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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 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 Dominican Republic.

Conclusion: There are many different explanatory variables for health. GDP per capita, health expenditure, and primary school enrollment is 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 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 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 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 and at the same time other countries lagging behind. We see today both health inequalities among countries as well as within countries.

Along with the improvements in health, the nature of health problems is changing. The population is ageing and the effects of urbanization and globalization accelerate the transmission of communicable diseases, and increase the burden of chronic and non-communicable disorders.

Furthermore, the globalization has an impact on the health care systems around the world, with rapid changes and transformation. As the world changes, with people being more mobile bringing new issues to the table, 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 sector does fail to anticipate the changes in many parts of the world, and to respond appropriately to the changes, sometimes too often with too little, or too late or too much in the wrong place. In addition to this, solutions cannot be of temporary character.

In many developing countries the health sector remains under-resourced. As the societies modernize, people demand more from the health care systems. Different ways of life mean different needs. When the population becomes wealthier, one would not settle with what was offered before, which implies further pressure on the health sector to adapt according to the demand of the population.

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 been associated with disappointing advances in access to health care. Despite many changes for the better, vaccination coverage in sub-Saharan Africa is still significantly lower than in the rest of the world. Childbirth care for mothers and newborns also continues to face problems. In 33 countries, skilled health personnel attend less than half of all births each year (World Health Organization). 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

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).

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 commitment to public investment. Poorer countries are still at much greater risk of war and civil conflict than richer countries.

Within developing countries, the best local governance can help produce 75 years or more of life expectancy, but with poor urban governance, life expectancy can be as low as 35 years (World Health Organization).

88 percent of cases of *diarrhea* worldwide are caused by unsafe water, inadequate sanitation or insufficient hygiene. These cases result in 1,5 million deaths each year, most being the deaths of children. Childhood *underweight* causes about 35 percent of all deaths of children under the age of five years worldwide. About 50 percent of this underweight or malnutrition is 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 and have a lower prognosis for full recovery. The total number of deaths caused directly and indirectly by malnutrition induced by unsafe water, inadequate sanitation and insufficient hygiene is up to 860 000 deaths per year among children under the age of five years. The transmission of malaria varies over space and time, but worldwide about 500 000 people die from malaria (World Health Organization).

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.

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 statistics 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.

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

The countries being studied in this thesis are Bolivia, Colombia, and 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 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 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 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 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 two last 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 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 ending 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 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 Dominican Republic being an island makes the comparison of health determinants and health status more interesting. Colombia is on the northern coast of South America, and Bolivia is situated in the center. 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 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 (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 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 situation and health care systems in developing regions

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.

Regarding the reduction of mortality rate among children under five and the maternal mortality rate, strategies include establishing national policies, standards and regulatory mechanisms for safe motherhood and developing systems to ensure their implementation; monitoring maternal and newborn health care status and access to services; and supporting programs for immunization, nutrition and water and sanitation interventions. It has taken about 40 years from 1960 to reduce child mortality by 50 percent. In South Asia, one of every ten children dies before their fifth birthday. The maternal mortality situation is still severe. The level of maternal mortality is approximately 530 000 deaths every year (Nayar & Razum, 2006). Nearly 90 percent of these deaths are in Sub-Saharan Africa and Asia. Women in developing countries still face very high risks of death and disability as a result of pregnancy. Due to this high rate of maternal mortality, the reduction is one of the major targets within the Millennium Development Goals. As one would expect, the poorest countries suffer the highest burden of maternal mortality. The women's lifetime risk of maternal death is almost 40 times higher in the developing than in the developed world (Collin et al., 2008).

Maternal mortality shows large disparities between developed and developing countries. Poverty contributes to this disparity, but it does not explain it completely because of the fact that countries with similar levels of socioeconomic development have different levels of maternal mortality.

In Sub-Saharan Africa, the Indian subcontinent, and Southeast Asia, half or more of adults have latent tuberculosis infection. Each year, between 7 and 8 million people throughout the world develop active tuberculosis, and the vast majority of cases occur in Sub-Saharan Africa and Asia. Tuberculosis is responsible for about one quarter of all preventable deaths in developing countries (Semba, 2008). The disease is distributed all over the world, but the burden of the infection and disease is found in developing countries. During the 1990s, Africa and Asia had the highest prevalence of tuberculosis.

Throughout the world, up to four million babies die each year during the first four weeks of life, and of these four million deaths, 99 percent occur in developing countries. More than 10 million children under the age of five die every year.

In the table below, we see how different regions throughout the world differ in the infant mortality and maternal mortality rate, for year 2000.

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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.

Table 2: Improvement in infant mortality rate (per 1 000 births) in different regions

Source: Christian (2008), published in Semba and others (2008)

	1960	1970	1980	1990	1995	2000	2002
Northern Africa	167	142	104	66	50	38	34
Sub-Saharan Africa	163	141	117	109	109	104	104
Latin America	102	86	61	43	35	30	28
Eastern Asia	147	83	48	37	36	32	30
South Asia	149	130	114	87	77	70	67
Southeastern Asia	111	87	68	54	45	38	36
Western Asia	152	128	83	53	55	50	49
Developing regions	142	109	88	71	67	62	61
World	127	96	79	64	61	57	55

As seen here in table 2, there have been significant improvements regarding infant mortality all over the world.

Diarrheal diseases are a leading cause of childhood morbidity and mortality in developing countries. An important contributing factor to these deaths is malnutrition. The World Health Organization estimated that diarrheal diseases caused 1,8 million deaths annually in 2000-2003. Most of these deaths occurred within the first two years of life. Diarrheal diseases are most commonly associated with poverty, poor sanitation and hygiene, inadequate water supplies, and limited education; hence

diarrheal deaths are concentrated in areas of high population density, extreme poverty, and poor access to health facilities. The deaths related to this disease are mainly concentrated to Sub-Saharan Africa and Southeast Asia (Lanata & Black 2008).

3.1 Latin America and the Caribbean

The Americas consists of North America, Latin America, and the Caribbean, where the two latter are considerably less developed than North America. The current public health status in the region is a reflection of interactions and changes in the size, composition, distribution, and behavior of the population. The burden of different diseases changes, and differs within the region, which is presented here in this chapter.

In the region of the Americas, human development and health have advanced over the past quarter-century. The population growth has dropped in 2006 to a rate of 1,2 percent on average per year, urbanization has expanded from 68,6 percent in 1980 to 78,9 percent in 2006, the coverage of basic services is increasing for the most part, however still less in rural areas; the general population has better access to education, water and sanitation services, primary health care, cost-effective technologies, and immunizations (Pan American Health Organization, 2007). This increased coverage has enabled the progress towards preventing and controlling the major communicable diseases. In table 3 below we see evidence of these improvements since the 1980s in the Americas regarding health and access to drinking water and sanitation services.

Table 3: Improvements in health and development in the Americas, 1980-2010.
Source: Pan American Health Organization

	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 improvements there are still many major challenges remaining. Communicable diseases such as HIV/Aids, malaria and tuberculosis; conditions such as obesity and diabetes; and accidents and violence remain. However, these health related problems stem from risk factors related to personal behavior, changes in diet and physical activity as well as consumption of tobacco, alcohol and narcotics.

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Social and economic disadvantages in rural areas have led people to migrate toward urban areas in search of employment and better living conditions. This puts a pressure on the services provided in the urban areas, needing to be able to meet the growing demand with more people. Since 1950, the urban population has been growing, reaching 77,4 percent in 2005. According to projections, the urban population in Latin America and the Caribbean is to reach almost 85 percent in 2030 (Pan American Health Organization, 2007).

Although advances in poverty reduction in recent years, many people are still living in poverty. In 2005, 40,6 percent of the population of the Americas (almost 213 million persons) continued to live in poverty, and as many as 88 million persons (16,8 percent) in extreme poverty (Pan American Health Organization, 2007). The gap between the richest and the poorest countries seems to widen and is projected to continue.

