

Public Health Capacity in Latin America and the Caribbean:

Assessment and Strengthening



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Executive Summary

The Latin American and Caribbean (LAC) countries vary greatly in terms of their level of development and epidemiological profiles, yet they face a series of common public health (PH) challenges in the 21st century. The persistence of diseases such as dengue, tuberculosis, and malaria and the emergence of new diseases such as HIV/AIDS, SARS, and avian flu as well as increasing cases of antimicrobial resistance emphasize the need for flexible and responsive PH systems. In addition, the changing epidemiological profile of the population, with an increase in morbidity from diabetes, heart disease and cancer pose additional challenges to public health systems.

Throughout the 1990s, Latin American and Caribbean countries implemented a series of Health Sector Reforms (HSR) in which the goal was to increase equity, effectiveness, quality, efficiency, sustainability and social participation. Even though these reforms have had some positive outcomes in reducing inequities in access and improving resource allocation, overall, HSR have not been successful in achieving the proposed goals. One of the reasons for this failure may be attributed to the fact that public health was largely absent from the reform agenda.

In order to bring public health to the forefront of the health debate, and in an attempt to address the crisis in public health practice, the Pan American Health Organization/World Health Organization (PAHO/WHO) launched the "Public Health in the Americas" Initiative. Within the framework of the Initiative, a methodological tool to measure the performance of *11 Essential Public Health Functions* (EPHF) was developed. The EPHFs were defined as the set of conditions that improve public health practice. Application of the tool and the performance measurement of the EPHF in 41 countries of the Region provided a dynamic starting point for the analysis of the existing strengths and weaknesses in the LAC Region public health sector. Specifically, the results helped to point out some of the gaps which need to be addressed in order to improve public health performance.

The measurement results provide a general, overall picture of the status of the EPHF in the Region. However, the tool is not focused on the evaluation of PH capacities, or those elements that constitute the foundation of public health practice. To strengthen PH capacity there is still a need for a tool or set of tools that permit countries to self-assess their PH capacities at the local and national level in further detail than the EPHF assessment tool allowed. There are different mechanisms to evaluate and intervene according to the needs of the country, and this paper will identify some of the tools that currently exist and some that are under development. The idea is for countries to examine these assessment tools and decide how they want to proceed with regard to strengthening their public health capacity.

This document was developed based on an in-depth literature review. Sources included country assessments, journal articles, survey data, publications, international cooperation documents and national policy documents in English, Spanish and Portuguese. While the literature review was comprehensive, the paper could have benefited from additional grey literature from the countries in the Region, which can be difficult to locate and obtain since it is not widely disseminated. One of the goals of circulating this paper is the identification of additional examples of strategies and interventions for monitoring, evaluating and strengthening public health capacities by the countries at the national and sub-national levels.

In the *first section* of the document, the concepts and definitions of public health and the relationship between public health systems and health care systems are discussed. In addition, the rationale for using the term PH capacity instead of PH infrastructure is addressed. The *second section* describes each of the elements of PH capacity in detail, outlines existing weaknesses, and identifies some strategies for strengthening and organizing PH capacities in the LAC Region. Lastly, the *third section* of the document discusses the application of several assessment tools developed by PAHO, WHO and other institutions in which the authors propose as inputs for assessing the current status of PH capacities.

The PH capacities as reflected in the literature and selected for this document are:

Public Health Workforce (PHWF) includes all workers whose primary responsibility is the provision of non-personal health services (core public-health). The PHWF can be divided in two categories: primary workforce including workers who are specifically in charge of public health activities or that hold job positions in public health; and secondary workforce, or those workers outside the health sector, usually from other ministries such as agriculture, transportation and education, international organizations and NGOs which also carry out public health activities.

Public Health Information Systems (PHIS) are defined as population-based and public health facility-based data sources. The main population-based sources of health information are census, household surveys and vital registration systems. The main public health facility-related data sources are public health surveillance, and data from the public health system and services, including systems for monitoring the PHWF, the allocation of financial resources, and public health technologies.

Public Health Technologies (PHT) include all of the physical resources and technologies used in the public health system, in addition to drugs and vaccines. These elements constitute the material foundation of the public health sector. They can also include equipment and medical devices, and support systems that allow the public health system to function adequately, such as public health laboratories, blood banks, etc.

Public Health Institutional and Organizational Capacity. Institutional capacity refers to the set of rules and norms that govern the functioning and operation of a public health system; it also determines the capability of the system to respond to public health challenges. Organizational capacity refers to an organization's ability to effectively, efficiently and sustainably exercise its functions to contribute to the institutional mission and vision, and to the policies and strategic objectives of the organization. Organizational capacity is a component of institutional development and refers to the configuration/structure of organizations with a public health focus that function within a given institutional framework.

Public Health Financial Resources refers to the collection, utilization, and management of resources to carry out public health activities as well as the impact of these resources on the health of the population and the public health system.

The purpose of this document is not to propose a new assessment tool to evaluate PH capacity. Most of the countries in the region have conducted several assessments and applied multiple tools that have generated important information about the elements that comprise PH capacity. However, this information is from the health system as a whole, including public health but not focusing solely on it. What is needed is the ability to disaggregate the data to collect information specifically about the public health system, thereby allowing the identification of those elements of PH capacity that are most in need of strengthening.

Some of the assessment tools specific to public health that were selected for the paper and have been developed by PAHO include the forthcoming *Evaluation Instrument of Surveillance Response Capacities*, the *Framework for Characterizing the Public Health Workforce* and the *Framework for Harmonizing the Essential Public Health Functions (EPHF) with the Functional Classification of Expenditures (FCE)*. Selected tools by other organizations include the CDC developed *State Public Health System Performance Assessment*, *Local Public Health System Performance Assessment* and the *Local Public Health Governance Assessment*. These tools have been updated in 2007 and the CDC has stated that, if there is considerable interest, these tools can be translated into Spanish and adapted to the local and/or community levels for application in LAC countries.

Without more detailed information, countries are not able to identify areas for intervention. In this context, more research is needed on the PH capacities mentioned above. The information gap is only now starting to be filled with recent attempts to quantify and qualify the public health workforce and to identify and monitor expenses on public health. However, in order to allow the implementation of evidence-based strengthening strategies, these efforts must be institutionalized.

Preface

Throughout the 1990s, Latin American and Caribbean countries implemented a series of Health Sector Reforms (HSR) in which the goal was to increase equity, effectiveness, quality, efficiency, sustainability and social participation. Even though these reforms have had some positive outcomes in reducing inequities in access and improving resource allocation, overall, HSR have not been successful in achieving the proposed goals.¹ One of the reasons for this failure may be attributed to the fact that public health was largely absent from the reform agenda.

In order to bring public health to the forefront of the health debate, and in an attempt to address the crisis in public health practice, the Pan American Health Organization/World Health Organization (PAHO/WHO) launched the "Public Health in the Americas" Initiative. Within the framework of the Initiative, a methodological tool to measure the performance of *11 Essential Public Health Functions* (EPHFs) was developed.² The EPHFs were defined as the set of conditions that improve public health practice.³ Application of the tool and the performance measurement of the EPHF in 41 countries of the Region provided a dynamic starting point for the analysis of the existing strengths and weaknesses in the LAC Region public health sector. Specifically, the results helped to point out some of the gaps which need to be addressed in order to improve public health performance.

In addition, in response to the need to further improve public health capacities in the Region of the Americas, PAHO/WHO and the United States Agency for International Development (USAID) have been working on public health strengthening, particularly the improvement of the public health workforce and the institutional capacity of the health authority to implement the EPHF. In this context, one of the main activities of the PAHO-USAID partnership included the characterization and development of public health capacities as the main mechanism to strengthen public health practice in the region.

The strengthening of public health capacities comes at an important time as PAHO/WHO member countries are being urged to implement the International Health Regulations (IHR). The IHR, a legally binding international agreement to prevent the spread of disease at the global level, were originally adopted in 1969 but underwent a process of revision in 2005 to adapt to current challenges posed by globalization and increased mobility of goods and

¹ International Society for Equity in Health, "Equity and Health Sector Reform in Latin America and the Caribbean from 1995 to 2005: Approaches and Limitations" (report commissioned by the International Society for Equity in Health – Chapter of the Americas. April 2006).

² Pan American Health Organization/World Health Organization (PAHO/WHO), *Public Health in the Americas: Conceptual Renewal, Performance Assessment, and Bases for Action* (Washington, DC: PAHO/WHO, 2002). The EPHFs that were measured are the following: 1) Monitoring, evaluation, and analysis of health status; 2) Public health surveillance, research, and control of risks and threats to public health; 3) Health promotion; 4) Social participation in health; 5) Development of policies and institutional capacity for planning and management in public health; 6) Strengthening of institutional capacity for regulation and enforcement in public health; 7) Evaluation and promotion of equitable access to necessary health services; 8) Human resources development and training in public health; 9) Quality assurance, personal and population-based health services; 10) Public health research; and 11) Reducing the impact of emergencies and disasters in health.

³ Fernando Muñoz et al., "Las funciones esenciales de la salud pública: un tema emergente en las reforma del sector de la salud," *Pan American Journal of Public Health – Special Issue on Health Sector Reform* (July-August 2000).

persons. In preparation for implementing the IHR, PAHO/WHO has been providing Member States with technical cooperation to assess existing public health capacities and implement strengthening plans.

In light of the challenges and opportunities presented above, public health has gained an important momentum in the Region. This is the context this paper was developed in; as a mechanism to help countries to improve their ability to reclaim public health as a main topic in the health agenda and make public health practice the mechanism for achieving the goal of health systems: improving the health of the population.

I. Introduction

The Latin American and Caribbean (LAC) countries vary greatly in terms of their level of development and epidemiological profiles, yet they face a series of common public health (PH) challenges in the 21st century. The persistence of diseases such as dengue, tuberculosis, and malaria and the emergence of new diseases like HIV/AIDS, SARS, and avian flu as well as increasing cases of antimicrobial resistance emphasize the need for flexible and responsive public health systems. Furthermore, the changing epidemiological profile of the population, with an increase in morbidity from diabetes, heart failure and cancer pose additional challenges to PH systems.⁴

Even though the LAC Region has witnessed outstanding strides in the improvement of some basic health indicators in recent decades;⁵ the overall public health situation is deficient in most countries. Avoidable mortality, for example, still surpasses one million deaths annually.⁶ Average country and/or regional data that demonstrate gradual improvements in maternal, infant and child mortality mask the fact that within certain groups, such as the poorest, indigenous and Afro-descents, for example, health indicators are not improving. Therefore, despite the fact that the overall health situation is improving, at the same time health inequity is increasing. This has contributed to great differences in health status between groups and/or the progressive deterioration of health indicators.^{7,8}

The slow and uneven progress towards confronting the aforementioned challenges can be explained partly by resource imbalances both within and between LAC countries. These imbalances—which manifest themselves in the shortage of *human resources* as well as in the existence of deficient *information systems*, weak *institutional* and *organizational capacity*, inadequate *health technologies*, and insufficient *financial resources*—have a negative impact

⁴ World Health Organization (WHO), *World Health Organization Report on Infectious Diseases: Removing Obstacles to Healthy Development* (Geneva: WHO, 1999).

⁵ United Nations Children's Fund (UNICEF), *Progress for Children: A Child Survival Report Card* (New York: UNICEF, 2004), http://www.unicef.org/progressforchildren/2004v1/pdf/pfc_eng.pdf (accessed December, 2005). The report notes, for example, that the under-five mortality rate in Latin America and the Caribbean has gone down from 153 per 1,000 live births in 1960 to 34 per 1,000 live births in 2002.

⁶ Carlyle Guerra de Macedo, "La extensión de la protección social en salud en el nuevo Estado latinoamericano," *Reforma y Democracia* 19 (2001), <http://unpan1.un.org/intradoc/groups/public/documents/CLAD/CLAD0039301.pdf>.

⁷ PAHO/WHO, *Programa Salud de los Grupos Indígenas de las Américas: Propuesta, Ejes de Trabajo y Plan de Acción 2005-2015* (Washington, DC: PAHO/WHO, 2004).

⁸ PAHO/WHO, *Exclusion in Health in Latin America and the Caribbean* (Washington, D.C.: PAHO/WHO, 2004).

on the performance of public health systems. Reversing this trend requires interventions targeted towards these five elements which will be referred to in this paper as *Public Health Capacities* (PH capacities).

In spite of the fact that investments in *PH capacities* have increased in many countries over the last two decades, strengthening these elements was not the primary focus of the health sector reform processes (HSR) of the 80s and 90s.⁹ In particular, HSR processes were centered primarily on introducing mainly structural, financial, and organizational changes as well as changes in service delivery. Interventions designed to strengthen the steering role of health authorities and improve public health practice have received far less attention. Aspects related to public health have largely been neglected, as if they were not a social and institutional responsibility –precisely when state support is most needed to modernize the capacities required for a functioning public health system.

One of the most important attempts to address current PH capacity in the Region was the Public Health in the Americas (PHA) Initiative which began as a PAHO mandate in 1999 and was subsequently adopted as a Directing Council resolution in 2000.¹⁰ The goal of the Initiative was threefold: to reach a regional consensus on the concept of public health and its essential functions, to develop a methodology to assess the status of these essential functions in the region, and based on the results of the assessment, to identify strengthening strategies.¹¹ The initiative defined 11 Essential Public Health Functions (EPHF) as the indispensable set of actions, under the sole responsibility of the state, which are fundamental for achieving the goal of public health: “to improve, promote, protect, and restore the health of the population through collective action”.¹²

Despite being a very valuable methodology, the EPHF assessment methodology lacks specificity in terms of the next steps that should be implemented after countries determine which EPHFs need strengthening. As will be described later, the measurement results provide a general, overall picture of the status of the EPHF in the Region. However, to strengthen PH capacities a more focalized mechanism is needed to pinpoint in which areas countries need technical cooperation and assistance.

Therefore, notwithstanding the achievements of the PHA Initiative, there is still a need for a tool or set of tools that permit countries to self-assess their PH capacities at the local and national level in further detail than the PHA methodology allowed. The goal is to move beyond macro-problems and to look more at each individual country needs at the sub-national level. There are different mechanisms to evaluate and intervene according to the needs of the country, and this paper will identify some of the tools that currently exist and some that are under development.

⁹ Muñoz et al., “Funciones esenciales de la salud pública,” op. cit. p. 8.

¹⁰ The 42nd Directing Council adopted Resolution CD 42/18 on September 2000, which urged member states to participate in the regional exercise to measure performance with respect to EPHF and use the results obtained to carry out interventions to develop their capacity and to improve public health practice.

¹¹ PAHO/WHO, *Public Health in the Americas*, op. cit. p. 8.

¹² Ibid.

The idea is for countries to examine these assessment tools and decide how they want to proceed with regard to strengthening PH capacities.

In the *first section* of the document, the concepts of *Public Health (PH) and Public Health Capacities* are discussed. The *second section* describes each of the elements of PH capacity in detail, outlines existing weaknesses, and identifies some strategies for strengthening and organizing PH capacities in the LAC Region. Lastly, the *third section* discusses the application of several assessment tools developed by PAHO and other institutions, which the authors propose as inputs for assessing the current status of PH capacities.

II. Methods

The document was developed based on an in-depth literature review. Sources included country assessments, journal articles, survey data, publications, international cooperation documents and national policy documents. Initially, the search for information focused on documents that contained the term “*Public Health Infrastructure*” or “*Public Health Capacities*” in English, Spanish and Portuguese. Subsequently, the search was expanded to include information on the public health workforce, public health organization and management, public health information systems, public health technologies, and financial resources, which are usually considered to be the elements that constitute the PH infrastructure or capacity.

The purpose of the literature review was to search for concrete definitions for these elements, while also compiling information on monitoring, evaluation, performance and strengthening strategies for each of these components in Latin America, the Caribbean, the United States, and Canada. While the literature review was comprehensive, the paper could have benefited from additional grey literature¹³ from the LAC countries. Albeit common in the Region, grey literature can be difficult to locate and obtain since it is not widely disseminated. One of the goals of circulating this paper is the identification of additional examples of strategies and interventions for monitoring, evaluating and strengthening public health capacities by the countries at the national and sub-national levels.

III. Key Concepts and Definitions

What is Public Health?¹⁴

There is no single definition of public health that is universally accepted. Some important definitions of public health were compiled and are presented below:

¹³ Grey literature refers to papers, reports, technical notes or other documents produced and published by governmental agencies, academic institutions and other groups that are not distributed or indexed by commercial publishers.

¹⁴ For a complete description of public health’s historical origins up to present day achievements and challenges, see chapter 3 of PAHO/WHO, *Public Health in the Americas* and Bernard J. Turnock, *Public Health: What it is and What it Does*, 3rd Ed. (Sudbury, MA: Jones and Bartlett Publishers, 2004).

- The effort (organized and unorganized) of a society stemming from its commitment to meet or attain its health ideals.¹⁵
- An organized effort by society, primarily through its public institutions, to improve, promote, protect, and restore the health of the population through collective action.¹⁶
- The science and art of preventing disease, prolonging life and promoting health and efficiency through organized community effort.¹⁷
- An integral part of the health system, public health is understood as the interventions carried out in society with health as the primary goal.¹⁸

The idea of basing the concept of PH on the health of the population has been gaining strength and consensus. “The health of a population is measured by health status indicators and is influenced by social, economic and physical environments, personal health practices, individual capacity and coping skills, human biology, early childhood development and health services.”¹⁹ Likewise, the concept of “collective health,” used particularly in the Brazilian context, frames health as a social phenomenon and therefore an area of public interest. According to Paim & Almeida Filho, collective health can be understood both as a scientific field, where knowledge about “health” from the perspective of different fields of study is generated; and as a practical field, where actions are carried out by multiple actors from different organizations within and outside of the sphere commonly known as the “health sector.”²⁰

What is the relationship between the Public Health System and the Health Care System?

For the purposes of this paper, public health will be referred to as a subsystem of the overall health system. As seen in Figure 1, the health system is much broader than the health care system or health care services, which include medical care. This figure illustrates these three health areas and their relationship to the following social components: private (the component that operates privately and includes the market), the non-State public or “community” sector (non-profit public and social services-oriented civil society organizations, such as charities and community organizations), and the State. The irregularly shaped shaded area represents the field of public health, which covers part of the health care system area, but also some additional areas outside of this area that have an impact on the health of the population.

¹⁵ “Terms of Reference,” in *The Crisis of Public Health: Reflections for the Debate*, ed. PAHO/WHO (Washington, D.C., 1992).

¹⁶ PAHO/WHO, *Public Health in the Americas*, op. cit. p. 8.

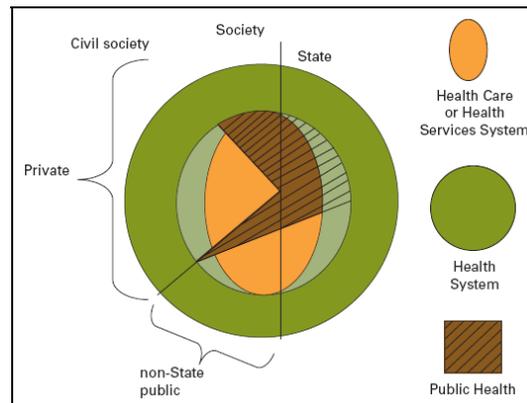
¹⁷ C.E.A. Winslow, “The Untilled Field of Public Health,” *Modern Medicine*, Vol. 2 (1920):183-191.

¹⁸ WHO, *World Health Report 2000 – Health Systems: Improving Performance* (Geneva: WHO, 2000).

¹⁹ Cited in Institute of Medicine (IOM), *The Future of the Public’s Health in the 21st Century*, Executive Summary (Washington, DC: National Academy Press, 2002).

²⁰ Jairnilson S. Paim and Naomar de Almeida Filho, “Saúde coletiva: uma “nova saúde pública” ou campo aberto a novos paradigmas?,” *Revista de Saúde Pública* 32, No. 4 (June 1998): 308.

Figure 1: Spheres of Health and Social Components



Source: PAHO/WHO, *Public Health in the Americas*.

As the name itself suggests, the field of public health is largely public and the State is the dominant contributor to the public health system.²¹ However, it is important to note that it is no longer sufficient to define PH in terms of only what the government does. Today there are a variety of NGOs that carry out diverse public health research projects and programs. It is worth mentioning that the character of public sector organizations differs in many important aspects from that of the private or voluntary sector. The goal of public health agencies is to measure and improve health outcomes, and although values such as efficiency and effectiveness - which are highly regarded in the private sector - are important, equity and fairness in access to health care and opportunities play a fundamental role.²²

Public health versus personal health

A differentiation can be made between the health care system (personal health) and public health (non-personal health services). Non-personal health services are those targeted at the environment or at the community.²³ However, there is a close and complementary relationship between public health and personal health care activities at all levels of attention, but most often with primary health care.²⁴

It is important to mention the difficulty of drawing a clear distinction between the scope of public health in the delivery of disease prevention and health promotion services to specific population groups on one hand and personal care on the other. Public health has some important responsibilities related to the guarantee of equitable access to services, quality in care and use of the public health perspective in the reorientation of health services delivery.

²¹ PAHO/WHO, *Public Health in the Americas*, op. cit. p. 8.

²² Turnock, *Public Health: What It Is and How It Works*, op. cit. p. 11.

²³ Julio Frenk, "The New Public Health," in *The Crisis of Public Health: Reflections for the Debate*, ed. PAHO/WHO (Washington, D.C., 1992).

²⁴ PAHO/WHO, *Public Health in the Americas*, op. cit. p. 8.

Public Health Infrastructure and Public Health Capacities

The elements necessary for a public health system to function constitute what is called public health capacities, also referred in the English literature as *Public Health Infrastructure (PHI)*, which is defined by the CDC as the “underlying foundation that supports the planning, delivery, and evaluation of all public health activities and practices.”²⁵ Turnock describes PHI as, “the systems, competencies, relationships and resources that enable performance of public health’s core functions and essential services in every community.”²⁶

In the context of the “Public Health in the Americas” Initiative, PHI was defined as the “set of stable and interconnected means by which public health activities are organized.” It is the permanent base of resources, and defines the ability of the National Health Authority (NHA) to execute the EPHF. The four elements that make up the public health infrastructure are:

1. Information – implies the existence of adequate information systems that generate timely and quality data.
2. Human Resources – entails the existence of a skilled and trained public health workforce that is responsive to the health needs of the population.
3. Organization – involves the capacity to connect all of the public health elements.
4. Physical resources – includes public health laboratories, instruments and equipment, etc.

In the Public Health in the Americas publication, the authors also highlight the importance of social capital, understood as citizen participation in health, as a component of the public health infrastructure. However, elaborating upon the concept of social capital and its impacts on public health is beyond the scope of this paper. On the other hand, the element of financial resources is not included in the framework of public health infrastructure presented in the Public Health in the Americas.

