SENIOR RESEARCH

Topic: Healthcare System Comparison: A Case of Switzerland and Thailand

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Abstract

Healthcare system comparison has mostly been done between countries in the OECD or countries belonging to the same community such as the ASEAN or the EU. This paper puts forth an international comparison of healthcare system onto applying them on two countries with significant differences. Switzerland is known as one of the best performing in terms of healthcare in the OECD and the world. At the same time, Thailand has been improving in terms of healthcare for the past decades and relatively well compared to other neighboring countries. This paper compares the two countries in terms of the resources, healthcare delivery, and structure of government authority. Given that the two countries are very different, this comparison gives us lessons on approaches that Switzerland has taken to become successful. One key lesson is that it has designed a scheme that creates incentive for people to have a healthy lifestyle. An incentive policy for healthier lifestyles should be implemented in Thailand to deal with the threat of financial sustainability without having to sacrifice the quality of the healthcare.

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Table of Contents

List of Tables

List of Figures

List of Abbreviations

The following table describes the significance of various abbreviations and acronyms used throughout the research. The page on which each one is defined or first used is given.

Abbreviation	**Meaning**	Page
CHF	Swiss Francs	41
FOPH	Federal Office of Public Health	47
GDP	Gross Domestic Product	20
MOPH	Ministry of Public Health	20
THB	Thai Baht	41
THE	Total Health Expenditure	22
UC	Universal Coverage	40

Introduction

Over the past decade, healthcare systems across the world face the same challenge of skyrocketing medical cost, aging populations, and dependence on expensive high-technology equipment and curing. However, for a long time, each country hadbeen adopting and developing different strategies and structure of healthcare system to serve its population's health needs while trying to stick to the three primary goals: Equity, efficiency, and financial sustainability. Given the different structure of healthcare systems, each country then has a different approach in coping with this globally common issue while trying to maintain a proper balance in access, quality, and cost. Cross-country comparisons of healthcare system have been done, in order to learn the main features which can turn into useful guidelines or lesson for other countries. Most comparative studies are done within the same country status (developed, developing, or undeveloped country) or economic status such as the OECD.[1][2] Therefore, I find comparing Switzerland and Thailand, which come from very different context interesting to study. Switzerland has been known as one of the OECD's best healthcare system with desirable outcomes in health measures. In 2011, average life expectancy in Switzerland is as high as 82.8 years, which is the highest among the OECD members, and always ranking in the top three of OECD for the previous years. As for Thailand, health outcomes have improved over the past decade. As of 2012, average life expectancy for a Thai population is 75 years, which is considered as a relatively high performance compared to other countries in the region. So, this comparisonbetween the two countries could generate possible guideline or suggestion on what kind of approach we could take in order to move toward a better healthcare system, including being financially sustainable especially amid this worldwide rising cost trend.

[1](Anell and Willis 2000)
[2](Leu, et al. 2009)

Research Objectives

The main objective of this study is tolearn the main characteristics and features of each system so that we can see how they affect the country's health status of population in general and also how they affect the performance of the healthcare system itself. Given that Switzerland and Thailand are in very different context, the specific objective is not to find the exact approach for Thailand to adopt but rather to adapt. This study aims to gain a lesson from the Swiss system that could serve as a possible adaptation for Thailand to consider.

Scope

The scope of research identifies the setting of this research. It covers the two following dimensions: the selected study body and the time interval. This research carries out a comparison of healthcare system in two selected countries, which are Thailand and Switzerland. The selected data covers the time period of 10 years, starting from 2002-2011, where data are mostly all-around available.

Literature Review

In order to compare any two things, we need to define an aspect to be compared and a basis to carry out the comparison. This notion applies to a healthcare system comparison as well. Therefore, we need to find the bases for an international comparison of healthcare systems.

The most commonly used basis is the 'healthcare expenditure', expressed either as a share of GDP (%) or a per capita expenditure. The amount of healthcare spending is used as a comparison basis because of the following reasons. First of all, historic expenditure data are available and easy to access. Health spending figures could be found in each country's National Health Account (NHA) report. However, for developed countries, data could also be found in the OECD's online database called 'OECD iLibrary'. Moreover, health expenditure has the advantage of representing data in one common unit, either as % or US$ PPP. Lastly, it's compatible with the current focus of OECD and many other countries on restraining healthcare costs. However, there are some drawbacks, which make this variable imperfect as a sole basis for comparison. First of all, the definition of health expenditure varies across countries and also over time. Secondly, the healthcare expenditure figure must be interpreted carefully. They can create misleading implication and interpretation. When expressed in the unit of % of GDP, a stable figure doesn't mean that healthcare expenditure is stable. It is actually saying that healthcare expenditure changes proportionately with the nation's GDP. Expressing it in the unit of 'per capita' instead solves this confusion problem but then new problem emerges. Problem is currencies conversion given the fact that exchange rates are inconstant. This problem could be fixed by applying Purchasing Power Parity (PPP) indices, which then create new problems of their own. They aren't applicable to the public, which are non-tradable, health services. Importantly, changes in health spending don't give a certain implication. Changes in spending figures could be a result of changes in real resources or just from changes in the price level or both. We can't distinguish whether the country dedicates more real resources to healthcare or the spending changes just by the change in price level.

Economically, health expenditure fails to capture the opportunity cost of healthcare services. In other words, the true economic costs are not included in the

figure. This opportunity cost is the forgone value of goods & services that healthcare staffs and equipment could have produced in the best alternative capability. Given that each country has different level of productivity, their opportunity costs of healthcare therefore differ. So, using 'health expenditure' as the only measure overlooks the substantial difference in opportunity cost of healthcare. Therefore, the interpretation could be misleading. By all the reasons mentioned above, real resource measures should be included in international comparison as well. (Anders Anell and Michael Willis 2000, 770-771)

Real resources of healthcare include the human resources and the equipment. These real resources could be further categorized on what geographical scale their factor prices are being determined: global market or national market. The internationally priced real resources are patent drugs and high-technology medical equipment such as CT scanners, MRI units, and Mammogram machines. On the other hand, domestically priced real resources are physicians, nurses, and other healthcare staffs for instance. Their wages are determined within the country.

Anders Anell and Michael Willis present a simple approach that allows us to combine financial resources (the health expenditure) and real resources in an organized and easy-to-interpret manner. This facilitates an international comparison of healthcare system. The approach is to include selected variables of resources and sort them into the three following groups: financial resources, internationally priced real resources, and domestically priced real resources. (Anders Anell and Michael Willis 2000, 771-772)

About the resources, there are two key points to keep in mind. First, the financial resources and real resources are linked dynamically through the concept of 'stock' and 'flow' variable. The stock of real healthcare resources take the flow of financial resources in terms of purchasing power, put simply as money. " The stock of real resources takes the flow of purchasing power (monetary expenditures) as compensation for its contribution to the output and performance of the health care system. Increasing the stock of real resources requires a commitment of monetary expenditures over both the short and long term. For example, investment in education and research can increase human capital." (Anders Anell and Michael Willis, 2000, 774) Second, the inputs mutually depend on each other. Therefore, the capability of the healthcare system depends on how effective the inputs are managed and also how the money is distributed among the inputs (real resources). To be more specific, the

productivity of physicians and nurses (human resources) depends on the complementary technology such as diagnostic equipment and drugs. Insufficient equipment and facilities reduce the potential capability of healthcare personnel. Deficient salaries, resulting from inefficient allocation of financial resources, generate lower incentive for work effort. In conclusion, we need 'effective' management of real resources and 'efficient' distribution of money within the healthcare system in order to make the system function at its optimal capability and generate the optimal level of output.

The approach by Anders Anell and Michael Willis is to create a 'spider-web' diagram. One spider web represents one country. The selected variables are labeled on each outer corner of the web. The approach allows us to do a cross-country comparison for each particular year. Start by focusing on a particular year, for each variable, look for the country with the maximum value for the variable and defines that as the 'resource frontier'. Then, recalculate the figures for all other countries in 'relative values', which is the actual value divides by the maximum value, which is the one that sets the resource frontier, of that variable. The relative values are then plot on the spider web, with the web center representing value of zero and outer most representing one. Values are shown correspondingly as relative size spans out from the web center to the outer corner, representing the value of 1 or the 'resource frontier'. Thus, the inner-ring web locating halfway to the outer web represents relative value of 0.5. After defining the resource frontier for every selected variable, we can plot out the relative values for all the compared countries. Once each country has all the relative values of selected variables plot out, we draw a line connecting the dots for that particular year. Also, we can apply the same process to other years, representing the dots and connecting line with a different color.

This 'spider-web' resource profile opens us up to greater ability to answer the following questions:

1. Which country dominates in terms of health expenditure?
2. Which country dominates in terms of technology?
3. Which country dominates in terms of labor resources?
4. What are the trends of each particular country?

As discussed earlier, the level of expenditure could be misleading as in the case for the United States and Sweden. Based on 1996 data, the United States defines the resource frontier for the financial resources, expressed as % of GDP, per capita,

and drug expenditure per capita. Sweden has 0.61, 0.43, and 0.6 times of health expenditure as % of GDP, health expenditure per capita, and drug expenditure per capita respectively. However, the amount of healthcare personnel (human resources) per capita is very proximate while USA was having lower hospital beds per capita. The pattern is the same for older years such as 1986 and 1981. This suggests that 'expenditure' alone is not enough to imply the contribution of healthcare system toward system's output that affects people's health status. A point to keep in mind is that the United States high health expenditure, including expenditure on pharmaceutics, could be explained by the high wages in the country and access to advanced technology and medical goods. Nonetheless, the monetary flow to the healthcare sector is an important determinant of healthcare system's performance and output. In order to make a comprehensive and meaningful comparison, both financial resources and real resources should be considered for a useful purpose in future management of the system.

The study was carried out on six wealthy OECD countries. The sample set shares common wealth status and potential to adopt modern healthcare yet contrasting structure of healthcare provision or healthcare system. The literature gap is therefore the application of this approach on developing countries such as Thailand. The paper itself stated the attractiveness of applying the presented approach to countries poorer than those in the OECD.

Other than resources allocated to the sector, the important aspects of healthcare are the system's delivery, financing and organization. Policymakers who participate in reform debates look for and observe specific characteristics of other countries' system. To be more specific, they are to examine the finance and provision structure of healthcare in other countries. The purpose of studying other nations' system is not to copy or adopt that particular structure but to see how adaptation can be made. Put differently, they are trying to learn what approaches those countries take to become successful in terms of healthcare and how to apply those approaches accordingly, given certain conditions of our country. "Reforming American health care does not mean that the United States could or should copy any country's institutions exactly. Americans cannot adopt another country's structure but they can adapt those approaches to America's inherited conditions; adaptation is clearly the key, for it is not possible to import one nation's healthcare system into another."

(Maryann Baribault and Carey Cloyd, Health Care Systems: Three International Comparisons, 1999)

An example of the healthcare system's feature to look at would be the healthcare delivery structure. It basically reflects the distribution of burden between the public sector and the private sector in providing healthcare services. This is one crucial concern due to the fact that a healthcare system actually has a potential adverse impact on people's wellbeing. The outcome depends on how the healthcare systems are being financed. Of the private sector, how high are the 'out-of-pocket' payments? Out-of-pocket payments are the amount households pay or co-pay for healthcare services they use. Whenever these payments are high relative to each household's income, the payments are considered 'financial catastrophic'. They are termed financial catastrophe because households are forced to cut down on their basic consumption or subsistence needs, including such thing as children's education, and pushed into poverty in cases of low-income households. Actually, many poor households often choose to avoid these unaffordable services, being unable to bear either this direct or indirect costs of healthcare. Eventually, they'll become further impoverished by the negative impact of illness on their health, productivity and in turn, earnings. Thus, protecting households from catastrophic health payments has become a widely accepted objective of a national health policy. This issue focus has affected structuring and designing healthcare systems and insurance mechanisms in many countries throughout the world. So, how high is the out-of-pocket payment to be considered as 'catastrophic'? From past studies, cut-off threshold was ranging from 5% to 20% of household income. By 2005, the World Health Organization (WHO) had proposed the threshold to be 40% of the household's non-subsistence income, which is the income available after paying for basic subsistence needs. (KeXu, David B Evans, Kei Kawabata, RiadhZeramdini, Jan Klavus, Christopher J L Murray, 2005, 1) (KeXu, David B Evans, Kei Kawabata, RiadhZeramdini, Jan Klavus, Christopher J L Murray, 2003, 111-112)

A quantitative approach, a double-log multivariate OLS regression model to be specific, has been used in a paper by KeXu, David B Evans, Kei Kawabata, et.al (Household Catastrophic Health Expenditure: A Multicountry Analysis, 2003). They set the proportion of households facing catastrophic expenditure as the dependent variable whereas out-of-pocket share of total health expenditure, total health

expenditure (% of GDP), and proportion of households below the poverty line are included in this double-log OLS regression as the explanatory (RHS) variables.