High rates of unemployment complicate the subscription in the social security system, hence limits the access to health care. Informal employment and child labor further complicate the situation. In the Americas, socioeconomic deterioration, characterized by poverty, rapid urbanization and social fragmentation, has contributed to greater inequalities and unhealthier environments, particularly affecting the rural populations.

Despite the improvements in child survival in the Americas since the “health for all” initiative was launched in 1978, an inequality has persisted. The distribution of the risk of dying before the age of five in the population of the Americas shows a significant inequality. The richest regions account only for eight percent of child deaths, whereas the poorest concentrates almost 40 percent of the child deaths.

The region of the Americas has made a lot of progress in reducing infant and child mortality rates. However, differences in child mortality continue to prevail among countries as well as within them. In countries with high child mortality rates, such as Bolivia, Peru, Guatemala and Brazil, but also in countries with relatively low rates, such as Colombia and Belize, internal inequalities persist. There are many critical determinants of health inequalities among infants and children, for example ethnic group, geographic location, and education. In Bolivia, Ecuador, Guatemala, Mexico, and Panama, infant mortality rates are consistently higher among rural indigenous populations than among their non-indigenous rural populations as well as among urban indigenous populations. An analysis of inequalities in mortality of children under five in relation to maternal education in Bolivia, Brazil, Colombia, the Dominican Republic, Guatemala, Haiti, and Peru indicates that child mortality level and mother’s educational level are inversely related (Pan American Health Organization, 2007).

In order to further reduce the child mortality, several constraints must be overcome, such as the lack of safe water to drink, exposure to disease-bearing mosquitoes, lack of immunization, and poor nutrition. With proven technologies – breastfeeding, vaccinations against main childhood diseases, clean water sources, and bed nets to prevent malaria – the great majority of childhood deaths could be prevented. Interventions and resources are available, but they are not being delivered to the mothers and children in need. The children most at risk are those in the poorest countries and in the most deprived communities within countries, those who are discriminated against because of gender, race, or ethnicity, those affected by HIV/Aids, those lacking good nutrition, those have been orphaned (many as a result

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of Aids), those subjected to violence, abuse, or exploitation, and in general those who lack access to essential goods and services. In 2003, 6,2 percent of all children under the age of 18 were orphans, and during the period 1999-2004, eight percent of females and eleven percent of males in between the ages of five and 14 were involved in child labor (Pan American Health Organization, 2007). This persistence of inequalities in health is confirmed by perinatal disorders and malnutrition being among the ten leading death causes in several Latin American countries.

Maternal health together with life expectancy is assumed to be a good indicator of a country's health status. If the maternal mortality rate drops, it can be assumed that a population's other health problems are also improving. 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, childbirth, and the postnatal period (Pan American Health Organization, 2007).

The Regional Strategy for Maternal Mortality and Morbidity Reduction in the Americas clearly states that:

“Maternal death is preventable: effective interventions are known; and investment in safe motherhood will not only reduce maternal and infant death and disability, but will also contribute to improved health, quality of life, and equity for women, their families, and communities. Safe motherhood interventions are among the most cost-effective in the health sector, particularly at the primary care level.” (Pan American Health Organization, 2007)

Maternal health is of great priority, and access to health services and resources is the core of child and maternal survival in the Americas. Health indicators, such as availability of physicians per population, proportion of deliveries attended by skilled personnel, low birthweight prevalence, and public health expenditure as a proportion of the gross domestic product are unequally distributed along the income quintiles of the Region's population, where the socioeconomically disadvantaged are at higher health risks. Worth noticing is the fact that percentage of births attended by skilled health personnel in the Americas is comparable with the rest of the world. In 2004, seven out of eight deliveries in the Americas were attended by skilled personnel (Pan American Health Organization, 2007).

Despite reductions in cases of malaria, it continues to constitute a significant public health problem. More than one million people (most of them children under five) die every year from Malaria, and in the Americas it is the cause of 0,4 percent of deaths among children under five. In recent years, the number of cases of dengue has increased from almost 400 000 in 1984 to over 430 000 cases in 2005 (Pan American Health Organization, 2007). Areas with poor sanitation are at a high risk of catching the dengue. Since there is no vaccine or cure for the disease, people can best deal with it by keeping their homes free of mosquitoes. Another health priority in the Americas is to fight tuberculosis. About 50 000 die of this disease every year. Furthermore, the so-called neglected tropical diseases are associated with poverty, malnutrition, lack of schooling, and unemployment.

The progress in the Americas can be attributed to many variables, such as changing demographics, improved economic productivity, greater urbanization, with more access to health services; increased food supplies, advances in medical science, more

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and better sanitation services, preventive care, innovative treatment methods for some communicable diseases, training and epidemiological surveillance, increases in financing of health interventions, social security, improvements in infrastructure, education; and social changes with an improvement in the status of women. One of the main reasons for the improvements in child survival in the Americas is the success of national immunization programs. This has resulted in avoiding the death of millions of children, and the focus for the future is to sustain the immunization and reach the people who yet have not benefited from existing and new vaccines.

Old public health problems have been solved, but new ones emerge and old ones reemerge, hence the epidemiological profile changes. Predictions state that deaths from chronic diseases will increase significantly over the next ten years, for example deaths from diabetes are expected to increase by over 80 percent (Pan American Health Organization, 2007). This is a result of the aging of the population as well as unhealthy behavior and individual choices related to nutrition and consumption of tobacco and alcohol.

Health care systems have played an important part in the dramatic rise in life expectancy that occurred during the 20th century. The health care systems have contributed enormously to better health and influenced the lives and well-being of billions of people all over the world. However, enormous gaps remain between the potential of health care systems and their actual performance, and there is still much variation in outcomes among countries which seem to have the same resources and possibilities (World Health Organization, 2000).

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

Growing demands on the health care system are increasing the competition for limited resources. Changes in the labor market, with a growing informal economy, have aggravated the situation for the populations, because of the link between access to health systems and the formal sector employment. Women experience greater exclusion than men because they are working domestically to a larger extent. When being employed, the women are more likely to work in the informal sector and in part-time occupations that are not usually covered by social security.

The gap between those who can and those who cannot access health care is widening in many countries. There are many reasons for this growing inequality: the downside of globalization, poverty, the loss of employment, lowered incomes, and great disparities in income distribution. Many countries have undertaken pro-poor health related interventions. However, these interventions do not always reach those in need, but instead seem to favor and extend the health gap between the rich and the poor.

An equity fund in Colombia has increased health insurance coverage for the poor and lowered financial barriers to the use of services. With this reform, insurance coverage among those in the highest income quintile increased from 60 percent in 1993 to 81 percent in 2003, whereas for the poorest quintile of income the coverage increased from nine percent in 1993 to 48 percent in 2003 (Pan American Health Organization, 2007).

Problems of health system financing remain. Some countries have extremely low health expenditures, while other countries are dependent on external resources and

highly vulnerable. Furthermore, out-of-pocket spending has increased in many countries, affecting the poorest. The amount and distribution of public health expenditure are critical factors in the equity/inequity that characterize health systems. In countries where the health systems are highly segmented, such as El Salvador, Guatemala, Honduras and Nicaragua, and in the Andean Area (Bolivia, Ecuador, Peru, Venezuela), public sector health funding is generally low and public sector coverage is therefore limited, while private expenditure is high and covers mostly private individuals. In these countries, with a large population being poor, serious inequalities in health care access result from low public sector spending on health and high out-of-pocket expenditure.