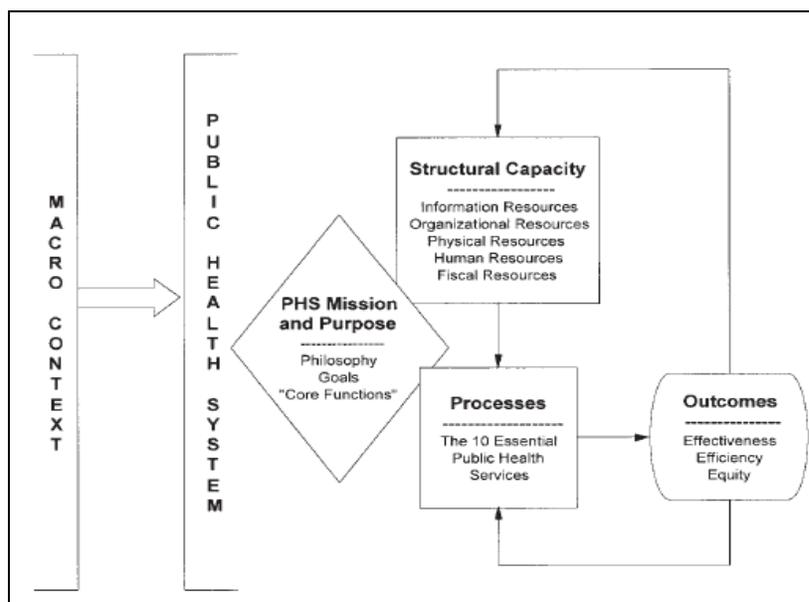
Handler et al. created a conceptual framework for a public health system as a basis for measuring system performance (see Figure 2)²⁷ that includes a component called “Structural Capacity” comprised of five elements: information, organizational, physical, human and fiscal resources.

²⁵ Centers for Disease Control and Prevention (CDC), *Public Health’s Infrastructure: A Status Report* (Atlanta, GA: CDC, 2001). The three components of *Public Health Infrastructure* identified by the CDC are the following: 1) Workforce Capacity and Competency; 2) Information and Data Systems; and 3) Organizational Capacity.

²⁶ Turnock, *Public Health: What It Is and How It Works*, op. cit. 11.

²⁷ Arden Handler, Michele Issel, and Bernard Turnock, “A Conceptual Framework to Measure Performance of the Public Health System,” *American Journal of Public Health* 91, No. 8 (2001), <http://www.ajph.org/cgi/reprint/91/8/1235>.

Figure 2: Conceptual Framework of the Public Health System (PHS)



Source: Handler et al, A Conceptual Framework to Measure Performance of the Public Health System.

While the conceptual framework by Handler et. al. is very helpful as a basis for measuring public health system performance, it is important to point out that a model of how the elements of structural capacity interact with each other does not exist in the literature. Perhaps developing a model defining this interaction could be a component of the strategies to strengthen PH capacity.

Capacity versus Infrastructure

In this document the authors have chosen to use the term PH capacity (or PH capacities) instead of PH infrastructure because it is more complete, flexible and inclusive. The term infrastructure has its origins on the physical space requirements and equipment needed to carry out health activities such as hospitals, clinics, health posts, offices, laboratories, and other equipment. This especially holds true for the literature in Spanish and Portuguese from the Americas, and the term public health infrastructure is not used frequently in the Region.

The word capacity combines the existing infrastructure with its abilities and potential to achieve public health goals. Capacity is defined as the capability to carry out the core functions of public health, which are assessment, policy development and assurance.²⁸ Beaglehole and Dal Poz define PH capacity as the mechanism that makes it possible to achieve public health objectives, with the PH workforce as its central component; however, there are also important elements such as resources, facilities and technology in their definition.

²⁸ IOM, *The Future of Public Health* (Washington: National Academy Press, 1988).

Therefore, Public Health Capacity, for the purposes of this document, is comprised of: i) Public Health Workforce; ii) Public Health Information Systems; iii) Public Health Technologies; iv) Institutional and Organizational Capacity; and (v) Financial Resources.

It is important to mention that PH capacities are very much context specific in terms of what a particular country or region needs to adequately respond to the public health needs of the population. For example, certain regions, such as Central America and the Caribbean in particular, need to have PH capacities which can prepare for and deal with the aftermath of hurricanes, floods and volcanic eruptions. Also, each country needs to have the flexibility to respond to the different diseases that affect populations living in low lying tropical areas (malaria, dengue) versus mountainous or arid regions, and urban versus rural differences in disease concentration and spread.

Below are definitions for each dimension of PH capacity:

1. Public Health Workforce (PHWF) includes all workers whose primary responsibility is the provision of non-personal health services (core public-health).²⁹ The PHWF can be divided into two categories: primary workforce including workers who are specifically in charge of public health activities or that hold job positions in public health; and secondary workforce, or those workers outside the health sector, usually from other ministries such as agriculture, transportation and education, international organizations and NGOs which also carry out public health activities.³⁰

2. Public Health Information Systems (PHIS) are defined as population-based and public health facility-based data sources. The main population-based sources of health information are census, household surveys and vital registration systems, including mortality and morbidity rates. The main public health facility-related data sources are public health surveillance, and data from the public health system and services, including systems for monitoring the PHWF, risk factors, health determinants (such as nutrition, environment, and socioeconomic status), the allocation of financial resources, and public health technologies.³¹

3. Public Health Technologies (PHT) include all of the physical resources and technologies used in the public health system, in addition to drugs and vaccines. These elements constitute the material foundation of the public

²⁹ Robert Beaglehole and Mario R. Dal Poz, "Public Health Workforce: Challenges and Policy Issues," Human Resources for Health (2003), <http://www.human-resources-health.com/content/1/1/4>.

³⁰ PAHO/WHO, *Public Health In The Americas, Strategies For Developing The Health Workforce: Based On Current Policies And Technical Evidence* (Washington, D.C.: PAHO/WHO, October 2006).

³¹ Adapted from definition used in the WHO Web site: <http://www.who.int/healthinfo/systems/en/> and www.who.int/healthmetrics/documents/hmnote_nationalsubnationalhealthinfosystems.pdf.

health sector.³² They can also include equipment and medical devices, and support systems that allow the public health system to function adequately, such as public health laboratories, blood banks, etc.

4. Public Health Institutional and Organizational Capacity. Institutional capacity refers to the set of rules and norms that govern the functioning and operation of a public health system; it also determines the capability of the system to respond to public health challenges. Organizational capacity refers to an organization's ability to effectively, efficiently and sustainably exercise its functions to contribute to the institutional mission and vision, and to the policies and strategic objectives of the organization. Organizational capacity is a component of institutional development and refers to the configuration/structure of organizations with a public health focus that function within a given institutional framework.

5. Public Health Financial Resources refers to the collection, utilization, and management of resources to carry out public health activities as well as the impact of these resources on the health of the population and the public health system.

Overview of the Public Health Context in Latin America and the Caribbean: from the 1980s until the present

In 1992, PAHO published "The Crisis of Public Health: Reflections for the Debate". This book defined the basis for revitalizing the conceptual, methodological and operational development of public health in the Region. In the 1980s and early 90s, countries in the Region faced economic and social crises that reflected in the health sector. The economic crisis stemmed from external debt, which included high interest payments, and which was accompanied by high inflation and recession. Socially, there was a reduction in benefits and an overall increase in poverty.³³

Likewise, the informal labor market has experienced a dramatic expansion in the past two decades. The new, globalized development model includes flexible labor contracts and strong pressure to reduce work-related costs.³⁴ Therefore, despite overall economic growth in some LAC countries, sufficient new jobs were not created and those that were generated were mainly in the precarious informal sector. Temporary and unstable employment, self-employment and underemployment are widespread in the region.

Frenk maintains that in the 1980s and early 90s public health institutions in the Americas experienced an intense and wide-ranging crisis.³⁵ Latin America has been a pioneer in the public health movement, establishing schools of public

³² PAHO/WHO, *Lineamientos Metodológicos - Análisis Sectorial en Salud: Una Herramienta para la Formulación de Políticas*, Special Edition 9, 3rd Version (Washington, DC: PAHO/WHO, 2004) http://www.lachealthsys.org/index.php?option=com_content&task=view&id=150&Itemid=169.

³³ "Analysis of Health Infrastructure (1987-1988)," in *The Crisis of Public Health: Reflections for the Debate*, ed. PAHO/WHO (Washington, D.C., 1992).

³⁴ International Labour Organization (ILO), and PAHO/WHO, *ILO-PAHO Joint Initiative on the Extension of Social Protection in Health*, Washington, D.C.: PAHO/WHO, 2005.

³⁵ Frenk, "The New Public Health," op. cit. p. 13.

health in Brazil and Mexico, respectively in 1919 and 1922, less than a decade after the first public health institution in the world was established. However, public health has become increasingly isolated both from scientific advances and from efforts to organize health systems; this tendency has relegated it to a secondary role in academia and in areas of its application.

*Disregard for or failure to recognize the importance of public health in the organization and the operation of health care systems and health services has been perhaps the leading cause of the low social effectiveness of health systems, low levels of satisfaction with care received and the failure of some of the sectoral reforms carried out in the last two decades.*³⁶

The main element that characterizes the current public health crisis is the “growing dissociation between existing knowledge about the social, ecological and psychological means for effectively preventing disease and the real capacity to put this knowledge into practice.”³⁷ The predominance of the medical model, which looks at health as the result of individual actions, poses a challenge to achieving “health” as conceptualized by WHO: “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”³⁸

The evidence shows that more than therapeutic measures are needed to improve the health of the population. Interventions at the social, political and economic levels are crucial to tackle the underlying causes of disease which lie on education, employment, housing, sanitation, quality of life, level of income. In this sense, public health, by looking at health as the result of concerted action by the community can offer a powerful tool for achieving better health outcomes. In conceiving of health solely as control of disease, there is a tendency to leave health actions confined to the health sector, which prevent addressing those determinants outside the sector that also affect health.

According to Orellana, public health underwent an evolution in the last decades. While initially the field of public health was expected to focus on the eradication of diseases, starting in the 1970s, society began to demand that public health be a mechanism for ensuring universal access to health care. However, with the shift toward a market-based economy during the 1980s and 1990s, health was transformed into a sector that produces consumer goods.³⁹ In the past years, however, the view that the market may not be the best mechanism to bring health to those who most need it, has been gaining strength and there may be grounds for suggesting a renaissance of public health.⁴⁰

³⁶ PAHO/WHO, *Public Health in the Americas*. op. cit. p. 8.

³⁷ Hernán Sandoval Orellana, “Public Health Situation and Trends” in *The Crisis of Public Health: Reflections for the Debate*, ed. PAHO/WHO (Washington, D.C., 1992).

³⁸ WHO, *Constitution of the World Health Organization* (Geneva: WHO, 1946).

³⁹ Orellana, “Public Health Situation and Trends”.

⁴⁰ Beaglehole and Dal Poz, “Public Health Workforce,” op. cit. p. 16.

As mentioned previously, even though there have been important achievements in improving health outcomes in the Region in the past decades, it is clear that more needs to be done to prevent the one million unjustified and avoidable deaths that still occur in the Americas each year. Public health, with its social justice orientation and its inherently political nature, is the best mechanism to reverse this situation and help achieve the goal of health systems, which is to improve the health of the population.

Present day reality

Public health capacity is outdated and vulnerable in the Americas: the workforce lacks appropriate training and reinforcements; laboratory capacity is antiquated; there is lack of real-time surveillance and epidemiological systems including ineffective and fragmented communications networks; domestic preparedness and emergency response capabilities are inadequate; and many communities still lack access to essential public health services.⁴¹ Day to day functioning of the public health system is required for food and drug safety issues, monitoring the incidence and spread of resistant microbes and chronic diseases as the Region continues to undergo the epidemiological transition from mostly infectious to chronic diseases.

Over time, PH systems and functions have been taken for granted and this has led to an erosion of PH capacity. Increasing investment in and understanding of PH is essential for reducing the burden of illness and injury on families, communities and the health care system as well as ensuring the ability to respond to disasters and epidemics.⁴² Renewed recognition of the critical importance of an effective PH system makes it increasingly important that health professionals, the government, NGOs, voluntary organizations and the public develop a common understanding of what public health does and what is needed for the system to function effectively-both on a day-to-day basis and in emergencies.⁴³

As mentioned previously, one of the most important attempts to assess current PH capacity in the Region was the Public Health in the Americas Initiative. In 2000, the 42nd Directing Council of PAHO adopted Resolution CD 42.R14 which urged member states to participate in the regional exercise to measure performance with respect to 11 defined Essential Public Health Functions (EPHF) and use the results obtained to carry out interventions to develop their capacity and improve public health practice. Public Health in the Americas was launched in 2002 as a partnership between the Latin American Center for Health Research (CLAISS), the Centers for Disease Control and Prevention (CDC) and PAHO/WHO.

⁴¹ IOM, *The Future of the Public's Health in the 21st Century* (Washington, DC: National Academy Press, 2002).

⁴² Canadian Public Health Association and Provincial and Territorial Public Health Associations, *A Path Toward Building Public Health Capacity* (Manitoba, Canada: Canadian Public Health Association, 2005).

⁴³ *Ibid.*

Figure 3: Essential Public Health Functions

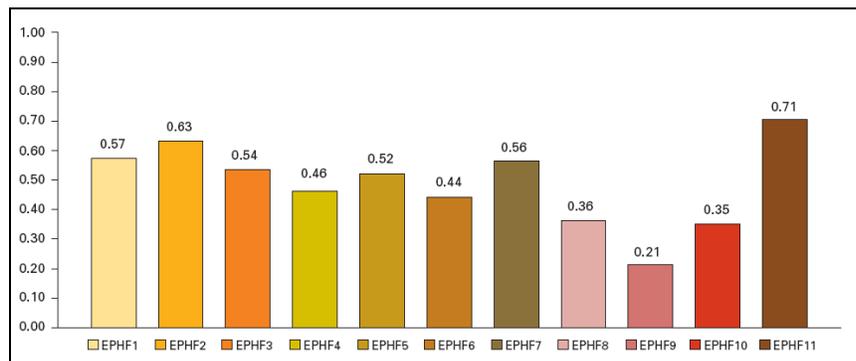
EPHF 1	Monitoring, Evaluation, and Analysis of Health Status
EPHF 2	Public Health Surveillance, Research, and Control of Risks and Threats to Public Health
EPHF 3	Health Promotion
EPHF 4	Social Participation in Health
EPHF 5	Development of Policies and Institutional Capacity for Planning and Management in Public Health
EPHF 6	Strengthening of Institutional Capacity for Regulation and Enforcement in Public Health
EPHF 7	Evaluation and Promotion of Equitable Access to Necessary Health Services
EPHF 8	Human Resources Development and Training in Public Health
EPHF 9	Quality Assurance in Personal and Population-based Health Services
EPHF 10	Research in Public Health
EPHF 11	Reduction of the Impact of Emergencies and Disasters on Health

Source: PAHO/WHO, *Public Health in the Americas*.

The EPHF performance measurement instrument, which was applied in 41 countries and territories of the Americas, offered a common framework to assess the status of the EPHF in the region and helped to identify strengths and weaknesses in public health practice. Based on the results of the application, countries were encouraged to develop strengthening plans, and to implement strategies to improve the steering role capacity of the health authority to execute the EPHF.

As shown in Figure 4, the regional assessment results revealed that the worst performance was found in the areas of quality of health services (EPHF 9); human resources development (EPHF 8); research in public health (EPHF 10); public health regulation and enforcement capacity (EPHF 6); and social participation in health (EPHF 4). On the other hand, the areas with the strongest performance were those related to the reduction of the impact of emergencies and disasters on health (EPHF 11) and public health surveillance (EPHF 2). With the exception of EPHF 11, overall, no function performed above 65%, which shows that there is great room for improvement.

Figure 4: Performance of the EPHF – Region of the Americas



Source: PAHO/WHO, *Public Health in the Americas*.

Due to fact that the LAC Region is heterogeneous and regional averages can mask sub-regional differences, the results of the EPHF measurements were also compiled by sub-region to complement the regional analysis. Countries were grouped into four sub-regions: 1) Central America, Spanish-speaking Caribbean and Haiti;⁴⁴ 2) English-speaking Caribbean and Netherlands Antilles;⁴⁵ 3) Andean;⁴⁶ 4) Southern Cone and Mexico.⁴⁷ The results show that different sub-regions had different strengths, which presents the possibility for cooperation in different areas within the LAC region.

In the sub-region of Central America, Spanish-speaking Caribbean and Haiti, relatively good performance was observed for the functions of public health surveillance (EPHF 2) and reducing the impact of emergencies and disasters (EPHF 11). The lowest performance levels were observed in the areas of quality assurance (EPHF 9) and human resources training and development (EPHF 8). The analysis of the results shows that there are several critical areas in need of improvement in the sub-region in question. These are: strengthening the capacity to evaluate public health actions and strategies, designing and implementing an incentive system for achieving public health results, and improving public health information systems.

In the sub-region of the English-speaking Caribbean and Netherlands Antilles, countries exhibited low to intermediate performance in nearly all of the EPHF, with only one function, EPHF 11 (reducing the impact of emergencies and disasters in health), performing adequately. The lowest performance was exhibited in the areas of public health research (EPHF 10) and quality assurance (EPHF 9). These results show that there is a clear need for strengthening the functions related to the steering role of the health sector as a mechanism to improve overall performance of the EPHF.

In the Andean sub-region, the results show that while countries display differences, they share the same weaknesses such as in the areas of regulation and planning, promoting social participation and health promotion. Most of the functions performed below 40%, with EPHFs 9 and 6 performing the worst while EPHFs 11 and 1 showed the best performance.

In the Southern Cone and Mexico sub-region, the results reveal that overall there is good EPHF performance in the countries, with EPHFs 1, 2 and 11 showing the best performance and EPHFs 9 and 8 showing the worst. There are common areas of weaknesses such as in the areas of regulation, human resources, social participation, and quality assurance.

⁴⁴ Central America and Spanish-Speaking Caribbean sub-region include the following countries: Costa Rica, Cuba, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Puerto Rico, and Dominican Republic.

⁴⁵ Countries include: Anguilla, Antigua, Aruba, Barbados, Bahamas, British Virgin Islands, Cayman Islands, Curaçao, Dominica, Grenada, Guyana, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent, Suriname, Turks and Caicos, Trinidad and Tobago, and Belize.

⁴⁶ Countries include Venezuela, Colombia, Ecuador, Peru, and Bolivia.

⁴⁷ Countries in the Southern Cone sub-region include Argentina, Brazil, Chile, Paraguay and Uruguay.

The Initiative provided countries with a general framework for developing public health strengthening plans. The framework emphasized six major areas of intervention: (i) strengthening the state's steering role in health; (ii) improving information systems; (iii) developing institutional competencies for management of public health policies; (iv) human resources development and training; (v) reorientation of health services toward promotion and prevention; and (vi) quality assurance.

However, although the methodology identifies areas for intervention, it lacks specificity in terms of what countries should do after they determine which EPHF they need to strengthen. For example, in the EPHF measurement tool, the questions for the measures and submeasures of the EPHF allow for only a "yes" or "no" response. A host of data is lost in terms of countries that have partially fulfilled certain measures. In order to address this problem, specific countries in the Region have adapted the tool to the sub-national level and applied in selected states or departments. For example, Brazil translated the tool into Portuguese, adapted it to the state-level, and applied it in six states, generating more detailed information that was used for the elaboration of strengthening agendas for those EPHF identified as the weakest in each state.

In the following section, a more in-depth discussion of the elements that constitute PH capacity will be presented. In addition, existing weaknesses in each element as well as strategies for strengthening and organizing PH capacities in the LAC Region will be discussed.

IV. Elements of Public Health Capacity

The improvement of the health status of the population in LAC countries relies on the development and maintenance of a strong PH Capacity fully capable of supporting public health actions. Specifically, efforts to improve public health should be centered on implementing policies, strategies, and plans designed to: (i) improve the quality and adequacy of the *public health workforce*; (ii) strengthen *public health information systems*; (iii) increase the efficiency of *public health technologies*; (iv) develop *institutional and organizational capacity*; and (v) ensure sustainable *financial resources* for public health.

Public Health Workforce (PHWF)

The PHWF can be broadly defined as those workers responsible for contributing - either directly or indirectly - to public health goals, regardless of their profession and institution where they actually work.⁴⁸ Beaglehole and Dal Poz define the PHWF as "those primarily involved in protecting and promoting the health of whole or specific populations (as distinct from activities directed to the care of individuals)... [it] is characterized by its diversity and complexity and

⁴⁸ Adapted from PAHO/WHO, *Public Health in the Americas*, op. cit. p. 8.

includes people from a wide range of occupational backgrounds.” The most common professional disciplines include physicians, nurses, environmental specialists, laboratorians, health educators, disease investigators, outreach workers, and managers. It can also include dentists, social workers, nutritionists, anthropologists, psychologists, economists, political scientists, engineers, information technology specialists, public health informaticians, epidemiologist, biostatisticians, and lawyers.⁴⁹

As can be seen by the description of the common professional disciplines above, there is considerable overlap in the activities of the public health workforce and the human resources in charge of providing care for individuals. To complicate matters, there is a critical deficit in the information about the public health workforce not only in the countries of the Region, but in developed countries as well.⁵⁰ What is known is that the current quantity and distribution of human resources in health in general is insufficient to meet the health needs of the population. Since the public health workforce is also part of the wider health workforce it can be inferred that the PHWF also faces challenges regarding size, adequacy and capacity to address public health problems.

The “global health workforce crisis” is widely considered to be one of the most critical issues currently facing public health care systems.⁵¹ Deficiencies in human resources pose “severe constraints to the capacity for effective service delivery”⁵² and in many countries, serve as major obstacles to the scaling up of public health interventions.⁵³ In the Region of the Americas, the development and training of the PHWF has been largely neglected. In the EPHF performance measurement exercise, five indicators related to EPHF 8 (human resources training and development in public health) were measured. They referred to the capacity to define the public health workforce; the quality of the workforce; efforts to provide continuing education and graduate training in public health; development of a culturally sensitive workforce; and capacity to provide technical assistance to sub-national levels to improve the PHWF. The results show that all of the indicators performed below 50%, revealing that not much attention has been paid to the development of the PHWF.

As previously mentioned, a major challenge of improving the PHWF lies in its proper definition. This has proven to be a difficult task since “the functions that must be performed to effectively provide public health services can no longer be carried out solely by that part of the health workforce that is specifically charged with public health responsibilities.”⁵⁴ Workers that carry out public health activities extend beyond the health workforce and may also include what is called the “secondary workforce” or those outside the health sector whose activities also have an impact on the health of the population. Steps have been taken to characterize the PHWF in the United States, the

⁴⁹ CDC, *Public Health Infrastructure*, op. cit. p. 14.

⁵⁰ PAHO/WHO, *Public Health in the Americas*, op. cit. p. 8.

⁵¹ WHO, *The World Health Report 2003: shaping the future* (Geneva: WHO, 2003).

⁵² WHO, *The World Health Report 2004: changing history* (Geneva: WHO, 2004).

⁵³ UN Millennium Project, *Health Systems Needs Assessment Guidelines* (2005).

⁵⁴ PAHO/WHO, *Public Health in the Americas*, op. cit. p. 8.

