

Health in South America

2012 Edition

Health Situation, Policies and Systems Overview

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**Health Information and Analysis Project (HSD/HA)
Country Focus Support Office (CFS)**

**Pan American Health Organization
World Health Organization**

Washington DC, 2012

HEALTH IN SOUTH AMERICA, 2012

It is also published in Spanish:

Salud en Sudamérica, edición de 2012: panorama de la situación de salud y de las políticas y sistemas de salud

PAHO/WHO Headquarters Library - Cataloguing

Pan American Health Organization

Health in South America, 2012 Edition: Health Situation, Policies and Systems Overview

Washington DC: 2012

ISBN: 978-92-75-31714-3

1. Health indicators
2. Health profile
3. Health inequities
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Acronyms

ALADI	Latin American Integration Association (LAIA)
ALBA	Bolivarian Alliance for the Peoples of Our America
CAN	Andean Community of Nations
CARICOM	Caribbean Community
CEPALSTAT	Economic Commission Latin America and the Caribbean Statistical Database
ECLAC	Economic Commission Latin America and the Caribbean
FAO	Food and Agriculture Organization
GNI	Gross National Income
HDI	Human Development Index
LB	Life Births
LE	Life Expectancy at Birth
MERCOSUR	Common Market of the South
MDG	Millennium Development Goal
ACTO	Amazon Cooperation Treaty Organization
PAHO/WHO	Pan American Health Organization / World Health Organization
UNDP	United Nation Development Program
UNASUR	Unión Suramericana de Naciones
UNICEF	United Nation Children's Emergency Fund
WHO	World Health Organization

Presentation

The Pan American Health Organization is pleased to present the publication of "Health in South America, 2012 Edition" which provides an updated overview of the health situation and its trends, as well as the most relevant aspects of policy and health systems in the countries of South America. The document follows the editorial line and content of the publication "Health in the Americas 2012" and updates the "Health in South America 2008" document, which was prepared in 2009 by the Pan American Health Organization as input information to the Health Advisory Council of UNASUR and to the 2010-2015 Five-Year Plan of UNASUR Health.

The relevant sections of the health situation presented in the document include the political, economic and social development context; the most relevant social determinants of health; the environment and human security; the health conditions and its trends; policies, organization, resources and performance of health systems; knowledge, and information technology; international cooperation and its sub regional approach; a synthesis and possible future scenarios.

Further improvement of health in South America, as expected in different health agendas, could effectively be reached through a more human, equitable and global development, in the context of the United Nation Millennium Development Goals. In order to achieve this, it is necessary to follow the lines for action regarding policies and strengthening of health systems pointed out by the Agenda of Health in the Americas 2008-2017.

Among the main challenges, emphasis should be given to the search for better levels and equity in the health situation of the population, effective access to quality health systems and the approach to the social determinants of health and wellbeing. For this, it is essential to evaluate and solve those problems and challenges still remaining, maintain the achievements and continue to work with the unfinished agenda in health and health sector. This will guide policies, decisions and actions which could be undertaken towards a greater global development of societies and health conditions of the populations.

With this document, the Pan American Health Organization aims to contribute with useful information - as analytical and descriptive input - to national authorities, professionals, students, workers and networks of people and institutions involved in healthcare, research and teaching of health. In general, it is addressed to all those who, in one way or another, are related to the field of public health at a community-level, at national and sub-regional levels in the countries of South America.

Mirta Roses Periago
Director
Pan American Health Organization

Executive Summary

The issues presented in this health situation overview in South America include: the political, economic, demographic and social development context; the relevant social determinants of health; the environment and human security; health conditions and its trends; policies, social and health protection systems; knowledge, information and technology; international cooperation and the sub-regional approach to health agendas.

In terms of the interaction between health and development, the first four chapters refer to relevant aspects of health conditions and determinant factors in the countries.

Chapter 1 presents aspects of the geographical, historical and political context, which in the case of South America have common characteristics among countries which facilitates integration and the creation of sub-regional integration organizations.

The relevant social determinants of health, summarized in Chapter 2, constitute an important context of health conditions, where low quality conditions of life and socioeconomic status contribute to a low level of health and avoidable situations, specially in vulnerable populations.

Chapter 3 presents main environment-related health conditions, risks and tendencies. Natural disasters, violence, road safety, work and food safety are also relevant to human security.

Chapter 4 shows how health conditions have had gradual historical progress achieved in health matters in the last decades. However, social and health inequalities continue, implying the need for further response of the necessary organized and pertinent actions that should be made by the health sector.

Chapter 5 describes some relevant aspects of policies and health legislation, social protection, and the organization, structure and functioning of health systems. The current structure and performance of national health systems (public and private mix) have been influenced by development trends and health sector reforms.

In some cases, reforms have emphasized modernization and major efficiency of the health system, with higher participation of the private sector,

and in others, mechanisms have focused on the increase of social protection and coverage of health services, with emphasis on including the more vulnerable and disadvantaged groups of the population.

Chapter 6 emphasizes recent application of technology, information management and knowledge to health matter, with initiatives such as the health virtual libraries networked, distance virtual learning (including the virtual campus of public health), use of social networks, teleHealth strategies and advances in health research.

Chapter 7 focuses on international cooperation and the sub-regional approach from countries and sub-regional integration organizations.

There are simultaneous and diverse health agendas in the sub-region, with great similarity and overlapping in the main issues covered. UNASUR Health has a five-year plan 2010-2015, whose objectives and expected results on crucial issues affecting the health and health systems in South America are relatively specific and concrete. The fulfillment of the UNASUR health plan would be facilitated by its compatibility with national agendas and other sub-regional organizations and the extent that all the agendas could meet the similar proposed goals.

Chapter 8 presents a synthesis and perspectives of the health situation in South America.

The document uses secondary information from diverse national and international sources, and reports a description that is relatively simple and analytical. The editorial approach and contents of the document is in line with the Health in the Americas 2012 publication and updates previous report on Health in South America 2008.

The information is updated until 2010, with main focus on the period 2006-2010. With this document, the Pan American Health Organization aims to contribute with an informative input to the policies and decision making in which all the South American countries are continuously involved, seeking to preserve and improve the health of different groups of their total population.

1. INTRODUCTION AND GENERAL BACKGROUND

This chapter outlines some aspects of the general background of the health conditions in South America, such as: the political, social and economic context; relevant characteristics of the population; the relationship between development level reached and health; and the objectives and guidelines to advance in health and development according to the United Nations Millennium Development Goals and the Health Agenda of the Americas 2008-2017.

Introduction

Health conditions and health systems in South American countries have continued their systematic gradual progress, with key achievements such as reducing avoidable health situations and increasing life expectancy at birth.

However, this progress has occurred at a different levels and speed between the different countries and within them. The existing differences in health tend to be related to the unequal global development in countries, with the marked influence of the main relevant social determinants of health. Countries have also had different progress in health policy and social protection systems, and in the organization, structure and performance of health systems.

All those factors are closely interrelated and immersed in the political and economic and social context of each country and in its geographical area. Therefore, the health conditions of the population in South America are related to the economic and social development as well as the demographic transition, with lower fertility and reduction of avoidable premature deaths.

This has contributed to the gradual aging of the population and changes in the epidemiological profile, with the rise of chronic diseases and health problems that are gradually concentrated at older ages (1-5). Avoidable communicable diseases affected to prevention and control continues to be a public health problem (especially in countries and places with low socioeconomic development). On the other hand, diseases of chronic-degenerative type have increased in relation to changes in lifestyle and aging population. Non communicable chronic diseases and external causes have replaced communicable diseases as the main cause of death and major cause of burden of illness (3-5).

Health and social protection systems have had different degrees of development (in organization,

resources, coverage of interventions), with gradual reforms and adjustments to the different types of political and economic changes. Countries continue developing and updating legal frameworks, policies, national plans and strategies in health matters. However, this progress is not always reached according to planned, due to many political, economic, cultural and social factors that could impede or delay the fulfillment of the objectives and goals proposed (1,5).

Alongside the unfinished part of the health agenda, new challenges tend to appear concerning to emerging situations like the international financial crisis since 2008 and the emergence of new risks, diseases and important problems of public health (1,3,5).

Complementing the work of the health sector in countries, the international cooperation and the establishment of alliances and international agreements is also relevant, particularly from the sub-regional integration organization existing in South America. These agendas seek to contribute to a more effective action in health, with benefits to all participating countries (1,5).

Geographical, historical and political context

South America is an American sub-region which comprises 12 countries, in an area of 18.7 million km² (map 1). In addition, to the east of Suriname and north of Brazil is the French Guyana, a French overseas department. The countries of South America, especially the Spanish speaking and Brazil are characterized by sharing many similar features in their population, culture, history and socio-economic development. However, within each country, there is a great diversity regarding the different opportunities of human development and welfare between the diverse population groups, which has implications in the health situation of each group and their equity health level achieved.

Table 1.1. Participation of countries in South American inter-governmental organizations, 2010

Country	Population 2010 (millions)	Membership to subregional organization of integration					
		CAN	MERCOSUR	ACTO	ALADI	CARICOM	ALBA
Argentina	40.7	Associated	Full		Full		
Bolivia	10.0	Full	Associated	Full	Full		Full
Brazil	195.4	Associated	Full	Full	Full		
Chile	17.1	Associated	Associated		Full		
Colombia	46.3	Full	Associated	Full	Full		
Ecuador	13.8	Full	Associated	Full	Full		Full
Guyana	0.8			Full		Full	
Paraguay	6.5	Associated	Full		Full		
Peru	29.5	Full	Associated	Full	Full		
Suriname	0.5			Full		Full	
Uruguay	3.4	Associated	Full		Full		
Venezuela	29.0		Associated	Full	Full		Full
Population (millions)							
- Full Members		99.6	246.0	325.3	391.7	1.3	52.8
- Total	393.0	362.7	391.7	325.3	391.7	1.3	52.8

Note: (*) - All South American countries are Member States of UNASUR, OAS and PAHO/WHO.

Total population covered by integration agencies = Includes full and associate members MERCOSUR: Southern Common Market; (CAN): Andean Community of Nations; ACTO: Organization of the Amazon Cooperation Treaty; (ALADI), Latin American Integration Association, CARICOM: Caribbean Community; ALBA: Bolivarian Alliance for the Peoples of Our America. The Amazon territory covered by ACTO counts with two estimates: 33.5 and 11 million inhabitants.

Sources: PHAO (2011) Population (5) Member States: www.comunidadandina.org; www.mercosur.org; www.ACT.org; www.aladi.org; www.alba.org; www.unasur.org.



The fact that these countries share not only geographical proximity but similarities related to a common history and culture, facilitates the understanding of the most relevant and common public health problems in the sub region, and also the establishment of agreements for joint action through health agendas and technical cooperation agreements.

The emergence of sub regional integration blocks has been encouraged by globalization and opening markets abroad. Although they could have other original purposes (such as commercial, economic or political), most of them tend to incorporate health and social agendas with relatively similar sanitary action and priorities. (Annex 1) (1,3,5,6)

The Andean Community of Nations was established in 1969, its member states are Bolivia, Colombia, Ecuador and Peru and the associated are Argentina, Brazil, Chile, Paraguay and Uruguay (7). MERCOSUR was created in 1991 as a trade agreement that evolved into a common market of economic, political and social integration, and public

policy issues such as health, education, environment, employment, democracy and human rights (7).

Since 2009, the 12 South American countries have established the Union of South American Nations (UNASUR). The Amazon Cooperation Treaty Organization (OTCA or ACTO) includes 8 countries. There is also the Latin American Integration Association (LAIA or ALADI). Guyana and Suriname are part of the Caribbean Community (CARICOM). Venezuela, Bolivia and Ecuador participate of the Bolivarian Alliance for the Peoples of Our America

(ALBA) (7-13). Table 1.1 indicates the participation of each South American country in the mentioned bodies, with estimated population coverage. UNASUR represents a global integration since includes countries that are members of existing sub regional organizations such as ALBA, CAN, MERCOSUR and CARICOM. The UNASUR main objective is to build up an space of unity and integration in South American Health in a participative and consensual way (13,14).

Table 1.2. Size and population growth in South American countries, 1990-2020

Country	Population	Increase	Population	Increase	Population	Increase	Population	Increase
	1990 (millions)	1990-2000 %	2000 (millions)	2000-2010 %	2010 (millions)	2010-2020 %	2020 (millions)	1990-2020 %
Argentina	32.6	13.1	36.9	10.2	40.7	7.8	43.9	34.4
Bolivia	6.7	24.8	8.3	20.4	10.0	15.9	11.6	74.1
Brazil	149.7	16.6	174.4	12.0	195.4	7.7	210.4	40.6
Chile	13.2	16.9	15.4	10.9	17.1	8.4	18.5	40.6
Colombia	33.2	19.8	39.8	16.4	46.3	12.7	52.2	57.2
Ecuador	10.3	20.3	12.3	11.8	13.8	18.5	16.4	59.3
Guyana	0.7	1.1	0.7	9.1	0.8	-3.4	0.8	6.6
Paraguay	4.2	25.9	5.3	21.6	6.5	16.9	7.6	79.1
Peru	21.7	19.3	25.9	14.1	29.5	9.9	32.4	49.6
Suriname	0.4	14.7	0.5	7.1	0.5	13.8	0.6	39.8
Uruguay	3.1	6.8	3.3	2.4	3.4	2.8	3.5	12.4
Venezuela	19.7	23.7	24.3	19.1	29.0	15.0	33.3	69.4
South America	295.5	17.5	347.3	13.2	393.0	9.7	431.2	45.9

Source: United Nations (2012) Department of Economic and Social Affairs, Population Division (www.unstats.org Database), Access February 2012.

Characteristics of the population

Population growth in South American countries has had different speeds and different changes in its age structure, highlighting a general trend toward aging, especially in countries with higher socio-economic development. Demographic change has influenced the epidemiological transition, with gradual increase in the incidence and prevalence of those problems and health needs increased with age (1, 2, 3).

In 2010, South America had 393 million inhabitants in countries of very different size of population: Brazil had almost 200 million inhabitants while Suriname was less than half a million. In 1990, the population structure in South America, by gender and age, showed a relatively regular pyramidal shape, for a relatively young population and an expansive

demographic trend (progressive increasing of children).

In 2010, the population had increased by 33%, the pyramidal structure shifted to older than 25 years old groups (higher aging), highlighting the increase of population over 80 years old, while in the five-year groups under 25 years old, there was a greater similarity of volume (even with a tendency to decrease in group size under 5 years old), related to relatively low fertility and low specific mortality rate in groups under 80 years old (figure 1.1) (16). Since 1990, the total population has increased one third, but the population under 15 years old increased by only 1.2%, whilst the group over 65 years old increased by 87.8% (Table 1.3) (16).

In 2010, South America amounted to 112.1 million children under 15 years (28.9%), 251.2 million people aged 15 to 64 years old (64.7%) and 24.7 million

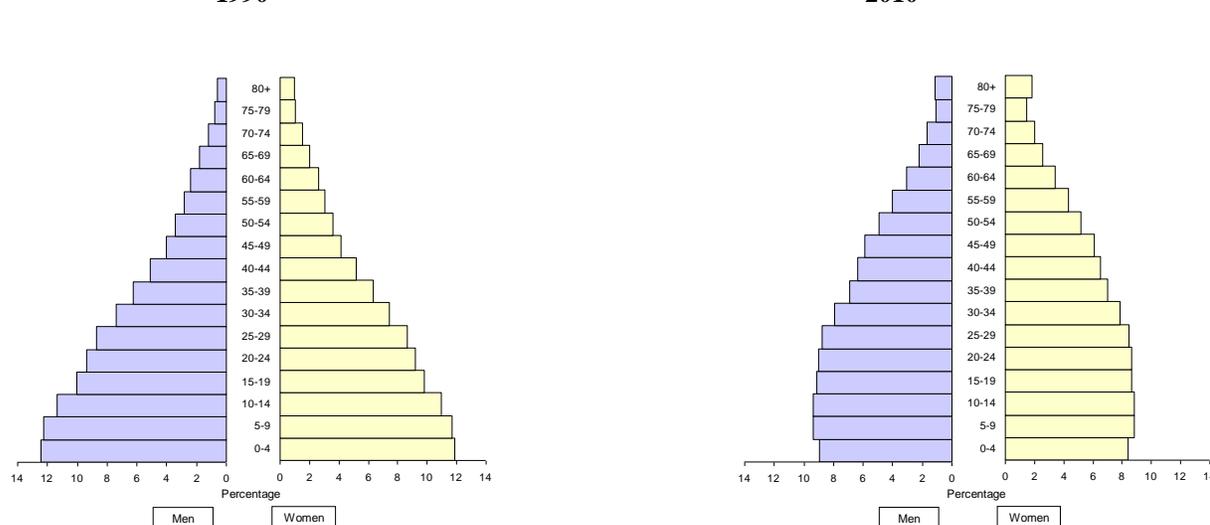
people 65 years and over (6.4%). The notorious increase in elderly has implications for the epidemiological profile, the increasing burden of illness related to chronic disease and aging, and the progressive requirement of increasing healing, rehabilitation and palliative types of health care.

Table 1.3. Variation in large groups of age in South American population, between 1990 and 2010.

Age (years)	Population 1990		Population 2010		Increase %
	Millions	%	Millions	%	
0 - 14	104.3	35.3	105.5	26.8	1.2
15 - 64	176.4	59.7	259.8	66.1	47.2
65 +	14.7	5.0	27.7	7.0	87.8
Total	295.4	100.0	393.0	100.0	33.0

Source: United Nations (2012) Department of Economic and Social Affairs, Population Division.

Figure 1.1. Population structure by age and gender, in South America, 1990 and 2010



Source: United Nations (2012) Department of Economic and Social Affairs, Population Division (Database)

The population structure by age is related to socio-economic development, since countries with the highest level, such as Argentina and Uruguay, have a proportion of adults over 65 years of almost 15%, in countries with a lower level, such as Bolivia and Paraguay, the elderly population represents only a 5%. At the same time, in Bolivia and Paraguay more than a third of the population is under 15 years, while that group, in Argentina and Uruguay only reaches a quarter of the population (Figure 1.2) (16).

Furthermore the natural growth, the size and demographic structure have been influenced by rural-urban migration and international migrations, which have increased in South America, favored by the process of globalization and the creation of integration blocks, constituting a complex issue, since flows are constantly changing. In general, labor migration patterns predominate linked to the profound economic asymmetries among these countries.

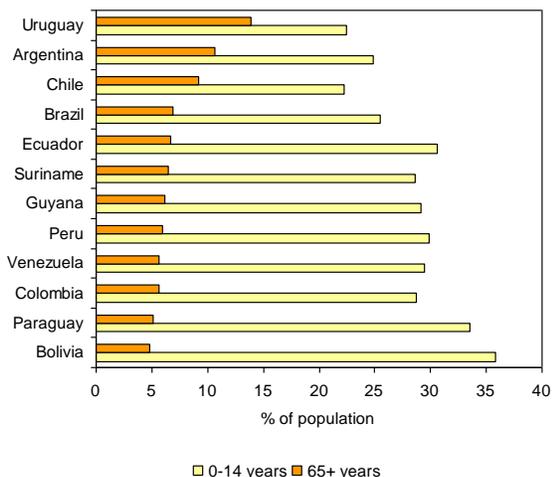
The displacement of populations due to political violence and internal armed conflicts, like in Colombia, is another important cause of migration. Primary or secondary economic reasons can also motivate migrations. The UN High Commissioner for Refugees (UNHCR) estimates that there are between 2 and 3.3 million of people internally displaced in the countries of the Andean Community of Nations, many of them looking for refuge in other countries of the sub region (3,5).

Development and Health

The economic and social development of the countries of South America in general has been accompanied by improvements in key social determinants related to health (as presented in Chapter 2), and has occurred under a wide range of political-economic predominant approaches, ranging from the market model with

neoliberal emphasis adopted by Chile up to the socialist model developed in Venezuela.

Figure 1.2. Proportion of children under 15 years and 65 years and over, in South America, 2010

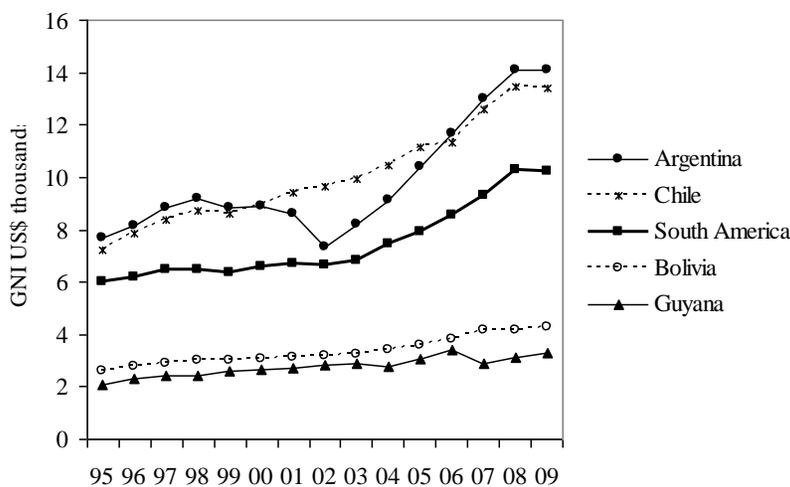


Source: United Nations (2012) Department of Economic and Social Affairs, Population Division (www.unstats.org Database).

Economic growth and social development, with greater economic and population exchange between South American countries (related to market opening and globalization) has made progress in all countries, but maintaining economic and social inequalities within each country, in detriment of those population groups which are poorer and excluded, with less social protection.

South America has an economic development level considered medium, expressed by a Gross National Income (GNI ppp value in thousands U.S. \$) which in 2009 amounted to U.S. \$ 10,214 per capita. In the period between 1995 and 2009, GNI per capita increased slowly but steadily in all South American countries (even in countries with lower GNI) (Figure 1.3) (17). However, the income gap among countries - and within them - has tended to increase, especially for the large increase in GNI occurred in countries with higher economic growth, as the case of Argentina, that in 2009 had the GNI U.S. \$ 14,090 per capita, the highest in South America, while Guyana achieved only U.S. \$ 3,270 per capita (17).

Figure 1.3. Evolution of Gross National Income (GNI) per capita (ppp adjusted, (USD thousands) in South America and in countries with extreme levels, 1995-2009



Source: PHAO (2012) Table Generator PHAO to GNI, 1995-2009 (Access June 4, 2012).

Between 2006 and 2010, the general trend to economic growth continued in the countries of South America. Unemployment and poverty rate decreased (although the absolute number of poor and indigents increased), and inflation remained relatively under

control. The countries continued being vulnerable to the economic crisis, as occurred worldwide in 2008. The economic vulnerability of countries is a factor to be considered in health determinants, especially those most closely related to social inequalities and poverty.

Economic vulnerability is related to difficult governance (many States have tended to decrease in size and function); slow decentralization; significant proportion of low-quality, informal and unstable employment; and persistence of social inequality. This, in turn, represents a greater risk in health conditions and less social protection, particularly in the most vulnerable groups (18-21).

For its magnitude and characteristics, the international financial crisis that occurred in 2008 and 2009, as well as the risks of influence from the European economic crisis, may potentially affect the economic development, social development and environmental sustainability of every country in South America. In 2008 and 2009, economies in South

America did not suffer the feared economic growth deceleration, although there was a smaller increase, after five years of steady expansion (18-21).

Among possible scenarios to consider, in case that a new international crisis could occur, is the eventual negative impact on income distribution (more critical in low-income households), rising unemployment and informal employment, and reduction of the medium income. Inflation increase could in turn, affect food prices and along with poverty, have a negative impact on the level of nutrition, with highest impact on the child population. To face this situation and avoid a negative social and health impact, countries are taking various measures, such as production market support and various subsidies (18, 19).

Table 1.4. Selected development indicators in South American Countries, 2010 *

Country	Population 2010 (millions)	Gros National Income (ppp) 2009 US\$	Poverty 2010 %	Indigence 2010 %	Literacy 2009 %	School Education years	Life Expect. at birth (years) 2010	Human Development Index 2010
Argentina	40.4	14,090	8.6	2.8	97.7	9.3	75.7	0.775
Bolivia	9.9	4,250	54.0	31.2	90.7	9.2	66.3	0.643
Brazil	194.9	10,160	24.9	7.0	90.0	7.2	72.9	0.699
Chile	17.1	13,420	11.5	3.6	98.6	9.7	78.8	0.783
Colombia	46.3	8,600	44.3	14.8	93.2	7.3	73.4	0.689
Ecuador	14.5	8,100	39.2	16.4	84.2	7.6	75.4	0.695
Guyana	0.8	3,270	...	...	...	8.0	67.9	0.611
Paraguay	6.5	4,430	54.8	30.7	94.6	7.7	72.3	0.640
Peru	29.1	8,120	31.3	9.8	89.6	8.7	73.7	0.723
Suriname	0.5	6,730	...	...	94.6	7.2	69.4	0.646
Uruguay	3.4	9,010	8.6	1.4	98.3	8.5	76.7	0.765
Venezuela	29.0	12,220	27.8	10.7	95.2	7.6	74.2	0.696
South America	392.3	10,214	27.6	9.2	93.5	7.9	73.6	0.709

Note: * or latest available year

Source: Health Situation in the Americas: Basic Indicators 2010. PAHO. Population, literacy, UNDP 2010: INB, Schooling, LEB, HDI
ECLAC: Poverty and indigence, 2010 (or latest available year) (Argentina, urban poverty).

As a synthesis of the economic and social development, Table 1.4 presents some basic socioeconomic indicators, including two that incorporate a component of health: life expectancy at birth and the Human Development Index (HDI). Systematically, Chile and Argentina recorded higher indicators of socioeconomic status and health, while Bolivia, Paraguay and Guyana show the lower level of health and development indicators, with less life expectancy at birth (Table 1.5) (21-24).

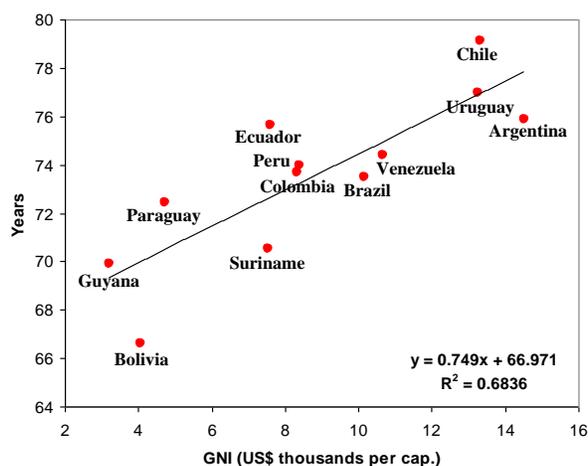
Life expectancy at birth (LE) - as a basic approach to indicate health level - has improved in all countries

since 1980. Life expectancy in South America increased eight years since the period 1980-1985 to the period 2005-2010 (Table 1.5). However, the LE improvement in countries with a higher economic standard remains systematically higher than in those countries with less economic level. For the period 2005-2010, the life expectancy for Guyana was estimated in 66.8 years and 65.5 years in Bolivia, which has a LE almost 13 years less than the LE achieved in Chile: 78.5 years (20).

Table 1.5. Evolution of life expectancy at birth in South American countries, 1980-2010

Country	Period					
	1980-1985	1985-1990	1990-1995	1995-2000	2000-2005	2005-2010
Argentina	70.2	71.0	72.1	73.2	74.3	75.2
Bolivia	53.9	57.3	60.0	62.0	63.8	65.5
Brazil	63.6	65.5	67.5	69.4	71.0	72.4
Chile	70.7	72.7	74.3	75.7	77.7	78.5
Colombia	66.8	68.0	68.7	70.3	71.6	72.8
Ecuador	64.5	67.5	70.0	72.3	74.2	75.0
Paraguay	67.1	67.6	68.5	69.4	70.8	71.8
Peru	61.6	64.4	66.7	68.4	69.9	71.4
Uruguay	71.0	72.1	73.0	74.1	75.2	76.2
Venezuela	68.8	70.5	71.5	72.2	72.8	73.8
South America	65.1	66.9	68.6	70.3	71.7	73.0

Source: ECLAC (2008) Socioeconomic Panorama of Latin America 2008.

Figure 1.4 Relationship between GNI per capita (ppp) and LE in South American countries, 2009

Source: PAHO, 2012, Table Generator of basic health indicators (BHI).

There is a systematic relationship between GNI per capita and life expectancy at birth in South American countries (Figure 1.5) (17). Chile, Uruguay, Argentina and Venezuela have the higher economic development (GNI per capita over US\$ 11,000) and major life expectancy, while Guyana and Bolivia - which have only a third or less than the GNI of the superior group (a bit more than US\$ 4 million) – have a life expectancy less than 68 years of age. However, for countries with similar levels of economic development there are differences in life expectancy, which probably reflects a heterogeneous influence of multiple social determinants and diverse coverage and effectiveness of health systems. Those countries with

more equal income distribution have reached life expectancy levels that are comparable, and sometimes better, than those with higher global income but more unequally distributed income (17).

Millennium Development Goals and Health Agenda for the Americas 2008-2017

The Millennium Development Goals of the United Nations and the Health Agenda for the Americas 2008 - 2017 are international commitments, agreed in order to contribute to drive progress in health and development in priority areas. Therefore, they are useful for monitoring health conditions and development in South America and determine the main challenges and priority action perspectives that countries and integration blocks of South America will face in the future (3,15)

The Global Agenda concerning the Millennium Development Goals (MDGs) was endorsed by the Heads of State in 2000 with the Millennium Declaration. It focuses on overcoming underdevelopment and includes Goals that are directly related to health (child mortality, maternal mortality, HIV and AIDS, malaria, tuberculosis and other infectious diseases). The rest of the Goals are, in general, closely related to health, especially those relating to social determinants of high relevance, such as poverty, education and nutrition (15). Each one of them has a series of more specific aims and indicators to monitor their fulfillment in 2015. In relation to MDG 4 (Reduce child mortality), it is expected that in 2015 it will be reduced to one third compared to the level of 1990, the mortality of children under 5 years and less than one year old, and universal coverage of measles vaccine will be achieved. In 1990, the mortality of

children under 5 years was 51 deaths per 1,000 live births, and the infant was 41 deaths per 1,000 live births. In 2015, it is expected a level of 17 and 14 deaths per 1,000 live births, respectively (15,17,24).