Around 2005, national health expenditure for all countries in Latin America and the Caribbean accounted for approximately seven percent of the region's GDP. Approximately 45 percent of this expenditure corresponded to public spending on health. The remaining 55 percent came from private expenditure, including direct out-of-pocket expenditure to purchase health goods and services and to cover health services consumed through private health insurance plans or pre-paid health care plans (Pan American Health Organization, 2007). In addition to the amount of public spending on health, its distribution among the poorest groups in a population is a critical factor in those groups' access to health services. Out-of-pocket spending by the poor is lower in countries where the distribution of public spending is tilted toward low-income groups. Chile, Costa Rica, and Uruguay distribute about 30 percent of public spending among the lowest income population. In countries where the poor are disadvantaged with regards to the distribution of public spending, the poor have to pay more for access. Ecuador and Guatemala are examples of this, where just over 12 percent of public health expenditure goes to the poorest, while the richest receives over 30 percent. Peru distributes public spending across all income groups alike. Chile, Costa Rica, and Uruguay have national health insurance systems, while Ecuador, Guatemala, and Peru have highly segmented health systems.

The greater the number of health workers available to a population the greater their influence will be on its level of health. As mentioned earlier, the maternal health is of high priority in developing countries, and as the availability of health workers increases, the rates of mortality decrease. The inverse relationship occurs in countries with a low density of health workers. Many of the countries in Latin America and the Caribbean have a critical shortage of health workers, and this shortage is expected to grow with the projected growth in population. There is a competition for the limited human resources, and up to 128 000 more physicians and nurses would need to be added to the workforce in this region in order to reach the 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).

3.2 Presentation of Bolivia, Colombia and Dominican Republic

With a general presentation of the health situation in Latin America and the Caribbean, we will now look deeper into the three countries chosen for the further analysis and comparison. Bolivia, Colombia, and Dominican Republic are three countries within the same classification as low-middle income countries, but with

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significant differences when looking at the main indicators, as presented in the table below.

Table 4: Main indicators for Bolivia, Colombia and Dominican Republic, year 2006
Source: The World Bank, 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	31 886,066
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 1000)	61	21	38
Population, total	9353846	45558450	9614670
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 the three countries, Colombia has the highest GDP. We see large differences regarding improved sanitation facilities, and Dominican Republic is more developed within the improved water source area, just to mention some of the differences in the main indicators. With this brief introduction we will now look further into each country and respective health care system.

3.2.1 Health and health care in Bolivia

Bolivia is one of the poorest countries in Latin America. In 2006, almost 40 percent of the population lived in extreme poverty. In addition to this, Bolivia is one of the most unequal countries, with the majority of the population not having access to enough opportunities to improve their quality of life. In 2001, 64 percent of the population did not bring in enough income to meet its basic needs. An examination of the distribution of per capita income reveals that, on average, the income of the wealthiest 20 percent of the population is 13 times higher than that of the poorest 20 percent. The Human Development Report 1999 listed Bolivia as a nation of intermediate human development, ranking it 112th on the human development index and 99th out of 146 countries on the Gender-related Development Index. In 1999, 63 percent of the population had an income below the poverty line, and 37 percent had income that did not purchase the basic food basket, which is equal to extreme poverty. In rural areas, more than 89 percent of the population lived in poverty and nearly 60 percent in extreme poverty (Pan American Health Organization, 2001).

The current distribution of mortality reveals a predominance of cardiovascular causes (40 percent), followed by communicable diseases (13 percent) and external causes (12 percent).

The percentage of coverage with respect to the first prenatal check-up increased from 44,9 percent to 52,5 percent between 1989 and 1994, reaching 69 percent in 1998. Coverage in urban areas is over 81 percent, while in rural areas it is under 53 percent. The percentage of coverage seems to decrease as the age of the mother and birth order increase. The most influential variable is the mother's level of education. The probability of under-five mortality varies to a large extent depending on the mother's educational level, and whether living in a rural or urban area (Pan American Health Organization, 2001).

Bolivia has a mix of public and private health care. The major provider of public health care is the Ministry of Social Welfare and Public Health, which operates hospitals, health centers, and health posts. The second largest provider is the Bolivian Institute for Social Security, which operates only for insured workers, pensioners, and their dependents. The individuals covered get benefits including free diagnosis, therapy, and drugs. There is also an informal medical care in Bolivia. The number of people consulting traditional healers varies with economic trends and increased during the economic crisis of 1985-1987 (Ii, 1996). At the local level, the municipal governments are in charge of administering health facilities. The Community Involvement and Administrative Decentralization acts have introduced a type of decentralization in which the municipalities are responsible for infrastructure and financing.

The health services network has 40 general hospitals, 30 specialized hospitals, 149 basic hospitals, 986 health centers, and 1 408 health posts, and out of these 2 613 facilities, 1 995 belong to the public sector, 197 to Social Security, 254 to Nongovernmental organizations, 101 to the Church, and 66 to the private sector (Pan American Health Organization, 2001).

The Basic Health Insurance is the most important health care policy of the Ministry of Health, and the municipalities contribute to its financing. Only 26 percent of the population is covered by the health insurance system, and over half the population practices traditional medicine. The private sector meets only five to ten percent of the

demand for health care services, which means that the remaining share of the population must be covered by the public sector. Limitations on access to the system leads to the conclusion that only half the population that should be served by the public sector actually has access to it, leaving the remaining 35 to 40 percent of the country's population without coverage (World Health Organization). The Second Health Sector Reform Project (1999-2006) focused on extending coverage and increasing quality of health services and strengthening local capacity to respond to health needs (World Bank). A large share of the population pays to enroll in the Basic Health Insurance, which, added to the payments for sonograms, laboratory tests, and drugs, leaves no doubt that this insurance is not free. It is however the cheapest alternative to private care for the population (Pan American Health Organization, 2001).

The most important financing entity in the public sector is the government; in the social security system, businesses/institutions; and in the private sector, households.

The social security sector provides coverage for salaried workers organized within the traditional social security financing schemes. These represent 25,8 percent of the coverage for the population. The private sector includes insurance companies, prepaid medical plans, and nongovernmental organizations. The nongovernmental organizations play a key role in Bolivia. Ten percent of Bolivia's population receives services from these providers. In certain municipalities and communities, the Church is the only health service provider (Pan American Health Organization, 2001).

Historically, Bolivia has not had an integrated health system. There has been large fragmentation and a lack of coordination within and among the subsectors. The current administration plans to construct a Bolivian health system based on universal insurance. The health services, with infrastructure and equipment, have been transferred to the municipalities, which have been allocating coparticipation funds for maintenance, equipment, and construction projects, in order to meet local needs. As a result of this decentralization of the health system, new actors have become more involved, who have increased the supply of public health services.

To summarize, the Bolivian health care system is divided into four sub sectors, 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 health care system. This fragmentation and segmentation cause significant inequalities regarding the access to the health care system. 27 percent of the Bolivian population is 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 30 percent of the population do not have access to any kind of health care services, except the traditional medicine (Bolivian Ministry of Health, 2004).

The main problem for Bolivia regarding health care seems to be the low coverage of the population. Far from the whole population is covered by the health insurance, hence many people cannot seek care. The Basic Health Insurance has reduced economic inaccessibility. Nevertheless, cultural, and especially geographical barriers remain, as well as other barriers related to response capacity, particularly 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, 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 during the last couple of decades demanded that decisions are 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 and Bolivian health care system, we will now move on to look more into the situation in Colombia, followed by the one in Dominican Republic.

3.2.2 Health and health care in Colombia

In 2001, Colombia was the fourth most populated country of America. During the last couple of decades the Colombian population has experienced demographic and epidemiological changes: an aging population (in 2000 life expectancy at birth was 71,2 years – 68,2 years for men and 74,8 years for women – and it has remained fairly unchanged over the last three years), a decline of fertility rates (from 7 children per woman in 1950-1955 to 2,7 children per woman in 1995-2000), and a fast urbanization (in 2000, 71 percent of the population was living in urban areas). Today, Colombia is positioned behind Chile and Venezuela, and ahead of Ecuador, Bolivia and Peru, in terms of life expectancy at birth and infant mortality among the American countries (Rosa & Alberto, 2004).

Of the Latin American countries, Colombia experiences one of the greatest disparities in income distribution. The Colombian economy is characterized by an unequal distribution of income, a high rate of unemployment, a high degree of informality, and a temporary nature of employment.