United Kingdom, and Australia, among other countries. In the Region of the Americas, a methodology for characterizing the PHWF was developed, which will be discussed in section V.

So far the process of strengthening the PHWF faces obstacles that are common to the wider health workforce. These include: the lack of planning and policies geared toward workforce development; matters pertaining to recruitment and retention of the workforce; issues related to allocation and distribution of public health professionals; and problems referring to public health training and capacity-building, among others.

In most countries of the Region, health authorities have not been concerned with the planning and analysis of the PHWF. On the contrary, government resources and attention have usually been focused on human resources for personal care. In addition, the health authority's attitude toward the PHWF has been mostly reactive and with a limited outlook.⁵⁵ Policy-making and planning is crucial to ensure that the PHWF is adequately trained and distributed equitably and in sufficient numbers. In this context, a more integrated, independent and systemic approach to the PHWF needs to be adopted when elaborating and implementing policies.⁵⁶

Another challenge refers to the recruitment and retention of the workforce. Generally, public health professions do not offer high salaries and demand a strong commitment, which, many times, requires relocation to remote areas. In addition, there are strong pull factors from developed countries that offer better wages, safer working conditions, better equipped facilities and more opportunities for professional development.⁵⁷ In the Caribbean, emigration of the nursing workforce poses a significant challenge. According to a PAHO report, trained nurses from these countries are in high demand in the United States and Canada. As a result, a large percentage of nurses left behind are nearing retirement, and 35 percent of nursing positions remain vacant.⁵⁸ Even though the percentage of nurses that work specifically on with public health activities in the Caribbean is unknown, it is likely that the shortage affects both personal and non-personal health services.

In addition, there is a strong need to better match the workforce training and development with the real health needs of the population. First, specialized doctors outnumber community health practitioners. This can pose a problem given that diseases that are prevalent in the Region such as TB, HIV/AIDS and Malaria are better handled with a community based approach. Second, most of the public health workforce is concentrated in urban centers, leaving rural areas with insufficient numbers of public health workers and considerably worse health outcomes.

⁵⁵ PAHO/WHO. *Estudio Delphi: Problemas presentes y futuros de los Recursos Humanos en Salud* (Washington, D.C.: PAHO/WHO, 2002).

⁵⁶ Gilles Dussault and Carl-Ardy Dubois, "Human Resources for Health Policies: A Critical Component in Health Policies," *HNP Discussion Paper* (Washington, D.C.: The World Bank, 2004).

⁵⁷ PAHO/WHO, *Strategies for Developing the Health Workforce*, op. cit. p. 16.

⁵⁸ Information accessed on PAHO Web site: http://www.paho.org/English/DD/PIN/ptoday18_sep05.htm.

Finally, traditional approaches to public health training have several limitations that must be addressed. An emphasis on epidemiology and other hard sciences have resulted in the neglect of health promotion and other public health areas. The lack of integration between academic institutions and decision-making bodies is another problem, exacerbating the lack of coordination between training and health needs. The lack of direct field experience, the view that public health is a medical specialty, and the high cost of training programs pose additional obstacles to the development of the PHWF.⁵⁹

In order to tackle the challenges mentioned above, Lichtveld and Cioffi offer a framework for building a vision for a sustainable and competent PHWF. The framework is based on six strategic elements: (i) monitoring workforce composition; (ii) identifying competencies and developing related curriculum; (iii) designing an integrated life-long learning delivery system; (iv) providing individual and organizational incentives to ensure competency development; (v) conducting evaluation and research; and (vi) assuring financial support.

In regards to the development of the core competencies needed for the workforce, an attempt has been made by the Public Health Agency of Canada to develop them. They were divided into seven categories:⁶⁰

1. Public Health sciences: includes knowledge related to public health sciences and the ability to apply it.
2. Assessment and analysis: describes the competencies needed to collect, assess, analyze and apply information (including data, facts, concepts and theories) with the goal of improving the decision-making process.
3. Policy and program planning, implementation and evaluation: comprises those competencies needed to effectively plan, implement and evaluate policies and/or programs in public health.
4. Partnerships, collaboration and advocacy: includes the capacity to influence and work with others to improve the health and well-being of the public through the pursuit of a common goal.
5. Diversity and inclusiveness: describes the socio-cultural competencies required to interact effectively with diverse individuals, groups and communities.
6. Communication: addresses numerous dimensions of communication needed to effectively provide information to the public.
7. Leadership: competencies that build capacity, improve performance and enhance the quality of the working environment.

⁵⁹ Beaglehole and Dal Poz, "Public Health Workforce," op. cit. p. 16.

⁶⁰ PAHO/WHO, *Strategies for Developing the Health Workforce*, op. cit. p. 16.

These competencies can help PH organizations to identify needs for staff development and training as well as to create the right mix of PH workers with different skill sets for given tasks. They can provide a framework for the recruitment process and increase the quality and the effectiveness of the PHWF in general.⁶¹

One mechanism that presents opportunities for bridging the gap between evaluation and planning related to the PHWF is the Observatory of Human Resources in Health. LAC countries have benefited from the information and recommendations that have come out of the activities of the national Observatory groups. Of particular note is the fact that since the launching of the Observatory initiative, three methodological handbooks have been produced at the regional level to improve the analysis of human resources and to optimize the use of existing resources. There are many examples in the Region of successful experiences in terms of the contributions of the Observatory to the strengthening of human resources in health. Similar mechanisms can be used for improving the PHWF:

- The national Observatory in Brazil is recognized as a unique and successful case of state and non-state interaction in health. The network has produced a substantial amount of valuable information and analyses as a result of the productive interplay between Brazil's Ministry of Health, PAHO and the network working stations. A few examples of the achievements of this network include: an inventory of human resources management practices at the local level; redistribution of physicians and nurses to underserved areas; and better knowledge of the dynamic of the physician's labor market in São Paulo State.⁶²
- Mexico has developed a national human resources planning methodology in a cooperative effort with its Federal States, professional associations, and universities. This methodology is now in the phase of detecting gaps between the epidemiological and demographical transitions and the profile, number, and distribution of trained medical professionals.
- El Salvador is a case in which the initiative boosted the action of a nongovernmental organization, the Inter-Institutional Group on the Development of Human Resources (GIDRHUS), which joined the efforts of the Ministry of Health and the main universities for better integration of training and services. This NGO was later transformed into a human resources policy think tank and is now the designated group for HR issues in the Reform Commission.⁶³
- The Ecuador Observatory Group was designated a formal advisory body of the National Health Council responsible for generating consensus on health policies. The observatory group (CONARHUS: National Committee on Human Resources in Health) has created a large database on training and employment that is currently on-line for use by the academic community and local policy-makers.

⁶¹ Public Health Agency of Canada (PHAC), *Core Competencies for Public Health in Canada* (Ottawa: PHAC, 2007).

⁶² Francisco E. Campos and Volker Hauck, "Networking collaboratively: The Brazilian Observatório on Human Resources in Health," *EDCPM Discussion Paper*, 57L (Maastricht, The Netherlands: ECPDM, 2005).

⁶³ Grupo Intersectorial Para el Desarrollo de los Recursos Humanos en Salud (GIDRHUS), *Observatorio de los recursos humanos en la reforma del sector salud* (GIDRHUS, 2003).

- PAHO offices in Argentina, Cuba, and Peru have also facilitated the work of the Observatory as part of the regular activities of its human resources' units.

The main lessons learned from the implementation of the Observatory initiative, and which were shared at the 134th Session of the Executive Committee, are listed in Box 1.

Box 1. Main Lessons Learned from the Implementation of the Observatory of Human Resources in Health⁶⁴

- Although the initiative of the Observatory, by means of its different expressions—direct technical cooperation, publications, cooperation between countries, and international and national forums—has contributed to increasing the visibility of human resources issues, the degree to which it has effectively reached the intended outcomes and impacts on the policy-making levels and in health sector strategies varies tremendously from one country to the other and over time.
- The high turnover of authorities at political levels in the countries of the Region is a factor that can be considered an obstacle towards assuring continuity for the initiative. On the other hand, however, it must also be recognized that the interinstitutional work of the observatory groups has helped to keep the theme of human resources within the political agenda in periods of transition between government administrations.
- There are still difficulties in advocating the need for information for policymaking on such sensitive issues like the regulation of professions or the redeployment of the health workforce. In many cases the vested interests of professional corporations or the time frames of the reform process do not provide the appropriate climate for discussions based on evidence.
- Experience from the countries shows the need to integrate relevant stakeholders, such as universities and professional associations, in more active and permanent ways, for their involvement may increase the sustainability of the initiative of the Observatory of Human Resources in Health.
- Many countries in the Region are elaborating policy instruments in human resources in the form of policy documents (Bolivia, Costa Rica, Ecuador, El Salvador, Nicaragua, Peru, and Saint Lucia) or through human resources norms and regulations in the areas of training or employment (Argentina, Brazil, Dominican Republic, Mexico, and Paraguay). It must be stressed that these instruments have been developed through participatory methods and have received the inputs of the countries' experiences, in order to gain applicability and sustainability.

In addition to serving as a core element of public health infrastructure, the *2000 World Health Report* contends that human resources contribute to the performance of all the main functions of health systems. Consequently, the report concludes that efforts to improve the effectiveness of human resources are central to improving health system performance.⁶⁵ Efforts to strengthen the wider health workforce should be implemented hand-in-hand with measures to improve the PHWF.

⁶⁴ PAHO/WHO, "Observatory of Human Resources in Health" (document prepared for 134th Session of Executive Committee, PAHO/WHO, Washington, DC, 2004).

⁶⁵ Beaglehole and Dal Poz, "Public Health Workforce," op. cit. p. 16.

Public Health Information Systems

Human resources, while indispensable, are not the only vital components of a well-functioning health system. Integrated public health information systems are also needed at district and national levels to “better assess health status and trends, track health system performance, and monitor progress toward health goals.”⁶⁶ Along with human resources deficiencies, shortages in adequate public health information contribute to the potential collapse of some health care systems and threaten the long-term viability of others. Health systems require “robust health information systems so that the health needs of populations, especially of the poor and marginalized, are clearly identified; to ensure that programmes [sic] are reaching those most in need; and to assess and improve performance.”⁶⁷

Public health information systems not only should gather data on health determinants, health outcomes, health system performance, and health infrastructure but also on health inequities, coverage, and use of services, including key stratifiers such as gender, socioeconomic status, ethnic group and geographical location.⁶⁸ Strong health information systems that incorporate both population and facility-based data on health inequities are essential in helping governments to demonstrate and address these inequities.⁶⁹

For the purposes of this paper, health information systems will be defined as “a set of components and procedures organized with the objective of generating information which will improve health care management decisions at all levels of the health system.”⁷⁰ A health information system cannot exist by itself but is a functional entity within the framework of a comprehensive health system that offers integrated health services, including curative care, rehabilitative care, disease prevention and health promotion services (WHO).

The components of a health information system are outlined in Figure 5.

⁶⁶ Lee Jong-Wook, “Global health improvement and WHO: shaping the future,” *Lancet* 362 (2003).

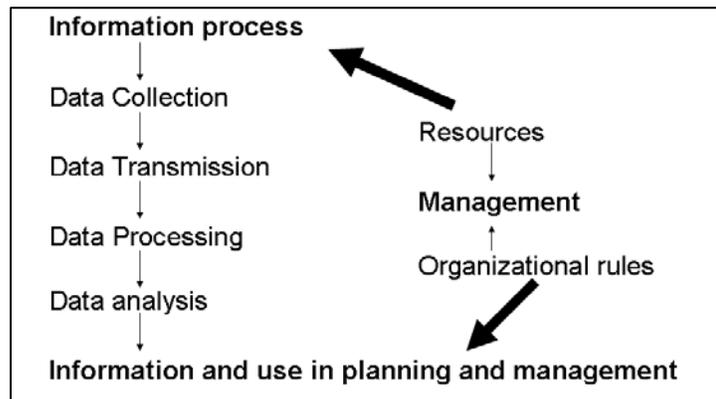
⁶⁷ WHO, *The World Health Report 2003*, op. cit. 23.

⁶⁸ Carla AbouZahr and Ties Boerma, “Health information systems: the foundations of public health,” *Bulletin of the World Health Organization* 83 (2005).

⁶⁹ Lexi Bambas et al., “Strengthening health information systems to address health equity challenges,” *Bulletin of the World Health Organization* 83 (2005).

⁷⁰ WHO, *The World Health Report 2000*, op. cit. p. 12.

Figure 5: Components of Health Information Systems



Source: WHO, *Design and Implementation of Health Information Systems*.

Public health information systems will be defined as subsystems which constitute important parts of health information systems. Public health information systems in this document will refer to:⁷¹

- Epidemiological surveillance for notifiable infectious diseases, certain environmental conditions and risk factors. Public health surveillance activities monitor health status and risk factors in the population.
- Special program reporting systems where public health plays the main role, such as tuberculosis control, HIV/AIDS, malaria, maternal and child health, substance abuse, school health.
- Administrative systems including public health financing systems, public health personnel systems, drugs and logistic systems, public health training programs, public health research programs and public health documentation management.
- Vital registration systems for births, deaths and migratory movements.

Information management and communication are key parts of public health capacities, on which the public health system is built. Public health information systems have historically been created using a “silo” approach -- different information systems for different programs that cannot communicate with each other.⁷² It is necessary to build integrated information systems that get the right information to the right people when they need it.

Most public health information systems in the LAC Region are “inadequate to meeting the requirements of the new models of health care being deployed in the context of health-reform initiatives.” According to the Health Metrics Network, health information is not available in many developing countries, including many in the LAC Region, “...due to underinvestment in the systems for data collection, analysis, dissemination and use.”⁷³ Consequently, health

⁷¹ This definition was adapted from WHO, *Design and Implementation of Health Information Systems* (Geneva: WHO, 2001).

⁷² National Association of County & City Health Officials (NACCHO) Web site, <http://www.naccho.org/topics/infrastructure/index.cfm>.

⁷³ HMN, *Towards a Framework and Standards for Country Health Information System Development* (Geneva: HMN, 2005).

decision makers are for the most part “unable to identify problems and needs, track progress, evaluate the impact of interventions, and make evidence-based decisions on health policy, programme [sic] design and resource allocation.”⁷⁴

In this context, the main challenges to strengthening PHIS are:⁷⁵

- Data collection method is inefficient, with some countries still employing paper registries. In addition, unnecessary data may be collected frequently.
- Most data sets from PHIS are neither complete nor completely accurate.⁷⁶ Each has problems with comprehensiveness, precision and timeliness.
- Lack of coverage of the entire population and under-registry of cases.
- The information collected is not analyzed, employed effectively or used at all.
- Data is aggregated, therefore losing its specificities in the process.
- Duplication and waste - the existence of several parallel subsystems that do not communicate with each other, are not integrated and are not articulated with the Ministry of Health.
- Poor quality of data due to a lack of human resources capacity to collect it and lack of motivation among public health service personnel.
- Lack of personnel with the capacity to analyze the information and to generate knowledge based on the findings.

Better information alone is not sufficient for resolving equity problems. Continuous monitoring of inequities, as well as the strengthening of country level capacity to use this information for effective planning, are also required for progress towards health equity. Furthermore, “until equity-oriented information collection and analysis have been institutionalized throughout the health information system, rather than through isolated initiatives, it is unlikely that governments and health development agencies will be able to secure comprehensive, long-term and effective reductions in health inequities.”⁷⁷

⁷⁴ Ibid.

⁷⁵ Compiled from personal communication with Dr. Ramon Martinez, Technical Advisor on Health Metrics, March 2007, and based on WHO, *Design and Implementation of Health Information Systems*.

⁷⁶ Turnock, *Public Health: What It Is and How It Works*, op. cit. 11.

⁷⁷ Ibid.

Box 2. The Elements of Health Information System Strengthening⁷⁸

- Establishment of consultation and coordination mechanisms that bring together all key stakeholders, including those working in health and statistics, and all producers and users of health data.
- An assessment of the current situation, including any current work to improve health statistics. Assessment template will also provide the basis for monitoring improvements.
- Agreement on a shared vision and goals for the future of the health information system.
- Definition of minimum standards for data availability, timeliness, and quality.
- Identification of strategic actions needed to achieve the vision, including prioritization of tasks.
- A detailed action plan including cost, with a timetable and allocation of responsibilities in order to achieve the desired outcomes.
- Synthesis, analysis and use of country evidence to inform planning, resource allocation and evaluation.
- Development and use of implementation monitoring and evaluation mechanisms, leading to reprogramming.
- A dissemination and communication plan to keep stakeholders – producers, users, and civil society – involved throughout the strengthening processes and report back on results obtained, especially at the evaluation and reprogramming stage.

Finally, it is important to reiterate that health information is also a fundamental input for public health policy-making, given that the latter is “critically dependent on the availability of sound data,” which in turn needs to be generated, analyzed, and disseminated through integrated health information networks.^{79,80} A sound health information system should function “...in a systemic manner, that is an organized process of gathering, sharing, analyzing, and using health-related data for decision-making, or a way of transforming information into knowledge for action.”⁸¹

Public Health Technologies

Public Health Technologies (PHT) refers to the drugs, vaccines, equipment and specific medical devices for public health services delivery as well as the organizational models and support systems⁸² necessary for the public health system to adequately function. In addition to the elements described above, PHT also refers to the personal skills and knowledge necessary to use these technologies. In this sense, PHT and PHWF are intrinsically connected. Without basic inputs such as primary health clinics, laboratories, medicines, vehicles, computers, communication systems and offices for public health workers to carry out their activities, the scope of public health action would be significantly limited.

⁷⁸ HMN, *Towards a Framework for Health Information System*, op. cit. p. 29.

⁷⁹ WHO, *The World Health Report 2004*, op. cit. p. 23.

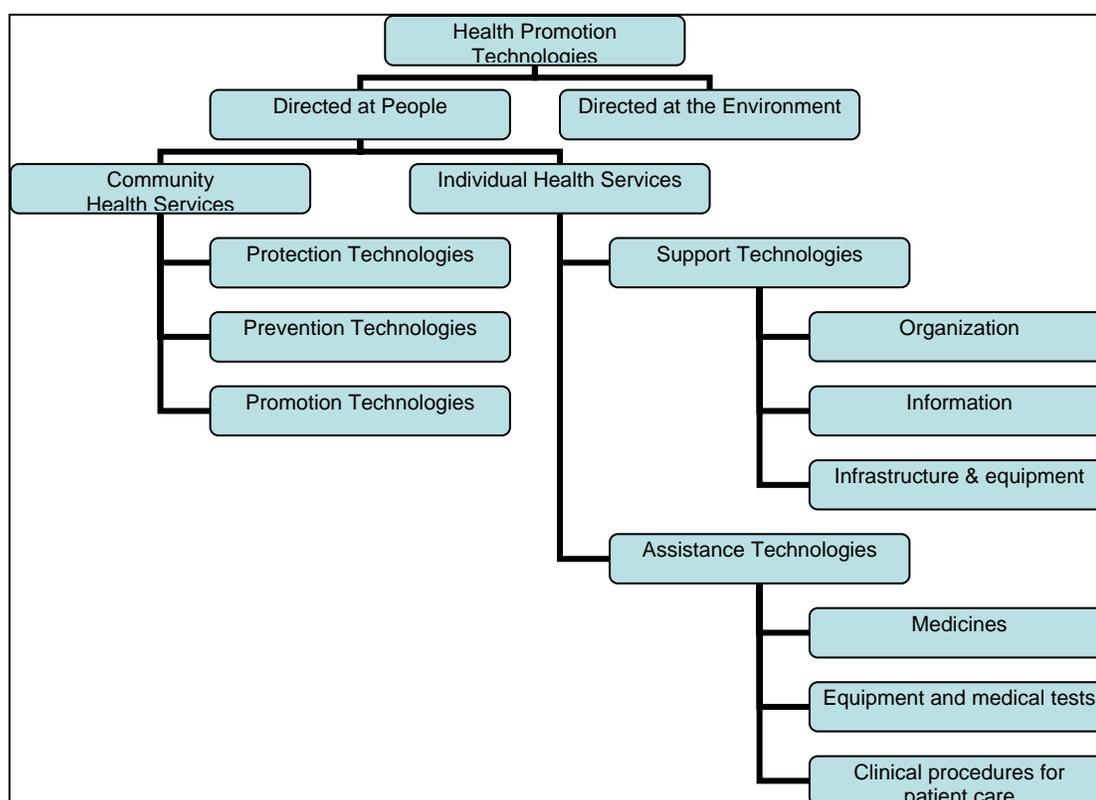
⁸⁰ AbouZahr and Boerma, “Health information systems: the foundations of public health,” op. cit. p. 28.

⁸¹ HMN, *Towards a Framework for Health Information System*, op. cit. p. 29.

⁸² PAHO/WHO, *Developing Health Technology Assessment in Latin America and the Caribbean* (Washington, D.C.: PAHO/WHO, 1998), <http://www.paho.org/English/HSP/hsp-OP-115.htm>.

According to the publication “Developing Health Technology Assessment in Latin America and the Caribbean” some of the problems faced by the countries in the Region are “the scarcity of many basic technologies, the excessive and indiscriminate use of expensive HT, the dearth of policies and standards to regulate the introduction and use of HT, the underdevelopment of support technologies (especially management information systems), and inequalities in access to available HT.”⁸³ It is important to state that the authors experienced difficulties finding publications that concentrated solely on PHT and instead most frequently found articles concentrating on HT with some aspects of PHT addressed. Therefore this subsection will focus on HT as they are related to PH activities. In Figure 6 an attempt is made to identify the linkages between health promotion technologies and personal and non-personal health services.

Figure 6: Relationship between Health Technologies and PHT



Source: PAHO/WHO, *Lineamientos Metodológicos - Análisis Sectorial en Salud*.

The development of health technologies in the Region has been to a large extent linked to the transfer of technologies from developed to developing countries. In many cases, this transfer has been partial since it was not followed by measures to prepare and strengthen the public health system to adopt and implement these technologies. The lack of adequate funds to maintain and replace installation and equipment resulted in the

⁸³ PAHO/WHO, *Developing Health Technology Assessment*.

progressive deterioration of these resources. In addition, in the beginning of the 1990s, the countries allocated less than 1% of their current budget to activities related to maintenance.⁸⁴

However, there are opportunities for reducing the gap in PHT within and between countries. First, technological innovations have already had a major impact on how major diseases are treated. New information technologies and telecommunications for health and public health service delivery, also called “telemedicine,” have the potential to bring services and promotional activities to remote locations, reduce costs linked to patient transfer, increase access to distance learning opportunities and promote the development of domiciliary care.

