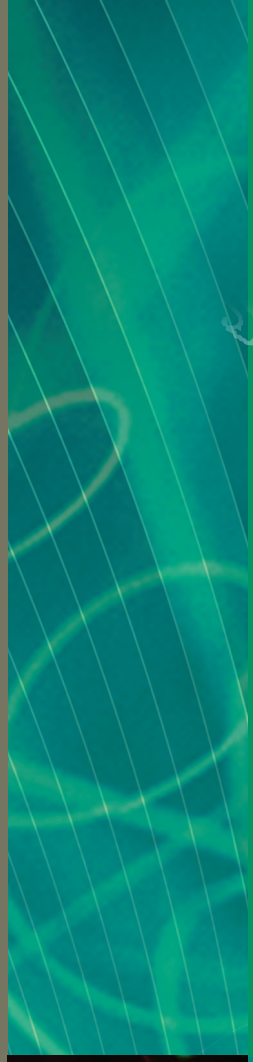
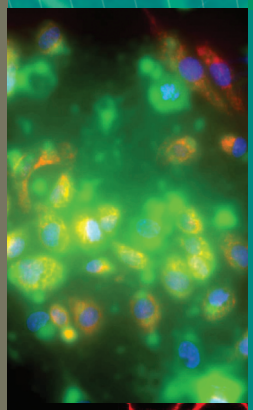
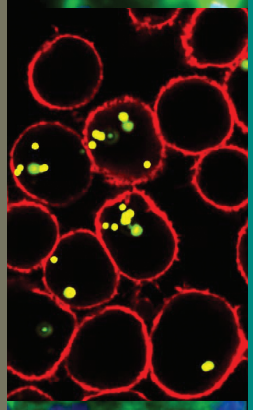
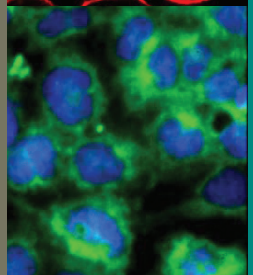
National Cancer Institute









Strategic Plan

OFFICE OF LATIN AMERICAN CANCER PROGRAM DEVELOPMENT

OFICINA DE DESARROLLO DE PROGRAMAS DE CÁNCER EN AMÉRICA LATINA

(National Cancer Institute and the Fogarty International Center)

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Contents

Introduction

Cancer is a leading cause of death worldwide, with over 7.6 million deaths attributed to cancer in 2005. Moreover, reflecting similar increases expected in the United States (U.S.), it is projected that global cancer mortality will climb to approximately 10.3 million deaths per year by 2020. Although cancer is generally considered to be a disease of developed countries, factors such as population migration and aging populations portend that cancer is increasingly becoming a major disease threat to developing nations. In fact, as indicated in **Table 1**, these trends are already becoming evident in several countries of Latin America.

Interestingly, cancer incidence and mortality trends observed for Latin American populations resemble those observed in the U.S. Hispanic population, where cancer is increasing. It also should be noted that there is little research evidence to inform an understanding of the influence of ongoing immigration from Latin America to the U.S. on cancer trends—in either the U.S. or the countries of origin. It is estimated that the U.S. Hispanic population will climb to 59.7 million and represent approximately 19% of the U.S. population by 2020.

Paralleling this worldwide increase in cancer incidence and mortality, results from decades of investments in cancer research are producing an unprecedented explosion of information and knowledge that is forging an ever-increasing understanding of cancer at the molecular level. These advances promise to provide a foundation for the future development of evidence-based individualized cancer detection, therapeutic and prevention strategies, and technologies. Therefore, early in the 21st century, U.S. oncology research communities are pursuing myriad studies of cancer that are driving toward a new era of personalized cancer medicine. In the aggregate, these advances have resulted in an increased life expectancy for individuals with cancer and a higher quality of life for nearly all cancer patients in the U.S. and in many other countries around the globe.

However, in spite of these advances in cancer research that are benefiting developed countries, cancer is currently ranked among the top three deadliest killers in Latin America.[1] Although many of these countries are progressive—investing in biomedical research and screening and offering current treatments to cancer patients—overall research and patient care capabilities in these countries are significantly underdeveloped by U.S. standards. As a result, individuals in Latin America are dying from preventable diseases such as gastric and cervical cancers.

These statistics—coupled with the estimate that the Hispanic population is destined to become the largest minority in the U.S.[2] in as little as 12 years—strongly suggest that reducing the burden of cancer in the U.S. will depend heavily on understanding and controlling cancer in this critical population group. Interestingly, this understanding will require basic and clinical studies conducted collaboratively across Latin America—as well as among U.S. Hispanics. It is critically important to consider initiating trans-Latin American research programs. In the year 2000, 80% of Hispanics living in the U.S. were of Mexican origin, and data from 2006 show that this population had since decreased to represent 65% of the total U.S. Hispanic population in 2004. These changes reflect a significant shift in Hispanic immigration patterns to the U.S., specifically the increasing immigration of individuals from other Latin American countries into the U.S. Hispanic population. This complex picture is further complicated by the fact that the average age of the U.S. Hispanic population

[1]American Cancer Society. "Latin America and the Caribbean."

[2]American Cancer Society. "Cancer Facts for 2007."

is 27 years, and very little research is under way to examine the effects of these population changes on the current or future U.S. or global cancer burden.

In recognition of the significant need and opportunities for programs across the continuum of cancer research and care in Latin America, the National Cancer Institute (NCI) and the Fogarty International Center (FIC), National Institutes of Health (NIH), have undertaken a pilot initiative to develop relevant research and training programs in five of these countries. The launch of the NCI–FIC Office of Latin American Cancer Program Development (OLACPD) correlates well with the globalization of science and health care that is currently under way. Latin American countries have tremendous human resources—including clinical networks and specimen resources—that could greatly enhance global clinical cancer research efforts. In addition, this pilot program will strive to increase the capability of these countries to participate and partner in cancer research, including the development of needed clinical trials networks, technology centers, and training to enhance the capability to deliver state-of-the-art cancer care to patients.

The OLACPD will develop appropriate strategies, programs, and other actions needed to advance the cancer research agenda and accelerate progress against cancer for the mutual benefit of the U.S. and Latin America. This Strategic Plan details the status of cancer and cancer research in Latin America and defines the approach and strategies that will be utilized in this pilot program to achieve the goals of this groundbreaking NCI–FIC partnership.

Pilot Program Mission

The mission of the OLACPD is to understand the current status of cancer, cancer research, and cancer treatment in selected Latin American countries and to use this information, as well as existing and new relationships, and capabilities to develop OLACPD programs and partnerships that both meet clinical needs in-country and enable joint progress in cancer research.

Operating Principles and Processes

The OLACPD will coordinate, develop, and administer multidisciplinary cancer research programs for Latin America in partnership with the FIC. To achieve this mission, the OLACPD will coordinate program activities with NCI Divisions, Offices, and Centers pertaining to Latin American cancer research. The OLACPD will maintain liaisons with appropriate Federal and non-Federal organizations, institutions, and scientists to inform and promote cancer research in Latin America. The OLACPD will proactively conduct program planning and evaluation activities in coordination with the FIC and other NIH Institutes and Centers (ICs) as appropriate and collaboratively track the cancer epidemiologic data of Hispanics who have come to the U.S. from Latin American countries. The OLACPD will make appropriate adjustments to the scientific direction of the program as trends arise.

Background

Cancer Health Statistics in Latin America

It has been estimated that one in eight deaths worldwide are due to cancer. Cancer has caused more deaths worldwide than AIDS, tuberculosis, and malaria combined.[3] This fact is attributed to the decrease of deaths from infectious diseases, urbanization and lifestyle trends, and the aging of the global population. As developing countries acquire Western diets, lifestyles, and risk behaviors such as smoking, it is projected that new cancer cases will increase significantly over the next decade and beyond.

In Latin American countries, the high incidence of cancers associated with infectious agents (i.e., cervical, stomach, liver cancers) can be ameliorated or prevented through interventions such as vaccines, antibiotics, and improved sanitation. Lung cancer can be addressed through education on smoking and lifestyle risks. Data from the World Health Organization (WHO) illustrating the five major cancers that are the leading causes of deaths from this disease in Mexico and Central America are shown in **Table 1**.

[3]World Health Organization.

Table 1: Leading Organ Sites and Associated Deaths From Cancer in Mexico and Other Countries of Latin America (Per 100,000, WHO 2005)

	1	2	3	4	5
Mexico	Trachea, Bronchus, Lung Cancers	Prostate Cancer	Stomach Cancer	Liver Cancer	Cervix Uteri Cancer
Ecuador	Stomach Cancer	Prostate Cancer	Cervix Uteri Cancer	Trachea, Bronchus, Lung Cancers	Colon and Rectum Cancers
Guatemala	Stomach Cancer	Liver Cancer	Trachea, Bronchus, Lung Cancers	Corpus Uteri Cancer	Prostate Cancer
Honduras	Stomach Cancer	Trachea, Bronchus, Lung Cancers	Prostate Cancer	Breast Cancer	Cervix Uteri Cancer
Nicaragua	Stomach Cancer	Cervix Uteri Cancer	Prostate Cancer	Colon and Rectum Cancers	Breast Cancer
Panama	Prostate Cancer	Stomach Cancer	Trachea, Bronchus, Lung Cancers	Colon and Rectum Cancers	Breast Cancer

Interestingly, deaths from lung cancer in Mexico reflect the trend seen in the U.S., perhaps due to proximity and the wide availability of tobacco products. However, cervical and uterine cancers remain major killers of women, likely as a result of inadequate screening and advanced cancers at the time of diagnosis. Overall, stomach cancer remains the major cancer causing mortality in most of these countries—a disease that can be nearly eradicated if appropriate diagnosis and treatment of *Helicobacter pylori* bacteria can become part of general clinical practice. Prostate and breast cancers also are prominent in the list of major sites responsible for mortality, with the exception of Guatemala, where uterine cancer remains a major cause of mortality.

Table 2 shows the five major organ sites that are the leading causes of mortality from cancer in eight countries in Latin America. As in Mexico, lung cancer is a major cause of death from cancer in four Latin American counties, whereas stomach cancer and cervical cancer are major causes of death in the other four countries. Prostate cancer is a major cause of death across nearly all of these countries, representing the number three cause of death from cancer in seven of the eight countries surveyed. Colon cancer and lymphoma appear as the second leading causes of death in at least two Latin American countries (Argentina and Peru), which raises interesting and profoundly important questions about their populations per se and the state of oncology diagnosis and treatment in those nations.

Table 2: Leading Organ Sites and Associated Deaths From Cancer in Eight Latin American Countries (Per 100,000, WHO 2005)

	1	2	3	4	5
Argentina	Trachea, Bronchus, Lung Cancers	Colon and Rectum Cancers	Breast Cancer	Prostate Cancer	Stomach Cancer
Bolivia	Cervix Uteri Cancer	Stomach Cancer	Prostate Cancer	Colon and Rectum Cancers	Breast Cancer
Brazil	Trachea, Bronchus, Lung Cancers	Stomach Cancer	Prostate Cancer	Colon and Rectum Cancers	Breast Cancer
Chile	Stomach Cancer	Trachea, Bronchus, Lung Cancers	Prostate Cancer	Colon and Rectum Cancers	Breast Cancer
Colombia	Stomach Cancer	Trachea, Bronchus, Lung Cancers	Prostate Cancer	Colon and Rectum Cancers	Breast Cancer
Paraguay	Trachea, Bronchus, Lung Cancers	Stomach Cancer	Prostate Cancer	Corpus Uteri Cancer	Breast Cancer
Peru	Stomach Cancer	Lymphomas, Multiple Myeloma	Prostate Cancer	Cervix Uteri Cancer	Colon and Rectum Cancers
Uruguay	Trachea, Bronchus, Lung Cancers	Colon and Rectum Cancers	Prostate Cancer	Breast Cancer	Stomach Cancer

As shown in **Tables 1 and 2**, although geographically separated, these regions are remarkably similar in that two *preventable* cancers—gastric and lung—are nearly uniformly the major cause of death from cancer across this broad array of Central and Latin American countries. **Table 3** reflects the leading cancer deaths for the U.S. population and U.S. Hispanic population as referenced by the American Cancer Society. It is clear that Hispanics who relocate to the U.S. benefit from the preventive strategies employed for infectious agent-associated cancers such as gastric cancer. However, smoking-associated lung cancer remains the number one cancer killer in both populations.