In relation to the fulfillment of MDG 5 (improve maternal health), it is also expected that by 2015 the existing level of maternal mortality existing in 1990 will be reduced in three quarters, i.e. a reduction from 188 to 47 deaths per 100,000 live births. The slow trend in reduction of maternal mortality, with 75 deaths per 100,000 live births in 2008, makes it unlikely that the expected target is met by 2015. So, WHO in conjunction with other agencies are supporting plans for a faster reduction of maternal mortality. In MDG 5 is also expected to achieve universal coverage of childbirth with skilled attendance, reducing the proportion of teenage pregnancies, and increasing the prevalence of contraception. It is also important to consider the challenge pointed out by national and international efforts to fight against HIV / AIDS, malaria and other diseases, which represent a major public health problem in South America (15, 17, 24).

The United Nations has set 2015 as the date for achieving the MDGs. The projections carried out from the observed trend until 2010, show that many of the health indicators in South America will not achieve the goal, either because in some cases there is a great challenge to be solved, with big difference between the initial level and the one pointed out as a target (which generally occurs in countries with less development and less ability to improve their health conditions), or because there are countries that already have a relatively good level of a particular indicator, and the efforts to pursue with their improvement require more complex and difficult mechanisms to be solved in the short and medium term.

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The Health Agenda for the Americas 2008 - 2017, is consistent with the Millennium Development Goals and with the WHO Eleventh General Program of Work, with a vision to achieve a healthier and equitable region, in which each person, family and community have the opportunity to reach their full potential. Furthermore, it is an important initiative that could serve as a framework for the harmonization and coordination of existing agendas in South America, at national and international level (2,3,25).

The 2008 – 2017 America's Health Agenda, which was approved in 2007 by all the health ministers of the region, defines the following areas of action for the region:

- Strengthening the national health authority
- Addressing health determinants
- Use of knowledge, science and technology
- Strengthening solidarity and sanitary security
- Reduce health inequities among countries and within them
- Reduce risks and diseases burden
- Increase social protection and the access to quality health services
- Strengthen the management and capacity of health workers (3)

The America's Health Agenda faces an important challenge, because the objectives and indexes needed require structural changes which commit the State itself (like strengthening the national health authority), the socioeconomic development (as tackling the social determinants and reduce inequities in health, especially at sub-national level), the political and economic framework (as strengthening social protection, sanitary security and health services access) and to strength health systems, including the essential human resource.

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2. RELEVANT SOCIAL DETERMINANTS OF HEALTH

The level of factors considered social determinants on health in diverse countries of South America, is synthesized in this chapter. They include: economic income, employment, poverty, education, food and nutrition, living conditions, water supply and sanitation, rural areas, social vulnerability and social protection. These factors are generally taken into account by the health sector and national health agendas when planning intra and inter-sector action.

Addressing social determinants

The relevant social determinants of health include economic income, employment, poverty, education, living conditions, water and basic sanitation, rural areas and some ethnic, cultural and migration conditions. All these factors are generally interrelated and concentrated among groups of population deprived from healthy living conditions, vulnerable and excluded, with less opportunity of access to health services. These types of determinants are frequently considered in the plans, agendas and strategies displayed by the countries of the region, seeking to extend and strengthen social protection and health-related policies to support the neediest groups and avoid their eventual negative impact in health.

However, the solution to many of these factors tends to be out of the reach of the health sector, and even beyond the reach of State level, especially in

those countries with limited level of economic development and limited capacity of the that State and health sector to effectively respond to those needs, in the short or medium term (1,2).

Therefore addressing the determinants tends to be considered mainly as social protection and reducing social inequities and the health sector tends to be involved across sectors.

Economic income

The different groups of the population participate with different proportion in the total economic income or expenditure, which becomes evident when comparing the received income distribution among groups according to income quintile. People from the lower income quintile in South America only receive 3.3% from the total, while those from the quintile of higher income receive 58.4% from the total (Table 2.1) (3).

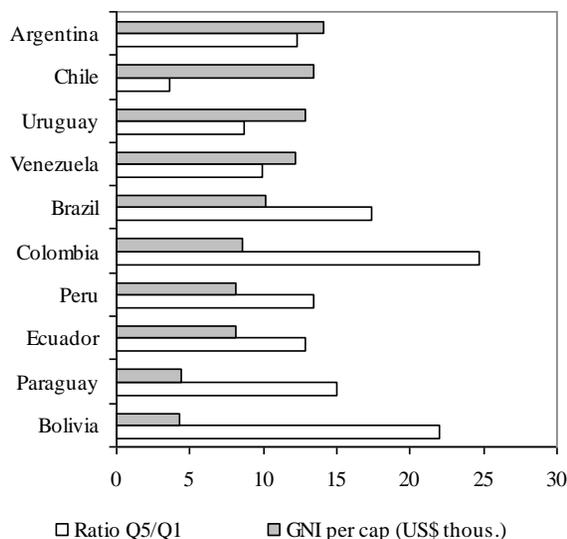
Table 2.1. People income distribution according to quintiles, in South American countries, 2010

Country	Income distribution by Quintile				
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Argentina	3.8	8.0	12.6	20.2	55.4
Bolivia	2.2	6.4	11.6	20.0	59.8
Brazil	2.8	6.6	11.0	18.0	61.8
Chile	4.2	7.8	11.6	18.4	58.0
Colombia	2.6	6.4	10.8	18.4	62.0
Ecuador	4.2	8.4	12.8	19.8	54.8
Paraguay	3.0	7.6	12.6	19.8	57.2
Peru	4.4	9.0	14.2	21.6	50.6
Uruguay	5.6	9.8	14.4	21.8	48.4
Venezuela	5.4	10.8	15.8	23.0	45.2
South America	3.3	7.4	11.9	19.1	58.4

Note: *2010 or last available year. Argentina (urban areas information)

Source: ECLAC, 2012, ECLACSTAT Data Base Access in June 4, 2012

Figure 2.1 Gross National Income per capita (GNI) ratio between the wealthier income quintile (Q5) and the poorest quintile (Q1) in South American countries, 2006 – 2009.



Note: Rate of Income between the wealthier quintile (Q5) in relation to the poorest quintile (Q1) in countries classified by GDP per capita (U.S. \$ thousands 2008 (ppp) value). No data for Guyana and Suriname.

Source: PAHO (2011) IBS 2011 and ratio Q5/Q1 2006-2009

Inequity of income among the different quintiles of population tends to be even bigger in countries with low economic development (Gross National Income per capita ppp), such as the case of Paraguay and Bolivia (fig. 2.1) (4).

Table 2.2 Unemployment rate in South American countries 1990, 2000 and 2010

Countries	Unemployment rate (%)		
	1990	2000	2010
Argentina	7.4	15.1	7.7
Bolivia	7.3	7.5	6.5
Brazil	4.3	7.1	6.7
Chile	7.8	9.7	8.2
Colombia	10.5	17.3	12.4
Ecuador	6.1	9.0	7.6
Paraguay	6.6	10.0	7.8
Peru	8.3	8.5	7.9
Suriname	15.8	14.0	12.1
Uruguay	8.5	13.6	7.1
Venezuela	10.4	13.9	8.6
South America	6.4	10.0	7.8

Note: Annual average rate. No data for Guyana.

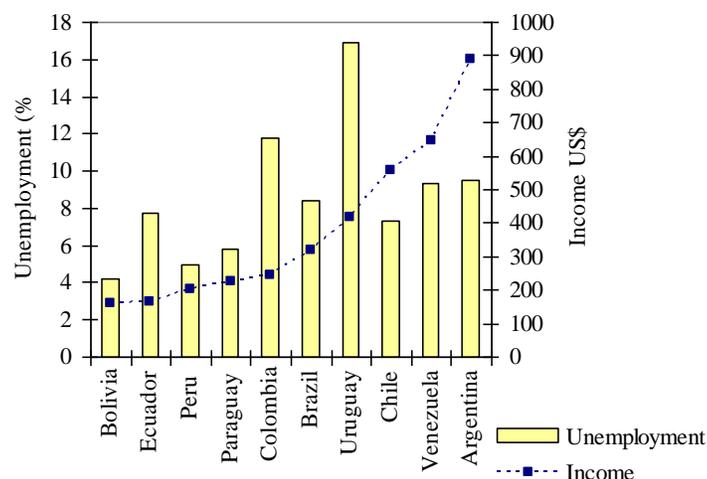
Source: ECLAC (2011) Latin America and the Caribbean (LAC) 2011 Statistical Year Report.

In spite of that in the last years there has been some advance towards to a better income distribution, inequities of income continue being significant. There are countries like Chile and Uruguay that have a great Basic Needs Index (BNI) and less income inequity (lower ratio between extreme quintiles of income) and countries with minor BNI, like Paraguay and Bolivia, with a higher income inequality).

Employment

In 2010, in South American countries the annual unemployment average rate was less than 9%, and only Colombia and Suriname registered a higher level (12%). Between 1990 and 2000, unemployment remained less than two digits, even though unemployment in 2000 was higher than in 1990, in some cases related to economic crisis in countries, such as Argentina (Table 2.2) (5). The income per employed worker and unemployment tends to progressively increase in the countries of lower income, with the exception of Uruguay and Colombia, whose unemployment rate is higher than in the rest of the countries, including those of lower income (fig. 2.2) (6).

Figure 2.2 Annual average income per employed worker and unemployment rate in countries of South America, 2006 or last available year.



Note: No available data for Guyana and Suriname. Income: (Year 2000 US\$).

Source: ECLAC (2008), 2008 Social Panorama in Latin America. ECLAC: Santiago, Chile.

Table 2.3. Income and wages (US\$) of men and women employed in different productivity sectors in South American countries, 2006 or last available year.

Country	Year	Total			Low productivity			High and middle productivity		
		Total	Men	Women	Total	Men	Women	Total	Men	Women
Argentina	2006	890	1055	665	783	1010	506	963	1084	787
Bolivia	2004	157	192	113	110	138	81	266	286	228
Brazil	2006	318	374	245	189	244	134	411	451	347
Chile	2006	555	639	428	437	586	287	607	657	516
Colombia	2005	243	276	201	227	290	159	260	262	258
Ecuador	2006	162	185	126	117	142	86	220	234	194
Paraguay	2005	224	275	162	149	188	108	338	385	265
Peru	2003	202	253	138	127	156	98	333	384	237
Uruguay	2005	417	477	341	240	294	184	471	542	592
Venezuela	2006	646	704	553	568	658	412	728	754	688
South America		384	447	298	# 360	197	465	398	754	688

Note: US\$ corresponding to 2000.

Source: ECLAC (2008), 2008 Social Panorama in Latin America. ECLAC: Santiago, Chile.

In 2006, South American countries had a medium income for each employed worker which was very different, from almost US\$ 900 in Argentina to only a little more than US\$ 150 in Bolivia (Table 2.3) (6). In general, there is a correlation between incomes per worker, which is higher as the countries have more economic development. Men receive systematically a higher income than women (US\$ 447 and US\$ 298, respectively), and the workers from high and medium productivity sectors receive more income than those of low productivity (US\$ 398 and US\$ 360 respectively). In some countries there is a great inequity of income among the productive sectors,

especially in countries with less economic growth: in Peru, the employees of medium and high productivity receive an income 2.6 times higher than those from the low productivity sector, reaching 2.4 times in Bolivia and 2.3 times in Paraguay, while in Brazil, a country that has a higher global economic development, it is 2.2 times higher.

In countries, the economic income systematically varies according to labor insertion, being higher in the employers than in the employees, in the public sector than in the private one, in professionals and technicians in relation to those who do not have that condition, while the minor economic income is

registered by those who work in the domestic service (Table 2.4) (7). Incomes are systematically higher in

urban areas than in the rural ones, and higher in men than in women.

Table 2.4. Mean income of the population employed economically active, according to labor insertion, in South American countries, 2010* (in multiples of the respective lines of poverty per capita).

Country	Total	Employers	Salaried workers					
			Total	Public Sector	Private sector			Domestic Employment
					Total	Professionals & technicians		
						Yes	No	
Argentina	10.0	27.9	8.4	11.0	7.7	12.3	7.3	2.8
Bolivia	3.4	7.1	3.8	5.0	3.5	6.4	2.9	1.9
Brazil	4.9	14.7	4.6	7.6	3.9	8.6	3.3	1.8
Chile	8.6	37.4	7.1	10.3	6.5	13.2	5.1	3.0
Colombia	3.9	9.0	4.2	8.4	3.7	9.1	3.2	1.9
Ecuador	4.0	13.1	4.1	6.8	3.5	6.0	3.2	2.4
Paraguay	3.1	9.7	2.9	4.0	2.6	4.5	2.6	1.6
Perú	3.3	6.5	3.8	4.9	3.6	6.6	3.1	2.2
Uruguay	4.6	11.0	4.6	6.4	4.2	8.3	3.8	2.1
Venezuela	3.8	7.1	3.8	4.7	3.3	4.5	3.2	1.9
South America	5.1	14.8	4.9	7.6	4.3	8.5	3.7	2.0

Note: *or last available year. No data for Suriname and Guyana.

South America: Balanced average according to countries' population.

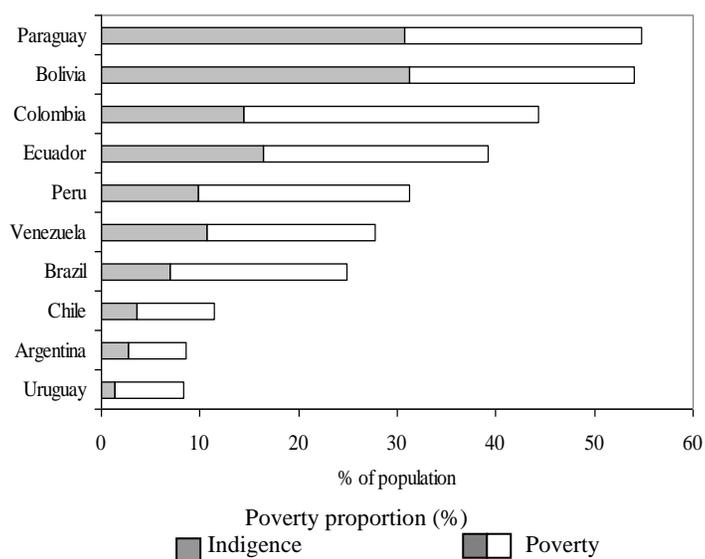
Source: ECLAC (2011), 2011 Social Panorama of Latin America and the Caribbean.

Poverty

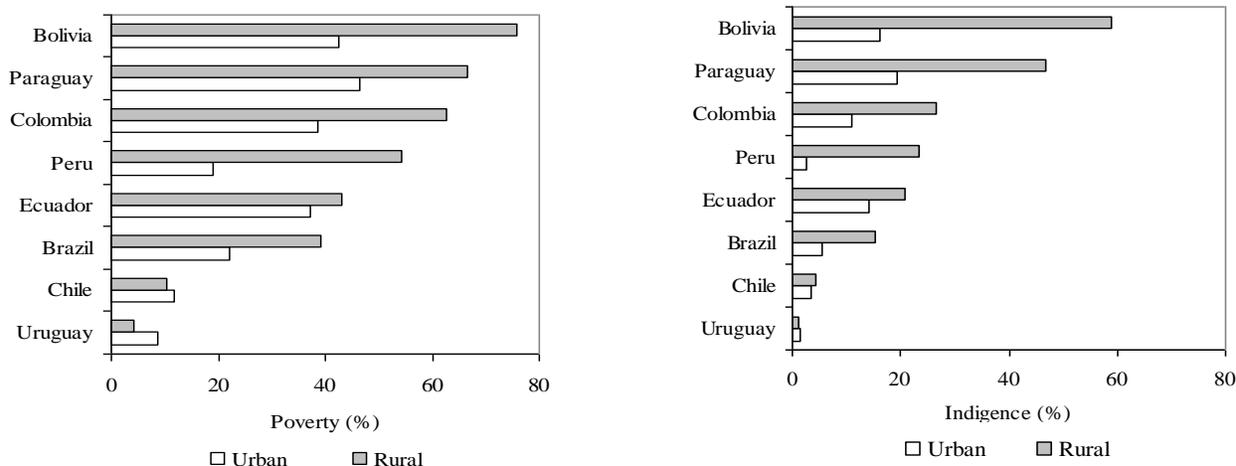
According to projections of 2010 national surveys or last available year (7), it was estimated that 107.7 millions of inhabitants in South America were living under poverty conditions, a little more than a fifth part of the population (21.3%), from which 35.9 million lived under extreme poverty or indigence, more than one of every ten inhabitants (11.1%). There is a large variation in poverty rate between South American countries (figure 2.3), which is related to both, global economic level of each country and to inequities of income existing in each country. More than half of the population in Paraguay and Bolivia is poor (54.8% and 54.0% respectively), which includes almost a third of the population which is indigent (30.7% and

31.2% respectively). In a positive aspect, in countries with higher development like Uruguay and Argentina, poverty is less than 10% (8.4% and 8.6% respectively).

Poverty and indigence are systematically higher in the rural area than in the urban area, highlighting that rural poverty in Paraguay is 80% higher than in the urban area and in Bolivia is 40% higher (figure 2.3). The contrast between urban and rural indigence is even higher: rural indigence is 140% higher than the urban area in Paraguay, while in Bolivia is 260%. On the other hand, in countries with a higher development like Chile and Uruguay, the different is much lower, whilst poverty is lower in the rural sectors (7).

Figure 2.3. Poverty and indigence in South American countries, 2010 or last available year.

Note: No available information for Guyana and Suriname.
 Source: ECLAC (2011). Social Panorama in Latin America, 2011.

Figure 2.4. Poverty and indigence in urban and rural areas in selected South American countries, 2010 or last available year.

Note: Countries with urban-rural information collected by ECLAC. No rural data recorded for Argentina and Venezuela.
 Source: ECLAC (2011), Social Panorama in Latin America, 2011.

Uruguay and Argentina had an economic crisis which made it difficult to reduce poverty a little after 2000, but afterwards they had an economic recovering.

According to ECLAC (2008) medium income growth has been the predominant factor in poverty and indigence reduction between 2002 and 2007 in countries such as Argentina (urban area), Colombia, Ecuador (urban area) and Venezuela, which had an important reduction of poverty. The result of distributive policies and a better distribution explains

the drop of more than half of poverty and indigence in Bolivia, Brazil and Chile, with reduction of indigence in Paraguay (6,8). In Brazil, the distributive policies have contributed to a reduction of 36% in income inequities during the period 2001-2011 (16).

According to surveys carried out in Latin America between 2003 and 2006 (6), 41% of people in Bolivia and 36% in Peru had unsatisfied basic needs. This condition means having three or more of the following conditions: low housing quality (wall, ceiling and

floor materials); lack of drinking water access; lack of sanitation (sewage systems with toilet connected to some evacuation system); lack of electric light; overcrowding (three or more persons per room); lack

of education access (children between 7 and 12 years who attend to school); and incapacity of sufficient consumption in households (6).

Table 2.5. Literacy and educational level in South American countries, 2010 (or last available year).

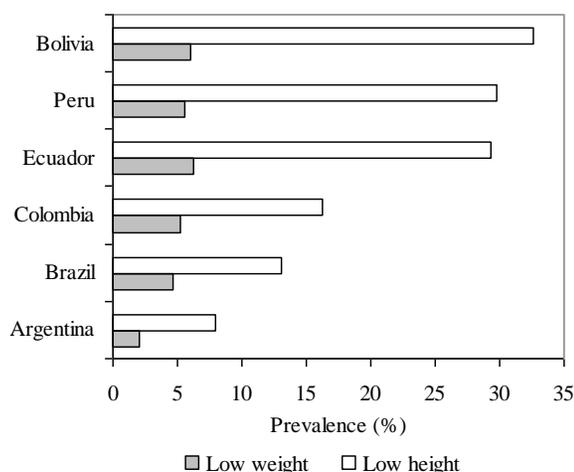
Country	Literacy	School enrollment			School
	2009	Primary	Secondary	Tertiary	years
	%	2010	2010	2010	Years
Argentina	97.7	116.7	85.9	69.4	9.3
Bolivia	90.7	107.2	81.3	38.3	9.2
Brazil	90.0	127.5	100.8	34.4	7.2
Chile	98.6	106.4	90.4	54.8	9.7
Colombia	93.2	120.2	94.6	37.0	7.3
Ecuador	84.2	117.5	75.4	42.4	7.6
Guyana	91.8	103.0	103.4	11.2	8.0
Paraguay	94.6	99.4	66.8	36.5	7.7
Peru	89.6	109.1	89.1	34.5	8.7
Suriname	94.6	113.8	75.4	12.3	7.2
Uruguay	98.3	113.6	87.9	64.9	8.5
Venezuela	95.2	103.2	82.1	78.2	7.6
South America	93.5	119.9	93.7	43.1	7.9

Source: UNDP (2011), 2011 Human Development Report; PAHO (2010), IBS (2010)

Education

The level of education achieved in the countries, and within them, is also systematically related to the social economic level reached and at the same time constitutes an important social determinant of health. Literacy in the region increased from 88% of the population in 1980 to 93.5% in 2009, with different increment in scholar attendance in the majority of the countries. Literacy is almost universal (higher than 95%) in four countries, whilst it is lower than 90% in Peru and Ecuador (Table 2.5). There is less coverage of secondary education enrollment in those countries with lower economic development and more rural areas (among other factors limiting education) as occur in Paraguay and Suriname. School years fluctuate between 9.7 years in Chile and 7.2 years in Suriname. Nevertheless, access to education remains higher for men than for women, particularly in rural zones, and the quality of education is differentiated according to family income. As a result of these differences, some persons have less opportunity to develop healthy behavior and access to quality employments and better living conditions (9,10).

Figure 2.5: Chronic malnutrition in children under 5 years old, 1998-2006



Source: PAHO (2008), Malnutrition in nursing babies and small children in Latin America and the Caribbean. Achieving the MDGs (Millennium Development Goals)

Food and nutrition

Based on malnutrition national surveys carried out in six South American countries, between 1998 and 2006,

there is a high level of chronic malnutrition in countries with less economic development level, such as Bolivia, Peru and Ecuador (figure 2.5). Low size prevalence (around 30% in those countries) is higher than low weight (around 6% in those countries) (11).

Water and basic sanitation

In countries with low coverage of drinking water and sanitation, the lack of access to adequate potable water facilities and sanitation is much more critical in rural sectors. It is one of the basic conditions of welfare and health protection in the households, avoiding sanitation-related health risks. This determinant is particularly more critical in areas of less socio economic level, rural and indigenous sectors.

Water supply and sanitation was especially critical in some groups of population in some countries, such as: In 2010, 79% of urban population in *Ecuador* received water from the public net but only 46% in the rural sector. In general, water quality is not guaranteed. That is why, 40% of population boiled it, 3% used chlorine and 1.3% filtrated it, while 22% used purified water in plastic bottles) and a third consumed it with no treatment. On the other hand, 10% of households do not have toilet and discharge directly to the sea, rivers, lakes or streams. From the served water eliminated through sewage system (66.6%), only 5% received an effective treatment. In 2009, 77.7% of urban population and 59.0% of rural one had access to drinking water in *Paraguay*. In indigenous communities, water was mainly obtained from other sources (such as wells, artesian wells, cisterns, surface water and dug wells). Only 8.5% of the population had access to the sanitary sewage system (16.3% in the urban zones versus 0.3% in the rural ones) (12).

During 2010 in *Peru*, 69.0% non poor households were supplied through the public net of water, but only 40% of the poor households. Almost a fifth of households (18.0%) and more than a third of poor households (36.0%) supply themselves from rivers, gutters, spring waters or a similar source. Only 57.5% of houses had connection to the public net, 27.6% had latrines, septic or blind wells and 14.9% had no system of evacuation systems (30.3% in rural areas). Sanitation was much more limited in Amazon zones. In 2010, 97.1% of population in urban zones in *Suriname* had access to improved potable water sources, but only 44.8% in the inner rural areas. Coverage of access to improved sanitary facilities reached 84% of the population. It was 90% in urban and coast zones had, but only 33% in the inner rural areas (12).

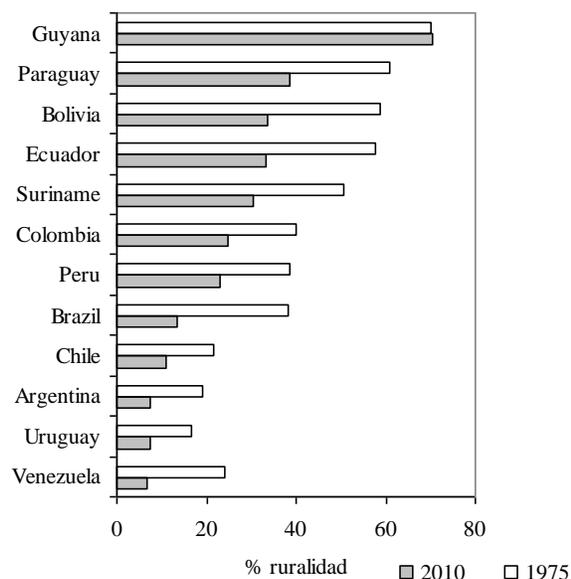
The sanitary and water coverage tend to be less in countries with lower social economic development conditions, especially in rural areas (more detailed information appears in section 3.2, chapter 3, about Environment).

Rural population

Almost a fifth of South American population lives in rural areas (18.3%). Countries with less socio economic development level tend to have more rural areas, as it occurs with *Guyana* (71.8%), *Paraguay* (41.5%) and *Bolivia* (35.8%) (Figure 2.6) (2,10).

In 1975, almost a third of the population lived in rural areas (36.2%), while in 2010 this proportion was reduced to a fifth (18.6%). The process of gradual urbanization has occurred in all the countries, in general neither with planning nor with protection of healthy conditions. The growing urbanization, in spite of facilitating the physical closeness of people to services, commerce and employment opportunities, can be associated to consumption patterns and unhealthy life styles (as inadequate diet, obesity, sedentary and drug abuse), to the deterioration of social support networks and increasing traumatism and violence (2,10).

Figure 2.6. Rural areas in South American countries, 1975 and 2010.



Source: ECLAC (2008) Millennium Development Goals. Progression towards the right to health in Latin America and the Caribbean ECLAC: Santiago, www.eclac.org; IBS PAHO 2010.

As indicated in other sections of this document, life in rural sectors is related to lower income conditions, housing, education and sanitary conditions, which

represent social determinants related to health and death situations which are avoidable. There is also less access to health attention, especially at more complex levels (13,14).

Social Vulnerability

There are groups of population that due to their socio economic conditions, displacement, ethnic or cultural origin and geographic location make themselves highly vulnerable to adverse conditions from the

physical or social environment, concentrating risk factors and a higher possibility to get sick and die. These same groups tend to have less social protection and less access to health systems due to geographical (as in the case of rural areas or poor settlements in the periphery of big cities), cultural or economic barriers (13,14). Social vulnerability based on the estimation of unsatisfied basic needs is consistent with the level of socio economic development and poverty proportion existing in the countries.

Table 2.6. Proportion and quantity of indigenous inhabitants in South American countries, 2004

Indigenous proportion	Quantity of indigenous inhabitants (thousand)		
	Less than 100	100 to 500	More than 500
More than 40%			Peru Bolivia Ecuador
5% to 40%	Suriname		Chile
Less than 5%	Guyana	Argentina Brazil Paraguay Venezuela	Colombia

Sources: PAHO (2007), Health in the Americas 2007, based on evaluation reports of the international decade of indigenous people worldwide, PAHO, 2004; Indigenous people, poverty and development, World Bank 2005; Lancet 2006; 367: 1859-69.

Table 2.7. Poverty in indigenous or Afro-descendant population groups, in rural and urban areas of selected South American countries, 2007 or last available year

Country	Year	Urban Area		Rural Area	
		No indigenous or afro-descendant %	Indigenous or afro-descendant %	No indigenous or afro-descendant %	Indigenous or afro-descendant %
Bolivia	2007	11.3	21.4	46.8	63.8
Brazil	2007	6.3	9.5	17.8	21.4
Chile	2006	3.1	4.2	3.0	6.2
Ecuador	2007	11.6	20.0	20.7	32.3
Paraguay	2007	18.1	31.7	26.0	47.0

Source: ECLAC (2008). Social Panorama in Latin America 2008. ECLAC: Santiago, Chile.

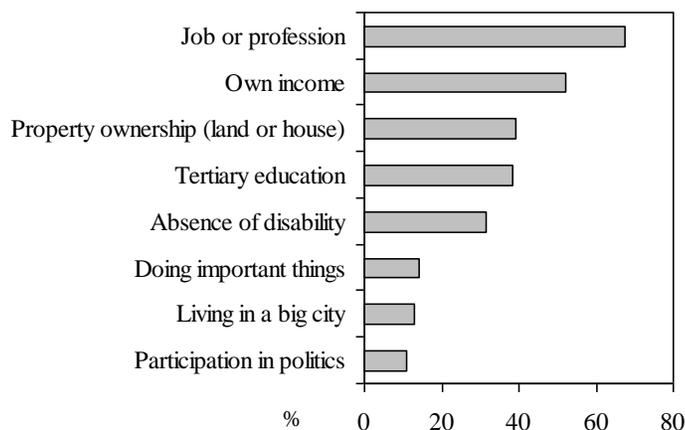
According to the Social Vulnerability Regional Atlas (PAHO-CELADE, 2011), the proportion of households with unsatisfied needs (limited building material for housing, overcrowded, education and households economic capacity) in Municipalities reaches 86.1% in Bolivia, 45.2% in Ecuador and 35.6% in Paraguay. On the other hand, it was only 16.9% and 16.2% in Argentina and Brazil respectively (15). Although there are no precise global estimations,

indigenous inhabitants represent an important proportion of the South American population, especially in Peru, Bolivia and Ecuador (Table 2.6) (6). Indigenous population tend to be particularly vulnerable in health matters, especially due to the influence of different kinds of socio economic and rural areas factors limiting the possibility of integration to the productive markets. They have less access to health promotion and prevention actions,

with less opportunities to achieve healthy conditions and life styles. Among the different countries it is consistently recorded that poverty increases among

indigenous or afro-descendant population groups, especially in rural sectors (Table 2.7) (6,14).

Figure 2.7. Main type of things that people should have, to feel as part of the society in South America, 2007



Note: Proportion of persons (%) who perceive things they should have to be part of the society. No data for Guyana and Suriname.

Source: ECLAC (2008) Socio Economic Panorama in Latin America and the Caribbean, based on especial tabulations of the Latin barometer Survey 2007. ECLAC: Santiago, Chile.

Social Exclusion

There are different types of factors which contribute to the exclusion of people from the productive market and benefits from the social network. These factors tend to concentrate in those people with lower socio economic level and with lack of insertion in the social network.

According to perception reported in surveys, people give big importance to having a series of things, in order to feel that they are part of society (figure 2.7) (6). Two thirds of people give greater importance to having a skill or profession (67.7%), and half gives importance to having their own income (52.0%). Having a house, land or property and higher education are also highly considered (39.1% and 38.3% respectively).