Public Health Laboratories in the Americas

Public health laboratories provide crucial services in an era when health threats can and do appear overnight. When new health risks emerge or well-known problems reoccur, public health laboratories analyze the threats, provide answers to mount effective responses and act with other health authorities, officials and first responders to protect the public. Unlike private medical laboratories — that perform tests to diagnose problems afflicting individual patients — public health laboratories safeguard entire communities. Some activities public health laboratories carry out include:⁸⁵

- Screening newborns for potentially life-threatening metabolic and genetic disorders.
- Monitoring communities for pathogens that spread in food or through contact with people or animals.
- Performing almost all testing to detect and monitor newly emerging infectious diseases like SARS and Avian Influenza.
- Testing drinking and some recreational water for bacteria, parasites, pesticides and other harmful substances.
- Rapidly identifying suspect agents (for example when in the United States in 2001 public health laboratories tested over 1,200 specimens a day during the anthrax attacks).

PAHO is currently involved in the development of three subregional networks for the epidemiological and laboratory-based surveillance of emerging and reemerging infectious diseases.⁸⁶ These efforts began with the establishment of the Surveillance Networks for Emerging and Reemerging Infectious Diseases in the Southern Cone and Amazon Region in 1998, and the Central American Network for the Prevention and Control of Emerging and Reemerging Diseases (RECACER) in 2001. Common network objectives entail (1) formalizing and strengthening cooperative work among the countries by creating functional subregional networks of laboratories and epidemiological services in

⁸⁴ Ibid.

⁸⁵ Association of Public Health Laboratories (APHL), *Defending the Public's Health*, Brochure, 2005. http://www.aphl.org/about_aphl/Documents/defending_phl.pdf.

⁸⁶ PAHO/WHO Communicable Diseases Unit, <http://www.paho.org/English/AD/DPC/CD/networks.htm>.

order to obtain accurate laboratory results for effective interventions; and (2) monitoring, preventing, and controlling emerging and reemerging infectious diseases.

Another initiative in the Americas, specifically related to rebuilding the public health laboratory capacity after Hurricanes George and Mitch in the Caribbean and Central America, is the American Public Health Laboratory (APHL) Reconstruction Project.⁸⁷ This project has been implemented in Honduras, Guatemala, Nicaragua, Costa Rica, El Salvador, Dominican Republic and Haiti to enable these countries to prepare for future natural disasters and other emergencies. APHL, in collaboration with PAHO, CDC, and USAID, built laboratory capability to detect and diagnose disease and environmental threats associated with disasters. Training and network development also enhanced public health capacity, ensuring the maintenance of laboratory capacity to monitor and control endemics and/or emerging infectious disease.

In sum, PHT in Latin America are in short supply and inefficiently allocated, which have resulted in duplication and resource wastage; specifically, the “concentration of physical and technological health infrastructure in urban centres [sic] and the wealthiest areas means that access to this infrastructure is restricted for population groups living in poor, rural, and remote geographical areas.”⁸⁸ Moreover, in many LAC countries, the existing stock of physical resources is ineffective because the resources are poorly maintained or inadequately administered.⁸⁹

Strengthening health systems in the LAC Region will require not only investment to acquire additional physical resources but also interventions aimed at improving efficiency in the management and use of existing resources. With respect to facilities, for example, this will require not only the construction of new public health facilities (health posts, laboratories, primary health clinics, office space for PH workers) but also the “...upgrading of existing facilities, and ongoing operation and maintenance of all facilities.”⁹⁰

Institutional and Organizational Capacity in Public Health

Each of the elements analyzed above (public health work force, public health information systems and public health technologies) are essential because they constitute the functional elements necessary for a functioning public health system. However, in order for these elements to contribute towards improving the performance of public health systems, they must be articulated and coordinated by a fourth element: *Institutional and Organizational Capacity*.

⁸⁷ APHL Web site, http://www.aphl.org/programs/international_health/Pages/default.aspx.

⁸⁸ Economic Commission for Latin America and the Caribbean (ECLAC), *The Millennium Development Goals: a Latin America and Caribbean perspective* (Santiago, Chile: ECLAC, 2005).

⁸⁹ PAHO/WHO, *Public Health in the Americas*. op. cit. p. 8.

⁹⁰ UN Millennium Project, *Health Systems Needs Assessment Guidelines*.

Institutional capacity refers to the set of rules and norms that govern the functioning and operation of a public health system.⁹¹ Each society organizes its social structures according to fundamental values and principles that have a direct impact on how organizations function.⁹² Institutional capacity determines the capability of the system to respond to public health challenges. In this regard, the steering role, as will be further discussed below, plays an important role through the formulation of policies for the public health sector, the adoption of a regulatory framework, the selection of financing mechanisms, the implementation of strategies for ensuring coverage of and access to health services, and the coordination of different actors in the public health sector.

Organizational capacity is defined as *the ability of an organization to effectively, efficiently and sustainably exercise the functions established for it to contribute to the institutional mission and vision and to the policies and strategic objectives of the organization.*⁹³ Organizational capacity is a component of institutional development. It refers to the configuration/structure of organizations with a public health focus (including financial, physical and human resources) that function within a given institutional framework, and which can be affected by structural and contextual factors. The organizational capacity is also influenced by normative and organizational models, specific policies and programs, organizational culture and history, among other factors.

An increasingly important aspect of organizational capacity is the ability to work through collaborative links with other agencies and organizations. Organizational resources include the complex web of federal, state and local public health agencies as well as mechanisms for linking public, private and voluntary organization through collaborative relationships.⁹⁴ Strengthening organizational capacity includes evaluating the strengths and weaknesses of the organizations or systems, in addition to analyzing the threats and opportunities that they face.

Four indispensable dimensions to strengthening organizational capacity are:

1. Human and institutional capacities: if the organization has serious deficiencies—such as the lack of a precise mission and vision, inadequate structure, anomalous practices, management and systems, a lack of incentives and an environment that does not facilitate high levels of performance—the performance of its staff is probably inadequate.
2. Planning and execution capacities.
3. Micro and macro dimensions: Different capacities are required at the micro level (program) than at the highest level (policy and planning).

⁹¹ PAHO/WHO, *Lineamientos Metodológicos - Análisis Sectorial en Salud: Una Herramienta para la Formulación de Políticas*.

⁹² An organization is considered to be groups of individuals linked by common goals and objectives, "each organization has a specific mission or purpose, resources appropriate to work towards that purpose, the ability to determine progress towards goals and objectives and a defined process for making decisions that change the direction of speed of the organization relative to its goals." ⁹² Turnock, *Public Health: What It Is and How It Works*.

⁹³ Adapted from PAHO/WHO, *Public Health in the Americas*, op. cit. p. 8.

⁹⁴ Turnock, *Public Health: What It Is and How It Works*, op. cit. 11.

4. Cognitive and practical dimensions: learning by trial and error or on the job, conceiving new practices and systems and assimilating work modes are some of the methods for applying and adapting knowledge.

The strengthening of capacities throughout the systems can be a challenge, given the structural inequalities that tend to exist among its components. Hence there is a need to establish a process to measure system performance. Deficiencies at any point in the system thus become evident and can be systematically detected and corrected.

Any plan for strengthening the organizational capacity should include improvements in the entire organization. This implies developing the leadership skills of managers, strengthening effective systems for financial and human resources planning, and developing processes that promote institutional, programming and financial sustainability. Depending on these improvements, NGOs, community organizations and public sector health programs make good management decisions and provide high-quality sustainable health services. In addition, it is always important to have mechanisms in place for supervising and evaluating systems, with the purpose of obtaining feedback to improve performance.

The institution that is primarily responsible for the organization of the elements for public health capacity and for leading, supervising, and monitoring the health system is the National Health Authority (NHA), which also has the responsibility for carrying out the steering role function in the health sector.⁹⁵ PAHO defines the Steering Role as the exercise of public health policy responsibilities and competencies inherent to the NHA, within the framework of relations between government and society in a modern State, which cannot be delegated. It includes the public decisions and actions necessary to guarantee and satisfy, within the national development framework, the health needs and legitimate aspirations of the social actors. The Ministries of Health are the principal health authorities and therefore are the primary entities responsible for exercising the steering role.⁹⁶ The steering role in health has six dimensions:

1. *Conduct/Lead* includes the capacity to guide the sector and mobilize actors in support of the National Health Policy.
2. *Regulation* encompasses the design and enforcement of the health regulatory framework that protects and promotes health.
3. *Orientation of Financing* includes the competencies to guarantee, monitor and steer the harmonization of resources from different sources in order to ensure equitable access to health services.

⁹⁵ PAHO/WHO, *Public Health in the Americas*. op. cit. p. 8.

⁹⁶ PAHO/WHO, *Marco Conceptual y Lineamientos Metodológicos – La Función Rectora de la Autoridad Sanitaria Nacional: Desempeño y Fortalecimiento* (Washington, DC: PAHO/WHO, forthcoming).

4. *Guarantee of Insurance*, which aims to guarantee access to a portfolio of health entitlements for the entire population, or specific plans for special population groups.
5. *Harmonization of Service Provision* is the ability to coordinate various providers and users groups in order to extend health care coverage equitably and efficiently.
6. *Execution of the Essential Public Health Functions (EPHFs)*.

Institutional development implies a focus on the continuous improvement of the skills, competences and aptitudes of the workforce and of the means and instruments that support public health systems in their task of exercising essential functions.⁹⁷ This process will ultimately result in improved capacity of the national health authority to exercise the steering role in health. Institutional capacity is an essential element in the effectiveness of programs and services; however, the development of policies, plans, and strategies for strengthening the institutional capacity should take place on a country-by-country basis.

One example of an emerging institutional framework that will have an impact on public health systems in the Americas is the International Health Regulations (IHR). The first International Health Regulations, adopted in 1969 by the WHO and all member countries applied to only three infectious diseases – cholera, plague and yellow fever. However, as mentioned previously, with new and emerging threats to public health in the 21st century, the regulations were updated in 2005 and adopted at the 58th World Health Assembly to protect global health security with the least interference to global travel and trade. IHR 2005 is a legally binding international agreement and meeting the new requirements will be challenging for many countries. WHO is mandated to provide Member States with technical assistance in strengthening their public health capacities and in facilitating the implementation of the IHR 2005. Together with WHO and other partners, from 2007-2009, all member countries will begin assessing their existing public health system, and improving its capacity for the detection, reporting, assessment of and response to public health events to meet the minimum core capacity requirements under IHR 2005, stated in the Annex 2.

PAHO/WHO's major tasks include:⁹⁸

- working collaboratively with the WHO IHR 2005 contact point , who will be defined by the Ministry of Health in each country;
- conducting global surveillance and intelligence gathering to detect significant public health risks;
- supporting Member States' efforts to assess their existing national public health structures and resources;
- supporting Member States' efforts to build and strengthen the core capacities for surveillance and response, and the core capacities at designated points of entry;

⁹⁷ Turnock, *Public Health: What It Is and How It Works*, op. cit. 11.

⁹⁸ PAHO/WHO, International Health Regulations (2005): Basic information for national policy-makers and partners, Brochure, <http://www.paho.org/english/dd/pin/IHR07eng.pdf>.

- assessing relevant events (including on-site assessment, when necessary) and determining whether or not a particular event constitutes a public health emergency of international concern, with the advice of a committee of external experts;
- developing and recommending measures for use by Member States during a public health emergency of international concern (with advice from a committee of external experts);
- providing technical assistance to Member States in their response to public health emergencies of international concern; and
- updating IHR (2005), its annexes and guidelines to maintain its scientific and regulatory validity.

Public Health Financial Resources

This element refers to the collection, utilization, and management of resources to carry out public health activities as well as the impact of these resources on the health of the population and the public health system.⁹⁹ The financial resources assigned to public health activities not only quantify in monetary terms the human, organizational, informational, and technological components mentioned in the earlier sections, but also reflect their importance in society. Financial resources therefore can measure the level of prioritization that each country devotes to public health.¹⁰⁰

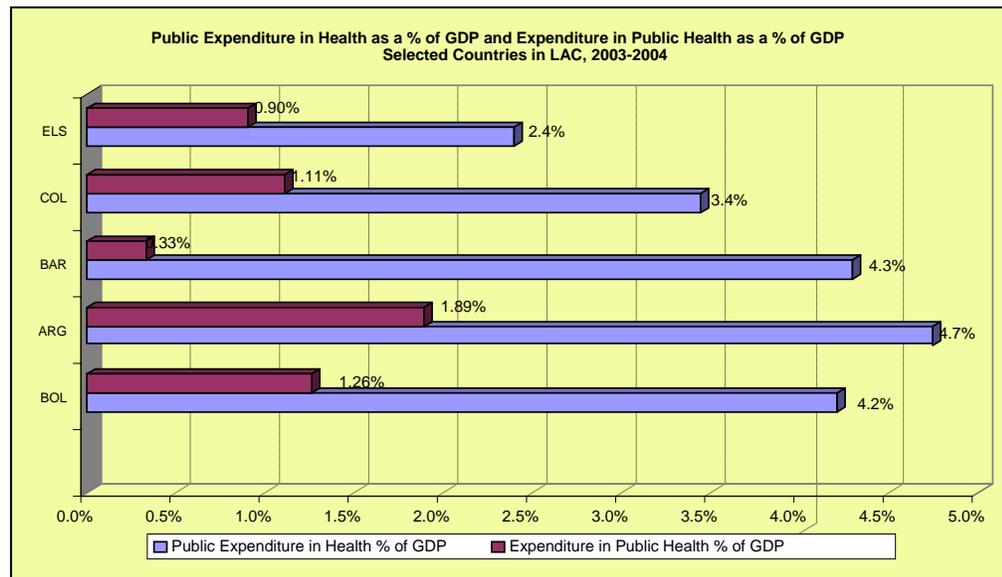
One factor that influences the allocation of resources to public health is its public good nature. Individuals may be reluctant to pay directly for public health services because they may not receive the benefits personally. Therefore, governments are usually the main financiers of public health actions and the ones responsible for ensuring that there are enough resources and a sustainable source of funding for public health activities. However, in most cases, the governments' attention and resources have been concentrated in personal health services (primarily diagnostic and clinical treatment services, and particularly hospital-based services that consume a large proportion of government health budgets).¹⁰¹ It is estimated that spending on activities associated with public health in the Americas represents less than 2% of the GDP as Figure 7 shows.

⁹⁹ Adapted from Honoré and Amy, "Public Health Finance."

¹⁰⁰ Turnock, *Public Health: What It Is and How It Works*, op. cit. 11.

¹⁰¹ WHO, *Essential Public Health Function: The Role of Ministries of Health* (53rd Session of the Regional Committee of the Regional Office for the Western Pacific, 16 July 2002).

Figure 7: Public Expenditure in Health



Source: Amparo Gordillo-Tobar, "Medición del Gasto en Salud Pública."

In the US, the vast majority of health care spending, as much as 95% by some estimates is directed toward medical care and biomedical research. However, there is strong evidence that behavior and environment are responsible for over 70% of avoidable mortality and health care is just one of the several determinants of health.¹⁰² Furthermore, the benefits of current investments in health care are inaccessible to many due to lack of insurance or access to services. A 2004 study showed that only 3% of the U.S. national budget was allocated to public health activities.¹⁰³ Now, due to new threats such as bioterrorism and avian flu, there has been a renewed interest in public health, which can possibly impact the allocation of resources.

The reasons why there are rather few financial resources being allocated to the PH sector are similar to the ones for the insufficient financing of health promotion programs, namely: (i) obstacles in calculating precisely the monetary costs and benefits of promotion activities, (ii) the inability of the financing body to internalize all the benefits of its investment, and (iii) the large time gap between the financing of the intervention and the effect leading to a reduction of costs. This demands the development and application of improved tools for measuring input and outcomes and the implementation of incentive mechanisms, making investments in health promotion and other public health actions more attractive.¹⁰⁴

¹⁰² IOM, *The Future of the Public's Health in the 21st Century*.

¹⁰³ PAHO/WHO, *Public Health in the Americas*.

¹⁰⁴ WHO, *Financing health promotion – Discussion Paper Number 4* (Geneva: WHO, 2007).

The true situation of spending in public health is not accurately known in most countries of the Region because itemized accounts are not kept for public health activities and thus determining their exact costs may be difficult. This lack of information hinders the ability to rationally allocate resources. Also, Ministries of Health must be able to negotiate funding with other ministries and demonstrate the cost-effectiveness of investing in public health. Furthermore, knowing current levels of expenditure and comparing it with the estimated cost required for the adequate performance of public health actions (as determined by the needs of the country) will allow for quantification of additional resources needed to fill the gap.¹⁰⁵

Knowledge of the sources and uses of public health funding remains scarce. Evidence is not readily available on efficient models for resource allocations, and metrics to measure funding outcomes have not yet been identified. Sustainability is also mired by the absence of information on innovative financing strategies.¹⁰⁶

The fact that public health is not under the responsibility of only one institution also complicates the task of tracking and estimating expenditures. As mentioned previously, the responsibility for exercising public health functions is shared among different organizations, both from within and outside the health sector and the state. In this context, it is difficult to identify exactly how much is needed and how to maximize these resources since different organizations with their own budgets are involved in performing public health actions. Turnock states that in the United States, it is estimated that nongovernmental organizations are responsible for delivering about one-fourth to one-third of the total essential public health services at the community level. He argues that the cost of these activities should also be considered in estimating total expenditures for public health.¹⁰⁷

Recently, this gap in information is being reduced as countries attempt to disaggregate public health spending from regular health care spending. Most countries already prepare National Health Accounts (NHA), which enable them to identify how much is spent in the health sector. However, one challenge refers to the need to be able to track expenditures in public health based on the categories used in national accounting methodologies which in many cases do not differentiate between public health and personal health services. To complicate matters, as previously mentioned, there is no universally accepted, clear cut definition of government public health care services.¹⁰⁸

There are internationally accepted accounting principles codified in the Systems of National Accounts (SNA), endorsed by the United Nations, which provides some guidance regarding the boundaries of public health. The SNA differentiates between individual and collective services thus defining what should be categorized as government

¹⁰⁵ Ibid.

¹⁰⁶ Honoré and Amy, "Public Health Finance."

¹⁰⁷ Turnock, *Public Health: What It Is and How It Works*.

¹⁰⁸ Arthur L. Sensenig, "Refining Estimates of Public Health Spending as Measured in National Health Expenditures Accounts: The United States Experience," *Journal of Public Health Management and Practice* 12(2), 2007, 104.

public health activities as opposed to government provision of personal health care services.¹⁰⁹ The SNA defines collective (public) services by the following characteristics:

- 1. Collective services can be delivered simultaneously to every member of the community or of particular sections of the community such as those in a particular region or a locality.*
- 2. The use of such services is usually passive and does not require the explicit agreement or active participation of all the individuals concerned.*
- 3. The provision of a collective service to one individual does not reduce the amount available to others in the same community or section of the community. There is no rivalry in acquisition.¹¹⁰*

Regarding the limits of public health and personal health care services, another convention developed by the OECD, *A System of Health Accounts (SHA)*, also offers some direction:

A wide range of government functions outside of health care deal with public safety and the protection of population health. For health accounting, the organization and performance of these services has to be separated from the health care function. Ambulance and rescue services of a general nature, but organized by fire-protection services, belong to health care. Base hospitals belong to the health care function, not the military or civil defense. Medical facilities reserved for war or peacetime disaster, on the other hand, belong to public safety or the military or defense function. A range of public safety measures (road and vehicle safety, construction and housing standards, veterinarian services, and product safety monitoring) are in some countries administered by public health authorities but are not included in the SHA boundaries of healthcare.¹¹¹

As part of the process of identifying, measuring and analyzing government investment in the public health system, countries such as the United States and Canada have been involved in refining the estimates of public health spending as measured in National Health Expenditure Accounts.

In Canada, the effort has centered on disaggregating the public health category in the National Health Expenditure Accounts. The public health category originally included the following classifications: measures to prevent the spread of communicable diseases, food and drug safety, health inspections, health promotion, community mental health programs, public health nursing and the general administration of public health departments. In the late 1990s, the Canadian Institute for Health Information (CIHI) conducted a series of feasibility studies that examined the possibility of redefining the public health classification by creating two separate categories: public health and administration. In

¹⁰⁹ Ibid.

¹¹⁰ Ibid.

¹¹¹ Ibid.

2005, these two categories were separated and a complete review of provincial and territorial estimates was undertaken. Significant variation was found in the results because of the differences in reporting public health expenses. This exercise revealed the difficulty of comparing figures across provinces in the absence of a common definition of public health and a common framework for classifying expenditures.¹¹²

Likewise, the United States has also been involved in a process to improve assessment of government public health activity. Three main challenges were identified in a report recently released on the subject: (i) lack of a definition of public health activity that can guide the collection of data at the federal, state and local levels; (ii) problems with existing data collection instruments to track expenditures on government health activities; and (iii) lack of data on state and local government expenditures for public health activities. In order to estimate public health expenditures, the federal budget must be examined in detail each year, with special attention to the fact that government public health activities usually appear in many agencies' budgets. The report concludes that public health systems research may be the solution for bridging the gap between public health practice and public health financing.¹¹³

In the article "Public Health Finance: Fundamental Theories, Concepts and Definition," Honoré and Amy argue that, in order to improve allocation and sustainability of financial resources for public health actions, four major actions need to be implemented at the steering role level. First, countries should conduct an assessment of the existing funding for the public health system, followed by the elaboration of a public health investment plan. Second, goals for public health financing should be identified (how much is needed to achieve adequate performance of public health functions, for example). Third, government must ensure financial transparency, including by adopting legislation as well as other regulatory and enforcement measures. Fourth, countries should do a better job of raising awareness about the importance of public health, which will have an impact on the allocation of resources for the field.¹¹⁴

In the area of education, the authors propose the following actions: (i) the identification of necessary workforce competencies in financial management; (ii) developing and promoting more graduate level courses on public health finance; and (iii) the creation of accreditation mechanisms for public health finance professionals. Likewise, in the field of research, a public health finance research agenda along with mechanisms to attract academics and students to the field is also needed. Finally, in regards to the practice of public health finance, "there is an immediate need for implementation of ameliorative financial management practices in public health."

¹¹² Geoff Ballinger, "Refining Estimates of Public Health Spending as Measured in National Health Expenditures Accounts: The Canadian Experience," *Journal of Public Health Management and Practice* 13(2), 2007.

¹¹³ Ibid.

¹¹⁴ Honoré and Amy, "Public Health Finance."

V. From Conceptualization to Operationalization: Assessing the Status of the Public Health Capacity in the LAC Region

The development of policies, plans, and strategies for strengthening public health must be based on an accurate assessment of the current status of the PH capacity. Moreover, when developing plans for strengthening public health, it is important to tailor them to the unique context of each country, given that the specific needs will vary significantly based on population density, epidemiological profile, the current number and geographical distribution of physical and human resources, as well as the history and culture of each health system. In addition to the data resulting from the “Public Health in the Americas” Initiative, numerous studies exist which attempt to ascertain the status of specific public health capacities in LAC.¹¹⁵ However, as mentioned previously, more sensitive and specific tools are not only needed to identify the weakness in the capacities on a micro-level, but also to help in the transition to a plan of action towards strengthening.