The Colombian health sector has undergone reforms being accompanied by increases in both social and health expenditure. Total health expenditure increased from 2,7 percent of the GDP in 1990 to 7,4 percent in 2000 (Rosa & Alberto, 2004). With the 1993 law 100, health care services production and delivery was required to occur in the context of a regulated market based on the separation of functions. The health service production was prior to the reform organized as a unified, integrated, and regulated system, and segmented into three independent subsystems: the public, the private, and the social security systems. This system had three types of problems: low levels of insurance coverage, inequities in the access to services, low levels of solidarity, and high inefficiency in the public provision (Gaviria et al., 2006).

The new system called National Social Security System for Health, was defined by the Law 100, approved in 1993 by the Congress, and its regulation is under the responsibility of the Ministry of Health and the National Health System Surveillance Institute that exerts control over the new system. This is considered to be one of the most ambitious social reforms ever undertaken in Latin America. The key principles of the reform included among others: equity in access to health services, mandatory health insurance for everyone, comprehensive coverage, and free choice of insurer and health provider. The reform mainly sought to solve the problems mentioned above by proposing to increase insurance coverage to 36 million people by 2000, by

increasing resources; to increase solidarity; and to increase efficiency through a radical change in the way of participation by the State.

The new health care system is divided into two different levels: the contributive regime, which is targeted at the population with resources, and the subsidized regime, which is designed to ensure health care for the poorest population. Persons who are affiliated to the contributive regime, contribute with 12 percent of their earned income. The employer pays for two thirds of the contribution and the employee pays for the rest. The ones who are enrolled in the subsidized regime, are selected through a test of their economic means. The eligible but not covered population has a right to services provided by public hospitals (Gaviria et al., 2006). Previously, the poor could go to public hospitals and receive free or inexpensive care *if* the hospital would accept them. This was financed through higher prices for customers who were able to pay for medical procedures. With the reform, local authorities were given the funds to finance a system of competitive private managed care organizations. The local authorities would compensate the health insurance organizations with risk-adjusted premiums for every individual covered.

The whole health care system is administered in a decentralized process, which implies the transfer of political, financial and administrative resources as well as decision-making powers to local governments, making the municipalities in charge of health promotion and disease prevention. The Plan of Health is formed by two regimes, as mentioned above, one contributory and one subsidized, and it must cover the entire population, hence guaranteeing a universal insurance. The contributory regime is carried out through the payment directly by the member, and the subsidized regime covers the most vulnerable population with less economic capacity. Until universal coverage is achieved, the population not covered by either of the two regimes, has access to those health services provided by public institutions and private institutions that have contracts with the State. The main sources of financing of the subsidized regime are the national public, transferred, or decentralized resources, resources from the regions, resources from the Family Compensation Funds, and a one percent of the wage contributions (Rosa & Alberto, 2004).

By the year 2001, Colombia had not achieved the objective set by the 1993 Law 100, guaranteeing universal health care coverage for its population. By that time, the Contributory Regime covered only 47,6 percent of the *non-poor*, while the Subsidized Regime covered 13,7 percent. This meant that at least four million inhabitants of the non-poor lacked coverage for health care. With regard to the *poor population*, it was estimated that 35 percent were covered by the Subsidized regime, 10,7 percent by the Contributory regime, and with 53,9 percent not being covered at all. With the reform of the health care system and the 1993 Law 100 the availability of financial resources to the health sector has increased. However, socio-economically under-developed municipalities remained those that experience higher percentage of deaths associated with undefined causes. Great difficulties remain for the poor and vulnerable with financing the health care. Although total expenditure and public spending in health have increased, Colombia is still far from guaranteeing universal coverage and equitable provision of the health plans set by Law 100 (Rosa & Alberto, 2004). However, the percentage of Colombians covered by any type of insurance rose from 28 percent to 57 percent between 1992 and 1997 (Barona et al., 2001). The Law 100 transformed the relationship between the poor who are covered by the system and health care providers. Prior to the reform, the poor could only

receive “charity care” from the public sector. Now the poor are entitled to receive health services by the public or private system through their insurance.

Regarding the health care supply, Colombia was not ready for the reform (Barona et al., 2001). Many hospitals were not modernized in order to be able to carry out the terms of the new law, for example most hospitals did not have accounting systems, and the information systems were under-developed causing problems for the information exchange.

The Colombian health care system occupied the first place in the world in financial equity in the WHO 2000 Report of Health Systems Performance, based on a measurement of relative expenses in health care by family. They found that since rich Colombian families spend more money in health care than poor families, the system is more financial equitable. However, the current situation of health care institutions in Colombia is critical as several public hospitals have been closed and others are going in the same direction (Restrepo & Valencia, 2002).

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 significant unequal distribution of resources in the country. 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 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 Dominican Republic

The Dominican Republic has a population of 9 million people and about 65% of these are residing in urban areas, implying a rather elevated share of the population living in the rural parts of the country. During the last decade, the country has experienced a decline in the annual growth rate of the population (from 1,73% in the period 1990-1995 to 1,61% in the period 2000-2005), which can be linked to the fall in total fertility and lower birth rates. Life expectancy at birth for men has increased from 66,47 years in the period 1990-1995 to 68,11 years in the period 2000-2004, whereas for women it has increased from 71,86 years to 74,35 (Pan American Health Organization, 2007).

The Dominican Republic has undergone economic and social changes, which have been accompanied by periods of economic crises and caused the country to establish new ways of relating to other countries through different trade agreements. During the 1990s, the Dominican Republic was one of the leading growing economies in Latin America and the Caribbean. The per capita income almost doubled from 1990 to 1999. However, the most vulnerable groups in society did not benefit from this improvement of living conditions. In fact, the poverty among this group actually increased. In 2002, 2,7% of the urban population was living in extreme poverty, and by the end of 2004, 42 of every 100 Dominicans were poor and of these, 16 were living in extreme poverty. The number of people below the poverty line has actually increased since year 2000. In 2003, 61,70% of the total population was living below the poverty line, and 33,01% below the extreme poverty line.

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Economic growth in the Dominican Republic has not been associated with human and social development, as we have seen. The country has actually lost ground in the Human Development Index, going down from 94th out of 199 countries to 98th in 2002 and 2003.

People in the rural areas are less fortunate when considering the access to fresh water and sanitation. A lot of houses in the countryside do not have water or electricity whereas in the large urban areas, such as the capital Santo Domingo, which is a large city, 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 one does not see many clinics, hardly any at all.

Malaria is mainly affecting the rural populations. Between 2000 and 2004, the annual number of infected people increased from 1 490 to 2 354. In 2005, 3 837 people were registered with malaria, with 64% being men, and the most affected age group was between 10 and 49 years. The same year 75% of all registered cases were in rural areas. Tuberculosis is a problem with high priority in public health. The rate of incidence is one of the highest in the region with about 7 000 new cases every year. HIV/AIDS is one of the main death causes for the population between 15 and 49 years. About 88 000 individuals are carrying the HIV-virus, including adults and children (World Health Organization, 2007).

In September 2000, the Ministry of Public Health and Social Assistance formulated and implemented a “Zero Tolerance Strategy” to reduce eight priority health problems: maternal mortality, infant mortality, vaccine-preventable diseases, dengue, malaria, tuberculosis, HIV/AIDS, and rabies. Since 1990 the trend in the incidence of malaria cases has been on the rise. The same trend goes for tuberculosis (an increase since 1990), whereas the annual incidence of HIV/AIDS has been declining. With regard to infant mortality in recent years, estimated mortality has declined. The number of deaths due to maternal mortality in the country is significant, due to high underreporting and ill-defined causes. The existence of elevated indices of maternal mortality together with a high level of health care coverage points to deficiencies in the organization and quality of care.

The difference in probability of death is considerably large when considering the level of education of the mother. There are significant differences between urban and rural areas, especially with respect to the annual prevalence of moderate and severe nutritional deficits among children under five years. As one would expect, the numbers are lower in the urban areas.