The perception of the importance of having no handicaps, reaches to almost a third (31.4%) and it is a factor that has implications to health (prevention, healing, rehabilitation, promotion of healthy life styles). The expectation to live in a big city is a factor

that encourages migrations, with economic, social and health implications.

Social protection

Social protection includes mechanisms, programs and subsidies in order to prevent or alleviate eventual lack of conditions or life adversities. On turn, this could prevent health-related needs, suffering and complications to population welfare that they cannot tackle in an autonomous way, in regard to issues like income, housing, education, health and other critical aspects.

Part of social protection is provided by the State and other by different entities based on contributions.

Since 2000, social public expenditure in security and social assistance has progressively increased in South America. In the period 2008-2009 the expenditure in South America reached approximately 542 dollars per capita (of 2005). While this expenditure became 719 and 711 dollars per capita in Uruguay and Brazil respectively, in Ecuador and Paraguay only reached 47 and 45 dollars respectively (Table 2.8) (7).

Table 2.8. Social public expenditure in security and social care (in dollars of 2005) in South American countries, 2000 to 2009

País	2000-2001 USD	2002-2003 USD	2004-2005 USD	2006-2007 USD	2008-2009 USD
Argentina	452	380	418	530	690
Bolivia	55	60	55	51	66
Brazil	492	534	569	642	711
Chile	500	492	465	440	545
Colombia	148	155	202	257	300
Ecuador	12	9	15	28	47
Paraguay	25	40	31	42	45
Peru	98	114	123	118	113
Uruguay	670	589	591	675	719
Venezuela	196	184	214	270	
South America	360	373	402	460	542

Note: No data for Guyana and Suriname.

Source: ECLAC 2011, Social Panorama in Latin America and the Caribbean, 2011.

Between 2000-2001 and 2008-2009, social public expenditure in security and social assistance as a percentage of the gross internal product, increased from 8.4% to 10.5% in South American countries, although with a wide range among countries: it reached 13.4% in Brazil but only 1.5% in Ecuador (Table 2.9) (7).

Social protection through social security fulfills an important role in the working population and can contribute towards social security systems. Social security coverage allows the workers to be socially protected through the affiliation to social security

systems and to have access to insurance and health systems. In 2006, two thirds of the employee persons referred to be affiliated to social prevision systems in Chile (66.7%). In Venezuela this proportion was a bit lower (60.9%) and half of the employees in Brazil had this condition (49.5%). Coverage in urban sectors is obviously higher than in rural sectors, higher in formal urban sector and in men (Table 2.10) (6). In all the countries there is a significant correlation between household income levels and social security coverage, because workers with higher income can make a highest contribution and have better coverage.

Table 2.9. Public spending on social security and social assistance as a percentage of GDP in South American countries, 2000 to 2009

País	2000-2001 %	2002-2003 %	2004-2005 %	2006-2007 %	2008-2009 %
Argentina	10.3	9.7	9.2	10.0	12.0
Bolivia	5.6	6.0	5.3	4.7	5.7
Brazil	11.2	12.0	12.1	12.8	13.4
Chile	7.9	7.5	6.5	5.8	6.9
Colombia	4.8	4.9	6.0	7.0	7.8
Ecuador	0.5	0.4	0.5	0.9	1.5
Paraguay	2.1	3.3	2.5	3.2	3.3
Peru	4.0	4.4	4.4	3.7	3.2
Uruguay	13.7	13.6	11.7	12.0	11.3
Venezuela	3.7	4.1	4.1	4.6	...
South America	8.4	8.8	8.9	9.4	10.5

Note: No data for Guyana and Suriname.

Source: ECLAC 2011, Social Panorama in Latin America and the Caribbean, 2011.

Table 2.10. Social security coverage in selected South American countries, 2006 or last available year

Country	Year	Total	Area		Urban Area		Women	Men
			Urban	Rural	Formal	Informal		
		%	%	%	%	%	%	%
Argentina	2006	...	60.0	...	68.8	22.3	55.0	64.1
Bolivia	2004	15.6	20.2	9.0	44.4	6.0	16.6	14.8
Brazil	2006	49.5	56.0	20.5	78.7	35.1	48.3	50.4
Chile	2006	66.7	68.1	55.7	82.6	51.6	62.9	69.0
Ecuador	2006	28.7	33.1	20.4	59.6	14.9	30.4	27.6
Paraguay	2005	14.1	20.0	6.0	46.5	4.4	15.3	13.4
Peru	2003	13.7	20.1	3.4	46.2	4.7	9.8	16.8
Uruguay	2005	...	61.1	...	82.7	40.5	60.7	61.5
Venezuela	2006	60.9	...	...	68.6	16.1	65.0	58.2

Source: ECLAC (2008) Social Panorama in Latin America and the Caribbean, ECLAC: Santiago, Chile.

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3. ENVIRONMENT AND HUMAN SECURITY

This chapter outlines some aspects of the environment that are related – either direct or indirectly – with health of the population and human security: sustainable development and environmental health; access to drinking water and basic sanitation; management of solid residues; deforestation and soil degradation; air pollution and its effects on health; labor environment and workers health; road security; types of violence; natural disasters; climate change and their effect on health; and food and nutritional security.

Addressing environmental conditions

South America has huge natural resources and environmental conditions which represent the great richness of the region (water, natural gas, forests, potentiality of agriculture and cattle). Nevertheless, the industrialization process and massive exploitation of natural products (such as forests) has led to an important deterioration of environmental conditions. Deforestation, soil erosion and desertification are affecting, in one way or another, all countries of the region, what represents a threat for the security of food and water supply, and increases population vulnerability in front of natural disasters (1,2).

Urban and industrial accelerated growth with no control and lack of urban planning has led to higher air (especially industrial and vehicular), water and soil pollution. New urban settlements, constituted by groups like migrants from rural areas, tend to have limited economic, housing, sanitary and living conditions, reducing the opportunities to count with physical and social environments which allow a healthy lifestyle. This makes health promotion and prevention more difficult (limited social network, poor education, inadequate diets, critical aspects like drugs abuse and violence) (1,2).

These major commercial and people interchange (facilitated by globalization) as well as free trade agreements have led to strengthening health-related legislation and surveillance to allow countries to face the arising serious unpredictable problems of public health over environmental conditions and people's health. This aspect is adequately addressed by the International Sanitary Regulations, as well as in the national and international efforts made for its application (1-3).

Drinking water and basic sanitation

Countries in South America have continued increasing their coverage to improved sources of drinking water and sanitation since the year 2000, mainly in urban areas. However, increase of coverage in rural areas and where the more vulnerable sectors of the population live still remains a challenge, towards obtaining universal connection via piping to the interior of the households.

The investment in widening and modernizing the drinking water infrastructure and sanitation is an important social investment, within the development policies. However, the relatively limited budgets managed by the states and the financial crisis tend to postpone or diminish the priority to invest in water and sanitation infrastructure. This includes the international loan requirements or the private agent's investment decisions (4).

Between 2000 and 2008, drinking water coverage in South America increased by 3.7%, reaching 95% in 2008. The biggest growth was produced in Paraguay (16.2%), even though it still continues to be one of the countries with lowest coverage (86%) (Table 3.1) (5).

Drinking water coverage in urban areas has become practically universal in South American countries, although it has reached only 80% of coverage in rural areas (in spite of a 10.0% increase since the year 2000). Paraguay has increased 29.4% of rural coverage in eight years, although it only reached 66% total coverage. Peru continues being the country with the lowest coverage of drinking water (82%), in spite of rising 3.7% between 2000 and 2008, which was made at the expense of an increase of 13.0% in rural sectors (nevertheless rural coverage reaches only 61%).

Table 3.1. Access coverage to improved drinking water sources in South American countries, urban and rural areas, in 2000 and 2008.

Country	Total			Urban			Rural		
	2000 %	2008 %	Increase %	2000 %	2008 %	Increase %	2000 %	2008 %	Increase %
Argentina	96	97	1.0	98	98	0.0	78	80	2.6
Bolivia	79	86	8.9	94	96	2.1	56	67	19.6
Brazil	93	97	4.3	97	99	2.1	75	84	12.0
Chile	94	96	2.1	99	99	0.0	66	75	13.6
Colombia	91	92	1.1	99	99	0.0	71	73	2.8
Ecuador	86	94	9.3	91	97	6.6	78	88	12.8
Guyana	89	94	5.6	93	98	5.4	87	93	6.9
Paraguay	74	86	16.2	92	99	7.6	51	66	29.4
Peru	79	82	3.8	90	90	0.0	54	61	13.0
Suriname	91	93	2.2	98	97	-1.0	73	81	11.0
Uruguay	98	100	2.0	99	100	1.0	88	100	13.6
Venezuela	92	...		94	...		74	...	
South America	91	95	3.7	96	98	1.7	72	80	10.0

Source: ECLAC (2012) ECLACSTATS. Access in June 2012 (5).

Table 3.2. Sanitation coverage in South American countries, urban and rural areas, in 2000 and 2008.

Country	Total			Urban			Rural		
	2000 %	2008 %	Increase %	2000 %	2008 %	Increase %	2000 %	2008 %	Increase %
Argentina	91	90	-1.1	92	91	-1.1	77	77	0.0
Bolivia	23	25	8.7	32	34	6.3	8	9	12.5
Brazil	75	80	6.7	84	87	3.6	36	37	2.8
Chile	92	96	4.3	96	98	2.1	71	83	16.9
Colombia	72	74	2.8	80	81	1.3	50	55	10.0
Ecuador	83	92	10.8	92	96	4.3	70	84	20.0
Guyana	79	81	2.5	85	85	0.0	77	80	3.9
Paraguay	58	70	20.7	79	90	13.9	31	40	29.0
Peru	62	68	9.7	77	81	5.2	27	36	33.3
Suriname	83	84	1.2	90	90	0.0	65	66	1.5
Uruguay	96	100	4.2	97	100	3.1	90	99	10.0
Venezuela	89	...		93	...		54	...	
South America	76	79	4.2	84	86	2.1	45	48	5.7

Source: ECLAC (2012) ECLACSTATS. Access in June 2012 (5).

Between 2000 and 2008, sanitation coverage in South America increased in 4.2%, reaching 79% in 2008. The higher increase took place in Paraguay (20.7%), although it still maintains a limited coverage (70%). In Bolivia only a quarter of the population has proper sanitary access (25%) (Table 3.2) (5). Sanitation coverage in urban areas in South American countries reached 86% in 2008, with an increase of 2.1% since

2000. There is a great variation of urban coverage among countries: in 2008, the range was between 100% and 34% (Uruguay and Bolivia respectively) (5). The higher rural sanitary coverage increase took place in Paraguay, with 29.0% in 8 years (in spite that it only reached 40% in 2008). That year, the range of coverage level in rural sanitation was wide: from 99% in Uruguay to just 9% in Bolivia.

Table 3.3. Annual mean of exposure to 2.5 ug/m3 PPM in air, in selected cities of South America, between 2006 and 2010 *

Country	City	Average annual PPM 2.5 ug/m3	Year
Peru	Lima	34.2	2010
Chile	Talca	32.8	2007
Chile	Santiago	31.7	2006
Chile	Concepcion	24.0	2007
Peru	Callao	19.6	2010
Ecuador	Quito	19.4	2009
Chile	Valparaiso	18.7	2007
Chile	Alto Hospicio (Iquique)	18.2	2008
Brazil	R Metropol. Sao Paulo	15.0	2009
Chile	Calama	14.5	2007
Brazil	Sao Paulo	11.0	2009

* Air quality is represented by annual mean concentration of fine particulate matter per million (PPM 2.5, i.e. particles smaller than 2.5 microns).

Source: WHO (2011) Urban outdoor air pollution database (7).

Air pollution and others

Atmospheric pollution is a problem which affects in different degrees the majority of cities in South

America, especially big cities with an industrial component or with a high intensity of vehicular traffic. However, there is little regional information, except in those cases in which due to the level of pollution, some measures have been taken, including specific monitoring, as in the case of Sao Paulo and Santiago de Chile (6). WHO (2011) maintains a data base on atmospheric pollution, but in the case of South America it has limited data from Brazil, Chile and Ecuador cities. In the period between 2006 and 2010, air pollution (measured through PPM 2.5 ug/m3 annual mean) in selected cities from South America fluctuated between 34.2% and 11.0% PPM 2.5 ug/m3 (Lima and Sao Paulo respectively) (Table 3.3) (7).

According to ECLAC (2003), cities which show higher pollution problems, apart from Sao Paulo and Santiago de Chile, are: Belo Horizonte, Bogota, Buenos Aires, Caracas, Cordova, La Paz, Lima, Mendoza, Quito, Rio de Janeiro and San Salvador (6). Factors like meteorological and topographical conditions contribute to this pollution. Cars are the main cause of environmental pollution. There is an important growth of the automotive park and also many vehicles get older and do not meet the basic conditions to prevent excessive pollution (6).

Table 3.4. Carbon dioxide emissions and consumption of substances exhausting the ozone layer in countries of South America, 1990 and 2008 or 2009

Country	Emissions of Carbon Dioxide						Consumption of substances exhausting the Ozone (disaggregated)	
	Total		per capita		for each USD GNI (const. 2000)		exhausting the Ozone (disaggregated)	
	Level 1990	Level 2008	Level 1990	Level 2008	Level 1990	Level 2008	Level 1990	Level 2009
Argentina	112607	192378	3.5	4.8	0.463	0.365	1514.5	395.4
Bolivia	5504	12835	0.8	1.3	0.269	0.335	76.7	4.4
Brazil	208875	393220	1.4	2.0	0.195	0.214	39337.3	1459.4
Chile	35486	73109	2.7	4.4	0.409	0.325	1015.5	246.5
Colombia	57336	67700	1.6	1.5	0.287	0.184	2152.7	320.9
Ecuador	16834	26824	1.6	2.0	0.298	0.263	648.6	82.2
Paraguay	2262	4118	0.5	0.7	0.133	0.152	240	25.9
Peru	21164	40535	1.0	1.4	0.218	0.179	892.9	27.3
Uruguay	3993	8328	1.3	2.5	0.184	0.214	464.8	36.8
Venezuela	122151	169533	6.2	6.0	0.646	0.516	4808.6	165.3
South America	586212	988580	2.0	2.6	0.281	0.254	51152	2764

Note: No data for Guyana and Suriname

Source: PSE ECLAC 2011.

Table 3.5. Modality proportion of rendering solid residual collection services in South American countries, 2010

Country	Direct	Other modalities			Total other
	municipal service	Services contract	Cooperatives	Other public	
	%	%	%	%	%
Argentina	45.6	54.3	0.1	0.0	54.4
Bolivia	53.7	37.9	8.4	0.0	45.3
Brazil	41.9	54.3	1.3	0.0	58.1
Chile	18.8	81.2	0.0	0.0	81.2
Colombia	30.6	69.0	0.4	0.0	69.4
Ecuador	79.9	19.9	0.2	0.0	21.1
Guyana	0.0	100.0	0.0	0.0	100.0
Paraguay	59.0	41.0	0.0	0.0	41.0
Peru	66.1	33.9	0.0	0.0	33.9
Uruguay	78.3	21.2	0.5	0.0	21.7
Venezuela	59.9	24.1	12.0	4.0	40.1
South America	45.1	51.5	1.8	0.3	54.9

Note: No data for Suriname

Source: Tello et al, 2010, Report on the Evaluation of Urban residues management in LAC 2010.

To face this situation, several new legal and normative mechanisms have been adopted in order to control and restrain higher pollution. For example, Chile has established a strict periodical control of gas emissions, restriction of pollution sources in periods of environmental alert or emergency, with partial vehicles restriction in those times.

Many aspects of agricultural and forestry activities do not represent a threat for the environment, such as harvest season and trees replacement or agricultural farming, particularly if it encourages or allows the renewal of a new forest in the land. However, the problem rises when the soil is derived to other uses and biomass residues are burnt, discharging big gas quantities of greenhouse effect that are released and end up into the atmosphere. Carbon dioxide emission in countries of South America grew 30% per capita between 1990 and 2008 (9).

Solid residues

The regional evaluation of urban residues management in Latin America and the Caribbean carried out in 2010 estimated significant positive changes compared to 2002 (9). However, several aspects are still pending. For example, nearly half of urban residues still receive inadequate disposal. Municipalities have financial constraints to meet and expand this function in the poorest marginal zones. The collection of solid residues in these areas is still

insufficient and in many occasions dumping grounds are maintained instead of sanitary landfills and this type of activity has poor regulation and control (9).

The management of solid residues has improved since 2002. Relevant issues for discussion and advance have been: recycling of residues, climate change, production, collection and policies for the final disposition of residues. But there still remain important challenges and pending issues, where the municipal level plays an essential role.

Less than a half (45%) of the solid urban residues collection is provided directly from municipalities and most of the rest depends on outsources services (51.1%) (Table 3.5). There is a small proportion provided by cooperatives (1.3%) and exceptionally there are services provided by other public entities, as in Venezuela where it represents 4%.

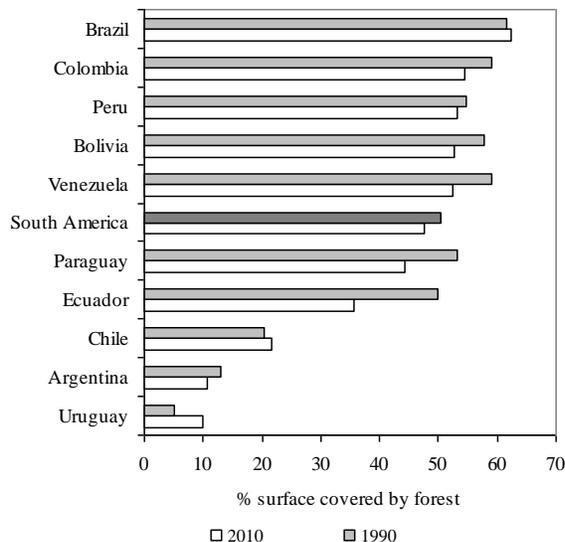
Solid residues management was more limited in some countries (10):

- In 2010, only 39.2% of the population in **Paraguay** had services of residue disposal, either by public or private collection (69.7% for the richer quintile and 7.5% for the poorest), 48.5% of population used burning (80.4% in rural zones), 70.8% of residues were thrown in controlled dumping grounds at open sky, and the rest in sanitary landfills.
- In 2009, 74.0% of population in **Peru** had solid residues collection services. From 8,532 tons of

garbage collected per day, 66.0% received some way of final disposition (14.7% were recycled and the rest went to sanitary landfills) and 29.8% were thrown into the environment (rivers and beaches are the main receivers).

- There was a limited capacity of residues management services in **Suriname**, in urban areas it reaches up to 70% of solid residues, but 39% in other districts. Illegal deposits and incineration of domestic garbage continues to be a persistent health risk (10).

Figure 3.1. Surface proportion covered by forests in Latin American countries 1990 and 2010.



Note: No data for Guyana and Suriname.

Source: Social Panorama in Latin America 2011, ECLAC 2011.

Deforestation and soil degradation

The South American ecosystem has a great wealth of forests and existing fertile lands, especially in the Amazons. However, the progressive deforestation of native forests and soil degradation has become an important concern, by causes mostly avoidable. There is a tendency towards the reduction of areas covered by forests in countries of South America; the national proportion of areas covered by forests, for 1990 and 2010, is synthesized in figure 3.1.

These are strongly influenced by powerful economic interests, which make it difficult for the states to have the mechanisms to protect forests. It is estimated that 17.4% of all greenhouse gas emissions are man made, through deforestation and forest degradation (11).

In many societies, agricultural lands and urban ground are private property and it is difficult for the

state to assume legal mechanisms to protect forests. Poorer groups and non-owners depending from agriculture can produce negative impact on nature, through cutting and burning trees to survive: This has decreased agricultural production and economic subsistence, leading to secondary migration from rural areas to other lands (11). Negative impact on health of caused by factors such as the lack of food and nutrition, poverty, emigration to other areas, social tensions (due to the lack of fertile lands for subsistence). These factors also contribute to the greenhouse effect.

Natural disasters

South America is a region with a great diversity of landscapes and climate. There are sectors particularly exposed to volcanic activity, earthquakes and tsunamis. Bad weather and climate changes in some areas result in sustained rainfalls, floods, alluviums, forest fires, snow storms and droughts. Natural and man made disasters affect the environment and health status of the population, both by direct consequences – as in the case of earthquakes or floods – or indirect, as in the case of deforestation or green areas loss in polluted and high population density cities. Relevant disasters reported in the period 2006-2010 include (10):

- Emergency situations and more recurrent disasters in **Argentina** are heavy snow storms, forest fires and possible earthquakes. In 2007 there was a drought resulting in the death of around 800 thousand cattle; heavy rains caused river overflows and evacuation of families. In 2008, Argentina received ash clouds from the volcano Chaiten (Chile) with economic and cattle losses. In 2009, a hurricane (San Pedro) caused 10 deaths, 60 injured and enormous material damages.
- Between 2003 and 2009, **Brazil** registered 9,583 emergency situations or state of public disasters (64.1% due to droughts and 30.2% to floods). Landslides are frequent and severe (Santa Catarina State in 2008 and Northeast in 2010). More than 90% of them are associated to human intervention (motorway building, trails and embankments, deforestation and degradation of the vegetation zones).
- Due to its volcanic nature, **Chile** has frequent seismic activity, like the earthquake and tsunami of February 2010 affecting four regions and causing 512 deaths, 16 people disappeared, and 800,000 victims (housing problems, poverty, sanitation, mental health and others), as well as loss of health infrastructure.
- During 2010 and the first quarter of 2011, floods in **Colombia** caused 400 death and nearly 3,200 persons affected, with thousands of houses and hectares of crops destroyed. Colombia has high risk of seismic

movements, sliding, tsunamis and volcanic eruptions (10).

- **Guyana** is vulnerable to a variety of natural and anthropogenic disasters that may worsen due to climate change, like floods. That contributes to the increasing of vector communicable diseases which are endemic in some areas of the country.
- Fires, droughts and floods are the main periodical natural disasters in **Paraguay**. Fires in some areas led to the declaration of national emergency in 2007. Its origin is essentially human, related to farming productive cycles and the burnt of solid residues. Between 2007 and 2010, there were serious effects from droughts in the Chaco region.
- **Uruguay** is exposed to fluvial flooding and other risks for which has prepared sanitary surveillance plans, energy policy and plans of action on climate change.
- **Venezuela** is exposed to frequent forest fires, heavy rains, floods and droughts (Niña and Niño phenomena). In 2010, rains reached 1657.5 millimeters per square meter, with 323,266 affected, 38 deaths, 31 thousand housing collapsed, nearly 400 roads, 39 bridges and 3 reservoirs damaged and 50 thousand harvests lost (10).

Climate change and its effects on health

During 2007, the Intergovernmental Group of Experts on Climate Change arrived to the conclusion that the

climatic changes observed are undeniable. This is based on the observed increases in air and oceans average temperatures worldwide, as well as the widespread melting of snow and ice and the raising of the average sea level in the world. The evidence around the world shows that raising temperatures are changing and disrupting the balance of natural ecosystems which satisfy the basic needs of life (19,20).

The adverse effect of climate change on health can be direct or indirect. Climate extremes such as heat stress and weather disasters directly affect health. Vectors disease transmission, water or food contamination and insecurity of water and food supply are indirect consequences of climate changes. Disasters, droughts and diseases caused by climate change may generate social and economic problems, as the displacement of entire populations (PAHO 2008). It is highly expected that climate change will continue occurring in the future, so countries, including the health sector, must make adjustments to effectively adapt to these changes. It includes strengthening health systems to be responsive to protect the population from risks associated to climate change. In particular, it will be necessary to strength the main interventions of public health in areas such as vectors control, protection of environmental health, promotion of health and monitoring diseases. To tackle these problems PAHO launched a Strategy and Plan of Action in 2011 (PAHO, 2011) (13, 19-21).

Table 3.6 Vehicles park and death rate caused by road traffic accidents, in South American countries, 2007

Country	Vehicles (millions)	Deaths by traffic accid. *100,000 pop	Mortalidad proporcional según tipo de vehículo o peatón				
			Driver or passenger vehicle		Bike riders	Other and no specified	
			4 wheels %	2-3 wheels %		Pedestrians %	Other and no specified %
Argentina	1.2	11.1	41.7	9.5	6.2	19.4	23.2
Bolivia	0.7	16.7	59.0	4.0	1.0	35.0	1.0
Brazil	49.6	22.9	9.8	20.0	4.6	27.9	37.7
Chile	2.8	13.5	24.3	2.6	6.5	40.1	26.6
Colombia	5.0	20.4	17.2	36.1	7.7	33.6	5.5
Ecuador	1.0	25.3	13.5	0.8	0.5	43.2	42.0
Guyana	0.1	21.6	34.7	15.9	15.9	30.0	3.4
Paraguay	0.6	28.7	2.8	24.2	1.1	36.9	35.0
Peru	1.4	8.8	18.0	0.0	3.0	78.0	1.0
Suriname	0.2	19.2	43.3	31.1	3.3	22.2	0.1
Uruguay	1.0	13.5	...	...	...	...	...
Venezuela	4.0	24.8	74.7	0.0	0.0	24.6	0.7
South America	67.6	20.1	21.3	15.9	4.4	32.4	25.2

Source: WHO (2009) Worldwide road security situation report; PAHO (2011) for deaths due to traffic accidents (2007-2009)

During the five year period 2006-2010, relevant reported situation at country level was (10):

- **Argentina** may be affected by glacier melting, an increased rainfall pattern (5% to 10%) and runoff (10% to 30%).
- In 2010, **Bolivia** carried out an evaluation of the national and sub-national sanitary vulnerability to climate change, as a base to design and implement adaptation measures.
- According to different national records, it is thought that the extreme events have increased, both in frequency and intensity in **Brazil**, specially rains causing a significant number of deaths and changes in the morbidity pattern (increase of diseases related to vectors or transmitted by water) and major economic losses.
- In 2010, winter wave in **Colombia** affected 2.27 million people, 341,000 houses, 751 highways, 807.609 hectares, 813 educational centers and 15 health centers.
- **Ecuador** has experienced heat or cold waves, scarcity of food and water, floodwaters and landslides, migrations and diseases transmitted by vectors and rodents.
- **Guyana** has become a world leader of mitigation promotion of climate change, for this purpose, it developed has a national strategy (in energy, highways, water resources and other relevant issues) (10).
- In 2006, there were huge floods inside of **Suriname** (30 thousand km² under water, including some 157 towns). In the low coast region there is vulnerability due to rainfall changes (10).

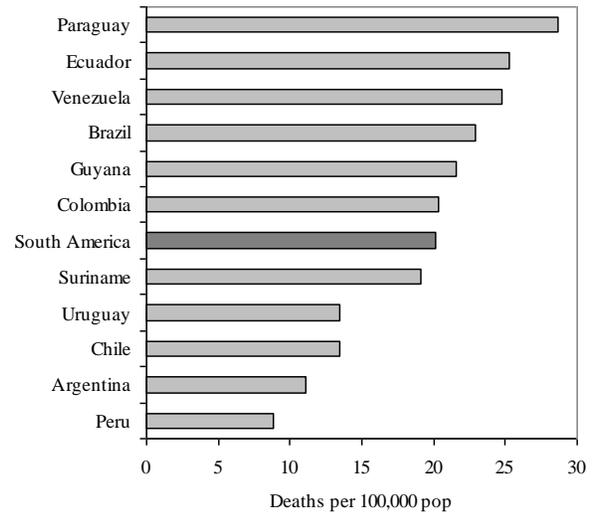
Road safety

In general, road safety is related to the socio economic and educational level of different countries, being more deficient in countries with medium and low income, although they have a less proportion of used vehicles on the streets. Nevertheless, the relationship between development level and specific mortality in South America is not clear, at least according to the information given by the world report on road safety in 2009 (Table 3.6) (14).

The majority of governments have established laws and mechanisms tending to reduce risks and improve road safety, with alcohol restriction, more strict requirements to the circulating vehicles, traffic regulations. At the same time, there have been also important promotion and educational campaigns.

In 2007 (or last available year), there were 67.6 million vehicles in South America, with approximately 79,500 annual deaths caused by traffic accidents (Table 3.6):

Figure 3.2 Mortality due to road traffic accidents in South American countries, 2007 to 2009.



Note: no data for Bolivia.

Source: PAHO (2011), IBS Brochure 2011

A fifth part of deaths happened to drivers or passengers of 4 wheels vehicles (21.3%), almost a third part to pedestrians (32.4%) and 15.9% to 2 to 3 wheels vehicles. Cyclists' deaths, although represented a relatively small proportion (4.4%), meant around 3,500 deaths per year (14). Between 2007 and 2009, annual mortality rate due to road traffic accidents in South American countries reached 20.1 deaths per 100,000 pop., with a rate at a country level, which fluctuates between 28.7 and 8.8 deaths per 100,000 pop. (Paraguay and Peru respectively). (Fig. 3.2) (15).

Violence

In South America, there are conflict and violence conditions which have both direct and indirect effects on health and welfare. There are old term persistent situations, like the guerrilla not yet solved in Colombia, or unforeseen situations of political tensions and military and social conflicts that reduce or risk human security, generate situations of unstable peace and compromise preferably the most vulnerable groups of civil population, especially displaced, migrants and population living under conflict situations (10,13). Freedom and rights of people can be rather limited and the states cannot always protect peace and support the recovery of conflicts consequences (13).

Conflicts and situations of violence, including those severe or prolonged, reduce confidence and makes it difficult the exercise of human rights and freedom of the population. Countries, with the support of international bodies including United Nations

agencies, contribute to the prevention and recuperation of conflicts, as well as to the search of reconciliation and democratic stability, together with the protection of public security and access to basic services such as health (13).

Table 3.7. Mortality rate by suicides and homicides in South American countries, 2007 to 2009.

Country	Suicide *100,000 pop	Homicide	
		in men *100,000 pop	Ratio men/women
Argentina	7.5	7.6	5.6
Bolivia	...	...	...
Brazil	5.6	53.8	10.5
Chile	11.5	8.5	7.2
Colombia	7.0	104.2	13.3
Ecuador	8.6	36.7	9.6
Guyana	24.3	26.5	4.2
Paraguay	6.5	28.1	9.3
Peru	1.7	5.0	5.5
Suriname	25.7	8.4	2.8
Uruguay	16.2	7.4	3.7
Venezuela	3.6	60.2	16.3
South America	6.1	48.2	10.1

Note: No data for Bolivia.