PAHO/WHO has developed several methodological tools that can be used toward this end, including, among others, the *EPHF Performance Assessment Tool* and the forthcoming *Evaluation Instrument of Surveillance Response Capacities*. PAHO/WHO has also elaborated and implemented other instruments that generate useful information for assessing specific elements of PH capacity such as the (i) *National Health Authority Mapping Tool*; (ii) the *Instrument for the Performance Evaluation of the NHA Steering Role Function*; (iii) the *Methodological Guidelines for the Elaboration of Health Systems Profiles*; and (iv) the *Health Sector Analysis Methodology*.¹¹⁶ In addition, other institutions such as CDC, USAID and JSI, Inc. have also developed assessment tools, which will be described in more detail in this section.

Table 1 contains a list of selected assessment tools and the PH capacities for which they can be most useful. Likewise, Table 2 includes a list of other tools/methodologies that also generate relevant information for determining the status of PH capacity, although they are more descriptive than the instruments listed in Table 1. It is worth mentioning that most of these instruments are geared toward assessing/describing capacities at the health system level. However, they contain indicators/measures that can be applied to and affect the functioning of public health systems. Finally, the list provided below is not all-encompassing; additional tools and methodologies may be available, especially at the country level.

¹¹⁵ Roberto Badía, Freddy Cárdenas and Miguel Angel González Block, *Nicaragua modernización de los hospitales del MINSA: propuesta de préstamo* (Managua: MINSa, 1998). Ministerio de Salud de Panamá, *La red pública de servicios de salud, reorganización y definición por niveles de atención y grados de complejidad* (Panamá: Ministerio de Salud, Departamento de Desarrollo de Modelos de Gestión, Sept. 2003). Adela Rosenkranz, *Estudio de factibilidad técnica para establecer laboratorios e implantar el control biológico de medicamentos en países seleccionados del Istmo Centroamericano* (Panamá, Washington, D.C.: OPS/OMS, 1986). Daniel Bitran, *Impacto económico de los desastres naturales en la infraestructura de salud* (Washington, D.C.: OPS/OMS, 1996). Aracely de León et al., *Análisis de la disponibilidad de recursos humanos, de los currícula y la infraestructura física de la Facultad de Ciencias Químicas y Farmacia referente a la formación de personal, en ciencia y tecnología farmacéutica* (Guatemala: OPS/OMS, 1990). Rocio Pinto Beltrán, *Evaluación de la infraestructura sanitaria de la Caja Nacional de Salud en La Paz* (tese de maestría, Universidad Mayor de San Andrés, 1993).

¹¹⁶ These tools can be accessed at the LACHEALTHSYS Web site: www.lachealthsys.org.

Table 1: Selected Assessment Tools/Instruments to Assess PH Capacity

Selected Assessment Tools/Instruments	Selected Tools/Instruments to Assess the Status of PH Capacity				
	Elements of PH Capacity				
	Workforce	Information Systems	Health Technologies	Institutional and Organizational Capacity	Financial Resources
Tools Developed by PAHO and WHO					
EPHF Performance Assessment Tool	X	X	X	X	
Instrument for Performance Evaluation of the NHA Steering Role				X	
Evaluation Instrument of Surveillance Response Capacities (IHR)**forthcoming		X	X	X	
Guide to Rapid Assessment of Human Resources for Health (WHO)	X				
Health Metrics Network Framework (WHO)		X			
Tools Developed by Other Institutions					
Performance of Routine Information System Management – PRISM (MEASURE Evaluation & JSI)		X			
State Public Health System Performance Assessment (CDC)	X	X	X	X	X
Local Public Health System Performance Assessment (CDC)	X	X	X	X	X
Local Public Health Governance Assessment Instrument (CDC)				X	
UN Millennium Project Health System Needs Assessment Guidelines					X

EPHF Performance Measurement Instrument.¹¹⁷ The measurement instrument offers a common framework for measuring the performance of the EPHF in all countries of the Americas while respecting the organizational structure of each country's health system. Therefore, in countries with a federal or unitary structure, the instrument follows the organizational model and the process of distribution of competencies of each National Health Authority (NHA). In order to analyze the measurement results, a scoring system was established to quantify the qualitative responses of

¹¹⁷ Available in English, Spanish, Portuguese and French at: http://www.lachealthsys.org/index.php?option=com_content&task=view&id=39&Itemid=50.

the measurements and sub-measurements. In addition, criteria were developed for each indicator to classify the obtained scores as strengths or weaknesses.

The autonomy of the NHA was respected in the selection of the working group participants that conducted the assessments. Special attention was given to ensure a balanced participation from both the national and sub-national levels of the NHA. There was also an emphasis placed on including representatives from the intermediate levels such as department, state, or province. Participation from experts within the academic sector, social security, non-governmental organizations, and other actors in the national public health community was also encouraged. During fifteen months of continuous collaboration between April, 2001 and June, 2002, a total of 41 national workshops took place to measure the performance of the 11 EPHF in the Region. The entire process had broad participation from the groups selected for the measurement exercise and was fully supported by the ministers of health. Additional support was given from the team of experts, who represented the organizations that participated in the design of the measurement instrument, and that served as external facilitators.

The Public Health in the Americas Initiative identified several indicators that can be used to assess the status of the different elements that comprise PH capacity. However, to measure a specific element, it is necessary to examine multiple EPHFs. For example, the indicators listed below were taken from different EPHFs and could be useful to assess more than one element that constitutes PH capacity:

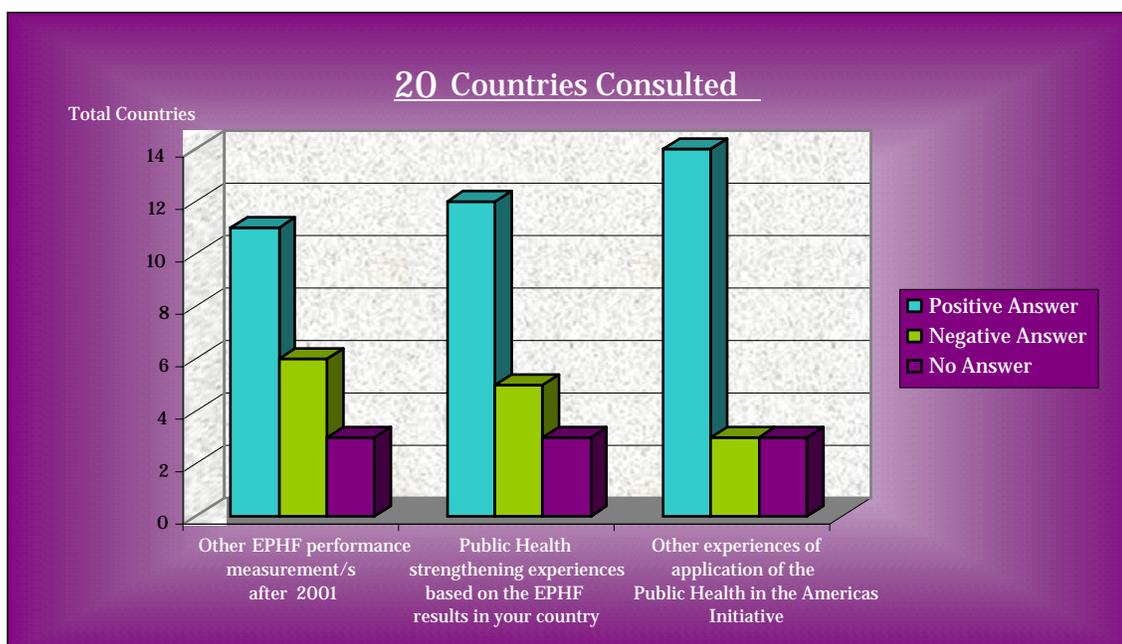
- *Expert Support and Resources for Monitoring Health Status*
- *Technical Support for Monitoring and Evaluating Health Status*
- *Public Health Surveillance Capacity and Expertise*
- *Public Health Laboratory Capacity*
- *Development of Institutional Capacity for the Management of Public Health Systems*
- *Management of International Cooperation in Public Health*
- *Knowledge, Skills, and Mechanisms for Reviewing, Improving and Enforcing Regulations*
- *Description of the Public Health Workforce Profile*
- *Continuing Education and Graduate Training in Public Health*
- *Systems for Technology Management and Health Technology Assessment that Support Decision-Making in Public Health*
- *Development of Institutional Research Capacity*

One interesting development regarding the application of the EPHF measurement instrument refers to the sub-national measurements that were conducted in selected countries in the Americas. In addition to the Brazilian

adaptation previously mentioned, the instrument was also adapted to the sub-national level and applied in Argentina, Colombia, Costa Rica, Honduras, and Peru.¹¹⁸ These countries, with the support of PAHO/WHO, took the lead in the adaptation of the tool for application at the sub-national level. This process clearly reflects the commitment at the country and local levels to keeping public health at the forefront of the overall health and development agendas.

In addition to the sub-national applications mentioned above, other countries in the Region have conducted follow-up national assessments with the purpose of identifying changes in the status of the EPHF over time, while others have used the results of the first measurement and/or subsequent assessments to elaborate strengthening plans. Figure 8 shows the number of countries in the Region that have been involved in some of these initiatives.

Figure 8: Current Initiatives on EPHF Measurement and Strengthening in Latin America, 2006¹¹⁹



Instrument for Performance Evaluation of the NHA Steering Role Function. This tool is especially useful for the assessment of *Institutional and Organizational Capacity*. Its application allows countries to generate a baseline assessment that will facilitate and strengthen the capacity of LAC countries' NHAs to identify the critical factors for the definition of strategies and plans to strengthen their health systems, and consequently, their capacity to improve health outcomes.

¹¹⁸ Available at: www.lachealthsys.org.

¹¹⁹ These results were compiled from a survey conducted with the PAHO/WHO Regional Offices of 20 countries of the Region of the Americas. Source: Carissa Etienne, "Balance y Perspectivas de las FESP en América Latina," Presentation given in the workshop *Balances y Perspectivas: Funciones Esenciales de la Salud Pública en las Américas*, PAHO/WHO, Lima, Peru, May 29-31, 2007.

Evaluation Instrument of Surveillance Response Capacities (International Health Regulations). As part of the process to implement the IHR 2005 in the Americas, PAHO's Communicable Diseases unit is currently developing the "*Evaluation Instrument of Surveillance Response Capacities*." This new tool will be part of the process that countries will follow to assess their public health services and will look not only at surveillance and laboratorial services associated with the Ministry of Health, but also at the different programs responsible for disease and vector control, water and food-safety, zoonosis, social communication and infectious disease health care services, including infection control (ambulatory and hospital). The assessment process and the tool are expected to be disseminated within the next couple of months.

Framework and Standards for Country Health Information Systems.¹²⁰ Public health decision-making, as observed in the third section of this paper, is critically dependent on the generation of "health intelligence," which is produced as a result of the correct processing of quality and timely health information.¹²¹ The framework developed by the Health Metrics Network (HMN), an initiative launched by the WHO, aims to "increase the availability and use of timely and accurate health information in countries and globally through shared agreement on goals and coordinated investment in core HIS (Health Information Systems)."¹²² The Framework has two main goals: (i) at the country level, it should allow for an HIS baseline assessment and diagnosis, for a roadmap for the development of HIS plans, and for ongoing monitoring and evaluation; and (ii) it should enable access to and use of better health information. HMN support is focused on low- and middle-income countries.

The application of the HMN framework must first take into account the fact that the scope, form, and content of health information system strengthening will depend on locally specific factors such as the structure of the government, the level of development, institutional capacities, and affordability (see Figure 9). The principles that should guide the implementation of the HMN framework include: i) country leadership and ownership; ii) a focus on individual countries' needs; iii) building on what already exists; iv) broad-based consensus-building; and v) HIS development as an incremental process.¹²³ Five phases of implementation are identified, namely: (1) assessment; (2) coordination and leadership; (3) planning and priority-setting; (4) implementation of HIS strengthening activities; (5) monitoring, evaluation and reprogramming.

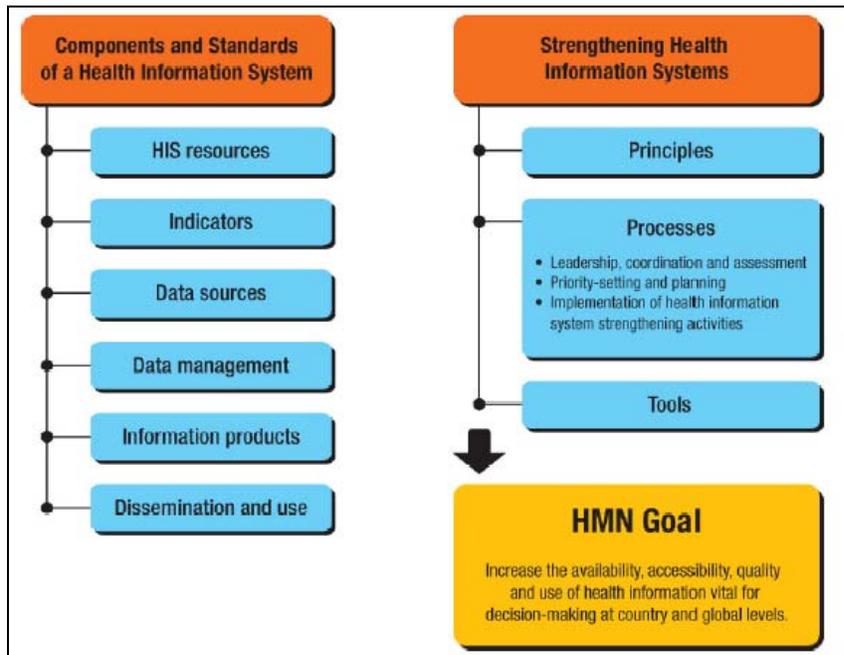
¹²⁰ Health Metrics Network, Framework and Standards for Country Health Information Systems (Geneva: Health Metrics Network, 2007). Available at: <http://www.who.int/healthmetrics/documents/framework/en/index.html>.

¹²¹ AbouZahr and Boerma, "Health information systems."

¹²² Tony Williams, "Building health information systems in the context of national strategies for the development of statistics," *Bulletin of the World Health Organization* 83(8) (2005), <http://www.who.int/bulletin/volumes/83/8/editorial30805.html/en/index.html>.

¹²³ More detailed information on how to apply the HMN framework along with the tool that can be used to assess the current status of HIS can be found at <http://www.who.int/healthmetrics/TAGmeetingDec/en/index.html>

Figure 9: The HMN Framework



Source: Health Metrics Network, *Framework and Standards for Country Health Information Systems*.

Performance of Routine Information System Management (PRISM).¹²⁴ The PRISM conceptual framework, developed by MEASURE Evaluation¹²⁵ and John Snow Inc., created tools to identify strengths and weaknesses of routine health information system performance and associated factors. The tools can be used to design a new system, to evaluate an existing system or to assess the impact of interventions on HIS. The PRISM framework includes the following tools:¹²⁶

1. *Performance Diagnostic Tool*. Determines the overall level of HIS performance, i.e. the level of data quality and use of information. It captures the technical determinants of RHIS performance, such as level of complexity of data collection forms and user-friendliness of information technology.
2. *Overview and Facility/Office Checklist*. This tool examines technical determinants, such as the structure and design of existing information systems in the health sector, information flows, and interaction between different information systems.
3. *Organizational and Behavioral Assessment Tool (OBAT)*. This tool identifies behavioral and organizational factors affecting HIS performance. Behavioral determinants include level of data demand, motivation,

¹²⁴ Available at: http://www.lachealthsys.org/index.php?option=com_content&task=view&id=191&Itemid=219.

¹²⁵ MEASURE Evaluation is funded by the U.S. Agency for International Development (USAID) and is implemented by the Carolina Population Center at the University of North Carolina in partnership with Constella Futures, John Snow, Inc., Macro International Inc., and Tulane University. To learn more about MEASURE Evaluation view www.cpc.unc.edu/measure.

¹²⁶ MEASURE Evaluation and USAID, *Using PRISM to strengthen and evaluate health information systems*, Brochure, <https://www.cpc.unc.edu/measure/publications/pdf/fs-07-18.pdf>.

confidence, task competence, and problem-solving skills. Organizational factors include level of promotion of a culture of information, merit criteria, and use of HIS information for performance appraisal.

4. *Management Assessment Tool*. This tool is designed to take rapid stock of the RHIS management practices and aid in developing recommendations for better management.

UN Millennium Project Health System Needs Assessment Guidelines.¹²⁷ The UN Millennium Project helps to determine the needs and related costs for achieving the MDGs. Specifically, the methodology requires working groups in the countries to: i) conduct a *Needs Assessment* that quantifies the requirements and provides information for planning and budgeting public investments and expenditures; ii) develop a matrix of interventions for mid- and long-term actions; iii) carry out a *Cost Analysis* with subsequent year-by-year costs that would provide a guide for effective multi-year and medium-term budgetary planning; and iv) hold intersectoral consultations in order to enrich and legitimize the key findings and conclusions of the working group.¹²⁸ The application of this methodology would permit countries to identify the costs of meeting these needs. By holding intersectoral consultations to discuss the results of applying this methodology, the countries can build consensus and support for the policy interventions that have been identified as the most appropriate and/or effective.

CDC Developed Tools.¹²⁹ The State Public Health System Performance Assessment, Local Public Health System Performance Assessment and Local Public Health Governance Assessment Instruments are tools developed by the National Public Health Performance Standards Program (NPHPSP). This program is a collaborative effort to improve the quality of public health practice and the performance of public health systems in the United States. Seven national public health organizations have partnered to develop national performance standards for state and local public health systems.¹³⁰ These tools have been recently updated in 2007 and the CDC has stated that, if there is considerable interest, these tools can be translated into Spanish and adapted to the local and/or community levels for application in LAC countries:¹³¹

- *State Public Health System Performance Assessment Tool*. This instrument focuses on the “state public health system,” which includes state public health agencies and other partners that contribute to public health services at the state level.

¹²⁷ Available at: <http://www.unmillenniumproject.org/documents/UserGuide-HealthSystem.pdf>.

¹²⁸ Presidential Commission on the Millennium Development Goals (COPDES) and the United Nations Country Team in the Dominican Republic (UNCT). “Investing in the Sustainable Development of the Dominican Republic.” *COPDES & UNCT* 2005.

¹²⁹ Available at: <http://www.cdc.gov/od/ocphp/nphpsp/NewInstrument.htm>.

¹³⁰ These organizations are: Centers for Disease Control and Prevention (CDC), Office of the Chief of Public Health Practice (CDC / OCPHP), American Public Health Association (APHA), Association of State and Territorial Health Officials (ASTHO), National Association of County and City Health Officials (NACCHO), National Association of Local Boards of Health (NALBOH), National Network of Public Health Institutes (NNPHI), and Public Health Foundation (PHF).

¹³¹ The CDC provided support for some of the 41 countries that participated in country-level EPHF assessments; the results were compiled in PAHO/WHO, *Public Health in the Americas*.

- *Local Public Health System Performance Assessment Tool.* This instrument focuses on the “local public health system” or all entities that contribute to public health services within a community.
- *Local Public Health Governance Assessment Tool.* This instrument focuses on the governing body accountable for public health at the local level. Such governing bodies may include boards of health, councils, or county commissioners. This tool is shorter in length than the state or local assessments.

There are four concepts that have helped to frame the NPHPSP:¹³²

- The standards are designed around ten Essential Public Health Services to assure that they fully cover the gamut of public health action needed at state and community levels.
- The standards focus on **the overall public health system** (all public, private, and voluntary entities that contribute to public health activities within a given area), rather than a single organization. This assures that the contributions of all entities are recognized in assessing the provision of essential public health services. This constitutes a main distinction between the CDC tools and the EPHF measurement tool, which concentrates solely on the NHA.
- The standards describe an optimal level of performance rather than provide minimum expectations. This assures that the standards can be used for continuous quality improvement.
- The standards can stimulate greater accomplishment and provide a level to which all public health systems can aspire to achieve.

¹³² National Public Health Performance Standards Program (NPHPSP), NPHPSP Fact Sheet, <http://www.cdc.gov/od/ocphp/nphpsp/nphpspfactsheet.htm>.

Table 2: Selected Assessment Tools/Instruments that Generate Information on the Status of PH capacity

Selected Assessment Tools/Instruments	Selected Tools/Instruments that Generate Information on the Status of PH Capacity				
	Elements of PH Capacity				
	Workforce	Information Systems	Health Technologies	Institutional and Organizational Capacity	Financial Resources
Tools Developed by PAHO and WHO					
Methodological Guidelines Health Systems Profiles	X	X	X	X	X
Methodological Guidelines Health Sector Analysis	X	X	X	X	X
NHA Mapping Tool				X	
Framework for Characterizing the Public Health Workforce	X				
Framework for Harmonizing the Essential Public Health Functions (EPHF) with the Functional Classification of Expenditures (FCE)					X
Basic Operational Frameworks for Essential Health Technologies (WHO)			X		

Methodological Guidelines for the Elaboration of Health Systems Profiles.¹³³ The most commonly applied tool in LAC countries is the *Methodological Guidelines for the Elaboration of Health Systems Profiles*. The Health Systems Profiles are concise descriptions of the structure and dynamics of health systems and can also be used for the monitoring and evaluation of health systems change. Its application generates information on all five elements of the EPHF infrastructure. Specifically, it requires the countries to provide information on the quantity and development of human resources, on determinants of health and epidemiological and demographic trends, the current supply of physical resources such as hospitals and drugs, the allocation of financial resources, as well as information on how all these elements are organized through the use of the NHA's *Steering Role Function*. The Health Systems Profiles have been completed for 35 countries in the LAC Region and there are efforts to update them every three years.

Methodological Guidelines for Health Sector Analysis.¹³⁴ Another tool applied in the LAC Region, although to a lesser extent, is the *Methodological Guidelines for Health Sector Analysis*. It generates a comprehensive analysis of

¹³³ Available in English, Spanish and Portuguese at: http://www.lachealthsys.org/index.php?option=com_content&task=view&id=131&Itemid=169.

¹³⁴ Available in Spanish only at: http://www.lachealthsys.org/index.php?option=com_content&task=view&id=150&Itemid=169.

the health sector as a whole—including an analysis of the institutional organization of the sector and of the planning and management of health systems and services—and its application provides valuable information that can be used to assess PH capacities. In addition, the difficulties encountered in the process of completing the Health Sector Analysis can give an indication of the current public health status of the country.

NHA Mapping Tool.¹³⁵ This tool helps to identify relevant institutions and actors in the public health sector that are legally and functionally responsible for carrying out the steering role functions. It is particularly important for generating information regarding *Institutional and Organizational Capacity*.

Framework for Characterizing the Public Health Workforce. The first step to develop and strengthen the public health workforce consists in its characterization. Rosenberg and Lovell,¹³⁶ with the support of PAHO/WHO, have developed a methodology for defining the PHWF, which is currently being pilot-tested in three countries of the Region. The methodology employs qualitative information to determine the formal and informal workforce, at both the national and subnational levels. The methodology also aims to identify the institutions and actors responsible for public health actions, including which functions and activities are carried out and how much time is spent on their performance. Additionally, the methodology supports the gathering of personal information on individual workers as a mechanism for better characterizing the public health professional.¹³⁷ The results of the pilot tests have not been disseminated yet, but they represent an important step toward strengthening the PHWF in the Region.

