Indonesia, in which deductibles and coinsurance or copayment does not exist for the publicly insured physician, diagnostic, and hospital services. However, Canada has less coverage than Indonesia in terms of certain services covered by the NHI. For instance, outpatient pharmaceutical cost and dental care are not covered by NHI in Canada, while Indonesia's JKN includes those services in its coverage. Thus,



private insurance in Canada is complementary to NHI coverage, securing for services that is not covered under NHI provision. According to the Commonwealth Fund issue brief by Glied et al. (2019), there is about 67% of the population who also purchased a private health insurance. Furthermore, 30% of Canada total national health expenditure is paid by private health insurance.

**Table 3.1 Coverage and benefit comparison of NHI in Indonesia, Taiwan, and Canada**

	<b>Indonesia</b>	<b>Taiwan</b>	<b>Canada</b>
Coverage to population	82%	101.5%	100%
Coverage exclusion	Indonesian who going abroad more than 6 months	Taiwanese who going abroad more than 6 months	Temporary visitors, undocumented and illegal immigrants
<b>Benefit covered</b>			
Inpatient service	Yes	Yes	Yes
Outpatient service	Yes	Yes	Yes
Glasses	Yes	No	No
Denture	Yes	No	No
Dental care	Yes	Yes	No
Prescription drugs	Yes	Yes	No
Rehabilitation services	Yes	Yes	No
Executive hospital room	No	No	No
Home care	No	Yes	No
Immunization	Yes (Basic)	No	No
Primary care provider	Community health center, private clinics and family physician	Private solo and group clinic	Private physicians office, community health center
Secondary care provider	Public and private hospital	District hospital, regional hospital, medical centers	Public and private, mostly not-for-profit (regional authorities)
Need medical referral	Yes (except in emergency)	Yes (There is option without referral)	Yes
Co-payment	No. (In progress of legislation)	Yes	No

*Source: Yip, Lee, Tsai, and Chen (2019), Commonwealth-Fund (2019)*

### 3.2.3. Healthcare delivery and resources

Sufficient health coverage could be interpreted when the adequate supply of health service meet the demand of the population. One of the elements of health services supply is health resources. As highlighted by Johnson et al. (2018), health resources such as the health workforce, medical facilities, and medical technology are among the critical success factors of a health system. Several healthcare resource measures could be the indicator to define and estimate the service quality and health outcomes.

As shown in Table 3.2, Indonesia's performance in several health resources indicator is still below the WHO standard. For instance, the physician-population ratio in Indonesia is 40 over 100,000 or 0.4 of 1,000, which below the WHO standard of 1:1000. WHO also recommends at least there are five hospital beds per 1,000 population; however, Indonesia still has a 1.2 ratio to 1,000 population. Table 3.2 compares the health resources of Indonesia, Taiwan, and Canada. In terms of the hospital provided for the JKN program, by December 2018, Healthcare BPJS has cooperated with 23,298 primary care providers (public, private, military, and type D hospital), 2,455 secondary level providers (public and private hospital), 2,903 pharmacies and 1,061 optical providers (Healthcare-BPJS, 2019).

Table 3.2 Healthcare resources indicators in Indonesia, Taiwan, and Canada - 2018

	Indonesia	Taiwan	Canada
Hospital beds per 1,000 population	1.2	3.2	2.7
Hospital average length of stay	4.3	9.4	7.4
Physician per 100,000 population	40	180	260
Nurses per 100,000 population	100	730	1,162
% of nationally contracted hospital	81	99	N/A

Source: Commonwealth-Fund (2019), OECD (2011), World-Bank (2019d)

Taiwan also made a great accomplishment in terms of the amount of contracted medical care providers, with a total of 28,752 hospitals and clinics by the end of 2018 (NHIA, 2019b). This number marked 92.8% of the total hospital and clinics in Taiwan have been affiliated with NHIA by the end of 2018. However, the insured beds intended for NHIA beneficiaries in those contracted medical providers are only 82.4%, which means not every bed in those providers is dedicated to NHI participants. The private sector dominates the delivery of healthcare in Taiwan. Referring NHIA report in 2014 as cited by (Yip et al., 2019), almost 70% of the total outpatient visits in Taiwan were delivered by private clinics, and about 48% of hospital inpatient was at not-for-profit, 31% at public hospitals and 19% at for-profit hospitals.

Healthcare delivery in Canada involves both the public and private sectors. The hospital services are managed by the local and provincial governments with a small portion yet significant of the religiously affiliated institution (Johnson et al., 2018). Private physicians still dominate the primary care services in entire nations, followed by a few number of community health centers. A ratio of roughly 260 physicians per 100,000 people in Canada (Table 3.2) is still below the OECD average of 330 physicians per 100,000 people. Canada also possesses an advanced infrastructure of medical imaging and diagnostic equipment. Johnson et al. (2018) mentioned that Canada has 14.7 CT scanners per million population and 8.9 MRI scanners per million of the population. However, this ratio is still below the OECD average, which accounts for 24.4 and 14.1 per million for CT and MRI scanners, respectively.

### **3.3. Current Issues and challenges**

Goodman, Musgrave, and Herrick (2004) said that most countries with national health insurance are facing rising health cost as one of the most prominent problems in financing the system. Yip et al. (2019) mentioned that the increase in health care expenditure is a result of multiple causes: population aging, technology advances, growing demand, and rising expectation from the population. Also, inefficiency and waste, such as fraud or abuse in

healthcare settings, worsen this issue. Since the development of JKN in 2014, Indonesia has been struggling to maintain its financial sustainability. As the administrator for this program, Healthcare BPJS, has been suffering from a fiscal deficit as a result of adverse selection trends, especially in the first year of JKN establishment. This shortfall emerges as a result of an imbalance between revenue collected (contribution and premium) and the service purchasing or payment to the provider. The imbalance continues to rise until recent years. Figure 3.4 depicts JKN health expenses compared with Taiwan's NHI, in which both of them was exceeded its revenues. JKN financial imbalance caused a delay in provider payment and negatively impacted hospital financial management. Therefore, the quality of care and patient satisfaction is being threatened to decrease and addressing this financial mismatch becomes the main concern of Indonesia's NHI.