Source: PAHO (2011) IBS Brochure 2011

For the period 2007 to 2009, it was estimated that there were around 191 thousand homicides per year in men, with a rate of 48.2 deaths per 100,000 pop., and around 24,000 suicides per year, with a rate of 10.1 deaths per 100,000 pop. Homicides are 10 times more frequent in men than in women (Table 3.7) (15). In relation to the prolonged problem of conflict and violence in Colombia, homicide rate in men is more the double than the regional level (14.2 per 100 thousand inhabitants), mainly in men (13 times more than in women). Violence is also an important problem of public health in Suriname and Guyana, where homicides provoke yearly 25.7 and 24.3 deaths per 100,000 pop. respectively.

Food and nutritional security

Lower income groups are more vulnerable to persistent food and nutrition limitations, and to the consequences of an eventual food crisis. Main risk factors related to food security include weather emergencies, prolonged conflicts and economic crisis. In those cases, it tends to produce high cost of living, higher price and less consumption (and with food of

less nutritive value), impacting in health and nutrition. This can occur during periods of economic crisis with secondary effect of food availability and consumption. South American countries were exposed to this risk between 2008 and 2009, due to the international financial crisis (13,16).

In the period 2006-2010, relevant issues reported at country level include (10):

- At the beginning of 2011 **Argentina** was declared free from aphthous fever with vaccination, from Newcastle disease and avian flu.
- In 2011 in **Brazil**, 15 Brazilian Confederate Units (including the Federal District) continue being considered free of aphthous fever with vaccination; in addition to the State of Santa Catarina which is considered free of aphthous fever with no vaccination.
- In 2010, **Ecuador** recorded 30.7 cases of food intoxication per 100.000 inhabitants and the rate of severe diarrheic disease was 4.9 per 100 inhabitants.
- **Paraguay**, in spite of its high food production level, faces risks due to changes in the agricultural production systems, with food security risks.
- In **Guyana**, the capacity of families to acquire food was limited by the inflation and repercussions of

worldwide shortage of food, and climate change. All that increased food and nutritional insecurity.

- In **Suriname**, there is periodical inspection of security on the sale and production of food, as well as on security in the use of pesticides. Diseases transmitted by food (DTF) have a low incidence (around 400 cases per year).
- Venezuela has implemented the Mercal Network aimed to reach coverage, structure and maintenance of strategic food reserves. It has benefited around 9.4 million of inhabitants in 2009. With this mechanism, 627,761 tons of food were distributed through 16,626 points of sale of the national commercial network (10).

Security at work

Conditions in health risk that are related to employment are very different in South America, due to the great range of variation in the types of job environments (from protected enterprises up to under-employment or employments with high risks, as in the uncontrolled small mining companies). There are also inequalities in the protection of workers' rights and

their work security (protection, work security, accident and professional diseases prevention) (18).

Social protection systems and insurances committed in working risk environment in well-organized enterprises, seek the maximum prevention of professional diseases and job accidents. Among the industries with higher job risks outstands mining, agriculture and building. Small enterprises (among 6 and 20 workers) are the ones that tend to have more accidents and diseases related to the place of work. Furthermore, in countries and areas of less development, workers tend to work more hours and with major risks exposition.

There are limitations to adequately know what happens with workers, given the great proportion of informal employment in some countries and geographical areas, lack of social protection and job insurances, as well as the great displacement to urban places and even to other countries. National statistics are generally based upon information given by formal firms which have better protection and social systems, preventive services and occupational health personnel.

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4. HEALTH CONDITIONS AND TRENDS

This chapter presents an outline of relevant health conditions and their trends in the different countries of South America. It includes information on death rate, main causes of deaths, morbidity, handicap and risk factors of major importance in public health.

The advancement achieved in health during the last decades is characterized mainly by the improvement of maternal-infantile health, the reduction of communicable diseases affected to control, a better nutrition, and a greater survival rate of the population. However, some health conditions still constitute problems in public health, such as the increasing prevalence of risk factors, morbidity and death rate due to non communicable chronic diseases, accidents and violence, mental health problems and the complications of health related to a non-healthy environment and lack of human security.

There are advances that represent an accomplished agenda, while others show unfinished or pending aspects in health agendas, such as cases of preventable and premature events and deaths, unattended diseases and avoidable inequalities in health (especially those associated with social inequities and poverty), in detriment of the health situation of the most unprotected and vulnerable groups.

Conditions of health in population groups

Different population groups have particularities and vulnerabilities in their health conditions, due to age (childhood, adolescence, adult and elderly), reproductive and risks conditions, or due to social, ethnical, job conditions or disability.

Maternal and reproductive health

Maternal and neonatal mortality has dropped in a considerable way in the majority of South American countries. However, there are still some countries (and within them in poor, excluded and vulnerable areas,) where there has been little progress. Therefore, the task of preventing and reducing maternal and infant mortality continues to be a very relevant and unfinished agenda.

Table 4.1 Reproductive health selected indicators in South American countries, 2010*

País	Population 2010 (millions)	Women aged 15-49 y. (millions)	Fecundity global rate (child./woman)	Live births (LB) (thousands)	Live births per 1,000 p.	Mortalidad materna	
						Deaths ** n	Ratio per 100,000 LB
Argentina	40.7	10.2	2.2	692.0	16.9	381	55.0
Bolivia	10.0	2.5	3.3	265.3	26.1	607	229.0
Brazil	195.4	54.0	1.9	3005.4	15.2	2173	72.3
Chile	17.1	4.6	1.8	245.4	14.2	42	16.6
Colombia	46.3	12.6	2.3	906.2	19.2	685	75.6
Ecuador	13.8	3.5	2.4	297.1	20.2	286	96.3
Guyana	0.8	0.2	2.2	13.4	17.7	14	106.0
Paraguay	6.5	1.6	2.9	158.4	23.9	198	125.3
Peru	29.5	7.9	2.4	588.6	19.9	547	93.0
Suriname	0.5	0.1	2.3	9.6	18.0	7	72.0
Uruguay	3.4	0.8	2.1	49.5	14.6	5	11.1
Venezuela	29.0	7.7	2.4	597.2	20.2	376	62.9
South America	393.0	105.8	2.1	6827.9	17.1	5321	74.6

Note: (*) or last available year, (**) Approach to estimated deaths according to rate of maternal mortality in 2008 or last available year in international projection.

Source: PAHO (2012) Table Generator of IBS from PAHO, access April 30, 2012 and PAHO (2010) IBS Brochure 2010; and WHO (2011), IBS Brochure 2011 (1-3).

Table 4.2. Maternal mortality Evolution in South America since 1990 and expected reduction according to the Millennium Development Objective 5 for 2015

Country	Maternal deaths per 100,000 LB				Reduction (%) since 1990		
	1990	2000	2009 *	2015 **	2000	2009	2015 **
Argentina	100	35	55	25	65	45	75
Bolivia	650	230	229	163	65	65	75
Brazil	220	90	72	55	59	67	75
Chile	40	19	17	10	53	59	75
Colombia	100	105	76	25	-5	24	75
Ecuador	150	97	96	38	35	36	75
Guyana	470	133	106	118	72	77	75
Paraguay	160	164	125	40	-2	22	75
Peru	280	185	93	70	34	67	75
Suriname	72	72	72	18	0	0	75
Uruguay	85	11	11	21	87	87	75
Venezuela	120	60	63	30	50	48	75
South America	188	92	75	47	51	60	75

Note: (*) or last available year; (**) Expected reduction of three quarters regarding the existing level in 1990.

Source: ECLACSTATS, Access April 30, 2012; IBS Table Generator from PAHO, Access April 30, 2012; and IBS Brochures 2010 and 2011 (1,2,4).

During 2010, 105.8 million women in South America were considered in fertile age (between 15 and 49 years old), producing 6.8 million live births (Table 4.1) (1-3). Global rate of fecundity was of 2.1 children per women, fluctuating among 2.9 in Paraguay, 1.9 in Brazil and 1.8 in Chile.

In 2008, 5,321 deaths due to obstetrics causes were recorded, which means 74.6 maternal deaths per every 100,000 live birth, with a wide range among countries (229 and 11 deaths per 100,000 live births in Bolivia and Uruguay respectively). However, there could be limitations to having national estimates of maternal deaths due to limitations of records. This is why maternal decrease could be greater than the one officially estimated in the countries, as it stated by the inter-agency group where WHO participates (2).

Bolivia due to its high level of maternal mortality is a priority country in the international agenda in order to reduce it. Brazil is also a priority country, although its rate of maternal mortality is similar to the total rate of South America, due to the fact that it is a country with approximately three million of live births per year and a great quantity of maternal deaths (around two thousand deaths, which represent 44.0% of the total in South America) (1,3).

Even though maternal mortality and morbidity affect women of all social and economic strata, a disproportionately high amount of women tend to die, due to avoidable causes, in the poorest and vulnerable sectors, including, adolescents, poor and illiterates, who mostly live in rural zones, with lack of basic obstetrics attention and greater risk of dying during childbirth. Maternal mortality represents the top of an iceberg among the range of complications from pregnancy, child delivery and postpartum, and is used as a basic indicator of maternal health, although it only represents the maximum complication (death).

Table 4.2 shows the evolution of maternal mortality in South American countries, from 1990 to 2009, and the expected reduction for 2015, according to the Millennium Development Objective 5. In 2015, a drop of 75% of maternal mortality is expected compared to the level in 1990. Nevertheless, until 2009, only a reduction of 60% had been achieved. Although the level in Uruguay and Guyana had already exceeded the 2015 goal (reduction of 87% and 77% respectively), probably that will not be achieved in the rest of the countries, due to the limited level of reduction achieved since 1990 (4).

Table 4.3. Main causes and level of maternal mortality in South American countries with different assistance coverage, 2007.

Countries	Health care coverage %	Maternal mortality rate (per 100.000 newborns)		
		16-49	50-100	> 100
Argentina, Chile, Uruguay	Contraception 75% - 80% Antenatal 80% -100% Child delivery 80% -100%	Abortion Preeclampsia & eclampsia Haemorrhage		
Brazil, Colombia, Ecuador, Venezuela	Contraception 40% - 70% Antenatal 65% -95% Child delivery 67% -98%		Preeclampsia & eclampsia Haemorrhage Abortion	
Bolivia, Paraguay Peru	Contraception 28% - 60% Antenatal 50% -85% Child delivery 30% -85%			Haemorrhage Preeclampsia & eclampsia Obstructed partum

Source: Schwarcz & Fescina, updated in 2007: Maternal Mortality in Latin America and the Caribbean. Schwarcz & Fescina. The Lancet 356. December 2000 (5).

Main causes and levels of maternal mortality in South American countries tend to be different, according to the national economic level and the assistance coverage achieved (table 4.3). Countries with highest level of economic development (Argentina, Chile and Uruguay) have a high level of assistance coverage and less maternal mortality, including avoidable causes such as abortion (considered illegal, predisposing

insecure abortion), hypertensive problems from pregnancy and hemorrhage. In the group of countries with lesser income (Bolivia, Paraguay and Peru), there is a limited access to health attention with qualified personnel in prenatal and childbirth assistance, hence maternal mortality has the highest level with main causes being highly avoidable, such as obstructed childbirth.

Table 4.4 Deaths of children under 5 years old, projected according to selected rates of infant mortality and under 5 years old in South America, 2009 or last available year.

Country	Live births (thous.)	Infant deaths		Deaths in < 5 y.		Deaths by ADI (< 5y)		Deaths by ARI (< 5y)	
		n (thous.)	Rate per 1,000 LB	n (thous.)	Rate per 1000 LB	n (thous.)	% of total deaths (< 5y)	n (thous.)	% of total deaths (< 5y)
Argentina	692.0	8.4	12.1	9.5	13.8	0.1	1.2	0.5	5.5
Bolivia	265.3	13.3	50	14.4	54.2	...	...	...	...
Brazil	3005.4	57.4	19.1	58.3	19.4	1.5	2.5	3.1	5.4
Chile	245.4	1.9	7.9	2.2	8.8	0.0	0.4	0.1	4.2
Colombia	906.2	18.7	20.6	17.3	19.1	0.5	2.7	1.2	6.9
Ecuador	297.1	4.9	16.4	6.0	20.1	0.2	3.7	0.8	12.7
Guyana	13.4	0.3	22	0.4	30.4	0.0	6.1	0.0	4.2
Paraguay	158.4	2.7	16.9	3.9	24.6	0.2	3.9	0.3	6.7
Peru	588.6	11.8	20	11.3	19.2	0.3	3.0	1.4	12.2
Suriname	9.6	0.2	20.3	0.3	30.5	0.0	1.8	0.0	4.4
Uruguay	49.5	0.4	7.7	0.5	10.8	0.0	1.6	0.0	7.0
Venezuela	597.2	9.4	15.8	10.9	18.3	0.7	6.1	0.7	6.2
South America	6827.9	129.3	18.5	131.0	19.2	3.5	2.6	8.1	5.8

Note: ADI: acute diarrheic infection; ARI: acute respiratory infection.

Figures could be underestimated, due to underreported and limitations of statistical production of the information.

Source: ECLAC (2012), PAHO (2011) (2.4)

Child health

In 2009, 6.8 million children were born in South America, 129 thousand of them died during the first year of life. That year, 57,000 infant deaths occurred in Brazil (44% of all annual deaths in South America), with a mortality rate slightly higher than the regional level. In Bolivia, with the highest mortality rate, 13,000 infant deaths are produced (which is 2.7 times the regional level) (Table 4.4) (2,4).

Mortality of children under 5 years old is mostly produced during the first year of life. In 2009, there were 131,000 deaths of children under 5 years old in South America, which is lightly superior to infant deaths (129,000), because only 1.7 thousand children between 1 and 4 years old died. However, mortality of children under 5 years old in Suriname is a third higher than the infant mortality rate and in Paraguay it is a quarter higher, showing a greater importance of mortality in the group of 1 to 4 years old in those two countries (time in which childhood mortality is highly avoidable and is influenced by social determinants of health) (2,4).

In 2009, there were 78 thousand neonatal deaths in South America, which represent 60% of infant

mortality, with approximately 11.4 deaths per 1,000 live birth. There is no updated information of neonatal deaths in South America, but the main causes of death known from 2002 to 2003 in Latin American and the Caribbean can be used as a reference: premature births caused around 28% of deaths, severe infections 26%, asphyxia at birth 23% and congenital anomalies 8% (6). Approximately 8.7% of the newborn in Latin America and the Caribbean suffers of low weight at birth (less than 2.500 gr.) which influences the great morbidity and neonatal deaths (6).

In 1990, infant mortality in South America was of 41 deaths per 1.000 live birth (fluctuating between 89 and 16 deaths per 1.000 live birth in Bolivia and Chile, respectively). According to the MDG 4, a reduction of 67% for 2015 is expected, but it had only been reduced by 55% up to 2010 (Table 4.5). In Peru and Guyana, that objective was practically achieved (66% in both of them), while the reduction in Uruguay and Ecuador was similar in both countries (62% in both of them). The reduction of infant mortality has had major limitations in Venezuela and Suriname (41% and 42% respectively) (1-4).

Table 4.5. Child mortality evolution in South America since 1990 and expected reduction according to Millennium Development Objective 4 for 2015.

Country	Deaths per 1,000 LB				Reduction (%) since 1990		
	1990	2000	2010 *	2015 **	2000	2010	2015 **
Argentina	25	18	12	8	30	52	67
Bolivia	89	60	50	29	33	44	67
Brazil	48	31	19	16	35	60	67
Chile	16	9	8	5	43	51	67
Colombia	26	23	21	9	13	21	67
Ecuador	43	27	16	14	38	62	67
Guyana	64	37	22	21	42	66	67
Paraguay	33	29	17	11	12	49	67
Peru	58	31	20	19	47	66	67
Suriname	35	35	20	12	1	42	67
Uruguay	20	15	8	7	26	62	67
Venezuela	27	21	16	9	22	41	67
South America	41	27	18	14	33	55	67

Note: (*) or last available year; (**) Reduction expected of two thirds regarding existing level in 1990.

Source: 1990 and 2000 data: ECLACSTATS, Access April 30, 2012; 2010 Data: IBS from PAHO 2010 and 2011; 2015 data: baseline projection 1990.

In 1990, the mortality rate in children under than 5 years old in South America was 51 deaths per 1.000 live births (fluctuating between 125 and 21 deaths per 1,000 live births in Bolivia and Chile, respectively). According to the MDG 4, a reduction of 66% for 2015

is expected, and it was already reduced by 62% in the year 2010 in South America. That year, the goal has already been met or surpassed in Guyana, Peru, Ecuador and Brazil (Table 4.6). Reduction had been more limited in Suriname and Paraguay (36% and 40% respectively).

The positive evolution achieved in childhood mortality reduction in the majority of the countries achieved during the first year of life, it suggests a health level similar to reduction observed in infant mortality rate, the specific mortality of the age group

1-4 years old has been associated to improvements in determinant factors including, among others, nutrition, sanity, incomes, maternal education and immunization, as well as a more effective and accessible primary health attention (1-4).

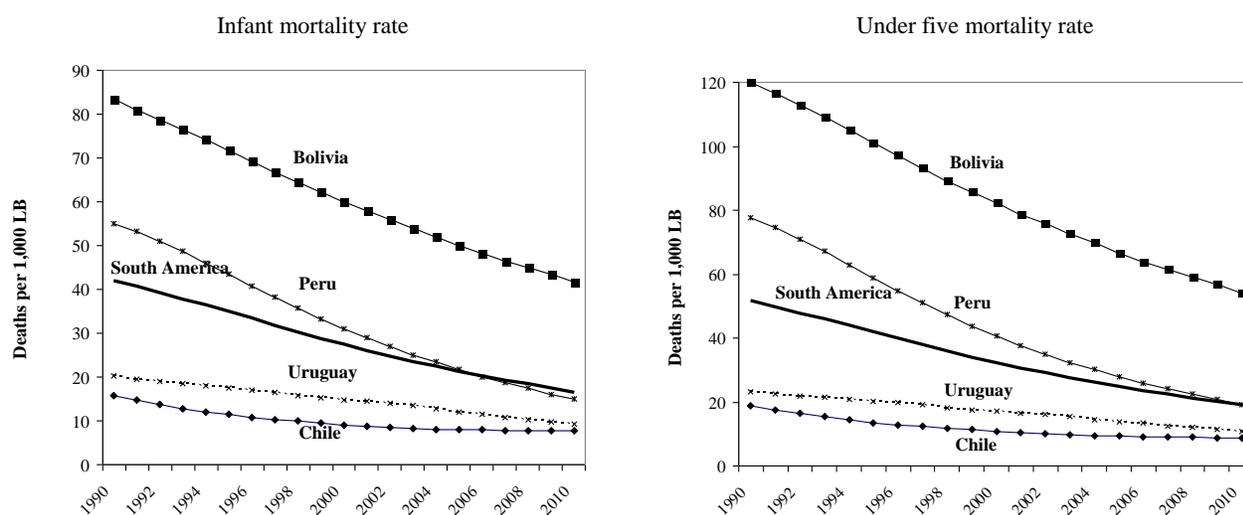
Table 4.6. Evolution of mortality of children under 5 years old in South America since 1990 and expected reduction according to Millennium Development Objective 4 for 2015.

Country	Deaths per 1,000 LB				Reduction (%) since 1990		
	1990	2000	2010 *	2015 **	2000	2010	2015 **
Argentina	29	20	12	10	32	58	67
Bolivia	125	82	50	42	34	60	67
Brazil	57	36	19	19	37	66	67
Chile	21	11	8	7	49	62	67
Colombia	35	27	21	12	23	41	67
Ecuador	57	33	16	19	43	71	67
Guyana	88	47	22	29	47	75	67
Paraguay	41	35	17	14	14	59	67
Peru	78	41	20	26	48	74	67
Suriname	48	40	20	16	17	58	67
Uruguay	23	17	8	8	26	67	67
Venezuela	33	25	16	11	25	52	67
South America	51	32	18	17	37	64	67

Note: (*) or last available year; (**) Expected reduction of two thirds as regards the existing level in 1990.

Source: Data for 1990 and 2000: ECLACSTATS, Access April 30, 2012; 2010 data: IBS from PAHO 2010 and 2011; 2015 data: Projection of the 1990 base line (4).

Fig. 4.1. Evolution of infant and under five years old mortality rate in South America from 1990 to 2010 and in countries with extreme levels in 1990



Source: ECLAC (2012) ECLACSTATS, revised April 2012 (4)

Fig. 4.1 shows the infant mortality trend in South America during the period 1990 to 2010 and the

countries with extreme levels in 1990. Bolivia and Peru had a highest level, whilst Uruguay and Chile had the

lowest (4). All the countries had experienced a reduction, in a rather asymptotical way. In Peru, infant mortality has had a significant reduction, reaching levels below the regional level. However, although in a minor degree, there is still a gap of mortality among countries which have extreme levels of mortality. Mortality in children less than 5 years old has had a similar trend (Fig. 4.2).

School health (5-14 years old)

The group of school age (5 to 14 years old) has a better health level than the other age groups. This is reflected, among other indicators, by a quite low mortality rate, with only 0.4 annual deaths per every one thousand inhabitants of that age. It fluctuates between 0.2 in Chile and 0.7 in Peru (Table 4.7) (3). However, it is possible to find nutritional problems in this age group, either due to deficit (consequence of chronic malnutrition) or excess, with overweight and obesity (3).

Table 4.7. Mortality by age groups in South American countries, towards 2006

Country	Specific mortality rate (per 1,000 pop) in groups of age			
	5-14 years	15-44 years	45-64 years	65+ years
Argentina	0.3	1.2	7.6	50.4
Bolivia	...	...	...	...
Brazil	0.4	2.3	9.0	47.5
Chile	0.2	1.0	5.1	41.2
Colombia	0.4	2.4	6.9	50.0
Ecuador	0.6	2.1	6.5	41.3
Guyana	0.6	3.1	10.4	43.1
Peru	0.7	1.6	7.3	47.3
Paraguay	0.5	1.2	7.5	57.7
Suriname	0.4	2.1	9.1	37.3
Uruguay	0.2	1.2	8.1	55.0
Venezuela	0.4	2.1	7.2	48.1
South America	0.4	2.0	8.0	48.5

Source: PAHO (2012), Table generator IBS, Access June 2012 (3)

Adolescent health (10 to 19 years old)

Adolescent health in general is of a relatively good level, compared to later ages. Relevant public health problems includes high risks of accident, use of

tobacco, alcohol and drugs, irresponsible sexual behavior predisposing to unwanted pregnancies; these problems are higher in adolescents with less educational level and more poverty and social vulnerability (3).

Adult health (15 to 64 years old)

In 2006 (or last available year), general mortality in the group from 15 to 44 years old was 2.0 per one thousands of inhabitants of that age, increasing to 8.0 in the group 45 to 64 years old. The minor level of mortality was recorded in Chile with a rate of 1.0 and 5.1 per one thousand inhabitants respectively, and the major level was registered in Guyana with 3.1 and 10.4 deaths per one thousand inhabitants respectively (Table 4.7) (3). As people grow older, there is a progressive increase of prevailing non communicable chronic diseases.

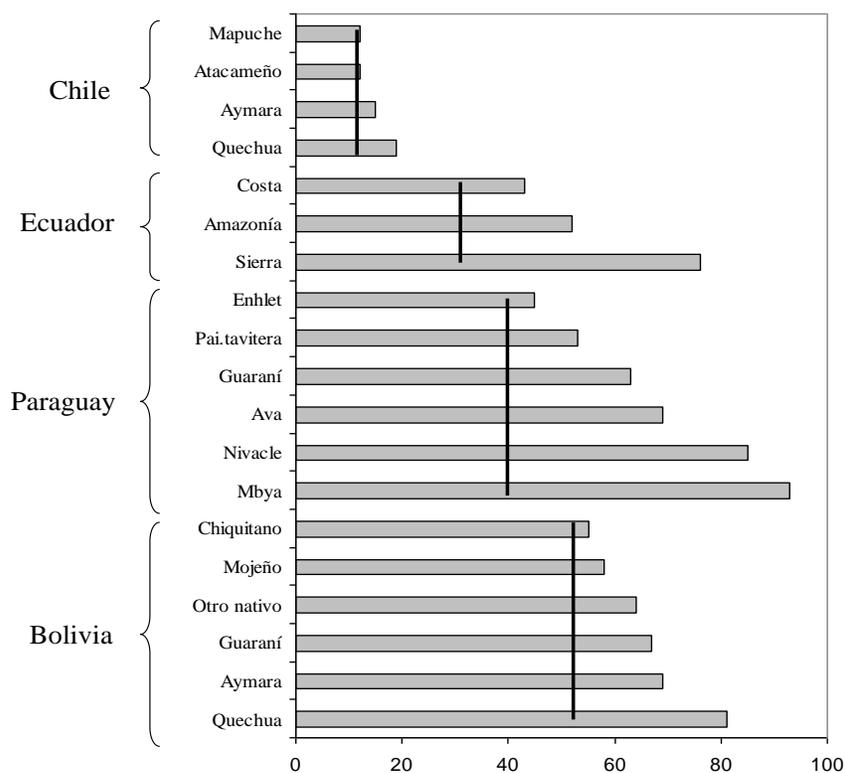
Elderly health (65 years and more)

In 2006 (or last available year), general mortality in the group of 65 years old and more, was 48.5 per one thousand inhabitants of that age, fluctuating between 57.7 and 37.3 deaths per one thousand inhabitants of 65 years old and more, recorded in Paraguay and Suriname respectively (Table 4.7) (3).

Workers health

Workers health has more support and security in countries, regions and job sources which count with major resources, education and occupational risk prevention mechanisms. On the contrary, job accidents and occupational diseases have higher incidence in some risky productive areas, such as mining, agriculture and building, and in small business. (7)

In spite of its importance, available official sources do not include the necessary information on health at working places, where there are great informality and less risk prevention, since they are less concern to routine statistics and in general there are no job insurances involved. Furthermore, experts on risks prevention and job security (as well as support medical centers) tend to concentrate in formal enterprises of a certain economic and productive importance and that tend to affiliate to public or private job insurance systems. (7).

Fig. 4.2. Infant mortality in native population or territories, in selected countries of South America, 2006

Source: ECLAC (2006) Social Panorama 2006 (LC/G.2326-P) (8)

Health in native and afro-descendant groups

Native and afro-descendant groups tend to have higher social vulnerability, under the influence of factors such as living in rural or isolated sectors, less access to education, formal employment and income, less conditions of sanitation, housing and living conditions with higher risk of communicable diseases and less access to health protection measures such as immunization and childbirth qualified attention (8). These groups have higher morbidity and mortality rates than other population groups, especially due to avoidable health events. There are difficulties in access to formal health services, due to distance, lack of centers, resources or personnel, as well as cultural differences. There is no consolidated quantitative information representative of health in native and afro-descendant groups in South America (8).

Higher health vulnerability of native and afro-descendant groups is represented by the level of infant mortality reported in native people of territories in four selected South American countries (fig. 4.2, 2006). Mortality rate is systematically higher than in non-native population, especially in Ecuador and Paraguay (8).

Social and health vulnerability increases with migration, particularly to big cities, loss of territories and cultural identity. Nevertheless, there are also inhabitants of native groups who believe that their quality of life has healthy aspects, and their culture and lifestyle follow the vision of the balance between natural and spiritual aspects and between individuals and their community (8). Furthermore, there is no a single intercultural model of health.

Health of disabled

It is estimated that 85 million people live with some kind of disability in Latin America, but only 2% of them are supported in their needs. In general, health systems have no capacity to address the matter in its real dimension and a minimum capacity of sector response (9). In spite of the importance of the problem, there is no major quantitative consolidated information representative of health of people with disability in South America. The problem of disability, which increases with age and in groups of population with major risk and social vulnerability, requires a global social support approach, including a multi-sector approach which highly transcends the possible efforts of health sector.

The causes of disability include: congenital problems, chronic progressive limitations and diseases of the elderly, malignancies and road accidents. In countries with less economic development, causes of disability also include infectious diseases, violence, malnutrition, and pregnancy and childbirth complications. (9)

Lack of response from the health sector is due, among several factors, to the lack of specific policies and laws, lack of research and deeper knowledge on the matter, lack of financial and human resources to assist, mitigate or to support the corresponding rehabilitation.

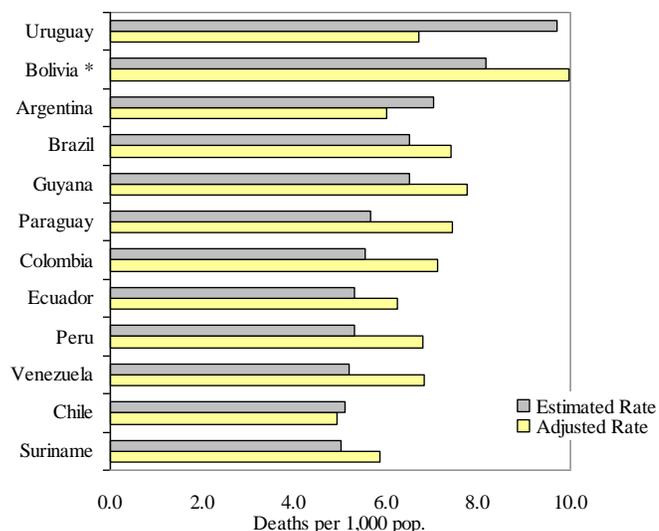
Mortality and trends

During the period 2007 to 2009, general mortality in South America was of 6.8 annual deaths per one

thousand inhabitants. The highest level of mortality estimated was registered in Uruguay (9.7 per one thousand inhabitants), related to the higher proportion of elderly in that country. When comparing adjusted rates of mortality, the country with the highest level is Bolivia (10.0 deaths per one thousand inhabitants), related to a greater excess of avoidable deaths (Fig. 4.3). On the other hand, Chile outstands for having less estimated and adjusted rates (5.1 and 4.1 per one thousand inhabitants, respectively).