Variable	Coefficient (SD)	p-value
Out-of-pocket payment share of total health expenditure	2.161 (0.199)	0.001
Total health expenditure share of GDP	1.645 (0.362)	0.001
Proportion of households below poverty line	0.173 (0.045)	0.001
Constant	2.733 (1.141)	0.02

Source: Table 3: Determinants of catastrophic health expenditure (Household catastrophic health expenditure: a multicountry analysis, KeXu, David B Evans, Kei Kawabata, et. al, 2003)

All explanatory variables are statistically significant at 1% SL and results are robust to changes in cut-off points for the term ‘ catastrophic’ and the ‘poverty line’. Plotting a figure for the first explanatory variable and the dependent variable, an overall positive relationship can be seen. However, at any given level of the ‘out-of-pocket share of total health expenditure’, the ‘proportion of households facing catastrophic expenditure’ varies across countries. So, of course, there are other important factors that lead to catastrophic expenditure.

Most developed countries have long developed social institutions such as social insurance or tax-funded health systems that protect households from catastrophic expenditure. Geographical dummies are not significant in the multivariate OLS regression. Still, the expected key factor toward the catastrophic payment is the out-of-pocket payments contribution to the total health expenditure. Opposing to out-of-pocket payment is the prepayment scheme, which come in various forms. Taxation, social insurance, and private insurance are examples of different

forms of prepayment. The strong relation between the two variables suggests that prepayment, which is a way of financial risk pooling, is the solution to the issue.

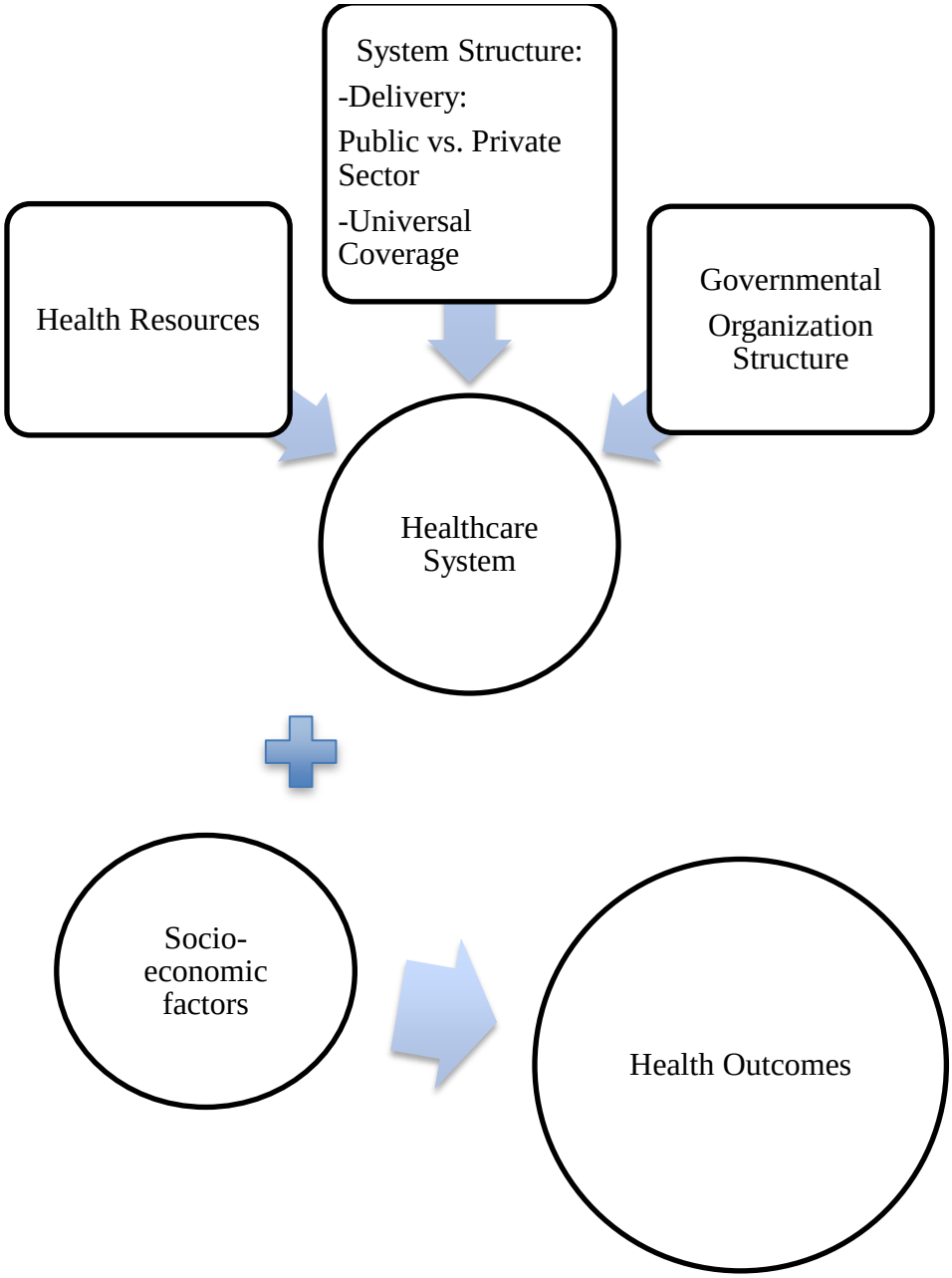
As stated earlier, there are cross-country variations within the group of same portion of out-of-pocket payments. Most of these variations are explained by the following three conditions:

1. Poverty
2. Level of Health Service Access and Use
3. Lack or failure of social mechanisms that pool financial risks.

Most developed countries don't face severe situations since their social mechanisms have been developing together with the healthcare system provision. On the other hand, in several middle-income countries, the development of social institutions to protect households has lagged behind the rapidly growing health service access and use. After all, the conclusion has been drawn, suggesting that reducing out-of-pocket payment is the right approach to protect population from financial catastrophe. Reducing out-of-pocket means a country has to develop sound social institutions such as social insurance scheme or a tax-financed healthcare system. Therefore, what we also expect to observe from healthcare system study would be the country's approach in pooling financial risk. It could be a prepayment either through a tax-based scheme or a social health insurance. (KeXu, David B Evans, et.al, 2005, 3-4) (KeXu, David B Evans, Kei Kawabata, et.al, 2003, 115-116)

Conceptual Framework

The study is based on how the healthcare system's performance is determined by a number of factors. Those factors act as the inputs to the healthcare system, which generates output of the system in terms of performance. This then along with other socio-economic factors affect the health outcomes of the country's population. The framework is summarized graphically below.



Methodology

The research is done on a qualitative approach and takes the form of a mix between historical and ethnographic research. Problems from past events and how they lead to current conditions are discussed. At the same time, this is an ethnographic research by descriptions of the current system and the intuitions behind the chosen structure, in which each country holds on to. However, it brings in some numerical data to complement the comparative study. Simple statistical figures are used to support particular points and statements.

Findings

Healthcare Expenditures (Financial Resources)

Total Health Expenditure (% of GDP)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	15.2	15.7	15.8	15.8	15.9	16.2	16.6	17.7	17.7	17.7
Switzerland	10.6	10.9	11	10.9	10.4	10.2	10.3	11	10.9	11
Thailand	3.7	3.6	3.5	3.5	3.5	3.6	4	4.2	3.9	4.1

Table 1: Total Health Expenditure as % of GDP (2002-2011)
Source: OECD iLibrary, Thai MOPH: IHPP's Publication of National Health Account

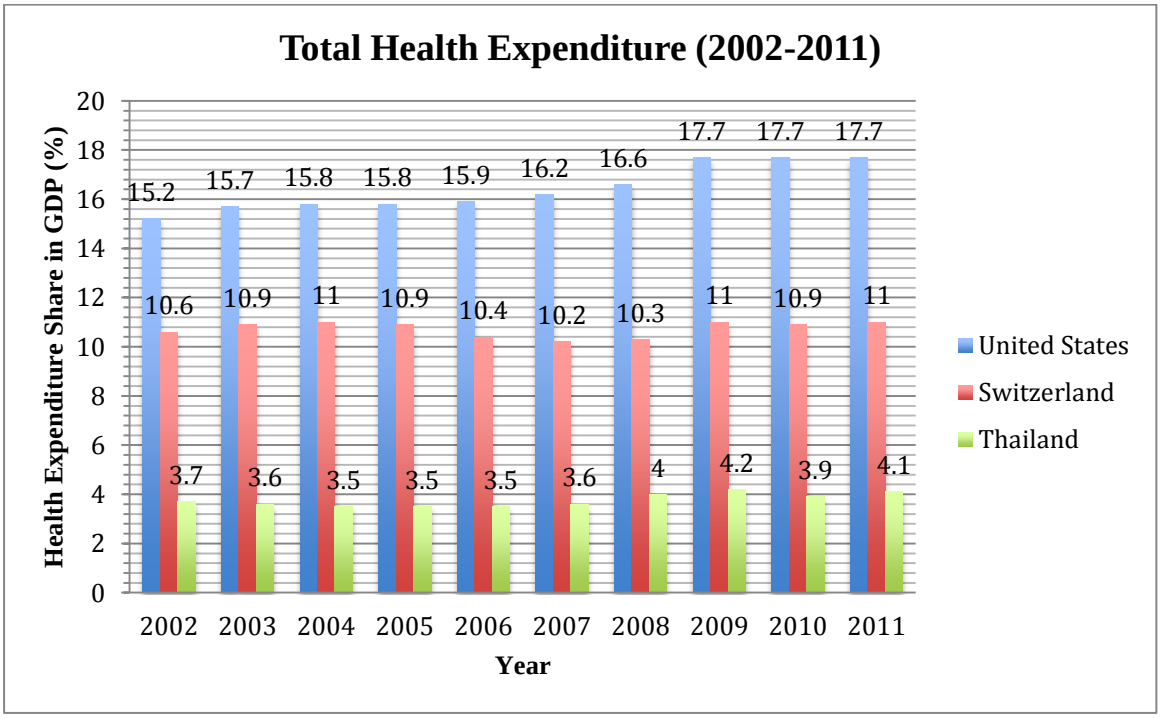


Figure 1: Total Health Expenditure as % of GDP (2002-2011)[3]

Source: Author constructed from Table 1

[3] As shown, Switzerland has always been allocating a higher portion of the national income (GDP) toward the healthcare sector than Thailand. Here, we included data from the United States of America to reflect the relative health spending of each country. Both Switzerland and Thailand tend to maintain their proportion of country's income allocated to healthcare, with Thailand's figures striking around 30% of those of Switzerland.

Per Capita Total Health Expenditure (PPP US$)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	5453	5989	6349	6728	7107	7483	7761	7990	8233	8608
Switzerland	3644	3744	3901	3981	4211	4539	4893	5098	5297	5564
Thailand	197	206	219	237	251	274	318	328	331	353

Table 2: Total Health Expenditure Per Capita (2002-2011)

Source: WHO

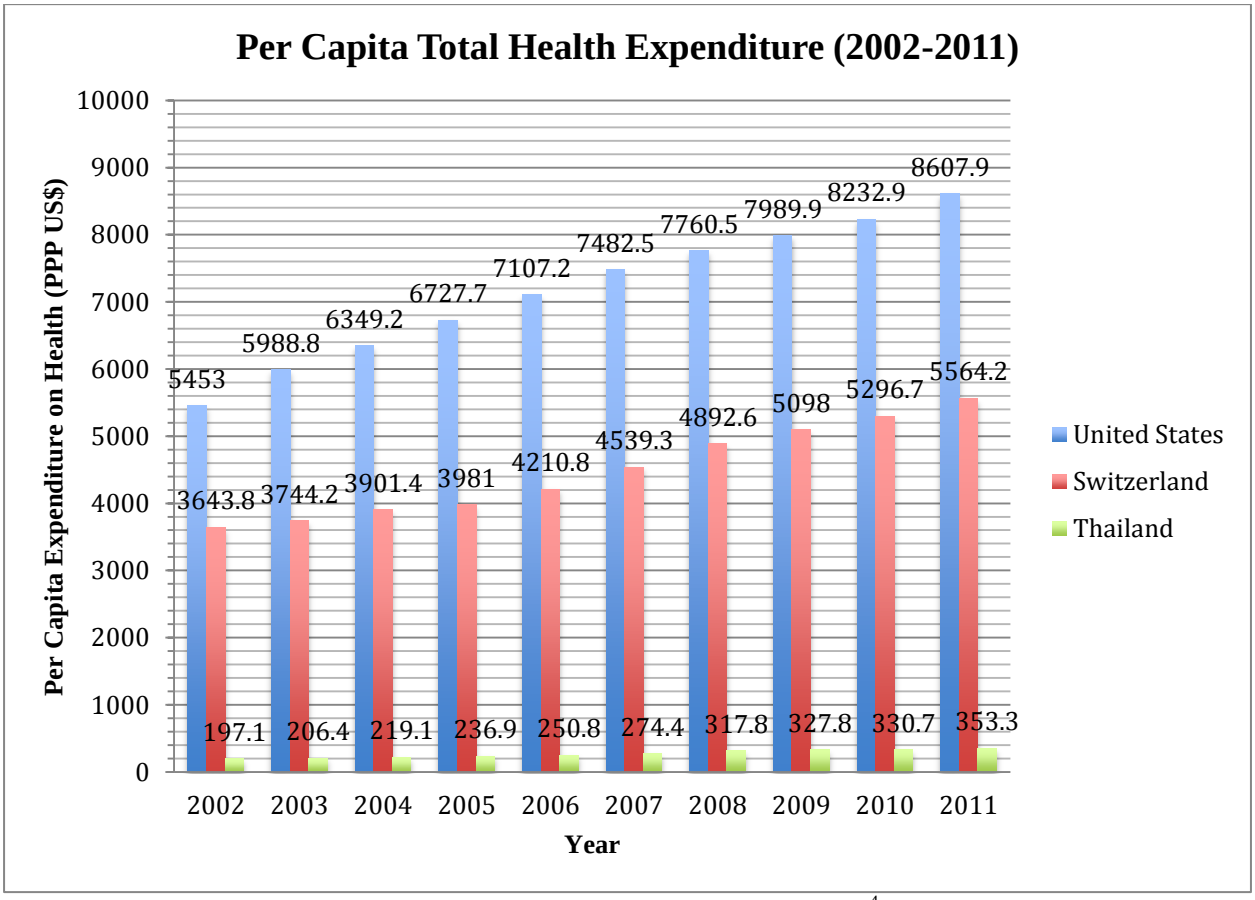


Figure 2: Total Health Expenditure Per Capita (2002-2011)[4]

