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HEALTH IN DEVELOPING COUNTRIES
-The determinants of health in Latin American and
Caribbean countries

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Abstract

Title: Health in developing countries – The determinants of health in Latin American and Caribbean countries

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Problem discussion: There are still today many problems related to health in developing countries. When reasoning on how to deal with these problems, it is important to study the determinants of health in each country. Each country has got its own characteristics. The development process never ends, and each health care system needs to be adaptable for the ongoing changes, in order to meet local needs. In the end, it is the health care system that counts and determines the final health status of the population.

Purpose: The purpose of this thesis is to study what determines health in three Latin American and Caribbean countries (Bolivia, Colombia and the Dominican Republic), how the significance of these determinants differ between the countries, and put these in relation to the design of the health care system.

Method: The thesis is based on empirical facts, along with a theoretical framework on health in developing countries, and a regression analysis, based on 28 Latin American and Caribbean countries, with data from World Bank Development Indicators for the year 2006. This method covers the current situation in the Latin American and Caribbean region, with a focus on health and the health care system in Bolivia, Colombia and the Dominican Republic.

Conclusion: There are many different explanatory variables for health. GDP per capita, health expenditure, and primary school enrollment are positively related to health, whereas the living in rural areas has a negative impact on health. This negative relation between health and rural living can be explained by the lack of universal health care coverage and less developed health care facilities in the rural settings. The main problem regarding health for Bolivia, Colombia and the Dominican Republic is associated with the lack of universal coverage of the population, especially the rural population, which shows a need for a more decentralized health care sector, with a focus on local individual needs.

Keywords: Health determinants; Health care system; Developing countries; Economic growth; Poverty; Rural population; Latin America

Summary

Good health is of great importance for developing countries. There has been progress regarding health problems during the last decades, and people are healthier, wealthier and live longer than 30 years ago. However, we see still today a lack of health care coverage in developing countries. This is one of the main problems for Latin American and Caribbean countries; that the health care sector does not reach out to the entire population.

The health care systems in Bolivia, Colombia and the Dominican Republic have undergone major changes during the last couple of years, with a focus on guaranteeing health care for everyone. These three countries face different premises, regarding government and environment, which in turn limits the economic development.

There are many different factors affecting the level of health in a country, such as social factors, politics, environment/location, economics, etcetera. The importance of these factors differs according to country. Rural living is especially important in Bolivia and the Dominican Republic, and it has a significantly negative effect on health, as opposed to Colombia, which has a smaller share of rural population.

As a country becomes richer, there is an increased possibility to develop the different sectors. However, results show that there is no significant relation between GDP per capita and public health expenditure (as a share of government expenditure). Some of the richer Latin American and Caribbean countries actually have a low share of expenditure on health, which can be explained by social and political influences. Due to corruption, resources do not always end up optimally allocated.

Altogether, these different determinants of health put a pressure on the design of each national health care system. Because of national differences and different premises, each country needs a tailored development program, and health care system. It might not be possible to design a health care system that would be suitable for every country. There are gains associated with decentralizing the health care sector so as to meet local needs.

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1 Introduction

People are healthier, wealthier and live longer today than 30 years ago. There have been significant improvements in access to water and sanitation, showing that progress is possible. The global health economy is growing, as well as the knowledge and understanding of health. The technological improvements are increasing the potential for improving health. However, this progress has been unequal around the world, with some countries improving their situation as other countries are lagging behind. We see today both health inequalities among countries as well as within countries.

As we see improvements in health, the nature of health problems is changing. An ageing population along with the effects of urbanization and globalization accelerate the transmission of communicable diseases.

Furthermore, the globalization has an impact on the health care systems around the world, with rapid changes. As the world changes, with people being more mobile, the society keeps changing and this puts pressure on the health care systems, with the need to be adaptable for changes in the population with regards to needs and demand. The health care sector fails to anticipate the changes in many parts of the world. Either the health care sector reacts too late, or too often with not enough resources. The scarce resources are often not used in the right way and hence end up in the wrong place. It is important that the solutions are not of temporary character.

Many countries have made improvements in order to face the Millennium Development Goals¹, whereas other countries, particularly in Africa, have stagnated. This slow progress in Africa has meant a slow improvement in access to health care, something that should be the main priority. Despite many changes for the better, vaccination coverage in sub-Saharan Africa is still significantly lower than in the rest of the world. The World Health Organization demonstrates how childbirth care for mothers and newborns continues to face problems. In 33 countries, skilled health personnel attend less than half of all births each year. Sub-Saharan Africa is also still the only region in the world where access to qualified providers at childbirth is not progressing.

There is variation in achievement across countries with the same income, particularly among poorer countries. Life expectancy in Ivory Coast (a country in West Africa) is nearly 17 years lower than in Nepal, and between Madagascar and Zambia, the difference is 18 years. Countries with similar level of income do experience different patterns of development and progress, and the question is what makes the people in Nepal live longer than the people in Ivory Coast.

In the developing countries we see a slow progress of education and access to modern transport systems. These are important in the further development. People are more exposed today to both environmental and health threats. People lack the possibility to invest in their own health and the governments lack the necessary resources and/or

¹ Eight goals to be achieved by 2015 that respond to the world's main development challenges: Eliminate extreme poverty and hunger, achieve universal primary education, promote gender equality, reduce child mortality, improve maternal health, combat HIV/Aids and malaria, ensure environmental sustainability, and finally develop a global partnership for development (UNDP).

commitment to public investment. The World Health Organization states that the best possible local governance can contribute to a longer life for the people, 75 years of life expectancy compared to 35 years with poor urban governance.

88 percent of cases of *diarrhea* worldwide are caused by unsafe water, inadequate sanitation or insufficient hygiene. The World Health Organization shows that these cases result in 1,5 million deaths each year, with most being children dying. Along with diarrhea, children in developing countries are suffering from being *underweight*, which is a problem that leads to about 35 percent of all deaths of children under the age of five all over the world. Underweight and malnutrition is often associated with repeated diarrhea. Such underweight in children is responsible for 70 000 deaths per year. Children suffering from underweight are also more vulnerable to infectious diseases. The total number of deaths caused directly and indirectly by malnutrition due to lack of fresh water, adequate sanitation or sufficient hygiene is up to 860 000 deaths per year among children under the age of five years, according to the World Health Organization.

Health care systems have had an important role when increasing the life expectancy during the 20th century. The general health is improving, and the health care systems have contributed to the well-being of people all over the world. However, large gaps remain between the potential and the actual performance of each health care system, and there is still much variation in outcomes among countries (World Health Organization, 2000, p. 3). Along with the variation among countries, there is a significant gap between those who can and those who cannot access health care within many countries. There are many reasons for this inequality, such as poverty, the loss of employment, lower incomes, globalization, as well as disparities in the income distribution (Pan American Health Organization, 2007, p. 24).

1.1 Problem discussion

The health of a population is affected by many different factors. These factors are different depending on the location in the world, hence different environments. The developing countries around the world face different health issues and problems but they all have in common the lack of resources. Often, individuals lack common knowledge on different diseases and the severity. The major diseases and death causes in Latin America are depression, violence and heart diseases, whereas in Sub-Saharan Africa the countries face HIV/Aids, malaria, respiratory diseases and diarrhea as main death causes, to a larger extent. The countries in South Asia face respiratory diseases, heart diseases, and diarrhea as major death causes.

The geographical location does influence this, but also other factors within the society such as level of education, public spending, general access to health care services, income level, etcetera, which is why this is interesting and important to study. Since countries are different in many ways, it is important to study which factors that have an impact on health and put the current health situation in relation to the way the health care system is designed: whether or not the whole population is covered by the health care system; whether or not there is equal access to the health care system; whether or not the basic needs are met. In the end it is the health care system that counts and determines the final health status: are the people being cured or do they die.

In our complex world today, it can be difficult to say exactly what a health care system is. The World Health Organization (2000) defines a health care system so as to include *all the activities whose primary purpose is to promote, restore or maintain health*.

1.2 Objective

My objective with this thesis is to look deeper into which factors determining the health status in developing countries and how the significance of each factor differs between the countries studied. These health determinants and the current health problems in each country that I have chosen to study will be related to the design of the health care systems. In order to do this I need to study, both empirically and theoretically, which factors that might have an impact.

Since the health determinants are supposed to have different impact on health in the different countries, I devote a chapter to describing the current situation with empirics and how the different health care systems are designed, in order to gain further understanding of the significance of each factor and why there are geographical differences. The countries are different in many ways; hence different changes and reforms need to be made, in accordance to the situation in the country.

Academic theory on the subject is used to gain understanding on development with focus on health issues. This is important for the further analysis in order to be able to discuss the importance of developing these under-developed countries with focus on the human capital, hence the health of the population. Since my focus is the health determinants in developing countries, I go through theories on the importance of health, from an economical and social perspective, and which factors that are expected to have an influence on health. These different determinants of health will be used for the further analysis along with the knowledge of each health care system, in order to reason on the differences among the countries, and what there is to be done in the future.

To succeed with my analysis, each chosen country is studied with a focus on health status and compared to the other countries in the study. I put up a regression model based on 28 countries in Latin America and the Caribbean. By doing this I will be able to see the difference in the level of significance among the different health determinants.

1.3 Purpose

The purpose of this thesis is divided into three parts:

- i. Present health determinants in developing countries
- ii. Show how the significance of these health determinants differs between countries
- iii. Relate the results to the design of the health care system

1.4 Delimitations

When choosing which countries to study, I limited myself to three countries in Latin America and the Caribbean, with all three countries being low-middle income

countries according to World Bank classification.² I have chosen countries within the same classification of income level to see how the significance of the factors affecting health is different among countries within the same continent and income-level group. The countries being studied in this thesis are Bolivia, Colombia, and the Dominican Republic. These are three different countries in many aspects, but they all have in common severe problems related to health and poorly developed health care systems.

Firstly, I wanted to study three countries being low-middle income countries. Within this group of countries the health care systems are somewhat developed, but there is still a long way to go. Secondly, I wanted to study three countries in different parts of the American continent, countries not being direct neighboring countries. I chose Bolivia, Colombia and the Dominican Republic since these countries face different environments, hence different health issues and therefore different pressure on the health care systems. I did this in order to be able to see geographical differences regarding health determinants and the success of the health care systems, but still within the same continent and income-level group. We have Bolivia in the center, Colombia in the north, and finally the Dominican Republic as an island in the Caribbean. In addition to this environmental aspect, the countries also face different political premises, with Bolivia being a socialist state, Colombia facing issues related to the mafia and drugs, and the Dominican Republic being a liberal democracy with a lot of corruption. These political differences are also expected to have an impact on the design of the health care system and the allocation of resources by the government.

1.5 Outline

I start off this thesis by presenting my method: what I have done and why I have chosen to do this. Chapter three is devoted to empirics, where I describe the health care systems in the chosen countries with statistics regarding the health care sector in each country. This is for the reader to keep in mind when reading through the thesis, which also will be further analyzed. Further, in chapter four, I present theories on the subject, which will be used further when discussing and analyzing the matter. Chapter five is where I present the regression results, which will be analyzed and discussed in the final chapters. This is where the results are related to the current situation in each country with respect to the health care system, in order to discuss national differences regarding health determinants, and the success of each health care system.

² Low-middle income country is according to World Bank a country with GNI per capita of between \$936 - \$3,705

2 Method

I start of this thesis by presenting the current health situation in the developing world, with a focus on the Latin American and Caribbean region. This is to get an understanding on the situation and why it is important to study. There are still today many problems related to health in this region, and chapter three is therefore designed for the reader to keep in mind when continuing reading the analysis and the final discussion. One needs to know and understand the situation in order to perform a good analysis of the problem.

In addition to this background information, I have decided to present the health care system in each country being studied more closely. I have done this in order to be able to draw conclusions regarding the determinants of health in relation to the health care system. By lifting up the different health care systems, I am able to, to some extent, say whether or not the system is efficient in providing health care services for the population. The systems that are being presented are the ones for Bolivia, Colombia and the Dominican Republic. One needs a broad understanding of the health care system when analyzing and discussing health and the factors that have an impact on the health, since it is the health care system and the health providers that determine the final state of health for each individual. When being ill, people seek care with the hope of being cured, hence it is important to study and discuss whether or not the health care system is designed properly in order to meet the national health problems.

As mentioned earlier, I have chosen these three countries because they are within the same classification of low-middle income countries according to the World Bank, and because they are not neighboring countries. With the Dominican Republic being an island the comparison of health determinants and health status becomes more interesting. Colombia is on the northern coast of South America, and Bolivia is situated in the center of the continent. This makes it possible to see differences that might depend on the location, within the same continent.