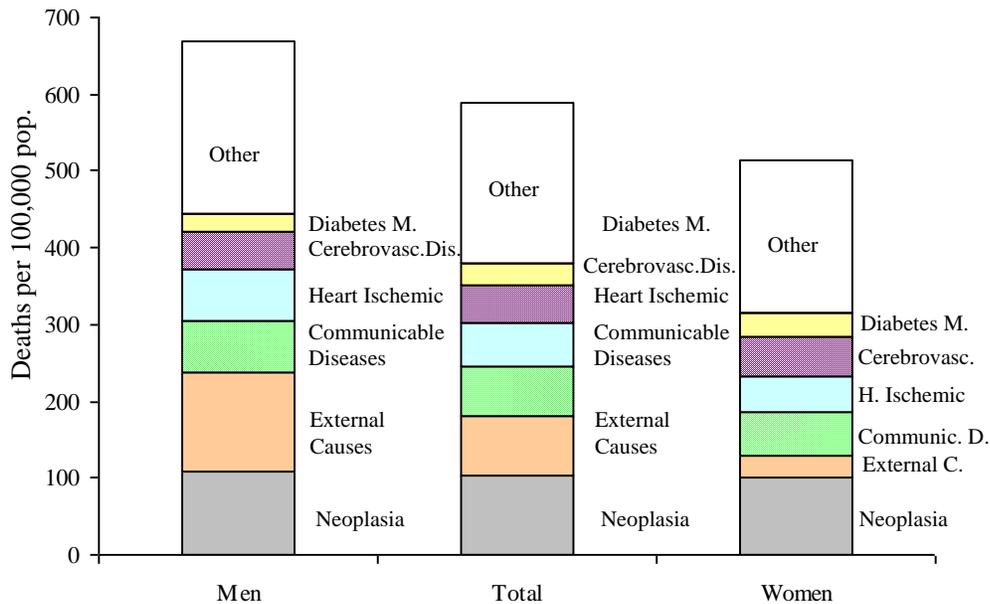
Men have a higher mortality rate than women, especially from external causes (Fig. 4.4). Countries such as Bolivia have the highest specific adjusted death rate due to communicable diseases and the lowest mortality rate due to circulatory system diseases (Fig. 4.5) (2).

Fig. 4.3. Estimated (corrected)* and adjusted, general mortality in South American countries, 2007 to 2009.**



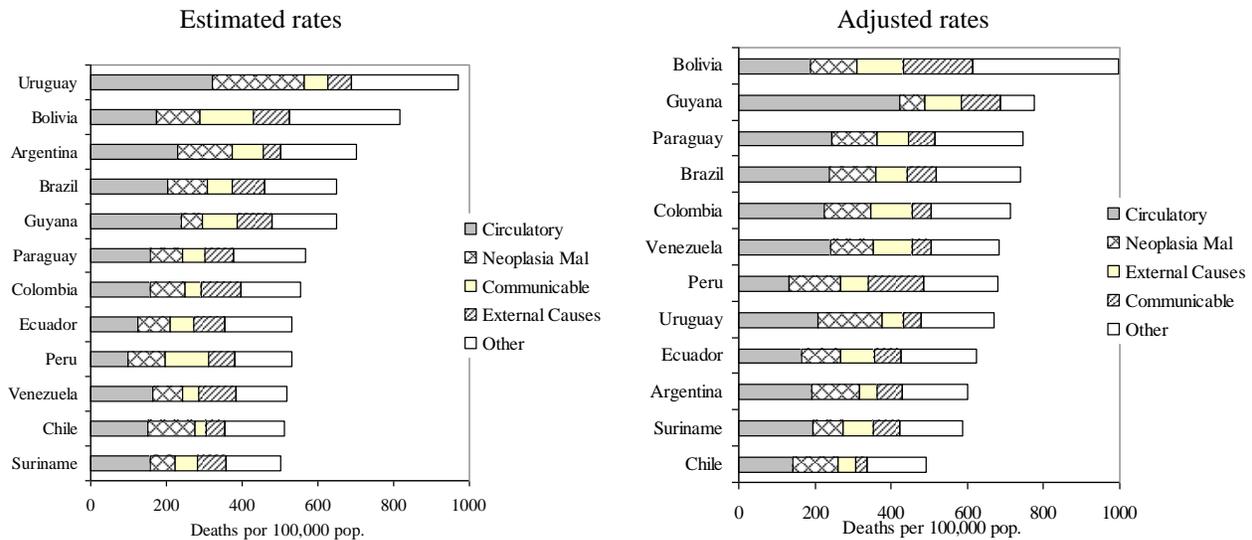
Note: * Modified: according to estimation of national sub-records; ** Adjusted by age and gender. Bolivia: 2002 to 2004. Source: PAHO (2011), 2011 Basic Health Indicators (2).

Fig. 4.4. Main mortality causes in South American men and women, period from 2007 to 2009



Source: PAHO (2011), Health Situation in the Americas. Basic Indicators 2011 (2).

Fig. 4.5. Main mortality causes in South American countries, period 2007 to 2009.

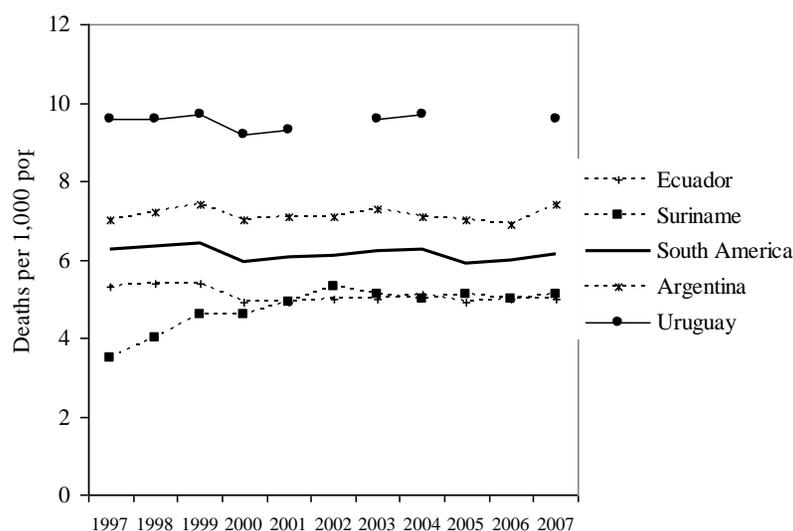


Note: Last available information from Bolivia: 2000-2004.

Source: PAHO (2011), Health Situation in the Americas. Basic Indicators 2011 (2).

General mortality has been maintained relatively steady in the period 1997 to 2007 (Fig. 4.6), since there has been a gradual aging process of the population, but there is a gradual mortality reduction in specific causes of mortality according to groups of age (3). The highest level of this trend is in Uruguay

and Argentina, while the lowest level is found in Ecuador and Suriname (which have much younger population). Mortality in this last country even increased between 1997 and 2002. This is probably influenced by an improvement in the coverage of the deaths records in these countries, especially in Suriname.

Fig. 4.6. General mortality evolution in South America, 1997 to 2007.

Source: PAHO (2012) Generator of IBS Tables of the Americas, Access June 2012 (3).

Table 4.8. Mortality by communicable diseases in South American countries, 2007 to 2009.

Country	Deaths due to Communicable Diseases per 100,000 pop.					
	Total		Men		Women	
	Estimated	Adjusted	Estimated	Adjusted	Estimated	Adjusted
Argentina	81.3	68.6	82.0	80.6	80.6	58.9
Bolivia	140.7	182.3	149.9	197.6	131.6	169.3
Brazil	66.1	74.8	73.1	86.3	59.5	64.5
Chile	30.8	29.8	32.0	34.3	29.6	25.6
Colombia	43.2	51.5	51.9	63.3	34.8	40.8
Ecuador	62.3	70.8	70.3	81.8	54.4	60.3
Guyana	92.2	103.8	106.6	120.9	77.1	85.9
Paraguay	58.7	72.0	64.4	80.1	53.5	64.4
Peru	114.7	145.5	126.0	165.5	103.6	126.9
Suriname	59.7	66.7	69.2	81.6	50.1	53.4
Uruguay	62.7	44.9	62.5	52.3	63.1	38.6
Venezuela	41.3	51.9	46.9	59.8	35.8	44.4
South America	66.8	75.3	73.4	87.0	60.6	64.9

Note: * Modified: according to estimation of national sub-records; ** Adjusted by age and gender. Bolivian data of 2002-2004 (last available year).

Source: PAHO (2011), 2011 IBS Brochure (2).

Morbidity and trends

The most relevant morbidity issues representing public health problems in countries of South America include communicable diseases and non-communicable diseases, especially chronic diseases, malignant neoplasm, nutrition diseases, mental disorders and accidents and violence.

Communicable diseases

Communicable diseases, especially those that could be reduced through adequate prevention and control (and effective primary health care), affect preferment millions of poor and vulnerable people in South America who have adverse conditions of life quality and less access to promotion, prevention and lack of access to effective healthcare.

Emergent and re-emergent diseases are becoming a growing threat to world security in health matters, with outbreaks which could appear in a country or region

but then could be disseminated to other areas. Some outbreaks of emergent or re-emergent diseases (like avian flu) at worldwide level have required international interventions in public health matters. This has provided a learned lesson when using improved surveillance and capacity to respond.

The experience obtained with the response organized by different countries to face new diseases has provided important lessons learned. It also has facilitated the acceptance and use of the International Health Regulation (IHR) (6).

During the period 2007 to 2009, mortality by communicable diseases in South America reached 66.8 annual deaths per every 100,000 pop., being higher in men than in women (73.4 and 60.6 respectively) (Table 4.8) (3). It is greater in countries with less socio economic level, rural areas and lower health conditions such as Bolivia and Peru, and it is lower in Chile, Venezuela and Colombia.

a) Diseases transmitted by vectors.

In 2010, 564 thousand cases of *dengue* in South America were reported, being 41,704 of them of the hemorrhagic type, with 221 deaths. Dengue is epidemic in Argentina: In 2009 there was a dengue fever outbreak with 26,923 confirmed cases and 5 deaths. In 2009 there was a dengue fever epidemic in Bolivia, with 84,000 suspicious cases, 7,421 confirmed cases and 25 deaths (two thirds in the Department of Santa Cruz). Around one million cases were notified in 2010 in Brazil (found in all the States) with 17,489 of them severe and 656 deaths. In 2010, there were 23 cases of dengue fever confirmed in Eastern Island (3,500 Km from continental territory of Chile). In 2010 there was an epidemic in Colombia with 157,152 notified cases, of which 6% were serious (lethality of 2,3%). Dengue fever is endemic and seasonal in Ecuador, with a few cases registered in 2010. In Suriname during 2010, 61,468 cases and 1 death were recorded.

In 2010, 13,559 cases were confirmed in Paraguay. In Peru in 2010, 13,031 cases of dengue fever were registered. In 2007 there was an epidemic outbreak in Venezuela and then another in 2010, with rates of 293.2 and 433.1 per 100,000 pop., respectively (10). In South America, 15.8% of the population lives in areas at risk of malaria, with the highest proportion in Guyana (92.6%) (2,10). More than a half million of *malaria* cases were reported (564,000 cases), most of them registered in Brazil and Colombia (Table 4.9) (2). The annual cases of malaria in Argentina and Bolivia during 2006-2010 dropped, with 13,769 confirmed cases in 2010. In Brazil In 2010, 335,000 cases were reported and the legal Amazon is highly endemic (over

90% of cases occur in that region). Malaria is mainly linked to changes in extractive economic activities that generate internal migration and temporary rural settlements.

Table 4.9. Risk and malaria cases in South American countries, 2010

Country	Pop in areas under risk of malaria	IPA malaria	Reported Cases
	%	* 1000 hab	Thousands
Argentina	0.0	0.0	0.1
Bolivia	12.8	10.7	13.8
Brazil	22.8	13.5	334.6
Chile	0.0	0.0	0.0
Colombia	14.5	17.3	117.5
Ecuador	3.1	2.6	1.9
Guyana	92.6	32.7	22.8
Paraguay	...	0.1	0.0
Peru	5.0	3.8	36.9
Suriname	14.9	6.9	0.5
Uruguay	0.0	0.0	0.0
Venezuela	23.4	5.4	35.8
South America	15.8	9.9	564.0

Source: PAHO (2011) Brochure IBS 2011 (2).

In Colombia, epidemic cycles occur every two to seven years, with 100 to 120,000 cases annually. In Ecuador the annual number of cases dropped in 2006 from 8,957 to 1,870 in 2010. In Guyana, 38,984 cases of malaria were reported in 2005 and 22,840 cases in 2010. Between 1990 and 2010, the incidence rate of malaria (annual parasite index) dropped from 0.79 to 0.004 in 2010 per 1,000 inhabitants in Paraguay.

The annual cases of malaria in Peru were 87,669 in 2005 and 36,886 in 2010. The coastal area of Suriname is currently free of malaria, but the transmission continues in the interior areas. The annual parasite index (API) increased from 5.92 in 2006 to 8.30 in 2010; almost a quarter of the population lived in areas at risk of malaria in Venezuela, with 35.828 cases per year (2,10).

In 2008, there was resurgence of jungle *yellow fever* in Argentina, with 9 confirmed cases and an episode in 2009, with two deaths. In Bolivia, the yellow fever cases dropped dramatically. In Brazil from 1990 to 2010 there were 587 cases and 259 deaths from yellow fever. No new cases have been reported in Ecuador since 2002. In Paraguay in January 2008 an outbreak of yellow fever was declared, with 27 cases and 10 deaths in four defined zones. In Peru there are yellow fever enzootic areas in the Amazon jungle, with sporadic outbreaks. From the 63 cases reported in 2010, 18 were confirmed and 14 deaths occurred. There are no reported cases of yellow fever in Suriname. In

Venezuela two cases of yellow fever were confirmed in 2008 (10).

Chagas disease in Argentina is in reduction, with 5 cases reported in 2010. In Bolivia, the Chagas is endemic in 168 municipalities. The department of La Paz has lowered the infestation rate in 2010, with a rate of 0.4% at home and 0.9% around the home. It is estimated that the prevalence in Brazil is 0.01%. Between 2000 and 2010, 1007 cases were reported of acute Chagas disease, of which 73% were transmitted orally. In Ecuador, the prevalence of Chagas was 0.03% in 2010, mainly affecting the provinces of Loja, El Oro, Guayas and Manabí, Orellana and Sucumbíos. The prevalence of Chagas in Guyana is unknown. From 2008, the interruption of vector transmission in the eastern region of Paraguay was certified. The prevalence of *Trypanosoma cruzi* in blood banks of endemic areas in Peru was 0.8% and in Suriname was 0.12%. The prevalence rate in Venezuela was 4.31% in 2010 (10).

Visceral **leishmaniasis** is a new phenomenon in northeastern Argentina, with 21 cases reported in 2010. In 2009, 150 cases of leishmaniasis were reported, 64% of which corresponded to the northwest and to 33% to the northeast. In 2010, 1,810 cases of cutaneous and mucocutaneous leishmaniasis were reported in Bolivia (17.4 cases per 100,000 pop.). Visceral leishmaniasis or Kala-azar is presented in 21 states of the five regions of Brazil, particularly in the periphery of big urban centers. In 2010 there were 22,397 cases of American tegumentary leishmaniasis in the country. There are 14,700 annual cases of leishmaniasis in Colombia (mostly military personnel stationed in forested areas). Cutaneous leishmaniasis is widespread in Ecuador especially in rural areas; about 1,500 cases per year are reported (with no registration in remote rural areas). Leishmaniasis is common in inland communities of Guyana (areas of mining and forest exploitation). In Paraguay Tegumentary leishmaniasis occurs in places where there are still tropical rainforest. In 2010, 37 cases were registered.

Annually, about 8,000 cases of leishmaniasis are reported in Peru, widely distributed in the mountains and jungle. In 2010, 7,689 cases were reported, 95.0% of the cutaneous form. American cutaneous leishmaniasis in 2006-2009 showed an average of 2,400 cases annually. Visceral leishmaniasis averaged 21 cases per year in Venezuela (10).

b) Vaccine-preventable diseases

Between 2006 and 2010, most countries did not report cases of **measles** due to native transmission, with this problem currently considered in process of elimination.

The last cases in Bolivia were confirmed in 2007. Outbreaks remain in indigenous areas of Ecuador. Imported cases were reported in Venezuela in 2007, and in Argentina in 2009 and 2010. Most countries reported no cases of **rubella** between 2006 and 2010, while others stopped registration of yearly cases by 2009, like Venezuela in 2007. Brazil reported the last case of rubella in 2008. Argentina and Brazil reported the last case of congenital rubella in 2009. The implementation of the strategy of eliminating rubella helps to consolidate **measles** elimination in the Region. Between 2006 and 2010, the national coverage of measles, **parotiditis** and rubella vaccine, was virtually universal in the different countries. All countries have integrated surveillance of rubella and measles, although it needs strengthening. It should be taken into account that areas of limited surveillance with less health care resources could have higher underestimated registry (10).

Tetanus cases have been reduced from the widespread use of tetanus toxoid, both in children and in women in childbearing age, linked to the prevention of **neonatal tetanus**. Sporadic cases of tetanus are reported in Chile, Bolivia, and Uruguay. About one or two cases a year of neonatal tetanus are reported in Bolivia, Paraguay, Venezuela, and one case in Peru (2009) (10).

The reporting rate of **hepatitis B** for the 5 years period, 2006-2010, remains stationary in Argentina, with 435 cases of hepatitis non-A (B, C, others) (rate of 13.42 per 100,000 pop.) in Uruguay.

The annual cases of **diphtheria** have declined significantly, as a result of using expanded immunization programs (EPI programs). There are isolated diphtheria cases in Bolivia (2010) and Paraguay. Between 2006 and 2010, there was the maintenance of **pertussis** remained stable in countries such as Argentina or Chile, with outbreaks in extreme groups of age (under 1 year old and elderly).

No cases of **polio** or circulating wild poliovirus were reported, although there was a low proportion of flaccid paralysis linked to the vaccine, as in the case of Bolivia (1.05 to 1.08 per 100,000 pop. vaccinated) (10).

In 2009 the **pandemic influenza A (H1N1)** affected the countries in South America. It was reported that the virus A (H1N1) caused 4,037 cases in Chile, 7,916 cases in Paraguay and 4,801 cases in Colombia in 2009. The vaccine to fight the pandemic influenza A (H1N1) was available in the countries in early 2010.

Between 2006 and 2010, the annual incidence of **parotiditis** declined 40% in Argentina and is maintained with annually reported cases in Chile and Peru. Between 2007 and 2008, there was an outbreak of

parotiditis in Venezuela, with more than 125.000 cases (474 per 100.000 pop.) but in 2010, the rate of *parotiditis* was 11.6 per 100,000 pop. in this country (10).

In the 2006-2010 five years period, countries continued to expand the vaccine schemes and to strengthening national immunization programs, either on a regular basis or campaigning to get an extended coverage. The following examples of the national immunization programs stand out (10):

- **Argentina:** In 2005 the vaccine against hepatitis A was added to different target groups, reaching 90.4% of newborns in 2009.
- **Bolivia:** Since 2006, the number of vaccines of the program reaches 13. It is also seasonal used against the flu and influenza A (H1N1), and was a pilot experience of the vaccine against human papilloma virus. There was a national campaign against yellow fever (85.6% coverage).
- **Brazil** has a large scheme in the national program. In 2010, the decavalent and pneumococcal vaccine were introduced.
- **Colombia:** has a broad scheme in the national program, but in 2010, there has been a decline in immunization coverage (under 90%).
- **Ecuador:** the seasonal influenza vaccine was incorporated (2006), rotavirus (2007) and the anti-pneumococcal (2010).
- **Guyana:** the rotavirus vaccine was incorporated (2010), as well as the pneumococcal vaccine (2011). Vaccination coverage is high, but has limitations within the country.
- **Paraguay:** rotavirus vaccines (2010) and pneumococcal (2011) were incorporated into the national immunization schedule.
- **Peru:** expanded the immunization schedule in the country, reaching 16 vaccines. The pneumococcal, rotavirus, influenza and pandemic influenza vaccines were introduced. The Accelerated Plan Against Yellow Fever was launched (2007) and the vaccination against hepatitis B (2008), alongside with various other campaigns reinforcing and extending coverage, achieving a high level of coverage on them.
- **Suriname:** The seasonal influenza vaccine and type A (H1N1) were included (2009 and 2010 respectively). Vaccination against hepatitis B is applied in health personnel. The coverage has increased to over 90%, but there are still pockets of low coverage of vaccination, particularly in the interior of rural areas and in some coastal communities.
- **Uruguay:** The immunization program, free and

obligatory and with an increase of the immunization schedule, has achieved universal coverage and has been effective in reducing the incidence of immune preventable diseases (10).

c) Zoonoses

Relevant zoonoses situation reported in countries include (10):

- In 2008, the last case of human rabies was registered in **Argentina**, with 6 cases in animals in 2009. An annual average of 384 cases of hydatid disease were reported between 2006 and 2009. Trichinosis showed an increasing trend, with a rate of 0.26 per 100,000 pop. in 2006 and 1.6 per 100,000 pop. in 2010. In the first 10 months of 2011, there had been 205 cases of canine rabies registered in **Bolivia**. In 2010 there were 49 cases of leptospirosis.
- Between 2006 and 2010, zoonoses and diseases transmitted by vectors in **Brazil** were the most commonly occurring and caused 40% of communicable diseases notifications.
- Hydatid disease (CE) is endemic in **Chile**, with 220 cases in 2010 (2.1 cases per 100,000 pop.). Hydatidosis causes 30 to 40 deaths per year (0, 2 deaths per 100,000 pop.). There were five cases of brucellosis in 2010, with a rate of 0.03 cases per 100,000 pop., 14 cases of trichinosis, (0.08 cases per 100,000 pop.). Not human rabies recorded since 1996.
- Notification of brucellosis is low (there is an under registration) in **Colombia** and the same happens with leptospirosis.
- In 2010 there were 74 outbreaks of aphthous fever in **Ecuador**. In 2009 there was one case of human rabies. No cases of plague were recorded.
- **Guyana** is considered free of aphthous fever since 2001, although the surveillance is maintained along the borders.
- **Paraguay** has had no cases of aphthous fever since 2006 (although there was a small outbreak in 2011).
- There was a case of human rabies in **Peru** in 2006 and another in 2010, and there are small outbreaks in rural areas, with 13 cases in 2010. Plague is concentrated in areas of extreme poverty, with 24 cases per year. Also important is the hepatic fascioliasis (highland areas), with prevalence of up to 30% of children, and hydatidosis, with morbidity (according to inpatient records) of 530 per 100,000 pop. and a death rate between 1% and 12% (10).
- There were no reported cases of human rabies or plague in 2006-2010 in **Suriname**. In 2010, 291 cases of cutaneous leishmaniasis were diagnosed. There are no reported cases of porcine flu, FMD or

carbuncle.

- There are no reported cases of human or canine rabies in **Uruguay**. The hantavirus is endemic, with 18 cases in 2010. Leptospirosis is endemic, with epidemic outbreaks with 97 cases (2.99 cases per 100,000 pop.) In 2010, there were 15 cases of brucellosis. Hydatid disease is endemic in some areas.
- There is occasional human rabies in **Venezuela**, no plague cases were reported between 2006 and 2010. (10).

Table 4.10. Prevalence of HIV / AIDS in 15 to 49 years old population South American selected countries, 1999 to 2009

Country	Prevalence (%) in the 15-49 years old pop.				
	1990	1995	2000	2005	2009
Argentina	0.3	0.3	0.4	0.4	0.5
Bolivia	0.1	0.2	0.2	0.2	0.2
Chile	0.0	0.1	0.2	0.3	0.4
Colombia	0.2	0.6	0.9	0.7	0.5
Ecuador	0.3	0.5	0.5	0.4	0.4
Guyana	2.8	2.2	1.5	1.1	1.2
Paraguay	0.0	0.2	0.3	0.3	0.3
Peru	0.4	0.5	0.5	0.4	0.4
Suriname	0.1	0.7	1.0	1.1	1.0
Uruguay	0.1	0.2	0.3	0.5	0.5

Source: ECLAC (2012), Access ECLACSTATS June 2012 (4).

The proportion of HIV-positive people with advanced HIV infection with access to antiretroviral drugs in 2006 and 2009 was very variable between countries, because while in Brazil and Chile it exceeded 60%, in Bolivia it was less than 20% and in Ecuador around 30% (figure 4.7) (11).

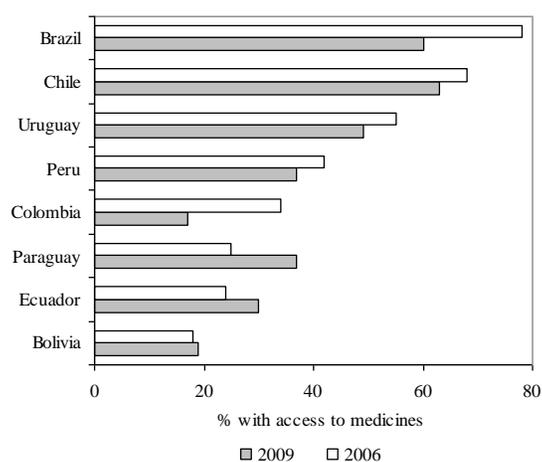
The relevant situation reported on HIV/AIDS in countries between 2006-2010 include (10):

- Between 2006 and 2009, the estimated prevalence of HIV in **Argentina** was 0.4% in population older than 15 years old. Approximately there are about 110,000 people infected with HIV. The reported incidence in 2009 was 16.4 cases in men and 9.6 women per 100,000 pop.
- In 2010, 6,176 cases were reported in **Bolivia**, with a prevalence of 0.05%. It is estimated that the country has about 12,000 people with HIV/AIDS.
- Approximately there are 630.000 people aged 15 to 49 years old with HIV/AIDS in **Brazil**. The

d) HIV/AIDS and other sexually transmitted infections

From 1990 to 2009, the estimated prevalence of HIV/AIDS on population 15 to 49 years old has had a different evolution between countries, with low levels in countries like Bolivia with 0,1% (probably also a problem of underreporting) and higher levels in Argentina, Uruguay and Colombia (0,5%). It has remained relatively stable in several countries since 2000, as in Bolivia, Paraguay, Peru, Suriname, while in Uruguay and Chile, there has been a gradual increase (Table 4.10) (4).

Figure 4.7. Proportion of HIV positive patients with advanced infection and access to antiretroviral drugs 2006 and 2009



Source: ECLAC 2011 based on UNDP MDG (11).

prevalence in the age group 15 to 49 years stays around 0.6% (0.4% in women and 0.8% in men). In 2010 they reported 34,212 new cases and 11,965 deaths (6.3 deaths per 100,000 pop.).

- It is estimated that in 2009 there were 40,000 HIV carriers in **Chile**, with a prevalence of 0.4% (12 carriers per 100,000 pop.). Case-fatality rate has tended to drop, with increased survival due to the granting of access to antiretroviral treatment.
- Between 1983 and 2009, 71,653 reported cases of HIV/AIDS in **Colombia** (6,924 reported in 2009), focused on high-risk groups. Blood donors were HIV positive 0.34% in 2009.
- Between 2005 and 2010 there was an increasing trend of HIV and AIDS cases in **Ecuador**, of 1,070 HIV cases and 474 AIDS in 2005 to 3,966 and 1,301 in 2010, respectively. The mortality rate has stabilized since 2005 at about 700 deaths annually.

- The prevalence of HIV infection has been dropped in **Guyana**. Between 2004 and 2009, the estimated prevalence of HIV among adults dropped from 2.2% to 1.1%. The proportion of deaths attributed to AIDS fell from 9.5% in 2005 to 4.7% in 2008.
- In 2009, the incidence of HIV / AIDS in **Paraguay** in 2009 was 15.1 per 100,000 pop. (an increase of 71% over 2005 notifications).
- In 2009, 3,042 cases of HIV and 12,041 cases of AIDS were reported in **Peru**, with treatment covering around 16,000 people.
- The prevalence of HIV / AIDS in **Uruguay** was 0.42% for 2008-2009. The AIDS mortality rate in 2009 was 5.05 per 100,000 pop.
- In 2009, the estimated prevalence of HIV infection was 1.1% in adults (groups of 15 to 49 years) in **Suriname**, with mortality in 2009 of 20.2 deaths per 100,000 pop. (21.5 in men and 18.9 in women).
- In 2006, there were 1,733 deaths from HIV / AIDS in **Venezuela** (6.1 deaths per 100,000 pop.) (10).

Other sexually transmitted diseases reported in countries include (10):

- The incidence of congenital syphilis remained about 1 per 1,000 live births in the period 2006-2010 in **Argentina**.
- In 2007, 43.7 cases of syphilis and genital ulcer per 100,000 pop. were reported in **Bolivia**, with chlamydiae (prevalence of 10.5%), trichomonas (4.6%), syphilis (2.6%) and gonorrhoea (0.5%). The infection by congenital syphilis still is an important public health problem, affecting 7.2% of pregnant women and 11 per 1,000 live births.
- Annual rate incidence of syphilis in 2008 was 16.6 cases per 100,000 pop. in **Chile**; 2.2% corresponded to congenital syphilis. In 2008, higher proportion of cases was notified in women (53%) and the age group most affected was the 20-24 years old. The incidence rate of gonorrhoea was 5.6 cases per 100,000 pop. in 2008. In 2003, 0.1% of the population over 17 years was a carrier of hepatitis virus B. Around 15% of women with active sexual life carried human papilloma virus.
- In **Ecuador**, in 2009 215 gestational syphilis cases and 111 congenital syphilis cases were notified, 2,308 cases of gonorrhoea (16.5 per 100,000 pop.) and 1,697 cases of genital herpes (12.1 per 100,000 pop.).
- The prevalence of prenatal syphilis in **Guyana** was 2.4% in 2004 and 0.7% in 2006, but no cases of congenital syphilis were reported in 2009.
- Congenital syphilis has increased in **Paraguay**, reaching 14 cases per 1,000 live births in 2010.
- In **Peru**, 442 cases of congenital syphilis were reported in 2008, and 376 in 2009.
- In **Suriname**, the number of reported cases of genital ulcers, including syphilis and genital herpes, was 122 cases in 2005 and 148 cases in 2008.
- In **Venezuela**, 81 annual cases of congenital syphilis were reported in the period 2007-2009, and 115 cases in 2010 (10).

e) Tuberculosis

In 2009, South America recorded more than 288,000 cases of tuberculosis (TB) (prevalence rate of 73 cases per 100,000 pop.), with more than 47,800 annual deaths (mortality rate of 12.2 deaths per 100,000 pop. Incidence rates are highest in Peru, Bolivia and Guyana. Between 1990 and 2009, the incidence of TB in South America dropped from 174 to 74 cases per 100,000 pop., while mortality was similar, with 12 deaths per 100,000 pop. (4). There has been a marked decrease in mortality in some countries with high mortality, such as Peru (down to less than a tenth), Ecuador (down to a third). In this period, Bolivia lowered mortality by almost half, although the country remains with the highest rate (21.0 per 100,000 pop.