Source: Author constructed from Table 2

[4] The figure shows each of the three country's health expenditure measured in an alternative form, per capita basis. The unit of measurement here is PPP US$, which is calculated through the Purchasing Power Parity (PPP) index of 2005 by the World Health Organization (WHO). Again, the United States dominates in terms of a much higher spending. Focusing on Switzerland and Thailand, Swiss total health expenditure per person has been significantly higher than that in Thailand. In 2002, Swiss figure is as high as 18.5 times of the Thai figure. Yet, the size-difference gap seems to be lessening over the interval of these selected ten years. In 2011, total health spending per capita in Switzerland is 15.7 times of the Thai magnitude of the same measure. Over the shown decade, Swiss total health expenditure per capita was 16.7 times, on average, bigger than in Thailand. However, for all three countries, there are increasing trends, which could be partly explained by the global rise in healthcare costs due to advanced medical technology and curing procedures.

Medical Non-Durables Expenditure (% of Total Health Expenditure)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	11.9	12.1	12.2	12.2	12.4	12.3	12.1	12.1	11.8	11.7
Switzerland	10.4	10.6	10.5	10.6	10.4	10.3	10.1	10.1	9.7	9.4
Thailand	3.9	3.9	4.1	4.3	4	3.1	3.8	4.7	5	N/A

Table 3: Expenditure on Non-Durable Medical Goods as % of Total Health Expenditure (THE)

Source: OECD's iLibrary, Thai MOPH: IHPP's Publication of National Health Account

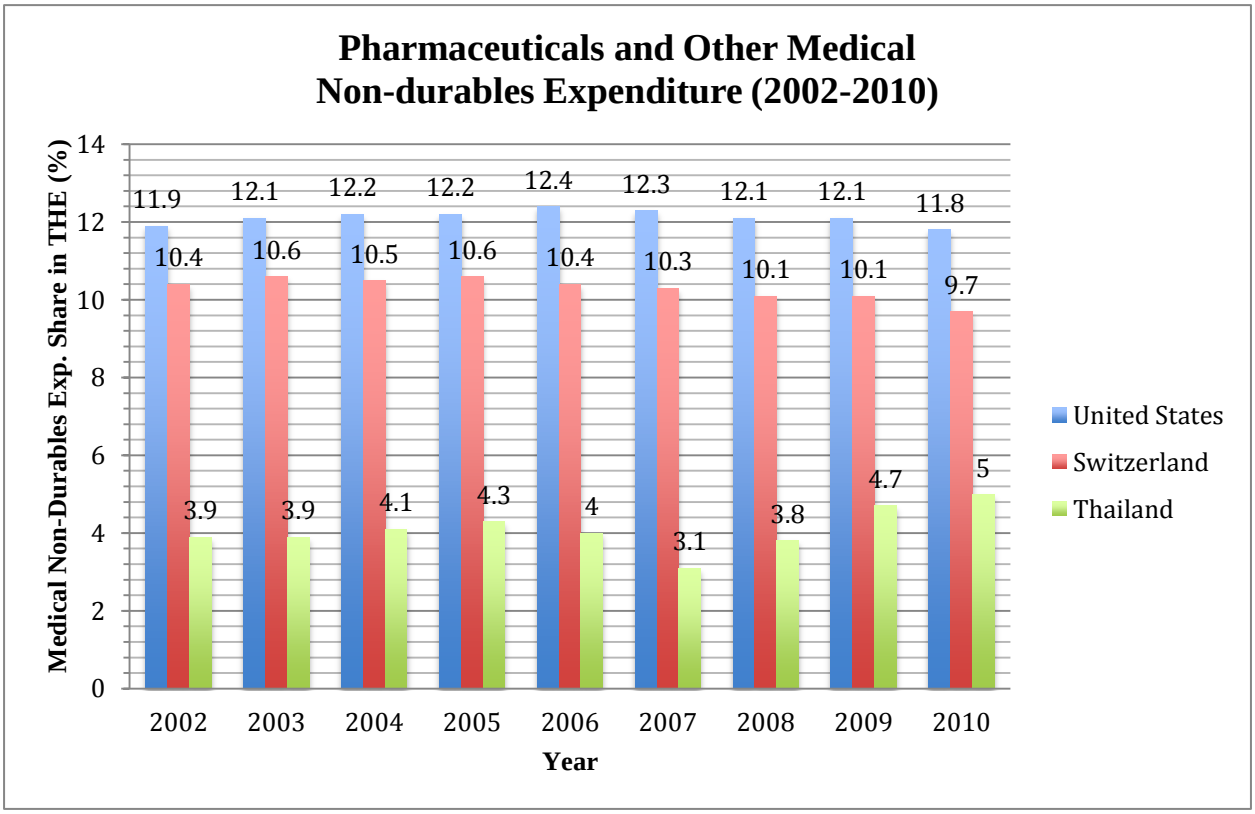


Figure 3: Expenditure on Medical Non-Durables as % of Total Health Expenditure (THE)[5]

Source: Author constructed from Table 3

[5] The term 'Medical Non-Durables' basically refers to drugs/pharmaceutics and other non-durable medical products. This excludes therapeutic appliances, which are classified as 'Durables' due to their long life of use. Together, all of these goods are referred to as 'Medical Goods'. (See Appendix1 for data on Medical Durables Expenditure and Medical Goods Expenditure in both Switzerland and Thailand)

Real Resources

CT scanners[6]

CT scanners (per 1m pop)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	N/A	29.26	32.29	N/A	34.02	34.31	N/A	N/A	N/A	40.89
Switzerland	N/A	N/A	N/A	N/A	N/A	31.39	32.04	32.8	32.58	33.62
Thailand	4.89	4	4.29	4.68	4.82	4.93	5.06	4.44	5.01	N/A

Table 4: Amount of CT Scanners per 1million Population

Source: OECD iLibrary, Thai MOPH: Bureau of Policy and Strategy's Report on Healthcare Resources

Among the internationally priced real healthcare resources, CT scanner is the only one with data availability for both countries and for the selected time period. Not until 2007 is the data in Switzerland available. However, Switzerland significantly has abundant amount of this medical equipment, compared to Thailand. For the period 2007-2011, it seems like the overall trend has been an increasing one. For Thailand, the value has been fluctuating since 2002-2010; therefore, the overall trend during the period can't be determined.

[6] Computed Tomography (CT) scanner gives a more detailed image, and in turn more information and accuracy, than normal X-rays. It is used for monitoring and detecting abnormality in different part of the bodies such as tumor, vascular disease, and etc. This high-technology medical equipment indicates whether the detected tumor is benign or malignant. Therefore, it's highly useful and needed in order to improve cancer detection since tumor indicates cancer if the tumor is malignant.

Hospital Beds

Hospital Beds (per 1,000 pop)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	3.39	3.33	3.26	3.2	3.18	3.14	3.13	3.08	3.05	N/A
Switzerland	5.95	5.82	5.67	5.54	5.39	5.36	5.21	5.1	4.96	4.87
Thailand	2.15	2.14	2.13	2.15	2.15	2.22	1.99	1.85	2.11	2.25

Table 5: Amount of Hospital Beds per 1,000 people

Source: OECD iLibrary, Thai MOPH: Bureau of Policy and Strategy's Report on Healthcare Resources

Switzerland has abundant hospital beds to support its population, compared to Thailand. It even has more beds per capita than in the United States, where the expenditure on health has always been the highest in the world. Additionally, there is a notable difference in the variable trend in these countries. This density of hospital beds has been decreasing in Switzerland (and also the United States) whereas it has been fluctuating in the case for Thailand. Thai endowment of hospital beds per population has been quite stable during 2002-2006 but then started to fluctuate. It increased in 2007 but then consecutively followed by a decreasing trend. Not until 2010 that it started to improve again and in 2011 even exceeded the previously stable level. So, if the trends continue for both Switzerland and Thailand, the two countries are converging in term of its amount of hospital beds per population.

Physicians (Professionally Active)[7]

Physicians (per 1,000 pop)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	2.5	2.54	2.54	2.58	2.57	2.58	2.58	2.58	2.57	2.6
Switzerland	3.56	3.72	3.75	3.8	3.85	3.85	3.88	3.9	3.87	3.9
Thailand	0.28	0.29	0.3	0.31	0.34	0.36	0.34	0.3	0.35	0.39

Table 6: Number of Physicians per 1,000 people

Source: OECD iLibrary, Thai MOPH: Bureau of Policy and Strategy's Report on Healthcare Resources

Switzerland has been hosting a higher amount of physicians per capita than in Thailand. Again, it even has more abundance of this human resource, measured on a per capita basis, than in the United States. However, the trends for both countries are the same. Both show an overall increasing trend in the number of this sub-category of human resource in the healthcare sector.

[7] Physician is a formal term for medical doctors. We can further subdivide the term 'physician' into 'practising' and 'professionally active'. 'Practising' refers only to those who have direct contacts – practical application of treatment or preventive care- with patients while 'Professionally Active' refers to all physicians that are still working, including those working on research study and health promotion without any direct contact with patients. This study selects 'professionally active physicians' as one of the domestic-priced real healthcare resources since the Thai database doesn't subdivide the physicians by their practical role.

Nurses (Registered/Professional)[8]

Nurses (per 1,000 pop)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Switzerland	N/A	N/A	N/A	N/A	N/A	10.31	10.15	10.26	10.47	10.68
Thailand	1.36	1.46	1.53	1.63	1.62	1.68	1.74	1.6	1.88	2.01

Table 7: Number of Professional Nurses per 1,000 people

Source: OECD iLibrary, Thai MOPH: Bureau of Policy and Strategy's Report on Healthcare Resources

For the period that data are available for both Switzerland and Thailand, Switzerland has been dominating in term of its amount of nurses per population. Due to unavailability of data in Switzerland in the period of 2002-2006, the overall trend can't be determined. Also, despite the availability of Swiss data in 2007-2011, no obvious trend can be seen. But for Thailand, the density of nurses has been exhibiting an overall increasing trend over the ten years period of 2002-2011.

[8] 'Nurses' refers to registered nurses, which are required to obtain a degree from a nursing program in college and also a nursing license. A registered nurse is term equivalent to the OECD termed 'professional nurse'. They are the nursing professionals who are responsible for patient care and preventive and curative measures in practice, either on their own or together with physicians.

Technical Nurses (Associates)[9]

Technical Nurses (per 1,000 pop)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Switzerland	N/A	N/A	N/A	N/A	N/A	4.4	4.76	4.94	5.55	5.92
Thailand	0.45	0.38	0.32	0.26	0.21	0.21	0.15	0.13	0.14	0.13

Table 8: Number of Technical Nurses per 1,000 people

Source: OECD iLibrary, Thai MOPH:Bureau of Policy and Strategy's Report on Healthcare Resources

Similar to the previous, Switzerland's data for technical nurses are unavailable from 2002-2006. However, trend implications in this case are different than the case for professional nurses. Over the period of 2007-2011, where Swiss data are available, there has been an increasing trend for the amount of technical nurses per population in Switzerland. For Thailand, the trend in technical nurse density has been an overall decreasing one, which is a trend reversal with the case for its professional nurse density.

[9] The term 'Technical Nurse' in Thailand refers to those nurses whose job concerns only primary care or nursing uncomplicated patients, handicapped, pregnant women, infants, elderly, mental retards, and patients with psychic problems. These nurses are not required to hold a nursing license and so are working under the supervision of health professionals such as registered/professional nurses. The technical nurses are also responsible for preparing medical equipment to be used in health services provision. This 'Technical Nurse' term is basically equivalent to the OECD's term of 'Associate Professional Nurse', referring to nurses who work under the supervision of healthcare, treatment, and referral plan implemented by medical, nursing, and other health professionals.

