UNIVERSITI PUTRA MALAYSIA

HEALTH FINANCING, HEALTH OUTCOMES AND ECONOMIC GROWTH IN DEVELOPED AND DEVELOPING COUNTRIES

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By

ABDALLA SIRAG FAGIR OMER

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements of the Degree of Doctor of Philosophy

May 2016

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DEDICATION

With gratitude, appreciation and love

I dedicate this work to my family, especially to my father, may Allah reward him the paradise.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the Degree of Doctor of Philosophy

HEALTH FINANCING, HEALTH OUTCOMES AND ECONOMIC GROWTH IN DEVELOPED AND DEVELOPING COUNTRIES

By

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May 2016

Chairman : Norashidah Mohamed Nor, PhD
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Sufficient health financing is important due to the precious value of health. Across the world, there exist large variations in health financing due the differences in many factors such as income level. In addition, health outcome is directly affected by health financing, income, education, and indirectly by the level of governance (governance quality). Moreover, economic growth is largely influenced by better health outcome, since healthier individuals tend to be more productive and learn faster. The current research aims to estimate the determinants of public health financing and out-of-pocket health expenditure in 181 countries from 1995 to 2012. The second objective examines the impact of public health financing and out-of-pocket health financing on health outcomes, particularly on infant and under-five mortality rates and life expectancy, in 172 countries. Also, the indirect effect of health financing through governance quality is tested. The Generalized Method of Moments is used to estimate the dynamic models in both first and second objectives. Moreover, the third objective aims to examine the non-linear relationship between life expectancy and economic growth, and public health financing and economic growth in developed and developing countries from 1981 to 2010 using the Dynamic Panel Threshold estimator.

The findings show that the GDP per capita and general government expenditure are crucial factors that affect health financing in low-income, middle-income, and high-income countries. Interestingly, external aid for health is found to have positive impact on public health financing in low-income countries, whereas it reduces public health financing in middle-income countries. The findings indicate that the external health funding tends to reduce public health financing, especially when it is received by a country with low governance quality. Remarkably, a high level of government effectiveness and control of corruption are found to be very influential in stimulating public health financing and helping to reduce out-of-pocket health financing in developed and developing countries.

Regarding the second objective, the results reveal that public health financing plays a decisive role in stimulating health outcomes in developed and developing countries.

However, the non-linear effect for health financing on health outcomes is observed, especially when health is financed by individuals' out-of-pocket expenditure. In particular, the out-of-pocket health expenditure found to be negatively related to health outcomes in low-income and middle-income countries, whereas it positively associated with health outcomes in high-income countries. In addition, the findings reveal the importance of socioeconomic factors such as income and education as key determinants of health outcomes. Further, the analysis of this study shows that governance quality positively correlated to health outcomes through its effect on public health financing.

Finally, the findings of the third objective contribute to economic growth literature by providing new evidence on the relationship between health and economic growth. The results indicate the existence of non-linear relationship between life expectancy and growth. In particular, life expectancy is useful to economic growth only to a certain threshold level; any further increase in longevity above the threshold would adversely affect growth. Furthermore, the findings show that public health financing has a non-linear effect on economic growth. Specifically, public health spending is beneficial to growth until a certain threshold level, above the threshold point, however; public health expenditure impedes economic growth.

For policymakers, greater efforts are needed to ensure the efficiency of public finances and health care systems in both developed as well as developing countries. The findings provide future insights for developing countries, and a chance to avoid the potential turning point by reforming their health systems.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

PEMBIAYAAN KESIHATAN, HASIL KESIHATAN DAN PERTUMBUHAN EKONOMI NEGARA MAJU DAN MEMBANGUN

Oleh

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Pembiayaan yang secukupnya amat perlu bagi mana-mana sistem kesihatan, terutama sekali apabila kesihatan dianggap sebagai sesuatu yang amat berharga. Di seluruh dunia, terdapat perbezaan ketara dalam pembiayaan kesihatan kerana ketidakseragaman dalam pelbagai faktor seperti tahap pendapatan. Di samping itu, hasil kesihatan yang dicapai sebahagian besarnya boleh dijelaskan menerusi cara kesihatan dibiayai, sebagaimana pertumbuhan ekonomi boleh dipengaruhi oleh hasil kesihatan. Kajian ini bertujuan untuk menilai faktor penentu pembiayaan kesihatan awam dan perbelanjaan kesihatan dari kocek di 181 negara dari tahun 1995 hingga 2012. Objektif kedua mengkaji kesan pembiayaan kesihatan awam dan perbelanjaan kesihatan dari kocek terhadap hasil kesihatan, terutamanya ke atas kadar kematian bayi dan kanak-kanak di bawah usia lima tahun, di 172 negara. Kaedah umum *Method of Moment* (kaedah yang menganggarkan parameter populasi) digunakan untuk menilai model dinamik bagi kedua-dua objektif. Manakala, objektif ketiga mengkaji hubungan tak linear antara jangka hayat dan pertumbuhan ekonomi, serta pembiayaan kesihatan awam dan pertumbuhan ekonomi, di negara maju dan negara sedang membangun dari tahun 1981 hingga 2010 menggunakan *Dynamic Panel Threshold estimator* (penganggar nilai ambang panel dinamik).

Hasil penemuan mendapati bahawa KDNK per kapita dan perbelanjaan kerajaan umum adalah faktor penting yang mempengaruhi pembiayaan kesihatan di negara berpendapatan rendah, sederhana dan tinggi. Satu penemuan yang menarik ialah bantuan luaran untuk kesihatan didapati memberikan kesan positif ke atas pembiayaan kesihatan awam di negara berpendapatan rendah, manakala ia mengurangkan pembiayaan kesihatan awam di negara berpendapatan sederhana. Penemuan ini menunjukkan bahawa pembiayaan kesihatan luaran lazimnya mengurangkan pembiayaan kesihatan awam, terutamanya apabila diterima oleh negara yang mempunyai tahap urus tadbir yang rendah. Lebih menarik lagi, tahap keberkesanan kerajaan dan kawalan rasuah didapati sangat penting dalam usaha menggalakkan pembiayaan kesihatan awam dan membantu mengurangkan pembiayaan kesihatan dari kocek di negara maju dan negara sedang membangun.

Berhubung dengan objektif kedua pula, penemuan kajian mendapati bahawa pembiayaan kesihatan awam memainkan peranan penting dalam mendorong hasil kesihatan di negara maju dan negara sedang membangun. Bagaimanapun, kesan tak monotonik bagi pembiayaan kesihatan terhadap hasil kesihatan telah ditemui, terutamanya apabila perbelanjaan kesihatan dibiayai menerusi perbelanjaan dari kocek individu. Secara khususnya, perbelanjaan dari kocek didapati mempunyai hubung kait negatif dengan hasil kesihatan di negara berpendapatan rendah dan sederhana, manakala ia mempunyai hubung kait positif dengan hasil kesihatan di negara berpendapatan tinggi. Selain itu, penemuan kajian mendapati betapa pentingnya faktor sosioekonomi seperti pendapatan dan pendidikan sebagai penentu utama hasil kesihatan. Dalam pada itu, analisis kajian ini mendapati bahawa kualiti urus tadbir mempunyai hubung kait positif dengan hasil kesihatan menerusi kesannya terhadap pembiayaan kesihatan awam.

Akhir sekali, penemuan objektif ketiga menyumbang kepada kesusateraan pertumbuhan ekonomi dengan mengemukakan bukti baru bagi hubungan antara kesihatan dan pertumbuhan ekonomi. Hasil kajian mendapati wujud hubungan tak monotonik antara jangka hayat dan pertumbuhan ekonomi. Secara khususnya, jangka hayat baik untuk pertumbuhan ekonomi hanya ke takat tertentu sahaja; sebarang peningkatan selanjutnya melebihi takat tersebut akan menjejaskan pertumbuhan. Di samping itu, hasil penemuan menunjukkan bahawa pembiayaan kesihatan awam mempunyai kesan tak linear terhadap pertumbuhan ekonomi. Secara khususnya, perbelanjaan kesihatan awam membawa manfaat kepada pertumbuhan sehingga takat tertentu, tetapi selepas takat tersebut, perbelanjaan kesihatan awam mengekang pertumbuhan ekonomi.

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I certify that a Thesis Examination Committee has met on 17 May 2016 to conduct the final examination of Abdalla Sirag Fagir Omer on his thesis entitled "Health Financing, Health Outcomes and Economic Growth in Developed and Developing Countries" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Health systems have played an important role in the dramatic rise in life expectancy during the 20th century. They have contributed enormously to better health, and influenced the lives and well-being of billions of men, women and children around the world; their role has become increasingly important. In today's complex world, it can be difficult to explain what a health system is, what it consists of, and where it begins and ends. The World Health Organization WHO 2000 report defines a health system as; "it includes all the activities whose primary purpose is to promote, restore or maintain health".