The relevant situation on reported tuberculosis in countries, include (10):

- In 2009, 10,657 cases were reported (26.6 cases per 100,000 pop.) In **Argentina**. The death rate was about 2 per 100,000 pop.
- The incidence of tuberculosis was 76.1 per 100,000 pop. in **Bolivia**.
- In 2010, 71,000 new cases were reported in **Brazil** (7.2 cases per 100,000 pop. In 2009, 4,800 deaths by tuberculosis were reported (including cases of co-infection with HIV).
- The TB incidence rate was 13.8 cases per 100,000 pop. in 2008 in **Chile**.
- In 2010 there were 11,433 new TB cases in **Colombia** (incidence of 25.1 cases per 100,000 pop.).
- In 2010, the prevalence of tuberculosis in **Ecuador** was 8.24 cases per 100,000 pop. Between 2009 and 2010, of 5,764 TB patients, 870 cases were co-infected with HIV.
- In **Guyana**, the prevalence of infection of tuberculosis fell to 14.8 cases per 100,000 pop. in 2008.
- The incidence of all forms of tuberculosis in **Paraguay** was reduced to 32.8 cases per 100,000 pop. in 2010 (in the incidence in indigenous population was 117 cases per 100,000 pop.).
- The morbidity rate from tuberculosis in **Peru** dropped to 108.5 cases per 100,000 pop. in 2010. That year, 31,984 new cases were reported, and 697 cases were

TB co-infected and human immunodeficiency virus. With the growing epidemic of HIV infection, the number of TB cases increased to 177 (34 cases per 100,000 pop.) in 2009.

- In 2010, 91,589 cases of respiratory TB were reported in **Venezuela** (3,252 new smear positive cases) (10).

f) Unattended Diseases

During 2005, the region registered a prevalence rate of **leprosy** of 0.39 per 10,000 pop. and a detection rate of 4.98 per 100,000 pop. Multibacillary (MB) cases range from 9.6% in Bolivia and to 1.3% in Argentina. The proportion of new cases with grade II disability also varies across the different countries. In 2010, 354 new cases of leprosy were reported in Argentina (detection rate of 0.9 per 100,000 pop.). Prevalence of leprosy in Brazil decreased, with 34,894 new cases in 2010 (1.56 cases per 10,000 pop. In 2010 Colombia reported 283 new cases of leprosy, (incidence of 0.61 cases per 100,000 pop.). In 2010 a total of 134 new cases of leprosy were detected in Ecuador. Between 2006 and 2010 Peru reported 67 new cases of leprosy occurred in the Amazon jungle. In 2010, in Uruguay there were 11 cases of leprosy in over 5 years old. In 2010 there were 63 cases of leprosy in Guyana (prevalence was 0.04 cases per 100,000 pop.), with an average annual detection of 26 new patients. In 2010 there were 392 new cases of leprosy in Paraguay. In 2009, 38 new cases of leprosy were detected in Suriname (0.7 per 10,000 pop.). During the period 2006-2010 there was an annual average of 650 new leprosy cases in Venezuela. (10).

Bolivian hemorrhagic fever killed 15 people in the period 2006-2010 in an endemic area of Bolivia. There is little information on the frequency of lymphatic filariasis in Brazil, restricted to some specific areas, in four municipalities. In 2010, 41,167 schistosomiasis cases were reported with a geographical distribution concentrated in the Northeast. Ecuador managed to interrupt transmission of onchocerciasis.

Lymphatic filariasis (LF) is endemic in Guyana, with 32 cases in 2007. Suriname is in the process of checking the interruption of the transmission of LF. In 2009 and 2010, Suriname reported 8.7% overall

prevalence of schistosomiasis, with a higher prevalence of helminthiasis in the interior. In Venezuela, onchocerciasis is in an interrupted transmission stage in the North-East Focus but still continue in the South Focus (10).

g) Emerging diseases

Between 2002 and 2008 there were sporadic cases of **cholera** in Brazil. While there are currently no cases of cholera in Suriname, the risk has increased due to frequent migration within the region with active cholera outbreaks. No cases of cholera were reported in Venezuela in the period, but 32 outbreaks of illness transmitted by food were investigated (10).

Between 2007 and 2011 there were 734 cases of **Hantavirus** in Brazil. In 2010, 14 cases of Hantavirus reported with 4 deaths in Bolivia. In 2010, there were 59 cases of Hantavirus in Chile (0.35 cases per 100,000 pop., with a mortality of 18%) (10).

In the first eight months of 2010, there were 773 confirmed cases of **Influenza A** in Brazil, with 99 deaths. The trend of confirmed cases during the pandemic influenza when Colombia notified the first case in 2009 went up to just over 300 cases in week 34, then declined sharply to levels below 50 cases per week throughout 2010. In 2009, a total of 232 deaths were confirmed and reported and 74 deaths in 2010. In 2009, 30 cases were reported in Guyana. The H1N1 pandemic flu had relatively limited impact in Suriname, with 110 confirmed cases and two deaths related to H1N1 between April and December 2009. In 2009, in Venezuela 12,667 suspected cases were notified and 2,800 cases of influenza A were confirmed (10.4 cases per 100,000 pop.) (10).

Table 4.11 illustrates a possible scenario of deaths, hospitalizations and outpatient consultations that would occur in the event of an influenza pandemic, with moderate impact (as the epidemic in 1968) or severe (as in 1918), assuming a clinical attack rate of 25% for the size of the 2010 population in South America. Considering that this type of scenario is uncertain, there is a wide range of possible impacts. The potential figures have great implication to guide the preparation which countries should have in its policies, plans, budgets and health care services (Adapted from PAHO, 2007 to population 2010) (3).

Table 4.11. Scenario of eventual deaths, hospitalizations and consultations in a situation of moderate or severe pandemic influenza in South America. Population 2010

Potential impact	Pandemics Scenario (thousands of population affected)			
	1968 (mild)		1918 (severe)	
Deaths	231.0		1,671.6	
Range	90.9	452.7	433.6	3,733.1
Hospital admissions	1,010.1		8,155.0	
Range	317.3	1,339.2	2,204.7	11,348.0
Outpatient consultation	52,659.7		47,325.7	
Range	41,290.5	75,482.8	40,167.6	63,746.4

Note: Scenario moderate influenza pandemic (as in 1968) or severe (as in 1918, with clinical attack rate (25%), South America's population projected to 2010.

Source: Adapted from Health estimates of the Americas 2007 (PAHO, 2007) (6).

Chronic not communicable diseases (CNCDs)

Non communicable chronic diseases constitute one of the priority public health problems in South America, with a tendency towards a gradual increase due to factors that still remain and have influenced its growth, including the aging population, unhealthy lifestyles as inactivity and poor diet. WHO estimations (2011) indicate that around 2008, 72% of deaths in South America corresponded to chronic non communicable diseases, 13% to traumatism and poisoning and 16% to other relevant ones (Table 4.12)

(12). Among non-communicable chronic diseases, cardiovascular diseases cause 30% of deaths, cancer 17%, chronic respiratory diseases 6%, diabetes mellitus 4% and other chronic non communicable diseases cause 14% of deaths. Countries with greater development and aging, such as Uruguay, Argentina and Chile, have more proportional mortality caused by non-communicable diseases (87%, 83% and 80% respectively), whereas less developed countries and with young population, such as Bolivia and Peru have lower levels (57% and 60% respectively).

Table 4.12. Proportional mortality in main causes of non- communicable diseases in South American Countries, 2008

Country	Cardiovasc. Diseases %	Cancer %	Respirat. Diseases %	Diabetes Mellitus %	Other NCD %	Other relevant %	Thrauma %	NCD Total %
Argentina	33	20	10	3	14	14	6	80
Bolivia	22	8	5	3	19	35	8	57
Brazil	33	16	6	5	14	14	12	74
Chile	30	23	6	4	20	9	8	83
Colombia	28	17	6	3	12	13	21	66
Ecuador	23	19	3	6	14	20	15	65
Guyana	36	8	2	8	12	21	13	66
Paraguay	28	17	3	8	12	20	12	69
Peru	19	18	4	2	16	31	10	60
Suriname	38	12	2	5	14	18	11	71
Uruguay	36	25	7	2	16	8	6	87
Venezuela	31	15	3	6	11	13	21	66
South America	30	17	6	4	14	16	13	72

Source: WHO (2011) Profiles of non-communicable diseases (12).

Risk factors

Overweight, an important risk factors for chronic diseases, reaches or exceeds half of the population in several countries and obesity fluctuates between 15% and 30% (Table 4.13) (12). Prevalence of high blood glucose level fluctuates between 5.5% and 11.5% and high cholesterol between 37% and 49%. However, it should be noted that this information corresponds to parameters measured in surveys and laboratory samples that may not reflect the actual country value or the dispersion of the situation within the country.

Prevalence of risk factors is relatively excessive, including daily smoking, physical inactivity, obesity and overweight. Hence, prevention strategies aimed to control these risk factors could be important in decreasing the burden of disease.

Other risk factors that should be addressed in order to prevent complications and diseases are alcohol and drug use, stress and other mental health problems, risk of road accidents and job-related accidents, violence and unsafe sexual and reproductive behavior.

Table 4.13. Prevalence of risk factors in countries of South America, 2008

País	Daily smoking %	Physical inactivity %	Blood high pressure %	High blood glucosa %	Over-weight %	Obesity %	High cholesterol %
Argentina	23.6	68.9	36.7	11.1	64.2	29.7	...
Bolivia	29.9	...	...	...	48.5	17.9	...
Brazil	14.1	48.6	40.0	9.7	51.7	18.8	42.8
Chile	35.5	...	43.2	10.6	65.3	29.4	49.1
Colombia	...	42.7	37.0	5.9	48.3	17.3	41.4
Ecuador	3.5	42.3	...	...	55.0	21.4	...
Guyana	...	...	...	...	...	...	...
Paraguay	14.3	40.3	...	9.6	...	...	...
Peru	...	...	31.7	5.5	46.3	15.7	37.2
Suriname	...	...	...	...	...	...	...
Uruguay	30.2	35.7	45.7	11.5	59.0	24.8	43.6
Venezuela	38.0	10.0	66.9	30.3	37.1

Source: Country profiles of non-communicable diseases, WHO 2011 (12)

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5. HEALTH POLICIES, SOCIAL PROTECTION AND HEALTH SYSTEMS

Previous chapters have outlined relevant aspects of health conditions and its determinants. Limitations in health status and priority public health problems existing in countries imply the need for organized and appropriate responses from the health sector (as well as other sectors). This chapter outlines main aspects of the health sector response to the problems and health needs of the population. That response is provided through public health policies, social protection, health insurance, as well as through effective organization, structure and performance of health care systems.

Trends in health sector development and reforms

The structuring and gradual development of the health sector in the countries of South America has been influenced by the historical, political and global development of each nation. In the last three decades, the health sector has been exposed to various processes of development, modernization and reforms. In some cases, such as Bolivia, Ecuador and Paraguay, the emphasis has been put on the extension of social protection coverage and access to better health services, in response to the health needs and rights of the population. The focus of this approach is increasing social protection coverage and health services, to ensure greater access. In other cases, such as Chile and Colombia, the emphasis has been put on modernization and efficiency of the health system, with higher private sector participation (under the model promoted by the World Bank). Most countries, especially those with lower income and less development and coverage of health services, have searched for new mechanisms to increase the coverage of health systems (such as the creation and extension of basic packages of social protection). Efforts have made especially to include groups of poor and marginalized population (1-6).

Sector development and reform processes have produced different results (4-7), including:

- In many countries, the various functions traditionally performed by the State were identified and separated, with a new set of actors: insurers, providers, auditors and the citizens themselves.
- The private sector growth was encouraged, with privatization processes (either direct or indirect) of the insurance system and health care provision.
- There were changes in the mechanism and sources of health financing, focused on financial sustainability.
- Several countries improved the performance of healthcare services, through various measures including the search for efficiency in planning, payment and control of the provision of healthcare services.
- Strategies to increase the coverage of health systems were especially applied to population groups without economic, cultural and geographical resources to get effective access to these services. Special budget were adopted, with mechanisms such as the creation of basic packages.
- Decentralization processes of the public system were carried out, looking for higher power and autonomy of the local level, promoting higher public participation.
- However, a number of problems related to sector reforms were identified (4-7), including:
 - Increased segmentation of the system, with multiple actors, and low integration of competitive systems.
 - The high competition between insurers, and between healthcare providers, to capture potential customers according to payment capacity, deepened that segmentation. Predominance of the proportion of pocket and private spending in many countries placed a burden on the population with less access to healthcare.
 - There were inadequacies in the financial distribution and low efficiency, with transaction costs increased
 - The leading role of the Ministry of Health was weakened with low regulation of insurance markets and health services.
 - In most countries, public spending dropped sharply (with public finance deficit for health), while pocket spending increased. The low funding and strict cost control has reduced resources in public health infrastructure and personnel, which in turn led to reduction in performance and efficiency, especially in the public health system.
 - The use of private criteria (quasi-market logic) in the public sector - with emphasis on competition within the public service network - reduced internal

solidarity, network efficiency, performance and overall efficiency of the public system.

- The introduction of economic incentives for the provision of individual health services led to prioritize curative versus preventive actions.
- The introduction of basic packages for the poor deepened the fragmentation of health systems. The creation of separate funds for different people with different taxable capacity led to the loss of solidarity within the system and deepened inequality in access to health care and health outcomes. The coverage to services did not increase as expected, with an increased demand faced with reduced resources.
- Decentralization was incomplete; the health authority could not ensure the integrity and equity of the system among different areas, due to its weakened steering role.

The current situation of health systems, with their achievements and problems, implies several challenges, including: to need to strengthen the steering role of the health authority, to strengthen and monitor essential public health functions; to seek ways to integrate the public healthcare network (in compliance with local autonomies) with solidarity and equity criteria; to recover the level of funding as well as critical resources to improve performance of the health system and strengthen the primary health care (4-7).

In the 2006-2010 period, different countries continued to strengthen the legislative framework, social protection and health systems, whose relevant aspects are synthesized in the following sections of the chapter. In order to consolidate the steering role, and in line with the Health Agenda for the Americas 2008-2017, the legislative framework was reinforced, with formulation of laws, health policies and plans, strengthening regulatory aspects (5,6).

Health legislation

The diversity of laws, plans and policies related to health that exist in different countries provide legislative and regulatory substrate for the development of social protection and health systems, and to facilitate the access of different population groups to health services. Between 2006 and 2010, a series of laws were produced in countries and the health issue was included in new constitutions (such as Ecuador and Bolivia), which seek to strengthen of the legal and regulatory framework to facilitate the exercise of the right to health, strengthen health systems and make them more appropriate to the needs

and demands of the population in terms of health (4,6).

The Constitution of Ecuador (2008) mandates the creation of social inclusion and equity systems, with universal and free public health services, especially to cover children, pregnant women, adolescents and elderly, persons with disabilities, and those who suffer complex and catastrophic illnesses. The Constitution of Bolivia (2009) recognizes the right to health and their relationship to integral development, multiculturalism, decentralization and autonomy, with the creation of a single National Health System and a social security scheme (6).

Among the relevant laws to strengthen health sector in the countries of South America, stand out:

- In **Argentina**, Ministries Law No. 26,338 (2007) provided the guidelines to implement the Federal Health System; the functions of the Central Health Ministry, coordination of health authorities from various levels and the overall planning of the sector. Law No. 26,529 (2009) refers to patient's rights.
- In **Bolivia**, the Framework Law of Autonomies and Decentralization on the Regime of autonomies, was promulgated in 2010. It contains the bases of the territorial organization of the State, the implementation of Universal Health Insurance, the Single Health System and the participation of indigenous and people from rural areas.
- In **Brazil**, Law Portaria No. 675 (2006) contains the Charter of the User Rights. The National Commission on Social Determinants of Health was also established.
- In **Chile**, Law No. 19,966 (2005) provides explicit guarantees of funding and benefits for a group of relevant diseases.
- Law No. 1,122 of **Colombia** (2007) refers to the Committee on Health Regulation and Mandatory Health Plans. The law includes the responsibility to unify the Benefits Plan, the universality of insurance, portability of benefits and financial sustainability.
- In **Ecuador**, the Health Act 2006 establishes the Ministry of Public Health as the health authority, with greater leadership and accountability functions. The Council of Citizen Participation and Social Control Law (2006) indicates the functions of the Council of Citizen Participation and Social Control, as well as monitoring and accountability mechanisms.
- In **Peru**, Law No. 29,124 (2007) refers to the citizen co-management and participation in primary health care centers of the Ministry of Health. Law No. 29,344 (2009) regulates universal health insurance; financing; provision and monitoring of insurance; and the essential insurance plan. The Law No. 29,414 (2009) sets out the rights of health services users.

• In **Uruguay**, Law No. 18,211 (2007) establishes the National Integrated Health System, creates the National Health Insurance and National Health Board. Law No. 18,131 (2007) created the National

Health Fund, and indicates the financing of National Health Insurance. Law No. 18,335 (2008) sets out the rights and obligations of patients and users of the Integrated National Health System (6).

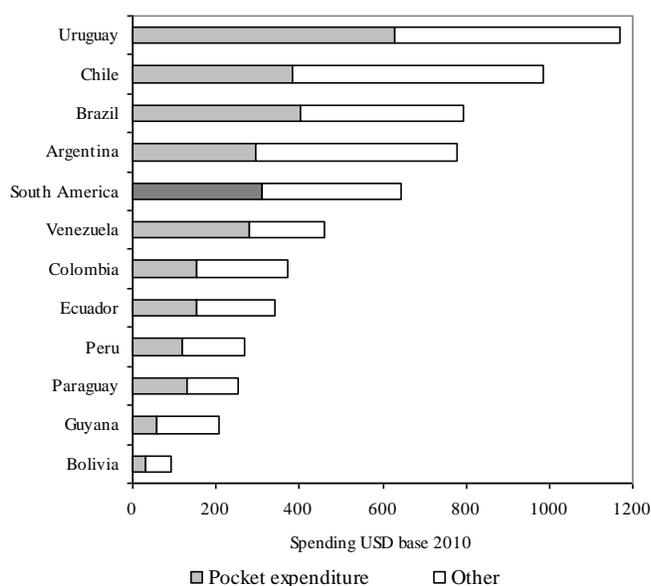
Table 5.1. Public social spending on health per capita in countries in South America, 2000-2009

País	2000-2001	2002-2003	2004-2005	2006-2007	2008-2009
	%	%	%	%	%
Argentina	220	170	198	245	327
Bolivia	30	33	36	36	37
Brazil	179	176	204	229	262
Chile	184	195	199	220	291
Colombia	67	56	66	69	75
Ecuador	18	27	32	37	53
Paraguay	15	17	15	22	25
Peru	34	40	39	40	54
Uruguay	171	149	165	213	299
Venezuela	77	73	84	106	...
South America	139	132	151	172	211

Note: Calculation based on U.S. \$ 2000.

Source: ECLAC (2011) Social Panorama of Latin America and the Caribbean.

Figure 5.1. Health expenditure per capita and pocket expenditure in South American countries, 2010



Note: Calculation based on U.S. \$, year 2010. There is no data available for Surinam,

Source: Social Panorama in LAC, ECLAC, 2011.

Financing and expenditure in health

From 2000 to 2009, public social spending on health per capita increased in all countries, especially countries with higher economic development, such as Argentina, Uruguay and Chile, which in 2008-2009 amounted to US\$ 327, US\$ 299 and US\$ 291, respectively; while Bolivia and Paraguay only reached US\$ 37 and US\$ 25, respectively (Table 5.1) (8). In 2010, health annual spending per capita amounted to approximately US\$ 644 in South America (base: year 2010).

Public social expenditure on health varies greatly between countries, while in Uruguay it reaches US\$ 1,168 in Bolivia it only reaches US\$ 90. Pocket spending accounts for 61% of spending in Venezuela and is a little more than half in Uruguay, Paraguay and Brazil (Figure 5.1) (8).

Social protection and health insurance

The population is covered through different social and insurance systems, including the public sector, social security, general private system and other especial systems such as the armed forces (each country has a different proportion). Coverage of access to health system is high in countries such as Chile, Brazil and Venezuela. The social health insurance amounts to two thirds in Chile and Colombia, in Argentina reaches half of the population, and it is slightly lower in Uruguay, while other countries have even lower population coverage. In Ecuador the private sector (nonprofit and for-profit) covers about a quarter of the population and just under a fifth in Chile, reaching much lower coverage in other countries. There are other entities or private sectors which have their own health systems (special regimes, such as the armed forces, police and organized groups of workers) (1-6).

Table 5.2 shows the population coverage, according to pension subsystem or health subsector in South American countries, for 2010 or last available year (4,6). The coverage given by social protection, including public and private insurance, reaches a universal theoretical coverage, at least regarding basic health care. It is important to highlight the case of Chile (in which healthcare is granted to provide universal cover in some priority diseases, and where the poor without formal insurance are also automatically entitled as beneficiaries of the National Health Fund). The Unified Health System reaches 80% of the population in Brazil and 66% in Venezuela. Social security covers to 68% of the population in Chile (FONASA), 67% in Colombia (Contributory Scheme and private brokers), 51% in Argentina (Social Works), 45% in Uruguay (Mutual), while in other countries, it reaches a more limited coverage.

Private insurance (profit and non-profit) reaches 26% of coverage in Ecuador, 19.6% in Brazil (especially for additional care) and 17.6% in Chile. In other countries, private insurance coverage is even lower.

Main factors contributing to actual social exclusion in health include: poverty, lack of education of the mother and ethnic condition in Bolivia; inadequate health infrastructure in Ecuador, ethnicity and lack of basic infrastructure (including electricity and sanitation that impacts on health) in Paraguay, and poverty, rural residence and ethnicity in Peru (4,6).

Chile has 13% of the population without health insurance coverage recorded from neither public nor private medical insurance, but that group does not belong to formal workers or the poor (who are automatically covered by the public system). Suriname has a public-private mix of partial coverage, reaching around 64% of the population, while Guyana also has a decentralized public-private mix and different types of uncoordinated actions (4,6).

Table 5.2. Population coverage by pension or health subsystem in South America, 2010 *

Country	Year	Subsystem	Population Coverage by subsystem
Argentina	2006 2010	Public	Universal basic coverage of the public health system (irrespective of individual social security or private insurance)
		Social Security	51%: Social work (Obras Sociales)
		Private	7.9%: Prepaid medical care
		Others	3.2%: Individuals with double insurance coverage, mainly through private plans (voluntary membership in prepaid, mutual, etc.)
Bolivia	2008	Public	11% Public: public subsector (Ministry of Health and Sports)
		Social Security	31% = 25%: National Health Fund (Caja Nacional de Salud CNS)] (20.8%), other social insurance funds in health (4.2%): Health Oil Fund [CPS], University Social Security [SSU], Private Bank Health [CSPB], Military Social Security Corporation [COSSMIL], CSC, CSCO, SINEC, COTEL
		Private	2006: 12% direct payments for services and private health insurance. Includes Non-Governmental Organizations (NGO)
		Without coverage	In 2006: 45% without access to health, and 72,8% without coverage from social security or private health insurance
Brazil	2006	Public	80.4%: exclusive coverage by the Unified Health System (SUS) (basic care coverage 98%; Family Health Program coverage 68.4%).
		Private	19.6%: Supplementary Health Care (14.4% private companies collective plan; 5.2% individual and family plans; 3.8% Supplementary Dental Care). The private insurance beneficiaries retain the integral right to coverage by SUS
Chile	2010	Public	100%: benefits guaranteed by the Explicit Guarantees of the Universal Access Plan (AUGE) (public or private provision).
		Social Security	73.5%: the National Health Fund (FONASA) (legal coverage).
		Private	16.3%: Private Health Insurance Institutions (ISAPRE).
		Others	6.7: Armed Forces.
			3.5% with no formal insurance
Colombia	2004	Public	29%: "linked" (population not affiliated to a social security system with access to limited services and benefits supplied by the Nation resources, governments and municipalities); universal coverage of the Basic Health Care Plan (collective public health).
		Social Security	General Social Security System in Health: 39.7% to 51.4% Contributory Scheme and with Subsidized Regime. 72 Health Promoting Companies
		Others	3.9%: special regimes; Armed Forces, Police, oil

HEALTH SITUATION, POLICIES AND SYSTEMS

			workers, Magisterium, Public Universities. 4.3% out of the social security system in health
Ecuador	2006	Public	28%: Ministry of Public Health.
		Social Security	21%: the Ecuadorian Social Security Institute (IESS): 11% (9% General Insurance, Retirement 2%) 7% Rural Social Security, Armed Forces and Police 3% (Social Security Institute of the Armed Forces [ISSFA] Social Security Institute of Police [SSPOL]).
		Private	26% (non-profit 6% [Board of Charities, NGOs and municipalities], with 20% profit [private health insurance 3%, and direct payment to private 17%]).
		Without coverage	27% with no access to health services. 76%: without coverage of social security or private health insurance
Guyana	2006	Social Security	Compulsory social insurance program for employees and self-employed from 16 to 60 years old.
Paraguay	2005	Public	35% to 42% access to of the Ministry of Health supply (estimated theoretical coverage).
		Social Security	18.4%: Social Security Institute [IPS] or other (individual, labor, family, military, police or abroad).
		Private	7.0%: direct payment services.
			38.6% without access to health services. 81.1% not covered by social security or private health insurance.
Peru	2010	Public	37.0%: Integral e Health Insurance, Ministry of Health.
		Social Security	20.1% EsSalud; Others: Health Service Provider entities, Armed Forces and Police (3%).
		Private	5.5% private insurance
			37.4%: Without social or private health insurance coverage
Surinam	2010	Public	54%: Ministry of Health: (30%); Ministry of Social Affairs (24%).
		Social Security	27%: State Health Insurance Fund (SZF): 21%: Medical Mission (subsidized by the Government of Suriname: 6%).
		Private	13% private insurance: business insurance plans (10%) and private insurance (3%)
		Others	1%
			5% without insurance
Uruguay	2006	Public	45.3%: Ministry of Health and Health Services Administration of the State (ASSE).
		Social Security	45.0%: Mutual insurance
		Private	1.8%: Integral coverage private insurance
		Others	7.6%: Armed Forces (5.3%); Police (2.3%)
Venezuela	2010	Public	Ministry of Popular Power for Health, “Mission Barrio Adentro” covers primary care
		Social Security	Social Security System (Includes Venezuelan Institute of Social Security) Social Security Benefit System for Workers and Working Environment.
		Private	Private insurance and prepaid medical service

Note: 2010 or latest available year

Source: PAHO (2007) Health in the Americas 2007, PAHO (2012) Country reports Health in the Americas 2012 publication.

Organization and health systems structure

Health systems in South America have different levels of development, coverage and performance capacity. Their organization and structure differ in: the financing mode and insurance, legal and regulatory structure; role of the state; integration (coordination, segmentation, fragmentation); participating sectors (public, social security, private); and the organization and integration of health care networks. These components of health systems in the countries of South America were subject to different changes (some of which were radical) regarding State reforms that also involved the health sector under similar principles, especially in the 1990's (1-5).

In most South American countries, the public system reaches greater national coverage in terms of infrastructure, personnel care and service delivery, especially in: primary care and rural areas, isolated and low-income population as well as those with higher social vulnerability. The organization of health care services is organized according to geographical areas of the country, according to levels of care, especially in the public sector. There state and private sector (different institutions) have their own health systems. Some systems with special arrangements (armed forces, police and organized groups of workers) include simultaneously insurance and health services for their beneficiaries (4,6).

In **Argentina** there are 24 provincial systems within the national public system, with approximately 9,000 health care facilities, of which 1,373 are inpatient centers. **Brazil** in 2010 issued a rule to improve the structure (reduce fragmentation) of care networks. **Chile** has 29 health services, each one with an established health care network. **Colombia** has 72 health promotion enterprises (71 are public) with their own provider's network under market criteria to cover their beneficiaries (no geographic criteria). In **Ecuador**, the Ministry of Health is the main provider of health care, system which is organized according to

provincial levels and health area, and also has a Solidarity Network of Care (6). **Guyana** has 10 health regions, each one with care network organized by level of care. In 2008, a health sector reform started in **Paraguay**; it was aimed to strengthen and improve the integration of the health care network, with emphasis on primary care network (Family Health Units) and articulation of the national health system. In **Peru**, the Ministry of Health and the Regional Health Bureaus have the largest health care network in the country, while other networks belong to social security and other sectors, such as the armed forces (6).

In **Suriname**, the Regional Health Services and Medical Mission provide primary care (in coastal and inland areas, respectively), while others provide other public and private health services. **Uruguay** is in the process of reform that promotes territorial networks across organizational boundaries, with emphasis on primary care. **Venezuela** has 17 states with varying degrees of decentralization, and a network of public facilities. Facilities include the ambulatory network "Mision Barrio Adentro" (with 8,600 medical consultation points) (6).

Infrastructure resources

Healthcare networks usually include a number of hospitals and outpatient centers from different organizations (public, private, military and police, mutual funds, and others). Table 5.4 presents the number and rate of hospital beds estimated for 1990, 2000 and 2010 (9). In 1990, there were 831,000 beds, with a ratio of 2.8 beds per one thousand inhabitants, their number decreased to 753,000 in 2000 and 748,000 in 2010 (with a ratio of 1.9 beds per 1,000 pop. in 2010). The reduction in the number of beds and availability of beds is related to, among other things, the decrease in hospitalizations rate that occurred in 1990, due to better prevention, shorter stay in hospitals and the possibility of outpatient attention for some procedures that previously required hospitalization (9).

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Table 5.3. Hospital beds availability in South American countries in 1990, 2000 and 2010

Country	1990		2000		2010	
	n (thous.)	Ratio x 1,000 p.	n (thous.)	Ratio x 1,000 p.	n (thous.)	Ratio x 1,000 p.
Argentina	70.6	2.2	76.0	2.1	83.9	2.1
Bolivia	9.2	1.4	8.6	1.0	10.8	1.1
Brazil	553.6	3.7	484.9	2.8	443.2	2.3
Chile	32.5	2.5	41.8	2.7	38.3	2.2
Colombia	45.9	1.4	38.2	1.0	56.3	1.2
Ecuador	17.0	1.7	19.6	1.6	22.4	1.5
Guyana	3.1	4.3	3.2	4.3	1.9	2.5
Paraguay	4.6	1.1	6.0	1.1	7.1	1.1
Peru	32.4	1.5	46.4	1.8	44.9	1.5
Suriname	1.6	3.9	1.7	3.6	1.7	3.2
Uruguay	8.3	2.7	6.3	1.9	6.1	1.8
Venezuela	52.1	2.6	20.1	0.8	31.0	1.1
South America	830.9	2.8	752.7	2.2	747.6	1.9

Source: ECALCSTATS (2012), based at the same time on multiple countries sources and agencies.

However, it is important to determine gaps in beds in relation to hospitalization needs of the population. While in countries like Brazil and Argentina, there are 2.3 and 2.1 beds per 1,000 pop. respectively in countries with a low economic development, such as Bolivia and Paraguay, this ratio reached only 1.1 beds per 1,000 pop. (9). There is no adequate information on resources or facilities of primary health care or maternal services, despite their key importance in health care (9).