Further in the thesis, in chapter four, I present theories on health and determinants of health, which I find appropriate for this particular analysis. I present the importance of good health and the relationship between health and economic growth, which shows why it is especially important to study the health situation in developing countries. The health determinants are presented with a focus on developing countries, and further in the thesis I will relate these health determinants to the current situation in each country with respect to the health care system, based on the regression results which will be presented in chapter five.

By using aggregated data I compare the health in low-middle income countries in Latin America and the Caribbean. I perform regression models based on 28 countries in the region. The number of observations (countries) is rather limited, which I am aware of being a weakness of the model. Data for Bolivia, Colombia and the Dominican Republic are put into the model and analyzed to see the significance of the different health determinants in this specific model. Even though these three countries are my focus, I mention some other countries as illustrative examples, to show contrasts and comparisons.

Due to the limitation regarding the number of observations, I cannot include that many explanatory variables in the model (as the explanatory variables loose their

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significance), which is why I put up different regression models, by replacing a third explanatory variable.

The regression model is as mentioned based on 28 countries. I have chosen life expectancy at birth as a measure of health. I find this to be a good measure of health, since good health is assumed to lead to a longer life. As explanatory variables I have chosen health expenditures, GDP per capita, share of total population living in rural areas, and primary school enrollment. These are chosen based on the empirical and theoretical framework, factors that are assumed to have an impact on health. The data I used for the regression analysis is found at the World Bank statistical database, namely the World Development Indicators for the year 2006. When studying developing countries, one needs to be aware of the limitations regarding data. There are no available data for the remaining countries in the Latin American and Caribbean region, which is why the number of observations ended up at 28, out of 38 countries.

I have chosen this particular method to see whether there is a difference in significance of each determinant of health between Bolivia, Colombia and the Dominican Republic. The results will be related to the different health care systems in order to discuss why the different health determinants have different significance depending on country, and hence different level of health. This is to see if the health care systems are successful in meeting the local health problems, and what there is to be done in the future.

3 Health and health care in developing regions

In this chapter we will acquire knowledge on the current situation in the developing regions throughout the world, in terms of health status, with a certain focus on the Latin American and Caribbean region. Main indicators for the health status are presented, such as infant and maternal mortality rates. Further focus will be on the health and health care systems in Bolivia, Colombia and the Dominican Republic.

The Millennium Development Goals (MDGs) were developed in the United Nations Millennium Declaration and signed in September 2000. The eight goals are: eliminate extreme poverty and hunger, achieve universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/Aids, malaria and other diseases; ensure environmental sustainability; and develop a global partnership for development (UNDP).

To get an initial idea of how the developing regions differ, table one below shows the differences in terms of infant and maternal mortality rate, for the year 2000.

Table 1: Infant and maternal mortality in year 2000 in different regions
Source: Collin and others (2008), Christian (2008), published in Semba and others (2008)

	Infant mortality rate (per 1 000 births)	Maternal mortality ratio (maternal deaths per 100 000 live births)
Sub-Saharan Africa	104	920
Middle-East and North Africa	45	130
South Asia	67	540
East Asia and Pacific	31	55
Latin America and Caribbean	27	190

Global trends suggest that infant mortality is declining in many regions within the developing world, but the burden is still significantly higher in Africa than in the Latin American and Caribbean region. It has taken about 40 years from 1960 to reduce child mortality by 50 percent all over the world, and the MDGs proposes an additional reduction by two-thirds by the year 2015. Furthermore, the level of maternal mortality remains high among the developing countries, with about 530 000 deaths per year. There are large disparities between developed and developing countries in terms of maternal mortality: One in every 16 dies of pregnancy-related complications in the developing countries, compared to one in every 2 800 in the developed countries (Nayar & Razum, 2006, p. 320). Women in developing countries still face very high risks of death as a result of pregnancy. The risk of maternal death is almost 40 times higher in the developing countries than in the developed countries (Collin et al., 2008, p. 39).

Along with HIV/Aids, tuberculosis is one of the infectious diseases leading to death. Tuberculosis is responsible for about 25 percent of all preventable deaths in the developing countries. Many of these deaths are related to the HIV infection. This disease is distributed all over the world, but the burden of the infection is found in developing countries. The majority of cases are found in sub-Saharan Africa and Asia, two regions that experienced the highest prevalence of tuberculosis during the 1990s (van Lettow & Whalen, 2008, p. 275).

3.1 Latin America and the Caribbean

The American continent (The Americas) consists of North America, Latin America, and the Caribbean, where the two latter are considerably less developed than North America.

During the past quarter of a century there has been considerable improvements regarding human development and health in the entire American region; including a drop in the population growth, an expanding urbanization, as well as an increasing coverage of basic services. The people in the American region have in general a better access nowadays to education and to primary health care, including fresh water supplies and sanitation. The recent improvements also cover new technologies available for the population, with an increasing rate of immunization. Altogether, these improvements enable a better prevention and control of many communicable diseases (Pan American Health Organization, 2007, p. 1-2). In the table below we see evidence of these improvements since the 1980s in the Americas regarding health and access to drinking water and sanitation services.

Table 2: Improvements in health and development in the Americas, 1980-2010
Source: *Health in the Americas*, Pan American Health Organization, 2007

	1980-1985	1990-1995	2005-2010
Life expectancy at birth (years)	68,8	71,1	74,9
Total fertility rate (children/woman)	3,1	2,6	2,6
Infant mortality (per 1 000 live births)	37,8	22,5	16,5
	1980-1984	1990-1994	2000-2004
Mortality from communicable diseases (rate/100 000 inhabitants)	109	62,8	55,9
	1980	1990	2005
Access to drinking water (%)	76	80	93
Access to sanitation services (%)	59	66	84
Nurses per 10 000 inhabitants	23,1	37,9	30

Despite these general improvements there are still many problems related to health remaining in this region. However, these health-related problems, such as HIV/Aids, malaria, tuberculosis, obesity and diabetes, are results of personal behavior, some more than others (Pan American Health Organization, 2007, p. 2).

Even though there have been important advances within poverty reduction, many people continue to live in poverty in the Americas. In 2005, 40,6 percent of the entire population in the American continent (about 213 million people) were still living in poverty, with as many as 88 million people in extreme poverty³ (16,8 percent). The so-called socioeconomic deterioration in the American continent (including poverty, rapid urbanization, and social fragmentation), has led to larger inequalities as well as unhealthier environments. This in turn has a greater impact on the rural population (Pan American Health Organization, 2007, p. 10).

Further improvements in the Americas regarding the reduction of infant and child mortality rates have been made. However, we still see today differences in child

³ The poverty line is \$2 per day, and the extreme poverty line is \$1,25 per day (World Bank)

mortality among countries, as well as within each country. Both countries with high child mortality (such as Bolivia, Peru, Guatemala, and Brazil) and countries with lower child mortality rates (for example Colombia and Belize) experience internal inequalities. It has been found that in Bolivia, Ecuador, Guatemala, Mexico, and Panama, infant mortality rates are much higher among rural indigenous populations, as opposed to rural non-indigenous as well as urban indigenous populations. Furthermore, findings in Bolivia, Brazil, Colombia, the Dominican Republic, Guatemala, Haiti, and Peru demonstrate an inverse relation between child mortality and mother's educational level, implying lower child mortality with higher education for the mother (Pan American Health Organization, 2007, p. 13).

More than 22 000 women in Latin America and the Caribbean die each year from complications of pregnancy and childbirth, deaths that could be prevented if appropriate interventions and care were available during the pregnancy, the birth, as well as the period after the birth (Pan American Health Organization, 2007, p. 14).

Regarding the financing of each health care system in the American continent, some countries have very low expenditures on health, whereas others are depending on external resources for the financing. This makes these countries vulnerable. Furthermore, many of these countries experience an increase in out-of-pocket spending on health care, which in turn is affecting the poor to a larger extent. Countries such as, El Salvador, Guatemala, Honduras, Nicaragua, Bolivia, Ecuador, Peru, and Venezuela, all have segmented health care systems with limited public sector coverage of the population (as a result of low public expenditure on health care). The private sector is very important in these countries, which covers mostly private individuals. Yet again, because of the large share of poor people, the inequalities regarding access to health care are strengthened (Pan American Health Organization, 2007, p. 24).

Furthermore, the health expenditure in the Latin American and Caribbean countries for the year 2005 was about seven percent of the region's collected GDP, and out of these expenditures 45 percent came from the public sector and the remaining 55 percent from private expenditure (including out-of-pocket expenditure on health care services) (Pan American Health Organization, 2007, p. 24).

Many of the countries in the Latin American and Caribbean region are lacking human resources in the health care sector. This shortage is expected to grow in the future, which in turn puts a lot of pressure on the current health workforce with people competing for the limited human resources. About 128 000 additional physicians and nurses are required for this region in order to reach an optimal ratio. In North America there are three nurses for every one physician, whereas in Latin America and the Caribbean there are three physicians for every nurse (Pan American Health Organization, 2007, p. 25).

3.2 Bolivia, Colombia and the Dominican Republic

With a general presentation of the health situation in Latin America and the Caribbean, we will now look more into the three countries chosen for the further analysis and comparison. Bolivia, Colombia and the Dominican Republic are three countries within the same classification as low-middle income countries, but with significant differences when looking at the main indicators, as presented in the table below.

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Table 3: Main indicators for Bolivia, Colombia and the Dominican Republic, year 2006

Source: The World Bank and The World Health Organization

Note: a) Numbers for year 2001

b) Numbers for year 2002

c) Numbers for year 2000

	<i>Bolivia</i>	<i>Colombia</i>	<i>Dominican Republic</i>
GDP (millions, current US\$)	11 451,84	135 672,61	31 886,07
Improved sanitation facilities, urban (% of urban population with access)	54	85	81
Improved water source (% of population with access)	86	93	95
Life expectancy at birth, total (years)	65,2	72,6	72
Mortality rate, under-5 (per 1 000)	61	21	38
Population, total	9 353 846	45 558 450	9 614 670
Ratio of girls to boys in primary and secondary education (%)	98,3	104	104
<i>Health expenditures for year 2005</i>			
External resources for health as percentage of total expenditure on health	6,8	0,0	2,5
General government expenditure on health as percentage of total expenditure on health	61,6	84,8	31,1
General government expenditure on health as percentage of total government expenditure	12,4	17,7	9,3
Out-of-pocket expenditure as percentage of private expenditure on health	81,4	45,1	86,4
Private expenditure on health as percentage of total expenditure on health	38,4	15,2	68,9
Social security expenditure on health as percentage of general government expenditure on health	62,1	69,5	26,8
Total expenditure on health as percentage of gross domestic product	6,9	7,3	5,4
<i>Health workforce</i>			
Number of dentistry personnel	5 997 ^a	33 951 ^b	7 000 ^c
Dentistry personnel density (per 10 000)	7,0 ^a	8,0 ^b	8,0 ^c
Number of nursing personnel	18 091 ^a	23 940 ^b	15 352 ^c
Nursing personnel density (per 10 000)	21,0 ^a	6,0 ^b	18,0 ^c
Number of physicians	10 329 ^a	58 761 ^b	15 670 ^c
Physician density (per 10 000)	12,0 ^a	14,0 ^b	19,0 ^c

Out of these three countries, Colombia has the highest GDP. We see large differences regarding improved sanitation facilities, and the Dominican Republic is more developed within the improved water source area, just to mention some of the differences among the main indicators. With this introduction we will now look further into each country and respective health care system, starting with Bolivia, followed by Colombia and the Dominican Republic.

3.2.1 Health and health care in Bolivia

Bolivia is one of the poorest countries in Latin America. It is also one of the most unequal countries, with the majority of the population not having access to enough opportunities to improve their quality of life. According to the *Human Development Report 1999*, Bolivia was considered to be a nation of intermediate human development. Out of 146 countries in the report, Bolivia was number 112 on the human development index and 99 on the gender-related development index. For that same year, 63 percent of the population earned an income below the poverty line, and 37 percent of the population could not purchase a basic food basket with their income, which is equal to extreme poverty. The situation is more severe in the rural areas, where more than 89 percent of the population lived in poverty and around 60 percent in extreme poverty for that same year (Pan American Health Organization, 2001, p. 3).

As shown in the report by the Pan American Health Organization, *Health Services System Profile Bolivia* (2001), the principal death cause for children under the age of five, is malnutrition, along with vaccine-preventable diseases, diarrhea and pneumonia. Child mortality rates are twice as high in rural areas as those in urban areas (Pan American Health Organization, 2001, p. 4).