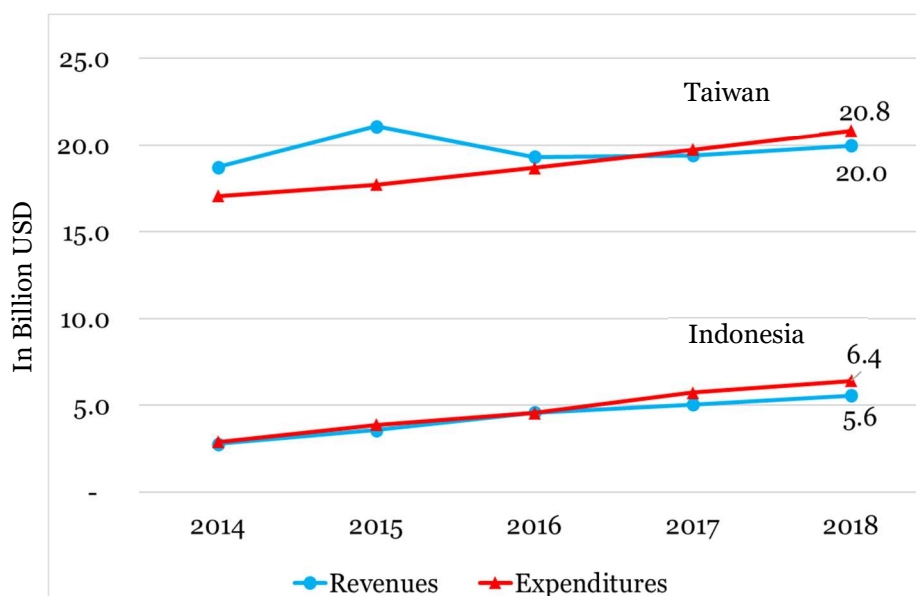


Figure 3.4. Indonesia and Taiwan NHI Revenues and Expenditures

Source: HealthcareBPJS (2019b), NHIA (2019b)

Given the fact that Taiwan's NHI does not require its participants to register with a primary care physician, has made the health care coordination between the primary and secondary level of care difficult (Commonwealth-Fund, 2019). This condition gives patients a

wide access to choose any clinics and general physicians when they have medical problems. In addition, NHIA allows its beneficiaries to directly reach the hospital without any medical referral from the primary care, regardless of the patient's problem severity level. These open mechanisms can cause fiscal problems for Taiwan. Since the gate-keeper concept does not exist and allows basic severity level cases being treated in hospital as the moderate and high severity level care service.

Wait times are still in the center of attention when discussing the Canadian health system. The limited resources, such as limited technological tools and service capabilities, have made the systems deal with a longer waiting time compared to other developed countries. These wait times comprise of a specialist consultation, elective surgery and treatment, and diagnostic. A study by the Fraser Institute (Barua, Jacques, & Collyer, 2018) mentioned the average time of certain wait times in Canada health care systems (Table 3.3). However, the waiting times are diverged among all of the provinces and territories.

**Table 3.3** Waiting times in Canada health care system

Waiting time segments	Average waiting time
From referral by a GP to consultation with a specialist	19.8 weeks
From the consultation with a specialist to the point at which the patient receives treatment (e.g. elective surgery)	11.0 weeks
From a medical instruction to CT scan examination	4.3 weeks
From a medical instruction to MRI examination	10.6 weeks
From a medical instruction to ultra sound examination	3.9 weeks

*Source: Barua et al. (2018)*

As the central issue, waiting times in Canada remains one of the main concern of its population for the future. Moreover, some Canadian citizens cross the international border to the U.S. to obtain immediate care service with an estimate of 1 billion USD annual spending (Johnson et al., 2018). However, each provincial and territorial government attempt to reduce the effect of decreased Canadian satisfaction by providing transparent and accessible

information regarding the specified wait. Thus, people will be aware of wait times and can ensure that others do not cut the line for the same services. Once the Canadian government successfully reduces wait times, significant changes in the prominent Canadian health insurance will be achieved.

Outpatient drug provision is varied among provinces and territories. Even though most of the provinces and territories do not include pharmaceutical (outpatient) benefits in the system, some provinces cover drugs and others do not. According to Johnson et al. (2018), outpatient drug represents 15.7% of the total national health expenditures, the second largest after hospital expenses. Only 42% of the drug costs are paid by the public sector, while 58% are paid by private insurance and out of pocket funds. Outpatient pharmaceuticals will remain as another crucial issue in Canada if the federal or regional government could not address the issue. The population demand for supplementary or complementary private health insurance is increasing to cover some of the services and benefit that not offered in the public plan, including pharmaceutical benefit.

The Healthcare workforce also serves as a potential challenge in Canada. There are at least four health care workforce aspects that will impact the overall health system performance. First, waiting times made some of the residents and specialist lost their opportunities in learning new cases for their expertise and education. Second, Canadian physicians as a population are aging, and the proportion of female (vs. male) physicians has been rising steadily. According to Canadian Institute of Health Information (2016), both older and female physicians work fewer work hours compared to younger male doctors. Third, even though 51% of all physicians in Canada is a general practitioner who serves as a family doctors and in a primary care setting, yet the patient still face a difficulty to make an appointment (Johnson et al., 2018). To address this, in 2008, Canada allowed nurse practitioner greater responsibilities in the healthcare setting in order to broaden accessibility.

#### **IV. HEALTH FINANCING STRATEGIES UNDER A SINGLE-PAYER SYSTEMS**

According to WHO (2020a), health financing is a fundamental element of health systems that can empower progress towards universal health coverage. Proper financial management is required in collecting adequate funds for health delivery and protect the population from financial catastrophe as well. Also, proper health financing would provide incentives for providers efficiently and sustaining the health system to work effectively for all stakeholders. However, dealing with the large system of public health financing is a sophisticated arrangement and requires commitment from stakeholders to support the program. This chapter will discuss the financial management of the health system, particularly strategies in maintaining financial sustainability under a single-payer system. As mentioned in the introduction, even though Indonesia, Taiwan, and Canada have the same financing method of single-payer, each of them has different and specific strategies that might impact the progress and outcomes of the overall health system.

##### **4.1. Economic concept and principle of single-payer systems**

A study concerning health expenditure growth under single-payer systems conducted by Cheng, Jin, Yang, and Blank (2018) determined that single-payer systems are considered more effective in containing cost and more efficient for administrative aspects than multi-payer systems. This statement is true in both ways: first, the single-payer system requires less marginal cost since there is only one entity in managing the collection fund and reimbursement of providers. Second, single-payer possess the power of purchasing and bargaining to obtain better healthcare quality and maintain efficient cost at the same time. In contrast, the multi-payer system is rendered by market-driven insurance of private entities that finance most of the health expenditures and have less purchasing power when dealing with the supply side (i.e., medical service from the provider).