Human resources

South America has approximately 862,000 physicians and 210,000 nurses and 330,000 dentists, which means a ratio of 22.0, 5.4 and 8.8 professionals per 10,000 pop., respectively. In 1990, there were 528,000 physicians in South America, with a ratio of 18 per 10,000 pop. This number increased to 716,000 in 2000

and to 862,000 in 2010, reaching a rate of 22 physicians per 10,000 pop (Table 5.4). In 2010, in Argentina and Brazil, there were 30 and 27 physicians per 10,000 pop., respectively, whilst in Bolivia and Paraguay there were only 5 and 8 physicians per 10,000 pop., respectively (6,9).

Availability of physicians per capita, in urban areas, is 8 to 10 times more than the availability in rural areas. Limitations on distribution of health professionals is affected by migration within the country (e.g. from the public sector to the private sector, or from rural to urban areas) and migration to countries that offer better career prospects.

A significant number of countries in the region do not have the personnel requirements needed to have a minimum coverage (a mix of 25 health workers per 10,000 pop.) (4, 7, 9).

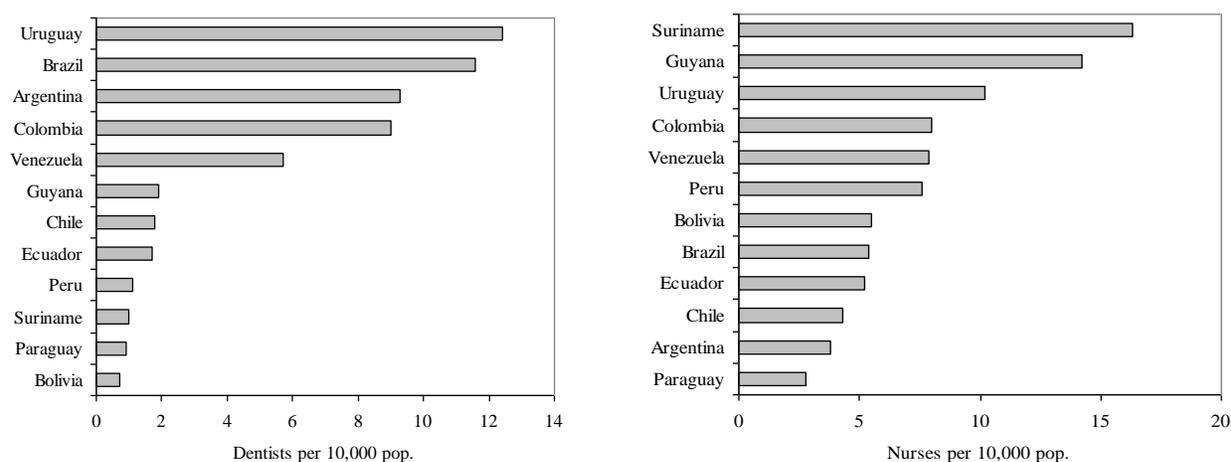
Table 5.4. Availability of physicians in South American countries in 1990, 2000 and 2010

Country	1990		2000		2010	
	n (thous.)	Ratio x 10,000 p.	n (thous.)	Ratio x 10,000 p.	n (thous.)	Ratio x 10,000 p.
Argentina	108.8	33.3	121.1	32.8	121.1	30.0
Bolivia	1.9	2.9	2.7	3.2	4.9	4.9
Brazil	308.0	20.6	423.8	24.3	527.6	27.1
Chile	6.1	4.6	18.2	11.8	23.5	13.7
Colombia	30.7	9.2	50.9	12.8	55.3	11.9
Ecuador	9.8	9.6	15.8	12.8	23.6	16.3
Guyana	0.3	4.1	0.3	3.8	0.5	6.6
Paraguay	2.8	6.6	4.9	9.2	5.2	8.1
Peru	16.4	7.6	30.0	11.6	48.9	16.8
Suriname	0.3	7.4	0.3	6.9	0.6	11.4
Uruguay	9.1	29.3	12.4	37.2	15.0	44.5
Venezuela	34.2	17.4	35.7	14.6	35.6	12.3
South America	528.4	17.9	715.9	20.6	861.8	22.0

Source: ECLACSTATS Databases (accessed February 28, 2012), itself based on multiple sources of countries and agencies (including PAHO Human Resources Observatory).

In 2007, there were 8.5 dentists per 10,000 pop., but while in countries like Uruguay Brazil it amounted to 12.4 and 11.6 dentists per 10,000 pop., they amounted only to 0.1 in Guyana and 0.9 in Suriname and Paraguay (figure 5.2) (11). For professional nurses, the availability is 5.4 per 10,000 pop. in South America. However, its variation is less clear in relation to the global development level of the countries.

There are 16 nurses per 10,000 pop., in Surinam but only 3 nurses per 10,000 pop. in Paraguay. There are different types of nurses in the countries, from those formed in universities to auxiliary nurses and even those formed by practice. In some countries, nurses cover obstetrics care, while in others, nurses and midwives constitute two separate professions, and even a combined profession of nurse-midwife has been created (7.10).

Figure 5.2. Dentists and nurses per 10,000 population in South American countries, 2007

Source: PAHO (2009). PAHO Basic Health Indicators 2009 (11).

It is estimated that most countries (especially in places with more poverty, needs and marginalization) do not have the necessary staff to achieve a sufficient level of coverage, especially in populations not reached by the private market and therefore depend on public health systems support, as in the case of Paraguay (9,1), Bolivia (10,8) and Guyana (9,2). In the period 2000-2004, significant increases were also recorded in the health workforce in some countries: Bolivia increased its rate by 120%, Paraguay in 44% and Colombia 24%. In MERCOSUR countries, physicians outnumber nurses at a ratio of 5 to 1 (7).

Existing limitations in health personnel increase with the migration of professionals within same country (e.g. from the public sector to the private sector, or from rural to urban areas) and migration to countries offering higher professional expectations. Sometimes migration is definitive, at least under the expectations of those who emigrate, and in others is temporary, as in the permanence of Cuban physicians in Venezuela (4,7). In the latter country, in 2007 there were more than 25,000 Cuban collaborators in the health area. In Chile, the migration of health personnel from Ecuador, Peru and Colombia contributes with professionals in primary care municipal services.

The training of human resources continues to use traditional methods that hardly encourage the development of conditions of leadership and creativity. Human resource planning is still limited (4,6).

There are important primary health level team-building experiences, such as undergraduate community services, and specialized professionals in Bolivia, Ecuador, Peru and Venezuela (where

physicians, nurses, midwives and physicians are appointed for health care in rural and marginal urban areas), and the Family Health Program in Brazil, which includes a teams of physicians, nurses and community health workers (6).

Human resource planning according to requirements remains insufficient. In 2007, Member States of the Region of the Americas committed themselves to 20 regional goals regarding Human Resources for Health towards 2015. The aim was to address the challenges established in the Action of Toronto, in the area of policy, distribution, retention, favorable environments, and to respond to healthcare needs of the population (10).

Medicines and Technology in Health

Access to medicines in the countries of South America is quite different. In general, countries are already involved in strengthening National Regulatory Authorities, the list of essential drugs, the use of free critical drugs, improving regulation, production and supply of drugs, and promoting rational use of medicines. Some countries have regulatory agencies, such as Brazil and Argentina, who are taking a recognized leadership role in pharmaceutical policies. Ecuador in 2000 passed a law of generic medicines, to ensure production and access to medicines, forcing the use of cheaper drugs in the public sector and requiring that at least a 20% of medicine production must be generic.

Countries such as Bolivia, Chile, Peru and Uruguay have increased public purchases; therefore they have increased the availability of pharmaceutical products (4,7).

Most South American countries have legal instruments for authorization and control of medicine functions, but most of these countries do not have a plan for institutional development. The drug regulatory fulfillment is high in most South American countries, but there are limitations in the monitoring and the role of the private sector (Table 5.5) (12). Health ministries are responsible compliance of drug regulations and their harmonization. Relevant actors are: the private sector, mainly through the pharmaceutical industry; the academic community;

the consumer protection organizations; and other stakeholders in the field of drugs and pharmaceuticals products (13).

The drug market has had a major growth worldwide. In 2006, countries in South America that led the sales were Brazil (U.S. \$ 8.150 million) and Argentina (U.S. \$ 2,148 million). In Argentina, domestic producers occupy half of the market (50% of laboratories), Chile 43%, Uruguay 26% and Brazil 25%. No country is completely self-sufficient. In Brazil imported products represent 19% of the market, 30% in Argentina, 40% in Peru, 50% in Uruguay and 80% in Ecuador (4,7).

Table 5.5. Regulatory drugs fulfillment in South American countries. 2008

Policy issue covered	Countries	
	n	%
Regulatory national authority	12 of 12	100
Trade authorization	11 of 12	92
Authorization for production of medicines	11 of 12	92
Authorization for distribution of medicines	11 of 12	92
Legal norms for authorizing export and import of medicines	11 of 12	92
Monitoring of medicines regulation	8 of 12	67
Compulsory prescription of generic medicines in private sector	6 of 12	50
Generic substitution allowed in private sector	9 of 10	90
Generic substitution allowed in public sector	10 of 10	100
Inspections carried out to pharmaceutical stores	10 of 12	83
Requirements for regulatory transparency, responsibility and ethic behavior	12 of 12	100

Note: Areas investigated include between 10 and 12 South American countries.

Source: PAHO (2008), WHO Overall Pharmaceutical Situation, Level I_AMRO ANALYSIS_tables_sept 2008. (PAHO, 2008b)

All countries in South America have lists of essential medicines that are used to guide the acquisition in the public sector, but it has not been widely used in practice. In Argentina, 78% of the prescriptions include the generic name (4,6). Self-medication remains a problem, particularly the use of antibiotics, which contributes significantly to antimicrobial resistance (6,13). Two thirds of drug financing in Latin America come from household spending and only a third from other sources. In Chile, public purchases increased with AUGE System (Universal Access with Explicit Guarantees) and is around 30% of total spending; in Brazil, the Unified Health (SUS) provides 25% of all drugs circulating in the country, in Peru represent 21% of the financing and Argentina approaches a 15% (3).

Price is the main barrier to essential medicines access. Access to and effective use of drugs depends largely on household income and spending capacity of

households. Several South American countries have developed policies and strategies to increase the availability and coverage of medicines, and the implementation of free programs for the more vulnerable groups. All the countries have some sort of free medicines provided for free for priority diseases (such as tuberculosis, malaria and AIDS), vaccines (expanded program of immunization), and vulnerable population groups (mothers and children) (7).

The Regional Rotating Fund for Strategic Public Health Supplies and the Rotating Fund for the Expanded Program of Immunization (EPI) for purchasing of Vaccines and acquisition of inputs have helped to reduce drug costs and supplies for the Member States of PAHO/WHO through technical cooperation for planning and supply management, pooled procurement and price negotiation directly with pharmaceutical manufacturers (18).

Table 5.6. Selected indicators of health care coverage in countries of South American countries, 2009 *

Country	Coverage (%)		Immunization coverage (%)				Contraception use in women (%)
	Antenatal	Delivery	DPT3	Polio3	BCG	Sar/SRPI	
Argentina	88.4	97.8	94.6	94.8	100.0	100.0	43.0
Bolivia	72.1	65.0	80.4	80.0	90.4	79.4	25.5
Brazil	89.5	98.9	96.0	97.3	100.0	97.8	87.2
Chile	95.6	99.8	92.0	92.0	96.0	93.0	64.0
Colombia	88.6	95.0	88.0	88.0	83.5	88.5	61.2
Ecuador	84.1	71.4	100.0	100.0	100.0	100.0	...
Guyana	94.8	95.8	95.0	95.0	98.0	95.0	43.0
Paraguay	67.8	93.1	76.0	76.0	74.2	76.7	79.4
Peru	92.2	94.7	92.5	92.1	95.3	93.9	74.4
Suriname	90.0	90.0	96.0	96.0	...	90.0	46.0
Uruguay	91.8	99.9	94.6	94.6	99.2	94.8	77.0
Venezuela	...	95.0	77.7	73.2	91.9	78.8	30.0
South America	82.1	95.8	92.5	92.8	96.1	94.3	68.2

Note: * or latest year available.

Source: Brochure PAHO / WHO Basic Indicators, Health Situation in the Americas 2011.

Provision of services and healthcare coverage

The predominant model of care and organization of services is clearer in the case of public health systems, where there is a clear trend to the existence of integrated care networks, based on primary health care. The strategy of primary health care - with renewed efforts committed by the countries of the world - is crucial to progress towards universal access and equitable health care. It focuses on the expansion of the scope of public health activities development - under the leadership of the National Health Authority - to promote healthy public policies through interagency and inter sector consensus, in conjunction with the community (15,16). Despite the emphasis on primary care, there still remains a tendency to keep with the predominantly curative model and health services are focused on hospitals and individual care (4,15,16).

The limitations of health services and community interaction restrict the expected impact of health systems to preserve, prevent and improve population health. Special importance is given to health promotion, expanded immunization program, health services through lifecycle, with emphasis on maternal and child health issues. Given inequities in health and healthcare, there are fewer resources and provision of services where they are most needed. Limitations in primary care resources and services could make the health system unsuccessful in improving equity in health and health care. Reforms that lead to an

uncoordinated decentralization of the health services system and the competitive pursuit of efficiency (quasi-markets) have been associated with difficulties in improving equity and reducing the excess of health events in poor countries and areas where diseases and deaths are highly preventable (2,4,15,16).

Despite the achievements, the proposed goal of "Health for All" (where primary health care played a central role) was not met in the Americas in 2000. The agenda formulated there is still unfinished. Several countries have promoted a primary health care "renewal process", in line with PAHO/WHO's approaches in 2005 and WHO in 2008, ratified by the countries of the world. Strengthening this strategy can contribute to achieve the MDGs more effectively (15,16).

In half of the countries, coverage of basic vaccines (DPT3, Polio 3 and BCG) has become universal or nearly universal (about 95%). Venezuela, Paraguay and Bolivia are countries with more limited coverage (Table 5.6) (17). Even in countries with high coverage, it is possible that coverage limitations may occur in areas with greater poverty, needs, and rural and less access opportunities. Although there is almost universal coverage of childbirth in half of the countries, maternal health care in less developed countries (and places within countries) still remains limited. Reported coverage of contraceptive use is more limited, with 68.2% in South America, although there is a large fluctuation at country level, since in Brazil reaches 87.2% but Bolivia and Venezuela only recorded 25.5% and 30.0%, respectively (17).

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6. KNOWLEDGE AND INFORMATION TECHNOLOGY

Knowledge and information technology applied to the health field provide important instruments to support policies, decision making and action in the health sector. This chapter highlights recent advance in issues such as virtual health libraries, cyber health, telehealth, the use of social networks, distance virtual education and health research.

Use of information technology

The development and incorporation of technology applied to health has increased the capacity and efficiency of the management and dissemination of information and knowledge, in support of action in the whole health sector. Application ranges from support to clinical care to the development of policies and decision making based on evidence. However, there are digital gaps and wide differences in the access and use of this modern field with high sophistication and costs. In South American countries, some relevant initiatives have contributed to better knowledge and communication related to health. Different types of national health information systems have been

developed, with different degree of development of information, automation, communication, and networked organization. Informatics platform and mechanisms supporting the management and dissemination of information and knowledge have facilitated the integration of health service networks, at different levels.

There is still a great potential to acquire, implement and use technologies favoring the management and sharing of information and knowledge. But there are important financial, structural, cultural and organizational limitations. As a result, overall progress in technology and knowledge management has been only partial, unequal and gradual, leading to a great diversity and disparity between countries and inside them.

Table 6.1 Internet and telephones access coverage in Latin American countries up to 2010.

Country	Fixed telephone lines per 100 pop.		Cell phone customers per 100 pop.		Internet users per 100 pop.	
	1990/1992	2010	2000	2010	2000	2010
Argentina	9.3	24.7	17.6	141.8	7.1	36.0
Bolivia	2.7	8.5	7.0	72.3	1.4	20.0
Brazil	6.3	21.6	13.3	104.1	2.9	40.7
Chile	6.6	20.2	22.1	116.0	16.5	45.0
Colombia	6.9	14.7	5.4	93.8	2.1	36.5
Ecuador	4.8	14.4	3.9	102.2	1.5	24.0
Paraguay	2.7	6.3	15.0	91.6	0.7	23.6
Peru	2.6	10.9	4.9	100.1	3.1	34.3
Uruguay	13.4	28.6	12.3	131.7	10.5	43.4
Venezuela	7.5	24.4	22.3	96.2	3.4	3.4
South America	6.3	19.6	12.7	105.2	3.8	35.1

Source: ECLAC 2011 (1).

Use of informatics and connectivity has had big expansion in all South American countries; between 1990 and 2010, telephone lines increased three times, reaching 19.2 lines per 100 inhabitants (table 6.1). Subscribers to mobile phones increased 8 times, surpassing the quantity of inhabitants (105.2 per 100 inhabitants) whilst subscribers to Internet increased almost 10 times, reaching 35.2 Internet users per 100 inhabitants (1). In 2010, the use of internet reached 45.0 users per 100 inhabitants in Chile but only 3.5 users per 100 inhabitants in Venezuela. Within

countries, there are probably big differences between urban and rural places (especially in the isolated areas), and between groups with different economic income.

Cyber Health

In 2005, WHO approved the strategy called Cyber Health, looking for more cost-effective and safer utilization of information and communication technology, to support knowledge in relevant aspects of health, such as management and performance of health

services, surveillance, education and research (2). In the same line, the 51° WHO Directive Board approved in 2011 the Strategy and Plan of Action on eHealth, with the purpose of contributing to improve quality and access to health services, through improving the use of information and communication technologies, as well as better access to health information (3).

Relevant components included in the Strategy of eHealth include:

- Electronic medical records.
- TeleHealth: use of information and communication technology in health services (it includes telemedicine).
- mHealth: support to mobile devices, such as mobile phones used in medicine and public health.
- E-learning: support to training or learning at distance.
- Continuing education on information and communication technology.
- Standardization and interoperability for interchange and data use, in an effective, precise and solid way.

In the period 2006-2010, South American countries developed, or continued with the development, of diverse initiatives related to the use of information and communication technology in the health field. Some of them are: the Virtual Health Library (VHL); health and public health courses on line and the setting of national nodes of the Virtual Campus of Public Health; higher investment in research and development, the EVIPNET initiative, and connectivity initiatives (3,4). Different surveys carried out by ECLAC and PAHO between 2010 and 2011 show, in a systematic way, that most of countries have established e-Health as a priority in their national agenda, developing policies or strategies in that regard, and most countries are investing in information and communication technology (3).

Virtual Health Library

The Virtual Health Library is an initiative led and promoted by the Latin American and Caribbean Center on Health Sciences Information (PAHO/BIREME) which has allowed the establishment of national networks of libraries in most the countries, and contributes to produce, disseminate and use scientific and technical information in research, education, promotion and assistance in health systems. They have Website Portals that gather, organize, offer access and disseminate scientific and technical information on health (5). The Virtual Health Library includes very relevant sources of

information in health and public health sciences in the countries (5):

Latin American and the Caribbean Literature Health Sciences (LILACS). It is a bibliographical index of literature on health sciences, published in all Latin American countries and the Caribbean since 1982. It is a cooperative product with participation of the VHL. Regarding the production of articles in magazines registered in LILACS, Brazil represents 69.1% of what is produced in Latin America and the Caribbean, followed by Chile, Colombia and Argentina, with 6.6%, 6.0% and 5.9% respectively.

Spanish Biographical Index on Health Sciences (SBIHS). It is produced by the National Library on Health Sciences of the Carlos III Institute of Health, at the Spanish Sanity and Consumption Ministry, and contains references from articles of sanitary scientific magazines edited in Spain, which have relevance in health and public health.

MEDLINE (Medical Literature Analysis and Retrieval System Online). It is a data base from medical and biomedical area in international literature, produced by NLM (National Library of Medicine, USA) that contains biographical references and summaries from more than 5,000 titles of magazines published in the United States and in other 70 countries. It contains references of articles published since 1966 up to date, covering the areas of: medicine, biomedicine, nursery, odontology, veterinary and connected sciences. The data base is monthly updated

Cochrane Library. It contains a collection of updated information sources on medicine based on evidence, including the Cochrane Systematical Revision Data Base –prepared by Cochrane’s Collaboration Groups. In Latin American and Caribbean countries, the access to Cochrane Library is available through VHL.

Scientific Electronic Library Online (SciELO). It is a bibliographic database for cooperative electronic publishing in developing countries. In the period 2006-2010, Brazil produced 83.4% of the articles contained in this database, followed by Colombia, Argentina and Chile (6.1%, 2.6% and 1.2% respectively).

Telehealth

In the period 2006-2010, Brazil, Mexico, Panama and Peru had adopted a telemedicine policy, as part of their health policies. Furthermore, Argentina, Brazil, Colombia and Panama counted with a legislation assuring the confidentiality of personal data, and also a set of specific norms to protect the personal identification in the electronic medical history.(3)

In that period, Argentina, Brazil, Colombia, Paraguay and Peru developed initiatives concerning the use of mobile devices (mHealth) aimed to improve the coverage, time and quality of data collection. Those are promissory initiatives despite limitations for a major application, specially the knowledge and training needed for their application and expansion,

and the cost benefit of the initiatives carried out until 2010. Some services were established or consolidated, including: call centers; free emergency phones; mobile telemedicine; reminder of medical appointments; mobilization of the community and information delivery (3,4).

Table 6.2 Ranking of the most visited websites from the Web 2.0, February 2001.

Country	Facebook N ^o	Youtube N ^o	Blogger N ^o	Wikipedia N ^o	Twitter N ^o
Argentina	1	4	...	11	12
Bolivia	1	5	6	10	...
Brazil	8	4	9	17	14
Chile	2	3	6	11	14
Colombia	1	4	8	9	10
Ecuador	1	5	8	9	11
Paraguay	1	4	7	12	15
Peru	2	4	6	9	13
Uruguay	1	4	6	11	14
Venezuela	1	5	7	10	11

Note: No data for Guyana and Suriname.

Source: PAHO (2011), Use of social nets in PAHO (6).

Use of social networks

Massive access and use of virtual communication media by the general population has facilitated the application of strategies of information and knowledge dissemination, such as advocacy for health and public health matters. Social networks are having an explosive increase in their institutional use. The impact of social networks such as Facebook, Twitter or LinkedIn are rapidly increasing in South America. Argentina, Colombia, Brazil and Chile have high coverage of Facebook use. In 2010, according to data from a global study on the online behavior of users in Latin America, it was reported that the average time spent in social nets was 5.2 hours per week, whilst 4.0 weekly hours were spent in the use of e-mail (6).

A study made by comScore Consulting (Oct. 2010) found that in Latin America there has been a great increase in Internet use (23% only between 2009 and 2010) and that the most used services were those aimed at searching information, use of social nets and checking of electronic mail. In South American countries, Facebook is one of the most visited sites (the most visited, in the majority of countries), then

Youtube, Blogger, Wikipedia and Twitter (Table 6.2) (6).

Virtual distance education

Surveys carried out by PAHO in countries, concerning the existence of virtual distance education, point out a series of limitations impeding a greater use, such as: the lack of policies and strategies support; lack of infrastructure; low diffusion of feasible alternatives of reachable use; and ignorance on the existence of that powerful and useful mechanism. As a result, there is a relative low demand for this accessible and very useful modality of virtual distance education (7).

The initiative of virtual distance education has encouraged higher training and development of health personnel competencies in the Americas, under the leadership and coordination of PAHO. The Virtual Campus of Public Health (VCPH) is a tool actively promoted by PAHO to support training in public health matters, providing software and some online courses. At national level, VCPH has been organized in national nodes within networks including academy, health authorities and PAHO/WHO professionals. The Virtual Campus is an empirical referent to guide the

development of online courses in specific matters related to public health and health services.

Health research

Argentina, Brazil, Ecuador, Panama, Paraguay, Peru and Venezuela reported to have established priority in health research with some advance in health research, such as the development of policies or national research agendas, national institutions dedicated to the theme, and the job search through inter-sector information network. In general, there are also national commissions on ethics and regulations to protect humans in health-related research (Ethical National Commissions) (4,8).

Brazil, Ecuador and Uruguay have increased more significantly their expenditure in research, even though the budget still is quite limited (under the goal of reaching 2% of GIP).

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7. INTERNATIONAL COOPERATION AND SUB-REGIONAL APPROACH

This chapter outlines main modalities of international cooperation in health as well as the collective benefit pursued by national and sub-regional health agendas. International cooperation and agreed agendas provide added value to national health sectors efforts made by countries of South America. Cooperation has different degrees and types of benefits in countries according to the condition of recipient of cooperation. There are also shared benefits in the countries participating in simultaneous international agendas as well as international multi-agency and multi-country alliances.

Introduction

Health-related international cooperation, either financial or technical, aims to support building capacity through the interchange of knowledge, skills, resources and technologies. Priority is given to public health priority areas, such as disease control, management risk, environmental health, family and community health, health services, emergencies and disasters, and humanitarian aid.

International cooperation in health in South American countries has different modalities, including bilateral and horizontal cooperation. The sub regional approach and working in international alliances facilitates the adoption of strategies and joint efforts on issues that are common to country members of each integration organization and with shared benefit from joint actions.

International cooperation

The official development assistance for health in South America has changed gradually, over the last decades, due to changes in finance from donors, recipients' needs, and the type of assistance granted (with priorities given according to the average income of each eligible country) (1). International cooperation in health tends to give priority for allocation of resources to countries with lower socioeconomic less and relatively unable to solve autonomously their priority health problems. Several countries, after improving their development conditions, such as Chile, Argentina and Uruguay, have become countries with low priority for receiving international cooperation, and are being able to share or even contribute as donors through their specific experience or financing in priority areas (1,2).

The new horizontal cooperation type of strategy, including the Technical Cooperation among Countries (TCC) (promoted by PAHO/WHO) is essentially a process by which two or more countries work together and share experiences and technical capacities as well

as resources, including the use of advice and financial support from external sources, when needed (1,4).

As part of its role, PAHO/WHO has contributed with inputs, resource mobilization and advocacy for international cooperation in the countries of South America. In 2009-2010, relevant areas in international technical cooperation included (5):

- Institutional capacity and financial management to address the international financial crisis (Brazil, Colombia, Ecuador and Venezuela)
- Food and nutritional security in children (Bolivia, Brazil, Colombia, Paraguay and Peru)
- Food safety (Argentina, Chile and Paraguay)
- Health of workers (Colombia and Ecuador)
- Healthy environments (Argentina, Chile and Ecuador)
- Tobacco control (Colombia, Paraguay, Peru, Uruguay and Venezuela)
- Disaster response (Chile)
- Plan for safe hospitals (Argentina, Bolivia, Ecuador and Peru)
- Violence (gender and other) (Ecuador, Colombia, Paraguay and Uruguay)
- Mental health (Argentina and Chile)
- Road safety (Argentina Brazil and Colombia)
- Social protection (Bolivia, Colombia and Uruguay)
- Health and safety, and the International Health Regulation (Argentina, Bolivia, Brazil, Chile, Ecuador, Paraguay, Peru and Uruguay)
- Pandemic influenza by Influenza A (H1N1), 2009 (Bolivia, Chile and Paraguay)
- Neglected diseases (Argentina, Bolivia, Brazil, Chile, Paraguay, Peru and Venezuela)
- Safe maternity, and maternal, newborn and child alliances (Bolivia, Chile, Ecuador and Paraguay)
 - Voices, Faces and Places (Argentina, Bolivia, Ecuador and Peru) (5).

Given the tendency to a reduction of donor funding, and the economic improvement of several South American countries, the official development assistance has been reduced. However, several alliances, partnerships and joint initiatives in health have been established, such as: the Neonatal Health Alliance for Latin America and the Caribbean; the Regional Working

Group for the Reduction of Maternal Mortality (GTR); the Safe Maternity Initiative; and the Pan American Alliance for Nutrition and Development (4).

These alliances with multiple partners, whether they are UN agencies or others, represent a mutually

beneficial joint work and facilitate the cooperative access to international funding sources. Examples include: the GAVI Alliance, the Global MDG Achievement Fund, of Spain, and the Global Fund to Fight AIDS, Tuberculosis and Malaria (4).

Table 7.1. Priority issues included in agendas and sub regional health plans in South America, 2010

Thematic issue	Area included (X) in health agenda of integration organization							
	UNASUR	CAN	MERCOSUR	ACTO	ALBA	CARICOM	ALADI	AMERICA
Surveillance and response to health events	X	X	X					X
Communicable diseases	X	X	X			X		X
Non communicable chronic diseases						X		X
Family and community health			X			X		X
Food and nutrition	X					X		X
National health authority								X
Sustainable development				X				X
Health promotion and social determinants	X	X	X			X		X
Knowledge, science and technology			X			X	X	X
Health security, disasters	X	X				X	X	X
Environmental health	X			X		X	X	X
Health inequities and frontiers	X	X	X					X
Health risks and burden of disease						X		X
Health policies and systems	X	X				X		X
Social protection and access to health services	X	X	X	X				X
Human resources in health	X	X				X		X
Medicines	X	X	X		X	X		X
Health technology			X					X

Sources: 2010-2015 Five-Year Plan of UNASUR SALUD; Plan 2008-2012 of CAN, MERCOSUR SGT Projects and Health; ALBA Projects, Projects ACTO Caribbean Cooperation in Health III, CARICOM Health Agenda for the Americas 2008-2017 (7 -15).

Sub regional approach and health agendas

There are multiple simultaneous health agendas in South America, at national, bi-national and sub regional levels, which are related to cooperation between countries or multilateral organizations (CAN, MERCOSUR, ACTO and UNASUR Health). In addition, South America is in line with the Health Agenda for the Americas 2008-2017 (PAHO/WHO) and the Global Health Agenda (WHO), along with more than a hundred Global Health Alliances. This diverse series of health-related agendas generally has a similarity in the topics covered, meaning the existence of overlapping and complement among them. Each level and type of agenda has a certain specificity and autonomy of objectives and expected benefits (Table 7.1) (6).

The health agenda of the Andean Community of Nations (CAN) has a Board reporting to the Meetings of Ministers of Health of the Andean Community

(REMSAA) and whose Technical Secretariat is the Hipólito Unanue Agreement (Andean Health Agency or ORAS-CONHU). The latter supports the implementation of the agreements of the Ministers of Health of the Andean Area (7). For instance, the REMSAA framework has supported better access to medicines, including the joint negotiation process of medicines against HIV/AIDS. In relation to health in borders, ORAS-CONHU is implementing the Andean Health Plan at Borders (PASAFRO) and PAMAFRO Project (Malaria Control in Border Areas of the Andean Region with community base) in order to reduce malaria in those borders with the highest incidence in the sub-region (7).