Children under the age of five form one of the most vulnerable groups in Bolivia. Special attention has been directed towards decreasing the child mortality rate, and there has been progress regarding the coverage of the children. As stated further in the report by the Pan American Health Organization from 2001, the percentage of coverage regarding the first prenatal check-up has kept increasing, from 44,9 percent in 1989 to 52,5 percent in 1994. The coverage rate reached 69 percent in 1998, showing that progress is possible. However, as mentioned briefly earlier, the situation is worse in the rural areas, with a coverage rate of around 53 percent compared to 81 percent in the urban areas. The under-five mortality varies to a large extent depending on the mother's educational level, and whether living in rural or urban areas. The percentage of coverage with respect to first prenatal check-up is around 39 percent among women with no education, whereas the percentage is around 92 percent among women with a high school education, which shows the importance of the mother's education (Pan American Health Organization, 2001, p. 13).

Throughout the Bolivian history, the health care system has undergone different reforms and structures. The major provider of public health care is the *Ministry of Social Welfare* (MSPS), with the role of overseeing, regulating, and executing national policies and strategies for the public sector. The entire health care services network manages 40 general hospitals, 30 specialized hospitals, 149 basic hospitals, 986 health care centers, and 1 408 health posts. Out of these 2 613 health care facilities throughout the country, 1 995 belong to the public sector, 197 to Social Security, 254 to nongovernmental organizations (NGOs), 101 to the church, and 66 to the private sector. But still, there is a considerably low health care coverage in the public sector (Pan American Health Organization, 2001, p. 5-6).

The Bolivian health care system can be divided into three different levels, namely national, department, and local. The Ministry of Health holds the steering role for the health care system, within the framework of the Decentralization and Community Involvement Acts. Further, at a departmental level, the national policies are implemented in a manner that fits with the national level. Finally, the local entities

and the municipal governments are in charge of the health care facilities and the delivery of the services (Pan American Health Organization, 2001, p. 9).

Today, as mentioned above, Bolivia has a mix of public and private health care. The public sector is the largest provider of health care, with the Basic Health Insurance being the most important health care policy for the Ministry of Health. A large share of the population pays to enroll in the Basic Health Insurance. This enrollment fee, along with paying for sonograms, laboratory tests and drugs, show that this insurance policy does not make health care free of charge. But still, this Basic Health Insurance policy is the cheapest alternative to private health care (Pan American Health Organization, 2001, p. 16).

The second largest provider is the *Bolivian Institute for Social Security*, which operates hospitals only for insured workers, pensioners, and their dependents. The individuals covered by the social security get benefits including free diagnosis, therapy, and drugs (Ii, 1996, p. 3). The social security sector covers about 26 percent of the population. Within the private sector we find the insurance companies, prepaid medical plans, and nongovernmental organizations. The main sources of financing the private sector are the health insurance premiums (Pan American Health Organization, 2001, p. 5-6).

The third health care provider that plays an important role in Bolivia, are the nongovernmental organizations (NGOs). Because of the high number of NGOs and their financial resources, more people can be provided with health care. In certain extremely poor and isolated areas, the church is the only health care service provider (Pan American Health Organization, 2001, p. 6). An estimated 30 percent of the Bolivian population are not covered by any formal medical care, making people consult the informal medical care and the traditional healers (Ii, 1996, p. 3).

As we have seen, the Bolivian health care sector is divided into subsectors. There is a lack of integration and coordination within the system. The goal for the Bolivian health care system is to be based on universal insurance. The delivery of health care services has been transferred to the municipalities in order to better meet the local needs, with the result of new actors becoming more involved and increasing the supply of public health care services (Pan American Health Organization, 2001, p. 18-19).

To summarize, the Bolivian health care system is divided into four subsectors, namely the public, the social security, the private, and the traditional medicine. This fragmentation of the system (especially between the public and the social security), and the segmentation (within the social security there are many people managing), constitute one of the major problems for the Bolivian health care system. This structure causes significant inequalities regarding the access to the health care system. About 27 percent of the Bolivian population are covered by the social security system, 30 percent by the Ministry of Health (the public sector), and ten percent by the private sector. This implies that the remaining 33 percent of the population do not have access to any kind of health care services, except the traditional medicine (Bolivian Ministry of Health, 2004, p. 7).

The main problem for Bolivia regarding the health care seems to be the low coverage of the population. Far from the entire population is covered by the health insurance, hence many people cannot seek care. The Basic Health Insurance has reduced the economic inaccessibility, although it does not make the health care free. Nevertheless,

cultural, and especially geographical barriers remain, particularly for those living in rural areas. Bolivia is a country with many different local ethnicities, many of which not speaking the same language, which of course makes it difficult for the people to understand their rights and opportunities. Spanish is the official language in Bolivia, along with aymara and quechua.

The current Bolivian government is socialist (Movimiento Al Socialismo). Criticism towards a centralized state as well as the discrimination of the indigenous population has led to the demand for an increased autonomy. The native population in Bolivia has experienced lower political influence, and these people have demanded that decisions should be made on a local level based on the native culture. With Evo Morales Ayma being the president of Bolivia, the indigenous population is for the first time represented in the government.

With this presentation of the current situation in Bolivia, and the Bolivian health care system, we will now move on to look more into the situation in Colombia, followed by the one in the Dominican Republic.

3.2.2 Health and health care in Colombia

Numbers show that Colombia was the fourth largest country in the American region in 2001, in terms of total population. The Colombian population has been target of demographic and epidemiological changes, which has implied an aging population, a decline in fertility rates, as well as a fast urbanization. In year 2000 the life expectancy at birth was 71,2 years, and it stayed at that same level during the coming three years. Regarding the fertility rates, there has been a significant decline, from seven children per woman in 1950-1955, to 2,7 children per woman in 1995-2000. The third important demographic change in Colombia is the increased level of urbanization, reaching 71 percent in 2000 (Rosa & Alberto, 2004, p. 130). Rosa and Alberto (2004) also mention that Colombia is currently positioned behind several Latin American countries (such as Chile and Venezuela) in terms of life expectancy at birth and infant mortality. Among the countries behind Colombia in terms of these determinants, we find Bolivia and Ecuador.

Another important information about Colombia and the Colombian economy is that it is strongly characterized by disparities in income distribution. Colombia actually has one of the greatest disparities regarding income distribution out of all the Latin American countries, with a high rate of unemployment, and a high degree of informality. One will also find an important temporary nature of employment, especially within the service sector (Rosa & Alberto, 2004, p. 130).

When it comes to the Colombian health care sector, there have been changes and reforms that have been followed by important increases in both social and health expenditure. For example, the total health expenditure increased from 2,7 percent of the GDP in 1990 to 7,4 percent in 2000 (Rosa & Alberto, 2004, p. 130). The most important, and ambitious, health reform, took place in 1993 when forming the *1993 Law 100*. With this reform, the production and delivery of health care services were set to take place within a regulated market, which in turn was based on the idea of separating the different functions. Before the reform was to be implemented, the Colombian health care system was divided into three independent sub-sectors, namely the public, the private, and the social security systems. These different sub-sectors were targeted for different social groups, and altogether they formed the

following major problems: low levels of insurance coverage, inequities in the access to the services, low levels of solidarity, and high inefficiency in the public provision (Gaviria et al., 2006, p. 6). The poor people were supposed to have equal access to health care, through the Colombian health care system. However, since many people did not have the economic capacity to pay for the services, the access remained limited for these poor people, hence the inequalities were intensified regarding the access (Barona et al., 2001, p. 45).

The reform in 1993 is considered to be one of the most ambitious reforms that have ever been agreed upon in Latin America. The main goals of this reform were to guarantee equity regarding accessing the health care services; make sure that the health insurance was mandatory for everyone; and achieve a comprehensive and full coverage of the population. Furthermore, there was a desire of having free choice of insurer and health care provider. The reform was designed so as to solve the problems mentioned above, and in order to accomplish this, insurance coverage was to be increased to 36 million people by year 2000, with an increase in resources, solidarity, and efficiency. All of this required a major change regarding State-participation (Gaviria et al., 2006 p. 7-8).

As mentioned above, the new health care system was designed so as to separate the different functions when it comes to producing and delivering health care services. The Ministry of Health holds the main steering role, whereas the municipalities are in charge of health promotion and disease prevention (Rosa & Alberto, 2004, p. 131). A step in the decentralization process has been to transfer political, financial, and administrative resources to the local governments. Another important element of this process was to shift the decision-making to the local governments (Barona et al., 2001, p. 45). With the introduction of Law 100, different institutions of medical care were introduced (mainly private alternatives), increasing the competitiveness. All these new institutions had the responsibility to make use of the resources that were provided by the government, in order to finance the health care for the poorest people (Restrepo & Valencia, 2002, p. 742).

The new health care system is divided into two different parts: the contributive regime and the subsidized regime. The contributive regime is mainly targeting the population with economic capacity, whereas the subsidized regime is designed so as to ensure health care for the poorest part of the population. Those covered by the contributive regime pay 12 percent of their earned income. The employer pays for two thirds of the contribution, and the employee pays the last third. After having considered the individual economic means, individuals can be covered by the subsidized regime if they fail to reach the requirements set for the individuals to be a part of the contributive regime. The coverage of the subsidized regime implies that individuals have a right to services provided by public hospitals (Gaviria et al., 2006, p. 8-9).

Barona and others (2001, p. 46) found that the introduction of the subsidized regime increased the number of people with insurance. The percentage of Colombians covered by any type of insurance rose from 28 percent to 57 percent between 1992 and 1997. This is obviously a positive development. However, by the year 2001, Colombia had yet not achieved the main objective (which was formed with the 1993 Law 100), namely guaranteeing universal health care coverage for its population. By that time, the contributive regime covered only 47,6 percent of the *non-poor*, while the subsidized regime covered 13,7 percent. This meant that somewhat four million

people were still left uncovered by the health care system. Regarding the *poor* people, we see different numbers for that same year. 35 percent were covered by the subsidized regime, and 10,7 percent by the contributive regime, leaving 53,9 percent uncovered by any of the two regimes (Rosa & Alberto, 2004, p. 139).

The Colombian health care system held the first place regarding financial equity (out of all countries in the world) in the World Health Organization (WHO) 2000 Report of Health Systems Performance. This result was based on a measurement of families' relative expenses on health care. The authors of this WHO report concluded that since rich Colombian families spend more money on health care (compared to poor families), the health care system is more financially equitable (Restrepo & Valencia, 2002, p. 743). However, as Restrepo and Valencia (2002) discuss, this WHO study is somewhat misleading since many public hospitals and health care facilities in Colombia have been shut down, with many more to face the same destiny. With the reform of the health care system and the 1993 Law 100 the availability of financial resources for the health care sector has increased, and more importantly, people are now entitled to receive health care services by the public or private system through their insurance, as opposed to before when they could only receive "charity-care" from the public sector (Barona et al., 2001, p. 48). However, great difficulties remain for the poor and vulnerable when it comes to financing the health care. As summarized by Rosa and Alberto (2004, p. 140), Colombia is still far from achieving universal coverage.

Furthermore, as mentioned by Barona and others (2001, p. 48-49), Colombia was not ready for this ambitious reform. When the Law 100 was to be fully implemented, there was still a significant disagreement on how to adjust the old health care centers and facilities in accordance to the new system. For example, most of the hospitals needed to be modernized, with accounting systems as well as information systems to be able to exchange information. In addition to this, the insurance companies were not ready for the important negotiations with the providers of the health care services. Another problem with the transition of the health care system, is the fact that the decisions were still taken on a centralized level, at the same time as the hospitals were meant to be autonomous. This had a negative effect on the function of the hospitals.

Colombia is a democracy with a modern constitution. However, there is a lack of a social agenda, in a country with large differences in income and a large share of poor people. There is a significantly unequal distribution of resources in Colombia. This conflict has a negative effect on the possibilities for development. Can this be a result of corruption?

Compared to the Bolivian health care system, the one in Colombia seems to be more developed and with a larger focus on achieving universal coverage. However, there is still a significantly large share of the population that is not covered by the insurance policies. Having read this presentation of the health care systems in Bolivia and in Colombia, we will now move to the Caribbean and the Dominican Republic.

3.2.3 Health and health care in the Dominican Republic

The Dominican Republic has a population of nine million people and about 65 percent of these are residing in urban areas. During the last decade, the country experienced a decline in the annual population growth rate (from 1,73 percent for the period 1990-1995 to 1,61 percent for the period 2000-2005). This can be linked to the fall in total fertility and the lower birth rates. Life expectancy at birth for men has increased from 66,47 years for the period 1990-1995 to 68,11 years for the period 2000-2004, whereas for women life expectancy at birth has increased from 71,86 to 74,35 years for the same periods (Pan American Health Organization, 2007, p. 6).