In most developing countries, resources are inadequate to ensure that all individuals have access to basic health services. About 150 million people suffer from financial hardship every year, for the reason that they have to pay by themselves in order to receive health care, and about 100 million are pushed into poverty because of this. The World Health Report 2010 stated that to achieve universal health coverage, governments could take action in the following ways: allocate additional resources for health; lessen financial obstacles and rise financial risk protection through pooling and prepayment; ensure more equitable and efficient use of the available resources (WHO, 2014). Therefore, in order to have effective health systems, they must be efficiently financed. In general, low-income countries have a higher share of private health expenditure than middle- and high-income countries, and out-of-pocket expenditures, as in Figure (1-1), make up the largest proportion of private expenditures.

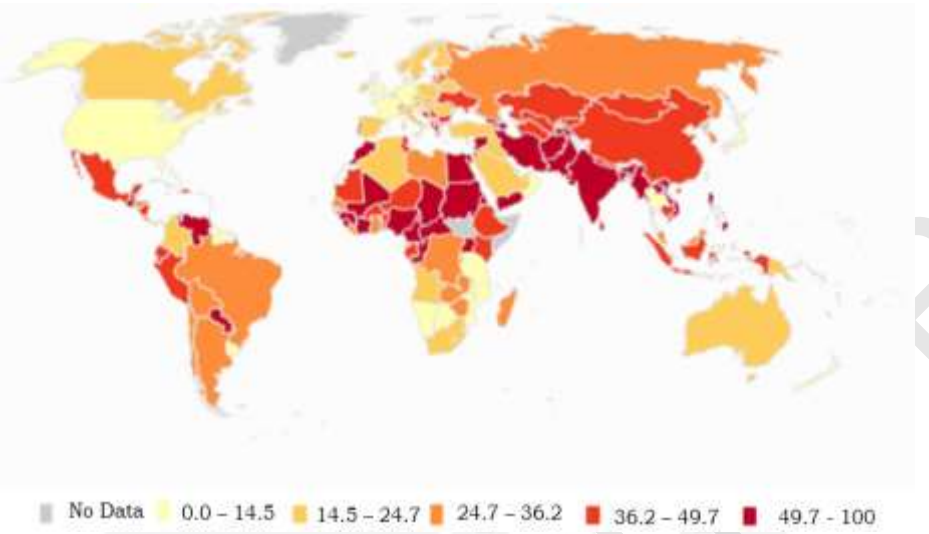

Figure 1.1: Out-of-pocket Health Expenditure. (% of total health expenditure)
Source: World Bank, 2011.

1.2 Health Financing Mechanisms

How health care systems are financed can have a huge influence on how people access health care services, and how much they pay out of their pockets for those services. There are some different health financing mechanisms such as General Revenue, Social Health Insurance, Private Health Insurance, Community Financing, Out-of-Pocket Spending and External Aids. In general, the way in which health is financed can be categorized into two; public health financing and private health financing.

1.2.1 Public Health Financing

Generally, public health financing refers to the total health expenditure by the government over a period of one year. One of the main health financing methods is through the general tax revenue, which is an essential source of health care funding in all countries with different income levels. Although the government's capability to provide general revenues is strongly associated with income, revenue can be raised from different types of taxes. The low-income countries tend to depend on taxes - such as import and export duties, which are easier to collect. Whereas in relatively higher income countries, the social health insurance and taxation are used to finance health. General tax revenue is used to finance an extensive range of government programs, including the health care systems (WHO, 2014).

In addition, social health insurance is a financing method that is used in different forms in low, middle and high-income countries alike. Insurance as a way of health financing usually comprises a defined contribution or premium, related to a clear set of benefits for a particular period. The risks of health care expenditures are pooled or shared

across individuals enrolled in insurance strategies or programs. Government or quasi-government has some control on the social health insurance schemes. For instance, in some countries, both government and non-government agencies can manage social health insurance for different population groups. However, the study is mainly concerned with analysis of public health financing regardless of the general taxation or social health insurance.

Many developing countries depend on foreign aid to varying extents, as sources to finance health care. Although several low-income countries depend heavily on external sources to finance their health care systems, domestic resources are usually more important in most countries, and are expected to be more sustainable sources. Development assistance for health (DAH) is a form of external funds contributions from international channels of assistance, which is used to improve health in low and middle-income countries. According to Ravishankar et al. (2009) "DAH does not contain support for allied fields such as humanitarian assistance, food aid, water and sanitation, education, and poverty alleviation that indirectly affect health". DAH has been rising over the last two decades, and has increased sharply since 2002 due to growths in public funding and increases in philanthropic donations. Specifically, DAH has increased from US$ 5.6 billion in 1990 to US$ 21.8 billion in 2007 (see, Ravishankar et al., 2009).

1.2.2 Private Health Financing

There are two forms of private health financing: private health insurance (PHI) and out-of-pocket health expenditure. In private health insurance patterns, consumers voluntarily purchase insurance from independent private providers, who charge premiums that do not reflect consumer's ability to pay for services, but reflect their risks. Private health insurance companies can be profit or non-profit institutions. Insurance purchases can be done by groups as well as individuals.

Another form of private health financing is out-of-pocket (OOP) payments, which take different forms including user fees or charges for service, co-payments for physician visits and prescription medications, informal payments, and compulsory payments on service users for materials and tests that may not be available in public health care facilities. Out-of-pocket payments, which are considered the major style of health care financing in low-income countries, are mostly larger than government expenditure. The OOP tends to decline as income rises, and other forms of financing mechanisms increase (Fan and Savedoff, 2014). Out-of-pocket payments are largely agreed to be a humble and unsustainable means to finance health care. Out-of-pocket health spending is reported as a major reason for household impoverishment (Wagstaff and van Doorslaer, 2003; Hamid et al., 2014). Therefore, reducing the extraordinary share of out-of-pocket payments in health systems is a universal target for health system development. However, as countries have accomplished high coverage with well-organized health financing system, they find some significance in keeping some level of out-of-pocket payments as incentives, so as to have efficient health care performance.

1.3 The Determinants of Health Financing

Achieving health coverage for the whole population does not necessarily indicate coverage for everything. Moving towards universal health coverage means to expand or maintain coverage in three dimensions: who is covered from the pooled funds; what type of services are covered; and how much of the cost is covered. An awareness of health care and service cost are important, to estimate how much to increase the health financing to expand the coverage in three dimensions. It estimated by the Commission on Macroeconomics and Health in 2001 that basic health care services could cost about US$ 34 per person. A recent estimate by WHO for the cost to provide basic health care, suggested that 49 low-income countries surveyed would need to spend less than US$ 44 per capita on average in 2009, rising to more than US$ 60 per capita in 2015. This shows that the increasing cost of health care and services can create an additional need for allocating more funds to finance health.

The WHO stated that only eight of the 49 low-income countries have the chance to finance health from their domestic resources, to reach the required level of health financing to achieve universal coverage by 2015. Many developed countries also need to raise additional funds, or diversify sources of financing to meet the increasing demand for health driven by additional factors such as aging populations, and the new medical procedures and technologies being developed to serve them. An important aspect of this issue is the observed diminishing working age of the population in some states, which leads to dramatic reduction in revenues from income taxes (Etienne et al., 2010).

1.3.1 Health Financing and National Income

Governments finance health both directly, through spending on the health sector, and indirectly, through spending on other related social sectors – to improve education levels or reduce poverty, for instance. Although it contains only the direct aspect, the proportion of government spending allocated to the health sector provides insight into the value placed on health by that government, which may vary greatly across countries. Figure (1-2) shows the share of public health spending on average as a share of GDP for different income groups for the period from 1995 to 2012. Note that for figure (1-2) and the subsequent figures in this section, low refers to low-income, lower refers to lower-middle-income, upper refers to upper-middle-income, and high refers to high-income. In the analysis the low and lower-middle-income countries are combined in one group (low-income). The contributions from external resources, which were channeled through the government budgetary process is also included in public spending on health.