Resource Profile: Switzerland and Thailand[10]

Total Health Expenditure (% of GDP)								
	Actual Values				Relative Values			
	2007	2008	2009	2010	2007	2008	2009	2010
Switzerland	10.2	10.3	11	10.9	1	1	1	1
Thailand	3.6	4	4.2	3.9	0.35	0.39	0.38	0.36

Table 9: Actual and Relative Values of Total Health Expenditure in Switzerland and Thailand

Source: Author constructed from Table 1

Per Capita Total Health Expenditure (PPP US$)								
	Actual Values				Relative Values			
	2007	2008	2009	2010	2007	2008	2009	2010
Switzerland	4539	4893	5098	5297	1	1	1	1
Thailand	274	318	328	331	0.06	0.06	0.06	0.06

Table 10: Actual and Relative Values of Per Capita Total Health Expenditure in Switzerland and Thailand

Source: Author constructed from Table 2

Medical Non-Durables Expenditure (% of THE)								
	Actual Values				Relative Values			
	2007	2008	2009	2010	2007	2008	2009	2010
Switzerland	10.3	10.1	10.1	9.7	1	1	1	1
Thailand	3.1	3.8	4.7	5	0.3	0.38	0.47	0.52

Table 11: Actual and Relative Values of Expenditure on Medical Non-Durable Goods in Switzerland and Thailand

Source: Author constructed from Table 3

[10] Only data during the period of 2007-2010 are presented and used in the relative values calculation. The reason is that the data on amount of CT scanners in Switzerland hadn't been available until 2007 whereas the Thai 2011 data on this variable is not available yet. Therefore, the only overlapping period of complete data in all resource variables is from 2007 to 2010. The focus should be on the right column tables, which display the relative values of selected resource variables.

CT Scanners per 1m population								
	Actual Values				Relative Values			
	2007	2008	2009	2010	2007	2008	2009	2010
Switzerland	31.4	32	32.8	32.6	1	1	1	1
Thailand	4.9	5.1	4.4	5	0.16	0.16	0.13	0.15

Table 12: Actual and Relative Amount of CT Scanners Per Capita in Switzerland and Thailand

Source: Author constructed from Table 4

Hospital Beds per 1,000 population								
	Actual Values				Relative Values			
	2007	2008	2009	2010	2007	2008	2009	2010
Switzerland	5.36	5.21	5.1	4.96	1	1	1	1
Thailand	2.22	1.99	1.85	2.11	0.41	0.38	0.36	0.43

Table 13: Actual and Relative Amount of Hospital Beds per Capita in Switzerland and Thailand

Source: Author constructed from Table 5

Physicians per 1,000 population								
	Actual Values				Relative Values			
	2007	2008	2009	2010	2007	2008	2009	2010
Switzerland	3.85	3.88	3.9	3.87	1	1	1	1
Thailand	0.36	0.34	0.3	0.35	0.09	0.09	0.08	0.09

Table 14: Actual and Relative Amount of Physicians per Capita in Switzerland and Thailand

Source: Author constructed from Table 6

Nurses per 1,000 population								
	Actual Values				Relative Values			
	2007	2008	2009	2010	2007	2008	2009	2010
Switzerland	10.31	10.15	10.26	10.47	1	1	1	1
Thailand	1.68	1.74	1.6	1.88	0.16	0.17	0.16	0.18

Table 15: Actual and Relative Amount of Nurses per Capita in Switzerland and Thailand

Source: Author constructed from Table 7

Technical Nurses per 1,000 population								
	Actual Values				Relative Values			
	2007	2008	2009	2010	2007	2008	2009	2010
Switzerland	4.4	4.76	4.94	5.55	1	1	1	1
Thailand	0.21	0.15	0.13	0.14	0.05	0.03	0.03	0.03

Table 16: Actual and Relative Amount of Technical Nurses per Capita in Switzerland and Thailand

Source: Author constructed from Table 8

From the actual values, Switzerland dominates in all measures of healthcare resources and therefore defines the 'resource frontier' for the whole focused time interval. So, Thailand's figures show relative size of Thai to the Swiss figures during this specified time period. The spider-web diagrams of both countries are plotted out on the next page.

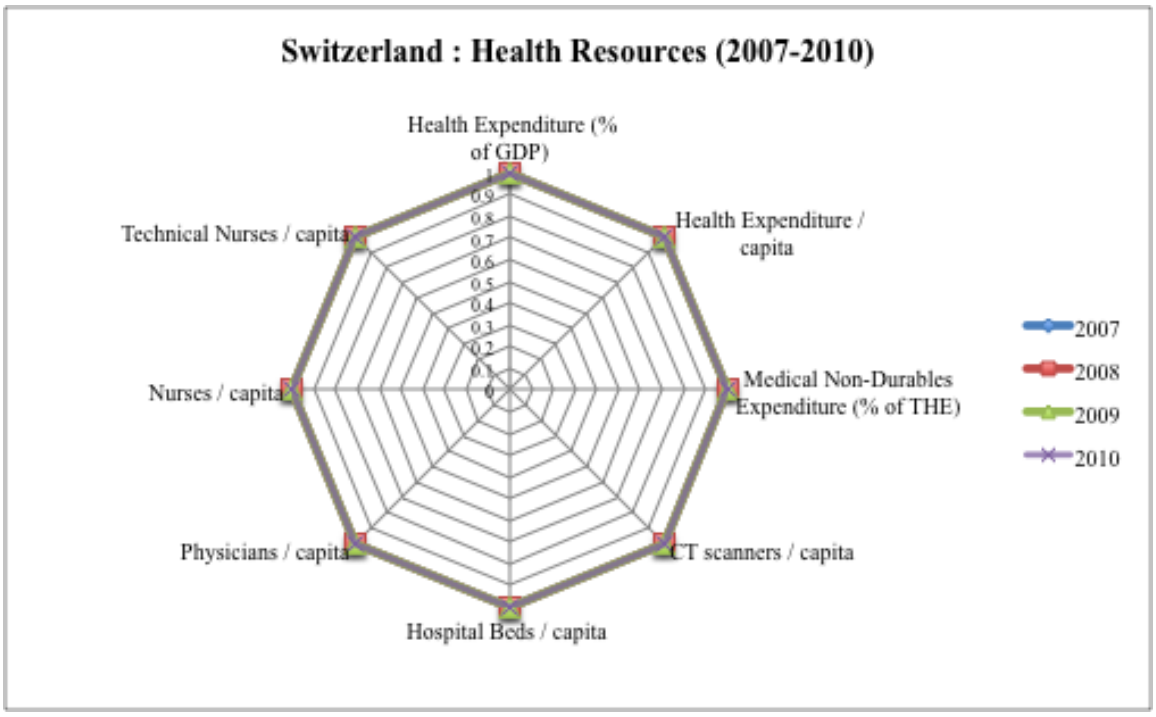


Figure 4: Switzerland's Health Resource Profile (2007-2010)

Source: Author constructed from Table9-Table16

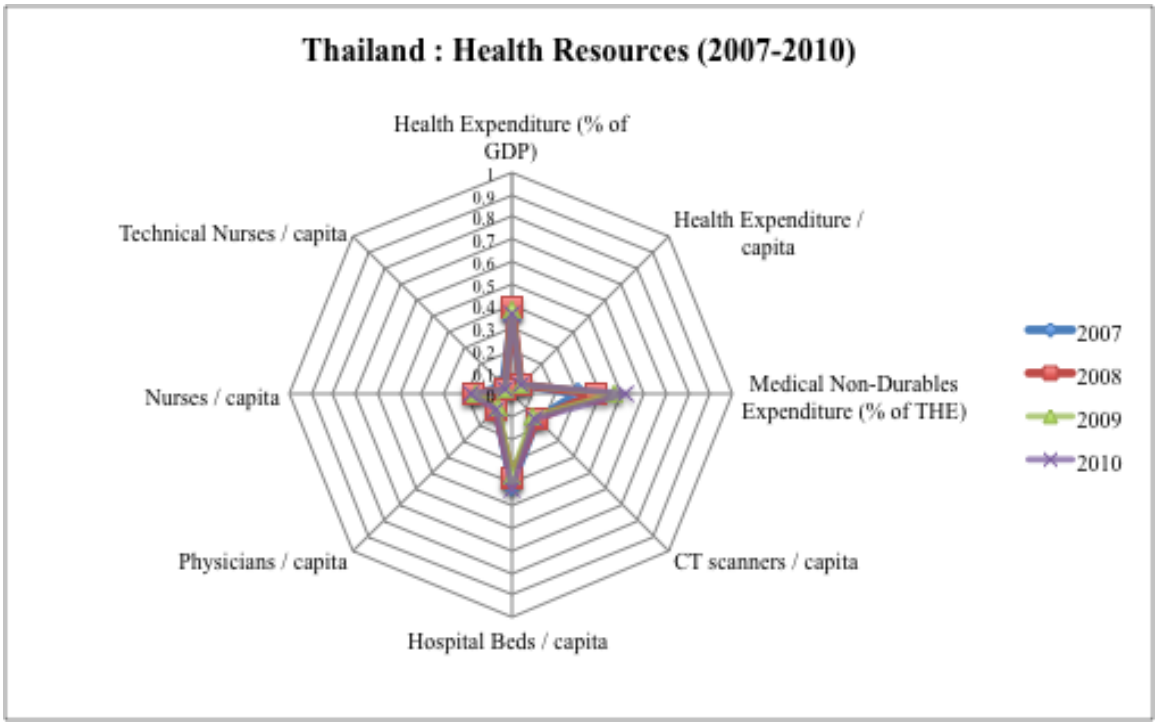


Figure 5: Thailand's Health Resource Profile (2007-2010)

Source: Author constructed from Table9-Table16

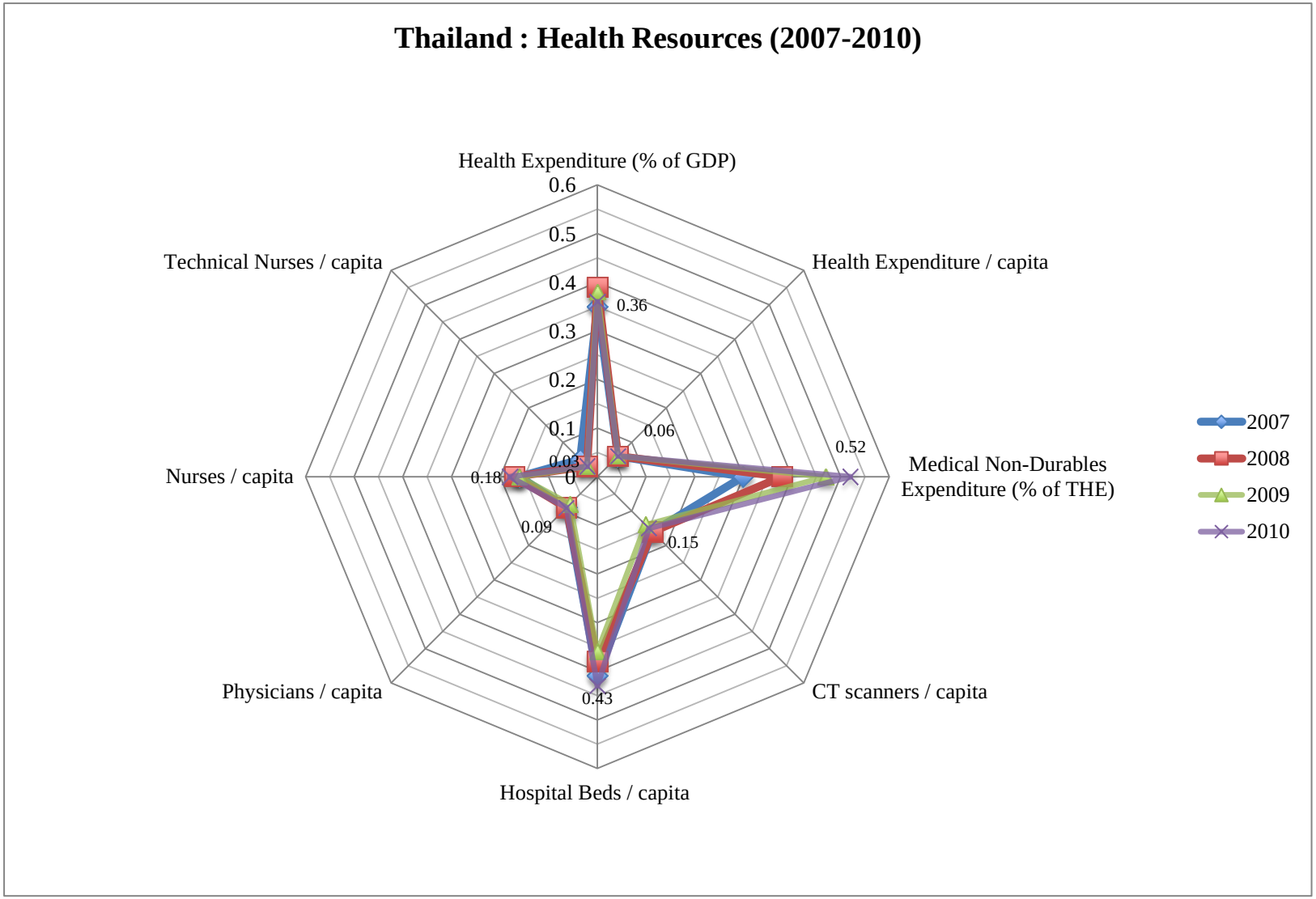


Figure 5.1: A Close-Up of Figure 5

From the spider-web diagrams, Switzerland dominates in both financial and real resources over the whole time period. In term of financial resources, Thailand has been relatively very weak in terms of amount of money allocated to healthcare measured on a per person basis. Undoubtedly, this enormous difference makes sense keeping in mind the significant difference in country's income and status. Thailand is still a developing country while Switzerland is a developed country with a very high standard and cost of living. However, Thailand's money allocation toward healthcare is modest with the other two variables (Share of Medical Non-Durables in Total Health Expenditure and Total Health Expenditure's Share in GDP) striking more or less than half size of those of Switzerland.