The Dominican Republic has undergone economic and social changes, which have been followed by periods of economic crisis. During the 1990s, the Dominican Republic was one of the leading growing economies in Latin America and the Caribbean. The GDP per capita almost doubled from 1990 to 1999. Despite this rapid growth in the 1990s, the most vulnerable groups in the Dominican society actually fell more behind. Poverty among this group increased. Between year 2000 and 2003, there has been a significant increase in the share of the population below the poverty line, as well as under the extreme poverty line⁴. In year 2000, 54,05 percent of the Dominican population were living below the poverty line, reaching 61,7 percent in year 2003; which is an increase from 4 679 331 to 5 714 738 people. Regarding the share of the population living below the extreme poverty line, there has been an increase from 27,77 percent to 33,01 percent for that same time period; which is an increase of about 600 000 people (from 2 403 283 to 3 057 121) (Pan American Health Organization, 2007, p. 10-11).

The numbers above confirm the fact that economic growth in this country has not been accompanied by human and social development. The Dominican Republic has actually fallen behind in the human development index, going down from 94th out of 199 countries in 2002, to 98th in 2003 (Pan American Health Organization, 2007, p. 11).

Government policies have contributed to an expansion of public provision. However, this expansion has occurred in an unregulated environment and it left many Dominicans without access to insurance, and even to affordable health care. Hesitant governments and their failures have left many Dominicans burdened with significant out-of-pocket payments, which in turn affect the individual welfare negatively. In addition to this, the level of health status and health care coverage remain unacceptable (La Forgia et al., 2004, p. 173).

The introduction of the Law Establishing the Dominican Social Security System (IDSS), and the General Health Law in 2001 have together laid the foundation for the creation of the National Health System and the Dominican Social Security System. The General Health Law regulates all activities that make it possible for the State to ensure the right to health. The State is therefore held accountable for guaranteeing the health of the Dominican population. The Law Establishing the Dominican Social Security System lays the groundwork for the development of a social protection system with universal coverage (Pan American Health Organization, 2007, p. 5).

Similar to other health care systems in the Latin American region, the Dominican health care system is based upon three subsystems: the public, the social security, and

⁴ The poverty line is \$2 per day, and the extreme poverty line is \$1,25 per day (World Bank)

the private system. The *Ministry of Public Health and Social Assistance* (SESPAS) is in charge of the public sector, with the mission to protect the health of the Dominican population. SESPAS holds a large network of health care facilities and it provides the population with health care at no charge (La Forgia et al., 2004, p. 174-175). SESPAS has the steering role of the public health care, including organizing and structuring the regional health care services, as well as ensuring equitable access to medications and guaranteeing health insurance for the entire population, with a certain focus on the most vulnerable groups (Pan American Health Organization, 2007, p. 27).

As opposed to the public system, the *Dominican Social Security Institute* (IDSS) has significantly low population coverage. IDSS is also operating health care facilities, but only five percent of the Dominican population is enrolled, with a certain focus on the large cities. The most important health care provider in the Dominican Republic is the private sector. It consists of hospitals and other health care centers. 12 percent of the population are covered by private insurance schemes (La Forgia et al., 2004, p. 175).

The social security system consists of two regimes: the contributive and the subsidiary. The contributive part implies that it is mandatory for every working Dominican individual to pay a certain percentage of the salary, namely 2,86 percent. The employer pays 6,67 percent of the employee's salary into the social security system. With this system, the employee will profit from a full insurance with everything included, even the medications. However, there are some hospitals and clinics that still do not accept this kind of insurance policy.

With this insurance system being divided into two regimes, everyone is included, the ones working and the ones not working. The second half of this system, the subsidiary regime, is designed for those who are not working; elderly, orphans, and even illegal immigrants. The state is set to cover 100 percent of everything for these people, and they are entitled to free health care at the public hospitals or other clinics within this regime. The Dominican Social Security System is set to cover the entire population no matter which system the individuals are assigned to depending on their job situation (Pan American Health Organization, 2007, p. 5).

Total expenditure on health care is relatively high in the Dominican Republic, compared to the Latin American average (reaching 6,5 percent of GDP in 1996 compared 6,2 percent, which was the Latin American average for that same year). Private financing represents about two-thirds of the total spending on health care, and most of it comes from out-of-pocket payments. This private health care spending is a burden for many poor Dominicans, which on average spend about eight percent of the household income on health care (La Forgia et al., 2004, p. 176). Government spending on health (as a percentage of GDP) has been kept stable just below two percent during recent years. In 2004 government spending on health was 0,98 percent of GDP (Pan American Health Organization, 2007, p. 17).

In 2004, the public sector had 1 234 health care centers, including 12 specialized hospitals, 40 provincial hospitals, 87 municipal hospitals, 739 clinics, and 324 physicians' offices. For that same year, 2,2 hospital beds were offered per 1 000 people. The public sector is still the largest provider of health care and somewhat 60 percent of the entire Dominican population turns to the public health care when in need of medical care. It is mainly the rural and the poorer urban populations that demand the public services (Pan American Health Organization, 2007, p. 20). The

number of private hospitals is constantly increasing, reaching over 200 in the mid-1990s. Along with an expansion of the public infrastructure, the Dominican government subsidized an expansion of the private medical infrastructure. Powerful and well-organized groups of physicians have put pressure on the government during recent years, generating construction of high-quality private hospitals, which have come to serve the middle- and high-income Dominicans (La Forgia et al., 2004, p. 184).

The Dominican president Leonel Fernández represents the Dominican Liberation Party (Partido de la Liberación Dominicana, PLD). During his first period as president (1996-2000) he modernized the country through economical reforms and changes in the legal system. He was reelected in 2008. The government faces today major problems with corruption and illegal drug trade.

Just like in Bolivia and in Colombia, the Dominican health care system is lacking when it comes to covering the entire population. There have been some major changes in the Dominican Republic during the last couple of years, trying to improve the situation for the population. However, the problems of reaching out to the rural population remains.

This information on each health care system and the major health problems are to be analyzed and put into relation with the theoretical framework being presented in the following chapter, as well as with the regression analysis further in this thesis. Altogether in order to come to conclusion what determines the health in each studied country and what there is to be done regarding the health care system.

4 Theoretical framework

The concept of development is different depending on the country being studied. It changes constantly according to the different situations and needs around the world. Every country has its own specific needs and demand different resources for further development. The development process never ends; one discusses instead adjustments of the ideas to make them suitable for the current situations. As the world is constantly changing, with climate change and new innovations, economies need resources and knowledge to adapt to these changes. One of the main factors in the development process is the human capital, which is why it is important to study which factors that affect health in developing countries, in order to know what there is to be focused on.

It is not only the external factors that change, but also the internal premises, within an economy. Economic development forces the economic and social organizations to change:

“As the population becomes more urbanized, traditional social structures may become less important, and the distribution of income may change.”
(Jack, 1999, p. 27)

This shows the importance of constantly adapting ideas and methods to the ongoing changes. As a result of economic progress, people tend to move towards the larger cities, where the job opportunities are, as well as the necessary facilities. This will also have a considerable impact on the problems related to health. As mentioned by Jack (1999), it is difficult to see the total effect on the general health status. Changing from agriculture to industrial production may reduce the incidence of some infectious diseases. In urban settings there is a greater access to health care facilities. However, the diseases mainly found in the rural areas are easily replaced by diseases related to an urban setting with pollution and stronger interaction between people, so-called communicable diseases (Jack, 1999, p. 27).

In terms of living standard, the gap between rich and poor nations is, still today in the twenty-first century, increasing. As Howitt states:

“The developing world suffers persistent poverty, while the developed world enjoys growing prosperity.” (Howitt, 2005, p. 19).

According to Howitt (2005), and many economists with him, this is an undesirable situation and the question is how to increase the growth rate of the developing countries, hence close the gap.

There are many different factors affecting the growth of an economy. One of the most important factors is the health of the population, and Howitt (2005) further mentions how health can explain the halting economic growth for the developing countries. It is a fact that large shares of the populations in the poorer countries face severe problems related to health (Howitt, 2005, p. 19). When looking at the world today we see how low income seems to cause poor health and how poor health causes low income. This is referred to as the *health-poverty trap* (Sala-i-Martin, 2005, p. 95), and Sala-i-Martin mentions how it is difficult for the developing countries to break this vicious circle.

One significant difference between the developed and the developing countries is the capacity to provide health care services. The under-developed countries face higher

disease burden and they have less resources to work with. The health care sector is supposed to meet the needs, without putting too much financial pressure on individuals and on the national economy (Hjortsberg, 2002, p. 71).

In this chapter we will look deeper into the importance of good health and how good health is necessary for the economic growth. Furthermore, I present different health determinants that are expected to be affecting the level of health in developing countries; for example the relation between income and health.

4.1 The importance of good health

The level of health affects the individual wellbeing, but it also has implications for the society's potential for development. At an individual level, good health is central for work productivity, education (the capacity to learn), and the capacity to grow physically and emotionally. When studying the general level of health within a country, one finds good health being a critical input in poverty reduction, economic growth, and long-term economic development (Hjortsberg, 2003, p. 756).

When considering the health worldwide, there have been important and significant improvements over the last two centuries. This is a result mainly because of changes in nutrition, hygiene, and public health. According to Semba (2008), a better hygiene and sanitation are the main factors for the reduction in infectious disease mortality over the last 200 years, and not the technological progress within the medical field (Semba, 2008, p. 1). Condorcet wrote in 1792:

“No one can doubt that, as preventive medicine improves and food and housing become healthier, as a way of life is established that develops our physical powers by exercise without ruining them by excess, as the two most virulent causes of deterioration, misery and excessive wealth, are eliminated, the average length of human life will be ensured. The improvement of medical practice, which will become more efficacious with the progress of reason and of the social order, will mean the end of infectious and hereditary diseases and illnesses brought on by climate, food, or working conditions. It is reasonable to hope that all other diseases may likewise disappear as their distant causes are discovered.”
(Semba, 2008, p. 2)

Condorcet and his work became a foundation for the progress of Western ideas regarding the health research. His thoughts on health care have had an influence and one can see the similarities with how we consider health care today. Better technology and innovations will improve the treatment of diseases, and in the long run people will experience a longer life.

Health is an important determinant of economic growth. There is a strong interaction between health and the process of gathering additional knowledge, which in turn is one of the driving factors behind economic growth (Muysken & van Zon, 2005, p. 41). Good health raises the level of human capital, which in turn has a positive effect on individual productivity, hence on the economic growth rates. Investments in good health help the escape from the poverty trap, which is why we will now move further into the relation between health and economic growth.

4.1.1 Health and economic growth

The World Bank presented in 1993 a report, *World Development Report, 1993: Investing in Health*, with the focus on how improved health is important for an increased economic growth in the developing countries:

“Improved health contributes to economic growth in four ways: it reduces production losses caused by worker illness; it permits the use of natural resources that had been totally or nearly inaccessible because of disease; it increases the enrollment of children in school and makes them better able to learn; and it frees for alternative uses resources that would otherwise have to be spent on treating illness.” (Hermansson & Lundgren, 2008, p. 34)

The improvement of public health is a crucial factor for creating a better economic situation for low-middle income countries. As mentioned in the report by the World Bank in 1993, trying to reduce poverty is not enough, it is important to focus on improving the possibilities for better health. According to the World Bank, creating possibilities for individual households, as well as for the state, to invest in good health is considered to be a main goal. Along with the World Bank, the World Health Organization also clearly states the great importance of improvement in general health as a strategy for economic growth and poverty reduction in low-middle income countries (Hermansson & Lundgren, 2008, p. 34-35).

As mentioned briefly earlier in this chapter, Howitt (2005) explains the importance of good health for economic growth. The author adds *health* as a variable in the growth model. Health is then assumed to affect the acquisition of knowledge and the wellbeing of the population. According to Howitt, the positive effect on the economic growth is a result of a healthier and a more productive labor force, which in turn leads to a higher production at any given level of inputs. Health should be considered as human capital just as knowledge. Hence, it is the combination between the average level of knowledge within a country and the level of health that drives the economic growth (Howitt, 2005, p. 29).

Grossman considered health to be something individuals consume and invest in (capital). As consumption good, health is a part of the utility function, and as capital, health reduces the number of days an individual is ill and increases the number of days an individual can participate actively in the labor market. Health is therefore not only something that individuals demand, but also something that individuals actually produce, by reducing the rate of depreciation on the stock of health they possess at birth (Hermansson & Lundgren, 2008, p. 37).

According to economic modernization theory, economic growth is the driving force behind economic development. Economic growth is associated with industrialization and urbanization, hence better standard of living and better access to medical care. This will in turn lead to a decline in mortality rates. As opposed to the economic modernization theory, the social modernization perspective emphasizes the role of education in the development process because of its link to labor market (human capital and productivity) and economic growth (Christian, 2008, p. 92).