A single-payer system is the extreme example of a monopsony when only one buyer of health service exists, or most dominate in the market (Santerre & Neun, 2012). In a monopsony system, the economic theory suggests that both the price and quantity of the product are lower than the perfectly competitive systems which have multiple buyer or seller. The monopsony purchaser will select the lowest prices at the point of provider supply level that still attractive for the insured population (Yip et al., 2019). Figure 4.1 illustrates the economic concept of monopsony, which answers how the single-payer system can lower health care prices. In a competitive market scheme where each buyer and seller acts as a price taker, the price (PC) will be determined as the demand curve from the market meets the supply curve from a healthcare provider (point C), also known as equilibrium. While in a monopsony, which there is only one buyer and many sellers, the price (PM) is determined as the result of the supply curve (point B) meet the crosses between the demand curve and marginal factor cost curve (point A). Thus, in a single-payer system, not only would the price decrease, but the quantity of services would also decrease. This reflects a common characteristic of single-payer national health insurance: lower prices for a comprehensive benefit, yet quantity is limited. Since medical care is in low quantity, people must wait for certain medical services such as elective surgery and Magnetic Resonance Imaging (MRI) diagnostic services.

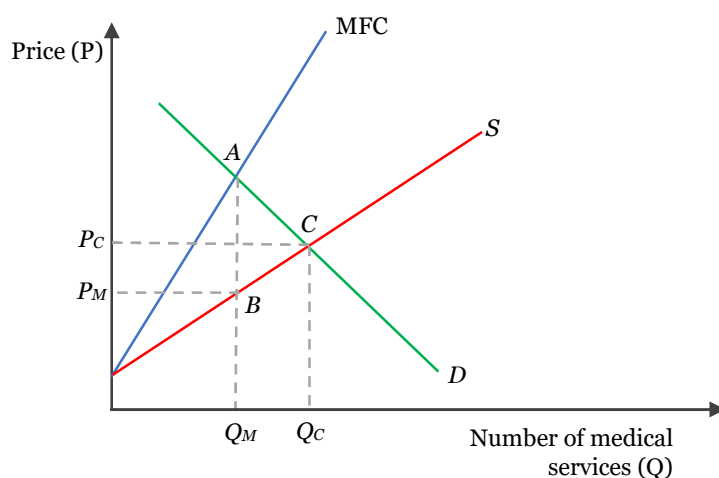


Figure 4.1 Monopsony Model of the Market for Hospital Services

Source: (Santerre & Neun, 2012)



## 4.2. Health Financing in Indonesia, Taiwan and Canada

According to Schieber, Baeza, Kress, and Maier (2006), health financing encompasses three foundational elements: revenue collection, risk pooling, and purchasing. Each of these components requires a complex and thorough management from stakeholders and usually take a long time to achieve the primary goal of universal coverage. This section will describe the health financing elements in Indonesia, Taiwan, and Canada, along with their strategies in maintaining and sustaining the overall national health insurance.

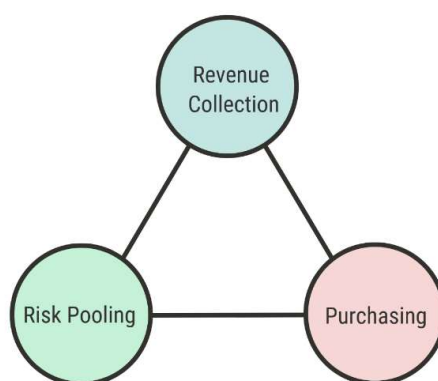


Figure 4.2 Foundational elements of health financing  
Source: Schieber et al. (2006)

### 4.2.1. Revenue Collection

Revenue collection is the financial process which describes how health system raises money from households, companies or organization, and other resources (WHO, 2000). An adequate revenue collection will be a strong foundation for the entire process of financing the health system. In a public insurance system, national or local governments are the main payer of health care through a variety of revenue collection mechanism. Indonesia and Taiwan use a combination of individuals, employers/organizations, and government contribution in collecting revenue for the national health insurance. Table 4.1 summarizes the revenue collection mechanism in Indonesia and Taiwan for each of the membership categories.

Table 4.1 Premium contribution structure in Indonesia and Taiwan

<b>Insured classification</b>	<b>Eligibility Criteria</b>	<b>Contribution</b>	
<i>Indonesia</i>			
PPU : Employee or formal workers	Civil servants, private employee, military and police	5% deduction of take home pay monthly salary. Cover up to four dependents without additional fee.	4% paid by employer, 1% by employee (80:20 contribution ratio)
PBPU : self-employed or non-formal workers	Non-poor and self-employed, entrepreneur	Premium per month per member. Class 1: IDR 80,000 Class 2: IDR 51,000 Class 3: IDR 25,500	100% paid by insured
PBI: subsidized members	Poor and near-poor based on MSA register	IDR 23,000 per month per member (Class 3 inpatient benefit)	Entirely subsidized by national and local government
<i>Taiwan</i>			
Category 1	Civil servants, volunteer servicemen, public office holders, private school teacher, public/private enterprises employee and self-employed independent	Employee: salary Basis x insurance premium rate x contribution ratio x (1 + number of dependents)  Employer: salary Basis x insurance premium rate x contribution ratio x (1 + average number of dependents)	Contribution ratio for employee: 30%. Except for self-employed will be 100%  70% contribution ratio of all employer. Except only 35% of private teacher employer, and 60% of public or private enterprises.  Government contribution exist only for private teacher (35%) and public/private workers (10%)
Category 2	Occupation union members, Foreign crew members	Employee: same with category 1	Insured contribution: 60% Government contribution of 40%
Category 3	Members of farmers', fishermen's and irrigation associations	Government: salary Basis x insurance premium rate x contribution ratio x (1 + actual number of people insured)	Insured contribution: 30% Government contribution of 70%
Category 4	Military services, the widows, inmates	Average monthly premium of category 1, 2, and 3	Entirely subsidized by Government
Category 5	Low-income households	Average monthly premium of category 1, 2, and 3	Entirely subsidized by Government
	Veterans and dependents		Government paid 100% for veterans and 30% for dependents
Category 6	Other individuals	Average predetermined monthly premium	Insured paid 60% and Government paid 40%

Source: HealthcareBPJS (2019a) and (NHIA, 2019a)

One of the main differences between Indonesia and Taiwan is the way the government contribute to the revenue collection. Taiwan government contributes to all NHI membership categories, except the self-employed worker who paid 100% for their premium. The government contribution ranges from 10% in private workers (category I), 70% for members of farmers' and fishermen's and irrigation associations (category 3), and 100% for low income, veterans, and military forces. In comparison to Taiwan, although Indonesian civil servants, police, and military forces salaries paid by public funding, there is no direct contribution from the national fund. Indonesia fully cover only for the poor based on the MSA list. In addition, the underprivileged population in some other area of Indonesia who does not include in the MSA list is covered 100% by the regional (province or municipal) authorities based on a similar list as the national list.