Framework for Harmonizing the Essential Public Health Functions (EPHF) with the Functional Classification of Expenditures (FCE).¹³⁸ In order to estimate the amount of resources needed for the implementation of the EPHF, the first step consists of the identification of how much is currently spent. Due to the fact that most countries aggregate public health expenditures or group them into other broader categories, it is difficult to assess how much is being allocated for each EPHF. One way to tackle this problem and to facilitate cross-country assessments is to harmonize the EPHF with the categories included in the Functional Classification of Expenditure (FCE) of the IMF's Government Finance Statistics Manual (GSFM). The GSFM is part of a series of international directives on statistical methodology published by the international Monetary Fund and widely used by countries to monitor government spending. By identifying to which category of the FCE each public health function corresponds, it is possible to

¹³⁵ Available in Spanish only at: http://www.lachealthsys.org/index.php?option=com_content&task=view&id=170&Itemid=152&lang=en.

¹³⁶ Mark W. Rosenberg and Sarah A. Lovell, *A Methodology for Projects to Characterize the Public Health Workforce in Costa Rica, Jamaica, and Mexico* (Ontario, Canada: Queen's University Department of Geography, 2006).

¹³⁷ PAHO/WHO, *Strategies for Developing the Health Workforce*.

¹³⁸ Available at: http://www.lachealthsys.org/index.php?option=com_content&task=view&id=201&Itemid=221.

monitor the allocation of resources. The harmonization of the EPHF with the FCE will help in the identification of the areas that are under funded as well as areas where resources are not generating the impact expected.¹³⁹

VI. Conclusion

Public health in the region of the Americas is at the crossroads. The absence of public health from the health sector reform agenda in the 1990s has been partly responsible for its deterioration in recent decades. In addition, the emergence of new health threats, the persistence of infectious disease combined with the changing epidemiological profile of the population pose continued challenges to public health systems. In order to take steps to improve health outcomes, countries must identify and address the gaps in their public health capacity. All actors involved in public health and the health sector, whether they are from the public, private or voluntary sectors, have an important decision to make, *to put public health at the forefront of the development agenda*.

Countries and international development agencies must make a commitment to prioritize public health. Some positive examples of progress being made in this area include Colombia's efforts to strengthen their public health surveillance systems,^{140, 141} and recent World Bank projects in Brazil and Argentina also to strengthen public health surveillance.^{142, 143} In addition, Argentina is participating in another World Bank project entitled *Essential Public Health Functions and Programs*¹⁴⁴ which aims to increase the coverage of ten prioritized public health programs and to improve the steering role and appropriate regulatory environment of Argentina's public health system.

This paper focused on strengthening public health capacities, or those elements that constitute the basis for implementing public health actions and providing tools for country self-assessment. The elements that constitute PH capacity are: i) Public Health Workforce; ii) Public Health Information Systems; iii) Public Health Technologies; iv) Institutional and Organizational Capacity; and (v) Financial Resources. PH capacities have been largely neglected in the Region of the Americas. As the results of the Public Health in the Americas Initiative show, countries underperformed in the majority of the Essential Public Health Functions (EPHF) analyzed. Most of these functions relate either directly or indirectly to the elements of PH capacity.

¹³⁹ PAHO/WHO Health Policies and Systems Unit (HSS/HP), *Harmonization of Essential Public Health Functions (EPHF) with the Functional Classification of Expenditure (FCE)* (Washington, D.C. : PAHO/WHO, 2004).

¹⁴⁰ Ministerio de la Protección Social, *Diario Oficial Decreto Numero 3518. Sistema de Vigilancia en Salud Pública* (Colombia, Bogota, 10 de octubre 2006).

¹⁴¹ Ministerio de la Protección Social y Organización Panamericana de la Salud (OPS/OMS), *Sistema Nacional de Vigilancia en Salud Pública: Aspectos Generales* (Colombia, Bogotá: Ministerio de la Protección Social y Organización Panamericana de la salud, Diciembre de 2005).

¹⁴² Ministério da Saúde, Projeto VIGISUS II – Subcomponente IV: Fortalecimento Institucional da Capacidade de Gestão em Vigilância em Saúde nos Estados e Municípios (Brasília, D.F., Brasil: Ministério da Saúde), <http://portal.saude.gov.br/portal/arquivos/pdf/vigisusII.pdf>.

¹⁴³ The World Bank. *Argentina: World Bank Approves \$220 Million for Public Health*, Press Release, <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/LACEXT/0,,contentMDK:21136153~menuPK:258568~pagePK:2865106~piPK:2865128~theSitePK:258554,00.html>

¹⁴⁴ The World Bank, *Public Health Surveillance and Disease Control Project in Argentina (VIGIA)*, <http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P055482>.

As mentioned previously, one major obstacle for better assessing PH capacity in the Region is the lack of information about the elements that comprise it. Most of the information available refers to these elements as they relate to health systems. Without information specific to the public health system, countries are not able to identify intervention areas. In this context, more research is needed on each PH capacity mentioned above. The information gap is only now starting to be filled with recent attempts to quantify and qualify the public health workforce and to identify and monitor public health expenditures. However, in order to allow the implementation of knowledge-based strengthening strategies, these efforts must be institutionalized.

In addition, a stronger commitment to strengthening public health research is needed. Essential Public Health Function 10, which refers to research in public health, was one of the worst performers in the Region, even though Latin America and the Caribbean had a strong tradition of Schools of Public Health and academic centers working on the subject. Over the past years, several factors have contributed to a decline in the capacity to produce quality and timely research in public health. However, the field of public health systems research, which examines the organization, financing and delivery of public health services/activities within communities and the impact of these services on public health, is emerging from the shadow of health services research.^{145,146} Even though research in public health and public health systems was not addressed in this paper, the authors recognize their importance in contributing to the improvement of the elements that constitute PH capacity, especially the public health workforce.

The purpose of this document was not to propose a new assessment tool to evaluate PH capacity, but rather to present a list of selected tools and methodologies that can assist in the process of collecting information on a specific capacity or capacities. Most of the countries in the region have already conducted several assessments and applied multiple tools that have generated important information about the elements that comprise PH capacity. However, this information concerns the health system as a whole. This data needs to be disaggregated to collect information specifically about the public health system, thereby allowing the identification of those elements of PH capacity that are most in need of strengthening.

The authors hope that this document will encourage countries to use some of the tools suggested to self-assess PH capacity at the subregional and local levels, and that these efforts will be published and circulated to benefit PH capacity building. In addition, countries are encouraged to develop their own instruments adapted from the examples provided.

¹⁴⁵ Scutchfield, F. Douglas, and K. Patrick. "Public Health Systems Research: The New Kid on the Block." *American Journal of Preventive Medicine* 32, 2 (2007): 173-4.

¹⁴⁶ Mays, Glen, Paul K. Halverson, and F. Douglas Scutchfield. "Behind the curve? What we know and need to learn from public health systems research." *Journal of Public Health Management & Practice*. 2003;9:179-182.

VII. Annex I – Strengthening PH Capacity: Country Experiences

1. Public Health Workforce

- **Public Health Workforce Development in the English Speaking Caribbean¹⁴⁷**

The range of responsibilities of the Environmental Health Practitioners in the Caribbean has increased considerably over the last two decades. This has been in response to the new challenges posed by the expansion of the national food industries, the high transmission of the dengue fever and other vector-borne diseases, the Caribbean economy's dependency on tourism, the transshipment of waste, and the emergence of new communicable diseases such as HIV/AIDS.

These new challenges have therefore created a demand for reorienting the training programs to deal with issues such as food safety, air quality, vector control, health education/promotion, solid waste management and environmental health impact assessment. Therefore, the functions of the Ministries of Health have become more oriented to policy and program planning, with special focus on:

1. Assessment and management of environmental health risks;
2. Establishment of protocols, procedures and standards;
3. Development of communication strategies;
4. Review of legislation and regulations;
5. Coordination of activities between government and private entities.

At the same time, the decline of the national economies in the region since the late 1990s has had a negative impact on the capacity of the Caribbean countries to invest in human resources development training abroad. This has resulted in fewer trained professionals and in an increase of the recruitment of unskilled workers to carry out functions of the Environmental Health Officer.

To reverse this trend, a restructuring of the Environmental Health Curricula among Caribbean Regional Environmental Health Institutions was needed. The harmonization of the curricula would be a first step to improve the situation, thereby creating structured programs, and facilitating the accreditation process. This would encourage the

¹⁴⁷ This section was based on a draft document prepared by the Joint PAHO/CARICOM Task Force for Training in Environmental Health, *Human Resource Development for Environmental Health Professionals of CARICOM Countries: Three-Step Training Program* (Bridgetown, Barbados, January 2003).

flow of professionals within the Caribbean Community (CARICOM), possibly minimizing the challenge of inadequate numbers of workers in specific countries.

A proposal to reform training in Environmental Health titled the “Three-Step Training Programme” was therefore elaborated after internal discussions with PAHO and other actors including the Caribbean Environmental Health Institute. After completing the four-year program, the candidate will be awarded a B.Sc. Degree. The specific objectives of the programs are listed in Box 1:

Box 1: Objectives of the “Three-Step Training Programme” in Environmental Health

- Facilitate a restructuring of the Environmental Health Curricula of the Caribbean Regional Environmental Health Training Institutions to offer a B.Sc. Degree in Environmental Health.
- Introduce a harmonized curriculum for Environmental Health Training in the Caribbean thereby facilitating equivalency and encouraging free movement of professionals.
- CARICOM nationals have increased access to a harmonized, structured, training program in Environmental Health.
- Enhance the skills of professionals working in the field of Environmental Health in CARICOM countries.
- Improve the capacity of Environmental Health Units to provide leadership in Environmental Health matters.

The process of developing the “Three-Step Training Programme” involved defining the competencies of various levels of Environmental Health personnel. Based on these skills, the program curriculum was developed. Step I of the program includes courses on food hygiene, communicable diseases, health care system delivery, vector control, health education, communications and ethics. Step II will take two years for completion and successful students will be awarded an Associate Degree upon finishing this stage. Courses in this second phase could be provided by distance learning for those countries without higher level academic institutions. Finally, Step III will offer specializations on Occupational Health and Safety, Vector Control, Food Safety, Environmental Health Engineering and Epidemiology.

In order to implement the program successfully, a series of conditions should be met by the countries including ensuring, among others: (i) sufficient and qualified human resources to deliver and coordinate the program; (ii) adequate physical facilities for training and laboratory practice; and (iii) capacity for distance learning. These requirements pose concerns regarding the costs to implement the program and raise the question of who will pay for the training, the students or governments. In order to address these concerns, it was recommended that countries undertake a study to assess the feasibility to implement the program.

2. Public Health Information Systems

- **Institutional Strengthening of the Health Surveillance Management Capacity in States and Municipalities**
–Project VIGISUS II-Brazil^{148,149}

The VIGISUS II Project is an initiative by the Brazilian government with support from the World Bank to improve and strengthen the National Health Surveillance System. The VIGISUS project began in 1999 and is being developed in three phases. The first phase, VIGISUS I, took place from 1999 to 2004 and was devoted to the organization of the national health surveillance system. VIGISUS II, which began in 2005 and will end in 2008 builds on the accomplishments of the first phase, while supporting the decentralization of health surveillance activities, and institutional reforms related to the health system.

VIGISUS II will: 1) finance activities to reduce morbidity and mortality and exposure to risk factors associated with ill health by strengthening the public health surveillance, and disease control systems at the national, state and municipal levels. It will also improve the use of vital statistics as a tool to monitor and prevent maternal and infant mortality, and collect and analyze health information for the assessment of health disparities; 2) improve the health outcomes of vulnerable groups, including indigenous populations and Quilombo communities,¹⁵⁰ by financing institutional reforms, extending coverage for basic services, enhancing the quality of care, addressing special and emerging health needs, and supporting community-driven initiatives

To meet these objectives, the project will finance laboratory and medical equipment for primary care facilities, vehicles and boats to transport patients and health teams, computer and communication equipment to gather surveillance data, consulting services, community-driven subprojects (e.g., construction and upgrading of health posts, basic laboratories and indigenous residences), training, workshops, seminars, and training materials, in addition to water supply, sanitation and housing upgrading subprojects.

The third phase, VIGISUS III, is scheduled for implementation between 2009 and 2011 and will serve to consolidate the system.

¹⁴⁸ Ministério da Saúde. *Projeto VIGISUS II – Subcomponente IV: Fortalecimento Institucional da Capacidade de Gestão em Vigilância em Saúde nos Estados e Municípios*. Brasília, D.F., Brasil: Ministério da Saúde, <http://portal.saude.gov.br/portal/arquivos/pdf/vigisusII.pdf>.

¹⁴⁹ The World Bank. VIGISUS II Brazil-Second Disease Surveillance and Control Project. <http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P083013>.

¹⁵⁰ Quilombos are hinterland settlements of ex-slaves of African descent.

- **Argentina Public Health Surveillance & Disease Control Project (VIGIA) and the Essential Public Health Functions Project**

The objective of VIGIA,¹⁵¹ which received support from the World Bank ending in 2006, was to strengthen national, provincial and municipal levels, and institutions responsible for public health policy and practice. The components called for: 1) strengthening the public health surveillance system at the national level and the institutional capacity of the Ministry of Health and Social Action (MSAS) to make informed decisions on prevention control, better monitor changes in health trends, and allocate resources effectively. 2) Improving disease control through institutional development at provincial levels to better monitor, control and prevent diseases. Namely, febrile illnesses, such as tuberculosis and dengue, in high incidence areas will be controlled, as well as other infectious and emergent diseases. 3) Strengthening the MSAS capacity to implement health promotion strategies through education, social mobilization, and policy advocacy. Training will be provided for dissemination practices, and required infrastructure, rehabilitation and equipment, will be made available under this component.

Essential Public Health Functions Project^{152,153}

As a result of years of deterioration, aggravated by recent economic and health system crises, the health system in Argentina faces four key challenges to improve its performance: (i) the urgent need to ensure access to basic health services for the poor; (ii) the need to effectively address the highly prevalent but also the emerging public health challenges (particularly Non-Communicable Diseases and HIV/AIDS); (iii) the need to introduce structural changes in the federal – provincial relationship in the health sector in order to improve the incentive framework for efficiency and equity in the allocation of public subsidies; and (iv) the need to further improve and consolidate the regulation of Social Security in health, also to improve the incentive framework for efficiency and equity within the system.

However, strengthening of the regulatory and oversight capacity for essential public health interventions, one of the three key policy actions of the strategy, is still in development and has been impeded by the significant problems the public health system in Argentina still faces namely: (i) weak stewardship capacity in public health at the central and provincial levels resulting in relatively poor outcomes; (ii) inequalities in coverage and access to public health programs with substantial discrepancies between provinces, and urban-rural populations; (iii) deficiency in implementation and funding for interventions that support and sustain behavioral change; (iv) insufficient research

¹⁵¹ The World Bank. *Public Health Surveillance and Disease Control Project in Argentina (VIGIA)*. <http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P055482>.

¹⁵² The World Bank. *Argentina: World Bank Approves \$220 Million for Public Health*. Press Release, <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/LACEXT/0,,contentMDK:21136153-menuPK:258568-pagePK:2865106-piPK:2865128-theSitePK:258554,00.html>.

¹⁵³ The World Bank. Project Information Document-Concept Stage. 2005. http://www.wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2005/09/13/000104615_20050914091445/Rendered/PDF/Rev10PID10AR0EPHF0Concept0Stage009101.05.pdf

capacity in public health; (v) lack of operationalization of the national and provincial strategy and programs in public health; (vi) absence of an effective public health infrastructure capable of addressing the public health priorities in the country; (vii) and an outdated HIV/AIDS strategy that needs to be modernized and better linked with the provincial level in the federal context of Argentina.

The Essential Public Health Functions Project, approved by the World Bank in late 2006, will contribute to improving the health intelligence of the system, particularly at the provincial levels, developing real-time public health information leading to action at the local level across the national health system and in the local community. The proposed project draws substantially on the recommendations of the 2003 sector analysis which recommended that priority public health programs needed to be protected and strengthened within a solid framework of stewardship, regulation and sector dialogue. It also expands on the work begun by the VIGIA project (which focused on public health surveillance and health promotion at the central level) and benefits from its experiences.

To transition from an overuse of emergency services, support will be continued for modernized, more equitable and better quality public health programs providing public goods such as vaccines, anti-retrovirals, treatment for TB and communicable diseases in border areas. The new project will complement the costly curative health interventions with strong prevention and health promotion interventions, and contribute to an improved and more cost-effective public health response to changing health priorities, including non-communicable diseases and injuries.

- **SIVIGILA-Public Health Surveillance System in Colombia**^{154,155}

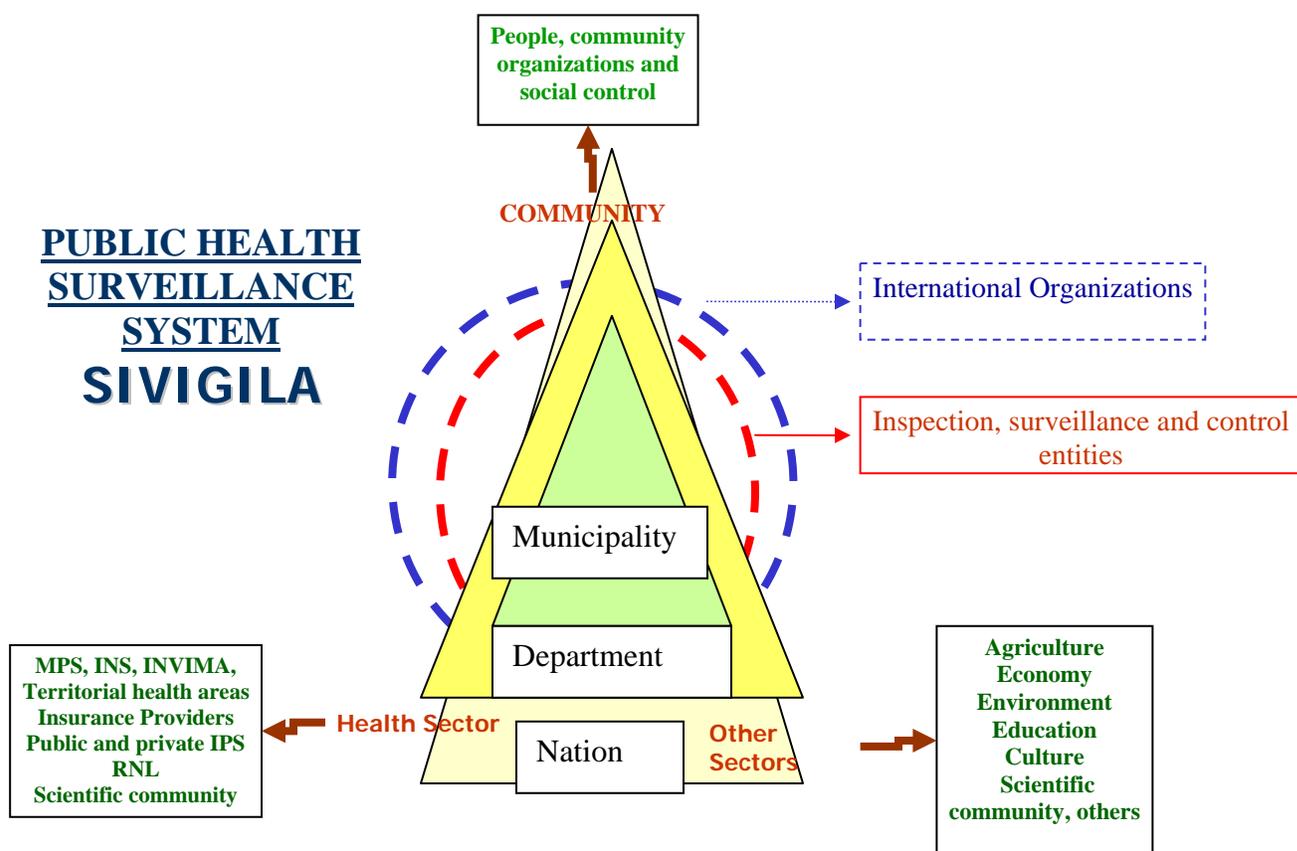
In 1999 the Ministry of Health published and disseminated the *Protocols of Surveillance in Public Health*, as a tool to support the performance of public health surveillance functions at the department level. Support is targeted to operational work, mainly at the municipal level, where existing health workers carry out surveillance activities, without necessarily having specialized knowledge. In 2006, the Ministry of Social Protection passed Decree 3518, the objective being to create and regulate the Public Health Surveillance System (SIVIGILA) to provide systematic information about events that affect or can affect the health of the population. The changes in the General System of Social Security in Health and the complexity of the disease profile, injuries, and deaths in the country make it necessary to define the conditions to develop the National Surveillance System in Public Health. In addition SIVIGILA will orient policy and planning in public health, assist in decision-making for prevention and control of

¹⁵⁴ Ministerio de la Protección Social. *Diario Oficial Decreto Numero 3518. Sistema de Vigilancia en Salud Pública*. Colombia, Bogotá, 10 de octubre 2006.

¹⁵⁵ Ministerio de la Protección Social, and Organización Panamericana de la Salud (OPS/OMS). *Sistema Nacional de Vigilancia en Salud Pública: Aspectos Generales*. Colombia, Bogotá: Ministerio de la Protección Social y Organización Panamericana de la salud, Diciembre de 2005.

diseases and risk factors in health. Lastly, it will optimize monitoring and evaluation of interventions, help to efficiently use the resources available and protect individual and collective health.

SIVIGILA is made up of a group of standards, procedures and resources (financial, technical and human) organized for the collection, analysis, interpretation, updating, dissemination, and systematic and timely evaluation of the information on health events for action. It has an organizational structure consisting of two main divisions: (1) Defining events that require surveillance and utilizing models for surveillance and (2) supporting processes for the national network of laboratories, management and information systems. To strengthen SIVIGILA, efforts have been made to improve information subsystems and knowledge management, including dissemination of information through a webpage and bulletins.



**This figure is from a presentation by the Colombian Ministry of Social Protection
 MPS-Ministry of Social Protection
 INS-National Institute of Health
 INVIMA- National Surveillance Institute of Medicines and Foods
 IPS- Service Providing Institutions
 RNL-National Laboratory Network

3. Institutional and Organizational Capacity in Public Health

- **Public Health Institutional Capacity: the Creation of Canada's Public Health Agency**

In the aftermath of the severe acute respiratory syndrome (SARS) epidemic in 2003, the report *Learning from SARS: renewal of public health in Canada* was released and subsequently, in September 2004, the Public Health Agency of Canada (PHAC) was created by the federal government. Up until this date, public health had been a part of Health Canada's Population and Public Health Branch.^{156,157} This action marked the beginning of a new approach to federal leadership and collaboration with provinces and territories on public health and responds to a consensus from the provinces, public health experts and civil society on the need for federal leadership on public health to be consolidated in a public agency.¹⁵⁸

Events leading to the creation of the PHAC

Public health reform initiatives in the past have failed largely due to the difficulty of obtaining cooperation among local, provincial/territorial and federal governments.¹⁵⁹ There have been unclear constitutional roles and public health responsibilities as well as disputes over funding and data sharing.