Table 3: Leading Organ Sites and Associated Deaths From Cancer: U.S. and U.S. Hispanic Populations (American Cancer Society 2006)

	1	2	3	4	5
United States	Trachea, Bronchus, Lung Cancers	Colon and Rectum Cancers	Breast Cancer	Lymphomas, Multiple Myeloma	Prostate Cancer
U.S. Hispanic Population	Lung and Bronchus Cancers	Colon and Rectum Cancers	Breast Cancer	Liver Cancer	Pancreatic Cancer

Although a number of Latin American countries with various levels of research and health care delivery capacity are of interest as potential candidates for participation in the OLACPD pilot program, the initial scope will focus primarily on Mexico, Brazil, Chile, Argentina, and Uruguay, and will be expanded in the future as appropriate.

Cancer Research and Health Care Networks[4]: Mexico, Brazil, Chile, Argentina, and Uruguay

The overall status of the research and development expertise and supporting infrastructures for both research and health care delivery is quite diverse across the large number of countries in Latin America. The following summary briefly captures an overall synopsis of these capabilities for each of the five target countries. A more detailed account of these country-by-country research and health care capability profiles can be found in **Appendix 1** of this Strategic Plan.

Mexico

Mexico, with a population of over 109 million, is a representative and democratic republic of 31 States, a Federal District, and an elected president.

Mexico's Health Care System. The Secretariat of Health is responsible for overseeing the quality, safety, and efficacy of drugs, reagents, immunobiologicals, and medical equipment in Mexico. It maintains national registries for all health supplies, regulates marketing by issuing licenses and health product registrations, and oversees advertising that appears in the mass media. In addition, the Secretariat of Health, with support from the social security institutions—especially the Instituto Mexicano del Seguro Social (IMSS)—provides public health care services. The social security system covers workers in the working population and comprises several institutions, each of which is funded by contributions from employers, employees, and the government. The IMSS is the largest institution in the system and serves about 80% of the covered population. The system also includes the State Workers Social Security and Services Institute (Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado), Petróleos Mexicanos, the Secretaria de la Defensa Nacional (Armed Forces), and the Armada de México (Navy).

The organization of individual health services is structured by levels of care. The first level includes health promotion, disease prevention, and outpatient care, and the second level provides basic specialties at general or specialized hospitals. The third level provides specialized care of greater complexity and clinical and basic research involving specialized physicians supported by specialized nursing and other professionals.

Universities and Academic Centers. Founded in 1551, the largest public university in Mexico is the National Autonomous University of Mexico (Universidad Nacional Autónoma de México), which conducts approximately 50% of the scientific research in Mexico, with satellite campuses and research centers across the country. The second largest university is the National Polytechnic Institute. Both of these institutions are public and are complemented by several public universities in the Mexican States, most notably the University of Guadalajara.

In addition to the public universities, the Monterrey Technological and Higher Education Institute (Instituto Tecnológico y de Estudios Superiores de Monterrey) is one of the leading private research institutions in Mexico, as are the Autonomous Technological Institute, the University of the Americas Puebla (Universidad de las Américas Puebla), and the Ibero-American University (Universidad Iberoamericana).

[4]All information was extracted and compiled from Pan American Health Organization Country Health Profiles; World Health Organization WHOSIS Global Database; U.S. Department of State; Social Medicine July 2008; and the Embassies of Mexico, Brazil, and Chile.

Scientific Research and Advanced Technologies. Health care is a primary "right" in Mexico and, consequently, there are more physicians than Ph.D.s in Mexico. Moreover, there is a regional disparity in the allocation of scientific resources, with over 75% of all doctoral degrees awarded by institutions in and around Mexico City.

The primary science and technology policymaking body of Mexico is the National Council for Science and Technology (Consejo Nacional de Ciencia y Tecnología, CONACYT). The CONACYT is a decentralized public body created in 1970 that comprises researchers, scientists, academicians, and government officials. Its focus is a national development program, which includes scholarships for mid-career and established researchers as well as technicians. Programs to support research—and the development of new industries—in fields such as energy, electronics, metalworking, and agronomy are also administered under the CONACYT. In addition, this body oversees a government–industry shared-risk program, research centers (many located in the provinces), and international scientific agreements.

Other Research Networks in Mexico. In addition to these government-supported clinical and research focused-institutions and organizations, Mexico is rapidly developing capabilities in advanced technologies and is engaging with major philanthropic investors to build scientific capacity and participate actively in the world scientific enterprise. Examples of organizations that reflect these trends include the National Institute of Genomic Medicine, the Mexican Foundation for Health, the CARSO Foundation, and the Nacional Instituto de Cancerologia (INCAN).

Brazil

Brazil, with a population of over 190 million, is a Federal republic with 26 States, a Federal District, and an elected president.

Health Care Systems. The Brazilian health system is composed of a large public, government-managed system—the Integrated Public Health System (Sistema Único de Saúde (SUS)). Private health insurance is widely available in Brazil and may be purchased on an individual basis or obtained as a work benefit—major employers usually offer private health insurance benefits. Public health care is still accessible for those who choose to obtain private health insurance. As of March 2007, more than 37 million Brazilians had private health insurance.

Universities and Academic Centers. In Brazil most health research includes physicians and scientists from both private and public institutions, constituting interdisciplinary teams. These include private institutions such as the Pontifical Catholic University of Paraná, the Pontifical Catholic University of São Paulo, and the Pontifical Catholic University of Campinas. Leading public institutions—such as the State University of Rio de Janeiro, the Federal University of Bahia, the Federal University of Ceará, the Federal University of Campina Grande, and the State University of São Paulo—often lead these teams.

Scientific Research and Advanced Technologies. As noted, scientific research and the development and implementation of advanced technologies in Brazil are largely carried out in public universities and research institutions, with over 73% of funding for basic research derived from government sources.

At the Federal government level, three major organizations fund research. The National Council for Scientific and Technological Development (CNPq) is the largest and most important science and technology organization in Brazil, with an annual budget of approximately $600 million U.S. dollars (USD). Ten national institutes and two directorates make up the CNPq. The Financier of Studies and Projects provides financial support to companies and institutions that invest in the development of new products and processes. The

third organization—Fundação Coordinação de Aperfeiçoamento de Pessoal de Nível Superior—has an annual budget of approximately $400 million USD and stimulates the development of human resources for teaching and research through the awarding of scholarships, grants, and other mechanisms.

Research funding is also provided at the State level by agencies such as the Foundation for Research Support of the State of São Paulo (FAPESP), the Foundation for Research Support of the State of Minas Gerais, and the Foundation for Research Support of the State of Rio de Janeiro.

Cancer Research Networks. The INCAN is administered under the Ministry of Health, with a Federal mandate to lead a countrywide policy for cancer control in Brazil. It delivers cancer care within the SUS. In addition, the INCAN coordinates public policies, develops research activities, and disseminates practices and knowledge on medical oncology. One of the most prominent research networks in Brazil is the Antonio Prudente Cancer Research Center in São Paulo, which consists of two additional institutions, the A.C. Cancer Hospital Camargo and the Ludwig Institute for Cancer Research.

Other Research Institutes. There are several other well-established research institutes in São Paulo State, including the Butantan Institute, a biomedical research center, and the Eldorado Institute, a nonprofit research, development, and technology innovation organization. Located in the Rio de Janeiro area, the Oswaldo Cruz Institute is also recognized as a scientific institution for research and development in the biomedical sciences and is considered the main public health research institution.

Chile

With a population of over 16 million, Chile is a unitary State, divided into 13 political-administrative regions, with a democratic government, and an elected president.

Health Care System. The Ministry of Health is the lead agency in the health care sector. It formulates and establishes health policies; issues general standards; and plans, supervises, monitors, and evaluates compliance with these directives. The National Health Fund (Fondo Nacional de Salud, FONASA), the ISAPRE (Isapre Banmedicas) Authority, the Public Health Institute, and the Central Supply Clearinghouse report to the Ministry of Health. The Public Health Institute is responsible for regulating drugs and medical products. The overall health services system combines public and private support. Public insurance is provided through the FONASA, which receives contributions from its members and transfers from the national government to cover indigent people and to carry out public health programs. The private sector is represented by ISAPREs, which are health insurers. Of particular importance in cancer care is the Plan AUGE (Explicitly Granted Universal Access), which guarantees access to diagnosis and treatment for all. In addition, two major cancer charities, the Corporación Nacional del Cancer (CONAC) and the Fundación Arturo Lopez Perez in Santiago, fill part of the economic gap. The CONAC provides free drugs, and the Fundación charges according to income.

Health Research and Advanced Technologies. Health research is carried out primarily in universities and research centers. To promote essential research on the country's priority health problems, the Ministry of Health has developed a national research policy directed toward implementing a systematic anticancer policy rooted in evidence-based medicine. The National Commission for Scientific and Technological Research (Comisión Nacional de Investigación Cientifica y Tecnológica, CONICYT) is the advisory body to the government in science and technology. The CONICYT has focused its efforts on the development of science and technology in an effort to improve the country's social and economic conditions. Other important institutions supporting science and technology research (both governmental and nongovernmental) are the Program of the Chilean Economic Development Agency, the National Fund for Science and Technology

Development, and the Program of Development and Technological Innovation of Chile. In addition, the mission of the Fundación Chile—a private, nonprofit institution—is to introduce innovation and develop human capital in the Chilean economy through technology management, in alliance with local and global knowledge networks. The Genoma Chile Initiative funds genomic studies and the Center for Scientific Studies is a private, nonprofit corporation for the development, promotion, and dissemination of scientific research.

Universities and Academic Centers. Health research in Chile is conducted primarily through networks of academic and research centers. Participating centers span nearly all of Chile, including the Universidad de Chile, Pontificia Universidad Católica de Chile, Universidad de Santiago de Chile, Universidad Metropolitana de Ciencias de la Educación, Universidad Tecnológica Metropolitana, Pontificia Universidad Católica de Valparaíso, Universidad de Valparaíso, and Universidad de Antofagasta.

Argentina

Argentina has a population of 41 million and is a democratic republic with a federation of 23 provinces and an elected president.

National Sanitary Policies and Plans. The Federal Plan of Health 2004–2007 proposes the following goals as the main lines for the new roles and responsibilities of the different parts of the health sector:

- Strengthening of the National Ministry of Health and the Provincial Ministries in their governing duties.
- Guarantees given by the regions on the assurance of universal basic health coverage.
- Development of preventive and promotion programs, emphasizing primary care and respecting the growing mechanisms of derivation within the care network by the provinces and townships.
- Protection of the financing of the established programs.
- Organization of the people to promote their role in the design and implementation of the model.