Unlike Indonesia and Taiwan, Canada raises the health system funding through provincial and federal general taxes. Canadian individual income taxes range from 15% to 33%, which partially fund the healthcare system (Mohr, 2020). As a decentralized federation, provincial and territorial provinces hold a primary role and responsibility for organizing and delivering health services, also maintaining the funding. Therefore, regional tax finances most of the health expenditures in each province and territory. In addition to regional tax-based revenue, the federal government also supports each province and territory with an annual federal cash contribution on an equal per capita basis through Canada Health Transfer (CHT). During the 2016-2017 fiscal year, an estimated 24 percent (USD28.8 billion) of provincial and territorial expenditures is coming from CHT (Allin & Rudoler, 2018). However, 30% of the total health care spending in Canada is funded through the private sector from out-of-pocket payment and private insurance.

#### **4.2.2. Risk pooling**

Pooling or risk pooling refers to the accumulation and management of revenues collected from the insured or NHI participant (members of the pool) to share the risks and protecting participants from unpredictable health expenses (Schieber et al., 2006). The main purpose of pooling risk is to share financial risk with all members of the pool for individual health treatment or interventions in which the need is uncertain. In a national single-payer system, the health risk pool is the entire nation. The larger the pool, the lower the risk of financial burden resulted from the probability of sickness. Risk pooling also refers to NHI efforts to maximizing coverage while lowering the total healthcare spending.

During the beginning of JKN, Indonesia face an adverse selection phenomenon made Healthcare BPJS suffering from approximately USD 138 million loss in its first year of establishment (HealthcareBPJS, 2015). The significant growth of JKN participants mainly consists of those who have a high risk and existing health problems such as diabetes, ischemic heart disease, and chronic renal failure. Meanwhile, healthier people have not yet participated in the program, resulting in less contribution and high medical expenses. The loss obtained in the beginning of JKN still continues each year until recently. However, GoI through the Ministry of Finance, continuously support the JKN program by adding a reserve funding each year to cover the loss, yet the amount and timing does not always match with the deficit suffered by the program. Healthcare BPJS is attempting several strategies to maximize the risk pooling by increasing the coverage of the population. However, a lack of valid demographic data and the geographic diversity in Indonesia could potentially become a barrier towards the universal coverage. Both the general census of the total population and JKN population coverage has difficulty reaching people in remote areas and islands.

Similar to Indonesia, Taiwan also faces less revenues compared to its expenditures. A mandated provision of national healthcare insurance in Indonesia and Taiwan is designed to

ensure equal access for the population, but, importantly, to obtain a maximum risk pooling. Reaching 100% coverage of the population, put Taiwan in a checkpoint of risk pooling. The next step is to maximize the effectiveness of the pooling by ensuring the collection ratio of the beneficiaries.

Risk pooling as Indonesia and Taiwan approaches does not apply in Canada. Since Canada obtain the revenue through general taxes, there is no particular risk pooling efforts in each province and territories except the tax collection. Tax payment is already a regular population economic activity. Tax based NHI, such as in Canada and some of the European nations, made the risk pooling mechanism is more straightforward compared to a premium bases NHI such as in Indonesia and Taiwan. Thus, Canada can concentrate more on the delivery and quality of health care.

#### **4.2.3. Purchasing**

As stated by WHO (2000), purchasing is the mechanism in which pooled funds are paid to providers for health care services used by the insured. Service purchasing or provider payments should be rendered to fulfill both cost-containment by lowering total expenses, and maintaining provider satisfaction by keeping prices attractive enough to satisfy contracted providers. In a single-payer system scheme as in Indonesia, Taiwan, and Canada, each government has its monopsony power to lower the cost by using an appropriate payment mechanism. However, the government also ought to maintain the best prices for all, including acceptance from the provider and the medical workforce. Canada recorded a large-scale campaign of the medical organization against its Medicare back in 1961 (Martin et al., 2018). This campaign was launched to communicate the medical workforce's worries regarding their losses and payment mechanisms in the universal publicly funded medical insurance. Indonesia was also facing a similar rejection in its beginning of the NHI.

Provider payment methods also play a significant role in determining health system financing performance. There are various purchasing methods used in order to furnish proper payment in every national health system. In general, Indonesia, Taiwan, and Canada use both prospective and retrospective payment systems. Prospective payments which refer to payment conducted before the service is being delivered, are usually implemented in primary care by delivering capitation fees. The global budget also could be considered as a prospective payment (discussed below in section 4.4). On the other hand, retrospective payments pay the reimbursement to the provider after the medical service delivered. The unit of payment in retrospective commonly includes fee-for-service, case-based payment, and per diem.

Based on the President Decree Number 19 Year 2016, JKN program uses two main payment methods to providers. First, capitation fees which are used as payments in primary health care settings include private and public basic health care clinics, general physician office, and type D hospital. Capitation cost per member per month ranges from IDR 3,000 to IDR 6,000 (for public-owned primary health centers) and from IDR 8,000 to 10,000 IDR for private family physicians clinics, depending on the service comprehensiveness (e.g., dental and basic laboratory test). In 2015, capitation fees accounted for 19% of the total health expenses that Healthcare BPJS paid for provider reimbursement (HealthcareBPJS, 2016). Following the fact that underutilization and a high rates of referral to secondary care, Indonesia implemented performance-based capitation (PCB) in 2016 as an effort to achieve better effectiveness of the gate-keeper concept of primary care, and an efficient way of cost containment in primary health care services (HealthcareBPJS, 2016). There are three PCB indicator which determined the capitation value such as contact rate, non-specialistic referral ratio, and chronic diseases program ratio (hypertension and diabetes).

The second payment system is case-based group payment, which used in secondary and tertiary providers. JKN uses a bundled payment called Indonesian Case Base Group (INA-CBG) tariff rates, which calculated from the diagnosis and treatment in a patient regardless of his or

her length of stay (Mahendradhata et al., 2017). Risk-sharing between insurers and providers is required in this kind of payment. Since the tariff is created by determining the average length of stay (LOS) of a case (disease or diagnosis), the provider could save a margin if they deliver effective care to the patient. On the other hand, if the hospital failed to deliver effective care that reflects in a longer LOS, then the hospital will have a negative margin from the payment of particular cases. According to Healthcare-BPJS (2019), by the end of 2018, hospital expenditure is the largest proportion of the NHI total health spending, account for 84.2 %.