During the last decades, the Dominican Republic has undergone major economic and social transformations. An important issue for the health sector has been the Law Establishing the Dominican Social Security System (IDSS), as well as the General Health Law. These two were introduced in 2001 and have 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, and the Law Establishing the Dominican Social Security System lays the groundwork for the development of a social protection system with universal coverage. The latter promotes the growth of insurance coverage via social contributions by employers, the State, and workers for the most low-income groups (Pan American Health Organization, 2007).

With this new legal framework, the State is accountable for guaranteeing the health of the entire population and mandating the necessary transformations so that the functions of the National Health System are divided and assumed by the different institutions that comprise it. The National Health Insurance Authority has the responsibility for financing the delivery of health care services to the low-income population.

Government policies have contributed to an expansion of public provision. However, this expansion has occurred in an unregulated environment and it left many individuals without access to insurance or affordable health care. Many Dominicans are burdened with welfare reducing out-of-pocket payments, and the levels of health status and coverage remain unsatisfactory and stagnant (La Forgia et al., 2003). Government interventions are justified as a response to market failure and to promote social norms. Governments are asked to tackle issues of lack of provision of public goods, goods with positive externalities, and incomplete insurance markets.

The Law Establishing the Dominican Social Security System states the benefits and plan of health care services to which the population will have a guaranteed right once the appropriate system of insurance has been identified and selected. This basic health plan has been specified to the extent that the Dominican Social Security System must cover the entire population regardless of the system a person is affiliated to in function of his/her job situation. This basic health plan includes curative treatment at every level of care, as well as preventive personal health services.

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% and the employer pays 6,67%. By doing this, 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 regime everyone is covered, the ones working and the ones not working. The subsidiary regime is for those who are not working, elderly, orphans, and even illegal immigrants. The state is set to cover 100% of everything for these people, and they are given a special social security card that will give them the right to access the public hospitals, or other clinics within this regime, for free. This includes the medications that the doctor prescribes for the patient. Without this social security, you are not entitled to free health care.

The Ministry of Public Health and Social Assistance (SESPAS) has the mission to protect the health of all Dominicans. It owns and operates a large network of facilities and provides health care at no charge to about one-quarter of the population for ambulatory services. The Dominican Social Security Institute (IDSS) has one of the lowest levels of population coverage in Latin America. Only 5% of the Dominican population is enrolled, with a heavy concentration in large cities, whereas 12% of the population is covered by private insurance schemes (La Forgia et al. 2003). SESPAS services are well targeted to poor households, however there is still considerable use of SESPAS services by better-off populations.

Since 1996, the country has begun implementing measures to ensure transparency in every part of health sector financing, with a view to the equitable distribution of available resources, in this way guaranteeing that the entire population has access to services. In 2002, the per capita health expenditure was US\$60, while the public

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expenditure on health accounted for 8,9% of the national budget in 1999, increasing to 11,07% (1,73% of GDP) in 2000 and to 9,53% (1,67% of GDP) in 2001. However, government spending on health for 2004 declined to 5,52% of the national budget, representing only 0,98% of GDP. Hospitals receive an amount equivalent to 40% of the budget that SESPAS allocates to each of its hospital centers, which is allocated for curative services such as hospitalization, ambulatory care, drugs and administrative services. Preventive services account for 5,0% of the national health expenditure (Pan American Health Organization, 2007).

Total expenditure on health care is relatively high in the Dominican Republic, compared to the Latin American average. 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 spending is a burden for many poor Dominicans, which on average spend about eight percent of household income on health care (La Forgia et al. 2003).

La Forgia and others (2003) discuss the roots of the government failure in the Dominican Republic. There is a large share of users of government health services that are well-off, while there is another equally significant share of poor people paying out-of-pocket to access care from private providers. The SESPAS user fee system may tax the poor while subsidizing those who have contacts within the system. Another factor is an insufficient insurance market. The privately insured seeks treatment in government facilities for illnesses not covered by their policies while those covered by social insurance (IDSS) purchase additional private policies to secure access to private providers.

The government has succeeded in raising immunization coverage in the country, but most often public health programs are underfinanced and suffer from budgetary reductions. In 1995, only about 10% of the total government health spending was directed to preventive, promotional and public health services, including water supply. The public health depends to a large extent on donor-financed projects in order to fill the financial and managerial gap (La Forgia et al., 2003).

In 2004 the public sector had 1 219 health centers. That same year the country had 2,2 hospital beds per person. The services provided directly to individuals aim at covering the entire Dominican population, especially the most disadvantaged groups. 60% of the population seeking medical care and hospitalization goes to public health facilities. The demand for these services is primarily associated with people living in rural areas and low-income urban areas.

By the mid-1980s, over 165 private hospitals existed in the capital Santo Domingo. However, only 10 of these had more than 50 beds, and more than 80% possessed less than 20 beds. More private hospitals were to be established in the capital, and by the mid-1990s the amount had risen to over 200. Many of these new hospitals were diagnostic specialty clinics. As the government expanded the public infrastructure, it also subsidized the expansion of private medical infrastructure. With pressure from powerful and well-organized physician groups, the government ended up subsidizing the construction of high quality private hospitals that generally serve middle- and high-income Dominicans (La Forgia et al. 2003). The Government has failed to attend the areas that require interventions, such as the financing of public and merit goods, providing information to consumers and protecting their interests, and regulating providers, insurers and training institutions.

The health care system 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. Sometimes they make the right decisions, sometimes they do not. The health situation is worse in the rural areas due to the lack of fresh water and garbage everywhere.

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 Dominican Republic during the last couple of years, trying to improve the situation for the population. However, the problem 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 the regression analysis further in this thesis. Altogether in order to come to conclusions what determines the health in each studied country and what there is to be done regarding the health care systems.

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 special needs and demand different resources. The development process never ends; one discusses instead adjustments of the ideas to make them suitable for the current situations. The world is constantly changing, with climate change and new innovations; hence economies need resources and knowledge to adapt to these changes. The main factor in the development process is the human capital, which is why it is important to study which factors affect health in developing countries in order to know what there is to be focused on.

As countries develop economically, the structure of economic and social organizations changes. As the population becomes more urbanized, traditional social structures may become less important, and the distribution of income may change. While the nature of health problems may change, the effect on the overall health status of the population is difficult to ascertain (Jack, 1999). For example, a switch from agriculture to industrial production may reduce the incidence of some infectious diseases found mainly in rural areas, but instead increase the incidence of other diseases related to pollution, or communicable diseases. In the urban areas there is greater access to health care providers and other public goods, but in these urban settings the people have to deal with the health effects of overcrowding, and the chance of contracting infectious diseases such as tuberculosis.

There are significant differences between developed and developing countries regarding capacities and health care services provided, which is to some extent due to the higher disease burden and severe resource constraints in the developing countries. In year 2000, the developing countries around the world accounted for 93 percent of the global disease burden, but only eleven percent of all health care spending (Hjortsberg, 2002).

In this chapter we will look deeper into the importance of good health and how it 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

Health is the foundation for work productivity, education (the capacity to learn), and the capacity to grow physically and emotionally. Good health in the population is an important input for the poverty reduction, economic growth, and long-term economic development (Hjortsberg, 2003). The level of health affects of course the wellbeing, but it has also implications for the society's potential for development.

Over the last two centuries, there has been a general improvement in the health of people worldwide, mainly due to changes in nutrition, hygiene, and public health. Mortality rates from infectious diseases have generally been declining in industrialized countries over the last 200 years, and improved nutrition and resistance to disease as well as better hygiene and sanitation have been cited as the main factors for a reduction in infectious disease mortality rather than technological advances in medicine. 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 increased and a better health and a stronger physical constitution 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)

Condorcet and his work became a foundation for the progress on Western thought on 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.