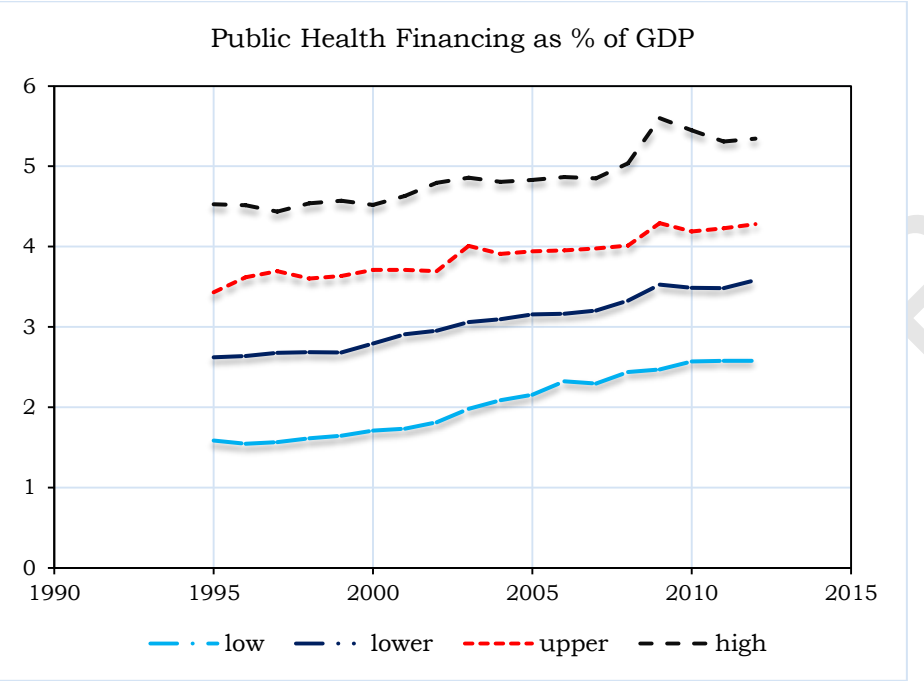

Figure 1.2: Public Health Financing.

Source: World Bank (2014), and author's calculation.
Note: low refers to low-income, lower refers to lower-middle-income, upper refers to upper-middle-income, and high refers to high-income. In the analysis the low and lower-middle-income countries are combined in one group (low-income).

The resources allocated to health in the high and upper middle-income countries, on average as a share of GDP, are more than the other income groups. Also, the low-income countries as a group show a slight increase in their government's commitment to health, particularly from 2002 and upward. However, the resources allocated to health, on average, are almost constant from 2010 to 2012 for the low-income countries group.

The income differences across countries may to large extent explain the huge variations in resources allocated to health. In general, health accounts for a higher share of Gross Domestic Product as countries get wealthier. A country like Chile can be a good example; it increased its share of public spending on health from 11% of total government expenditure in 1996 to 16% ten years later, during a period of rapid economic growth (Missoni and Solimano, 2010).

However, a country's relative income is not the only factor that influences the share of public health financing. Substantial variations exist between countries with a similar income level, indicating different levels of public commitment to health care systems.

For example, in high-income countries, the share of GDP devoted to health varies from almost 1.8% to 9.9% in 2012. Importantly, even though the priority given to health by governments rises with national income, some governments distribute a higher share of resources to finance health despite their low level of national income; while other relatively rich countries allocate smaller proportions to fund the health sector. Although public commitment toward population health tends to increase with higher income, some high-income countries have almost constant or have witnessed decreasing trends during the period from 1996 to 2012. Following the same pattern, African leaders agreed in the Abuja Declaration 2001 to set a target of allocating at least 15% of their annual budgets to the improvement of the health sector (African Union, 2001). Disappointingly, some African countries allocated a lower share of their total budgets to health than they did before the Abuja Declaration.[1]

1.3.2 Health Financing Modes

The enhancements in public health financing indicate the expansions in health care coverage. Some empirical studies, such as Moreno-serra and Smith (2011), used public health spending to measure how the health system is covered. They indicate that any shortages in public health financing would reduce the total number of the population covered by the health system. Consequently, with less coverage, many individuals may be forced to pay out of their pockets to get medical services. The trends of out-of-pocket health expenditures as way to finance health are major concern for health nowadays, since it has been found to be a major contributor to household impoverishment (Hamid et al., 2014). As shown in figure (1-3), the out-of-pocket health expenditure on average as a share of total health expenditure shows an approximately constant trend in middle and high-income countries. The highest percentage of out-of-pocket health expenditure as a share of total health expenditure is recorded in low-income countries; it reached a peak of 53.8 on average as a percent of total expenditure on health in 2002 followed by slight decline, but still remained above 45 percent of total health spending. For lower middle-income countries, the trend is almost constant from 1995 to 2012; the out-of-pocket health expenditure represents on average about 40 percent. However, upper and high-income countries recorded on average around 30 percent and 20 percent, respectively.

[1] See data on public health spending of any country provided by the National Health Accounts Database.

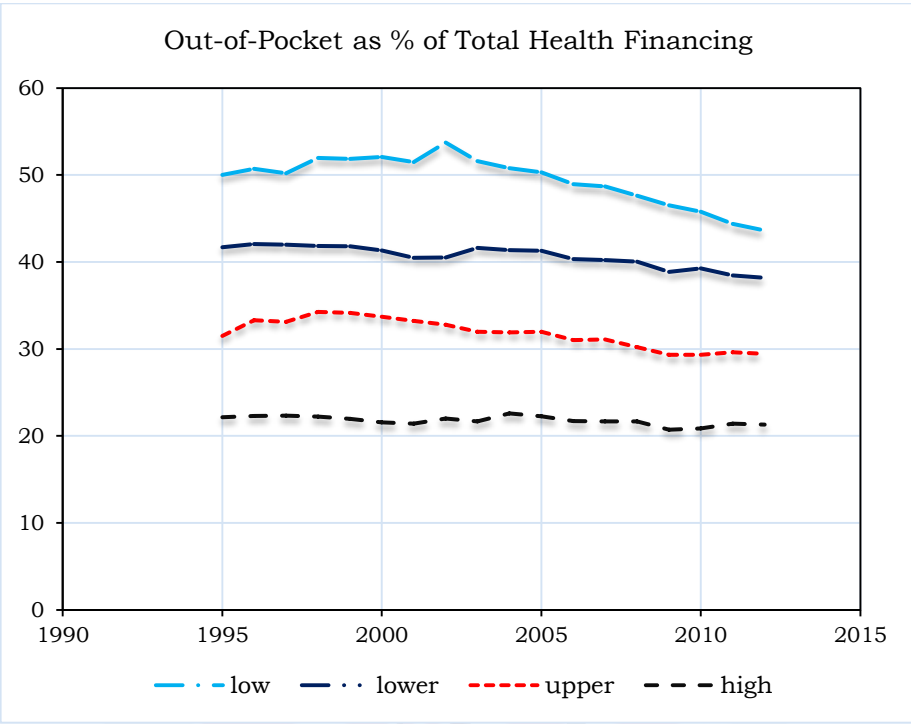

Figure 1.3: Out-of-pocket Health Expenditure.

Source: World Bank (2014), and author's calculation.
Note: low refers to low-income, lower refers to lower-middle-income, upper refers to upper-middle-income, and high refers to high-income. In the analysis the low and lower-middle-income countries are combined in one group (low-income).

1.3.3 Demographic Changes

All countries around the world are experiencing varying rates of demographic change. In general, developed countries are characterized by low mortality and low fertility, and most developing nations are transforming from high to low fertility with considerable variations in mortality rates. The forecasting for the next years assumes that population growth rates and fertility rates will decline, and life expectancies will increase in all regions. As a result of varying demographic changes, countries all around the world will be faced with considerable challenges regarding how to finance health with respect to all these changes.

Figures (1-4), (1-5) and (1-6) show population age structures for different countries based on their income level. Overall, they illustrate variations and transformations in population age structures between 1980 and 2010. Particularly, figure (1-4) indicates declining trends of the young population as a percentage of the total in all income groups, but high-income countries have the lowest ratio, while figure (1-5) illustrates the population age structure between 15-64 years as a percentage of the total. This age

structure shows a slight increase among income groups, and variation between countries is not much. On the other hand, figure (1-6) demonstrates population ages 65 years and above as a share of the total. It can be seen from the figure (1-6) that the aging population is increasing largely, especially in high-income countries.

It is worth mentioning that the decrease of the young population, mainly as a result of declining fertility rates over time, is expected to raise in the near future which may reduce the population ages 15-64 (Gottret and Schieber, 2006). Additionally, the increase in population ages 65 years and above, which is largely due to the reduction in mortality rates, is also projected to increase (UN, 2009).

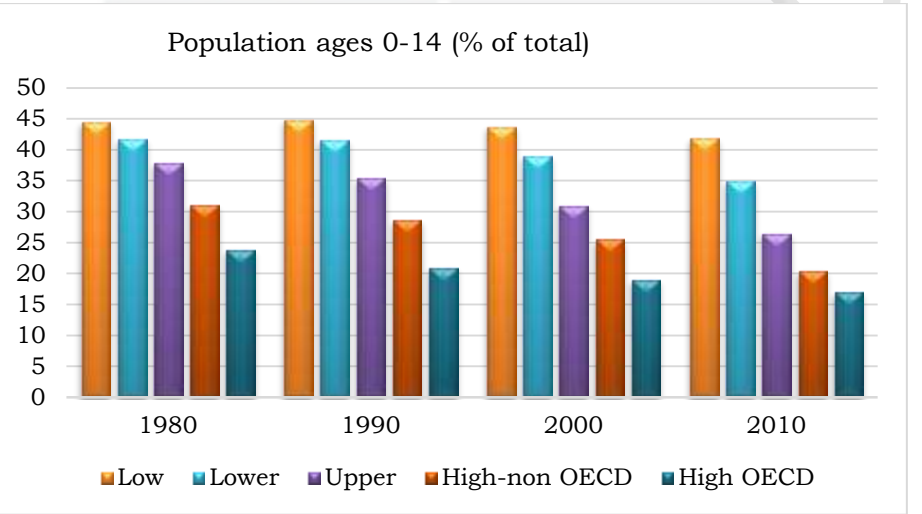

Figure 1.4: Population ages 0-14.