**Table 4.2 Provider reimbursement (purchasing methods) in Indonesia, Taiwan, and Canada**

	Indonesia	Taiwan	Canada
Hospital payment	Case-mix bundled payment (INA-CBGs)	Global budget	Global budget
Primary care payment	Capitation and per diem	Fee-for-service. Piloting of capitated.	Fee-for-service. Capitation initiated in some provinces.
Physician payment	Included in hospital bundled payment or capitation in primary care setting	Fee for service. Predominantly salaried by hospital.	Fee-for-service based on the fee schedule. Mostly directly bill provincial government.
Hospital Tariff	Ina-DRGs	Tw-DRGs and Fee schedule	Fee schedule
Co-payment	No	Yes	No

*Source: Commonwealth-Fund (2019), (HealthcareBPJS, 2019a)*

Taiwan still uses fee-for-service payment methods for most of the provider reimbursement. Even though Taiwan already implemented a global budgeting cap in allocating health care expenditures, the uses of other payment methods that incentivize providers to increase efficiency and quality remains limited. Taiwan started to implement a diagnosis-related group system (Tw-DRG) since January 2010. This bundled payment with doctor fee schedule used in the hospital setting aimed to increase quality care and cost containment. The other

payment methods that were also developed in 2001 is pay-for-performance which used limited to diabetes, asthma, tuberculosis, hypertension, schizophrenia, hepatitis B and C and early chronic kidney disease (Yip et al., 2019).

Cost-sharing in medical expenses is critical in contributing to the likelihood of medical service utilization by consumers. According to Santerre and Neun (2012), the combination of the high level of out-of-pocket price and a fixed payment reimbursement method (e.g. global budget, capitation, and bundled payment) will produce a very low likelihood of medical services utilization (cell 3 in Figure 4.2). This combination is the most efficient way to control unnecessary medical services from both demand (patient) and supply (provider) side. Indonesia's hospital utilization is in cell 1 with almost no copayment or cost-sharing combined with a fixed payment reimbursement such as Ina-CBGs and capitation. Meanwhile, Taiwan could be considered in cell 3 by imposing high copayment and global budget or in cell 4 by combining high copayment and fee-for-service as a variable payment to physicians. Meanwhile, since copayment does not exist in Canada, a mixture with a global budget in each province and territories, make Canada is in cell 1 with a low likelihood of utilization. However, most of physicians are paid by fee-for-service (variable payment) make Canada also could be in cell 2 with a high likelihood of overutilization.

Type of reimbursement scheme

		Fixed payment	Variable payment
Out-of-pocket price to customer	Low	Low likelihood (1)	High likelihood (2)
	High	Very low likelihood (3)	Moderate likelihood (4)

Figure 4.3 The likelihood of a large volume of medical services for different reimbursement and consumer copayment mechanism



Source: (Santerre & Neun, 2012)

The copayment is considered as a way to control health spending from the demand side of the consumer and to reduce overutilization and unnecessary services. Taiwan requires patients to pay some portion of the healthcare cost they received. As described by NHIA (2019a), the reason for imposing a copayment is to make the insured aware that healthcare services are used for those who necessarily need medical assistance and should not be wasted in any conditions. Table 4.3 highlights examples of copayment in Taiwan's NHI. The copayment is excluded for some of the membership criteria, such as low-income households, veterans, military forces, children under three years old, and patients with catastrophic illness.

Table 4.3 Required copayment in Taiwan's NHI

Healthcare settings	Copayment (Coinsurance for Inpatient care)
Outpatient visit	50 NT\$ (Dental care and Chinese Medicine), 150 – 550 NT\$ (Emergency care) and 50-420 NT\$ (Western medicine)
Drugs prescription	20-80 NT\$ (drug cost 100-500 NT\$), 100-200 NT\$ (drug cost 500-1000 NT\$ above)
Inpatient care	5% to 30% of the cost of hospitalization

At the end of 2018, in an effort for cost control and quality care, Indonesia initiated a copayment provision through the Minister of Health, Regulation Number 51 the Year 2018. Copayment will be implemented only in hospital settings and composed of 10,000 IDR to 20,000 IDR (0.51 to 1.22 USD) for each outpatient visit and 10% of total INA-CBG cost for each inpatient care. However, this regulation will only be applied to certain cases and diagnoses, which will be determined further by the MOH. Thus, as of March 2020, this copayment provision has not been implemented.

### 4.3. Global budget

The global budget cap possesses critical roles in maintaining the financial sustainability of NHI in Taiwan. In response to rapid cost inflation, since the 1980s, many OECD countries have adopted global budget at the national or sub-system level of their health system (Yip et al., 2019). Under global budget system, a fixed amount of funding is allocated to healthcare providers in a way to purchase the service delivery to the insured for a certain of times, usually one fiscal year (UBC-Center, 2014). Most of the countries which applied global budget have been reducing their health care inflation, including Taiwan.

Cheng et al. (2018) mentioned that the global budget cap is considered as the most powerful tool which contributed to slowing the growth of Taiwan's inflating health care expenditure in the last two decades. An aggregate budget ceiling with a point-based single fee schedule is set to limit the total spending of NHI to its expected revenue, with negotiation among key stakeholders to determine the annual budget growth rate (Yip et al., 2019). Taiwan implemented the global budget in a gradual order. The first global budget cap was designated for dental health care in 1998, following Chinese medicine in 2000, western medicine clinics in 2001, and the hospital sector in 2002.

The National Health Insurance Committee (NHIC), which consists of 35 members representing payer groups, providers, government, and academic experts, negotiates and sets an annual prospective global budget within the expenditure target from the Taiwan government. According to Yip et al. (2019), the formula of the sector budget (dental, Chinese medicine, western medicine or hospital sector):

*Sector budget*<sub>(t,j)</sub>

$$= [(Basic\ benefit\ budget)_{(t-1,j)} * (1 + Growth\ rate\ of\ basic\ benefit\ budget_{(t,j)})] + Special\ program\ budget_{(t,j)}$$

where t and j represent the year and sector, respectively. The basic benefit budget might be calculated from the assigned fiscal year allocation of each sector. Negotiable factors and non-negotiable factors determine the growth rate of the annual increase in the basic benefit. The growth rate for negotiable factors is determined within the NHIC. The non-negotiable factor, which includes growth factors that beyond NHI policies, is formulated as:

$$\begin{aligned}
 & \textit{Growth rate of non – negotiable factor} \\
 & = \textit{growth rate in the number of NHI enrollees} \\
 & + \textit{growth rate in cost due to demographic (age – sex structure) changes} \\
 & + \textit{growth rate in Medical Customer Price Index (MCPI)}
 \end{aligned}$$

The estimation of growth rate in cost due to demographic changes and growth rate in MCPI is determined by multiple stakeholders and annual national index. For instance, in 2016, the total annual increase of the basic benefits budget for the hospital sector was 5.33%, it comprises of 0.94% negotiable and 4.40% of non-negotiable factor growth. Special program budget is an additional budget that aims to improve access, quality, and effectiveness of care such as the Pay-for-performance program, the Family Physician Initiative, the Capitation Payment Initiative, and the Post-acute Care Initiative.