Good health is a crucial component of overall well-being. Good health raises levels of human capital, which has a positive effect on individual productivity and on economic growth rates. There is an important spillover effect in that the resources used for preventive health treatments are freed for alternative uses in fighting other negative externalities such as poverty within the nation. For the developing countries, the investment in good health provides a means of escaping from the poverty trap. A healthy population is more productive and has an increased capacity for learning. This is especially important for the developing countries.

There is an observed positive relationship between health expenditures and economic growth (Muysken & van Zon, 2005). Health itself is an important determinant of economic growth. The health state of the population at the aggregate level determines the extent to which potential labor services embodied in the population can be used effectively, 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)

The improvement of public health is a crucial factor for creating a better economic situation for low-middle income countries. 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.

Grossman considered health as something individuals consume, and as capital individuals invest in. As consumption, 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. Hence, health is not only something being demanded, but also something being produced by individuals by reducing the rate of depreciation on the stock of health they possess at birth (Hermansson & Lundgren, 2008).

Economic, social, and political modernization, along with dependency theories, may influence infant mortality. Economic modernization theory stresses economic growth as the driving force behind development within countries. Economic growth is tied to increases in industrialization and urbanization and thereby standards of living and access to medical care, which may lead to decline in mortality. A social modernization perspective stresses the role of education as an international factor in the development process. More education may result in economic growth due to increased viability in the labor market. It has further been demonstrated that maternal education induces behavioral changes, which may have an impact on better feeding and child care practices and health services utilization, which in turn may have an impact on child health (Christian, 2008).

As opposed to the modernization theory, the dependency theory states that the capitalist nations create a global division of labor and trade dependence that destabilizes the economies of developing countries, leading to decreased economic growth and increased income inequality. When the economic growth is halting, the state ability to generate revenue decreases, which further reduces the ability to support funding of health and social service programs. Many developing countries are caught in a debt crisis, which in turn may directly affect government spending on programs to reduce for example infant mortality.

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. The factors determining the health behaviors can be seen in different contexts: physical, socio-economic, cultural, and political. Therefore, the utilization of a health care system, public or private, formal or non-formal, 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 the health care system itself. A main driver for the health seeking behavior is the organization of the health care system (Hatcher & Shaikh, 2004). This health seeking behavior is strongly related to the level of health, hence a major determinant of health.

Another important factor is the cost of utilization and the expected benefits of care for the individual. The individual may choose to visit a health facility, or choose not to act on the illness at all. The accessibility of health care is of great importance, where

both distance and means of transport count. There is of course also the socio-economic background, and the individual's ability to pay for health care.

We assume that an individual seeks maximum utility or satisfaction in life. If an individual is ill and knows that consulting the health care will cure him or her, the individual might not seek care because of the marginal cost of investing in health. The cost of seeking care is a significant determinant. When seeking care, the individual needs to take into account both out-of-pocket payments and time costs, which in turn depends on labor income and the cost of lost household production. Differences in health care utilization within populations in developing countries are often explained by the cost of access to health care (Hjortsberg, 2003). Time costs include time for reaching the facility, waiting time, and time for consultation. Monetary costs include fees for services, and traveling costs (Hjortsberg, 2002).

The level of labor income affects the decision to seek care, and hence the health status. We assume that the individual's income overall is positively related to health-care consumption. With a higher wealth and an increased budget, an individual being sick can increase his or her investments in health; hence wealth is expected to have a positive effect of health care utilization (Hjortsberg, 2003).

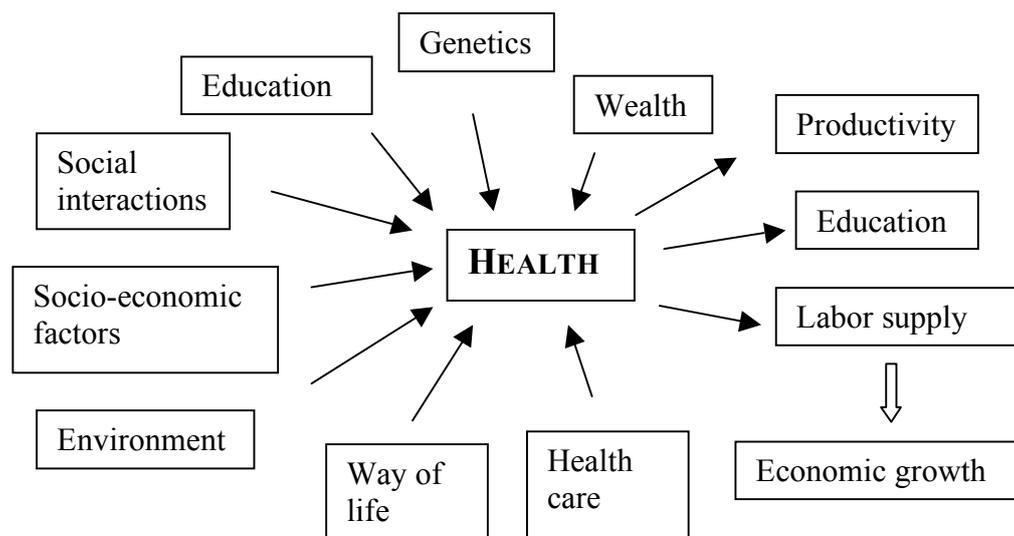


Figure 1: Health determinants

In the 1970s, evidence emerged that health services alone are not sufficient to improve health. There is a need to go one step further. In India, it was demonstrated that although piped water reduced child diarrhea, these benefits bypassed households where the mother was poorly educated, which implies that education (in particular maternal education) needs to be a part of the health system. Different sectors need to work together, which in turn states the need for a so-called “joined-up government” that communicate and coordinate the different activities in a complementary way (Harpham, 2008).

Health research used to focus on individual characteristics, but today there is increasing evidence that place, or community-level factors, have an independent effect on health. Physical features of where individuals live, services, social networks, crime, reputation of the place, etcetera are supposed to have an additional impact on individual health (Harpham, 2008).

With this introduction to what is assumed to determine health, we will now look more into three categories of determinants, namely poverty and the relation between income and health; social interactions; and the obvious health determinant, health care services.

4.2.1 Poverty

Poverty might be the main determinant of health. There are several methods for measuring poverty, such as income/consumption, unmet basic needs, and vulnerability. The poverty aspect is not only on an individual level, but also on a national level, referring to the economy as a whole and its resources. With the lack of resources, an individual is limited regarding demanding and consuming health care; hence the individual health might be negatively affected. Poor people cannot afford prevention before the disease appears and they cannot afford doctors and medication once they have been infected. When thinking about poverty in terms of vulnerability, one takes into consideration the amount of assets of a household and how the household is vulnerable to attacks on these capitals, in the form of sudden shocks like climate disaster, or high inflation rates eroding the capital.

Poverty is also strongly associated with malnutrition, which in turn makes people more vulnerable to infectious diseases. Poor people are more likely to go untreated and, therefore, to suffer from worse health.

Another important linkage to poverty is lack of education. Poor people tend to have less education, especially in developing countries. It has been documented that one of the key determinants of child mortality is the literacy of mothers. Very simple education, such as understanding the importance of hand washing, the use of soap, the need to drink clean water, can reduce the incidence of early age diseases, and mortality (Sala-i-Martin, 2005).

Many studies have shown a positive correlation between income and health status (Jack, 1999). With a higher level of GDP per capita, the population experiences a longer life expectancy. However, it is the *use* of income that is of importance in the determination of health status. Additional income for an individual would not increase his or her life expectancy. But still, one can expect that once the income increases, consumption of health-improving goods and services also increases.

Being poor is often also associated with poor-quality housing conditions. Evidence demonstrates that poor-quality housing conditions are associated with health problems, such as respiratory infections, asthma, poisoning, tuberculosis, infectious diseases, and injuries in children. Access to affordable housing can also affect health, because paying a large proportion of one's income for housing can mean increased stress, which can lead to poor mental health, and less money for other necessities, like food, thus leading to poor nutrition (Harpham, 2008).