Health Care System. The Ministerio de Salud y Acción Social de la Nación (MSAS, Ministry of Health and Social Action) is the organization in charge of standardizing, regulating, planning, and evaluating health care activities in the country. In Argentina the health care system is organized around three main providers:

1. The public sector, which supplies free clinical care for hospital inpatients and outpatients. A charge is made to outpatients for medicines. This sector covers about 50% of the population.
2. Mutuals or social plans (around 300 in number), administered by trade unions. In these Obras Sociales, which are semi-public, employers and employees each pay a fixed fee. The mutuals cover the cost of medical care and medicines in varying proportions and differences between the fixed fees and the actual cost of treatment are paid by the patient. In the past, these plans have usually covered around 45% of the population, although the percentage has fallen recently due to increasing unemployment, with more people resorting to seeking care within the public sector.
3. The private sector, where patients meet the total cost of their medical care. This sector covers approximately 5% of the population.

Individual Health Services. All provinces haves organized networks of hospitals and ambulatory services, some of which are very advanced. Many others have services of primary care, which are not always well integrated with the provincial networks, which have wider coverage and response capacity. Some provinces have integrally transferred the primary health care to the township level. The diagnostic support services in the public sector are integrated into the hospital network. In the private sector, those services are mostly located in the hospital network but, in the largest cities, there are usually autonomous diagnostic support units that provide services to the health plans.

Health Supplies. Within the drug market, almost all the final products are produced in the country. However, in the case of other medical and health supplies, those produced in Argentina represent 25% of the total. Although there is no updating on the size and structure of immunobiological products in Argentina, it is estimated that 85% of those supplies are imported and 15% are locally produced with the required quality standards.

Human Resources. The results obtained by the National Network Observatory of Human Resources for Health in Argentina showed that in 1998 there were 440,100 health workers (3% of the economically active population). Doctors represent 24.7% of such workers; dentists, 6.6%; and nurses and assistant nurses, 19.6%.

Health Research and Technology. The financing system for research is provided by the Science and Technique Ministry through the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), to scientific and technological researchers of different levels who will be working in the most diverse institutions, both public and private. The national universities and the National Health and Environment Ministry—through the Undersecretary of Sanitary Relations and Health Research—contribute also to that financing with research scholarships. Recently, the Argentine government has established the new Ministry of Science, Technology, and Productive Innovation to promote research, technology, and application of new technologies.

Major Research Networks. The Instituto Leloir is a private, nonprofit research institute that supports biomedical research, through 25 laboratories, that range from basic biochemistry to gene therapy. Instituto Leloir was founded 60 years ago, and it has positioned itself as the premier institution of basic and "applied" research in Argentina. With a research staff of over 170 investigators, the institute is well funded by national and international grants. The European Union and several private foundations as well as industry contribute to the overall funding of $7.5 million USD per year. For applied cancer research, the institute is affiliated with three major clinical hospitals: Hospital Naval (Navy Hospital), Oncology Municipal Hospital Maria Curie, and Instituto Roffo of the Universidad de Buenos Aires. Altogether, these hospitals receive over 3,000 new cancer patients per year. In addition, these clinical institutions have ample experience in implementing clinical trials, in particular with industry.

Health Sector Expenditure and Financing. In 2003, 54% of health expenditures were public and 46% were from the private sector. Of the public expenditures, 55% were financed: 5% by Social Security and 45% directly from taxes. In 2002, the total health expenditures were estimated at $23.6 million USD, which represented a per capita expenditure of about $745 USD. The largest external financing contributions come from loans for projects from the Inter-American Development Bank and the World Bank.
http://www.paho.org/English/DD/AIS/cp_032.htm

Uruguay[5]

Uruguay has a population of 3.5 million and is a constitutional republic with 19 departments and an elected president.

National Health Plans and Policies. The following six health-related objectives have been established since the 2000–2005 period:

1. Strengthen the management of public and private health care institutions.

2. Adapt the supply of available services to the epidemiological characteristics and needs of the population.

3. Make health care coverage universal by facilitating access and care at the four levels of complexity.

4. Enhance the quality of services at the four levels of complexity.

5. Rationalize the use of services at the Institutes of Highly Specialized Medicine.

6. Promote the participation of service users and health care institutions in order to solve problems in a climate of trust and respect for the rights of citizens.

Health Care Reform. The government's main concern is the coverage and maintenance of the mutual assistance system, which means reorganizing the management of the mutual assistance associations and their health care models. The Integrated National Health System would provide comprehensive care to all people residing in the country, guaranteeing equitable and universal coverage. The system is based on complementary private and public sectors. The overall strategic orientation is toward primary care. The system favors basic health services and fosters health promotion, prevention, and rehabilitation.

Health Care System. The health system is divided into public and private sectors. The public sector is composed of the Ministry of Public Health (Ministerio de Salud Pública (MSP)), Administration of State Health Services (Administración de Servicios de Salud del Estado (ASSE)), Hospital of Specialties (Hospital de Clínicas, Universidad de la República), Veteran's Health Services, Police Health Services, the health services of the 19 States (Departamentos), the Bank of Social Welfare (Banco de Previsión Social), and the Medical Services of the Autonomous Entities and Decentralized Services (Servicios Médicos de Entes Autónomos y Servicios Descentralizados). The private health care sector consists of Collective Health Care Institutions (Instituciones de Asistencia Médica Colectiva (IAMC)), private hospitals, private insurers, institutes of highly specialized medicine, preventive medical clinics, diagnostic and treatment facilities, pharmacies, and exclusively private care practices. Before health care reform, primary coverage was provided by: (1) public subsystem (ASSE) with 48% of the population; (2) Social Security (collective medical care institutes); and (3) private subsystems, Instituciones de Asistencia Médica Colectiva (IAMC) with 43% of the population.

Health Supplies. The Ministry of Public Health controls the requirements and demands for registering drugs that are regarded as necessary, effective, and safe and are produced under conditions that ensure their quality. It also monitors the standards for the inspection of production laboratories, points of distribution and sale, and production processes. To perform this task, the Ministry has units for evaluation and registration,

[5]Social Medicine Volume 3, Number 2, July 2008; PAHO and WHO data.

inspection (manufacturers, importers, distributors, and sale and disbursement sites), and laboratory analysis for drug quality control. The basic inspection activities focus on production laboratories or marketing and on products, including labeling and advertising. Several factors impede the Ministry of Public Health's performance of these functions to varying degrees, among them shortages of human resources, delays in administrative processes, and the interests of the pharmaceutical industry.

Human Resources. In addition to the University of the Republic, private universities and institutes for the training of physicians, professional nurses, dentists, and nursing auxiliaries have been established in health research and technology.

Health Research and Technology. Most funding for research and technology comes from industry, Europe, and the National Council of Scientific and Technical Research (CONICYT).

Major Research Networks. The Pasteur Institute comprises eight major units: cell biology, crystallography, analytic biochemistry and proteomics, animal models, bioinformatics, protein production, biophysics, and molecular biology. Each unit comprises highly specialized laboratories involved in specific research projects in the areas of microbiology, immunology, cancer, and neurosciences using proteomics, genomics, structural biology, and bioinformatics in a multidisciplinary setting. The Institute for Biology Research Clemente Estable is a government institution, subsidized by the Ministry of Health and Culture. The institute comprises four research programs: neurosciences, biotechnology in applied agriculture, health and biomedicine, and environmental sciences.

Health Sector Expenditure and Financing. Per capita health expenditure in 1998 was $697 USD, and total spending on health was equivalent to 10% of GDP. Public spending (46%) and private spending (54%) were relatively proportional. Public spending on health accounted for 14% of overall government outlays. The public sector accounts for all spending on health promotion, disease prevention, and epidemiological surveillance. In 1998, the private sector spent approximately four times more on drugs ($266 million USD) than the public sector ($70 million USD). In addition, the private sector spent $975 million USD on personnel costs, while the public sector spent $223 million USD.

Uruguay is a member of Mercosur or Mercosul (Mercado Común del Sur, or Southern Common Market) which is a Regional Trade Agreement (RTA) among Argentina, Brazil, Paraguay, and Uruguay founded in 1991 with the purpose of promoting free trade and the fluid movement of goods, people, and currency.
http://www.paho.org/English/DD/AIS/cp_858.htm

Goals of the OLACPD Pilot Program

The goals of the OLACPD partnership between the NCI and the FIC are to:

- Develop a comprehensive understanding of the status of the disease burden and cancer research and cancer care infrastructures in the targeted countries in Latin America
- Promote and leverage partnerships for mutual benefit across the continuum of basic and clinical cancer research in these countries
- Build collaborative relationships across Mexico and Latin America that will enable the co-development and in-country sustainability of the required resources and expertise to enable cancer research and the conduct of high-quality clinical studies in the target countries

In addition, the pilot program will result in a better understanding of cancer incidence and mortality in the diverse populations that make up Latin America. Over time, this knowledge will facilitate the design and conduct of clinical trials in these target countries based on their own efforts and will also provide direction to improve patient management of Hispanic populations in the U.S. Overall, achieving these goals has the potential to improve cancer medicine and control in these five countries and ultimately drive improved health and health care on a global basis.

OLACPD Pilot Program Key Strategies and Multiphase Plan

The OLACPD will achieve these goals through the implementation of a series of key strategies carried out in three phases. The overall strategic scope of the program will engage multiple institutions, organizations, and philanthropic and government partners across Latin America and the U.S. The elements of this "level-of-evidence" strategic approach to building the OLACPD will proceed as follows:

- The foundation of the OLACPD will be established through the planning and implementation of a thorough **"due diligence" process** to both understand the current status of cancer and cancer research in the target countries and establish the high-level contacts needed for execution of the program.
- In addition to due diligence and workshops, the OLACPD will seek input from a group of experts—the **OLACPD Expert Focus Group (OLACPD EFG)**—to inform planning.
- Key to the success of the OLACPD is a strong partnership that will leverage the experience and expertise of both the **NCI and the FIC. The NCI will seek to strengthen and build this partnership** early and throughout the pilot program.
- The NCI has a long history of international collaborations and programs focused on basic and clinical research, and the **OLACPD will leverage, strengthen, and, where needed, establish new collaborative efforts across the Institute.**

- Finally, to ensure stepwise development of these strategies building toward a fully functional research effort in the targeted Latin American countries, **a multiphase plan of specific actions and milestones will be developed and implemented over a 3-year period.**

Phase I: Due Diligence, Knowledge Building, and Feasibility Assessment (January 2008-Ongoing)

The initial phase of the OLACPD pilot program will consist of a thorough due diligence program to gain an understanding of both the cancer burden and the current status of cancer research and delivery of cancer care in the target countries and establish key contacts. In addition during this phase, a group of experts will be assembled to provide input to the program; the relationship between the NCI and the FIC will be further defined and strengthened; collaborations with existing NCI Latin America-focused programs will be established and/or strengthened; and strategic planning for workshops will be undertaken. This phase is critical to the success of the program to ensure an understanding of both the scope of the program and existing opportunities for partnerships. All of these Phase I efforts began in early 2008 and are well under way.

Overall Plan for Phase I

Due Diligence Process. A process and series of preliminary studies and investigative meetings will constitute a large portion of the Phase I process. The goal is to fully understand in-country needs and resources and identify key potential scientific and clinical participants in the pilot program. In addition, these investigative efforts will identify potential Federal and philanthropic partners for the OLACPD pilot program.