The lines of action of the five strategic areas, developed by the Andean Health and approved by the Ministers of Health Organization, include:

1. Integration in Health: Integration Agenda; Andean Health Program at Borders (PASAFRO), Malaria Control Project in border areas (PAMAFRO).

2. Epidemiological Surveillance and Environmental Health, Epidemiological Surveillance, Environmental Health and Water, Emergencies and Disasters.
3. Medicines and Health Technology: Policy and Access to Medicines and Biological Products, Health Technology.
4. Human Resources: Human Resources in Health, Economy and Health,
5. Promotion and Health Protection: Anti-Smoking, Intercultural Health, HIV / AIDS, Teen Pregnancy Prevention, Eradication of Child Malnutrition, Worker's Health (7).

Meetings of Ministers of Health of MERCOSUR and Associated States (RMSMEA) address the harmonization of health policies, while the Sub-Working Group (SWG) N° 11 focus in health work on regulatory harmonization. In addition, other sub-groups focused on Agriculture and Environment (SGT No. 6 and 8 respectively) also include issues relating to health and even relates to other working groups such as MERCOSUR Education or Agriculture (8).

Priorities in MERCOSUR health action seek to give continuity in the efforts to harmonize the rules for free circulation of health products. It also seeks to improve the performance of the regulatory authorities and the harmonization of regulations, including: the identification of aspects relating to good manufacturing practices and pharmaceutical and pharma-chemical control; blood and blood products; medical products; domestic use chemicals; information systems and epidemiological data analysis and technologies evaluation; among other topics, which include timely access to communication; donation and transplantation of organs, tissues and cells; adoption and implementation of the International Health Regulations; health surveillance system (dengue and other diseases); strengthening the health situation for the population in border areas, integrated policy for HIV and STIs, sexual and reproductive health; integrated policy for tobacco control; monitoring of natural disasters and accidents with dangerous products; environmental and worker health policy; public health research; and equity in access to knowledge, as a public health good (8).

The RMSMEA includes technical groups focused on the analysis and review of proposals which are then brought to the attention of the Ministers of Health. These are: articulations groups, intergovernmental commissions and ad-hoc groups (8). The SGT 11 includes three specific commissions:

- Commission on Health Products (covering psychotropic and narcotics products, blood and blood products, medical products, domestic health cosmetics);
- Commission on Health Care Services (professional practice development, evaluation and use of technology in health care service)
- Commission on Health Surveillance for Non-communicable Diseases

The Amazon Cooperation Treaty Organization (ACTO) was created in 1978 in order to promote joint actions for the harmonious development of the Amazon Basin, with a shared commitment to environmental protection and the rational use of natural resources in the Amazon, in line with principles of sustainable development (7). Unlike CAN and MERCOSUR, ACTO has more specific objectives, therefore its nature and conformation is different. ACTO works through committees, one of them is the Health Special Commission of the Amazon (CESAM). PAHO / WHO has been collaborating with ACTO since 2001. The specific aim of this Commission is to promote sustainable development of the respective Amazon territory of the signatory States, so that these joint actions produce equitable and mutually beneficial results, as well as the preservation of the environment and the conservation and rational use of natural resources of those territories (9).

ACTO has a technical cooperation agenda that is based on a Framework Agreement between ACTO and PAHO which may include, among others, a number of relevant areas (9):

- Capacity building, institutional development and strengthening of commissions related to health and environment;
- Environmental health, including water resources and management of the trans-boundary basin of the Amazon River;
- Communicable diseases, with emphasis on malaria and epidemiological surveillance network;
- Sustainable development of the Amazon territories.
- Improving the quality of life and access to health services for the Amazonian populations.

The UNASUR Health agenda

The South American Health Council (UNASUR SALUD) is a permanent body constituted by the Ministers of Health of the UNASUR, which has the general objective of “consolidating South America as a health integration space that contributes towards Health for All and to the development and integration of sub

regional efforts and achievements of MERCOSUR, ORAS CONHU and ACTO” (10).

In March 2010, the 2010-2015 Five Year Plan UNASUR SALUD (11) was approved, which included five areas that pursue specific strategic objectives, each one with defined expected results:

1. *South American Network of Health Surveillance and Response*. Its strategic goal is to establish a network for the epidemiological surveillance and control of communicable diseases, non-communicable and public health events.

Its expected outputs are:

- Risk, regional morbidity and mortality indicators selection
- Implement reporting system VIGISAS / RAVE
- Implementation of monitoring and evaluation of epidemiological surveillance
- Implementation of the necessary capacity for surveillance and response for public health events of national and international importance.
- Strategies for prevention and control of non-communicable diseases.
- Promotion of the South American Program on Immunization

2. *Development of Universal Health Systems*. The strategic objective is to create universal health systems in the countries of South America, recognizing the right to health and an inclusive approach. Its expected outputs are:

- Improve equity and access to health systems
- Mechanism for monitoring and evaluation of health systems
- Democratization of health systems with empowerment and participation of citizens

3. *Universal Access to Medicines*. The strategic objective is to develop strategies and work plans to improve access to medicines. Its expected outputs are:

- Recommendations for strengthening the coordination production capacities of medicines in the region
- Reducing barriers to access due to intellectual property (IP)
- Reducing barriers through incentives for innovation and medicine development
- Developing strategies for pricing policy to favor access to medicines
- Development and promotion of strategies for rational use of medicines
- Supervision and control to promote access to safe, effective and quality medicines
- A sub-regional South American policy to universal access to medicines

- Promoting the production and use of generic medicines

4. *Health promotion and actions on the determinants of health*. The strategic objective is to strengthen health promotion and action on social determinants, to reduce inequities by generating information, inter-sector coordination and community participation in the formulation, implementation and monitoring of public health policies. Its expected outputs are:

- Establishment of basic indicators on health equity, criteria to evaluate policies on reduction of inequities, and monitoring mechanisms.
- Availability of contents on promotion and health determinants, in the development and management of human resources.
- Availability of methods, inter-sector coordination strategies, and social participation in health policy, to support policy implementation.
- Social communication mechanisms available to ensure access to information on PS and DSS to different segments of society.
- Multicenter research projects in the areas of public policy
- Defined strategies to promote dialogue and analysis of impact of health policies, on the various groups of UNASUR.

5. *Development and Management of Human Resources in Health*. The strategic objective is to strengthen the formulation, implementation and management of health human resources in general, and especially in the technical areas of the health agenda of UNASUR. Its expected outputs are:

- Sustainable policies on human resources
- Reduced worker migration and impact on health systems in the region.
- Promotion of research development and leadership in priority areas, based on the promotion of the South American Institute for Health Governance (ISAGS).
- Encourage continued training in the institutional networks structured in priority areas of the UNASUR’s Health Agenda.

According to the Five Year Plan, Health Ministers constitute the Coordinating Committee, supported by technical groups with a set of issues to be incorporated in the Five Year Plan: food sovereignty, hunger, food and nutrition; environmental health (climate change and job); immigrants’ health, promoting a coordinated and supportive response to emergencies and disasters; gender, mental health, multiculturalism, health careers and violence; strengthening social participation; and promoting the incorporation of social and community organizations (11).

The fulfillment of the various agendas can be better targeted and coordinated through effective monitoring. Therefore, it is crucial the strengthening

of integral information communication systems and monitoring agendas in UNASUR SALUD.

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8. SYNTHESIS AND PERSPECTIVES

This chapter presents a synthesis of the main characteristics of the health situation and its determinants in South American countries, as outlined in the document, the current situation of health policies and systems, and the perspectives and challenges in the health agenda that countries will face in the future.

General Background

The countries in South America, beyond the particularities of each one, share some similarities in their prevalent political, economic and human development. Common history, language and culture have contributed to these similarities. In general, the overall context has evolved positively, under the influence of global changes occurred in the last three decades. Relevant processes have been globalization, democratization, changes in role and reforms of the state, development and crisis in social security systems, and economic growth. On the other hand, the main limitation has been the maintenance, or even growth, of inequality and social exclusion.

State action is emphasized in some countries as an essential factor to pursue progress focused on equity and the needs of the population, while in other countries, progress is seen as based on modernization focused on the market and efficiency, with emphasis on privatization and the reduction of the size and influence of the State. In general, the diverse type of state reforms have produced benefits with economic growth and social development, but also have increased social and economic inequalities, to the detriment of poor and excluded groups of the population, with less social protection and ability to pay.

Countries continued with economic growth in the period 2006-2010, but they are still vulnerable to eventual economic crisis, such as the one that occurred in 2008, and this could have negative impact on living conditions and health. Unemployment and poverty rates decreased during 2006-2010 (although the absolute number of poor and indigent people increased), with inflation relatively under control.

Economic progress and human development is systematically related to gradual improvement in health conditions, particularly in the prevention of avoidable health events and premature deaths, and the increase of life expectancy at birth. Chile and Argentina have reached the highest socioeconomic and health indicators, while Bolivia and Guyana remain with the lowest levels. Life expectancy at birth in South America reached 75.5 years of age in 2010, but there is a difference of almost 13 years between the countries with extreme values.

The population in South America reached almost 400 million people in 2010. Around half of them were Brazilian inhabitants. A quarter of the population was under 15 years of age, two thirds was between 15 and 64 years old and 7% was 65 years and older.

From 1990-2010, the population growth has been gradually reduced, at different levels and speed between countries. The population structure has changed towards aging, especially in countries with greater global development. In that period, the population of South America increased in one third (33%), but the proportion of children less than 15 years of age increased only in 1% and the group of people 65 years and over increased by almost 90%. Demographic changes have contributed to the epidemiological transition process, increasing the prevalence and complications of diseases and health problems related to aging.

Countries simultaneously participate in one or more integration organizations, which in general include similar health agendas. All the 12 countries participate in UNASUR. MERCOSUR covers 4 Full Member States and 6 Associated States, almost covering the entire population of South America (except Guyana and Suriname). The Andean Community (CAN) includes 4 Full Member States and 5 Associated Members, (in total, 365 million of people). The Bolivarian Alliance for the Peoples of the Americas (ALBA) includes 4 countries, with a total of 53 million inhabitants. The Amazon Cooperation Treaty Organization (ACTO) includes 8 Member Countries, but the specific population living in the Amazon area of those countries has two different estimates: 34 and 11 million inhabitants.

Social determinants of health

Differential socioeconomic development between different areas and groups within countries produce social inequalities with conditions that could contribute to health inequity. Population groups with lower socioeconomic development tend to be excluded from the benefits of development and social protection. Thus, they could be more vulnerable, with lower levels of health and higher rates of health preventable events.

Health conditions and health systems in the countries of South America are influenced by the political, economic and social context. This progress has been

uneven among various population groups, to the detriment of the most deprived and vulnerable ones. The gradients and health inequalities are significantly related to variations in these types of determinants, which imply the search for the necessary plans, decisions and actions that constitute as a whole, a coherent response from the health sector. Therefore, it is important to monitor the trends of social determinants, which are interlinked and contribute to the remarkable inequality and gaps in health and health systems.

Among the important social determinants of health stand out economic income, employment, poverty, education, housing conditions, water and sanitation, rural areas and some ethnic conditions, cultural and migration that are concentrated in vulnerable and excluded population groups, with low quality of life and less opportunity to access to health services. However, it should be noted that most countries in the region are making important efforts made and strategies implemented, in order to extend coverage to reach the neediest groups.

In general, the social determinants of health are considered important by countries and sub-regional groups at the moment of proposing the development and integration of agendas. that should be translated in concrete plans, decisions actions on health. However, the possibility for solution to many of these determinant factors lies outside the scope of the health sector, and even beyond the scope of what could be resolved at the state level (in the short term), especially in countries with limited economic development level, limited state capacity of the State and the health sector.

The different population groups in South American countries have quite different participation in national income and expenditure, which become evident when comparing the distribution of income received by income quintile groups: people in the lowest income quintile in South America only receive 3.3% of the total income, while those in the highest income quintile receive 58.4% of the total. In less developed countries, income inequality between extreme quintiles of population tends to be higher. Although in recent years there has been some progress towards a better distribution of income, income inequality still remains high.

In 2006, the average income of each employed worker was quite diverse (six times more in Argentina than in Bolivia) with higher income in men than women. In 2010, the annual average unemployment rate was generally less than two digits. That year, approximately 108 million people lived in poverty

conditions (21.3% of the population), and 36 million in extreme poverty or indigence (11.1%). More than half the population in Paraguay and Bolivia is poor, and nearly a third of the population is homeless. Poverty and indigence are consistently higher in rural than in urban areas.

In 2010, literacy in South America reached 94% and schooling increased in most countries, at different levels. Access to education remained higher for men than for women, particularly in rural areas, and the quality and level of education was related to household income.

Rural areas have less access to drinking water and sanitation. Improved drinking water sources in South America reached 94% of access, becoming almost universal in urban areas (97%) but covering only 79% in rural areas. The conditions of access to improved sanitation facilities reached 78% in South America, but only 48% in rural areas.

Less than one fifth (18%) of the population lives in rural areas in South America. Life in rural areas is associated with lower income conditions, housing, education and sanitation. These social determinants relate to health events and deaths that are preventable, as well as less access to health care. The less developed countries tend to have more rural areas, as Guyana, Paraguay and Bolivia. On the other hand, increasing urbanization also involves unplanned problems such as poor diet, obesity, sedentary lifestyle, alcohol and drugs, accidents and violence.

Groups of people who are under limited socioeconomic conditions, displacement, ethnic or cultural background and geographical location, become highly vulnerable to factors or adverse circumstances from the physical or social environment. Since they concentrate risk factors, are more likely to get sick and die. Added to this, they tend to have less social protection and less access to health systems due to geographical barriers as well as cultural and economic constrains (such as in the case of rural areas or poor peri-urban settlements of large cities). Indigenous peoples tend to be particularly vulnerable in terms of health, with fewer conditions and healthy lifestyles opportunities, less promotion and prevention in health.

Two thirds of the salaried workers referred to be affiliated to social welfare systems. Coverage of social protection in urban areas is significantly higher than in rural areas, as well as higher in urban formal sector, and in men. The social security coverage increase with level of income in all countries, where the groups of workers with higher incomes can make greater contribution and have greater coverage.

Environment and Human Security

South America has huge natural resources and environmental conditions, representing a great wealth in the region (water, natural gas, forestry, agriculture and livestock potential). However, the process of industrialization and massive exploitation of natural products (such as forests) has led to a significant deterioration of environmental conditions.

Deforestation, soil erosion and desertification have been affecting all countries in the region, to a greater or lesser extent, becoming an increasing threat to the security of the supply of food and water, and increasing the vulnerability of the population to natural disasters.

Natural and man made disasters, as well as environmental degradation, are having direct and indirect consequences on health of the population. The accelerated and uncontrolled urban and industrial growth with lack of planning has led to increasing air pollution (especially due to industrial and vehicle sources), as well as water and soil contamination. New urban settlements in bigger cities, especially populated by groups such as migrants from rural areas, tend to have limited socioeconomic conditions, poor housing, sanitation and quality of life. All that limits the opportunities to have physical and social environments that could favor a healthy lifestyle, making health promotion and prevention more difficult (limited social network, low education, poor diets, and critical negative issues such as alcohol, drug abuse and violence). Environmental degradation mostly affects health conditions of the poorest population groups, who are vulnerable and unprotected (both urban and rural). The recurrence of emergencies and disasters, mainly natural and unpredictable, has had a progressive impact in loss of life and property.

Progressive deterioration environment has had an impact on the political, economic and social situation in several of the countries, due to factors such as deforestation and soil erosion, urban and unplanned industrial growth, what has led to increased pollution in air, water and soil. However, countries and the international community have raised overall awareness, with the emergence of promissory national and international efforts, like the Sustainable Development Initiative, as well as forums and related strategies. All that represents an intensive and active search for a more effective collective approach to face this complex and relevant health-related topic.

According to the current scenario and trends in countries of South America, the negative impact of

climate change will probably continue to be a challenge that will require a multi-sector approach, at national and international levels. Therefore, it is needed to continue with the international efforts, including joint action of the sub-regional integration organizations. In that way, collective action could be more efficient and effective in facing issues such as floods, droughts, access to clean water, agricultural, communicable diseases and others events.

Despite increasing awareness and health security efforts in countries and international health agendas, the preparation and response capacity remains an unfinished agenda. Efforts made by the United Nations for Sustainable Development point out a promising but difficult challenge towards achieving a healthy environment and better protection of human security.

Health conditions and trends

Level of health, health conditions and risks factors have some similarities in South American countries, especially among those having similar socioeconomic level (human development) and population structure. Changes in demographic and epidemiologic profile in different countries have led to a new scenario characterized by aging of the population and reduction of many avoidable diseases and diseases. It has implied new priorities for the health agenda, given the increasing relevance of non communicable chronic diseases, accidents and violence, mental health and diseases related to non healthy environment.

The systematic improvement of health indicators in countries reflect that health conditions in South American countries, and inside them, have continued with a gradual advance in the last decades. Some important achievements have been reached in some issues such as the improvement in maternal and child health, reduction of communicable diseases affected to prevention and control, nutrition and a higher life expectancy. In general, this improvement has tend to occur in same line that the major development of socio economic conditions and quality of life, as well as with the implementation of social protection mechanisms or the expansion of its coverage, so as to reach the most vulnerable groups. It has occurred simultaneously with the increase of health services coverage, especially in primary health care.

The incidence and remaining high frequency of some communicable diseases in South America, especially in poor and rural sectors of the population, continue causing high and avoidable complications and diseases, which means that the national and international epidemiologic vigilance continues to be very necessary

to address an effective response of prevention and control, in a relevant and timely way.

It means that there is positive gradual advancement in health situation, but some uncompleted or pending aspects of the health agendas still remain (especially in priority groups and areas). It is necessary to continue with strategies and efforts looking for: the reduction of avoidable events, including preventable and premature deaths; avoidable health inequities; the unequal opportunity for health promotion and prevention; and inequities in the access to health care services.

According to the current situation and trends, it is expected that some relevant health-related aspects will continue being a priority in public health, such as the epidemiologic transition, the aging of population and the remaining existence of groups of population under vulnerability, risk and burden of disease.

Those gaps and inequities in health which are most related to social inequities will be difficult to ameliorate, unless effective inter-sector policies and mechanisms to reduce social inequities could be adopted, and health systems could continue improving their performance, effectiveness and coverage. That implies the need of a greater strength of policies and strategies focused on preventing the impact of social inequities in health, through actions to prevent avoidable events and to strength health promotion and primary health care access and effectiveness.

Strategies and planned action for effective prevention and control of risk factors and non communicable chronic diseases will continue to be a challenge requiring multi-sector involvement, as well as cultural changes and greater community participation.

Mortality due to some avoidable causes, such as cervical and breast cancer, sepsis, malnutrition and acute respiratory infections, could be reduced with major effectiveness and coverage of health primary attention. Thanks to the historical priority given to maternal-infant care, infant mortality has gradually dropped in South America, although there are still differences at international and sub-national level, remaining as unfinished agenda in some countries and areas.

The incidence and prevalence of some communicable diseases (such as tuberculosis, HIV/AIDS, dengue fever and malaria), will continue causing preventable complications and disease, especially in sectors of poor, rural population and frontiers. Interventions to address risks factors of the main causes of death escape from direct control of the health sector, especially in case of: external causes,

cardiovascular diseases, diabetes, chronic obstructive pulmonary diseases and HIV/AIDS.

Chagas still remains endemic, together with some other unattended communicable diseases. Some countries continue reporting wild yellow fever. Human hydrophobia (transmitted by dogs) is in a phase of elimination, although there are some sporadic outbreaks.

South American countries should continue to be alert to potential of a pandemic that could appear, such as flu. Also, there is monitoring of the eventual impact of an international financial crisis, which could have wide potential repercussions on countries of the region. It represents a challenge that requires an exhaustive revision, with the necessary actions to respond effectively. The International Health Regulation adopted by countries is a critical mechanism to be prepared for epidemics or emergency of unexpected serious health events.

The process of decentralization and distribution of resources in health services should be based on proper analysis and planning to be responsive to the different health needs. Particular emphasis should be given to the poorest, rural, excluded and vulnerable, who generally are the neediest for health care but have less access.

When available knowledge, technology and experience have been applied to maternal and neonatal care, they have been highly effective in drastically reducing the occurrence of maternal and neonatal complications and death. However, it has been difficult to be in track with the expected goals of the MDG. It is important to evaluate the concrete difficulties to achieve a more radical advance. That cannot be achieved making just the same current efforts, and in an isolated way, but it requires the development of effective policies, strategies and interventions, as specifically needed.

Coverage of quality improvement in the healthcare of women, newly born and children, through a safer maternities and secure births needs to be continued. National strategies for reduction of maternal and child deaths are focused not only on the reduction of mortality and morbidity, but on contributing to a better health, life quality and equity, both for the mother and the child. Those strategies include: the integration of specific programs and actions as well as the integration to the of healthcare network; primary attention; and the active participation of the community. It looks for sustainable, accessible and quality healthcare programs.

To ensure proper knowledge of the needs and adequacy of the health system response, it is important to maintain the integrated network of national systems of surveillance, monitoring and observation focused on relevant matters of public health. They will provide information and evidence to support the development of

policies, plans, decision making and action, to contribute to the final objective which is to preserve and improve health of the population.

Health policies, social protection and health systems

In the last three decades, the health sector in South American countries has been exposed to different development processes, modernization and sector reforms. In some cases, there were radical changes in the organization, structure, financing and development of health systems, with implications for the access of the population to them. Despite the great diversity of changes between countries and through time, there were two main modalities of reform and progress: a group of countries focused on the role of the State to extend social protection and health services coverage, emphasizing on primary health attention. Other countries, such as Colombia and Chile, applied a neoliberal reform involving the state and health sector, with emphasis on decentralization, modernization, privatization and efficiency.

In the defined separation of functions (specially in countries with neoliberal reform), the actors were the State and regulatory entities, with active participation of insurers, employers and citizens. Under this approach, decentralization and increase of private sector were highly promoted (including the privatization of insurance and public provision of health). In the financing and performance of healthcare services, the efficiency and new mechanisms to increase coverage of health systems were emphasized. Basic packages and the extension of social protection were implemented, especially aimed to include coverage for the poor and marginal groups of population.

The mixture of benefits and problems resulting from neoliberal reforms, implies challenges of action, including the necessity of: strengthening the steering role of the sanitary authority, strengthening and monitoring the essential functions of public health, searching for mechanisms to integrate the public network (respecting local autonomies) with solidarity and equity criteria, recuperating the level of financing and resources to improve efficiency in the healthcare system.

Between 2006 and 2010, the new legislative contribution supported the strengthening of legal and normative frame with especial emphasis on the right to health, strengthening health systems and making the responsiveness to the health needs and demands of the population more relevant. Social public health expenses in South American countries reached

approximately 2.9% of Gross National Product (annual expense US\$ 108 dollars per inhabitant) having close relationship with the economic income per inhabitant (it was over US\$ 1,000 in Argentina, whilst was less than US\$ 200 in Peru, Bolivia, Ecuador and Guyana).

Total coverage of social protection in health is high in countries like Chile, Brazil and Venezuela. Social security in health reaches two thirds in Chile and Colombia, reaches half of the population in Argentina, a little less in Uruguay, while in the other countries it is more limited. Private sector (with and without profit purposes) covers approximately a quarter of the population in Ecuador and a little less than a fifth in Chile.

In most of South American countries, the public healthcare system has the highest national coverage in infrastructure, human resources and supply of health services, especially at a primary care level and in those rural and isolated places, with less resources and higher social vulnerability. There are state or private entities that count with their own health system (special regimes), as in the case of the armed forces, police and organized groups of workers, as petroleum workers as in Venezuela. In 2010, there were 748 thousand beds in South America (1.9 beds per 1.000 inhabitants), and approximately 862 thousand physicians, 210 thousand nurses and 330 thousand dentists (22.0, 5.4 and 8.8 per 10,000 inhabitants respectively). Nevertheless, health personnel tends to have limited availability, bad distribution and lack of an adequate profile to best respond to specific health needs of different groups of the population. Those obstacles are accentuated by the internal and external migration. Loss of key staff specially occurs in the public health system and in the poorest countries and areas. Human resources planning continues being limited, whilst the university education of health professionals continues being focused on the traditional curative approach and centered in hospitals.

Homes have become the main source for financing medicines in Latin America (two thirds of the total), whilst access to essential medicines is difficult for more than a half of the population. Prices constitute the main barrier while their costs continue increasing. List of essential medicines contributes to guarantee the rational use of medicines. Self medication continues being a problem in the region, especially with the use of antibiotics. Many countries have developed policies and strategies to increase the availability and coverage of medicines, such as free programs for the most needed population.

In general, there is a public-private mixture in the financing and insurance in health systems. In nine countries there is a social security system. In general, the

provision of services is also mixed. The access, at least for primary health care, is universal in most of countries. The governments insist on the emphasis put on primary healthcare, however the predominance of the curative model and of specialties in the provision of healthcare continue to be predominant. Health care, still is mainly centered in hospitals and individual care. Non coordinated decentralization of the network of services and the competitive search for efficiency (quasi-market) have made difficult the improvement of equity and better performance of health services, especially in countries and areas with lower quality of life and higher vulnerability.

Facing the structural problems and challenges of health systems is an ongoing task, especially: problems of fragmentation; limitations in financing and in assurance and provision of services; better integration of healthcare networks; primary health care; healthcare quality and response effectiveness.

An adequate and equity-related approach development will help to reduce existent asymmetries among health systems in the region, with a better and fairer access and coverage to health services. The effective protection to the poorest, marginal and vulnerable population, approaching the main determinant factors in health, especially those related to social exclusion, risks exposure, non planned urbanization and climatic change. The recovery or strengthening of institutional capacities of national health authorities includes: strengthening sector management (formulation, execution and evaluation of public policies); regulation (for instance, insurance mechanisms and access to public health facilities); supervision and control of interventions and results; better performance of essential functions of public health; and adequate economic-financial management and fundraising.

Current priorities are related to the need for improving the planning of human resources, their availability and distribution (according to necessity and equity criteria); better working conditions; mechanisms to control migratory flow; and reorienting tertiary education and training according to main health-related needs. National and international priority should be also given to improving their availability; distribution; efficiency, and training of human resources.

It is important to develop or strengthen policies that regulate all the process of production, commercialization, distribution and rational use of medicines. All that includes strategies of transparency in the procedures of authorization; the establishment

of appropriate quality standards; and diffusion of information referring to medicines.

Knowledge and information technology

Until 2010, South American countries have developed different initiatives related to the use of information and communication technologies applied to the health field, such as: the Virtual Health Library; the use of on line courses related to health and public health and the configuration of national nodes of public health campus; major investment in research and development; the EVIPNET research; and connectivity initiatives.

In spite of the advance reached during these years, a series of limitations continue, such as the lack of global training strategies, limited investment in research or lack of the necessary infrastructure to carry out initiatives and projects concerning knowledge and information and communication technologies management. There are differences in the development and functioning of the knowledge information technology, between countries and inside them. Financing and training for use is required. The development of information technology tends to concentrate in those areas with higher socioeconomic development, in detriment to those places with less development and resources.

Important challenges in countries are overcoming the issues mentioned above, as well as working on increasing the scientific production, promoting higher participation in information networks and strengthening the conditions for better use of health information and communications technologies.

The search for solutions pursued by the Strategies on Cyberhealth and eHealth could produce important benefits, especially if they are supported by effective governmental policies and strategies (as they have been established by many governments) and the adequate technology to respond to the most relevant needs for information and communication. PAHO and other agencies should continue supporting the structure of national and regional information networks for the incorporation, strengthening and promotion of the effective functioning of diverse virtual health libraries, virtual education at distance, and health research.

One of the main challenges will be the interoperability and a first step to this will be to achieve an agreement to generate a national electronic identification with a unique individual identification to be used at all the entities of the health system. The contribution achieved in relation to eHealth and its components of bookstores, education at distance and research support, represents a gradual and solid effort for the use of basic technology to support decisions making based on the evidence, in line with the promotion of higher use of social networks.

International cooperation and sub-regional approach

Cooperation for health development has gradually changed during the last decades, due to changes in donor finances, necessities of the receptors and grant modality to select the candidate countries for receiving assistance. In technical cooperation matters, some South American countries, such as Brazil, Argentina and Chile, have gradually transformed into cooperation donors for some specific areas, due to the economic development and national capacity they have reached. Some other countries, such as Bolivia, continue being a priority to receive international cooperation. The modality of mutual or horizontal cooperation, among similar countries, is gradually increasing.

The set of national and sub-regional health agendas have in general a high level of similarity in the issues they cover. This is useful and favors horizontal work and cooperation.

A more integrated and efficient sub-regional approach could be facilitated by the analysis and promotion of proper coordination of the different health agendas, the specific health aspects that they cover, the areas of those agendas established in the processes of South American integration and the added value that each could have, both in technical cooperation from PAHO/WHO and in the development of alliances in matters related to health.

All that implies the benefit of harmonization of the common issues within national and international agendas, to face health conditions and determinants whose coverage transcend frontiers and regions. Health-related areas covered by different agendas, outstanding epidemiologic aspects, including malaria and tuberculosis and HIV/AIDS, the improvement of health systems, actions in frontier zones, joint efforts of countries to integrate health agendas.

Given its condition of being an agency specialized in health, and as part of the intergovernmental system of the Americas, PAHO/WHO has the role to accompany and give technical assistance to the actions involved in the different health agendas. That is why it is the leader entity for the fulfillment of the 2008-2017 Health Agenda of the Americas and, moreover, it contributes with some financing and biennial plans to support sub-regional health agendas, the development of South-South technical cooperation, and resource mobilization.

It also relies on multiple Alliances related with health, and there is also the new strategy called "Technical Cooperation among Countries" (TCC). With their contribution to the set of agendas and initiatives, there is also the needs for harmonization and integration of agendas (protecting their autonomies and particularities).

Medium term health plans (such as five-year plans), developed at national and sub-regional level, usually have defined expected results. However, there is not security that those results would be accomplished in the planned period. Most of those plans do not sufficiently specify the necessary resources and efforts to achieve each expected result.

Integrated work of governments to fulfill the MDG, facilitates advance in health-related matters and social determinants. It includes the opportunity to strengthen national and sub-regional agencies to deal with maternal-infant situation, AIDS, tuberculosis, malaria and malnutrition. The use of international alliances on these matters, which at national level include the more relevant sectors and actors of the society, simultaneously represent the possibility of achieving results that in an isolated way would not be reached and, at the same time, proposes the great challenge of joined and integrated action to accomplish the goals and objectives established at different levels.