There is a variety of mechanisms that explain how poverty and economic underdevelopment cause poor health. Further in this theoretical chapter the theory of

Wagstaff (2002) will be presented, with a focus on the relation between income and health, and how richer individuals are likely to end up with higher levels of health.

4.2.2 Social determinants

This is a broad concept, *social determinants*, and includes anything that man does, from labor, services, to religion and arts. Another important component within this group of determinants is the interactions between people, the so-called social connections. These interactions do not always result in positive social interactions. Negative social interactions, such as violence and feelings of insecurity are especially important since they might have a larger impact on individual health.

Consumption of some goods and services has potentially negative effects on health status. These effects include exposure to pollution, increased likelihood of motor vehicle accidents, overconsumption of alcohol, smoking, indulgence in unsafe sex, and consumption of unhealthy food. Some of these goods, such as alcohol, cigarettes, and high-fat foods, may only be affordable at certain levels of income. At the same time, some goods may become more expensive for an individual as income increases, because the opportunity cost associated with the consumption also increases. In the presence of potentially disastrous consequences, current and future income may be significant determinants of the individual behavior and consumption. There is a cultural aspect of this, that people have different opportunity cost of consuming the same good, depending on social status, work, etcetera (Jack, 1999).

4.2.3 Health care services

Health care services remain important in health planning. They might just be the most obvious input into good health. The services can be broken down into availability, access, appropriateness, and affordability. The physical accessibility to primary health care is crucial, but due to lack of developed infrastructure and transport system, many people in developing countries cannot access these health services. The availability of transport, and the physical distance to the health facility do influence the health seeking behavior, and hence the individual health (Hatcher & Shaikh, 2004).

When it comes to seeking care, the medical personnel are expected to have an information advantage, and knowing how to treat the disease. The patients rely on the physicians and nurses. The attitude of the health provider and the patient satisfaction with the treatment further play a role in the health seeking behavior. Another aspect of the health care services determining the individual health is the presence of hospitals. The health care providers make priority between diseases and individuals, which affect the individual's expectations of medical treatment. It has been found that low rates of health care utilization depend on poor quality of services and high non-financial costs for consuming care (Hjortsberg, 2003).

The variation of size, distribution, and composition within a country's health care workforce is of great concern. The number of health workers available in a country is a key indicator of that country's capacity to provide delivery and interventions. A properly and competent workforce is essential to any successful health care system. There is evidence of a significant positive correlation between the level of economic development in a country and its number of human resources for health (Howard et al., 2006). Countries with higher GDP per capita spend more on health care than countries with lower GDP, implying a larger health workforce in richer countries.

This is important to consider when finding solutions to problems in health care systems in developing countries.

The health care services are crucial especially for people residing in rural areas in developing countries. Developing countries face the problem of investing in the training of health care professionals. For many reasons, medical personnel and resources may not be available or accessible for such residents. For example, health workers might instead search for a job in an urban setting where the situation is better with more resources and opportunities. It is shown that the level of health service in rural or poor areas has decreased, leading to a lower quality and productivity of health services, closure of hospitals, increasing waiting times, reduced numbers of available beds for patients, etcetera (Howard et al., 2006).

Developing countries face the problem of guaranteeing full accessibility to health care services. This problem is associated with another problem, namely where to locate different types of facility to provide health care. Location decisions for health care is especially important because of the universal need; the fact that it must be provided throughout a nation. For developing countries, location decisions are generally taken locally by government officers or by local elected leaders, or by both. In the absence of any formal analysis of alternatives, the final decision may be made on political or other considerations, which might not result in optimal decisions (Rahman & Smith, 1999).

There is evidence that access to health care facilities is more difficult for the rural population in developing countries, which is why location-allocation modeling can play a significant role in making health care facilities more accessible to the people. It is a matter of making the most effective use of the available resources (Rahman & Smith, 1999).

In an ideal world, facilities could be established at the sites determined by an optimal decision. In practice there are constraints that prevent this optimum from being implemented, which leads to compromising in order to meet political and other restrictions. Location decisions give rise to inequalities regarding access to health care facilities, hence the level of 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 have different levels of inequalities in health. Wagstaff (2002) presented a theory trying to explain these international differences. With this theory, he captured the essential factors determining the link between health and income.

Firstly, Wagstaff assumes 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) has a price and is subject to diminishing returns in the production of health. Individuals have a fixed money income (Y) and they have to decide how much to spend on the production of health and how much to spend on general consumption (C).

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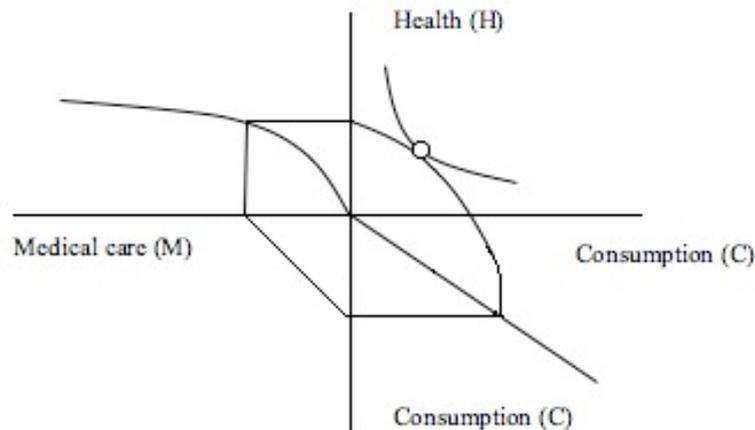


Figure 2: The demand-for-health decision of a typical individual

The figure above shows the situation of a typical individual. The northwest quadrant shows the relationship between health and medical care. The southwest quadrant shows the individual's budget constraint. The southeast quadrant is a device for tracing round consumption on the lower vertical axis to the right-hand horizontal in the northeast quadrant. By tracing round through the quadrants we get the frontier in the northeast quadrant that shows the various possible combinations of health and consumption that the individual can choose, given the budget constraint and the health production technology. The individual's preferences are shown by the indifference curves. The negative slope of the curves reflects the individual's willingness to trade off health against consumption. The preferred combination of health and consumption is where the frontier is tangential to the highest indifference curve the individual can reach.

In this framework, evidently, richer individuals are likely to end up with higher levels of health. The theory suggests some reasons why health inequalities might vary across countries. It is expected that countries with high levels of income inequality and with policies that reduce the price of medical care have low levels of health inequality. The theory also suggests that differences between countries in health inequalities may reflect differences in average incomes.

In developing countries, poverty is the main cause of inaccessibility to health care. Lack of resources prevents large populations from meeting their basic requirements in terms of biological needs, food, clothing and lodging. This enhances the vulnerability to illness and the spread of epidemics. It is inevitable that the availability of health resources is strictly correlated to the economic level of a country. With the International Development Goals there is a growing interest in and concern for socio-economic inequalities in health in the developing world. Organizations such as the World Bank and the World Health Organization have stated the improvement of the health outcomes of the world's poor as their primary objective. This increasing focus on the health of the world's poor reflects the idea that inequalities in health outcomes between rich and poor are unjust. This is not simply a question of poverty, but also of social justice and equity (Wagstaff, 2002).

Wagstaff (2002) has found that socio-economic inequalities in health exist in developing countries and are to the disadvantage of the poor. This goes for all indicators studied: rates of mortality, malnutrition, diarrhea and ARI (Acute Respiratory Infection) are higher in poorer groups. Furthermore, inequalities in under-five mortality are higher than inequalities in infant mortality. Latin America has the largest inequalities on all of these six indicators, whereas inequalities in child mortality and malnutrition are less pronounced in Sub-Saharan Africa.

Health inequalities also vary across countries. We expect countries with high levels of income inequality and that reduce the price of medical care to have low levels of health inequality. The theory presented by Wagstaff (2002) suggests that cross-country differences in health inequalities may reflect differences in average incomes, but it does not tell us whether it is the richer countries that will have higher health inequalities or the poorer countries. The theory tells us instead that if the income elasticity of health rises as income rise, health inequalities will be larger in richer countries.