Further Development of Internal Partnership with the FIC. The NCI has established an active dialogue with the FIC and will implement the OLACPD strategies through this partnership as is most appropriate. Specifically, this will include the FIC's ongoing international programs and expertise in training and capacity building and in international policy in the targeted Latin American countries. In return, the FIC will gain an in-depth understanding of the extensive research portfolio and resources of the NCI that can be jointly leveraged through this partnership. Current programs that are of joint interest and subject to future discussions include the FIC's Clinical Research Training Scholars program, International Research Collaboration Award, and international Non-communicable Chronic Diseases Research Training Program.

Ongoing Development of Collaborations with NCI and FIC Programs. A key strategy for the development of the OLACPD is the leverage and expansion of current NCI basic, translational, and clinical cancer research programs, especially the augmentation of clinical trials programs, biospecimen programs, advanced technology development initiatives, and bioinformatics systems in the targeted Latin American countries. In addition, the OLACPD will implement a strategic focus on in-country training development in partnership with the FIC. The OLACPD will leverage this broad range of existing NCI and FIC capabilities and relationships, along with new contacts, to implement a small number of pilot efforts in **Phase II** and expanded initiatives in **Phase III** through the following three key strategic programs:

- *Scientific and Clinical Research Pilot Program.* This clinical research-oriented program will provide important information on treatment responses and related pharmacogenomic pathways and ultimately enhance ongoing international programs in Latin America. Long- and short-term training of investigators and clinicians and advanced application of new technologies will promote long-term excellence. A number of NCI programs offer opportunities to pursue these strategies through either existing efforts or new collaborative initiatives with the OLACPD.

- *Technology and Capacity Building Program.* The programs that constitute this capacity building effort will provide needed information on cancer epidemiology, enhance communication among investigators, and improve the research infrastructure to carry out high-quality cancer research. The Office of Cancer Genomics, The Cancer Genome Atlas, and Cancer Genetic Markers of Susceptibility all offer opportunities for mutually beneficial partnerships with Latin American clinical cohorts, human tissue networks, and a range of advanced technology programs to augment U.S. studies and provide needed training for Latin American investigators. For example, the NCI's Office of Biorepositories and Biospecimen Research and the NCI Center for Bioinformatics will have opportunities to adapt best practices and bioinformatics software for biospecimen collection, annotation, storage, and banking through new partnerships with the targeted Latin American countries.

- *Training Program.* This program will ensure that the targeted countries will be able to sustain their efforts in high-quality basic, translational, and clinical cancer research. In fact, to a large extent, success of the OLACPD will depend on the development of needed training in these countries. A large number of the training opportunities to be pursued through the OLACPD over the next 3 years will involve leveraging both existing FIC and NCI programs as well as new initiatives. For example, the Cancer Centers Branch may benefit from a bidirectional exchange training program whereby Latin American investigators in the U.S. and U.S. investigators gain experience in Latin American cancer research networks.

Development of the OLACPD Expert Focus Group. A group of high-level scientific and clinical research leaders with knowledge and experience across the continuum of cancer research will provide expert input for the pilot program. The success of this pilot program relies on the balance and composition of the EFG. This pilot program will be enriched and well informed through the efforts of this expert group. The EFG will provide input on program needs and suggestions on best practices and approaches to the leadership of the OLACPD. The membership will represent stakeholders in Mexico, Latin America, and the U.S. who are experienced in developing cancer research and training programs as well as capacity building in critical regions of Mexico and Latin America.

Develop and Implement a Multiphase Action Plan. The goals of the OLACPD pilot program will be achieved through a stepwise series of programs and activities designed to build a solid foundation for cancer research, including clinical studies and trials, within the constraints of existing in-country capabilities and available resources. This plan is being fully developed as part of Phase I of the overall program.

Status of Phase I

Due Diligence, Knowledge Building, and Feasibility Assessment (January 2008–Ongoing). Phase I activities are well under way, and the completion of several activities is targeted for the end of 2008 or before. The due diligence process has already achieved substantial progress, the EFG is being organized, and other aspects of Phase I—most critically, preliminary planning for the later phases of the implementation plan—are nearing completion.

During Phase I, OLACPD staff members have undertaken early efforts to conduct data collection on cancer statistics in Latin America and engage in due diligence discussions with the targeted countries and exploratory discussions with relevant U.S. organizations vested in cancer research. International organizations such as the Pan American Health Organization (PAHO) and the WHO are invaluable resources for country health profiles and epidemiologic data, and these organizations will offer opportunities to develop key contacts. These data and this analysis will help the OLACPD determine the best approaches for developing the Scientific and Clinical Research Pilot Program, the Technology and Capacity Building Program, and the Training Program.

Preliminary information will continue to be gathered and assembled to assess the current status of cancer burdens (both prevalence and mortality), the response of health care systems, and the location of research networks and their capabilities. The data will be compiled from available reference sources, including the WHO, the PAHO, the International Agency for Research on Cancer, and the FIC.

In parallel, initial contacts are being made with the Ministries of Health in the targeted countries and other governmental agencies involved in science and technology to discuss the OLACPD pilot program as a new collaborative research opportunity. The OLACPD has also initiated discussions with national and local organizations and with societies and foundations with a cancer focus to explore interests in partnering this pilot program. In conjunction, these discussions will address the planning of ongoing workshops and conferences primarily directed toward Latin American cancer issues. Foundations and other nongovernment organizations based in the U.S. and Latin America are already being contacted during the initial due diligence process and are demonstrating significant interest.

EFG Staffing and Organization. The OLACPD is in the process of identifying experts for the EFG that will provide program input. The EFG will offer expert opinions to the NCI and FIC leadership on high-value opportunities for conducting clinical translational research in Mexico and other parts of Latin America. The EFG will suggest scope and provide comments on the feasibility of cancer development programs proposed by the NCI–FIC partnership and provide overall feedback to the NCI–FIC leadership on other proposed activities in the pilot program.

Workshop and Conference Organization. The exchange of scientific ideas and communication will be facilitated through selected workshops and conferences to identify and refine concepts and develop scientific questions specific to issues and barriers in Latin America. Workshops will have a dual purpose: to provide needed short-term training for the conduct of clinical trials and to provide an advanced curricula format to inform current methods, technologies, and procedures as needed in the respective target countries. Conferences will also focus on teaching and information exchange through poster presentations, seminars, and symposia to promote networking and collaborations.

Milestones for Phase I (June 2008-January 2009 and Ongoing)

Phase I activities represent foundational and, in many cases, ongoing steps for the establishment of the OLACPD. The following milestones represent progress anticipated in Phase I in 2008 and beyond:

- Completion of due diligence—**end of 2008**
- Selection and confirmation of the EFG—**September 2008**
- Introduction to and substantive discussions with Ministries of Health in target countries—**end of 2008**
- Key contacts identified and discussions under way—**2008 and beyond as appropriate**
- Workshop and conference planning—**December 2008 and beyond as appropriate**
- Site visits to targeted Latin American countries completed—**end of 2008 and beyond as appropriate**

Phase II: Pilot Research Studies (December 2009-February 2011)

Pilot studies will be designed to provide information both on the in-country cancer burden and to leverage existing resources for the mutual benefit of the partners. Careful attention will be paid to lessons learned so that more mature programs in clinical networks, advanced technologies, and training development can be created and implemented in Phase III.

Overall Plan for Phase II

In the second phase of the OLACPD pilot program, initial pilot research studies will be collaboratively planned with the targeted countries based on need and existing capabilities. For example, in instances where high-quality existing capabilities are present to conduct limited clinical investigations, small studies of high-mortality cancers will be given priority, especially for those diseases where philanthropic funds exist to match government funds from the U.S. and the respective targeted countries.

Scientific and Clinical Research Pilot Program—Pilot Research Studies (Figure 1). Selected pilot studies will be carried out in collaboration with U.S. academic research institutions and their respective counterparts in Mexico and other countries in Latin America. Figure 1 illustrates the objectives and short- and long-term strategies for what is anticipated to be primarily small clinical trials with correlative science studies. These pilot studies will investigate those regions where an acute identifiable need exists (e.g., gastric cancer in Chile, classification of cervical cancers in some areas of Mexico) or where there is an ongoing study that will benefit from a U.S. cancer center partner (e.g., University of Mexico, or the M.D. Anderson Cancer Center). Specific issues regarding ethics (local and U.S.), regulatory compliance, and best practices will be studied, and approaches will be developed to address key gaps. The lessons learned from these initial studies will help the OLACPD develop long-term strategies as well as harmonize NIH policies and procedures to the specific cultural and legal circumstances extant in Mexico and other Latin American countries.

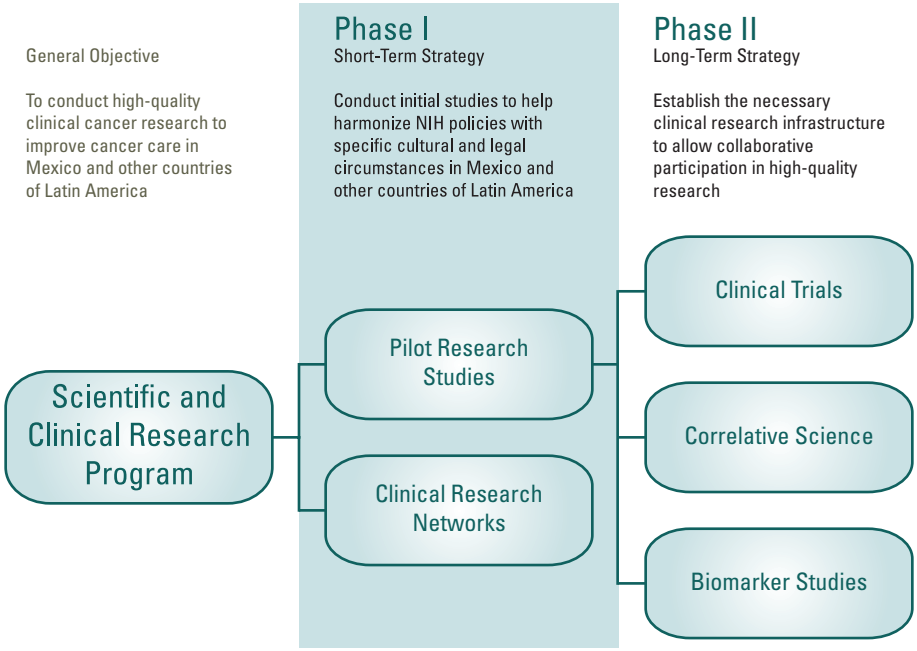


Figure 1: Overview of Scientific and Clinical Research Pilot Program

Initiatives Planned for Phase II. During Phase II, research areas for initial pilot studies to address cancer issues in Latin America will be identified primarily on the basis of mortality, prevalence, and in-country capacity to build a working partnership. To accomplish these initiatives, this phase will include organizing regional workshops on topics ranging from short-term training for specific techniques or procedures to protocol development and design. Efforts will also be made to enhance or set up needed regional review board and ethics committee(s) to harmonize (where possible and appropriate) processes and procedures between local and U.S. regulatory policies. For example, these programs could cover protocol review groups and data safety monitoring committees. Also, it may be prudent to investigate the possibility of augmenting regional institutional review boards with comparable U.S. partners versus changing in-country practices. These committees will be vital to adapting the appropriate policies and best practices needed to govern key functions such as data management, biospecimen collection, stewardship, and annotation, which will be critical to virtually all collaborative programs.