Source: World Bank (2014), and author's calculation.
Note: low refers to low-income, lower refers to lower-middle-income, upper refers to upper-middle-income, and high refers to high-income. In the analysis the low and lower-middle-income countries are combined in one group (low-income).

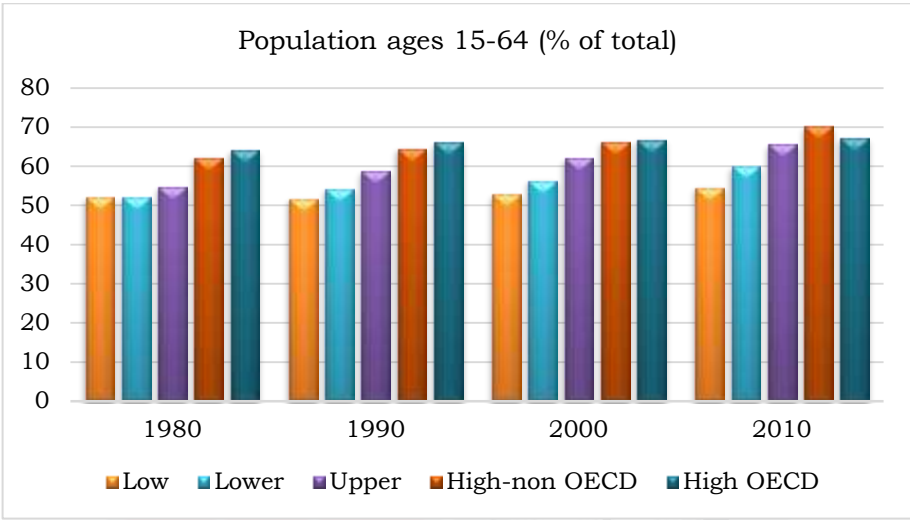

Figure 1.5: Population ages 15-64.

Source: World Bank (2014), and author's calculation.
Note: low refers to low-income, lower refers to lower-middle-income, upper refers to upper-middle-income, and high refers to high-income. In the analysis the low and lower-middle-income countries are combined in one group (low-income).

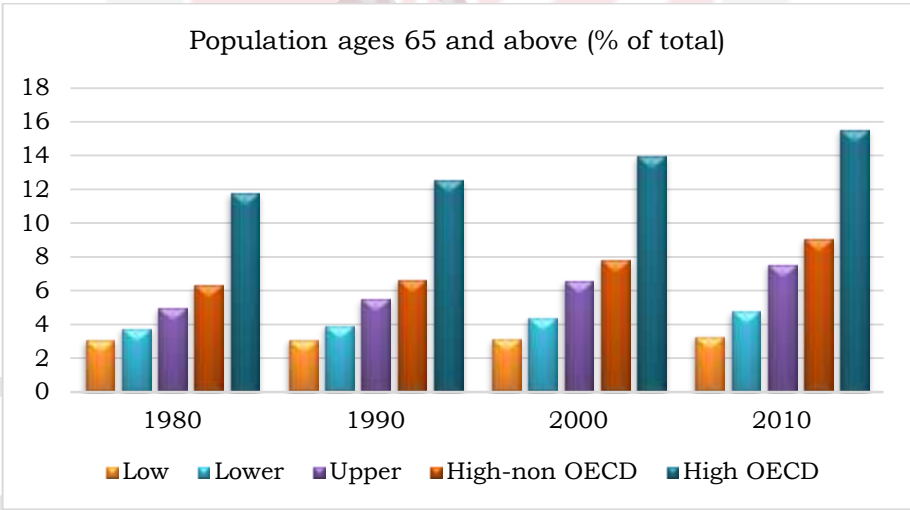

Figure 1.6: Population ages 65 and above.

Source: World Bank (2014), and author's calculation.
Note: low refers to low-income, lower refers to lower-middle-income, upper refers to upper-middle-income, and high refers to high-income. In the analysis the low and lower-middle-income countries are combined in one group (low-income).

Although developing countries with particularly low income are still struggling with health financing issues related to the high rates of mortality and fertility, the ratio of an aging population will continue to rise in all nations as economic, social and epidemiological changes occur. The needs of aging populations in the near future should be anticipated in order to implement sustainable health financing mechanisms, to make sure that these populations have access to health care services over the long run.

On the other hand, the cost of the aging population is quite significant, because people at the end of their lives tend to consume more health care and services (Galama, 2011). Furthermore, the percentage of the population that contributes to health financing will decline as fertility rates decrease, leading to a large and increasing proportion of aging population relying on a decreasing proportion of labor force, or increasing the dependency ratio. This will pose problems, especially in the long run, due to the scarcity of resources that the health system will face. However, in developing countries there is a balanced population structure and a larger proportion of younger generation and increasing workforce that may support health financing (Gottret and Schieber, 2006).

1.3.4 Epidemiological Transition

The epidemiological transition across the world has serious consequences on health outcomes, the pattern of diseases, and health expenditure. The epidemiological transition is the changes in the main causes of mortality and morbidity. At the beginning of the demographic transition, mortality rates started to decline mainly due to the reduction in mortality caused by infectious diseases and child maternal conditions. As a result of health transition, fertility rates and prevalence of communicable diseases decline, the average age of the population tends to rise. Eventually, there is a greater aging population, and they are more likely to have more non-communicable diseases than the young population. Therefore, the sustainable health financing schemes must be implemented to ensure that the needs of these aging populations are met.

The burden of communicable disease poses significant challenges for most developing countries. Diseases like malaria, HIV/AIDS, and tuberculosis TB, constitute a real threat to health care systems in many low and middle-income countries. From the reported HIV/AIDS death cases, 80 percent occurred in Sub-Saharan Africa, and from the total reported deaths due to malaria, 90 percent occurred there as well (Etienne et al., 2010). In addition, the TB prevalence in Sub-Saharan Africa was reported to be the highest in the world. The burden of these major killers is very crucial on the already weak health systems in low and many middle-income countries. Overall, the epidemiological transition affects health financing by influencing population health care needs and the type of services demanded, and therefore, the amount of funds allocated to pay for them (Gottret and Schieber, 2006).

1.3.5 Governance Quality

According to the Oxford dictionary, the word governance refers to the activity of governing a country or controlling a company or organization. There exist different definitions of governance from various institutions; however, in this study the definition of World Governance Indicators (WGI) is used. According to the WGI, "governance consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them"(WGI, 2015). The quality of governance refers to the degree to which the interaction of public institutions leads to improvement of the outcomes of a certain government policy.

Although health financing needs differ according to the variations in costs of health care, the age structures of the population and the patterns of diseases, the governance quality also plays an important part on how much to spend on health. Many developing countries have a low level of institutional quality, such as low government effectiveness and high corruption, accompanied by low public health financing (Cummings et al., 2009).

Making health a key political issue is very important, because achieving universal health coverage involves dealing with marginalized and poor people, which may help to persuade policymakers to place health financing at the top of their political agenda (Gottret et al., 2008). The effectiveness of governmental institutions and the degree of controlling corruption may play a decisive role to improve health financing from both domestic and external sources. Many developing countries have a low level of governance quality, such as low government effectiveness and high corruption accompanied by low public health financing (Cummings et al., 2009). Issues such as corruption and bureaucracy to a large extent determine the size and effectiveness of public or private health financing (Rajkumar and Swaroop, 2008).

The role of institutions and governance as the key elements for development efficiency has been emphasized widely in the recent economics literature. If the quality of institutions in a particular country were weak, public allocation of resources would lead to the inefficient performance of public finances. For example, Rajkumar and Swaroop (2008) highlighted the important role of governance quality in determining the size and effectiveness of public finances. Moreover, Lu et al. (2010) pointed out that the development assistance for health leads to a reduction in public health financing in developing countries. They argued that for any received amount of health assistance by a developing country, the ministry of finance tends to reduce the demotic allocation of resources to the health sector.

Most developing countries, mainly low and middle-income countries tend to have low governance quality compared to high-income countries. These developing nations tend to allocate a low share of their budgets to the health sector. Therefore, the level of

governance quality may play a deceiving role in determining the size and efficiency of its public health finance. A recent study by Liang and Mirelman (2014) showed governance quality as one the explanatory variables for the large variations in health financing between countries. Also, they found that development assistance for health tends to reduce public health financing, especially in countries with low governance quality, such as developing countries.