Global budget is the most common health care funding in Canada until recently. The first global budget method was implemented in Saskatchewan in 1946 with the purpose to replace the per-diem system for hospital-based services. This hallmark global budget system was based on an estimated 90% occupancy rate for the hospital (Johnson et al., 2018). Subsequently, in 1969, Ontario also converted hospital reimbursement from traditional fee-for-service to a global budgeting system in 1969 to gain more effective cost-containment (Lave, Jacobs, & Markel, 1992). Similar to Taiwan, Canada's global budgeting system also comprises a basic benefit from the previous year's funding level and calculated by inflation, service growth, new and expanded services, and life support. Inflation and service growth are set by a formula created by the MOH

and hospital, respectively. The newly expanded services and life support services (e.g., hemodialysis, cardiac surgery, parenteral nutrition) are subject to negotiations between each hospital and the ministry.

The structure of funding distribution is different between Taiwan and Canada. NHIC in Taiwan cover the setting of annual global budget nationally for the entire region and spreads the funding to each region. Subsequently, each NHI regional office will allocate the assigned global budget to each hospital in their region. However, since the administrator of NHI in Canada is the provincial and territorial government, they set the annual global budget for each individual hospital. Thus, a set of inflation and growth rates exist in Canada for the provinces and territories. Although global budget remains as the principal payment method for hospital reimbursement, some of the provinces have been experimenting with several supplementary funding approaches (Government-of-Canada, 2019).

Indonesia is in the progress of preparing the transitional payment methods for hospital reimbursement. In 2019, a global budgeting pilot project was conducted by Healthcare BPJS in two public hospitals setting. The project attempted to measure the accuracy of the projected global budget by calculations based on case-mix and basic hospital rates. Several elements were calculated to adjust the growth and inflation rate, such as bed occupancy rate, number of beds at inpatient class, tariff regions, and growth of enrollees. The study demonstrated that the projection of the budget went well as expected since the utilization up to March 2019 was 24.66% for Hospital A and 24.35% for hospital B of the 25% standard realization for the third month (Mundiharno et al., 2019). During the implementation, Healthcare BPJS and hospital also monitor several related indicators such as visit rate, unit cost, readmission, full referral, capacity and hospital volume, and contra-referral program. The project signaled that the calculation conducted by Healthcare BPJS and hospitals were on the correct path to a broader global budget for hospital settings in Indonesia.

#### **4.4. System Design and Support**

The previous section has discussed various financial aspects as an attempt to maintain the financial sustainability of an NHI in Indonesia, Taiwan, and Canada. This section will elaborate on the non-financial element in NHI, which also support and contribute to the financial sustainability of the system. There are at least three components that could be significant support in the financial maintenance of the health system: leadership and governance, health information and technology, and the role of organization, boards, and related agencies.

##### **4.4.1. Leadership and governance**

According to Johnson et al. (2018), leadership and governance is one of the health system building blocks and critical elements. Regardless what development level or socioeconomic status of a defined population, the successful process of a health reform mainly depends on its government and policymaker. For instance, in Indonesia, irrespective of its desire to achieve universal coverage, the government has succeeded in moving one step ahead to lead the nation into a new path of better coverage and accessibility for most of the population, especially the poor and disadvantage communities. Britnell (2015) mentioned that Indonesia's health reform in achieving the-largest single-payer system in the world is laudable and will inspire the other low- and middle-income countries to do the same endeavor.

Indonesia could learn from Taiwan's NHI reform on alleviating the financial problems and increasing risk pooling in 2013. At the beginning of the reform, the government of Taiwan imposes significant policies concerning fund collection, risk pooling, and payment methods. According to Yip et al. (2019) an intense negotiation process between NHIC stakeholders during the setting of the global budget cap becomes the main strategy to balance multiple objectives as they manage health care expenditure and ensure access and quality in Taiwan. As Indonesia's

intention to initiate the global budget cap, a similar committee should be structured as part of the primary strategy.

Canada is often chosen as a primary model for other countries when concerning a single-payer publicly funded health system. A strong commitment from the regional government, combined with support from the federal government has produced a sustainable single-payer system for more than three decades. The commitment has been reflected in public funding shares in total health spending, which accounts for more than 70% in 2015 (Figure 2.4). In comparison, Indonesia and Taiwan have less public funding shares with 45.2% and 60.9%, respectively. Political and economic condition has also influenced Canada health system. In support to the health system reform, the federal government of Canada also regulates and organize several provisions such as the safety and efficacy of medical devices, pharmaceutical, and funds health research Commonwealth-Fund (2019). A rigorous provision also being part of federal government leadership when the Canada Health Act succeeds in enforcing provinces and territories to restrict the practice of balance billing. Thus, physician is not allowed to charge any bill to the patient for the service above the government fee schedule (Johnson et al., 2018).

There are always consequences that come with new policies that impacted the population and multiple stakeholders. Indonesia, Taiwan, and Canada were experiencing the same reaction from the medical organization, pharmaceutical, and even its population in general regarding the plan or initial establishment of the NHI. The strong commitment is a key and required in building and maintaining the health system. Government commitment reflects in how Taiwan induced a broad of public funding support to almost each of the NHI members category. The government funding flow not into the poor and undeserved category, but the public or private workers also receive government proportion as their premium to NHIA. On the other hand, regardless of its economic status, Indonesia's government funding limit to cover the poor and

almost poor beneficiaries. However, GoI has shown its commitment to support the JKN program by supplying additional funds to the Healthcare BPJS deficit balance each year.

#### **4.4.2 Health Information Technology**

Information technologies has influenced almost all human living dimension, including health care. According to Zeng, Reynolds, and Sharp (2009), health information technology (HIT) is a pivotal element to simplify the healthcare delivery system in improving quality and lead to a cost-efficient system. Current HIT in the health system that supports the performance of the overall health system includes the existence of electronic health records, network systems between health care providers, and accessibility to updated healthcare databases. Several particular advances in HIT also assist NHI in managing its health expenditure and administrative processes such as electronic reimbursement tools and fraud and abuse detection system. Indonesia, Taiwan, and Canada have their various information technology in supporting the NHI performance.