A good health is important for economic growth and development of a country. Which factors determine health then?

4.2 Health determinants

In relation to each health care system, one needs to consider the different determinants of health, such as environmental, social, and service factors. Since individual health depends, to a large extent, on the health care system, it is also important to consider the factors determining the health seeking behavior, which can be seen in different perspectives, namely physical, socio-economic, cultural, and political. As Hatcher and Shaikh (2004) conclude, the use of the health care system may depend on socio-demographic factors, social structures, level of education, cultural beliefs and practices, gender discrimination, status of women, economic and political systems, environmental conditions, the disease pattern and last but not least the health care system itself. These authors find that the organization of the health care system has an important impact on the health seeking behavior among individuals (Hatcher & Shaikh, 2004, p. 49). The health seeking behavior is strongly related to the level of health, hence a major determinant of health.

In addition to the factors mentioned above, Hjortsberg (2003) points out the importance of the cost of utilization and the expected benefits when seeking care, for the individual. The individual may choose to visit a health care center and act on the illness, or not. This individual decision is, as pointed out by Hjortsberg (2003), influenced by the physical accessibility of the health care facility (both distance and means of transport taken into account), the socio-economic background, and evidently the individual ability to pay for the services (Hjortsberg, 2003, p. 755).

In the article from 2003, Hjortsberg assumes that an individual seeks maximal utility. If an individual is ill, he or she might not seek care because of the marginal cost of investing in health, even though the health care will cure the illness. The cost of seeking care is a significant determinant, and the individual needs to take into account out-of-pocket payments as well as time costs. These costs depend on labor income and the cost of lost household production. It is this cost of access that causes the differences in health care utilization between different social groups within the developing countries (Hjortsberg, 2003, p. 757). Hjortsberg defines *time costs* as time for reaching the facility, waiting time, and time for the actual consultation, as opposed to *monetary costs*, which include fees for services, and traveling costs (Hjortsberg, 2002, p. 72).

The level of labor income has an expected effect on the decision to seek care, and hence the health status. Hjortsberg further assumes a positive relation between the individual income and health care consumption. As the budget increases, a sick individual can increase the investments in health (Hjortsberg, 2003, p. 757). There is an expected positive relation between wealth and health care utilization.

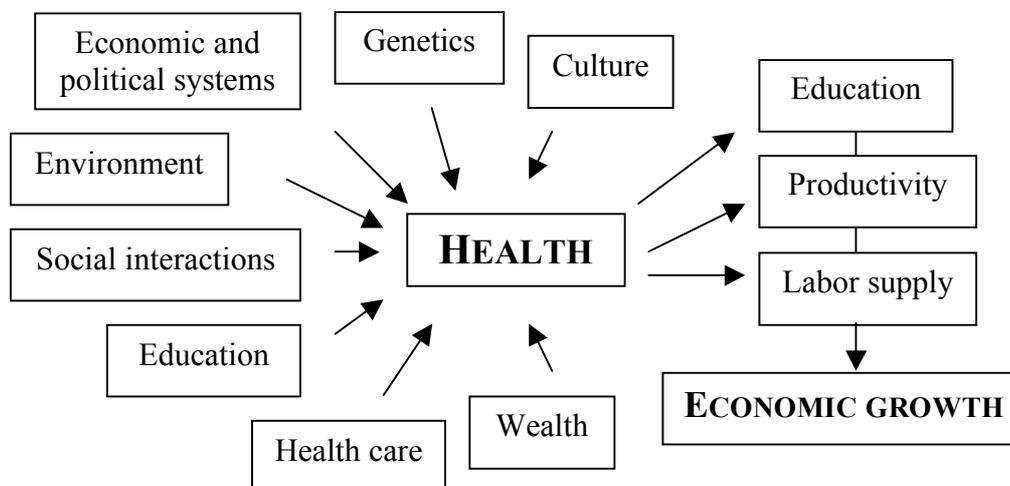


Figure 1: A scheme of expected determinants of health and health seeking behavior

Evidence from the 1970s show that health care services alone are not sufficient to improve health. In India it was demonstrated that better sanitation and fresh water supplies reduced child diarrhea. However, households with lower education did not benefit from the positive effects. Education (in particular maternal education) needs to be a part of the health care system, in order to make the best use of the changes and improvements to see positive results (Harpham, 2009, p 108). There is a need for a so-called “joined-up government”. Harpham defines this as government departments communicating and coordinating activities in order to complement each other (Harpham, 2009, p. 108).

The different expected determinants of health affect one another, and according to Harpham they need to be examined in a *multi-level* way. Individual characteristics have an obvious impact on the level of health, but it is also important to consider physical features of where individuals live; services, social networks, crime rate, reputation of the place, etcetera, which in turn are also supposed to have an effect on individual health (Harpham, 2009, p. 108).

We will now look more into two categories of determinants, namely poverty (and the relation between income and health); and the obvious health determinant, health care services.

4.2.1 Poverty

“Poverty not only excludes people from the benefits of health care system but also restricts them from participating in decisions that affect their health, resulting in greater health inequalities.” (Hatcher & Shaikh, 2004, p. 51)

Poverty might be main determinant of health. The poverty aspect should not only be seen on an individual level, but also on a national level, referring to the economy as a whole and its resources. One can measure poverty in many different ways. Harpham reveals four methods, namely by measuring income/consumption, unmet basic needs,

asset indicators, and vulnerability. When thinking about poverty in terms of vulnerability, one takes into consideration the amount of assets of a household (physical, social, natural, financial, and human capital) and how the household is vulnerable to sudden shocks, such as natural disasters, or high inflation rates eroding the capital (Harpham, 2009, p. 109).

With the lack of resources, an individual is, as seen above, limited regarding demanding and consuming health care; hence the individual health is negatively affected. This lack of material resources is considered to be the most obvious factor linking poverty to health. Without the possibility to pay for health care, it is difficult to prevent a disease, before it appears, and to be cured once being infected. In addition to this, being poor is strongly associated with being malnourished, implying being more vulnerable to infectious diseases (Sala-i-Martin, 2005, p. 95-96). Hence, poorer people are more likely to suffer from a lower health status.

Further channels through which health is affected by poverty, are the fact that poor people tend to live in overcrowded areas; the fact that poor people are more likely to live far away from doctors and health care centers; and the fact that poor people tend to be less educated. Overcrowded areas, or even the far-off rural areas, are often characterized by the lack of clean water and sanitation. In addition to this, when living in distant rural areas, isolated from doctors and health care centers, there is an increased cost of seeking care; hence poor people in these areas are more likely to go untreated. Furthermore, it has been shown that basic education is crucial for the individual health, including understanding the importance of clean water and the use of soap. Simple basic education can reduce the incidence of many diseases and prevent early age mortality (Sala-i-Martin, 2005, p. 97).

Being poor is often associated with poor-quality housing conditions. Evidence reveals that poor-quality housing conditions are in turn associated with health problems. The physical environment is of great importance, however paying a large amount of one's income for better housing can cause increased stress, and leave the individual with less money for other necessities, such as food (Harpham, 2009, p. 110).

Studies have shown a positive relation between income and health. With a higher level of GDP per capita, the population experiences a longer life expectancy. However, it is the *use* of the income that is of great importance when determining the health status. Additional income would increase the life expectancy of an individual, but one can also expect that once the income increases, the consumption of health-improving goods and services would increase, although it might not be the only main priority of individuals (Jack, 1999, p. 34).

There is, as we have seen above, a variety of mechanisms explaining how poverty and economic underdevelopment affect health. Further in this theoretical chapter, we will look deeper into a theory presented by Wagstaff (2002), which focuses on the relation between income and health, and how richer individuals are likely to end up with higher levels of health.

4.2.2 Health care services

Health care services remain important, and they might just be the most obvious input when achieving a good level of health. The health care services can be broken down into four aspects, namely availability, access, appropriateness, and affordability (Harpham, 2009, p. 111).

When it comes to seeking care, the medical personnel are expected to have an information advantage, and knowing how to treat the illness. The patients rely on the physicians and nurses. Therefore, the attitude of the health care provider along with the patient satisfaction play an important part in the individual health seeking behavior (Hatcher & Shaikh, 2004, p. 51-52). It is a fact that health care providers make priority when choosing which diseases and individuals to treat. This in turn affects individual perceptions of the treatments. Furthermore, it has been found that low rates of health care-usage depend on poor quality, as well as high costs for consuming the health care (Hjortsberg, 2003, p. 758).

It is important to consider the size, distribution, and composition of the health care workforce within a country. The number of health workers can be seen as an indicator of the country's ability to provide the population with health care (Howard et al., 2006, p. 2-3).

The health workforce is associated with the economic development, and evidence shows that the number of workers within the health care sector is positively correlated with the economic development; the better the economic development, the higher the number of human resources for health. Countries with higher GDP per capita can (and do) spend more on health care than low-income countries, which is reflected by the size of the health workforce (Howard et al., 2006, p. 3).

"A properly trained and competent workforce is essential to any successful health care system." (Howard et al., 2006, p. 3)

Many developing countries face the problem of investing in the training of health care professionals, which makes it harder for the people to find good-quality health care services. This is a major problem, especially for the population in the rural areas, with a scarce supply of medical personnel and resources. It is a fact that health workers might apply for a job in the urban settings where the situation is better with more resources and opportunities, instead of choosing to work in the rural areas. As more doctors and nurses chose to work in the urban areas, there is an increased burden left for those working in the rural areas (Howard et al., 2006, p. 9). The result of this shortage, is a lower standard and productivity in the rural areas, with hospitals shutting down, longer waiting times for care, a lower number of hospital beds for patients, etcetera (Howard et al., 2006, p. 12).

The presence of the health care facilities and the physical accessibility to primary health care is an important aspect to consider. However, due to the lack of developed infrastructure and transport system, many people in developing countries cannot access these health care services. The availability of transport, and the physical distance to the health care facilities do influence the health seeking behavior, and hence the individual health (Hatcher & Shaikh, 2004, p. 51).

"The under-utilization of the health services in public sector has been almost a universal phenomenon in developing countries." (Hatcher & Shaikh, 2004, p. 51)

The problem of guaranteeing full accessibility to health care services is associated with another problem, namely where to locate the health care facilities in order to provide the entire population with health care. Location decisions for health care is especially important because of the universal need; the fact that health care must be provided throughout an entire nation (Rahman & Smith, 1999, p. 896).

As Rahman and Smith (1999) demonstrate, there is an optimum to be reached regarding location decisions. However, in practice, there are several constraints preventing this optimum from being realized, such as politics and other restrictions. Evidence reveals the fact that it is more difficult for the rural population to access the health care facilities in developing countries, which is why the so-called location-allocation modeling is considered to play a significant part when making these facilities more accessible for the people. According to Rahman and Smith (1999), it is a matter of making the most efficient use of the available resources (Rahman & Smith, 1999, p. 897).

Location decisions give rise to inequalities regarding access to health care facilities, and the use of the services, which in turn imply inequalities regarding individual health. The remaining of this chapter is devoted to a theory presented by Wagstaff (2002) that focuses on health inequalities, and how they are formed.

4.3 Health inequalities

Countries and regions all have different levels of inequalities regarding health. Wagstaff (2002) presented with *“Inequalities in Health in Developing Countries: Swimming Against the Tide”* a theory trying to explain these international differences. In this final part of the theoretical chapter we will look more into this theory and see how Wagstaff demonstrates the relation between health and income. The following description is similar to the one presented by Wagstaff himself in his article from 2002, with an explicit focus on his model and the theory behind the model.

To start off, Wagstaff makes the assumption that health (H) is produced by the individual using medical care, the individual’s time, and other goods and services, such as food. Medical care (M) comes at a cost, and it is subject to diminishing returns in the production of health. Furthermore, individuals are assumed to have a fixed monetary income (Y), for which they decide themselves how much to spend on the production of health and on general consumption (C). The relation between these four factors is demonstrated in the figure below (as proposed by Wagstaff (2002)).