Rising health inequalities in both developing and developed countries seem to be associated with rising incomes. One explanation for this is that technological change in the production of health goes hand-in-hand with economic growth, and these new technologies often seem to be assimilated by the richer instead of the poor. This does not mean that economic growth should be held back, since rising incomes implies 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 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 different health determinants have different significance and importance in Bolivia, Colombia and 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, where I have added a third explanatory variable. In the first model, I added share of rural population as explanatory variable, whereas in the second 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 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 5. 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 5: 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 five, 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 1 below.

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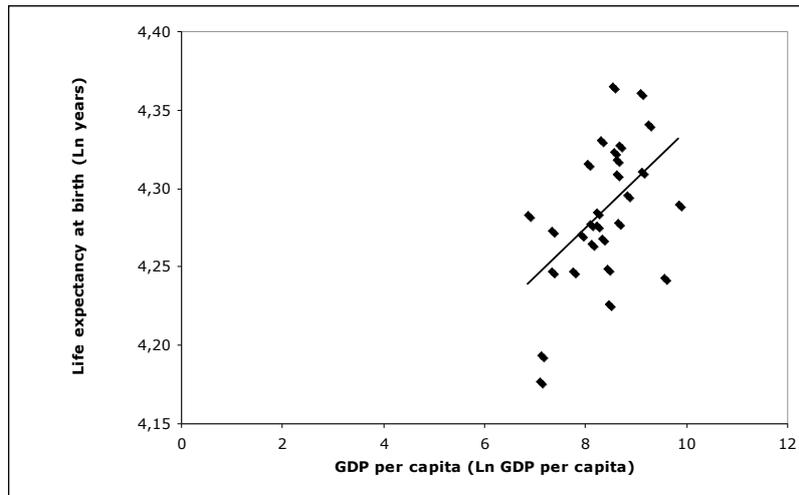


Diagram 1: Relation between Life expectancy and GDP per capita

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 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.

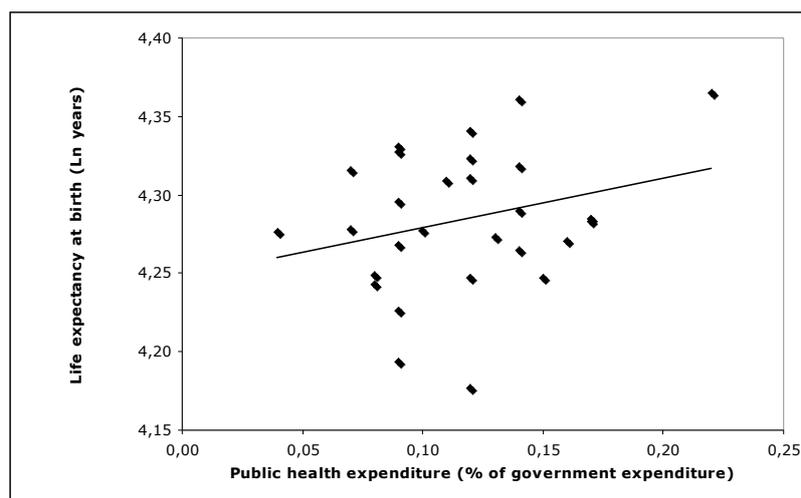


Diagram 2: Relation between Life expectancy and Public health expenditure

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 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 Dominican Republic, and the difference in life expectancy only 0,5 year). Even though Dominican Republic has almost the same level of GDP per capita as Colombia, there is the larger share of rural population in 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 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 that many explanatory variables. Health expenditure and GDP per capita are obvious explanatory variables for health. 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.

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.

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Table 6: 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.

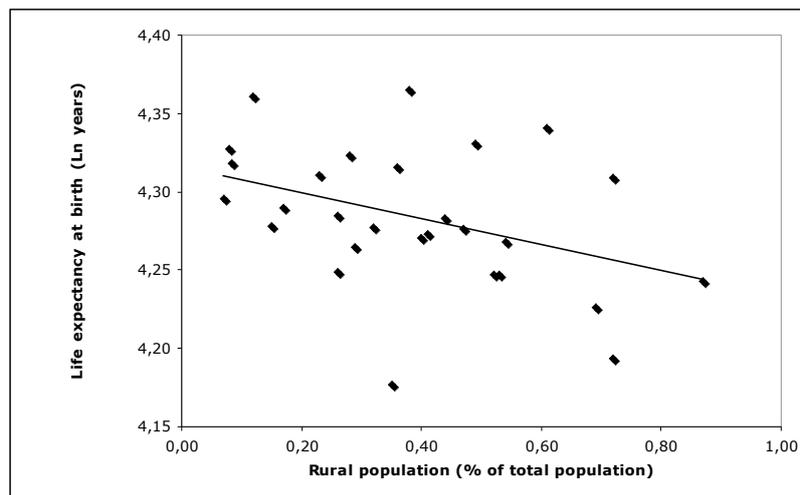


Diagram 3: Relation between Life expectancy and Rural population

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, 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 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 Dominican Republic (See appendix for data).

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 Dominican Republic, due to the higher GDP per capita and share of health expenditure in Colombia. As the theory of Wagstaff 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. I therefore performed another regression, by replacing rural population with primary school enrollment, and the coefficients are as stated below in table seven.

Table 7: 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

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.

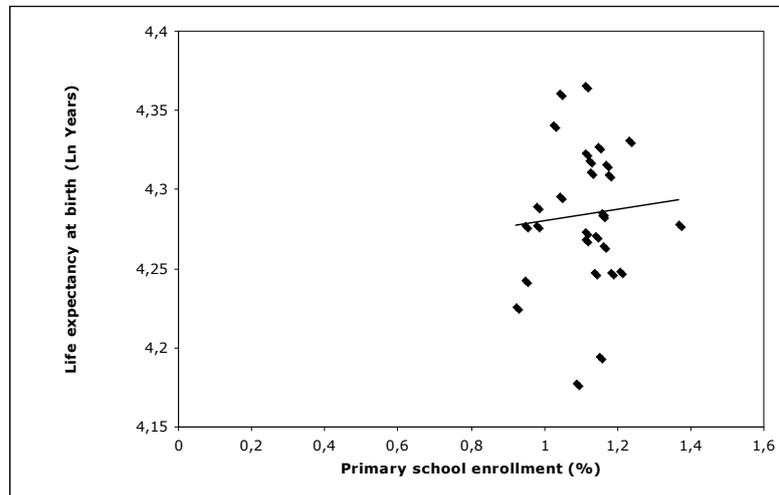


Diagram 4: Relation between Life expectancy and Primary school enrollment

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.³ This shows that in these 28 countries, almost all children are included in the primary education. In 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 Dominican Republic, with some children of the official school age not attending primary school. The higher

³ This measure of school enrollment does not have a natural maximum at a particular level, such as 100 percent. As we can see in this diagram, many countries have reported levels above 100 percent, in the range of 100 and 140 percent. These high levels signal high access and participation, but they are also indicators of 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).

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 illness. 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 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.

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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 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 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 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 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 Dominican Republic, but regarding the health care system, there is still a long way to

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go. With the recent reforms, the poor people are now entitled to health care through their insurance. As shown earlier, there is still a considerably large share of people living under poverty-conditions in Bolivia, Colombia and Dominican Republic, even 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.

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 individually regional characteristics. Bolivia and Dominican Republic face the problem of low rate of coverage especially among the rural population. In Bolivia there are many different ethnic groups living in the rural areas, not speaking the same language, which in turn puts pressure on the education and 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 does affect other people as well.

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 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.

As shown earlier in the thesis, economic growth in 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 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. 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.

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 system in Bolivia, Colombia and 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 Dominican Republic, which is associated with modern politics. However, there are still significant problems related to illegal drug trade and poverty. With 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.

An interesting result is the fact that Bolivia, Colombia and 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.

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.

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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