Milestones for Phase II (January 2009-February 2011)

The following milestones represent progress anticipated for Phase II:

- Regional review committee(s) set up and engaged for targeted studies—**end of first quarter 2009**
- Standards and policies adapted for biospecimen annotation, storage, and delivery in target countries—**end of first quarter 2009**
- Short-term joint training on conduct of clinical trials—**January 2009-January 2010**
- Opening pilot studies on breast, cervical, and gastric cancers—**targeted for April 2009**
- Announcing first Request for Application (RFA) or Program Announcement (PA)—**June 2009**
- Review and assessment of pilot studies—**ongoing, completed by October 2010**

Phase III: OLACPD Full Pilot Program Implementation (January 2010-February 2011)

Phase III will focus on capacity building in the targeted countries to enable the conduct of basic research, acquisition and integration of advanced technologies, and development and/or clinical research to move toward evidence-based cancer treatment and diagnostic and preventive strategies.

Overall Plan for Phase III

Lessons learned in Phase II of the pilot program will be used in Phase III to set goals and establish more expanded programs in clinical research and clinical networks, advanced technologies, and training development in targeted countries. Clinical research expertise and supporting in-country infrastructure will be assessed during and at the completion of pilot studies in Phase II to provide a foundation for the collaborative performance of high-quality cancer research, especially translational and clinical research. Phase III will also focus on the implementation of best practices programs in areas such as biospecimen acquisition and stewardship and bioinformatics. The expansion of successful programs in Phase III will depend on continuing to build a base of government and philanthropic support for the range of initiatives needed across the cancer research continuum required to address specific in-country needs.

Establishment of Regional Clinical Cancer Networks (Figure 2). Latin American countries have established health care centers, academic institutions, and research centers as separate entities. As shown in **Figure 2**, the OLACPD will leverage these existing networks through the establishment of regional support offices, or "hubs." These regional installations will serve to simplify and facilitate logistics and other needs as appropriate.

As seen from the PAHO Country Health Profiles, cancer research is conducted through a number of consortia-type arrangements with academia and research centers. The health care centers are able to facilitate clinical trials or treatment trials more effectively under the social medicine system than can be easily accomplished in the U.S.. These Latin American research networks also provide health care management for cancer patients. It is anticipated that these existing networks can be leveraged through collaborations between the NCI and the FIC through the OLACPD pilot program for the benefit of both the U.S. and the targeted Latin American countries. These types of partnerships promise to improve clinical and translational research in Latin America and inform research overall on cancer in the U.S. Hispanic population. All studies will be structured with clear milestones and outcomes to provide maximal benefit to the partners.

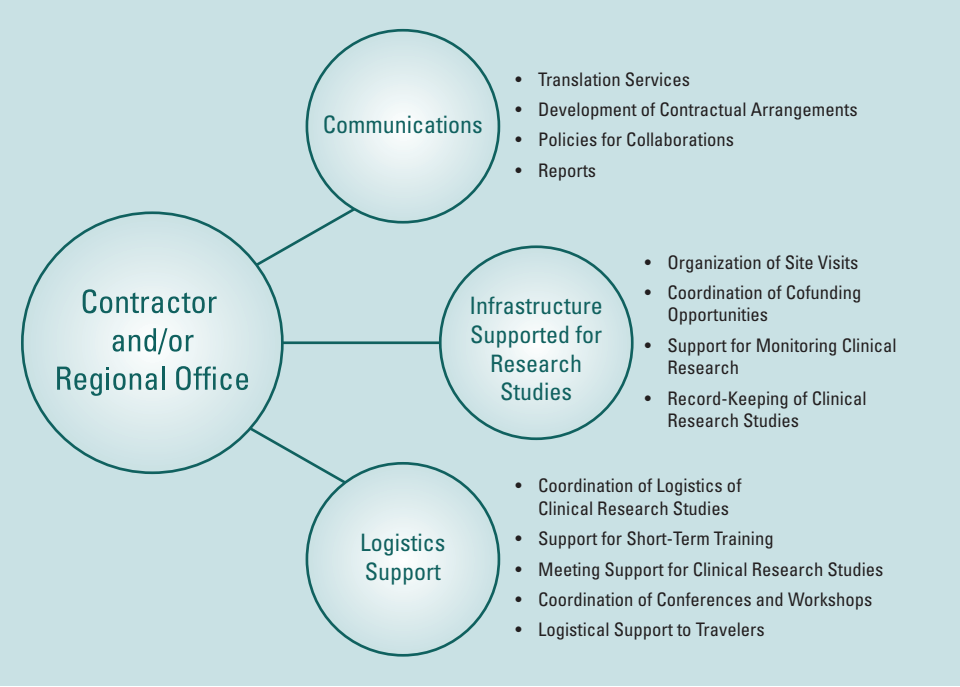


Figure 2: Overview of Regional Clinical Cancer Networks

Based on the consortia arrangement, academic institutions, research centers, and health care centers offer the opportunity to model research networks that resemble existing experience and expertise in the NCI Cancer Centers Program. One of the major strategies of Phase III is to identify and further develop robust Regional Clinical Cancer Networks in the targeted Latin American countries and work with these groups to establish accreditation programs as centers of excellence in cancer research. A program to assess the capacity of these networks to perform at a high level in terms of conducting high-quality clinical cancer research will depend on their capabilities and their compliance in areas such as ethics, regulatory policies, technologies and infrastructure, and the supportive business infrastructure.

Technology and Capacity Building Pilot Program (Figure 3). The goal of this strategic element of the pilot program is to adapt advanced technologies and assist the targeted countries in building the in-country research capacity needed for basic, translational, and clinical cancer research through mutually beneficial partnerships. Several of these programs will by necessity focus on building valuable infrastructure for personalized medicine. **Figure 3** illustrates that specific resources targeted for development include (virtual) tumor and biospecimen banks, cancer registries, caBIG™-compatible bioinformatics infrastructures, and regional centers of advanced technology.

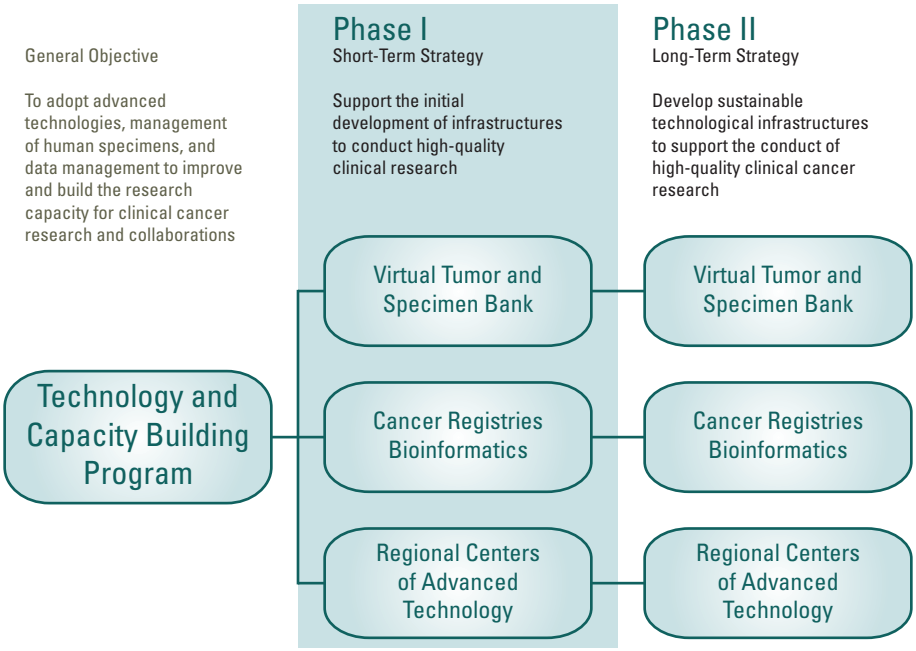


Figure 3: Overview of Technology and Capacity Building Pilot Program

In selected countries, virtual tumor and biospecimen banks will be enhanced or established to make biospecimen resources available to the international research community. This is a challenging undertaking, and the OLACPD will employ a number of resources to achieve this goal. Specific tools developed by the NCI will be engaged and adapted for the purpose of enhancing in-country current bioinformatics platforms. Participating institutions in Mexico and other Latin American countries will be encouraged to adapt established standard operating procedures to design and maintain high-quality repositories with well-annotated specimens. Appropriate procedures and logistics regarding tissue sharing, shipping, and handling will be addressed in a collaborative fashion between Latin American research networks and the NCI.

The OLACPD will also support and enable the establishment of cancer registries to facilitate the generation of valid information on cancer prevalence and mortality rates in the targeted Latin American countries. This strategy will be implemented stepwise, first, by adapting existing international cancer registry standards to the cultural and legal circumstances of the targeted countries and, second, by establishing processes that will allow investigators to monitor cancer trends and effects on cancer care. It is planned that cancer registries will be initially developed as pilot programs and that respective countries will assume responsibility and ultimately integrate these resources into their long-term health care strategies. In partnership with the NCI Center for Bioinformatics, it is anticipated that these countries will be able to develop interoperable platforms and exchange data on cancer on an international basis.

Application technologies such as computational biology and informatics developed for cancer research are complex and expensive and require high-level training. However, to achieve the goals of the rapidly moving fields that make up cancer research today, the OLACPD will endeavor to enable the target countries with the needed base level of expertise and infrastructure to establish regional centers of advanced technology—initially supported through seed funds and subsequently supported through in-country resources. This is a complex mission that will include adapting a range of advanced technologies such as genomics and proteomics. It will be critical that these technologies are well understood and properly applied in these Latin American countries to keep pace with 21st century cancer medicine.

Depending on needs and opportunities, several approaches will be used to fund these technology and capacity building programs in the targeted countries. These will include mechanisms such as RFAs and PAs, and every effort will be made to leverage cofunding opportunities for this critical effort. The OLACPD will also develop appropriate business models to support this initiative to ensure future in-country support and self-sustainability.

Training Pilot Program (Figure 4). It is anticipated that training development through the OLACPD will begin in Phase II of the pilot program. As shown in **Figure 4**, the overall goal of this program is to create a cadre of basic and clinical scientists who will over time assume leadership for the advancement of cancer research in the targeted Latin American countries. It is anticipated that three classes of training programs will be important to meet the goals of the OLACPD pilot program, including training in clinical research; traditional postdoctoral and sabbatical training; and training in advanced methodologies, techniques, and technologies.

A major goal of the OLACPD will be the initiation of programs that will support the development of basic and clinical investigators to conduct cancer research. This program will also complement the development of clinical networks. Several strategies will be employed to achieve this goal, including training basic and clinical investigators in cancer research to attract the next generation of investigators, increasing the current pool of outstanding researchers in clinical research, and improving clinical cancer care through training beyond cancer researchers to include nursing and other professionals. The “north–south” type of program will be employed as appropriate to train Latin American investigators in the U.S. However, the “south–south” type of training programs (in-country) will be utilized in countries such as Mexico, Chile, Brazil, Argentina, and Uruguay, where the appropriate facilities and environment exist on a regional basis.

The Training Program will focus on different levels of training (postdoctoral, fellowship, sabbatical, visiting professorship, etc.) and will be funded through the most appropriate mechanisms. For example, the RFA and PA mechanisms will facilitate collaboration among the many NIH institutions such as the NCI–FIC Non-communicable Chronic Diseases Research Training Program. The experience of the FIC in these areas will be sought in designing and developing training development programs for the OLACPD.