To this end, the discrepancies in health financing could be attributable to the differences in many factors, such as the level of national income, the mechanism of health financing, the pattern of diseases, the structure of the population and the quality of governance. This study estimates the above-mentioned factors, to explain how they can affect the level of public health financing and out-of-pocket health expenditure in different income groups.

1.4 The Determinants of Health Outcomes

The focus of this study is on analyzing health outcomes, based on the changes observed on: infant mortality rate (IMR), under-five mortality (UMR), and life expectancy at birth (LE). From figures (1-7), (1-8), and (1-9), it can be seen that there is an overall improvement in LE and a remarkable decline in IMR and UMR from 1960 to 2012. However, the figures show a slowdown in the improvement in these health indicators. The improvement in LE after the mid 1980s was slower than the period of the 1970s, except for high-income countries that tended to have the same pattern of increments. Recent studies point out that the reduction in IMR and UMR in the 1990s was much slower than the previous decades (Deaton and Drèze, 2002; Wagstaff and Claeson, 2004; Deaton, 2004). This claim can only be true – as shown in figures (1-8) and (1-9) – in the case of high-income countries. On the contrary, the other income countries witnessed a clear increase in the rate of UMR and IMR reduction. The relative improvement in IMR and UMR reduction in developing countries or low and middle-income countries is both remarkable and puzzling at the same time, because these countries have relatively low income and health financing. These improvements are the result of tremendous efforts, whether at local or international contribution in the form of immunization programs (Cornia et al., 2008).

The slowdown in LE increment drives the attention to the influencing determinants of health and other social determinants. The Preston curve suggested that the relationship between LE and income per capita is concave, and that economic growth leads to convergence in life expectancy in the long run between developing and developed countries. According to Mcmichael et al., (2004), high-income countries have the highest LE trend, whereas upper middle-income nations are converging toward developed nations as shown in figure (1-7). In contrast, low-income countries have the lowest LE, which indicates that there are other factors, such as immunization, environmental and governance quality, besides the usual explanations of life expectancy convergence that should be taken into account. The child mortality is affected by income level of the household or parents, because more income creates greater chances for families to consume medical and non-medical goods (Khanam et

al., 2009; Khanam et al., 2014). Therefore, rich households are more likely to have their children healthier.

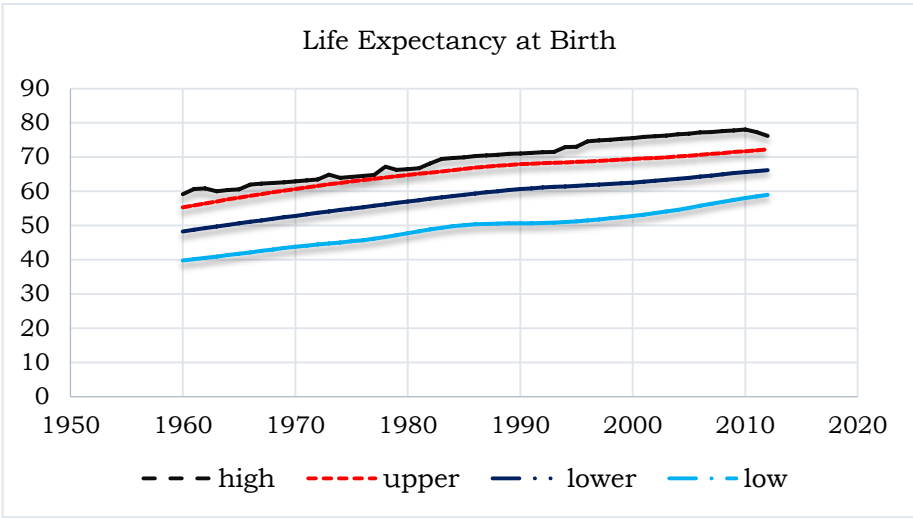

Figure 1.7: Life Expectancy at Birth.

Source: World Bank (2014), and author's calculation.
Note: low refers to low-income, lower refers to lower-middle-income, upper refers to upper-middle-income, and high refers to high-income. In the analysis the low and lower-middle-income countries are combined in one group (low-income).

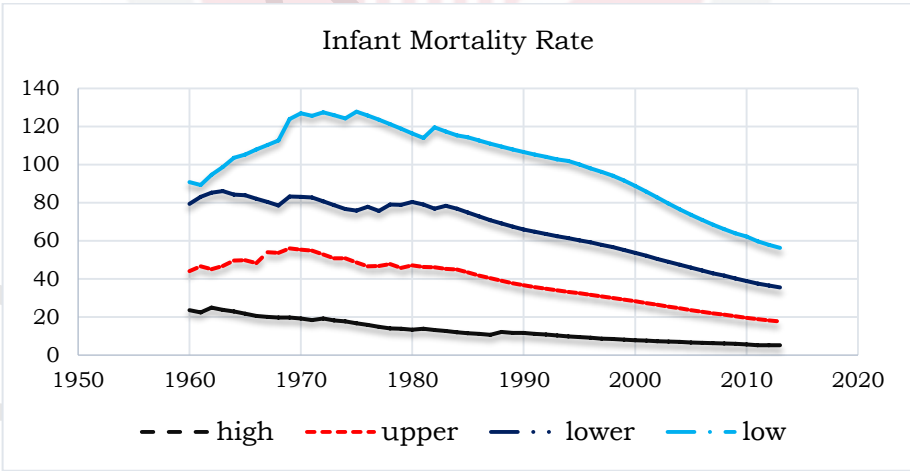

Figure 1.8: Infant Mortality Rate.
Source: World Bank (2014), and author's calculation.
Note: low refers to low-income, lower refers to lower-middle-income, upper refers to upper-middle-income, and high refers to high-income. In the analysis the low and lower-middle-income countries are combined in one group (low-income).

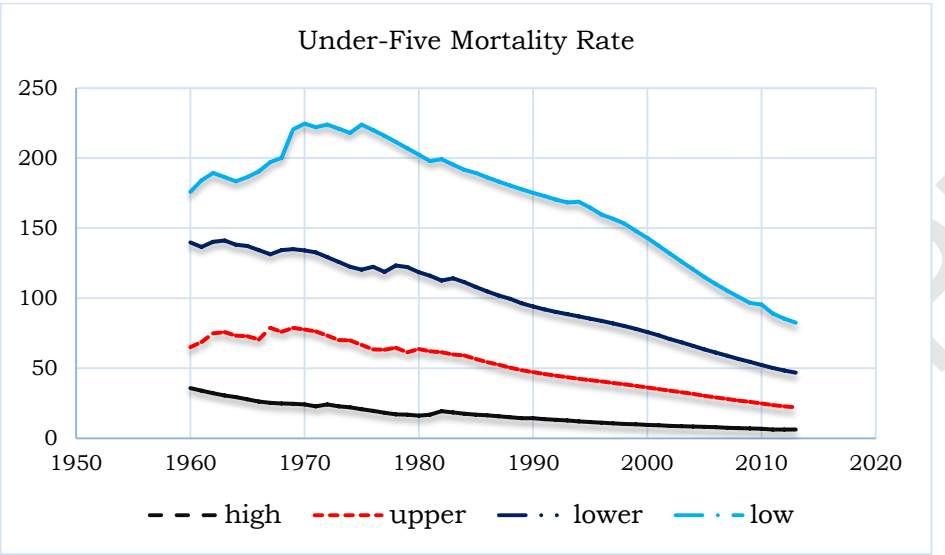

Figure 1.9: Under-Five Mortality Rate.

Source: World Bank (2014), and author's calculation.
Note: low refers to low-income, lower refers to lower-middle-income, upper refers to upper-middle-income, and high refers to high-income. In the analysis the low and lower-middle-income countries are combined in one group (low-income).

Studying the social and economic determinants of health financing, and how it can affect health outcomes is therefore necessary to provide reasonable explanations for the change in health outcomes. The impact of any economic changes on health outcome -even in similar countries- may vary considerably due to variations in an initial condition such as the gross domestic product per capita, education, health coverage, and the institutions and government policies. Therefore, caution is required when applying panel data analysis to identify the contributing factors (Cornia et al., 2008).

1.4.1 Health Financing and Health Outcomes

One of the fundamental determinants of health outcome is the ability of individuals to get access to the essential health services. In a well-financed health system, individuals mostly have higher access to medical care and services, compared to the under-financed system. In general, the allocation of public health financing relies on the budgetary processes and the political systems, and it is often faced by the sub-optimal allocation of funds between levels of care across regions. For instance, the same amounts of resources can be used to expand and improve the current services, or it can be used to cover more of the population in rural areas, like building new hospitals. These alternative allocations of public resources have considerable effects on health status.