The previous public health system was highly fragmented with governments working independently. The system could be described as a grouping of multiple systems with varying roles, strengths and linkages and each province and territory had its own public health legislation.¹⁶⁰ Public health services were delivered through regional health authorities or the provincial/territorial government. In addition, there was little information available on the functioning of Canada's public health systems, since there was no accepted list of expected system functions therefore making it difficult to assess performance.

To address these challenges, in 2003, the Ad Hoc Committee on the Future of Public Health in Canada (of the Canadian Institutes of Health Research) came up with the following key elements of a national public health system based on their collective experience and on the results of a previous Canadian key informant survey of public health capacity.¹⁶¹

¹⁵⁶ Ballinger, "Refining Estimates of Public Health Spending as Measured in National Health Expenditure Accounts: The Canadian Experience."

¹⁵⁷ Canadian Institutes of Health Research, "The Future of Public Health in Canada: Developing a Public Health Systems for the 21st Century," <http://www.cihr-irsc.gc.ca>.

¹⁵⁸ Ibid.

¹⁵⁹ Kumanan Wilson, "A Canadian Agency for Public Health: Could it work?," *Canadian Medical Association Journal* Vol. 170, No. 2, 2004, <http://www.cmaj.ca/cgi/reprint/170/2/222.pdf>.

¹⁶⁰ Canadian Institutes of Health Research, "The Future of Public Health in Canada."

¹⁶¹ Ibid.

- Clearly defined essential functions of public health;
- Defined roles and responsibilities at each level of the system (national, provincial/territorial, regional/local);
- Consistent, modern legislation within each jurisdiction across the country to support those functions, roles and responsibilities;
- Appropriate delivery structures to accomplish functions, roles, and responsibilities within each jurisdiction;
- Appropriate funding levels and mechanisms that ensure equitable availability of public health services to all Canadians;
- Appropriate numbers of well-trained staff;
- Appropriate information systems to support assessment and surveillance;
- Access to expertise and support to develop a prospective vision, carry out these responsibilities expertly and efficiently, and support innovation and evaluation;
- Accountability mechanisms at each level of the system.

Some immediate steps taken were to:

- Define the Public Health System;
- Reach consensus on essential functions of the public health system;
- Implement system performance assessment;
- Establish standards for minimum public health programs and services;
- Strengthen public health legislation;
- Strengthen Public Health System Structures;
- Establish a national public health leadership position;
- Develop a strong, national network for public health expertise;
- Improve funding levels and mechanisms;
- Strengthen Supporting Elements for Effective Service Delivery:
- Develop and support the public health workforce;
- Develop and disseminate a comprehensive review of the scientific evidence base for public health;
- Collaboration;
- Target common health goals;
- Encourage broad partnerships.

Structure and Main Role of the PHAC

As part of the process of reforming the public health system in Canada, the PHAC was created. The National Advisory Committee on SARS and Public Health determined that “the agency would be at arm’s length from government, although answerable to the MOH.”¹⁶² It is federally financed and project funds are distributed through local and provincial/territorial partnerships. The committee viewed this strategy as less contentious than a single large transfer of money and as a key to enhancing collaboration.

PHAC is led by the Chief Public Health Officer, who reports directly to the Minister of Health. The Agency acts as a hub for health surveillance, threat identification and disease prevention and control programs. Main activities focus on:¹⁶³

- Preventing chronic diseases, including cancer and heart disease;
- Preventing injuries;
- Responding to public health emergencies and infectious disease outbreaks.

PHAC will serve as the vehicle to share Canada’s experiences at the global level and also to apply research and development to Canadian public health programs and policies. In addition, the agency will play a leadership role with global partners, such as WHO, CDC and the new European Centre for Disease Prevention and Control.

Under PHAC, public health strategies are now supported by a new level of coordination and collaboration that includes government, academia, researchers and NGOs. The Pan Canadian Public Health Network (discussed below) and the six National Collaborating Centres for Public Health are important actors with the PHAC.

Pan-Canadian Public Health Network

The Pan-Canadian Public Health Network, created in 2005, serves as a forum for multilateral intergovernmental collaboration on public health issues; the Network’s mandate comes from the conference of federal/provincial/territorial deputy ministers of health.¹⁶⁴ The collaborative action of the Network with the PHAC and other public health actors serves to share public health knowledge and expertise and provide opportunities for learning from best practices in the country.

¹⁶² Wilson, “A Canadian Agency for Public Health: Could it work?.”

¹⁶³ Public Health Agency of Canada Web site, www.phac-aspc.gc.ca.

¹⁶⁴ The Pan-Canadian Public Health Network Web site, http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/2005/2005_26bk1_e.html.

Leadership for the Network is provided by a Council consisting of representatives of each province and territory and the federal government. The vast majority of the work of the Network will be executed through an initial series of six Expert Groups on the following issues:¹⁶⁵

1. Communicable Disease Control
2. Emergency Preparedness and Response
3. Canadian Public Health Laboratories
4. Surveillance and Information
5. Non-Communicable Disease and Injury Prevention and Control
6. Health Promotion

The need for multilateral federal, provincial and territorial collaboration in public health exists because of the interdependence inherent in the provision of public health services. One of the Network's main goals is to improve the ability of governments to coordinate and collaborate in public health, including preparing for and responding to future public health challenges, opportunities and threats.¹⁶⁶

The Future of the PHAC and the Pan-Canadian Public Health Network

If the collaborative approach of the PHAC and the Network with governments and other public health actors is not successful, the federal government will have to adopt a more hierarchical approach to public health reform.¹⁶⁷ The PHAC in theory has the autonomy to choose which projects they will fund in the regions and provinces/territories. For example, if a particular program does not meet PHAC national standards, the agency may deny funding.¹⁶⁸

Creation of the agency and the Network as well as strengthening the public health system are necessary first steps towards change; however, they are insufficient without defined accountabilities, operationalized relationships and supporting legislation.¹⁶⁹ In addition, persistent political will and leadership are required to ensure PHAC and Network effectiveness and preparedness before another public health crisis like SARS hits.¹⁷⁰

¹⁶⁵ Ibid.

¹⁶⁶ Ibid.

¹⁶⁷ Wilson, "A Canadian Agency for Public Health: Could it work?."

¹⁶⁸ Ibid.

¹⁶⁹ Jeffrey C. Lozon and L. Miin Alikhan, "Canada's Public Health System: Is the Pace of Progress Sufficient?," *HealthcarePapers* 7, No. 3, 2007.

¹⁷⁰ Ibid.

- **Organizational Capacity of the Brazilian National Health Surveillance Agency (ANVISA)**

The Brazilian National Health Surveillance Agency (ANVISA) was created in 1999 through Law No. 9,782 as a regulatory agency linked to the Ministry of Health. It is a public organization with financial, technical, and administrative autonomy, although it ultimately functions with state oversight.¹⁷¹ ANVISA's purpose is to protect the health of the population through the control of the production and trade of products and services that are subject to public health surveillance. Its duties include, among many others, product registration (including cosmetics, foodstuffs, medicines and other related products), import and export authorization, certification of companies and products, , carrying out specific studies, supervision of pharmaceutical manufacturing and post-marketing surveillance, as well as maintaining control of ports, airports and borders.¹⁷²

The creation of ANVISA was made possible through important institutional changes that occurred in Brazil during the 1990s. On the macro sphere, the intensification of international trade and the adoption of international agreements required governments to adapt their health surveillance structures. At the same time, in the micro sphere, problems related to inefficient public health surveillance combined with allegations of corruption and nepotism in the existing surveillance agency led to a call both by civil society and actors within the government and private sector (especially industries interested in expanding their reach in the international market) for the creation of an independent health surveillance body. Therefore, the creation of a National Health Surveillance Agency became a government priority in 1998.¹⁷³

From its inception, ANVISA had to adapt to the existing arrangement of health surveillance in Brazil and the division of responsibilities established by Law No. 8.080/90, which state that the municipal level is responsible for the implementation of health actions, including those related to public health surveillance. The federal and state levels also execute health surveillance actions, but always in a complimentary manner. This arrangement follows the general logic of decentralization of the Unified Health System (SUS), which grants the municipality the responsibility for executing health actions. Therefore, ANVISA is not an entity with autonomous capacity for action; its actions are interdependent with those that the states and municipalities carry out through their own public health surveillance agencies.¹⁷⁴

The graph below shows the structure of the national health surveillance system in Brazil.

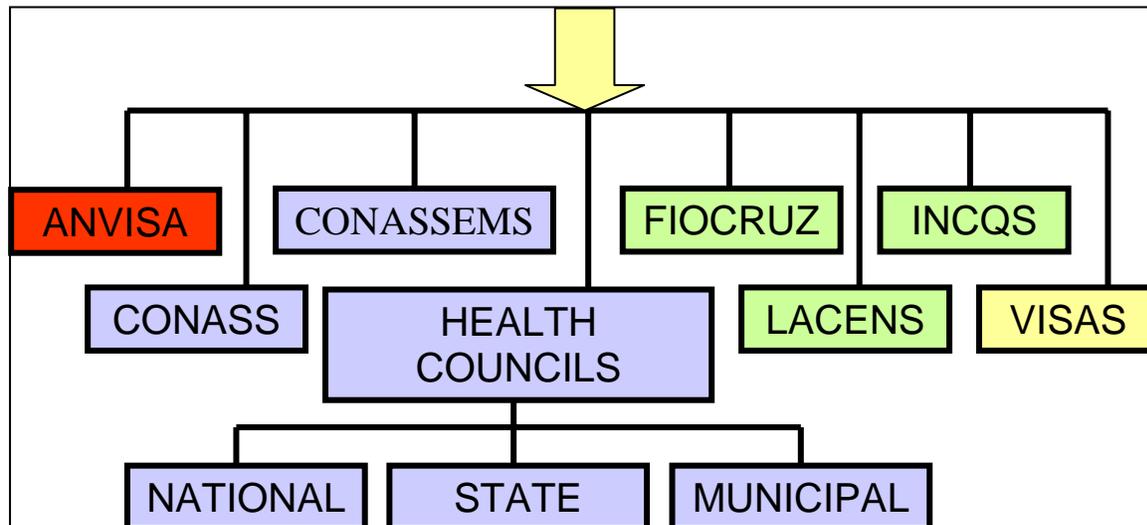
¹⁷¹ Márcia Franke Piovesan and Maria Eliana Labra, "Institutional Change and Political Decision-Making in the Creation of the Brazilian National Health Surveillance Agency," *Cadernos de Saúde Pública* 23, No. 6 (Jun 2007).

¹⁷² Geraldo Lucchese, "Globalização e Regulação Sanitária" (PhD Dissertation, ENSP/FIOCRUZ, 2001).

¹⁷³ Piovesan and Labra, "Institutional Change and Political Decision-Making in the Creation of the Brazilian National Health Surveillance Agency,"

¹⁷⁴ Lucchese, "Globalização e Regulação Sanitária."

NATIONAL HEALTH SURVEILLANCE SYSTEM¹⁷⁵



ANVISA: National Health Surveillance Agency, CONASS: National Council of State Health Secretaries, CONASSEMS: National Council of Municipal Health Secretaries, VISAS: Federal, State and Municipal Health Surveillance Centers, LACENS: Public Health Central Laboratories, INCQS: National Institute for Quality Control in Health, FIOCRUZ: Oswaldo Cruz Foundation

In this context, ANVISA functions as the central agency for public health surveillance in Brazil with the support of a national reference laboratory, the National Institute for Quality Control in Health (INCQS), which is administratively linked to the Oswaldo Cruz Foundation (FIOCRUZ). The INCQS provides laboratorial services to public health surveillance actions implemented in the entire country and functions as the national coordinator of a network of state laboratories. There are 27 health surveillance agencies at the State Health Secretariat level, which regulate and coordinate the state health surveillance systems and carry out the main monitoring and control actions established by the national system.¹⁷⁶

At the municipal level, public health surveillance capacity varies in terms of infrastructure, resources and preparedness. The level of complexity of surveillance actions carried out at the municipal level depends on the size and capacity of the municipality and the type of responsibilities defined according to the decentralized management of the SUS. Municipalities can supplement the federal and state laws related to the application and execution of public health surveillance actions and services, according to the local needs. Since municipal governments by nature are closely linked to the populations they serve, they are more familiar with the health problems at the local level and therefore are better equipped to respond to public health challenges. In Brazil, the logic of decentralization is thus to bring surveillance closer to the population.¹⁷⁷

¹⁷⁵ Marcio Luiz Varani, *Riscos da Tecnologia Médica, o papel da Vigilância Sanitária* (PowerPoint Presentation, May 2006).

¹⁷⁶ Ibid.

¹⁷⁷ ANVISA, *Cartilha de Vigilância Sanitária*, 2nd ed. (Brasília, D.F., Brazil: ANVISA, 2002)

4. Public Health Financial Resources

- **Harmonization of Essential Public Health Functions (EPHF) with the Functional Classification of the Government Finance Statistics Manual (GSFM-2001) in Bolivia¹⁷⁸**

The Government Finance Statistics Manual (GSFM)-2001 is part of a series of statistical guidelines published by the International Monetary Fund (IMF). It is an internationally accepted system for presenting data on the financial activities of governments. The GSFM-2001 classifies health expenditures in 6 categories: 1) Medical products, appliances, and equipment; 2) Outpatient services; 3) Hospital Services; 4) Public health services; 5) Health-related research and development; and 6) health not elsewhere classified. Services provided to individuals are classified under the first four categories and collective services fall under the last two categories. Below a table with the functional classification of expenditures in health according to the GSFM-2001 are presented.

Functional Classification of Health Expenditures, GSFM-2001

Division	Group	Class	Description
707			Health
	7071		Medical Products, appliances, and equipment
	7072		Outpatient services
	7073		Hospital Services
	7074		Public health services
		707401	<i>Provision of public health services</i>
		707402	<i>Administration, inspection, operation, or support of public health services</i>
		707403	<i>Preparation and dissemination of information on public health matters</i>
	7075		Health-related research and development
		707501	<i>Health-related research and development</i>
		707502	<i>Public health-related research and development</i>
	7076		Health not elsewhere classified
		707601	<i>Administration, operation, or support of activities</i>
		707602	<i>Health affairs and services that cannot be assigned elsewhere</i>

Source: PAHO/WHO Health Policies and Systems Unit (HSS/HP), Harmonization of Essential Public Health Functions (EPHF) with the Functional Classification of Expenditure (FCM)

In order to obtain more detailed information on the amount of resources being spent on the Essential Public Health Functions (EPHF), PAHO/WHO Health Policies and Systems Unit elaborated a methodology for harmonizing the

¹⁷⁸ The information presented in this section was based on: PAHO/WHO Health Policies and Systems Unit (HSS/HP). *Bolivia: Harmonization of Essential Public Health Functions (EPHF) with the Functional Classification of the Government Finance Statistics Manual (GSFM-2001)* (Washington, D.C.: PAHO/WHO, forthcoming).

EPHF with the functional classification presented in the table above.¹⁷⁹ The methodology was applied in Bolivia and it aimed to: (i) estimate expenditure on EPHF in that country; (ii) identify in which functions the resources are being spent; and (iii) determine how much it would cost to fully implement the EPHF.

The process of harmonizing the GSFM with the EPHF included grouping specific programs or project into different categories of the GSFM. For example, projects related to the Chagas control, epidemiological surveillance, malaria control and sexual and reproductive health were grouped under “provision of public health services” or classification 707401 of the Manual. Programs and projects related to human resources training, information, education and support for community health workers were grouped under “preparation and dissemination of information on public health matters,” or classification 707403 of the Manual.

The results show that spending on EPHF in Bolivia in the year 2002 was US\$63 million, corresponding to 2.5% of the share of total public spending. Most of the expenditures were concentrated on EPHF 9 (quality assurance in personal and population-based health services), EPHF 7 (evaluation and promotion of equitable access to necessary health services) and EPHF 5 (development of policies and institutional capacity for planning and management in public health). Most of the financing for these EPHF came from domestic sources, especially from the Ministry of Health (MOH).

¹⁷⁹ PAHO/WHO Health Policies and Systems Unit (HSS/HP), Harmonization of Essential Public Health Functions (EPHF) with the Functional Classification of Expenditure (FCM). Working Document (Washington, D.C.: PAHO/WHO, 2004).

VIII. Annex II - IHR Core Capacities

A. CORE CAPACITY REQUIREMENTS FOR SURVEILLANCE AND RESPONSE

1. States Parties shall utilize existing national structures and resources to meet their core capacity requirements under these Regulations, including with regard to:

- (a) their surveillance, reporting, notification, verification, response and collaboration activities; and
- (b) their activities concerning designated airports, ports and ground crossings.

2. Each State Party shall assess, within two years following the entry into force of these Regulations for that State Party, the ability of existing national structures and resources to meet the minimum requirements described in this Annex. As a result of such assessment, States Parties shall develop and implement plans of action to ensure that these core capacities are present and functioning throughout their territories as set out in paragraph 1 of Article 5 and paragraph 1 of Article 13.

3. States Parties and WHO shall support assessments, planning and implementation processes under this Annex.

4. At the local community level and/or primary public health response level

The capacities:

- (a) to detect events involving disease or death above expected levels for the particular time and place in all areas within the territory of the State Party; and
- (b) to report all available essential information immediately to the appropriate level of healthcare response. At the community level, reporting shall be to local community health-care institutions or the appropriate health personnel. At the primary public health response level, reporting shall be to the intermediate or national response level, depending on organizational structures. For the purposes of this Annex, essential information includes the following: clinical descriptions, laboratory results, sources and type of risk, numbers of human cases and deaths, conditions affecting the spread of the disease and the health measures employed; and
- (c) to implement preliminary control measures immediately.

5. At the intermediate public health response levels

The capacities:

- (a) to confirm the status of reported events and to support or implement additional control measures; and

(b) to assess reported events immediately and, if found urgent, to report all essential information to the national level. For the purposes of this Annex, the criteria for urgent events include serious public health impact and/or unusual or unexpected nature with high potential for spread.

6. At the national level

Assessment and notification. The capacities:

- (a) to assess all reports of urgent events within 48 hours; and
- (b) to notify WHO immediately through the National IHR Focal Point when the assessment indicates the event is notifiable pursuant to paragraph 1 of Article 6 and Annex 2 and to inform WHO as required pursuant to Article 7 and paragraph 2 of Article 9.

Public health response. The capacities:

- (a) to determine rapidly the control measures required to prevent domestic and international spread;
- (b) to provide support through specialized staff, laboratory analysis of samples (domestically or through collaborating centres) and logistical assistance (e.g. equipment, supplies and transport);
- (c) to provide on-site assistance as required to supplement local investigations;
- (d) to provide a direct operational link with senior health and other officials to approve rapidly and implement containment and control measures;
- (e) to provide direct liaison with other relevant government ministries;
- (f) to provide, by the most efficient means of communication available, links with hospitals, clinics, airports, ports, ground crossings, laboratories and other key operational areas for the dissemination of information and recommendations received from WHO regarding events in the State Party's own territory and in the territories of other States Parties;
- (g) to establish, operate and maintain a national public health emergency response plan, including the creation of multidisciplinary/multisectoral teams to respond to events that may constitute a public health emergency of international concern; and
- (h) to provide the foregoing on a 24-hour basis.

B. CORE CAPACITY REQUIREMENTS FOR DESIGNATED AIRPORTS, PORTS AND GROUND CROSSINGS

1. At all times

The capacities:

- (a) to provide access to (i) an appropriate medical service including diagnostic facilities located so as to allow the prompt assessment and care of ill travelers, and (ii) adequate staff, equipment and premises;

- (b) to provide access to equipment and personnel for the transport of ill travelers to an appropriate medical facility;
- (c) to provide trained personnel for the inspection of conveyances;
- (d) to ensure a safe environment for travelers using point of entry facilities, including potable water supplies, eating establishments, flight catering facilities, public washrooms, appropriate solid and liquid waste disposal services and other potential risk areas, by conducting inspection programmes, as appropriate; and
- (e) to provide as far as practicable a programme and trained personnel for the control of vectors and reservoirs in and near points of entry.

2. For responding to events that may constitute a public health emergency of international concern

The capacities:

- (a) to provide appropriate public health emergency response by establishing and maintaining a public health emergency contingency plan, including the nomination of a coordinator and contact points for relevant point of entry, public health and other agencies and services;
- (b) to provide assessment of and care for affected travelers or animals by establishing arrangements with local medical and veterinary facilities for their isolation, treatment and other support services that may be required;
- (c) to provide appropriate space, separate from other travelers, to interview suspect or affected persons;
- (d) to provide for the assessment and, if required, quarantine of suspect travelers, preferably in facilities away from the point of entry;
- (e) to apply recommended measures to disinfect, decontaminate or otherwise treat baggage, cargo, containers, conveyances, goods or postal parcels including, when appropriate, at locations specially designated and equipped for this purpose;
- (f) to apply entry or exit controls for arriving and departing travelers; and
- (g) to provide access to specially designated equipment, and to trained personnel with appropriate personal protection, for the transfer of travelers who may carry infection or contamination.

IX. Bibliography

AbouZahr, Carla, and Ties Boerma. "Health information systems: the foundations of public health." *Bulletin of the World Health Organization* 83, 8 (2005):578-583.

ANVISA. Cartilha de Vigilância Sanitária, 2nd ed. Brasília, D.F., Brazil: ANVISA, 2002.

Arriagada, Irma, Verónica Aranda, and Francisca Miranda. *Políticas y programas de salud en América Latina: Problemas y Propuestas*. División de Desarrollo Social. Santiago: CEPAL, 2005.

Association of Public Health Laboratories (APHL). *Defending the Public's Health*. Brochure, 2005, http://www.aphl.org/about_aphl/Documents/defending_phl.pdf.

Badgley, Robin F.. "Public Health: Trends and Challenges." In *The Crisis of Public Health: Reflections for the Debate*, edited by PAHO/WHO, 53-67. Washington, D.C., 1992.

Badía, Roberto, Freddy Cárdenas, and Miguel Angel González Block. *Nicaragua modernización de los hospitales del MINSA: propuesta de préstamo*. Managua: MINSA, 1998.

Baker, E. L., J.S. Blumenstock, J. Jensen, R. D. Morris, and A. D. Moulton. "Building the legal foundation for an effective public health system." *Journal of Law, Medicine & Ethics* 30, 3 (2002): 48-51.

Baker Jr., Edward L., Margaret A. Potter, Deborah L. Jones, Shawna L. Mercer, Joan P. Cioffi, Lawrence W. Green, Paul K. Halverson, Maureen Y. Lichtveld, and David W. Fleming. "The public health infrastructure and our nation's health." *Annual Review of Public Health* 26 (2005):303-318.

Baker E, Kaplan J. "Strengthening the Nation's Public Health Infrastructure: Historic Challenge, Unprecedented Opportunity." *Health Affairs* 21, No. 6 (2002).