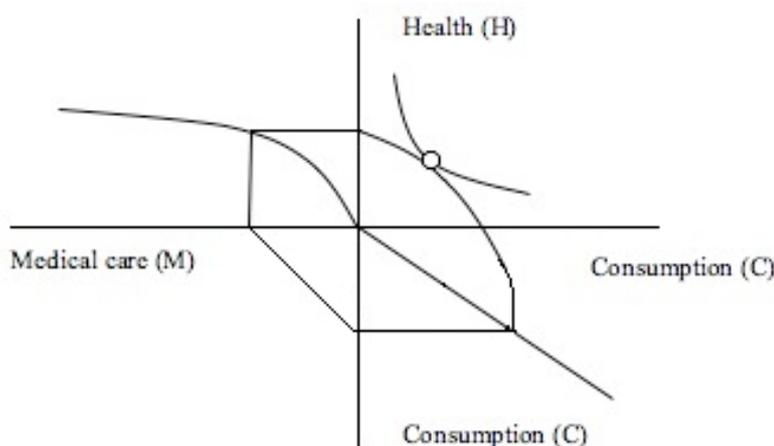


Figure 2: The demand-for-health decision of a typical individual

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The figure above demonstrates the situation of a typical individual, according to Wagstaff. The upper left quadrant shows the relation between health and medical care: more medical care implies better health, with diminishing returns. The lower left quadrant shows the individual's budget constraint. As stated by Wagstaff, the lower right quadrant is a "device" for tracing round consumption, which results in the frontier in the upper right quadrant, showing the different possible combinations of health and consumption for the individual, given the budget constraint and the health production technology. The individual's preferences are represented by the indifference curves in that same quadrant. The negative slope of the indifference curves reflects the individual's willingness to trade health against consumption, and we find the preferred combination of health and consumption in the tangency point between the frontier and the highest indifference curve.

Increases in income inequality will result in higher levels of health inequality. This is one of the predictions behind this model. By eliminating the income inequality, one will also find the health inequality being eliminated, given an *unchanged average income*. By controlling and keeping other determinants of health inequality as constant, one can see how an unequal income distribution implies an unequal health distribution across income groups.

If we instead consider increasing average incomes, the effects on health inequalities are less evident. By raising the income of both rich and poor individuals (by the same proportion), the average income will be raised, with the *relative* income inequality left unchanged. With higher income the individuals (rich as well as poor) will raise their level of health according to this model. Can we then see a decrease in the health inequality? Depending on how the figure is drawn, one can notice that the poorer individuals' health rises by a larger proportion than the richer individuals' health. However, it is also possible to find an increase in the relative health inequality (if the figure is drawn with a new tangency for the richer individuals northwest of the initial tangency). A third possible result is obviously that relative inequality is unchanged, it all depends on how the figure is drawn.

In this framework, evidently, richer individuals are more likely to end up with higher levels of health. Wagstaff's theory suggests some reasons why health inequalities might vary across countries. For instance, countries with high levels of income inequality and price reductions of medical care experience low levels of health inequality. This theory also proposes that international differences in health inequalities may be a reflection of differences in average incomes.

In order to spot the effect of rising average incomes, we assumed in the two scenarios above that everything but the income stayed unchanged. Just as Wagstaff says, this is an unlikely situation. With rising incomes, one can easily assume improvements in health technology, implying an upward shift in the health production function in the upper left quadrant in the figure. As a country gets richer, more money can be spent (per person) on health and other goods and services. This will also imply that each dollar spent on health care will produce more health. The shift in the health production function will lead to further shifts in the health-income relationship above, ending up at higher levels of health.

In developing countries, poverty is the main cause of inaccessibility to health care. Lack of resources prevents large populations from meeting their basic requirements, such as medical care, food, clothing and housing. This makes individuals more

vulnerable to illness and there is a significant risk of increased spread of epidemics. It is obvious that the availability of health care resources is strongly correlated to the economic level of a country. However, as mentioned by Wagstaff, this is not simply a question of poverty, but also of social justice and equity.

Wagstaff has found that socio-economic inequalities in health do exist in developing countries, and that they are to the disadvantage of the poor. The result is the same, whether looking at rates of mortality, malnutrition, diarrhea, and ARI (Acute Respiratory Infection), the indicators are all higher within poorer groups.

Wagstaff suggests that differences among countries regarding health inequalities reflect to some extent differences in average incomes. His theory does not tell us whether it is the richer countries or the poorer countries that will end up with larger health inequalities, but instead that if the income elasticity of health increases as income rises, health inequalities will be larger in richer countries.

Rising health inequalities in both developing and developed countries seem to be associated with rising incomes. Wagstaff explains this by showing how technological change in the production of health goes hand-in-hand with economic growth. These technological improvements are often more absorbed by the richer and not by the poor. However, Wagstaff stresses that economic growth should not be held back, since rising incomes imply other attractions such as better education, better infrastructure etcetera, which in turn lead to better possibility to achieve and maintain a good level of health.

Now we are familiar with the current health situation and the health care systems in the three countries of interest for this thesis, as well as the theoretical framework when studying health determinants and health in developing countries, in particular the importance of good health. With this in mind, we will now move into the regression analysis to see whether or not the health determinants differ in significance and importance in Bolivia, Colombia and the Dominican Republic.

5 Analysis

In this chapter I present different regression models, which are based on 28 countries in the Latin American and Caribbean region. I have chosen life expectancy as a measure of health (the dependent variable), with GDP per capita, and health expenditures as explanatory variables. Due to the limitations regarding the number of observations, I have used different regression models, by adding a third explanatory variable. In the second model, I added share of rural population as explanatory variable, whereas in the third regression model I replaced rural population with primary school enrollment. This procedure was necessary since by adding explanatory variables the significance of each variable decreases.

The data used for this analysis is taken from the World Bank: World Development Indicators, for the year 2006.

With this rather simple regression model we will look more closely into how these different determinants differ in Bolivia, Colombia and the Dominican Republic.

5.1 The effect of GDP per capita and health expenditure on health

By running the first regression I found the following coefficients, as listed below in table four. To start of I included only health expenditure and GDP per capita, whereas in the second regression I extended the model by adding the share of population living in rural areas.

Table 4: Regression model

R-squared	0,373
Adjusted R-squared	0,323
Number of observations	28

Explanatory variables	Coefficients
Constant	3,953 (0,088)***
Health expenditure	0,408 (0,189)**
GDP per capita	0,034 (0,010)***

*: coefficient significant at a 10% level of significance

** : coefficient significant at a 5% level of significance

***: coefficient significant at a 1% level of significance

As seen in table four, both health expenditure and GDP per capita have a positive impact on life expectancy. GDP per capita is the most significant explanatory variable in the model. The relation between life expectancy and GDP per capita is plotted in diagram one below.

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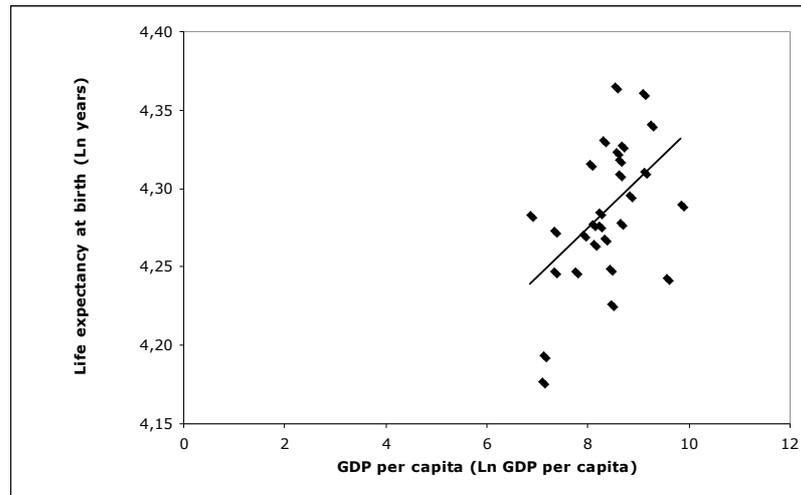


Diagram 1: Relation between Life expectancy and GDP per capita

We can see here in the diagram above how there is a significant positive relation between GDP per capita and life expectancy for the 28 countries in the region. Higher GDP per capita means a longer life expectancy.

For the three countries of interest, Colombia is the most developed one, compared to Bolivia and the Dominican Republic in the sense that GDP is higher and health expenditure as a percentage of total government spending is higher.

The positive relation between life expectancy and public health expenditure is shown in the diagram below, where we can see how higher public health expenditure is associated with a longer life.

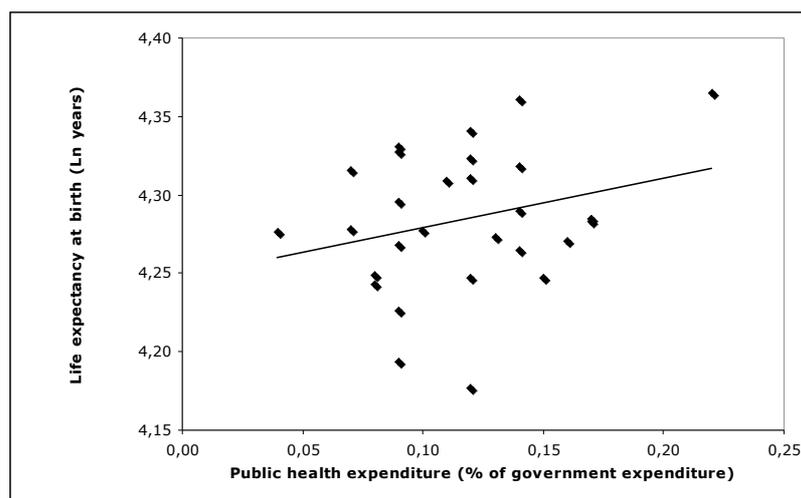


Diagram 2: Relation between Life expectancy and Public health expenditure

As the positive coefficient for health expenditure indicated, higher health expenditure implies a longer life expectancy. With higher health expenditure, health care facilities can be improved, the number of health workers can be increased, consultations can be guaranteed, medications can be distributed, etcetera, which in turn is positive for the population that can seek care and be cured (if curable).

Colombia has undergone some major changes regarding the health care system during the recent years, and the share of health expenditure was the second largest among the Latin American and Caribbean countries in 2006 (17 percent compared to 22 percent in Costa Rica). Costa Rica was not only the country with the largest share of health expenditure; it also had the longest life expectancy among the 28 countries. This supports the obvious importance of health expenditure.

The difference in life expectancy between Bolivia and Colombia was almost 7,5 years in 2006. However, it is obvious that this difference is not only explained by the countries' income level. Bahamas, for example, had the highest level of GDP per capita, but life expectancy was almost six years shorter than in Costa Rica for that same year. Furthermore, life expectancy for Bahamas was only 0,5 years longer than in Nicaragua, the country at the bottom of the list regarding GDP per capita (958,14 compared to 19 057,14 in Bahamas). This shows that there is more to it than just the GDP per capita when determining life expectancy. However, for Bolivia, the relation between short life expectancy and low level of GDP per capita, is considerably significant. When only considering Colombia and the Dominican Republic, and the relation between GDP per capita and life expectancy, these countries are quite similar. They have almost the same level of GDP per capita, and almost the same life expectancy (GDP per capita at 3737 in Colombia compared to 3316 in the Dominican Republic, and the difference in life expectancy only 0,5 year). Even though the Dominican Republic has almost the same level of GDP per capita as Colombia, there is the larger share of rural population in the Dominican Republic affecting life expectancy negatively, to a larger extent than in Colombia.

5.1.1 Relation between GDP per capita and health expenditure

In addition to these results, it is interesting to see how GDP per capita and health expenditure are linked together. One might expect that high GDP per capita is associated with higher health expenditure, and vice versa. However, due to social and political premises, this might not always be the case. This is especially important to take into consideration for developing countries.

When dividing these 28 Latin American and Caribbean countries into two equally large groups, *high* and *low*, for GDP per capita and for health expenditure, we get the following setting as shown below.

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		<i>GDP per capita</i>	
		High	Low
<i>Health expenditure</i>	High	ARG, BHS, BRB, CHL, CRI, MEX, PAN	COL, GTM, HND, NIC, PER, PRY, SLV
	Low	BRA, GRD, LCA, SUR, TTO, URY, VEN	BLZ, BOL, DOM, ECU, GUY, JAM, VCT

Note: See appendix for full country name

As we see here, there is no clear-cut relation between high GDP per capita and high share of health expenditure. In some countries, *low* GDP per capita is accompanied by *high* share of health expenditure, like in Colombia, Honduras and Paraguay among others, whereas in other countries *high* GDP per capita is followed by *low* share of health expenditure, which is the case for countries such as Brazil, Uruguay and Venezuela. It is obvious that there are many factors affecting this relation between GDP per capita and health expenditure.

Both GDP per capita and share of health expenditure are important for life expectancy as we see. However, high GDP per capita is not necessarily associated with high share of health expenditure among the Latin American and Caribbean countries. One might expect that high level of income would automatically imply higher health expenditure, but that is not always the case for these Latin American and Caribbean countries. With health and human capital being of high importance in developing countries, it is crucial for these countries to reallocate resources with the health sector being of higher priority. The Latin American and Caribbean region is a region with large differences regarding income level. Some countries are poor, and yet some countries are considered to be high-income countries, but they all have problems related to health, which makes it interesting regarding the impact of GDP per capita on life expectancy. It is a matter of organization of the health care system. A country can be rich, but with a poorly developed health care system, and low share of health expenditure, the human capital does not evolve. This supports the fact that there are many more explanatory variables that one needs to take into consideration, which is why we now will look at the effect of location, more specifically the rural population.