In terms of medical technology, which is reflected only through available CT scanners here, Thailand's access on this high-cost medical equipment is still low.
This somehow points back to the fact that Thailand spends much lesser on the healthcare sector. It is understandable by difference in national income and in turn, spending toward healthcare. Next to discuss is human resources, which are locally priced unlike CT scanners. Still, Thailand has obviously low human resources whether it's physician, professional nurse, or associate nurse whereas facilities such as hospital beds are quite abundant.

Lastly, observing on changes and trends, all variables remain quite constant. Yet, the variable 'medical non-durables' in Thailand has been showing an increasing trend. These goods have been taking up a higher and higher portion of the total health expenditure. In other words, from the given financial healthcare resources, more and more portion is being spent on these medical non-durable goods.

In summary, our country has allocated lower resources toward healthcare. Specifically, our human resources in the sector are very low despite the modest amount of hospital beds available to the population. In terms of monetary expenditure, the absolute value of money our nation spent on health, measured on a per capita basis, is substantially very low. However, when considering with our national income, our dedication on healthcare is not extremely low or too far behind from Switzerland. Also, more and more weight in Thai health spending has been on the non-durable medical goods such as pharmaceutics/drugs. The main disadvantage probably is the inadequate stock of people working in the healthcare industry. The next section of discussion is on the healthcare delivery structure and how the burden is shared between the government and the private sector.

Healthcare Delivery

The government and non-government healthcare organizations all play a role in providing healthcare services to the people. However, each country has a different structure in healthcare delivery. To be specific, the weight of service delivering responsibility between the public (government) sector and the private sector (households, insurance firms, and non-government service providers) differs across countries. The two main bodies can also be referred to as the healthcare sector's 'financing agents' since the health spending came from either one of these two. Despite the structure of the delivery system, each country's general goal is to ensure its population has equal access to quality care. The governmental health organization overlooks and regulates the healthcare system in concerns of healthcare education, prevention, and other related health services.

Financing Agents

Data on the share of each financing agent in the total health expenditure shows the weight composition and relative reliance on the country's governmental body and private sector accordingly. This data of Switzerland and Thailand over the selected period covering 2002 to 2011 are shown below.

Thailand: Share of Financing Agent (% of THE)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Public	63.2	63.5	64.7	64.1	72.4	76	75.9	74.3	74.8	N/A
Private	36.5	36.2	35.1	35.6	27.3	23.7	23.8	25.4	24.9	N/A
RoW	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	N/A

Table 17: Thailand's Share of Financing Agent in Total Health Expenditure (2002-2011)

Source: Thai MOPH: IHPP's Publication of National Health Account

Switzerland: Share of Financing Agent (% of THE)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Public	57.7	58.3	58.4	59.5	59.1	59.1	65.2	65.5	65.2	64.9
Private	42.3	41.7	41.6	40.5	40.9	40.9	34.8	34.5	34.8	35.1

Table 18: Switzerland's Share of Financing Agent in Total Health Expenditure (2002-2011)

Source: OECD's iLibrary

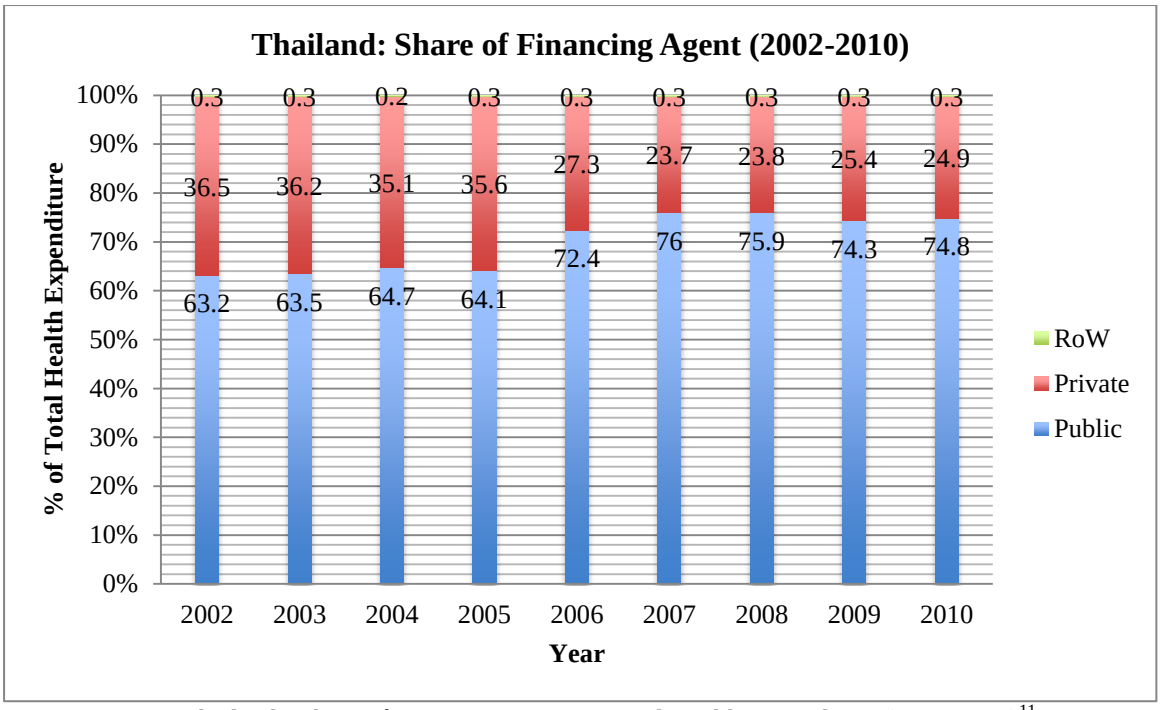


Figure 6: Thailand's Share of Financing Agent in Total Health Expenditure (2002-2010)[11]

Source: Author constructed from Table 17

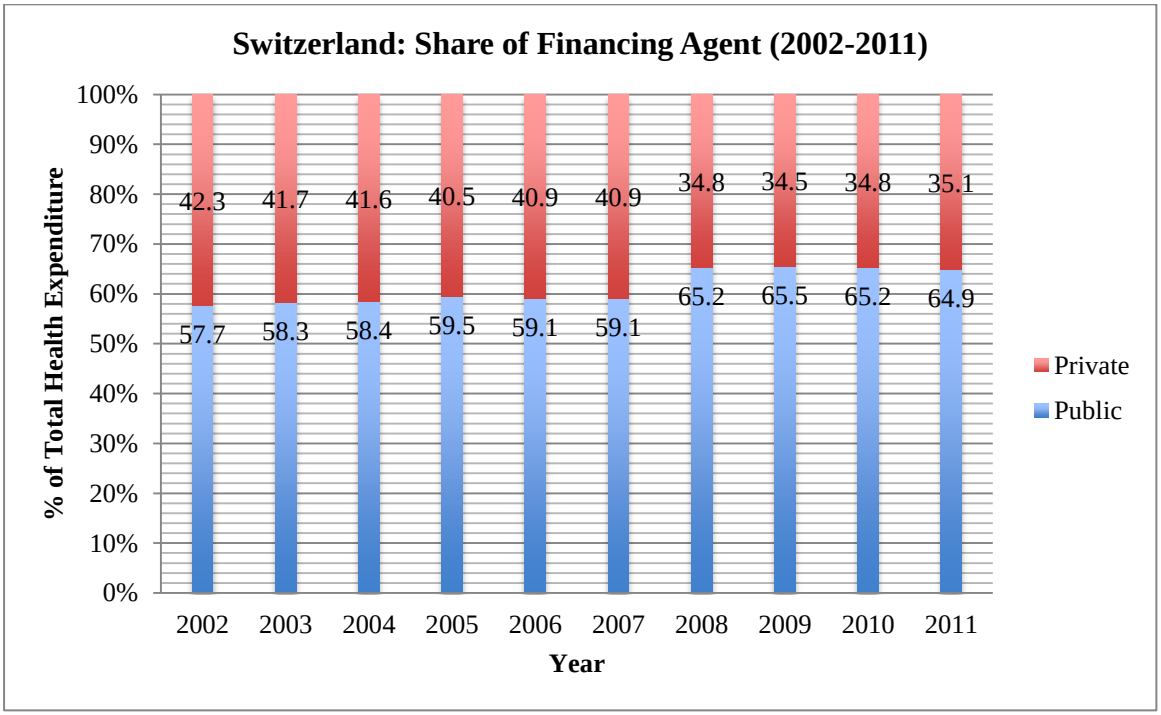


Figure 7: Switzerland's Share of Financing Agent in Total Health Expenditure (2002-2011)

Source: Author constructed from Table 18

[11] Data of 2011 is not available yet.

Thailand

With only a small portion of the nation's total expenditure on health is from the private sector and financial aids from the rest of the world, Thailand has high dependence on the government spending in healthcare. Most of the healthcare services are delivered by the public sector, especially in the case of rural areas and non-urbanized provinces. The country's private hospitals concentrate in Bangkok and are only present mostly in big or high-populated provinces such as Chiang Mai, Chonburi, and Phuket. Also, private hospitals charge expensive user fees. Therefore, the poor and common households, which mark the majority of Thai population, acquire health services from the public providers.

The level of offered medical care and operation scale of the Thai public healthcare providers are summarized in the diagram below. (See Appendix2 for definition of the level of medical care). These government-based healthcare providers are funded by the government budget allocated by the agency called 'National Health Security Office', abbreviated as the NHSO. Over the past decade, the amount of allocated budget increases by more than two times, implying the government has been noticing a higher importance of healthcare.

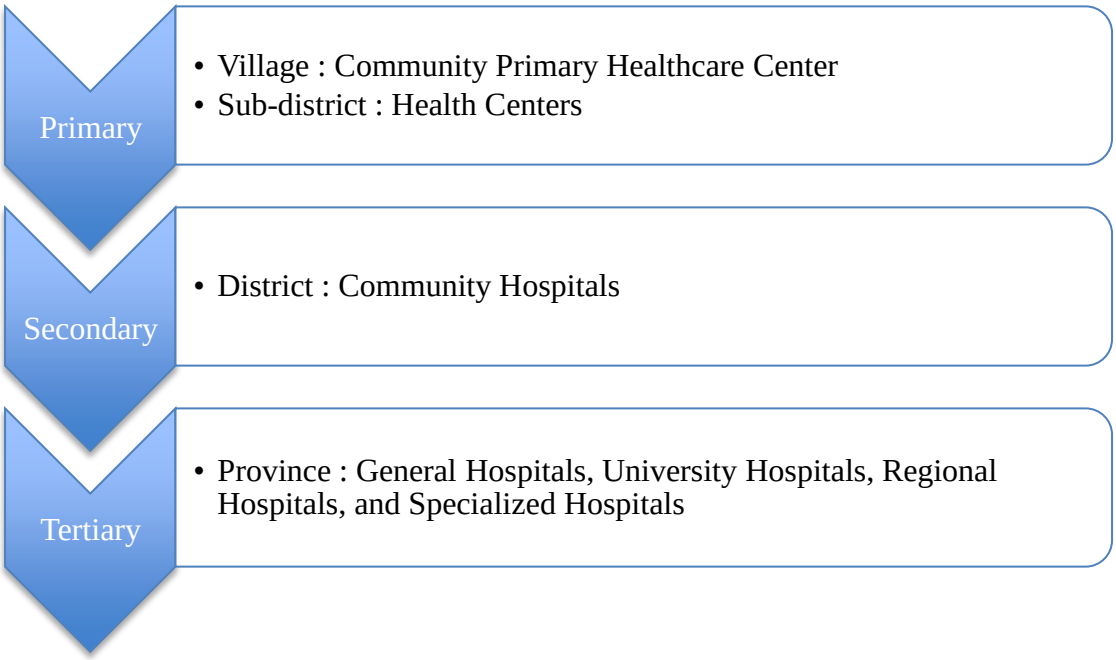


Figure 8: Level of Medical Care and Corresponding Operational Scale of Public Healthcare Providers in Thailand

Each sub-district (Tambon) usually has 1-2 health centers. In 2009, the government health policy focused on improving the system of public health service providers at all medical care levels through standardization. The government has decided to upgrade the sub-district health centers into hospitals. They were then re-termed as 'Tambon Health Promoting Hospital' instead of health centers. The conceptual framework behind the upgrade is the important role of primary care in developing the system of public health services. Through this 'Tambon Health Promoting Hospital', the services emphasize on disease prevention, dealing with risk health factors, and health behavior adjustment as these are tackling with health problems from the causes. Through this operational scale of health service provider, the people in upcountry and rural areas, which mark the majority of the country's population, have access to services that encourage them to adopt a proper healthy lifestyle.