Health information advances approach should prioritize its health system main problem. As to contribute in addressing the waiting times miscellaneous in Canada, a health information system provide web-based access to monitor the waiting times in particular provider for certain services that an individual in to. This approach succeeds in gaining people's trust as the waiting time is transparent and in a proper order even though the patient should wait.

Taiwan has developed a HIT for claim and reimbursement mechanism that makes the process comes very fast comparing to the other health system. Besides, NHIA also has developed an automatic auditing system that could detect potential fraud based on analyses of claim records. According to Yip et al. (2019), approximately 150 thousand USD (1.7%) of total claims annually have been declined as a verified fraud by professional review. In addition, this electronic system also facilitates utilization review for evaluation appropriateness and service quality. Taiwan also established Pharma Cloud in 2013 as the tools to reduce duplication of drug

prescription and eliminate adverse drug reactions and also serve as a monitoring system for NHIA. In the first-year implementation, Pharma Cloud has produced a 3.3% efficiency of the total drug expenses, an amount of 133 million USD (Yip et al., 2019). Furthermore, the cloud system has expanded into NHI Medicloud, covering also medical test results, examinations and surgeries, and discharge summaries information.

Similar to Taiwan, the JKN program in Indonesia also has several information technologies that directly related to financial performance and for the overall performance of the health system. One tool that contributes to reducing the additional payment is DEFRADA (*Deteksi Potensi Fraud Dengan Analisa Data*), a health information tool developed by Healthcare BPJS to detect potential fraud for hospital claims. According to Healthcare BPJS, as mentioned by ISSA (2017), DEFRADA accounts up to 30% of the total cost efficiency from hospitals in 2017.

#### **4.4.3. Board, agency and organization**

Building a sustainable health system with all of its supportive components is complicated and requires cooperation from various organizations. For instance, the success of Taiwan's expenditure management is not solely achieved by the implementation of a global budget cap, but commitment and co-management of professional organizations such as the Taiwan National Physician Association, Taiwan National Hospital Association, and Taiwan National Dental Association serve as crucial factors in complementing the global budget management (Yip et al., 2019). Moreover, the establishment of separate organizations out of the NHI administering agency is common to support and improve the overall performance of the national health insurance system.

Indonesia has several boards and organizations that designated solely following the establishment of NHI and other organization which supports improve NHI performance as one of their responsibilities. Dewan Jaminan Sosial Nasional (DJSN) or social national security



council is a president subordinate organization responsible for formularizing general policies and evaluation of social security program as mentioned in Law Number 40 Year 2004 regarding SJSN. This board consists of several experts that elected directly by GoI. However, a policy brief from World-Bank (2012) argued that the specific functions and roles of DJSN remain unclear in addressing several problems in JKN program. More thorough roles and authorities of DJSN might be contributing significantly to healthcare BPJS performance in maintaining the sustainability of the JKN program in Indonesia.

In order to ensure the healthcare service utilization and cost-containment aspects, the JKN program comes up with *Komite Formularium Nasional* (KFN), a national committee of pharmaceutical formulary and *Tim Kendali Mutu dan Kendali Biaya* (TKMKB), a board of healthcare quality and cost control. The KFN is responsible for regulating the list of efficient and qualified drugs that can be used by JKN providers to treat the patients. Healthcare BPJS will not cover prescriptions out of the formulary. The main challenge for KFN is the existence of particular drugs due to pharma companies that produce less for a specific drug that includes in the national formulary. Better coordination could help the government and pharma companies, which are mostly private for-profit companies. TKMKB mainly serves as the mediator if there are dispute claims from the provider. The Healthcare BPJS will not pay claims that considered as inappropriate by TKMKB. In order to broaden the scope of TKMKB, each of regional office of Healthcare BPJS form specific region teams. Each month the TKMKB regional office would report the findings from the providers' claim as a result of inappropriate claims.

Similar to TKMKB in Indonesia, Taiwan also maintains a panel review system of medical records to effectively monitor the trends of healthcare cost. Any services that are considered inappropriate by this panel will not be paid (Wu et al., 2010). Taiwan has more supporting bureau than Indonesia. There are at least four bureaus and committees under the department of health which have supported and worked together with NHIA (formerly as BNHI) since its

establishment in 1995. These organizations include NHI Supervisory Committee, NHI Dispute Mediation Committee, NHI Medical Expenditure Negotiation Committee, Bureau of Medical Affairs and several other bureaus (Figure 4.4). All of these bureaus are solely designated to support the overall performance of the NHI program in Taiwan.

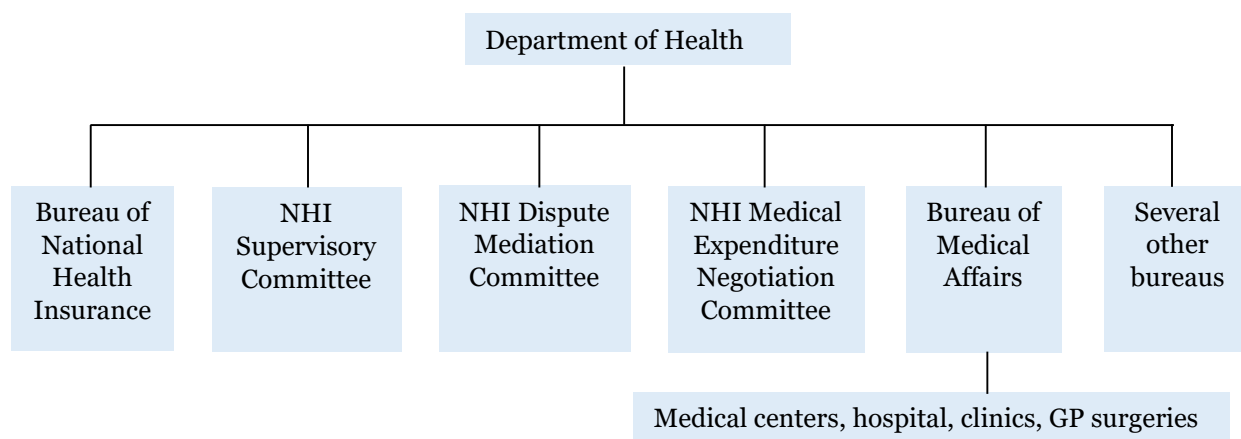


Figure 4.4 Supporting committee and bureau in Taiwan's BNHI

Source: (Wu et al., 2010)

NHI in Indonesia and Taiwan possess many similarities in the way they manage NHI, yet the organizational structure of each is quite different and can impact each agency's authority performance. Since NHIA is structured under the Taiwan Ministry of Health (MOH), all of the resources in MOH is easily flow into NHIA. In contrast, Healthcare BPJS structured under the President, having the same level as MOH, resulting in gaps in delivering policies and implementing service to the beneficiaries. The workflow is less smooth compared to Taiwan since Indonesian MOH and Healthcare BPJS require a coordinated relationship. This structure sometimes results in a uncoordinated and confliction opinions when making policy decisions .