Ballinger, Geoff. "Refining Estimates of Public Health Spending as Measured in National Health Expenditures Accounts: The Canadian Experience." *Journal of Public Health Management and Practice* 13(2), 2007.

Bambas, Lexi, Paula Braveman, J. Norberto W. Dachs, Iris Delgado, Emmanuela Gakidou, Kath Moser, Liz Rolfe, Jeanette Vega, & Christina Zarowsky. "Strengthening health information systems to address health equity challenges." *Bulletin of the World Health Organization* 83 (2005):597-603.

Beaglehole, Robert and Mario R. Dal Poz. "Public health workforce: challenges and policy issues." *Human Resources for Health* 1 (2003), <http://www.human-resources-health.com/content/1/1/4>.

Beaulieu, Joyce, F. Douglas Scutchfield, and Ann V. Kelly. "Content and Criterion Validity Evaluation of National Public Health Performance Standards Measurement Instruments." *Public Health Reports* 118, No. 6 (Nov-Dec 2003), http://www.publichealthreports.org/userfiles/118_6/118508.pdf.

Benjamin, Georges C. "Public health infrastructure: creating a solid foundation." *Physician Executive* 27, No. 2 (2001): 86-87.

Berkowitz, Bobbie and Ray M. Nicola. "Public health infrastructure system change: outcomes from the turning point initiative." *Journal of Public Health Management & Practice* 9, No 3 (2003): 224-227.

Bettcher, Douglas W., Steve Sapirie, and Eric H. T. Goon. "Essential Public Health Functions: Results of the International Delphi Study." *World Health Statistics Quarterly* 51, No. 1 (1998).

Bitran, Daniel. *Impacto económico de los desastres naturales en la infraestructura de salud*. Washington, D.C.; Organización Panamericana de la Salud, 1996.

Campos, Francisco E. and Volker Hauck. "Networking collaboratively: The Brazilian Observatório on Human Resources in Health." *EDCPM Discussion Paper* 57L, Maastricht, The Netherlands: European Centre for Development Policy Management, 2005.

Canadian Public Health Association and Provincial and Territorial Public Health Associations. *A Path Toward Building Public Health Capacity*. Manitoba, Canada: Canadian Public Health Association, 2005.

Caribbean Commission on Health and Development. *Report of the Caribbean Commission on Health and Development*. July 2005.

Centers for Disease Control and Prevention (CDC). *Public Health's Infrastructure: A Status Report*. Atlanta, GA: CDC, 2001.

CDC. *Rebuilding public health infrastructure: Governmental Public Health Implementation Team – Final Report and Recommendations*. Washington, DC: CDC, 2004: 71.

Clark, M.. "Health Sector Reform in Costa Rica: Reinforcing a Public System." *Paper prepared for the Woodrow Wilson Center Workshops on Education and Health Reforms*, Washington, D.C., 2002.

De Savigny, Don, Harun Kasale, Conrad Mbuya, and Graham Reid. *Fixing Health Systems: Lessons Learned*. Ottawa, Canada: International Development Research Centre (IDRC), 2005, http://www.idrc.ca/es/ev-64764-201-1-DO_TOPIC.html.

Dussault, Gilles and Carl-Ardy Dubois. "Human Resources for Health Policies: A Critical Component in Health Policies." *HNP Discussion Paper*. Washington, D.C.: The World Bank, 2004.

Economic Commission for Latin America and the Caribbean (ECLAC). *The Millennium Development Goals: a Latin America and Caribbean perspective*. Santiago, Chile: ECLAC, 2005.

Etienne, Carissa. "Balance y Perspectivas de las FESP en América Latina." Presentation given in the PAHO/WHO workshop *Balances y Perspectivas: Funciones Esenciales de la Salud Pública en las Américas*, Lima, Peru, May 29-31, 2007.

Fay, Marianne and Mary Morrison. *Infrastructure in Latin America & the Caribbean: recent developments and key challenges*. Washington, DC: World Bank, IDB, 2005.

Ferreira, José Roberto. "The Crisis." In *The Crisis of Public Health: Reflections for the Debate*, edited by PAHO/WHO, 209-212. Washington, D.C., 1992.

Fraser, Barbara. "Human resources for health in the Americas." Comment/editorial. *The Lancet*, vol. 369 (2007).

Frenk, Julio. "The New Public Health." In *The Crisis of Public Health: Reflections for the Debate*, edited by PAHO/WHO, 68-87. Washington, D.C., 1992.

García-Roco Pérez, Oscar, Nancy Castañeda González, Zoila Pérez González, and Hilda Labrada Iribarren. "La Salud Pública en América Latina y el Caribe." *Revista Humanidades Médicas* Vol. 2, No. 5 (May-Aug. 2002).

Gobierno de Chile. *Que es Plan AUGE?*. http://www.gobiernodechile.cl/plan_auge/que_es_auge.asp.

Gordillo-Tobar, Amparo. "Medición del Gasto en Salud Pública." Presentation given in the PAHO/WHO workshop *Balances y Perspectivas: Funciones Esenciales de la Salud Pública en las Américas*, Lima, Peru, May 29-31, 2007.

Gordillo-Tobar, Amparo and Pasqualina Curcio. *Harmonization of Essential Public Health Functions (EPHF) with the Functional Classification of Expenditure (FCE)*. Working Document. Washington, D.C. : PAHO/WHO, 2004.

Griffiths, Siân, and Jenny Wright, eds. *Public Health Capacity: The Challenges for Public Health*. United Kingdom: Royal Colleges of Physicians, May 2004.

Grupo Intersectorial para el Desarrollo de los Recursos Humanos en Salud (GIDRHUS). *Observatorio de los recursos humanos en la reforma del sector salud*. San Salvador: GIDRHUS, 2003.

Guerra de Macedo, Carlyle. *La extensión de la protección social en salud en el nuevo Estado latinoamericano*. Centro Latinoamericano de Administración para el Desarrollo (CLAD), 2001, <http://www.clad.org.ve/anales5/macedo.html>.

Guerra de Macedo, Carlyle. "The Context." In *The Crisis of Public Health: Reflections for the Debate*, edited by PAHO/WHO, 213-219. Washington, D.C., 1992.

Handler, Arden, Michele Issel and Bernard Turnock. "A Conceptual Framework to Measure Performance of the Public Health System." *American Journal of Public Health* 91, No. 8 (2001), <http://www.ajph.org/cgi/reprint/91/8/1235>.

Health Metrics Network (HMN). *Issues in Health Information: National and Subnational Health Information Systems*. Geneva: HMN, 2005, www.who.int/entity/healthmetrics/library/issue_1_05apr.doc

HMN. *Towards a Framework and Standards for Country Health Information System Development*. Geneva: HMN, 2005.

Healthy People 2010 Project. "23. Public health infrastructure." In *Healthy People 2010: Volume II*. Atlanta, GA: CDC, 2001.

Henderson, Donald A.. "Health in the Year 2000 and Beyond." In *The Crisis of Public Health: Reflections for the Debate*, edited by PAHO/WHO, 86-91. Washington, D.C., 1992.

Homedes, Núria and Antonio Ugalde. "Human resources: the Cinderella of health sector reform in Latin America." *Human Resources for Health* 3 (2005).

Honoré, Peggy A., and Brian W. Amy. "Public Health Finance: Fundamental Theories, Concepts, and Definitions." *Journal of Public Health Management & Practice* 13, Issue 2 (March/April 2007), <http://www.jphmp.com>.

Hsiao, William C. *What is a Health System? Why Should We Care?*. Boston, MA: Harvard School of Public Health, August 2003, [http://www.hsph.harvard.edu/phcf/Papers/What%20Is%20A%20Health%20System-Final%20\(general%20format\)%208.5.03.pdf](http://www.hsph.harvard.edu/phcf/Papers/What%20Is%20A%20Health%20System-Final%20(general%20format)%208.5.03.pdf).

Hurtado, Margarita. *Understanding and Measuring the Performance of Health Care Services Delivery*. Washington, D.C.: PAHO/WHO, September 2006.

Institute of Medicine (IOM). *The Future of Public Health*. Washington, D.C.: National Academy Press, 1998.

International Labour Organization (ILO), and PAHO/WHO. *ILO-PAHO Joint Initiative on the Extension of Social Protection in Health*. Washington, D.C.: PAHO/WHO, 2005.

Institute of Medicine (IOM). *The Future of the Public's Health in the 21st Century*. Washington, DC: National Academy Press, 2002.

Joint PAHO/CARICOM Task Force for Training in Environmental Health. *Human Resource Development for Environmental Health Professionals of CARICOM Countries: Three-Step Training Program*. Bridgetown, Barbados: PAHO/CARICOM, January 2003).

Jong-Wook, Lee. "Global health improvement and WHO: shaping the future." *The Lancet* 362 (2003): 2083-88.

Khaleghian, Peyvand, and Monica Das Gupta. "Public Management and Essential Public Health Functions." *World Bank Policy Research Working Paper 3220*. Washington, D.C.: The World Bank, 2004.

Koplan, Jeffrey P. "Building infrastructure to protect the public's health." *Lecture, Conference: Building Infrastructure to Protect the Public's Health*, Atlanta, GA, Sept 21, 2001.

León, Aracely de, Sandra Sesam, Lillian Irving, and Carlos Avila. *Análisis de la disponibilidad de recursos humanos, de los currícula y la infraestructura física de la Facultad de Ciencias Químicas y Farmacia referente a la formación de personal, en ciencia y tecnología farmacéutica*. Guatemala, OPS/OMS, 1990.

Leppo, K. *Strengthening capacities for policy development and strategic management in national health systems*. Geneva: WHO, 2001.

Lozon, Jeffrey C. and L. Miin Alikhan. "Canada's Public Health System: Is the Pace of Progress Sufficient?." *HealthcarePapers* 7, No. 3 (2007): 52-59.

Lucchese, Geraldo. "Globalização e Regulação Sanitária." PhD Dissertation, ENSP/FIOCRUZ, 2001.

Lurie, N. "The public health infrastructure: rebuild or redesign?" *Health Affairs*, Vol. 21, No. 6 (Nov-Dec 2002): 28-30.

Mays, Glen, Paul K. Halverson, and F. Douglas Scutchfield. "Making Public Health Improvements Real: The Vital Role of Systems Research." *Journal of Public Health Management & Practice* 10, No. 3 (May/June 2004):183-185.

MEASURE Evaluation and USAID. *Using PRISM to strengthen and evaluate health information systems*. Brochure, <https://www.cpc.unc.edu/measure/publications/pdf/fs-07-18.pdf>.

Milstien, Julie B., Amie Batson and Albert I. Wertheimer. "Vaccines and Drugs: Characteristics of Their Use to Meet Public Health Goals." *HNP Discussion Paper*. Washington, D.C.: The World Bank, 2005.

Ministério da Saúde. *Projeto VIGISUS II – Subcomponente IV: Fortalecimento Institucional da Capacidade de Gestão em Vigilância em Saúde nos Estados e Municípios*. Brasília, D.F., Brasil: Ministério da Saúde, <http://portal.saude.gov.br/portal/arquivos/pdf/vigisusII.pdf>.

Ministerio de la Protección Social. *Diario Oficial Decreto Numero 3518. Sistema de Vigilancia en Salud Pública*. Colombia, Bogota, 10 de octubre 2006.

Ministerio de la Protección Social, and Organización Panamericana de la Salud (OPS/OMS). *Sistema Nacional de Vigilancia en Salud Pública: Aspectos Generales*. Colombia, Bogotá: Ministerio de la Protección Social y Organización Panamericana de la salud, Diciembre de 2005.

Ministerio de Salud de Panama. *La red pública de servicios de salud, reorganización y definición por niveles de atención y grados de complejidad*. Ministerio de Salud de Panama, Departamento de Desarrollo de Modelos de Gestión, Sept. 2003.

Ministerio de Salud and Instituto de Desarrollo de Recursos Humanos (IDREH). *El Perú Respondiendo a los Desafíos de la Década de Recursos Humanos en Salud*. Serie de Recursos Humanos en Salud No. 5. Peru: Ministerio de Salud, 2006.

Ministry of Health of Costa Rica. *Health Sector Analysis of Costa Rica*. San Jose, Costa Rica: Ministry of Health, 2002, http://www.lachealthsys.org/index.php?option=com_content&task=view&id=118&Itemid=142.

Moodie, Rob, Elizabeth Pisani, and Monica de Castellarnau. "Infraestructura para la promoción de la salud: el arte de lo posible." *Paper presented at the Quinta Conferencia Mundial de Promoción de la Salud*, Mexico, D.F., Mexico, 5-9 June, 2000.

Muñoz, Fernando, Daniel López-Acuña, Carlyle Guerra de Macedo, Wade Hanna, Mónica Larrieu, Soledad Ubilla, and José Luis Zeballos. "Las funciones esenciales de la salud pública: un tema emergente en las reforma del sector de la salud." *Pan American Journal of Public Health* 8 (1/2) (2000).

Murray, Christopher J. L.. "Towards Good Practice for Health Statistics: Lessons from the Millennium Development Goals Health Indicators." *The Lancet* 369, No. 9564 (March 2007).

National Public Health Performance Standards Program (NPHPSP). *NPHPSP Fact Sheet*, <http://www.cdc.gov/od/ocphp/nphpsp/nphpspfactsheet.htm>.

Organización Panamericana de la Salud/Organización Mundial de la Salud (OPS/OMS). *e-Salud en Latinoamérica y el Caribe: Tendencias y Temas Emergentes*. Edited by Roberto J. Rodrigues, Nora C. Oliveri, José Luis Monteagudo, Antonio Hernández, and Tomás Sandor. Washington, D.C. OPS/OMS: 2003.

OPS/OMS. *Estudio Delphi: Problemas presentes y futuros de los Recursos Humanos en Salud* (Washington, D.C.: OPS/OMS, 2002).

OPS/OMS. *Lineamientos Metodológicos - Análisis Sectorial en Salud: Una Herramienta para la Formulación de Políticas*. Special Edition 9, 3rd Version. Washington, DC: OPS/OMS, 2004, http://www.lachealthsys.org/index.php?option=com_content&task=view&id=150&Itemid=169.

OPS/OMS. *La Función Rectora de la Autoridad Sanitaria Nacional: Desempeño y Fortalecimiento*. Washington, DC: OPS/OMS, forthcoming.

OPS/OMS. *Programa Salud de los Pueblos Indígenas de las Américas: Propuesta, Ejes de Trabajo y Plan de Acción 2005-2015*. Washington, DC: OPS/OMS, 2004.

Paim, Jairnilson S., and Naomar de Almeida Filho. "Saúde coletiva: uma "nova saúde pública" ou campo aberto a novos paradigmas?" *Revista de Saúde Pública* 32, No. 4 (June 1998): 308.

Pan American Health Organization / World Health Organization (PAHO/WHO). *Developing Health Technology Assessment in Latin America and the Caribbean*. Washington, D.C.: PAHO/WHO, 1998, <http://www.paho.org/English/HSP/hsp-OP-115.htm>.

PAHO/WHO. *Exclusion in Health in Latin America and the Caribbean*. Washington, DC: PAHO/WHO, 2004.

PAHO/WHO. *Health System Profile of Brazil*. Washington, D.C.: PAHO/WHO, 2005.

PAHO/WHO. *International Health Regulations (2005): Basic information for national policy-makers and partners*. Brochure, <http://www.paho.org/english/dd/pin/IHR07eng.pdf>.

PAHO/WHO. *National Epidemiological Surveillance Information: Systems and Statistical Information Systems in the Region of the Americas*, <http://www.paho.org/English/DD/AIS/vigilancia-en.htm>.

PAHO/WHO. "Nursing Shortage Threatens Health Care." *Newsletter of the Pan American Health Organization* (2005), http://www.paho.org/English/DD/PIN/ptoday18_sep05.htm.

PAHO/WHO. *Observatory of Human Resources in Health*. Document presented to 134th Session of Executive Committee. Washington, DC: PAHO/WHO, 2004.

PAHO/WHO. *Public Health in the Americas: Conceptual Renewal, Performance Assessment, and Bases for Action*. Washington, DC: PAHO/WHO, 2002.

PAHO/WHO. *Public Health in the Americas, Strategies for Developing the Health Workforce: Based on Current Policies and Technical Evidence*. Washington, D.C.: PAHO/WHO, October 2006.

PAHO/WHO. *Report of the Working Group Meeting on Access to Essential Public Health Supplies and Procurement Mechanism*. Washington, D.C.: PAHO/WHO, 2004.

PAHO/WHO Health Policies and Systems Unit (HSS/HP). *Bolivia: Harmonization of Essential Public Health Functions (EPHF) with the Functional Classification of the Government Finance Statistics Manual (GSFM-2001)*. Washington, D.C.: PAHO/WHO, forthcoming.

PAHO/WHO Health Policies and Systems Unit (HSS/HP). *La rectoría: Componente clave de la reforma del sector salud en Costa Rica*. Washington, DC: PAHO/WHO; forthcoming.

PAHO/WHO Health Policies and Systems Unit (HSS/HP). *La reforma de salud en Chile: Priorización de la rectoría y el rol de la participación ciudadana*. Washington, DC: PAHO/WHO; forthcoming.

Pan-Canadian Public Health Network Web site, http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/2005/2005_26bk1_e.html.

Pinto Beltrán, R. *Evaluación de la infraestructura sanitaria de la Caja Nacional de Salud en La Paz*. Bolivia, La Paz, 1993.

Piovesan, Márcia Franke, and Maria Eliana Labra. "Institutional Change and Political Decision-Making in the Creation of the Brazilian National Health Surveillance Agency." *Cadernos de Saúde Pública* 23, No. 6 (Jun 2007).

Presidential Commission on the Millennium Development Goals (COPDES) and the United Nations Country Team in the Dominican Republic (UNCT). *Investing in the Sustainable Development of the Dominican Republic*. COPDES & UNCT, 2005.

Public Health Agency of Canada (PHAC). *Core Competencies for Public Health in Canada*. Release 1.0. Ottawa: PHAC, 2007.

PHAC Web site, www.phac-aspc.gc.ca.

Rodrigues Roberto J., and Ahmad Risk. "eHealth in Latin America and the Caribbean: Development and Policy Issues." *Journal of Medical Internet Research* 5(1) (2003).

Rosenberg, Mark W., and Sarah A. Lovell. *A Methodology for Projects to Characterize the Public Health Workforce in Costa Rica, Jamaica, and Mexico*. Ontario, Canada: Queen's University Department of Geography, 2006.

Rosenkranz, Adela. *Estudio de factibilidad técnica para establecer laboratorios e implantar el control biológico de medicamentos en países seleccionados del Istmo Centroamericano*. Washington, DC: OPS, 1986.

Sensenig, Arthur L. "Refining Estimates of Public Health Spending as Measured in National Health Expenditures Accounts: The United States Experience." *Journal of Public Health Management and Practice* 12(2), 2007, 104.

Scutchfield, F. Douglas, and K. Patrick. "Public Health Systems Research: The New Kid on the Block." *American Journal of Preventive Medicine* 32, 2 (2007): 173-4.

Terris, Milton. "Current Trends in Public Health in the Americas." In *The Crisis of Public Health: Reflections for the Debate*, edited by PAHO/WHO, 166-183. Washington, D.C., 1992.

Testa, Mario. "Public Health: Its Sense and Meaning." In *The Crisis of Public Health: Reflections for the Debate*, edited by PAHO/WHO, 184-206. Washington, D.C., 1992.

The World Bank. *Argentina: World Bank Approves \$220 Million for Public Health*. Press Release, <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/LACEXT/0,,contentMDK:21136153-menuPK:258568-pagePK:2865106-piPK:2865128-theSitePK:258554,00.html>.

The World Bank. *Project Information Document-Concept Stage*. 2005. http://www.wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2005/09/13/000104615_20050914091445/Rend ered/PDF/Rev10PID10AR0EPHF0Concept0Stage009101.05.pdf.

The World Bank. "Public Health and Bank Operations." *Health, Nutrition and Population Series*. Washington, D.C., 2002.

The World Bank. *Public Health Surveillance and Disease Control Project in Argentina (VIGIA)*, <http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P055482>.

The World Bank. VIGISUS II Brazil Second Disease Surveillance and Control Project, <http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P083013>.

Turnock, Bernard J., and Arden S. Handler. "From Measuring to Improving Public Health Practice." *Annual Review of Public Health* 18 (1997): 261-282.

Turnock, Bernard J. *Public Health: What It Is and What It Does*. 3rd Ed. Sudbury, MA: Jones and Bartlett Publishers, 2004.

United Nation Millennium Project. *Health Systems Needs Assessment Guidelines*. New York: UN Millennium Project, 2005, <http://www.unmillenniumproject.org/documents/UserGuide-HealthSystem.pdf>.

United Nation's Children Fund (UNICEF). *Progress for Children: A Child Survival Report Card*. New York: UNICEF, 2004, <http://www.unicef.org/progressforchildren/2004v1/latinCaribbean.php>.

Urriola Urbina, Rafael. "Health Care Financing and Equity: Public Insurance in Chile." *CEPAL Review* 87 (2005), <http://www.eclac.org/publicaciones/xml/5/25575/G2287iUrriola.pdf>.

Varani, Marcio Luiz. *Riscos da Tecnologia Médica - O Papel da Vigilância Sanitária*. PowerPoint Presentation, May 2006.

Waldman, Eliseo Alves. *Vigilância em Saúde Pública*. São Paulo: Faculdade de Saúde Pública da USP, 1998.

Williams, Tony. "Building health information systems in the context of national strategies for the development of statistics." *Bulletin of the World Health Organization* 83(8), (2005).

Wilson, Kumanan. "A Canadian Agency for Public Health: Could it work?." *Canadian Medical Association Journal* Vol. 170, No. 2 (2004), <http://www.cmaj.ca/cgi/reprint/170/2/222.pdf>.

Winslow, C.E.A.. "The Untilled Field of Public Health." *Modern Medicine*, Vol. 2. (1920): 183-191.

World Health Organization (WHO). *A Guide to Rapid Assessment of Human Resources for Health (WHO)*. Geneva: WHO, 2004, http://www.who.int/hrh/tools/en/Rapid_Assessment_guide.pdf.

WHO. *Basic operational frameworks (BOF) for essential health technologies*, <http://www.who.int/eht/frameworks/en/>.

WHO. *Design and Implementation of Health Information Systems*. Edited by Theo Lippeveld, Rainer Sauerborn and Claude Bodart. Geneva: WHO, 2001.

WHO. *Essential Public Health Function: The Role of Ministries of Health*. 53rd Section of the Regional Committee of the Regional Office for the Western Pacific, 16 July 2002.

WHO. *Financing health promotion*. Discussion Paper Number 4-2007. Geneva: WHO 2007.

WHO. *World Health Organization Report on Infectious Diseases: Removing Obstacles to Healthy Development*. Geneva: WHO, 1999.

WHO. *The World Health Report 2000: Health Systems - Improving Performance*. Geneva: WHO, 2000.

WHO. *The World Health Report 2003: Shaping the Future*. Geneva: WHO, 2003.

WHO. *The World Health Report 2004: Changing History*. Geneva: WHO, 2004.