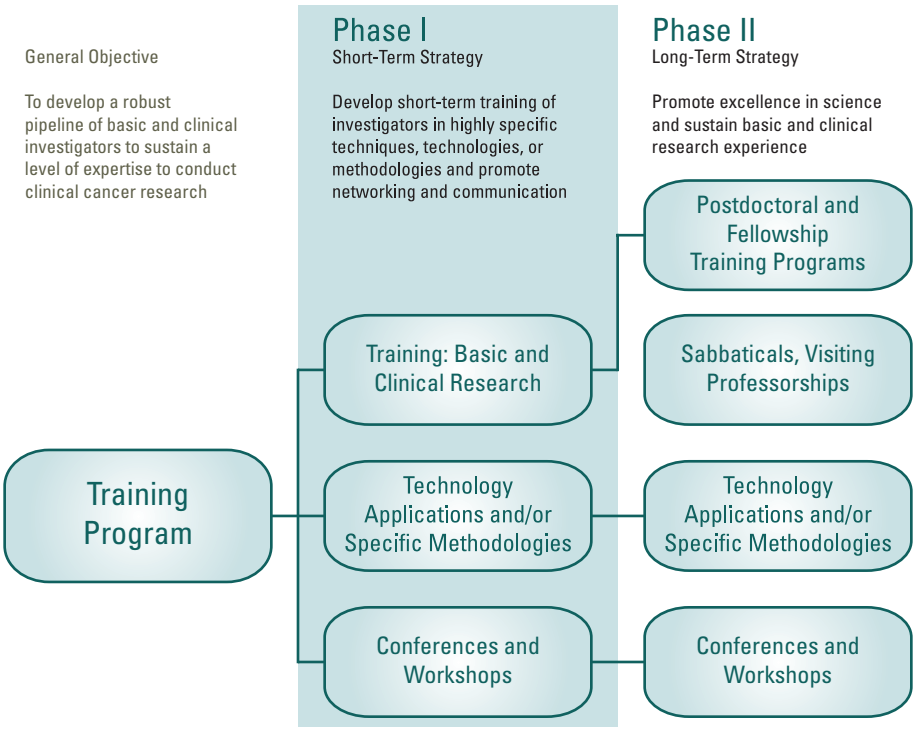


Figure 4: Overview of Training Program

A major focus of the training experience for nearly all investigators will be to provide access to instruction in the application of newly established technologies and methodologies. This type of training will be critical to establishing and sustaining a strong cadre of cancer researchers at all levels. To accomplish this goal, the OLACPD will seek to establish partnerships between existing cancer research networks in Latin American and U.S. cancer centers. The goal of these training development programs will go beyond providing direct training in technologies to promote the development of the technical and intellectual resources needed to build local capabilities. Achieving this goal will promote international collaborations of high-quality research standards within and outside Latin America.

Funding for Clinical Research Networks through Partnerships. As shown in **Figure 5**, the OLACPD will seek to fund the planned novel networks through a combination of U.S. and Latin American government and philanthropic resources. It is anticipated that a combination of partners could range from north–south collaborations, such as U.S. partnerships with Latin American entities, to south–south collaborations for in-country translational research.

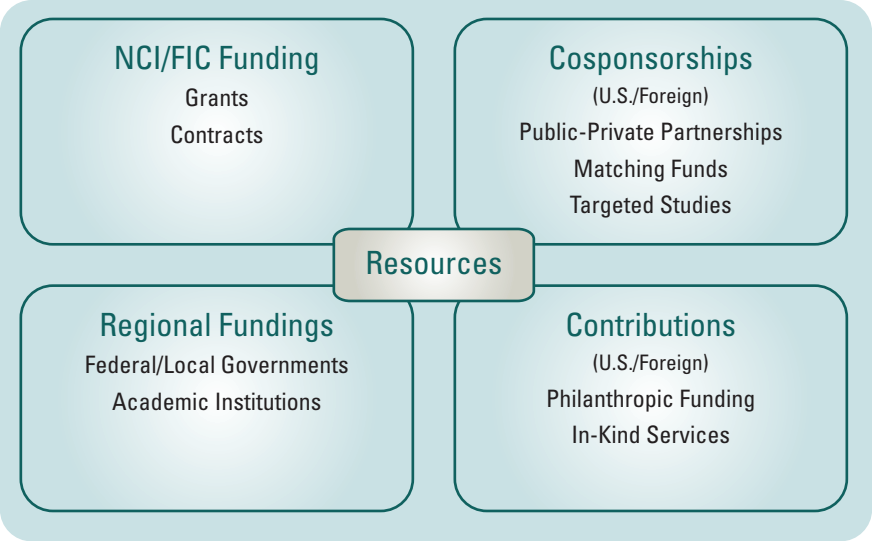


Figure 5: Funding OLACPD Programs Through Partnerships

To further support this concept, and achieve many of the key strategies outlined, the OLACPD plans to develop an appropriate business model that would allow the establishment of two to three regional clinical cancer networks as illustrated in **Figure 2**. This concept will be further explored during Phase II of the pilot program to determine whether strategically locating these types of offices will facilitate the work of the OLACPD.

Milestones for Phase III (November 2010-September 2011)

The following milestones are anticipated to monitor progress in Phase III:

- Implement the Phase III strategy for the Scientific and Clinical Research Pilot Program, including formal acknowledgment and launch of regional clinical cancer networks and selected full-scale clinical trials initiated with appropriate correlative science studies—**December 2010–February 2011**

- Implement long-term strategy for the Technology and Capacity Building Program, including launch of selected regional centers of advanced technology, cancer registries with international accreditation, and virtual tumor and specimen banks under way—**January 2011–July 2011**

- Implement long-term strategy for the Personnel Development Program, including appropriate mechanisms for training (e.g., FIC partnerships, RFAs, PAs); development of partnerships for technologies/methodologies training; and expansion of the Personnel Development Program to include regional training programs—**December 2010–June 2011**

Appendix 1

Research and Health Care Capabilities of Mexico, Brazil, Chile, Argentina, and Uruguay[6]

Mexico

Policies and national health plans: The "National Development Plan, 1995–2000" was established as a priority for combating inequity among persons, genders, productive sectors, and geographical regions. The health policies implemented along the same lines were oriented toward the reorganization of the system to expand its coverage and provide more efficient and effective services and to deal with prevalent diseases and the new health challenges that have arisen from the changes in the national epidemiologic and demographic profile. The provisions of this plan include free choice of family physician, family health insurance for those who can pay, decentralization of services, a basic health care package at the municipality level, reorganization of the system under the Secretariat of Health, and separation of financing and service delivery within the Instituto Mexicano del Seguro Social (IMSS). To meet the second objective, 11 program areas were established for disease prevention and health promotion and in-service research.

Health sector reform: In fulfillment of the National Health Sector Reform Program 1995–2000, the system was opened to the population with the capacity to pay and resulted in an increase of the insured population from 48 million to 55 million. The population without regular access to health care services was reduced to 500,000 persons. The Secretariat of Health has concentrated more on regulation of the sector and less on direct delivery of services. Extensive managerial training has been provided, and measures have been taken to improve quality control. In 2000, the Specialized Health Insurance Institutions were created to provide comprehensive private health insurance and new financing systems were tested.

Health system: The social security system—which covers workers in the formal economy (58 million in 2000)—comprises several institutions, each of which is funded by contributions from employers, employees, and the government. The IMSS is the largest institution in the system and serves about 80% of the covered population. The system also includes the State Workers' Social Security and Services Institute, Petróleos Mexicanos, the Armed Forces, and the Navy. The legal framework of the sector is based on two general laws: the General Health Law and the Social Security Law. Several Mexican states have their own legislation. Within the framework of the North American Free Trade Agreement (NAFTA), intergovernmental groups of the U.S., Mexico, and Canada work to harmonize legislation concerning products and health-related services. The Secretaría de Salud de México (SS) provides leadership of the health system. Private health services are fragmented—48% of the 31,241 beds of private hospitals in 1999 were located in establishments with fewer than 15 beds. The SS provides care of unequal quality and with variable prices. Nongovernmental organizations provide important development in areas such as reproductive health, domestic violence, and AIDS and other diseases, working increasingly in a coordinated way through networks.

Organization of regulatory actions: The Secretariat of Health is responsible for overseeing the quality, safety, and efficacy of drugs, reagents, immunobiologicals, and medical equipment. It maintains national registries for all health supplies, regulates marketing by issuing licenses and health product registrations, and oversees advertising that appears in the mass media. The verification, analytical control, and evaluation of drugs and supplies are performed by Secretariat of Health laboratories or authorized third-party institutes. Potable water supply and sanitation services are the responsibility of municipalities. Each state has its own law or

[6]All data in this section have been extracted from Pan American Health Organization materials.

code on potable water, as well as a water commission that provides the municipalities with technical and financial support. Private enterprise provides water on a very small scale. The use of chemical substances is authorized by the General Directorate of Environmental Health under the Secretariat of Health, and the Intersecretaria Commission on Pesticide, Fertilizer, and Toxic Substance Control is responsible for their regulation and marketing as well as for controlling their effects on health and the environment. Air quality is monitored in 14 cities of the country by stations that measure the most critical atmospheric contaminants. The General Directorate for the Sanitary Quality of Goods and Services, in collaboration with the National Public Health Laboratory, is responsible for monitoring health-related products and services. Between 1998 and 2000, 24% of the water samples packaged for human consumption had microbiological problems.

Organization of public health care services: Public health care services are provided by the Secretariat of Health with support from the social security institutions, especially the IMSS. Programs of community health include health promotion and disease prevention activities in homes, schools, and workplaces. The SS and the Secretariat of Public Education offered a health program for school children and adolescents in 30,000 schools and also carried out the Healthy Schools Initiative. Since 1998, all health institutions utilize the ICD-10 for classification of mortality. The drinking water infrastructure covered 88% of the population in 2000; 23 states had coverage higher than 85%, and 5 states had coverage lower than 70%. In 2000, 95% of the drinking water was disinfected. Sewage disposal services covered 76% of the population in 2000, and 5 states had coverage higher than 85%, 17 states had between 70% and 85% coverage, and the remaining 10 states had coverage lower than 70%. In 2000, 76% of the population had access to sewage services and excreta disposal—urban population, 90%, and rural, 37%. There is an official standard for handling hospital waste and the majority of such waste is incinerated.

Organization of individual health care services: The organization of individual health care services is structured by levels of care. The first level includes actions of health promotion, disease prevention, and outpatient care. It also includes basic sanitation, family planning, prenatal care, puerperium and newborn care, surveillance of nutrition and growth of the child, immunization, case management of diarrhea, antiparasitic treatment, care for respiratory infections, prevention and control of pulmonary TB, prevention and control of hypertension and diabetes mellitus, accident prevention and initial management of lesions, social involvement, and prevention and control of cervical cancer. The second level provides basic specialties at general or specialized hospitals. Outpatient care and hospitalization are available and, in general, diagnostic imaging and laboratory support services are also provided. The third level provides specialized care of greater complexity as well as clinical and basic research of specialized physicians with support of specialized nursing and other professionals. In 1997, the Program of Education, Health and Feeding was launched for families in extreme poverty and provides monetary support, educational fellowships, nutritional supplement to children younger than 5, pregnant women, and women who are lactating. In 2000, some 2.6 million families from 31 states benefited from this program.

Health supplies: The national and international pharmaceutical industry is made up of more than 150 companies. In 2000, they produced more than 95% of drugs for domestic consumption. The sixth edition of the official Mexican pharmacopoeia was published in 1994, followed by supplements in 1995, 1997, and 2000 updating the specifications for drug manufacturing and for marketing in the country.