5.2 The effect of location on health

As presented in the theoretical framework, the location is a major determinant of health. As mentioned, the regression model cannot include many explanatory variables. Health expenditure and GDP per capita are obvious explanatory variables for health as we have seen. For this second regression model I included rural population, because of its importance especially in developing countries, and due to the low coverage rate of people living in rural areas.

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I included rural population as a third explanatory variable, and just as the theory states along with the regression results, it has a negative effect on life expectancy.

Table 5: Regression model

R-squared	0,431
Adjusted R-squared	0,359
Number of observations	28
Explanatory variables	Coefficients
Constant	4,008 (0,092)***
Health expenditure	0,352 (0,187)**
GDP per capita	0,031 (0,010)***
Rural population	-0,053 (0,034)*

*: coefficient significant at a 10% level of significance
 **: coefficient significant at a 5% level of significance
 ***: coefficient significant at a 1% level of significance

This negative relation between rural living and life expectancy is shown in the diagram below.

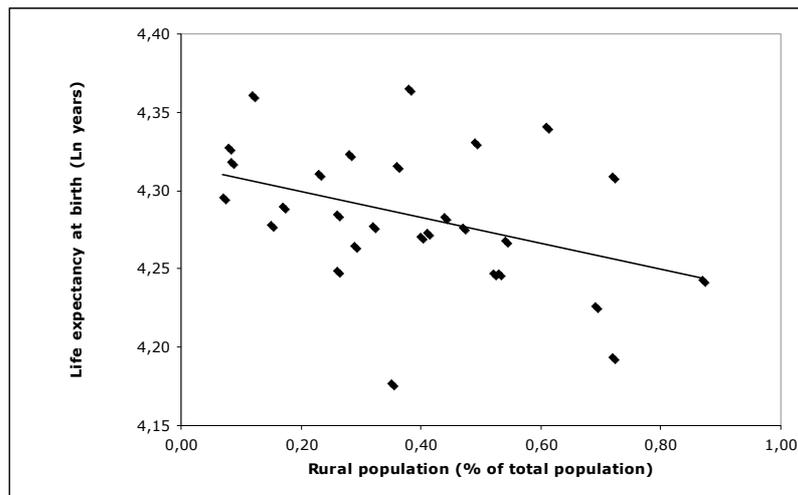


Diagram 3: Relation between Life expectancy and Rural population

The negative effect of rural population can be associated with the fact that there is a lack of sanitation facilities in rural settings, as opposed to larger cities and urban areas. The rural population faces tougher living conditions, and the problems related to health are different than in the urban areas. Lack of infrastructure makes it harder for these people to reach the facilities.

In addition to this, the coverage of health care services and health insurance schemes are far from universal, and it is especially the rural population that is neglected. As presented in chapter three, the health care systems have undergone changes in order to cover more people. For example, the Dominican Republic has a large share of

people living in rural settings, with no access to electricity or drinking water, which has an obvious effect on the health status. A major problem is how to include these people in the system. It is a matter of reaching out to the people in the rural areas, and informing them about their rights. Once you are registered in the national system, you are entitled to free health care as a Dominican citizen, which is a good way of guaranteeing health care services for the poor population. However, it puts a pressure on administration and organization. Countries such as the Dominican Republic need to focus more resources into including the rural population. There is a smaller share of the total population in Colombia living in rural areas, which makes this a less significant determinant of health in Colombia, as opposed to Bolivia and the Dominican Republic (26 percent in Colombia compared to 32 percent in the Dominican Republic and 35 percent in Bolivia).

For Bolivia there is the major problem regarding the indigenous population being neglected and left outside of the system.

However, the rural population does have a negative impact on life expectancy in Colombia as well, but not to the same extent as in Bolivia and the Dominican Republic, due to the higher GDP per capita and share of health expenditure in Colombia. As the theory of Wagstaff (2002) presented earlier states, richer countries have better possibilities to obtain and maintain a better level of health. One can assume that the higher GDP per capita and the share of health expenditure in Colombia are balancing the situation. With a higher income the government can focus its resources so as to improve the situation by for example increasing the health expenditure, hence reducing the problems associated with for example the rural population.

5.3 The effect of education on health

Another important determinant of health is education. Due to the limitations regarding the number of observations, more explanatory variables could not be included in the previous model without the existing variables losing their significance. For this third regression, I replaced rural population with primary school enrollment, and the coefficients are as stated below in table six.

Table 6: Regression model

R-squared	0,431
Adjusted R-squared	0,36
Number of observations	28
Explanatory variables	Coefficients
Constant	3,779 (0,139)***
Health expenditure	0,395 (0,183)**
GDP per capita	0,039 (0,010)***
School enrollment	0,119 (0,076)*

*: coefficient significant at a 10% level of significance

**: coefficient significant at a 5% level of significance

***: coefficient significant at a 1% level of significance

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The explanatory variables health expenditure and GDP per capita are still as significant as in the previous model; affecting life expectancy positively. Primary school enrollment also has a positive impact on life expectancy.

With a basic education, including learning to read and count, people are expected to experience a longer life. Even though the coefficient for school enrollment is larger than the one for GDP per capita, it is not the most important determinant of health in this model. GDP per capita is still the variable that affects life expectancy the most. This positive relation between life expectancy and primary school enrollment is shown in the diagram below.

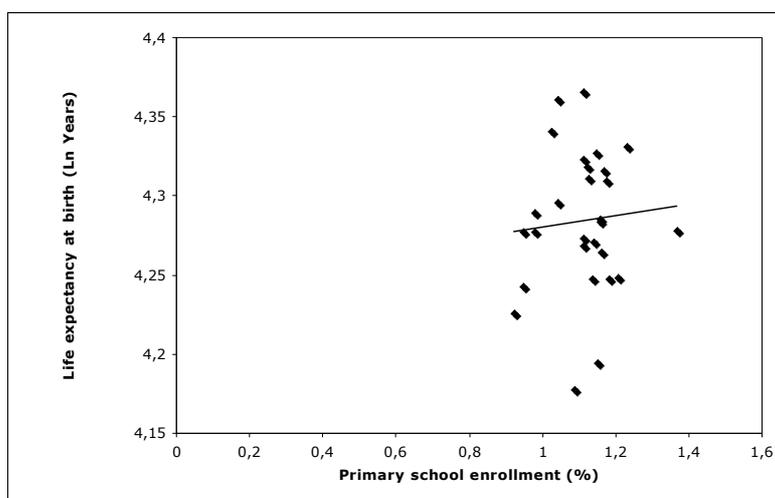


Diagram 4: Relation between Life expectancy and Primary school enrollment

The positive relation between life expectancy and primary school enrollment is not as significant as for example between life expectancy and GDP per capita (the trend line is not as steep in diagram four). However, this does not mean that it is less important to develop the primary education and include all the children in the education. Education and information is crucial; learning about the risks of certain behavior, symptoms of diseases and the severity of certain diseases. There are of course limitations on what children can be taught in primary school, but learning how to read and count will help the children for the future. This is something we might take as given in the developed world, but for the poor people living in rural areas, isolated from facilities (both schools and health care centers), a primary education is especially important, where they can learn the importance of for example clean hands and drinking fresh water.

The countries have reported levels between 90 percent and 140 percent.⁵ This shows that in these 28 countries, almost all children are included in the primary education. In the Dominican Republic the rate of primary school enrollment was 98 percent, compared to 116 percent in Colombia and 109 percent in Bolivia for that same year. These numbers show that the school system was more mature in the Dominican Republic, with some children of the official school age not attending primary school. The higher rates for Bolivia and Colombia might be associated with high participation, but also with high rates of repetition.

Education is an important factor for the human capital and life expectancy. As more children are included in the primary education, one can expect to see more children moving on to secondary education, and from there keep on educating themselves. The primary school needs to be inspiring for the children, giving them incentives to learn things, to see the importance of education. In small-towns or rural settings there are often only primary schools, which means that in order to get a higher education, people either have to move or migrate to the bigger cities. However, there is a strong connection between education and poverty. Poor people might not have the possibilities to leave their old life behind and migrate to a bigger city. Yet again, these different determinants of health are all linked together.

As mentioned earlier, education needs to be incorporated within the health care sector, and not seen separately, since they complement each other and are both important for the health. Education improves knowledge about health and illnesses. Education and literacy facilitate access to a wide range of useful written material on health and health care. Health education within the health sector provides a useful contribution to the general level of health knowledge and health risk awareness among the poorly educated.

Bolivia, Colombia, and the Dominican Republic all have in common the low rate of coverage, which to some extent can be explained by lack of information and education. People in some areas are not aware of their rights. This is a major problem, especially in Bolivia with many different ethnicities that do not speak Spanish, which is the official language (along with aymara and quechua). Primary education is therefore very important in this kind of cultural setting; the importance of learning the official language. In addition to this, the health planning with regard to location of the facilities is important to consider, especially in the countries with a larger share of rural population.

5.3.1 Relation between GDP per capita and primary school enrollment

By dividing the 28 countries into two equally large groups, *high* and *low*, but this time for GDP per capita and primary school enrollment, it is possible to see the relation between the two variables. One can assume that with a higher GDP per capita, more children are in general enrolled in primary education. A richer country (in terms of GDP per capita) has more resources to guarantee education for the population, whereas a poorer country is more constrained in terms of resources.

⁵ Levels higher than 100 percent signal high access and participation, but also indicate inefficiency caused by high rates of repetition and/or high re-entry. A fully mature primary school system would imply a 100 percent level (or close to 100), meaning that all children in school are of the official school age, and that late school entry, repetition rates, and dropout rates are all very low (World Bank).

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		<i>GDP per capita</i>	
		High	Low
<i>School enrollment</i>	High	SUR, LCA, BRA, URY, MEX,	NIC, GUY, HND, GTM, SLV, ECU, PER, COL, BLZ
	Low	GRD, CRI, PAN, ARG, VEN, CHL, BRB, TTO, BHS	BOL, PRY, DOM, JAM, VCT

Note: See appendix for full country name

With a quick look at this classification above, it might look like high GDP is more strongly associated with low rate of school enrollment and vice versa. However, one needs to keep in mind that some of the countries have reported numbers over 100 percent. Rates above 100 percent can mean that the school system is not mature, with a high rate of repetition. This implies that high level of GDP per capita actually is associated with a more mature school system, with reported rates of enrollment closer to 100 percent (lower rates).

The two countries reporting the most mature school systems were the Dominican Republic and Barbados (reporting numbers close to 100). Brazil reported a rate of school enrollment of 140, implying a immature school system. However, one can then reason whether it is better with a rate of 140 than 92,5 as for Grenada. Either way, primary education is of great importance for health.

6 Conclusion

There are many different factors that determine the level of health. They are all linked together, such as poverty, education, GDP, environment, health expenditure, etcetera. Low income-level leads to larger share of poor people, lower health expenditure, and lower education, as poor people are less prone to seek education possibilities. The environment, where people live, also has a significant impact on health. The problems related to health are different in rural and urban areas. The important difference between rural and urban areas is however the access to health care services. The rural population in these Latin American and Caribbean countries is isolated in the way that they cannot seek care to the same extent as in the urban areas. Just as for education, most of the developed facilities are in the bigger cities, which makes rural living situation a significant and important determinant of health.

As presented among the health determinants, poverty may be considered to be the most important. It seems to be the factor along with geographical location within the countries that affects the health seeking behavior the most, and hence the level of health. Poverty is strongly associated with many additional factors that determine the health, such as lack of education, poor living-conditions, etcetera. They all go hand in hand, and the relations go in both directions, for example no education does in most cases imply lower standard of living and in turn worse health.

In addition to this, there is also a difference in significance in different countries. With location we see different problems related to health. In the end, it is the health care system that settles the final health condition; curing the individuals, teach the population about risks, symptoms, etcetera; or leaving the population uncovered by the health care system, hence facing an early death. In this part of the world, Latin America and the Caribbean, we see health problems that we normally would not meet in Europe. This is of course due to the geographical location, but also the design and development of the health care system. In Europe and the rest of the developed world, there is no problem regarding people not being covered by health insurances and not having the possibility to seek care when being ill (low coverage is not a significant problem). This is the major problem for many developing countries, along with not knowing the rights and possibilities for the people.