In fact, public spending on health in developing countries is relatively low, which may explain the large proportions of out-of-pocket expenditure on health. In the other words, when public health financing is low then it is quite difficult to cover the entire population, thus some individuals pay directly from their income to get access to health care services (Cornia et al., 2008; Rajkumar and Swaroop, 2008). Many previous literatures emphasized that an increment in public health financing is a fundamental aspect that lead to improved health outcomes through increasing coverage and access to health services (Cornia et al., 2008; Rajkumar and Swaroop, 2008; Hu and Mendoza, 2013; Asiskovitch, 2010; Akhmedjonov et al., 2011; Moreno-serra and Smith, 2011).

Figure (1-10) shows the direction of the relationship between public health financing and health outcomes in almost 172 countries. Predominantly, there is a negative relationship between public health financing as a percentage of GDP, and infant and under-five mortality rates as shown in (A) and (B), whereas there is a positive association between public health financing and life expectancy. Mostly, the figure indicates the presence of a positive connection between public health financing and the improvement of the population's health outcomes.

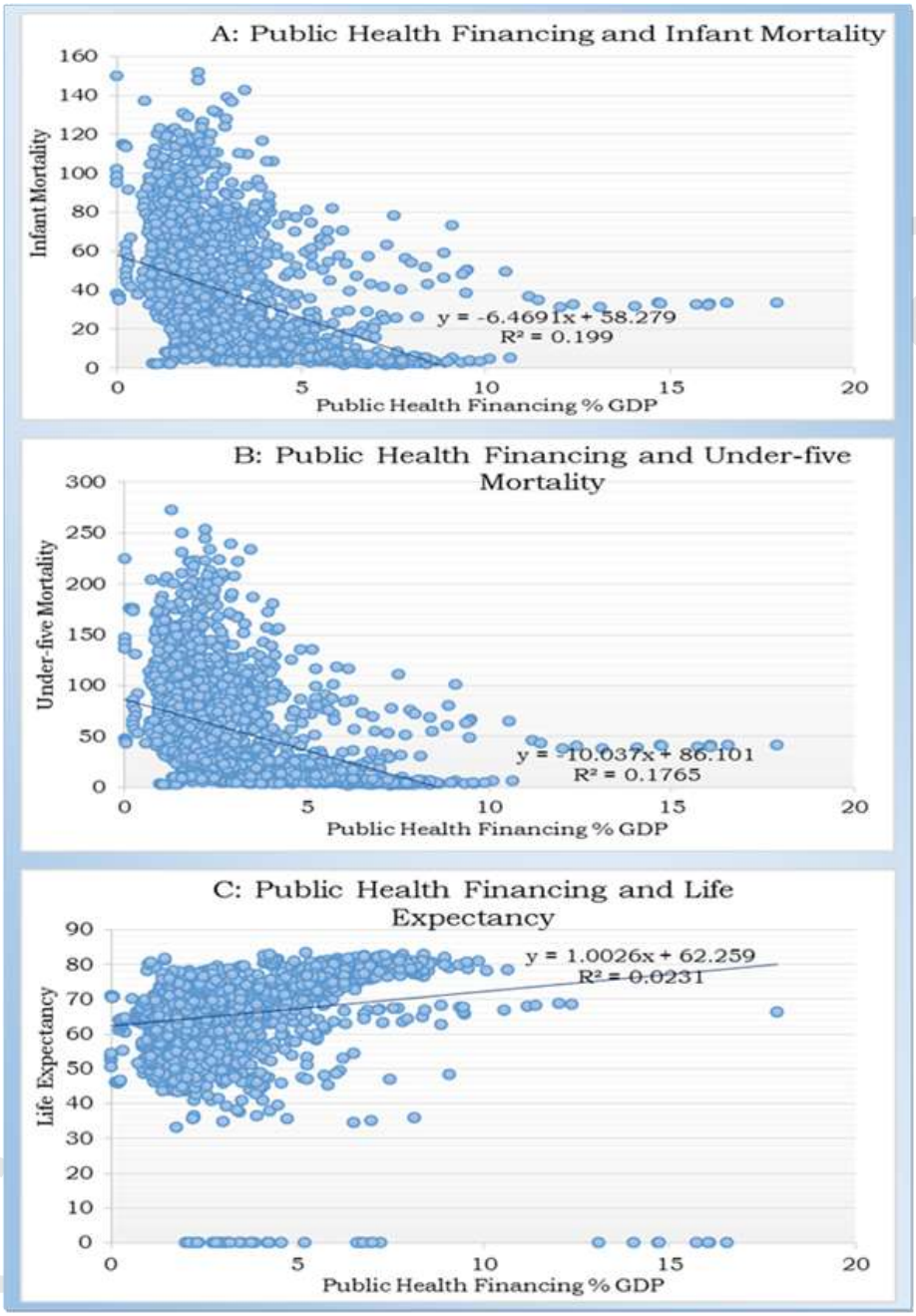

Figure 1.10: Public Health Financing and Health Outcomes.
Source: World Bank (2014), and author's calculation.

1.4.2 Socioeconomic Factors and Health Outcomes

In general, income of a household is assessed during a certain period, usually one year. The ability of the household to meet their necessary needs such as food, medicine and shelter, depends on their distribution of income over the entire period. The households' ability to secure their needs rely on the income level, thus the increment and stability of income has a direct and positive effect on their health outcome. However, income instability has a negative effect on health outcome because it leads to increased income inequality, which may affect future health status through its adverse effect on GDP growth rate. Normally, the poor are highly affected by income instability than the rich. In addition, the volatility of income has an essential effect on investment and on the medium term growth rate. In developing nations, output instability may affect public spending due to the high revenue output elasticity (Cornia et al., 2008; Hu and Mendoza, 2013; Hare et al., 2013). The households' ability to secure their needs rely on the income level, thus income has a direct and positive effect on individuals' health.

People with a higher level of schooling are fast learners of new health information, and they take advantage of the medical technology. Personnel that are more educated tend to have better skills and different decision-making patterns than less educated people. Therefore, they earn more income that helps them to improve their health status. Moreover, well-educated individuals are more likely to have healthier lifestyles and more health awareness; thus, their health status is positively affected by their level of education. Further, parents' education level can play a decisive role in reducing infant mortality rate and under five years old mortality rate. Several empirical studies argue that a low level of education is associated with adverse effects on health status; on the other hand, higher education tends to improve life expectancy and reduce child mortality (Fuchs, 2004; Cutler and Lleras-muney, 2006; DeWalt et al., 2004; Feinstein et al., 2006; Cornia et al., 2008; Asiskovitch, 2010; Hu and Mendoza, 2013).

1.4.3 Environmental Quality and Health Outcomes

The effects of environmental contamination on health outcomes, especially among the poor, are unquestionable as individuals are exposed to various types of pollutants. The main source of the environmental damage is air pollution, which may affect individuals' health and productivity. Zuidema and Nentjes (1997) and Hansen and Selte (2000) argued that air pollution and sickness leave are strongly correlated. The consumption of fuels in industries, and vehicles in particular, has been a major source of pollution posing health hazards. It is widely recognized that smog is one of the major causes of global warming and several diseases in the world (Romieu and Hernandez-Avila, 2003). The health effects of suspended particulate matter (SPM), emissions of carbon dioxide (CO_2), emissions of sulfur dioxide (SO_2), and nitrogen oxides emissions (NO_x), include cardiovascular and respiratory diseases, chronic bronchitis, increased morbidity and mortality. Nowadays, with the growing industries around the world, the CO_2 emission is increasing rapidly, and so are the health risks of individuals, especially in less developed areas (Cornia et al., 2008).

Air pollution and climate change are known to cause harmful environmental effects on population's health through their effects on food and water security, heat waves and infectious diseases. For instance, Zhang et al. (2010) and Kan et al. (2012) show that the environmental degradation in China expressed by climate change and air pollution affects the population's health by increasing mortality and infectious diseases. They argue that reducing fossil fuels consumption reduces greenhouse gasses emissions and benefits health.

1.4.4 Governance Quality and Health Outcomes

The governance quality can influence the outcomes of various government policies. The governance quality may also play an important role on how effective health care finance on population's health outcomes. Developing countries, in general, have low governance quality shown by government effectiveness and corruption control accompanied by poor health outcomes (Cummings et al., 2009). The level of corruption and bureaucracy can explain the effectiveness of public health finances in improving health outcomes (Rajkumar and Swaroop, 2008). The role of institutions and governance as the key elements for development efficiency has been emphasized widely in the recent economics literature. If the quality of institutions in a particular country were weak, public allocation of resources would lead to the inefficient performance of public finances. For example, Rajkumar and Swaroop (2008) highlighted the important role of governance quality in determining the size and effectiveness of public finances.

Public finances with better government quality may lead to an improvement in public outcome. Therefore, assessing the relationship between public spending and its outcome required considering the governance quality, because the impact may vary due to the variations in the quality of governance. The quality of governance refers to the degree to which the interaction of public institutions leads to improvement of the outcomes of a certain policy. For example, the health outcomes in the Eastern Mediterranean Region are associated with better governance quality such as high government effectiveness, besides income and health financing (Farag, 2009). Moreover, Rajkumar and Swaroop (2008) examined the effect of governance in determining the efficiency of public spending in improving public outcomes, such as education and health. Their findings showed that public health expenditure is more effective in reducing child mortality rate in countries with better governance quality. In addition, in countries with low governance quality, public spending has no impact on education and health outcomes.