Human resources: In 1999, the rates of physicians, nurses, and dentists per 100,000 had not varied from recent years. In 1999 they were 131, 182, and 9, respectively. In that same year, 62,951 physicians and 29,365 nurses worked in private hospital units. There were 1,033 programs of health sciences. In terms of largest numbers, 545 of them are at the specialized level and 297 at the bachelor's degree level. By area of

knowledge, the largest numbers were medicine (509) and dentistry (167). There were 79,524 students in the 78 schools of medicine in 1999, with 77% at public schools.
http://www.paho.org/English/DD/AIS/cp_484.htm

Brazil

National health policies and plans: The national health policy is based on the Federal Constitution of 1988, which sets out the principles and directives for the delivery of health care in the country through the Unified Health System (Sistema Unico de Saude (SUS)). Under the constitution, the activities of the federal government are to be based on multiyear plans approved by the national congress for 4-year periods. The essential objectives of the health sector were improvement of the overall health situation, with emphasis on reduction of child mortality, and political-institutional reorganization of the sector, with a view to enhancing the operative capacity of the SUS. The plan for the next period (2000–2003) reinforces the previous objectives and prioritizes measures to ensure access to activities and services, improve care, and consolidate the decentralization of SUS management.

Health sector reform: The current legal provisions governing the operation of the health system, instituted in 1996, seek to shift responsibility for administration of the SUS to municipal governments, with technical and financial cooperation from the federal government and states. Another regionalization initiative is the creation of health consortia, which pool the resources of several neighboring municipalities. An important instrument of support for regionalization is the Project to Strengthen and Reorganize the SUS.

Regulatory actions: Procedures for the registration, control, and labeling of foods are established under federal legislation, which assigns specific responsibilities to the health and agricultural sectors. In the health sector, health inspection activities have been decentralized to the state and municipal governments. The environmental policy derives from specific legislation and from the Constitution of 1998.

Public health care services: The main strategy for strengthening primary health care is the Family Health Program, introduced by the municipal health secretariats in collaboration with the states and the Ministry of Public Health. The federal government supplies technical support and transfers funding through the Piso de Atençao Básica. Disease prevention and control activities follow guidelines established by technical experts in the Ministry of Public Health. The National Epidemiology Center, an agency of the National Health Foundation, coordinates the national epidemiological surveillance system, which provides information about and analysis of the national health situation.

Individual health care services: In 1999, 66% of the country's 7,806 hospitals, 70% of its 485,000 hospital beds, and 87% of its 723 specialized hospitals belonged to the private sector. In the area of diagnostic support and therapy, 95% of the 7,318 establishments were also private. Some 73% of the 41,000 ambulatory care facilities were operated by the public. Hospital beds in the public sector were distributed as follows: surgery (21%), clinical medicine (30%), pediatrics (17%), obstetrics (14%), psychiatry (11%), and other areas (7%). In the same year, 43% of public hospital beds and one-half of the hospital admissions were in municipal establishments. Since 1999, the Ministry of Public Health has been carrying out a health surveillance project in Amazonia that includes epidemiological and environmental health surveillance, indigenous health, and disease control components. With $600 million USD from a World Bank loan, efforts are being made to improve the operational infrastructure by training in human resources and research studies. An estimated 25% of the population is covered by at least one form of health insurance; 75% of the insurance plans are offered by commercial operators and companies with self-managed plans.

Health supplies: Brazil is one of the world's largest consumers of drugs, accounting for a 3.5% share of the world market. To expand the access of the population to drugs, incentives have been offered for marketing generic products, which cost an average of 40% less than brand-name products. In 2000, 14 companies were authorized to produce generic drugs, and about 200 registered generic drugs were being produced in 601 different forms. In 1998, the National Drug Policy was approved, whose purpose is to ensure the safety, efficacy, and quality of drugs and promote rational use and access by the population to essential products. The responsibility for national production of immunobiologicals is entrusted to public laboratories, which have a longstanding tradition of producing vaccines and sera for use in official programs. The Ministry of Public Health invested some $120 million USD in developing the capacity of these laboratories. In 2000, the supply of products was sufficient to meet the need for heterologous sera, such as those used in vaccines against tuberculosis, measles, diphtheria, tetanus, whooping cough, yellow fever, and rabies. In 1999, quality control of transfused blood consisted of 26 coordinating centers and 44 regional centers.

Human resources: In 1999, the country had some 237,000 physicians, 145,000 dentists, 77,000 nurses, 26,000 dietitians, and 56,000 veterinarians. The national average ratio was 14 physicians per 10,000 population. In 1999, of the 665,000 professional positions, 65% were occupied by physicians, followed by nurses (11%), dentists (8%), pharmacists and biochemists (3.2%), physical therapists (2.8%), and other professionals (10%). An estimated 1.4 million health sector jobs are occupied by technical and auxiliary training.

Health sector expenditure: In 1998, national health expenditure amounted to $62 million USD, which corresponded to nearly 7.9% of the GDP. Of that total, public spending accounted for 41.2%, and private expenditure accounted for 58.8%.
http://www.paho.org/English/DD/AIS/cp_076.htm

Chile

National health policies and plans: The policies and plans defined for the period 2000–2006 established the following strategic goals: (1) stress the importance of citizen health rights; (2) reform the finance system; (3) prepare a program for equitable access to health services; (4) modernize the social safety net for health; (5) improve health guarantees in the public sector; (6) develop a government health promotion policy; (7) monitor respect for the rights of members of the private health insurance plans (Isapres Banmedica, ISAPRE); and (8) institutionalize the quality of care. The Ministry of Health's short-term goals (2000–2002) were to provide timely access to care, respect for the health rights of citizens by adhering to the patients' Bill of Rights, and creation of a national program of user participation.

Health sector reform strategies and programs: To advance reform, the government established an interministerial committee in 2000. The basic proposal establishes a guaranteed plan that is binding on the public insurer Fondo Nacional de Salud (FONASA) and the private insurers (ISAPREs) and ensures effective and timely treatment of the most frequent, most serious, and most costly diseases. Priority is placed on primary care, and the family and community health teams will be strengthened. In structural terms, the reform is intended to create a solidarity fund, financed by government contributions and three-sevenths of the mandatory health care quotas, which will finance a guaranteed plan for the members of the FONASA and the ISAPREs.

Health system: The Ministry of Health is the lead agency in the sector. It formulates and establishes health policies; issues general standards and plans; and supervises, monitors, and evaluates compliance with them. The Health Services, the FONASA, the ISAPRE Authority, the Public Health Institute, and the Central Supply Clearinghouse report to the Ministry of Health. There is also an Environmental Health Service in the Santiago metropolitan region. The Public Health Institute is responsible for regulating drugs and medical

inputs. The health services system is mixed. Public insurance is provided through the FONASA, which receives contributions from its members and transfers from the national government to cover indigent individuals and to carry out public health programs. The private sector is represented by ISAPREs, which are health insurers. Services are delivered by public and private suppliers. The vast majority of primary care establishments depend on "communes," and the hospitals are under the direction of the Health Services. There are a series of clinics, centers, laboratories, and pharmacies managed by private individuals or companies. The FONASA covers 63% of the population and the ISAPREs 23%. The remaining 14% of the population is covered by other private plans (such as the armed forces plan) or has no insurance at all.

Organization of health regulatory actions: Health care is regulated by rules that form part of the Ministry of Health's programs. The programs define coverage, frequency of contacts between users and service providers, and the responsibilities of the different levels in the system. The Health Services directorates are responsible for regulating public and private health care establishments located in the territory of the respective Health Service.

Health supplies: The drug market is governed by a series of regulations on standards for products and distribution and sales chains and is affected by factors such as the significant market share of generic drugs, the large presence of national laboratories, and the existence of the Ministry of Health's Central Supply Clearinghouse. There are no price controls on medications. Generic drugs account for 38% of the total pharmaceutical market.

Food quality: A new regulation governing food safety has been promulgated. There is also a control and hygiene program with national coverage and coordination, which is supported by the national network of bromatological laboratories.

Prevention and control programs: The Ministry of Health's basic programs (children, women, adults, and oral health) have been designed to take a comprehensive approach, including promotion, prevention, treatment, and rehabilitation. The Ministry of Health has established specific prevention programs, including immunization, food supplements, control of respiratory diseases, prevention of traffic accidents, control of the Red Tide, and eradication of Chagas disease. There are also programs that detect uterine cervix and breast cancers with coverage of 60% and 30%, respectively.

Health analysis: The Public Health Institute carries out epidemiological surveillance in cooperation with the Ministry of Health's Epidemiology Department. Through the National Control Department, the Public Health Institute monitors the national system for control of pharmaceutical products, food, cosmetics, pesticides for sanitary and domestic use, and medical articles. With regard to potable water and excreta disposal services, in 1998, 99% of the urban population had access to potable water through public systems, 90% had access to sewage systems, and 4% had access to mainly septic tanks and soakaways. Of the urban population, 1% (115,000 people) had no water service, and 7% (853,000 people) had no adequate sewage disposal system. Pollution prevention and control studies indicate that metering equipment should be installed in the cities of Rancagua, Temuco, Valparaiso, and Viña del Mar.

Organization of individual health services: The public health network comprises ambulatory and hospital facilities offering services of differing complexities. They include 196 general hospitals, 20 high-complexity hospitals, 526 primary care clinics, 1,840 rural health posts and medical stations, and 73 establishments of other kinds. There is 1 clinic for about 28,500 people (1 per 17,100 if only FONASA members are considered). There is 1 rural post for every 1,900 rural dwellers, considering only FONASA members, who represent an estimated 14.6% of the total population. The country has about 30,000 hospital beds, or 1 bed per 5,000 people (or 1 bed per 3,000 FONASA beneficiaries). In 1998, there were approximately 1 million discharges from

public hospitals. Acute treatment is provided by emergency services in hospitals and emergency primary care services. The main private hospital and clinics also offer emergency care. Auxiliary diagnostic and therapeutic services are offered by the public and private sectors. In the public sector, the services are located in hospitals and respond to demand generated by ambulatory services and hospitals.

Human resources: The country had 17,467 physicians in 1998 (18 physicians per 10,000 population). It is estimated that just 8,000 of the country's 18,000 nurses worked in the public sector. In 2000, the public health sector employed 90,000 people, and administrative and service staff members accounted for one-third of the total.

Health research and technology: Health research is carried out primarily in universities and research centers. The government, through the National Science and Technology Council, provides incentives for health research that has targeted basic sciences and clinical areas more than public health. To promote essential research on the country's priority health problems, the Ministry of Health has developed a national research policy on health policies.

Health sector expenditure and financing: In 1999, average per capita spending for the total beneficiary population of the FONASA and ISAPREs was $279 USD ($245 USD for FONASA beneficiaries and $362 USD for ISAPRE beneficiaries). The public sector is financed from government contributions, quotas, and copayments by members of the public system and operating system. In 1999, this distribution was 54%, 39%, and 7%, respectively. In 1990, the figures were 41%, 53%, and 6%, respectively. Direct contributions by municipalities, which averaged $8.50 USD per capita in 1998, should be added to these figures. Spending on health accounted for 17.1% of public social spending in 1999. As a percentage of the GDP, health spending rose from 2.0% in 1990 to 2.8% in 1999.

Technical cooperation and external financing: In 2000 external technical cooperation was received for projects on the quality of life, mental health, epilepsy, measures of equity in health, and HIV/AIDS. Efforts were made to seek lines of work shared with the United Nations system and between it and its national counterparts.
http://www.paho.org/English/DD/AIS/cp_152.htm

Argentina

National sanitary policies and plans: The Federal Plan of Health 2004–2007 proposes the following as main lines for the new roles and responsibilities of the different parts of the sector :

- Strengthening of the National Ministry of Health and the Provincial Ministries in their governing duties.
- Guarantees given by the regions on the assurance of the universal basic coverage.
- Development of preventive and promotion programs, emphasizing primary care and respecting the growing mechanisms of derivation within the care network by the provinces and townships.
- Protection of the financing of the established programs.
- Organization of the people to promote their role in the design and implementation of the model.