Switzerland

While Thailand relies heavily on the government for healthcare, this is not the case for Switzerland. Swiss healthcare has low dependence on the general government in terms of health spending. The health expenditure financed by the public sector in Switzerland has always been lower than the OECD's average for the whole period of ten years. (See Appendix2 for OECD countries' share of public sector in the total health expenditure over the period of 2002-2011)

The high relevance of the private sector is due to the fact that all Swiss residents are obligated to purchase a basic health insurance from the private insurance firms. Thus, one major source of the high private expenditure on health comes from the insurance firms. However, another source of contribution to the private health expenditure is the out-of-pocket payments from households. It seems contradictory that the country has a prepayment scheme in the form of compulsory health insurance but still has high out-of-pocket healthcare. Actually, Switzerland has one of the highest out-of-pocket health payments, ranking fifth in the OECD in 2009. However, there are complications and so cautions to be made in interpretation. The significantly high amount of out-of-pocket payments may lead us to believe that large portion of Swiss households would be facing severe financial catastrophe. One of the arguments against it would be the fact that households that are paying for long-term care, which accounts for one-third of the nation's out-of-pocket spending, mostly receive cash

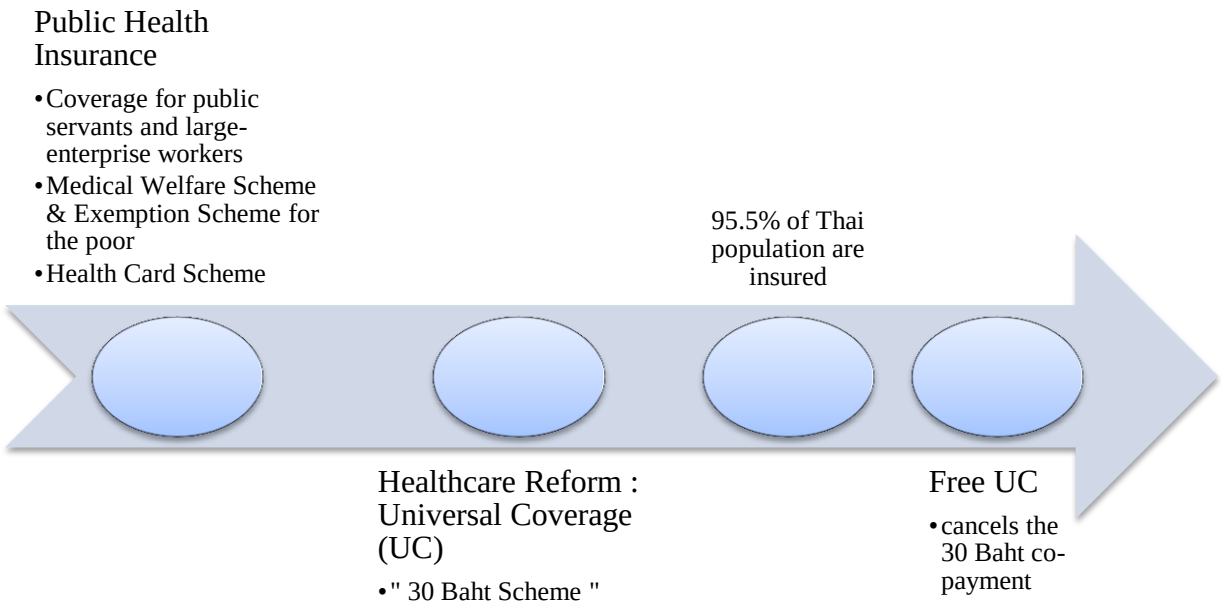
benefits. Therefore, the high out-of-pocket payment misrepresents high financial burden without taking into account the financial aid these households receive. Another main argument will be discussed through the health insurance scheme in the next section.

Health Insurance Scheme & Universal Coverage

Building on the literature review, a prepayment scheme is another major feature of the healthcare system to focus on. The development of a prepayment scheme and social institutions to pool financial risk, reducing financial catastrophe faced by the nation's households, are addressed for each country at a time.

Thailand

For the evolution of public universal coverage in Thailand, we date back to the time when the well known "30 Baht Co-Payment Scheme" was being introduced. A progress of public insurance scheme in Thailand can be briefly summarized by the following timeline.



In the 1990s, the public health insurance schemes provide coverage for civil servants, workers in large enterprises, and poor households. The public servants and those enterprise workers are covered through the 'Civil Servant Medical Benefit Scheme', 'Social Security Scheme' and 'Workmen's Compensation Scheme' accordingly. Meanwhile, there were 'Medical Welfare Scheme' and 'Type B Exemption Scheme' for the poor but the latter depends on the public health staffs' decision on waiving the payments. Also, there was a voluntary yet subsidized 'Health Card Scheme', which was covering 20% of the Thai population at that time. Households who own the card were paying an annual fee of 500 Baht for the healthcare. Under these public health insurance schemes, only 40% of Thai people were being insured. Of the rest 60%, those lacking coverage counted for 28% of the population whereas 32% were only receiving means-tested assistance from the Medical Welfare Scheme.

In 2001, health reforms were carried out. The major one is the implementation of the universal coverage scheme called "30 Baht Treats All Diseases Project", which requires a co-payment of only 30 Baht for treatment defined in as basic benefits. This universal coverage scheme basically replaced the existing Health Card, Medical Welfare, and Type B Exemption Schemes and extended coverage to the whole population, not only on some particular groups as the previous schemes did. Citizens are required to register at their home area's contracting unit in order to get a gold card. There were two types of gold cards: the regular and the special version, which is only for the poor people, elderly and children. With this special version of gold card, they are exempted from the 30 Baht co-payment. But, both types of gold card equally entitle cardholders to receive the care in their corresponding area only; however, there were exceptions in case of any accident or emergency. A national list indicates the drugs that can be prescribed. Cost ceilings are present in the case for chronic disease or any other high-cost treatments. This universal coverage (UC) scheme was financed through government revenues that are allocated by the National Health Security Office (NHSO) to local purchasing offices, who then make contracts with local contracting units for primary care (CUPS). The amount of fund allocated to each CUP depends on the amount of population in that CUP's area of service. The CUPs then use the fund to support the local service units and pay for referrals when patients need secondary or tertiary care.

By 2004, the amount of insured population had more than doubled from the 2001 figure. It went up from 25 million to more than 59million people or from 40% of the total population to 95.5%. However, the government canceled the 30 Baht co-payment in 2007. Since then, the government has been offering 'Free Universal Coverage' for the Thai people.

While the major success of this low-cost healthcare populist policy was the rapidly expanding population coverage and access to healthcare, early criticisms were on the service limitation to only the individual's home area and claimed lower quality healthcare services. But, the current challenge of the Thai healthcare system is upon the issue of 'Financial Sustainability'. The threats to the system's financial sustainability include both a common concern across nations and Thailand specific issues that arise from its current system structure. The common global concern is the continuous rise in demand for healthcare services and also healthcare costs. On the other hand, internal threats arise from own structure of the healthcare system. The highly competitive circumstance in the government budgeting process leads to instable financing of the Universal Coverage. Additionally, few gaps in the UC's covered benefits enhance an increase in healthcare spending. Lastly, the current existence of the three insurance schemes (Civil Servant Medical Benefit Scheme, Social Security Scheme, and the Universal Coverage Scheme) creates difficulty in coordination among the three schemes.

There are several major issues of the universal coverage healthcare in Thailand. The introduction of the 30 Baht scheme opened Thai population up to equitable access to primary healthcare. With the very low copayment of only 30 Baht, which now has become a zero co-payment, people tend to over-utilize the services and inefficient consumption of prescribed drugs. People lost their incentives for disease prevention and healthy lifestyles due to the available access to free healthcare. Adding up to the fact that hospitals are of limited amount, especially in the upcountry and rural areas,density of patientsincreases and leads to lower efficient services. Higher density of patients at a hospital, given scarce healthcare personnel especially in non-urbanized provinces, increases the chance of physician's mistakes in diagnosis and treatment procedure. As a result, filings against the hospitals are becoming more common.Moreover, under the UC scheme, budgeting constraint affects the quality of care since the budget allocated to the healthcare provider is calculated on the per capita basis not as per service charge. Thus, when patients visit the hospital often, the

hospital is losing on its profits. Given this budget constraint, it comes down to moral and ethic issues among the healthcare providers. It depends on each hospital's discretion whether to prescribe fine quality drugs, which the allocated budget might not be able to cover, or prescribing only some amount while asking the patients to get the rest from their respective primary or secondary healthcare providers.

Switzerland

Switzerland offers a universal healthcare through the law that requires all residents to get a basic health insurance plan from private health insurance firms. It is a comprehensive basic package including the three insurance types -sickness, maternity, and accident- and covering a range of treatments listed in the Swiss Federal Law on Health Insurance. The package has expanded over time still to include treatment that is considered appropriate and effective in both medical and cost perspectives. Thus, there is no double standard in basic healthcare throughout the whole country. Examples of the treatment covered in this mandatory basic package are as follows:

- Hospital Stay and Outpatient care in any general ward

-Nursing care, either at home or nursing home (maximum of 60 hours per week)

-Examination and treatment by a physician at a patient's home

-Rehabilitation (ordered by a physician)

-Nutritionist/diabetic consultation (maximum of 6 sessions)

-Legal Abortion

-Maternity costs (includes 7 routine examinations, post-natal examination, childbirth and 3 breast-feeding consultations

-Contribution to spectacles and contact lenses of CHF 180 (6,622 THB or 201.6 USD) per year for children and CHF 180 over 5 year period for adults[12]

[12] As of January 1,2014, the exchange rate is 36.79 THB/CHF. and 1.12 USD/CHF.

Regulated Insurance Market

Insurers : insurance firms

The insurance market is strictly regulated. The insurance firms are not allowed to deny any clients. Also, the insurers are prohibited to price discriminate their clients Even though the firms are allowed to set their own premium rate, this particular premium rate must apply to all of its clients in the same age-group. In other words, insurers can't charge premium basing on each client's health condition or risk of claims. Foundation 18 was created in order to make sure the insurance firms obey the rule. Based on the gender and age of clients, the foundation redistributes funds from low health risk plans to those with higher health risks. It's a process of risk-equalization that makes insurers willing to abide to the rule of constant premium rate despite of the client's risk of claims. Given that the basic package offered is universal across the country, the only way for insurers to compete is through their 'price' of the insurance plan, which is the 'premium'. So, the premium varies both within and across cantons of Switzerland. The level of premium is related to the amount of deductibles and the managed care organizations (MCOs) of each plan. However, the deductibles are regulated by the federal government through setting the possible range at $300 CHF to $2500 CHF. Also, the government plays a role in financial assistance to the households by setting some standard arrangements concerning cost sharing. For example, the annual co-payment of households is capped at 700CHF to prevent them from catastrophic expenditure. In the case for prescriptive drugs, the minimum deductible is set at 300 CHF together with a 10% co-insurance rate. However, the co-payment increases to 20% rate if the consumers choose brand drugs over generic drugs. (See Appendix3 for Insurance Terminology)Rate regulations are summarized in the following table.

	Adults	Children
Premium	No regulations	No regulations
Deductible	300 CHF-2,500 CHF	100CHF-600CHF
Co-Insurance Rate	10%	10%
(Using brand drugs)	20%	20%
Co-Payment (per year)	Max. 700 CHF	Max. 350 CHF

Table 19: Regulated Rates for Compulsory Health Insurance in Switzerland

Source: constructed by author

Moreover, the insurance firms include some health plans that hire managed careorganizations (MCOs). For a plan with a MCO, the MCO will make contract with only specific providers, which most of the time are their own medical centers, in order to reduce costs.Additionally, most MCOs use physician networks, in which general practitioners act as gatekeepers. As a result, the consumers are further more limited in the freedom of choice in choosing the healthcare provider. Therefore, with less consumer rights, the basic plan with a MCO charges lower premiums to the clients. Thus, the premium rates depend not only on the deductible amount but also on the option of whether to have a managed care in the plan or not.