The study aim to estimate the indirect effect of governance quality on health outcomes through public health financing, which distinguishes this study from other literature, since there are only a few studies that have highlighted the relevance of governance to health outcomes (Rajkumar and Swaroop, 2008; Farag, 2009; Farag et al. 2013; Hu and Mendoza, 2013).

1.5 Health and Economic Growth

Many factors influence health status and a country's ability to provide quality health services for its people. The Ministry of Health is an important actor, but so are other government departments, donor organizations, civil society groups and communities themselves. For example, investments in roads can improve access to health services; inflation targets can constrain health spending; and civil service reform can create opportunities - or limits - to hiring more healthy workers.

The WHO is concerned with the impact of better health on development and poverty reduction, and conversely, with the impact of development policies on the achievement of health goals. In particular, it aims to build support across governments for higher levels of investment in health, and to ensure that health is the priority within overall economic and development plans. In this context, 'health and development' plans may support health policies that aim to fulfill the needs of the poorest groups of the population by providing better access to health services. The WHO also works with donors to ensure that aid for health is adequate, effective and targeted at priority health problems (Reeder and Terry, 2013).

Economic growth can lead to better health, nutrition, and education. Rich countries have the capability to invest in public health and medical care. However, the relationship runs in the other direction as well. There are reasons that health enhancements may contribute to economic development. First, good health can increase workers' productivity, either through fewer days off or through increased output while working. Improved health of family members will have a similar impact on reducing time lost to caring for dependents. Second, reduced diseases and improved nutrition, particularly in early childhood, normally lead to improving cognitive development, and increase the ability of learning. Healthy children gain more from school and have fewer days absent due to illness. Improved education through either of these mechanisms adds to human capital – a significant determinant of economic growth. The third reason is that healthier individuals will often have the ability and incentive to save more, and this accumulation of capital may help fuel growth through investment. Similarly, companies may be more likely to invest more when workforces are healthier or better educated.

It is important to recognize the concept of health in a wide sense, to describe the association between health and economic growth (WHO, 2001). Health does not refer only to the absence of diseases; it also shows the ability of individuals to improve their potential during their lifetime. In that sense, health is an important asset people possess in order to improve economic and social well-being. Additionally, health affects economic growth indirectly through its impact on people's education, which strongly affects their income level (The Mexican Commission on Macroeconomics and Health report, 2004).

Good health plays a substantial role in determining economic growth. Therefore, public health financing appears to be an influential factor that may lead to enhancement of economic growth, whereas the out-of-pocket health expenditure is one of the main reasons that lead to household impoverishment. As developed nations tend to allocate a large proportion of their budgets to health care services, their level of health outcomes and economic development is high. It should be mentioned that health here is measured by life expectancy and public health financing. In literature, many studies have pointed out the impact of public health spending on economic growth; for example, Baldacci et al. (2008) found a strong positive relationship between public spending on health and education on human capital, and thus economic growth. However, the increasing numbers of the aging population around the world, especially in developed countries as a result of the demographic transition, present some questions regarding the monotonic relationship between public health expenditure and economic growth (Martins and Veiga, 2014).

Regarding the impact of life expectancy on growth, a long term study for some industrialized countries carried out by Arora (2001), clearly illustrated the role that health plays in economic growth from the nineteenth century in currently developed nations. The study revealed that health improvements as expressed by higher life expectancies led to a real enhancement in productivity, and as a result, stimulated long term growth. The author argued that the high rates of morbidity and mortality are one of the reasons for the low economic performance in many developing countries nowadays. In addition to that, in the nineteenth century the industrialized countries faced a similar demographic transition to the one faced by many developing countries today.

On the other hand, a study by Acemoglu and Johnson (2007) concluded that the epidemiological transition increases life expectancy, which appears to have no impact on economic development. Cervellati and Sunde (2011a) used a finite mixture model for 47 countries, and concluded that the relationship between life expectancy and economic growth is non-linear. This evidence draws attention to studying the impact of life expectancy on growth, considering the demographic transition. In that context, An and Jeon (2006) discussed the effect of longevity on economic growth considering the demographic changes, and accounting for the possibility of a non-linear relationship between life expectancy and growth. They argued that the relationship tended to be non-linear between demographic changes and economic growth.

Another argument made by Desbordes (2011) is that the non-monotonic relationship between health and growth is contingent on the initial level of life expectancy. For instance, countries with higher life expectancy have a positive and significant impact on GDP per capita, and the opposite is true.

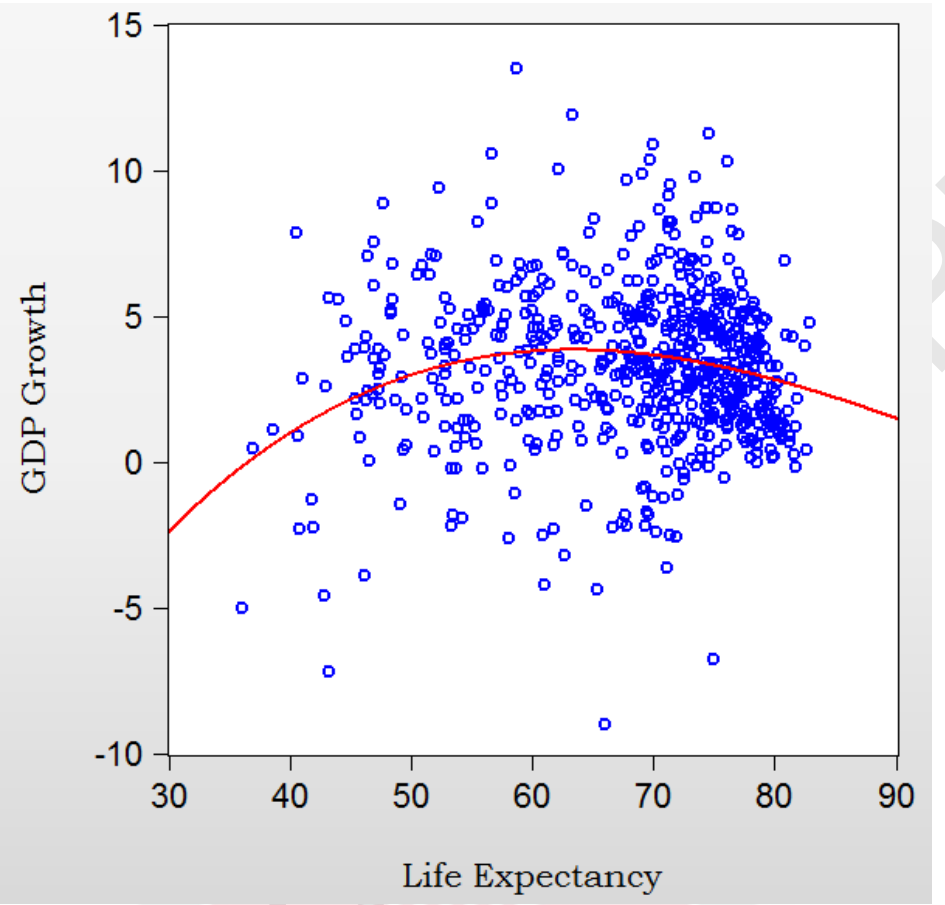

Figure 1.11: Life Expectancy and GDP Growth.
Source: World Bank (2014), and author's calculation.

The relationship takes the form such as that shown in figure (1-11). The figure shows the possibility of a non-linear relationship between life expectancy and GDP per capita growth for different developed and developing countries with different levels of life expectancy. It shows that at the initial stage, any increase in life expectancy improves growth, but any increase in life expectancy, after a certain level, reduces growth. The assumption of non-linearity has to be empirically examined in order to explain the changes in the relationship.

1.6 Research Problem

In this research, there are three main issues related to health financing to be addressed. The first issue identifies the determinants of health financing modes. Normally, health care services in some cases can be above the financial capability of individuals, particularly in most developing countries. Additionally, how resources are provided to

finance health care could take many forms, such as government or public funding and private funding. In fact, developed countries have high public health financing as a share of GDP, and low out-of-pocket as a share of total health expenditure.[2] On the other hand, developing countries have low public health financing, and as a result individuals tend to pay high out-of-pocket expenditure to cover the cost of health care services (Etienne et al., 2010). Public health financing in most countries remains low, and fails to provide services to the entire population, especially in developing countries, and thus people find no way to get treatments unless they pay for it out of their pockets. It has been projected that a high percentage of the world's 1.3 billion poor have no access to medical services, basically because they cannot afford to pay when they need to use the services (Preker et al., 2004).