Health system: The Argentine health system has two important characteristics. First, it is very decentralized to the provincial level. The second important characteristic is the historical role that workers have played

in the country. During the 1950s, the main instrument to finance health care was the responsibility of the workers' unions constituted in the so-called Social Works (Obras Sociales). Even today, those Social Works represent more than 300 organizations with their corresponding health care plans, whose effectiveness is irregular. The Ministry of Health publishes basic standards about the provision of health services and the conditions of functioning of those services.

Prevention and control of diseases: The Program of Maternal and Infant Health Care protects women and children at risk. It emphasizes prenatal care, delivery of care, and control of the health and development of children. The vaccine coverage increased progressively during the 1980–2002 period. Since 1990, vaccine coverage has been higher than 80% in all provinces and, since 1995, higher than 85%. In 2002, the national coverage was 93.8% for Sabin (third dose), 92.5% for DPT (third dose), and 95% for measles vaccine. The program against human retrovirus and AIDS provides charge-free antiretroviral drugs to the uninsured population, supports the determinations of viral load, and develops informative actions directed to the general public and focuses those actions on high-risk groups.

Health analysis: The National Program of Health Statistics (NPHS) provides statistics on living conditions and health problems, delivering data on vital statistics (marriages, birth rate, mortality), morbidity, hospital productivity, and availability and usage of health resources for the process of management on various levels. The National System of Epidemiological Surveillance (NSES) is responsible for the register of Mandatory Medical Notifications. The NSES consolidates, on a weekly basis, the data of those diseases whose notification is mandatory, as well as associated laboratory data.

Drinkable water and sewage disposal: In the entire country (urban and rural areas), the drinkable water and/or drainage services are operated by 1,548 companies or bodies. Of these organizations. 68% are private companies and the remaining 32% are state-operated bodies. The coverage of drinkable water in 2001 was 77%, but there is inequitable distribution of these services.

Food protection: The development of local and provincial systems of food protection is currently a priority within the preventive approaches based on the use of good practices of food rendering (processing), analysis of risks, and control of critical points. The communication of risks has been strengthened through educational campaigns using mass media, education programs in schools, and development of educational materials for use in different fields. Argentina coordinates the Codex Alimentarius Latin America Committee and the Salmonella and Pulse Net surveillance networks for the region.

Individual health services: All provinces have organized networks of hospital and ambulatory services, some of which are very advanced. Many others have primary care services, which are not always well integrated with the provincial networks, which have wider coverage and response capacity. Some provinces have integrally transferred the primary health care to the township level. Diagnostic support services in the public sector are integrated into the hospital network. In the private sector, those services are mostly located in the hospital network, but in the largest cities, autonomous diagnostic support units usually hire services with health plans.

Health supplies: Within the drug market, almost all the final products are produced within the country. However, in the case of other medical and health supplies, those produced in Argentina represent 25% of the total. Although there is no updating on the size and structure of immunobiological products in Argentina, it is estimated that 85% of those supplies are imported and 15% are locally produced with the required quality standards. In the Bases of the Federal Health Plan 2004–2007, the importance of the Drugs National Policy (DNP), which was incorporated in 2002, ratifies and establishes a new regulatory framework with clear and set rules that benefit the sanitary system. That policy was defined initially in the Need and Urgency Decree

No. 486/2002, which established the sanitary emergency in the national territory and was ratified by the Law of Use of Drugs by their Generic Name (No. 25,649). The absolute priority assumed by the DNP is the promotion of population access to the drugs. According to international experience, the principal strategies that were defined were the regulation of the drug market and the direct provision of drugs to persons without the economic resources to buy medicines from drugstores. The national government guaranteed, from 2004 to 2007, through the REMEDIAR program, the supply of drugs for mostly ambulatory treatments to 5,300 Centers of Primary Health Care in the country. The REMEDIAR program allows response to 80% of all patient visits in those centers.

Human resources: The results obtained by the National Network Observatory of Human Resources for Health in Argentina showed that in 1998 there were 440,100 health workers (3% of the economically active population). Doctors represent 24.7%; dentists, 6.6%; and nurses and assistant nurses, 19.6%.

Health research and technology: The financing system for research is unusual. It consists of awarding positions and doctorate scholarships, given by the Science and Technique Ministry through the CONICET, to scientific and technological researchers of varying levels who will be working in the most diverse institutions, both public and private. The national universities and the National Health and Environment Ministry through the Undersecretary of Sanitary Relations and Health Research also contribute through research scholarships.

Health sector expenditure and financing: In 2003, 54% of the health expenditure was public and 46% was private. Of the public expenditure, 55% was financed by Social Security (5%) and directly from taxes (45%). In 2002, the total health expenditure was estimated at $23.6 million USD, which represented a per capita expenditure of about $745 USD. The largest external financing contributions come from loans for projects from the Inter-American Development Bank and the World Bank.
http://www.paho.org/English/DD/AIS/cp_032.htm

Uruguay

National health plans and policies: The following six main health-related objectives have been established for the 2000–2005 period: (1) strengthen the management of public and private health care institutions; (2) adapt the supply of available services to the epidemiological characteristics and needs of the population; (3) make health care coverage universal by facilitating access and care at the four levels of complexity; (4) enhance the quality of services at the four levels of complexity; (5) rationalize the use of services at the Institutes of Highly Specialized Medicine; and (6) promote the participation of service users and health care institutions in order to solve problems in a climate of trust and respect for the rights of citizens. The Ministry of Public Health has established a program, under an agreement with the principal health care institutions, to overcome the crisis affecting the Collective Health Care Institutions (CHCI) and to maintain job opportunities. Reducing the prices that the public pays for drugs is one of the priorities established by the Ministry of Public Health. Prices could drop significantly, as much as 40%, if an agreement were reached between the Ministry and the chambers representing domestic and foreign laboratories.

Health sector reform: The government's main concern is the coverage and maintenance of the mutual assistance system, which means reorganizing the management of the mutual assistance associations and their health care models. To this end, the Minister of Public Health convened the Intersectoral Commission for the Strengthening of the Mutual Assistance System. In 2000 and early 2001, the Ministry conducted a number of CHCI management audits to analyze the financial status of the institutions. The audits reflected the debt situation of the CHCIs.

Health system: The public health system in Uruguay comprises two sectors: public and private. The public sector is made up of the institutions under the Ministry of Public Health, through the State Health Services Administration (ASSE); University of the Republic (University Hospital); Armed Forces Health Service; Police Health Service; Social Welfare Bank; health services of autonomous and decentralized agencies; and services delivered by the 19 departments. The private health sector consists mainly of the collective health care institutions, which are private, nonprofit organizations that are formed and operate under the provisions of Law No. 15,181 and its regulatory decrees. There are some 48 CHCIs that provide medical care to almost one-half of the population through prepaid comprehensive health insurance. There are also several private sanatoriums, which provide private medical care to high-income groups; most of them lease their services to the CHCIs and offer partial insurance coverage. In terms of coverage, the ASSE serves 33.7% of the population; the CHCIs, 46.6%; the Armed Forces Health Service, 4.2%; the Police Health Service, 1.8%; and other institutions, 1.2%. Some 11.7% of the population does not have formal coverage, and there are no data for 0.9%. Partial medical insurance has been expanding rapidly since the early 1980s.

Organization of public health care services: In the area of maternal and child health, the Ministry of Public Health has promoted activities aimed at newborns weighing less than 1,500 gm and at sudden infant death, especially at home. It was anticipated that starting in 2001, professional assistance would be provided free of charge to all women receiving care in the public sector.

Potable water, excreta disposal, and sewerage services: The coverage of potable water services is high in Uruguay (98% of the total population). Sewerage service coverage is 80% in the urban area of Montevideo. In urban areas in the provinces, such services are provided to one-half of the population. The State Sanitarian Works Administration (OSE) has set in motion plans for the treatment of effluents in large cities and has proposed other solutions appropriate for small towns. Of the country's population, 46% is connected to the sanitation system and 48% eliminates wastewater "in situ."

Food safety: Uruguay has traditionally had a high level of food hygiene. The year 1994 saw the start of intersectoral coordination and structuring of institutional and technical resources for food safety. The National Advisory Commission for Foodstuffs was formed. It operates within the orbit of the Ministry of Public Health and consists of representatives of the national and municipal public sector, chambers of industry and the food trade, and consumer organizations. The System for the Epidemiological Surveillance of Foodborne Diseases, which is coordinated by the Ministry of Public Health, provides nationwide coverage.

Organization of individual health care services: There are 76 blood collection centers in Uruguay, 51 of which process blood. Transfusions are regulated by a number of laws and decrees.

Health supplies: A broad legal framework regulates the importation, production, distribution, sale, and advertising of drugs. The Ministry of Public Health controls the requirements and demands for registering drugs that are regarded as necessary, effective, safe, and produced under conditions that ensure their quality. It also monitors the standards for the inspection of production laboratories, points of distribution and sale, and production processes. To perform this task, the Ministry has units for evaluation and registration, inspection (of manufacturers, importers, distributors, and sale and disbursement sites), and laboratory analysis for drug quality control. The basic inspection activities focus on production laboratories or marketing and on products, including labeling and advertising. Several factors impede the Ministry of Public Health's performance of these functions to varying degrees, among them shortages of human resources, delays in administrative processes, and the interests of the pharmaceutical industry.

Human resources: As of December 31, 1999, there were 12,486 physicians (39.5 per 10,000 population), 2,613 professional nurses (8.2 per 10,000 population), and 4,050 dentists (12.8 per 10,000 population) in

Uruguay. The training of human resources for health is not planned. In addition to the University of the Republic, private universities and institutes for the training of physicians, professional nurses, dentists, and nursing auxiliaries have been established in recent years. In general, there is a surplus of physicians and a shortage of professional nurses.

Health research and technology: Very little research in health technology is conducted in Uruguay, and it is performed outside the Ministry of Public Health. Records are not available to estimate the number of clinical trials for evaluating the efficacy and safety of new procedures.

Health sector expenditure and financing: Per capita health expenditure in 1998 was $697 USD, and total spending on health was equivalent to 10% of GDP. Public spending (46%) and private spending (54%) were relatively proportional. Public spending on health accounted for 14% of overall government outlays. The public sector accounts for all spending on health promotion, disease prevention, and epidemiological surveillance. In 1998, the private sector spent approximately four times more on drugs ($266 million USD) than the public sector ($70 million USD). In addition, the private sector spent $975 million USD on personnel costs, while the public sector spent $223 million USD.

External technical cooperation and financing: Both the World Bank and the Inter-American Development Bank (IDB) cooperate with the Ministry of Public Health and other institutions in the area of social services. Cooperation focuses on such areas as the decentralization of the Ministry's health care services, improvements in the identification of beneficiaries, and the training of human resources to manage the services. The Ministry of Public Health, in coordination with PAHO, continues the activities indicated in the Agreement between Uruguay and the Region of Emilia-Romagna, Italy, in the area of mental health. On several occasions in the 1998–1999 period, the PAHO/WHO Country Office in Uruguay provided advisory services in the area of health services management, with a view toward strengthening the Dr. Manuel Quintela University Hospital.
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