Insured : individuals and households

The clients or 'the insured' face some degree of limited freedom of choice as well. A penalty applies if one fails to purchase the compulsory basic insurance package. However, low-income households that can't afford the premium payments receive financial assistance from their canton, which is an exercise of government power at the cantonal level. The administration and power distribution of the government will be discussed in details later in this study. But, the residents are free to choose the insurance firms. Also, they are free to choose the healthcare provider from the approved list but only that it must be in the client's canton of residence. Consumers are allowed to change the insurance company at a maximum of two times per year. The decision making process is facilitated by the high availability of public information on

health insurance firms. Comparisons and journals available online are examples of the widelyavailable information source.

Moreover, there is a 'No-Claim Bonus Scheme', which creates a self-reinforcing force toward containing healthcare costs. The scheme reduces the amount of premium charged for clients who didn't make any insurance claims. Also, the premium reduction is in an increasing rate and can reaches to even 45% reduction in premium amount after 5 years. The scheme is designed to discourage over-utilization of healthcare services through creating incentives toward healthier lifestyles.

Advantages and benefits of this unique Swiss healthcare system can be summarized as follows:

1. No Adverse Selection
2. Equality in Healthcare Access
3. High Market Competition in the Insurance Market
4. Discouraged Over-Utilization of Health Services

The problem of adverse selection is eliminated through the action that all insurance firms provide the same basic package to all clients, having no rights to choose which client to accept or reject. Low-income households, who can't afford to pay the premium, receive financial assistance from the government, which in this case refers to the cantonal authority. The government, in this place, refers to each canton's authority. So, it's each canton's responsibility to make sure all of the canton's residents are covered by the basic health insurance plan. This legislation basically opens up the chance for every resident to have access to the basic healthcare.

In addition to the basic package, a supplementary insurance package is also available for consumers. The package extends beyond those offered in the basic compulsory plan. Examples of benefits of the supplementary package are more choices concerning the basic treatment (having the rights to choose from any hospital, guaranteed privacy through having a one-bed room and treatment from most senior physicians) and dental care. Most Swiss residents acquire this supplementary health insurance despite the fact that it's only voluntary.

However, just as every other health systems, there are some critiques and issues of this unique and low public dependent healthcare system. One of

them concerns over the rising costs of healthcare in the country. Arguments were made that it partly came from the increased comprehensiveness of the basic package. Since 1985, benefits covered in the basic package expanded by more than 33%, as of January 2013. Possible end to this issue could have been removing the increased treatment benefits and placing them in the supplementary package instead. However, given that the supplementary insurance market is unregulated and so insurers are allowed to select clients based on their health risks, the problem of equitable access to healthcare will then emerge. Thus, necessary reforms are required to ensure that chronically ill people will not be prevented from getting the needed treatment. Another issue of this current Swiss system is the insufficient risk equalization. As discussed earlier, the risk-equalization is needed to run the mechanism of insurance firms not risk-selecting their clients. The current risk-equalization is only based on measures like sex and age, which are not enough to efficiently risk-equalize. A possible solution is to include other factors such as health status as measures. In January 2012, some improvement has been attempted by including a risk factor measured by the individual's hospital (or nursing home) stays for more than 3 days in the previous year. Another critique is made on the consumers' restricted choice, being limited to only cantonal hospitals of individual's canton of residence. Yet, this regulation was intentionally designed for the cost-saving purpose.

Administration

Centralized Case: Thailand

The Ministry of Public Health (MOPH) oversees the healthcare system in the country. Generally, the main function of the MOPH and its subordinate agencies is to oversee health promotion, disease prevention and control, medical care services, and rehabilitation with their authority stated by law.

Specifically, the MOPH is responsible for the following tasks:

1. Determine both the national and international health policies and strategies, taking into account the ongoing situation and changes.
2. Develop an efficient and equitable healthcare system that emphasizes on basic rights, specialized service and emergency medicine, surveillance system, disease prevention and control and health threats. Also, it needs to be ready and practical for both the normal situation and emergency.
3. Raise health consciousness, promote health and improve health behaviors by encouraging all sectors to participate
4. Develop a health management system that meets the standard of quality while keeping in line with the king's philosophy of Sufficiency Economy
5. Determine direction policy on health research and knowledge management

The following is the list of agencies that belong to the Ministry of Public Health:

-Office of the Minister

-Office of the Permanent Secretary (OPS)

-Department of Medical Services

-Department of Disease Control

-Department for Development of Thai Traditional and Alternative Medicine

-Department of Medical Sciences

-Department of Health Service Support

-Department of Mental Health

-Department of Health

-Food and Drug Administration

(See Appendix4 for all agencies in the Ministry of Public Health and Appendix5 for Autonomous Agencies under the MOPH's supervision)

The organizational structure and administrative system is presented in the following figure, where the bold line represents interaction in the form of 'supervision' whereas the dashed line represents 'information & coordination' relationship.

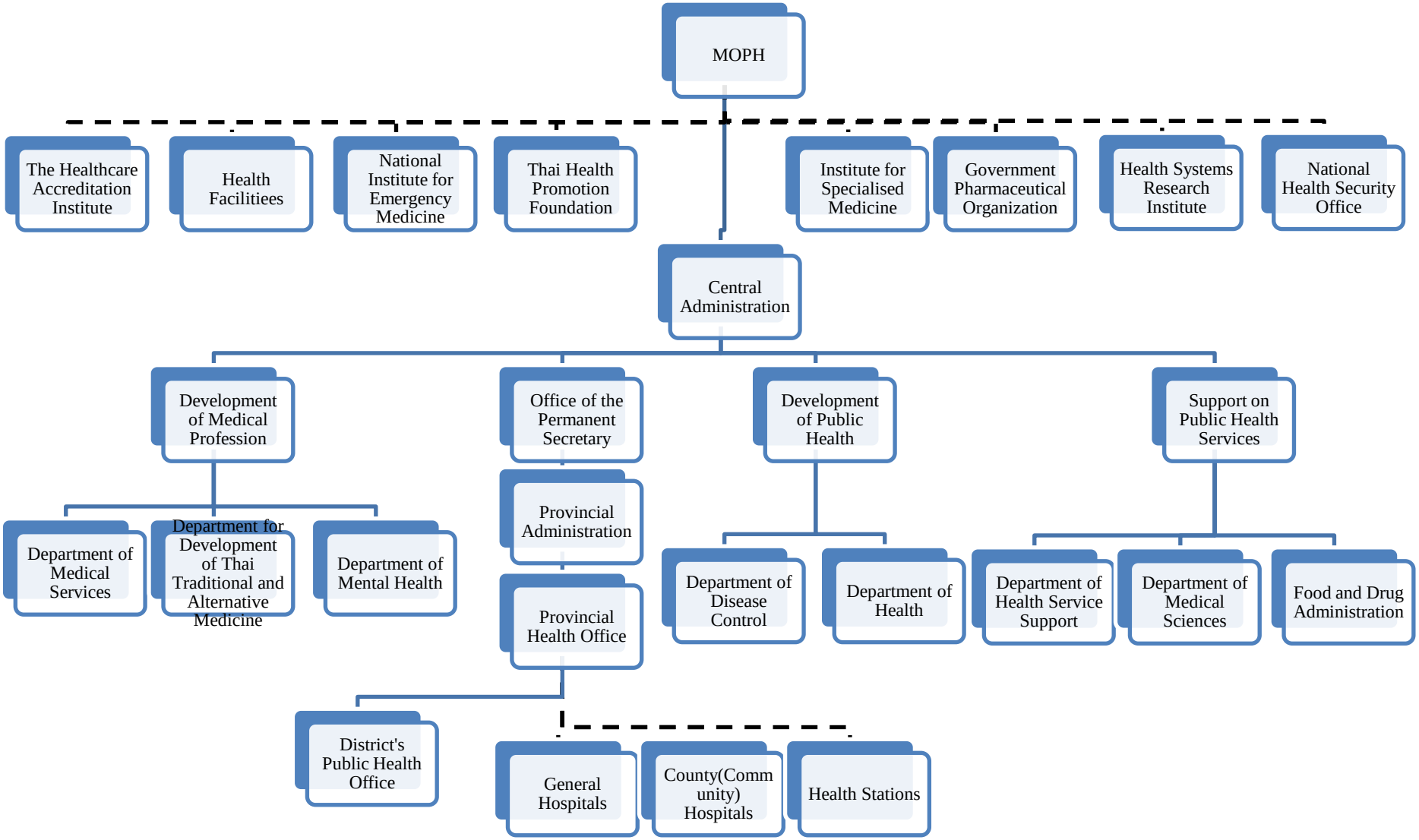


Figure 9: Administrative System in the Ministry of Public Health (MOPH)

Source: Author constructed based on data available in Thai on MOPH's webpage (http://www.moph.go.th/power_moph/moph_edit.html)

The MOPH administration can be divided into two levels: the Central Administration and the Provincial Administration. The central administration is made up of the Office of the Permanent Secretary (OPS) and other departmental level agencies such as Department of Medical Services, Department of Disease Control, and Food and Drug Administration. This can be seen in figure 9, where the departments are grouped by their function under the central administration.

The Office of the Permanent Secretary is the only agency of the MOPH that examines all provincial level health service units. It coordinates with other technical departments of the MOPH in order to provide technical supports. It is primarily responsible for plan and policy supervising, evaluating operations of the MOPH's agencies, yielding medical registration and health institution related law, producing and developing health personnel, health management and technical systems.

On the other hand, provincial health administration is under the provincial governor but also under the supervision of the Office of the Permanent Secretary (OPS). Health Administration at the provincial level also receives logistic support from the OPS and technical support from other departments. The provincial administration breaks down into public health office at the provincial level, district, sub-district, and health center at the village level. Overall, the authority and command line starts from the big scale with OPS supervising the Provincial Public Health Office (PPHO), which in turn supervises and supports the District/Sub-District Health Office. Therefore, the organizational structure of Thai healthcare system is still considered relatively centralized to the power of the MOPH.Despite the Decentralization Act in 1999, the MOPH still dominates in term of authority and controls operations in most of the public healthcare facilities.

Decentralized Case: Switzerland

The country of Switzerland consists of 26 sovereign cantons. The cantons are independent to the degree that full legislative power lies with the cantons unless restricted by the constitution. If so, the power lies with the Swiss Confederation, which is \federal government body.

The federal organization responsible for healthcare is called 'The Federal Office of Public Health (FOPH)', which belongs to the Federal Department of Home Affairs. Generally, the primary roles of FOPH are to

1. Take care of public health in the country (along with each of the cantons)
2. Develop national health policy
3. Represent Switzerland in health interests in international organizations (WHO, OECD) and among other countries (EU)

For the process, specifically, The Federal Constitution sets the requirements, regarding health, for the Federal Office of Public Health (FOPH). The FOPH are then responsible for the laws, based on the standards set by the constitution. The FOPH is responsible for a wide range of tasks included in the following list:

- Legislation on social insurance and health insurance
- regulations on chemicals and medicines
- legislation in areas of biosafety
- research on humans and transplantation medicine
- health promotion
- national campaigns dealing with addiction and STD
- radiation protection
- regulation of university medical and health professionals

Switzerland serves as a perfect example for a decentralized case of authority in healthcare. It works with cooperation within the nation. The Swiss health system is structured in a federalism manner that is legislative power lies within the cantons, unless the constitution expressly empowered the Swiss confederation. The confederation and the cantons are then both responsible, yet in different areas, for healthcare.

The FOPH plays the key role by organizing the system at the federal level, managing political decisions and create regulations. Meanwhile, the cantons monitor the system, make sure the federal laws are enforced, and provide the healthcare accordingly. This includes ensuring all residents have purchased the basic health insurance plan. Therefore, it's the canton's responsibility to give financial assistance in any approach such as through subsidies for households who can't afford to pay the premiums.

Each canton is also responsible for authorizing drugs and medicines control at the cantonal level. However, the cantons have managed to set an agreement together in order to standardize regulations across all of them. Other cantonal authority exercise in healthcare is on setting fees for physicians and hospital stays. A service fee basis for physicians is agreed between the health insurance associations and medical associations whereas charges for hospital stay are agreed between health insurance associations and the hospitals. The main point is that both agreed 'service fees' apply only to the cantonal scale, not for the whole country.

Another major cantonal responsibility in health department is taking care of capacity planning of the hospital sector. In order to avoid political conflicts with the healthcare providers when the canton decides capacity should be reduced, the cantonal authorityhas established working groups among the hospitals for compromising purposes. The working group facilitates hearings and negotiations between the cantonal authority and the hospitals, the service providers. Therefore, canton's capacity reduction in the hospital sector is not commonly done through shutting down hospitals or cutting them off the hospital list. Instead, it's done through a 'shared burden' among the hospitals through reducing the number of hospital beds in case of trying to achieve a cost-effective capacity.