The supporting committee and organization in the Canada health system vary by province and territory. Some of the provinces have a health services review committee such as in Manitoba which established in 1985 and serves as an active board in controlling the utilization

and quality of the province's health coverage (Government-of-Canada, 2019). Alberta provinces also instituted the Advisory Committee on the Utilization of Medical Services in 1987. In addition, federal organizations such as Canadian College of Health Service Executives and the Canadian Institute for Health Information (CIHI), provide broader oversight on uniform treatments and approaches for the larger health system. Canadian College of Health Service Executives established a certification program for hospital administrators whose goal was to provide basic professional knowledge and competency. The primary benefits of having professionally trained administrators are their capability not only to provide care but also to maintain financial matters, objectivity to resource planning, and their awareness to cost containment and efficiency (Davies, 1999). CIHI is responsible for providing accessible and vital data that contribute to the decision-making process of the regional health authorities' health policies, including the detection of fraud and unnecessary services.

#### **4.5. Lesson Learned for Indonesia**

The basic description of financial sustainability is a state of balancing the revenue or resources against the health expenses for an expected period. The efforts to balance both sides involve broad sectors of financing elements and multiple approaches from stakeholders. In the previous section, NHI financial strategies in Indonesia, Taiwan, and Canada have been discussed, resulting in some commonalities and differences among those three health systems. There are some keys take away, particularly for Indonesia as a central attention in this study, that can be learned to improve overall performance and addressing the financial crisis that Indonesia cope with this currently.

Adequate resources that reflect the ability of revenue collection are a primary issue in financing the health system. A rising health expenditure will not be a significant problem if the resources are sufficient. Compared to Taiwan, which has identical premium based funding, Indonesia needs to increase several aspects in terms of calculation and government

contribution. The calculation of formal worker's premium in Taiwan involves the number of dependents of each employee. A larger household will pay more premium than a smaller or unmarried worker. However, a formal worker in Indonesia pays a premium that includes up to four dependents. In this case, there is a potential revenue loss due to uncalculated dependents portion. Adjusting the premium calculation of formal workers (PPU) will contribute a significant increase in revenue collected for JKN program.

In addition, Taiwan government's contribution goes to the poor, but also to almost all the categories (as described in Table 4.1), including private sectors. In contrast, Indonesia government's contribution solely goes to the destitute category with no contribution portion to the other category, such as formal workers. Taiwan's strategy by including government's contribution on each of the membership categories will support the premium collection rates and create a positive branding of the NHIA. Indonesia might consider to implement a similar approach of broadening the government contribution. However, this effort will depend on and strongly influenced by the economic growth and government commitment in allocating national health budget.

Based on the comparison of medical coverage and benefit in the three health systems, it is clear that Indonesia has the most comprehensive benefits. Unfortunately, those broad benefits are not balanced adequately with resources such as medical facilities and appropriate funding of Healthcare BPJS. Reducing the level of benefit should be considered; most Canadian provinces do not cover several services as Indonesia does, such as dental care, prescription drugs, and rehabilitative care (see Table 3.1). Thus, private health insurance can cover those services as their benefit plan and provinces health authorities could reduce their health expenditure. Another consideration in controlling utilization is by imposing cost-sharing or copayment as Taiwan implement in their NHI. Imposing copayment will be a big challenge for Indonesia since the JKN program was started in no cost-sharing provision.

In terms of provider payment, both Canada and Taiwan implement a successful global budget cap to control the health care cost. The combination of global budget and INA-CBGs in Indonesia will be more challenging, however as Canada and Taiwan use the global budget only for hospital costs, and physicians are still paid by fee-for-service methods. The formulation of a global budget cap requires a significant effort and government role to unite related stakeholders in determining a global budget cap for each hospital in Indonesia.

Innovation in health information technologies is a must to leverage Indonesian health system performance. Taiwan's NHI Medicloud represent government commitment in providing real-time cloud-based services for the physician to restore individual patient treatment and medication history as well as increasing customer satisfaction and controlling health care cost. A significant capital investment will be required for information technological advances, which involves a massive data storage. Thus, commitment from GoI and multiple other stakeholders such as medical and hospital associations, experts, and local government is greatly needed.

Another lesson learned from Canada is the broader approaches than only focus specifically on financing the system. Public health institutions in Canada are actively focused on population health and preventive care to reduce the morbidity and incidence of a disease and health problems. Moreover, Canada regulates the availability and quality of healthcare workers such as physicians, midwives and nurses as a supporting effort to the overall performance of the health system.

## V. CONCLUSION

Even though Indonesia, Taiwan, and Canada each apply a single-payer system in maintaining their universal coverage, they differ in the execution of this system in many ways. In terms of the national structure of each NHI, Indonesia and Taiwan have similarities in organizing approach and structuring the membership management of their nationally managed NHI. Despite of universal coverage in each province and territories, Canada does not have an federally managed system such in Indonesia and Taiwan. This does not appear to be an obstacle, however, for Canada to achieve high performance in health outcomes compared to Taiwan and Indonesia.

In terms of health system financing, each of the health systems has commonalities and differences. In contrast to Canada, who used general taxes as the only sources of health system revenues, Indonesia and Taiwan have a similar approach in revenue collection by a broad premium based on individual and employer combined with a minor tax-based public funding. Indonesia and Canada have an intense concentration in gatekeeper concepts lead by general practitioners in the primary care setting as one of the efforts in cost-containment and quality assurance. Taiwan and Canada have developed their global budget cap system as a primary cost-containment mechanism, which Indonesia is still in early planning for developing the same methods.

Financial sustainability of NHI program not merely depend on how the agency collects revenue and spending the fund, but also how to manage the membership and controlling health care utilization, minimizing fraud and providing supportive prevention program. Broad of organization and committee plays an essential role in maintaining the financial status equilibrium of each NHI in Indonesia, Taiwan, and Canada.

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