The purpose of this thesis was to see whether the significance of the different determinants differ depending on geographical location. The focus was on Bolivia, Colombia and the Dominican Republic, three low-middle income countries with problems related to health. The regression results show that the chosen explanatory variables do have an effect on health. GDP per capita is the most important positive determinant for all three countries, and share of rural population is negatively associated with health. Among these three countries, GDP per capita is most positively significant for Colombian health, whereas share of rural population has the largest negative effect in Bolivia, followed by the Dominican Republic. With a lower share of rural population in Colombia, this variable does not affect the health to the same extent.

The regression results show reason for Bolivia and the Dominican Republic to increase their health expenditure, with a focus on the rural population. The rural population is not as large in Colombia. Colombia is a more developed country than Bolivia and the Dominican Republic, but regarding the health care system, there is

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still a long way to go. With the recent reforms, the poor people are now entitled to health care through their insurances. As shown earlier, there is still a considerably large share of people living under poverty-conditions in Bolivia, Colombia and the Dominican Republic, even under extreme poverty-conditions. As the theory of Wagstaff states, richer people are likely to end up with higher levels of health and the poor people are at a disadvantage when it comes to accessing the health care services. Since good health and a descent human capital is crucial for an under-developed country, it is important to guarantee universal health care coverage. Why then is lack of coverage still a major problem, and how can the countries guarantee full coverage with limitations regarding the financial resources?

7 Discussion

The main problem for these Latin American and Caribbean countries is the fact that many people are not covered by the health care system. There is an existing health care system, but there are large inequalities when it comes to seeking and accessing the care.

With the ever-changing conditions in today's society, the health care sector needs to keep changing to meet the demand. Health care today is not what it was some decades ago. The health problems are different, new technology has led to new forms of treatment and medications, and people demand more of the health care. As people become more aware of the risks, the severity of certain diseases, and their social rights, the demand changes. In addition to this, there is a never-ending change in the disease pattern, with old death causes being replaced by new ones affecting the individuals' health.

Is it possible to design one health care system that would work for every country, guaranteeing universal coverage, and how would it look? Evidently this would be hard to achieve since every country is different with different problems related to health, socio-economic differences, etcetera. Just as every developing country needs different means and methods in the developing process, due to geographical differences etcetera, one needs to consider each country individually when designing the health care system. It is obvious that one of the main problems for the developing countries in Latin America and the Caribbean is the lack of universal coverage. One might not see this as a big problem, that it is easily solved. However, depending on the country, different actions need to be pursued due to the individual regional characteristics. Bolivia and the Dominican Republic face the problem of low rate of coverage especially among the rural population. In Bolivia there are many different ethnical groups living in the rural areas, not speaking the same language, which in turn puts pressure on the education and the information systems. These people are not only poor, but also limited when it comes to social capabilities and possibilities.

Each health care system needs to be designed so as to meet the national problems and needs. If a country is especially struck by HIV/Aids, more education is needed and should therefore be incorporated within the health care system. There should be more pressure on developing an information system in order to educate and inform the people about the risks and symptoms of different diseases, not only to keep themselves healthy, but also other people. The health status of one person affects other people as well, especially in under-developed conditions with bad sanitation and a higher risk of diseases spreading.

Education and information is important, especially in the rural areas where the sanitary situation is worse. Basic knowledge, such as informing people about the importance of washing the hands in order to prevent transmission of bacteria, could help a lot. Basic and primary education is more important than one might expect. For example, local health workers can raise the level of knowledge and awareness of severity of diseases by educating people individually, in groups, at public meetings, home visits, or printed information material for the public.

The share of health expenditures (as a percentage of total GDP) is very low in general among the low-middle income countries in the Latin American and Caribbean region. This is important to consider especially for a developing country with many problems

related to health. As mentioned earlier in this thesis, a good human capital is important for a further development and economic growth in a country. There should be a sharper focus on the national health. Take the Dominican Republic as an example. It is a country with enormous socioeconomic differences, and low health expenditures. There are resources within the country but one can wonder what the government focuses on when allocating the resources. All over the country one can see construction sites; building new luxury resorts for tourists, when people are living under extreme poverty conditions. The Dominican government is working on reaching out to the whole population. People are entitled to free health care, but they need to be registered in the system. This is a problem especially for the rural population not being registered in the national system; hence they do not have the same guarantee of health care and the same rights as the ones being registered. Another important aspect is the bad infrastructure preventing the poor people in the rural sites from accessing the facilities that they need.

As shown earlier in the thesis, economic growth in the Dominican Republic has not been associated with a reduction in poverty and an improvement for the poor population. The poor population has instead increased. This shows that the resources are not used optimally for the population. With an increase in income, one needs to make sure that everyone is included and get to be a part of the improvements, especially the poor people in need.

Bolivia, Colombia and the Dominican Republic all have in common the goal of universal coverage. The government cannot take for granted that people are aware of their rights. Due to the strong relation between different health determinants, education (as an example) needs to be incorporated better in the health care system. When improving the rural living conditions, there needs to be a sharper focus on educating the people about the severity of certain diseases, as well as developing infrastructure. People should be able to physically reach the health care services. This will facilitate the universal coverage. It is clear that governments have limited resources in these developing countries, and cannot meet every need at the same time. Decision makers and health planners must use the resources as efficiently as possible. It is not simply a matter of increasing the public spending. About half of the rural population is covered by the health care system in Bolivia, and this is to some extent explained by the mother's age and educational level. This shows that there is a strong need for education especially in the rural areas.

Regarding the location of health care facilities there is an optimum, namely full accessibility and universal coverage. This is what we want to achieve in the developing countries. Due to resource limitations this is not achievable in developing countries, which is why there needs to be a consensus on how much deviation from the optimum that is accepted.

People in the rural areas are less fortunate when considering the access to fresh water and sanitation. Based on my own observations, most of the houses in the countryside in the Dominican Republic do not have water or electricity whereas in the large urban areas, such as the capital Santo Domingo, most of the households have access to water. In the rural areas, far away from the cities, the people are to a large extent relying on fresh water sources, rivers with drinkable water. The same goes for the access to sanitation. In the countryside there are hardly any clinics or health care centers at all.

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The health care system in the Dominican Republic is very variable, depending on rural and urban areas. In the rural settings there are no specific politics to follow, hence the physicians and the health workforce choose sometimes whatever they feel like. As the Dominicans say themselves; “*Sometimes the physicians make the right decisions, sometimes they do not.*” When seeking care, the patient needs to feel secure knowing that he or she is in good hands, and is treated according to the standard procedures.

There are gains associated with decentralization of the health care system for these low-middle income countries. With a decentralization of the health care system, the countries will experience an improved understanding of local perceptions and needs, increased community participation, and improved access to the health care services. The health care systems in Bolivia, Colombia and the Dominican Republic all have undergone major reforms recently, with a focus on achieving universal coverage, by decentralizing the systems. Numbers show that progress is possible, however it is a slow process. These three countries are moving more and more towards a decentralized health care sector, as the municipalities get more control and responsibility for the health planning, in order to meet the local needs. This has been shown to be successful regarding the coverage of the population. The Colombian health care system seems to be the most equitable one, but there is still a long way to go before reaching universal coverage.

Bolivia is a socialist state. For the first time in history, the president represents the indigenous population. With the native population being neglected during decades, the current government is now focusing on improving the situation for the native population, by taking native traditions and cultures into account, as well as the local needs. Colombia is corrupt. It is a democracy, but with many problems especially associated with the mafia and the drug trade. These political problems might neglect the development of the health care system, and the health of the population. The Liberal party governs the Dominican Republic, which is associated with modern politics. However, there are still significant problems related to illegal drug trade and poverty. With the Dominican Republic being a liberal economy, there is more focus on the individual effort, which is shown by the high private expenditure on health, and the low social security expenditure on health in this country.

There have been changes in the legal framework in order to include the poor population in the system, but due to corruption, resources are not allocated in an optimal way. These different political premises limit the development process, and they way the health care sector can evolve. A problem is the fact that politicians have a short-term focus. Decisions are made based on private utility, not the utility for the entire population, in a long run.

An interesting result is the fact that Bolivia, Colombia and the Dominican Republic face the same main problem. The design of the health care systems is quite similar in these countries, even though they are not direct neighboring countries, plus face different political premises, with different governmental directions, but still corruption in each country imposing problems for the health care system.

There is a strong connection between economic growth and health, and this relation goes in both directions. Economic growth lead to a better health (if resources are used in a efficient and optimal way), and a better health lead to economic growth as the population is more productive and can drive the economy forward. Investments in

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health today are expected to have positive external effects for the future. However, in order to make the best use of the human resources adjustments are required within the societies. A healthier population will demand more of the society; more possibilities to continue to develop the human capital.

We have seen the importance of health for these developing countries, but also the need for further development regarding the allocation of resources so as to achieve a better level of health. These countries have a lot to win by including the entire population and secure a descent level of health, for example a more productive population; and richer, both in terms of money and additional earned income, but also in terms of an improved physical well-being. This would make the people feel that they are a part of the system, and not neglected. A richer and healthier population means a stronger nation. The young generation is the future of every nation, driving the country forward in terms of development and strengthening the economy.

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Appendix

List of countries:

ARG: Argentina
BHS: Bahamas
BLZ: Belize
BOL: Bolivia
BRA: Brazil
BRB: Barbados
CHL: Chile
COL: Colombia
CRI: Costa Rica
DOM: Dominican Republic
ECU: Ecuador
GRD: Grenada
GTM: Guatemala
GUY: Guyana
HND: Honduras
JAM: Jamaica
LCA: St. Lucia
MEX: Mexico
NIC: Nicaragua
PAN: Panama
PER: Peru
PRY: Paraguay
SLV: El Salvador
SUR: Suriname
TTO: Trinidad and Tobago
URY: Uruguay
VCT: St. Vincent and the Grenadines
VEN: Venezuela

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YEAR 2006	Life expectancy	GDP per capita	Ln Life expectancy	Health expenditure	Ln GDP per capita	Rural population	School enrollment
BOL	65,1791	1224,2922	4,1771	0,1200	7,1101	0,3500	1,0885
COL	72,5949	3737,3458	4,2849	0,1700	8,2261	0,2600	1,1595
DOM	72,0275	3316,3973	4,2770	0,1000	8,1066	0,3200	0,9817
ARG	75,0265	5474,5125	4,3178	0,1400	8,6079	0,0840	1,1235
BHS	72,9130	19057,1353	4,2893	0,1400	9,8552	0,1700	0,9816
BRB	76,7721	10426,8843	4,3408	0,1200	9,2521	0,6100	1,0273
BLZ	75,9937	4076,2916	4,3306	0,0900	8,3129	0,4900	1,2317
BRA	72,0836	5662,9220	4,2778	0,0700	8,6417	0,1500	1,3687
CHL	78,2944	8911,2403	4,3605	0,1400	9,0951	0,1200	1,0435
CRI	78,6557	5121,0825	4,3651	0,2200	8,5411	0,3800	1,1134
ECU	74,8340	3136,0293	4,3153	0,0700	8,0507	0,3600	1,1684
SLV	71,5412	2758,4620	4,2703	0,1600	7,9224	0,4000	1,1396
GRD	68,4294	4783,3850	4,2258	0,0900	8,4729	0,6900	0,9250
GTM	69,9142	2319,7659	4,2473	0,1200	7,7492	0,5200	1,1362
GUY	66,2805	1237,5622	4,1939	0,0900	7,1209	0,7200	1,1523
HND	69,8907	1543,4668	4,2469	0,1500	7,3418	0,5300	1,1821
JAM	72,0000	3763,8277	4,2767	0,0400	8,2332	0,4700	0,9495
MEX	74,4711	9104,3199	4,3104	0,1200	9,1165	0,2300	1,1270
NIC	72,4771	958,1422	4,2833	0,1700	6,8650	0,4400	1,1589
PAN	75,4016	5212,7155	4,3228	0,1200	8,5589	0,2800	1,1150
PRY	71,7585	1541,7569	4,2733	0,1300	7,3407	0,4100	1,1134
PER	71,1172	3346,3062	4,2643	0,1400	8,1156	0,2900	1,1640
LCA	74,3867	5512,0741	4,3093	0,1100	8,6147	0,7200	1,1771
VCT	71,3812	4125,9791	4,2680	0,0900	8,3251	0,5400	1,1124
SUR	69,9921	4645,0266	4,2484	0,0800	8,4436	0,2600	1,2075
TTO	69,5774	14376,7879	4,2424	0,0800	9,5734	0,8700	0,9471
URY	75,7298	5837,4110	4,3272	0,0900	8,6720	0,0800	1,1497
VEN	73,3676	6825,8116	4,2955	0,0900	8,8285	0,0700	1,0432

Source: World Bank: World Development Indicators