On the other hand, a positive list of drugs, or in other words prescription drugs, is determined by the Federal Department of Interior so the list applies to the whole country of Switzerland. The table below summarizes the major responsibilities under the federal and cantonal power respectively.

Federal Office of Public Health (FOPH)	**Cantonal Authority**
Manage political decisions	Ensure the laws are enforced
Organize the healthcare system	Provide healthcare accordingly
Determine the positive list of drugs	Subsidize citizens on their premiums
-	Authorize drugs & medicine control
-	Set fees for physicians & hospital stays
-	Take care of Hospital Planning

Discussion

The main features of the healthcare system in both countries are summarized in the comparison table below.

Switzerland	Thailand
Higher Healthcare Resources	Lower Healthcare Resources
Private Exp. based	Public Exp. based
Government backed UC by private insurance	UC provided by the government
Created Incentive for healthier lifestyles	Potential of Over-Utilization of Services and Inefficient Consumption of Prescriptive Drugs
Decentralized Power on Public Provision of Healthcare & facilities	Centralized Power on Public Provision of Healthcare & facilities
Cost-effective Hospital Planning	Population-based Funded to local contracting units (healthcare providers)

Table 20: Summary of Comparable Features of the Healthcare System in Switzerland and Thailand

In summary, Switzerland has been allocating higher resources to the healthcare sector. Meanwhile, the structure and financing of healthcare in Switzerland and Thailand is very different. While most of the Swiss health expenditure came from the private sector, Thailand depends heavily on the public sector. In universal coverage terms, the Swiss universal coverage is government backed while being provided by private insurance firms. On the other hand, the universalcoverage in Thailand is provided by the government. Due to very low or zero co-payment, Thai people lack the incentives to take care of their health and tend to over-visit the healthcare providers. For the power structure, Switzerland has the decentralized power with each canton providing healthcare and responsible for financial assistance of its residents. In contrast, Thai healthcare is still considered a centralized with the MOPH operating most of the healthcare facilities.

Conclusion

Thailand has fewer resources –both financial and real- in the healthcare industry. However, the country has been showing a higher portion of total health spending on pharmaceutics and other nondurable medical goods. Also, facilities like available hospital beds are not the problem. Human resources are what the country lack, especially in the rural areas where specialized physicians are rare.

Given the difference in national income and socioeconomic conditions, it's not clear whether Thailand can adopt the same healthcare system structure as the one in Switzerland. However, a few valuable lessons are learned from studying the features of the successful and satisfying healthcare system in Switzerland. The whole healthcare system doesn't rely much on the government spending but on the private sector. The government plays a role in creating this circumstance through its law that promotes equality in healthcare access. The private sector plays a role in the universal coverage whereas the government provides backup to the system through financial assistance for necessary cases. Moreover, the scheme is well designed with the generation of incentives for the population to be responsible for their own health, shifting toward a healthier lifestyle.

Therefore, our recommendation would be for Thailand to work on designing a policy to promote self-health awareness in order to deal with the increasing healthcare cost. With a proper incentive policy, the problem of over-utilization of services would not be severe. As a result, Thailand will not have to contain cost through sacrificing quality of healthcare or access to new medical technology that are actually important.

Problems and Limitations

The problem and limitation of the research is due to the lack of parallelism in the data. Given that Switzerland is a member of the OECD whereas Thailand is not, limitations exist in comparison based on statistical figures. Different data source tend to have different methodology in measuring each particular variable; therefore, a potential bias exists. Moreover, this potential bias is even higher in the case of a variable measured in a currency unit, per capita total health expenditure for instance. This data obtained from the Thai National Health Account is presented in Thai Baht. Despite the complementary of a crude exchange rate, it's not possible to compare with the Swiss figures expressed in units of 2005 PPP US$. Therefore, for this specific variable, the data source is shifted to the World Health Organization instead in order to have a data expressed in a common unit, calculated by the same source. In addition, data on the high-cost medical equipment are most of the time incomplete. Data on Swiss Magnetic Resonance Imaging (MRI) units and Mammograms Machines resource are not available; therefore, they are not included in the web diagram. They could have been useful for the health resource comparison since MRI are best suited for examining brain tumors and spinal cord whereas mammograms are specifically for detecting breast cancer.

Possible Extension of Study

The research could be extended in many dimensions since healthcare is a broad yet important topic. The presented resource profile comparison could be extended when data such as healthcare MRI units, Mammogram machines, and total healthcare labor force (healthcare employment as % of total employment) are available for both countries. If that is the case, a more comprehensive healthcare comparison through resource profile could be achieved. Also, including any other country of interest is another possible extension of this research study.

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Appendices

Appendix 1: Medical Durables Expenditure and Medical Goods Expenditure in Switzerland and Thailand (2002-2011)

Medical Durables Exp. (% of Total Health Expenditure)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.5	1.4	1.5
Switzerland	2	2.2	2.3	2.2	2	1.9	2	2.1	2	2
Thailand	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.2	N/A

Table 21: Expenditure on Durable Medical Goods as % of THE (2002-2011)

Source: OECD iLibrary, Thai MOPH: IHPP's Publication of National Health Account

Medical Goods Expenditure (% of Total Health Expenditure)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
United States	13.6	13.7	13.8	13.7	13.9	13.8	13.5	13.6	13.2	13.2
Switzerland	12.4	12.8	12.8	12.8	12.4	12.2	12.1	12.2	11.7	11.4
Thailand	4	4	4.2	4.4	4.3	3.3	4	4.9	5.2	N/A

Table 22: Expenditure on All Medical Goods as % of THE (2002-2011)

Source: OECD iLibrary, Thai MOPH: IHPP's Publication of National Health Account

Appendix 2: Share of The Public Sector in Total Health Expenditure of All OECD Countries (2002-2011)

Public Expenditure on Health (% of Total Health Expenditure)										
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Chile	54.51	38.81	39.86	40.04	42.14	43.21	44.06	47.65	47.22	46.86
United States	43.92	43.76	44.07	44.23	45	45.16	46	47.21	47.57	47.79
Korea	54.98	52.6	52.94	53.27	54.82	55.08	54.84	56.72	56.46	55.34
Israel	63.24	61.69	60.9	59.29	61.77	60.24	60.91	61.8	60.92	60.8
Switzerland	57.74	58.35	58.39	59.46	59.13	59.08	65.15	65.54	65.24	64.89
Portugal	68.55	68.69	68.08	67.96	67	66.68	65.3	66.53	65.94	65.01
Hungary	70.21	71.09	69.6	70.03	69.77	67.26	67.05	65.68	64.79	65.04
Greece	57.99	59.79	59.12	60.11	62.03	60.35	59.94	68.39	66.82	65.05
Ireland	76.4	76.84	77.26	75.96	75.37	75.69	75.37	72.58	69.56	66.96
Poland	71.16	69.91	68.58	69.3	69.9	70.39	71.77	71.58	71.22	70.28
Canada	69.52	70.17	70.32	70.24	69.76	70.19	70.49	70.92	70.76	70.39
Slovak Republic	89.06	88.32	73.77	74.4	68.32	66.85	67.76	65.69	64.48	70.93
Spain	71.29	70.24	70.53	70.9	71.57	71.85	73.04	74.73	74.2	73.05
Slovenia	73.37	71.63	73.13	72.69	72.29	71.9	73.97	73.72	73.99	73.71
Finland	72.46	72.78	73.3	73.81	74.85	74.38	74.5	75.19	74.76	75.43
Belgium	73.8	75.19	76.01	76.12	73.83	73.35	74.9	76.05	75.09	75.91
Austria	74.77	74.49	74.69	75.32	75.66	75.81	76.32	76.22	75.82	76.24
Germany	79.05	78.48	76.77	76.62	76.41	76.38	76.44	76.79	76.74	76.45
France	79.66	77.81	77.69	77.71	77.21	77.26	76.82	76.99	76.94	76.75
Italy	75.89	76.16	77.37	77.94	78.15	78.25	78.94	78.87	78.52	77.84
Estonia	77.12	76.75	75.55	76.7	73.25	75.58	77.81	75.25	78.85	79.32

Iceland	81.89	81.67	81.21	81.36	81.95	82.51	82.6	81.98	80.43	80.37
Sweden	81.42	82.01	81.37	81.16	81.13	81.36	81.5	81.5	81.51	81.62
New Zealand	77.9	78.34	79.63	79.68	80.07	82.39	82.84	83.02	83.17	82.69
United Kingdom	79.43	79.48	81.04	80.95	81.32	80.15	81.05	82.6	83.55	82.84
Luxembourg	85.53	84.22	84.81	84.92	85.13	85.61	88.48	86.58	85.53	84.06
Czech Republic	90.47	89.8	89.15	87.31	86.73	85.19	82.55	83.96	83.76	84.18
Norway	83.48	83.71	83.56	83.54	83.78	84.1	84.4	84.57	84.7	84.9
Denmark	84.49	84.55	84.27	84.48	84.64	84.4	84.66	85.04	85.13	85.31
Australia	66.91	66.11	66.68	66.89	66.59	67.51	67.86	68.51	67.83	N/A
Japan	81.26	80.42	80.75	81.58	79.45	80.38	81.36	81.52	82.1	N/A
Mexico	43.87	44.17	45.16	45.03	45.22	45.4	46.92	48.26	47.32	N/A
Netherlands	62.46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Turkey	70.68	71.92	71.25	67.84	68.34	67.83	73.02	N/A	N/A	N/A
AVERAGE	71.9	71.51	71.12	71.12	70.99	70.96	71.78	72.24	71.9	72.41

Table 23: Public Expenditure on Health of OECD countries (2002-2011)

Source: OECD iLibrary

Appendix 3: Health Insurance Terminology

Here are the list of common terms and their general definitions used in health insurance:

Premium

-an agreed amount of money to be paid for the insurance coverage over a defined period

Deductible

-a fixed maximum amount of money that a policyholder has to pay by him/herself for a medical service that's actually covered by the insurance plan. It's a threshold that when the service cost exceeds, the insurer steps in and pays for the excess cost.

Common Characteristics:

-Deductibles can be per individual and per family

-Deductibles could be broken down in cases of specific services

i.e. a hospitalization deductible per admission

-Deductibles may vary, depending on the service provider's presence on or off the approved list.

Copayment

-a cost-sharing concept in which the insured (policyholder) and the insurer together pay for the medical service consumed by the policyholder. The insured pays a fixed amount for the medical service and the insurer pays for the rest of the reimbursement. Some insurance plans require, for some specific services, that a deductible need to be met first before copayment applies.

Common Characteristics:

-Copayment rates could vary across services

-For some plans, deductible must be met first before copayment applies

Coinsurance

-an another form of cost-sharing scheme that makes the insured person pays a quoted rate (% percentage) of medical expenses even after the deductible. So, the policyholder is partially responsible for the insurance covering the excess cost from the deductible 'threshold'. The insurer takes responsibility for the rest of reimbursement but not infinitely, only up to allowed charges. If charges exceed what the insurer defines as *"usual, customary and reasonable"*, the policyholder is again also responsible.

Common Characteristics:

-Coinsurance rates are different across service types

-Coinsurance rates also depend on the service provider's status of whether being in the insurer's approved list or not.

Maximum out-of-pocket expense

-the maximum amount of money a group member has to pay out of his/her pocket per year. The plan and group member shares the cost of covered expenses until reaching the maximum. After that, the insurer pays for all covered expenses, mostly up to a lifetime maximum. Note that this is different from the 'Out-of-Pocket' expense in healthcare financing discussed in this paper.

Gatekeeper

-a person who manages the policyholder's treatment. When the policyholder gets ill, the gatekeeper coordinates in and authorizes client's medical services, lab studies, specialty referrals and hospitalizations.

Appendix 4: List of All Agencies in the Ministry of Public Health (MOPH)

-Office of Inspector-General
-Health Technical Office
-Bureau of Central Administration
-Information and Communication Technology Center
-Praboromrajchanok Institute of Health Workforce Development
-Nursing College
-Boromarajonani College of Nursing
-Sirindhorn College of Public Health
-Bureau of Policy and Strategy
-Bureau of Information
-Bureau of International Health
-International Health Policy Program
-Bureau of Inspection and Evaluation
-Health Insurance Office
-Bureau of Rural Health Administration
-Administration System Development Bureau
-Office of Country Coordination Mechanism Secretariat
-Office of the Collaborative Project to Increase Production of Rural Doctor
-Provincial Public Health Office
-District Health Office
-Office of Inspector-General
-Health Technical Office
-Bureau of Central Administration
-Information and Communication Technology Center

Appendix 5: Autonomous Agencies under the MOPH supervision

-Health System Research Institute (HSRI)

The institute conducts research in association with other sciences (i.e. social sciences, economics, psychology) in order to develop health programs and solve health problems in a more effective manner. The governing board of HSRI is appointed by the cabinet and consists of seventeen members, including seven senior experts.

-Government Pharmaceutical Organization (GPO)

GPO is a state enterprise that operates under the management of committee appointed by the Minister of Public Health. Its responsibility is to produce drugs and medical supplies and research on the production of these goods.