There are large variations in the determining factors that drive public or out-of-pocket health financing in both the developed and developing world. In the literature, the income differences between countries has been emphasized as one of the important elements that determine health financing. In addition, there are other important determinants that may explain why some countries allocate higher funds to health than others do. For instance, the demographic transition and change in age structure have different impacts on health financing in both developed and developing countries. Furthermore, the epidemiological transition, which indicates the pattern of diseases, may also affect how health is being financed. Most importantly, the governance quality can play a critical role in determining health financing. In a country where the quality of governance is relatively weak, the allocation of public resources is not efficient. The importance of health financing to improve health care services is a well-studied issue in the literature. However, the quality of governance which may largely determine the size and effectiveness of health financing needs to be addressed (Rajkumar and Swaroop, 2008).

The second issue of this research addresses how health outcomes are affected by health financing patterns and other factors. In general, the method of how health care services are financed in a particular country may largely affect the level of health outcomes as well as economic growth. In a well-financed health system, the health care services tend to cover the vast majority of the population. To achieve health coverage for the majority of the population, countries are required to provide accessible, available and non-discriminating health care services in order to meet the increasing needs, due to the changes in medical technology, aging population, and higher pricing of health care services. The sustainability of health coverage (public health financing) would improve population's health status, such as life expectancy and mortality rates, in the long term.

However, in most developing countries, health expenditure from a public source of financing is inadequate to cover the entire population, and consequently people pay directly out of their pockets to get medical services. Both low public health financing and high out-of-pocket health financing have serious implications for individuals' health condition. Besides that, OOP expenses may have serious consequences on

[2] See figures (1-2) and (1-3).

health outcomes. It is noticeable that out-of-pocket health financing stops people – especially the poor- from using preventive care, and they get medication only when they are in dire need of it. This delay in getting treatment leads to worsening health status. Further, the persistence of out-of-pocket expenditure as a moderate way to finance health is one of the main factors that contribute to the impoverishment of households. Therefore, the mechanism of how to finance health is ultimately important in determining health status.

Change in health outcomes is also affected by socioeconomic factors such as income, and thus the income stability has a direct and positive effect on health levels. Similarly, the level of education is associated with adverse effects on mortality rates, and is positively related to life expectancy. Another factor that can explain the variations in health outcomes is environmental quality, since individuals are exposed to various types of pollutants. Furthermore, the impact of governance quality can affect health outcomes through public health financing, as pointed out by Hu and Mendoza (2013). Therefore, it is important to study these determinants to have reasonable explanations for differences in health outcomes among countries.

The third issue discusses the possibility of a non-linear relationship between health and economic development. Health is a very important element in driving economic growth toward more progress. The reduction in child and adult mortality explains the improvement in life expectancy at birth in many countries. The overall health outcome improves as a result of declining mortality and morbidity. In general, countries with higher life expectancy tend to be more developed, and their income is relatively higher compared to those that have lower life expectancy. Several empirical studies confirmed that increase in life expectancy is positively associated with a high economic growth rate. The demographic transition is highly associated with life expectancy, since the increase in longevity will result in an increased aging population (Cuaresma et al. 2014).

In developed countries, the population of 60 years and above makes up 21% of the total population, with the expectation that it will reach 33% by 2050. In developing regions, the percentage of the population of 60 years and above is about 8% of the total population, but this number is expected to reach approximately 20% of the entire population by the year 2050. Globally, the number of aging population is projected to triple and reach almost 2 billion by the year 2050. Moreover, the world's population aged 80 years and above is also expected to reach 395 million in 2050 (UN, 2009). Nonetheless, the demographic changes, such as increase in life expectancy and decrease in fertility rate, raise many questions regarding the nature of the relationship between health and economic growth. Moreover, Potrafke (2010) argues that the demographic transition has significant effects on health expenditure in most developed countries.

Some empirical works deviated from the usual interpretations of the monotonic relationship between health and growth, indicating that life expectancy and public health expenditure may have a non-linear effect on economic growth. For example,

Aísa and Pueyo (2006) emphasize the non-linear effect of public health expenditure and life expectancy on economic growth, and Carboni and Medda (2011) also show that estimating the impact of public health expenditure on growth without considering the possibility of the non-linear effect may lead to miss-specified model. Along with the growth in aging population in many countries, there is an increasing concern about the existence of an inverted U-shape between health and economic growth which requires further empirical investigation.

1.7 Objectives of the Study

The general objective of the study aims to evaluate the impact of health financing in determining health outcomes, and how health systems contribute to economic growth. The specific objectives are:

i. To examine the determinants of public as well as out-of-pocket health financing.
ii. To evaluate the impact of health financing mechanisms incorporating the governance quality on health outcomes.
iii. To examine the relationship between health and economic growth.

1.8 Significance of the Study

Health is one of the most important things to humans; people value health for its direct and indirect effects on investment and consumption, as perfection is rarely achieved by most people. Healthy individuals are characterized by a high level of productivity, and thus can earn more income. The same thing applies at the macro level, where the overall health outcome plays an effective role in raising the total output and contributes significantly to the level of economic growth. The critical importance of health for humans made global efforts united to provide a comprehensive global coverage for health services. The World Health Organization (WHO) launched an appeal "universal coverage" for health, where all individuals should have equal access to health care and services, regardless of their ability to pay for it. It becomes increasingly difficult to ignore that even high-income countries are struggling to sustain current health services, and to ensure that each person can afford to use them (Reeder and Terry, 2013). The problem of how to afford and sustain financial risk protection is significant everywhere. In most cases, out-of-pocket health expenditure is high in countries where public health spending is very marginal, and cannot enable a sizeable proportion of the population to have access to health services.

Some studies have investigated the impact of health care financing and how it influences health status for both individuals and countries. Mostly, all these studies have focused on studying developed countries such as OECDs and high-income countries. However, developing nations have not received the proper attention of conducting such studies to improve their health care systems. The main aim of this work is to find the link between health care systems and the level of economic growth, with a little emphasis on the developing world. Considerable numbers of empirical studies have been done on establishing a link between health, productivity and

economic growth; and the relationship tends to be positive almost in all cases. However, this thesis investigates the relationship between health care systems and economic growth in developed and developing countries, using a non-linear framework.

This study also contributes to the existing literature, by examining the determinants of health financing in 181 low, middle and high-income countries. The findings of this study suggest that the level of economic growth is an essential factor that leads to an increase in government finances, as indicated by Wagner's law that as the GDP of a country increases, the expenditure of the government would increase. The negative relationship between the components of health financing supports the health financing transition hypothesis introduced by Fan and Savedoff (2014), where they argue that there are two trends of health financing over time; that is, increasing trend of public health financing and declining trend of out-of-pocket health expenditure. Moreover, the results of this research support the idea that the variations in health financing between countries can also be explained by the epidemiological and demographic transition. The change in the causes of mortality and morbidity, and the increasing trends of aging population around the world constitute as additional factors that cause higher demand for health, and thus health financing. Importantly, physical space of government seems to be an important determinant of health financing, which indicates that public health financing is large if total government expenditure as a share of GDP is large. As a result, total government expenditure is adversely linked to out-of-pocket health expenditure. Likewise, external resources for health is a necessary variable that helps to explain health expenditure function, especially in developing countries. The findings, however, have significant implications for the understanding of how the variations in health financing across countries is explained by the level of governance quality.

The present study makes several noteworthy contributions to health outcomes literature, by examining the effect of public health financing and out-of-pocket health expenditure on infant mortality rate, under-five mortality rate and life expectancy in 172 countries from 1995 to 2012. The results point out public health financing as a major variable that contributes largely to the reduction of child mortality and the improvement of life expectancy, indicating the critical role of health coverage in developed and developing countries. The empirical findings of this study contribute to the existing health outcome literature by providing a new understanding of the association between out-of-pocket health expenditure and health outcomes, as the findings show that out-of-pocket expenses leans toward worsening health in low-income countries but improves health outcome in higher income countries slightly. Although there are various studies that show that out-of-pocket health expenditure may lead to increased poverty, studies that link between out-of-pocket health expenditure and health outcomes are inadequate. Moreover, the results indicate that health deteriorates as a result of high pollution, and any policies that target reduction of greenhouse gas emissions can lead to better health. This work contributes to existing knowledge by providing evidence that shows the importance of governance quality for better health outcomes. Most importantly, the study provides a new understanding of the relationship between health and economic growth, putting the demographic transition into consideration. The contribution of this study has been to confirm that

life expectancy and public health financing have non-linear effects on economic growth.

1.9 Organization of Chapters

The research chapters are organized as follows: the second chapter contains theoretical as well as empirical literature related to health financing and its determinants, health financing and health outcomes, and also health and economic growth. The third chapter presents the adopted theoretical models, such as demand for health and longevity, and the neoclassical growth model of health and economic growth. In addition, chapter three also includes the empirical methodology and the data. The fourth chapter presents the findings and discussions. Finally, chapter five contains the summary and conclusion of the research.

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