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## Inequities in Health and the Region of the Americas

In addition to the many health problems that Latin American and Caribbean countries have traditionally faced, they now must cope with new challenges brought about by such health risks as the AIDS epidemic, increasing violence, environmental hazards, and new and re-emerging diseases. These changes are occurring in the context of political and economic reforms, the increasing decentralization of health services that is inherent to the health sector reform process and escalating costs.

In any society, health status is related to individual biological and social characteristics, economic and political organization, social structure, and cultural background, as well as demographic and macroecological processes, all of which must be considered in order to discern long-term trends of the health/disease process. Developing the capability to establish reliable information systems and to analyze health status measures will facilitate a more precise definition of sectoral priorities, improved programming, monitoring, and evaluation of health programs.

During 1995, the health situation of the Region's countries in large part resulted from complex economic and social adjustments that pushed segments of the population into deeper poverty. This situation, in turn, translated into great disparities in the health conditions of different countries and population groups: Latin American and Caribbean countries show some of the greatest social inequities in the world. These socioeconomic changes have sharply curtailed the ability of health institutions to adequately distribute equitable services to vulnerable segments of the population,

bringing the problem of inequity and the search for a solution to it to the forefront.

For the Pan American Health Organization, the search for a way to ensure equity in the provision of and access to health care services represents one of the greatest challenges to its technical cooperation. Only, by identifying gaps in equity and access can effective actions that target the populations at greatest risk be programmed and implemented. Acknowledging this critical need, the Director of the Pan American Sanitary Bureau assigned high priority to a work plan designed to improve the Organization's capability to describe, analyze, and interpret the health situation and trends of the Region's countries and to strengthen the capability of the countries themselves to analyze their health situation and target their interventions accordingly. Data gathered and studies and analyses conducted will supply invaluable information to political and strategic planning and management processes and to efforts to evaluate and redirect technical cooperation activities in the countries. This information also will inform technical cooperation activities directed at defining and formulating investment projects or special programs and effective disease prevention and control strategies. Further, the information will help mobilize financial resources, define research priorities, and provide data for periodic publications on monitoring the health situation and trends in the Region.

To this end, the Organization has been working to define a set of core data that can be used for health and trend assessment analyses. The data will be complemented with important bibliographic and

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background information that can contribute to better understand the health situation. A special effort is being made to select basic indicators disaggregated by major inequity characteristics such as gender, ethnicity, social class, race, and geographic distribution.

This article will review the health situation of countries in the Region of the Americas and provide documentation of the importance of addressing equity gaps in health as part of health sector reform processes. This review will utilize basic health and health policy indicators that the countries provided to PAHO's Technical Information System.

### Methodology

Various indicators of health conditions, resources, coverage, mortality, and morbidity were analyzed in order to highlight inequities among the countries. All the data analyzed were obtained from *Health Conditions in the Americas (1)* and *Health Situation in the Americas: Basic Indicators 1995 (2)*.

Using discriminant analysis, 42 countries and other political units were classified in 5 groups, according to their per capita gross national product (GNP) (Table 1). This indicator represents a reasonable approximation of the resources available to each country for satisfying the basic needs of their people. The minimum and maximum values within each per capita GNP range, correspond to the lowest and highest values reported within each group.

The other indicators were analyzed by comparing the value of each country in a group with a calculated average for the group distribution. There were instances when the data was not available for all the countries within a group, as was the case with the income ratio of the highest 20% vs. the lowest 20% of the population, for which only 23 of the 42 countries had data. The percent of the gross domestic product (GDP) spent on health should not be analyzed independently from the GDP for each country. Any analysis of mortality data should consider the limitations inherent in this type of indicator; most importantly, data availability and quality.

### Inequities in the population's living conditions

The grouping of countries by GNP was the first step in evaluating equity gaps in health; it is the initial approach in estimating the resources that are available for meeting the population's needs.

**TABLE 1.** Selected countries and other political units of the Region of the Americas, grouped by per capita GNP in US\$, around 1993.

Group	Country	per capita GNP (US\$)
I	Cayman Islands	24,740
	United States of America	20,555
	Canada	20,000
	Bermuda	12,900
	Aruba	11,420
	Bahamas	10,600
	British Virgin Islands	26,200
II	Netherlands Antilles	7,220
	Argentina	7,000
	Puerto Rico	6,540
	Antigua and Barbuda	6,230
	Barbados	5,930
	Anguilla	5,700
	Turks and Caicos Islands	7,800
III	Saint Kitts and Nevis	4,410
	Trinidad and Tabago	3,380
	Uruguay	3,380
	México	3,610
	Saint Lucia	3,380
	Chile	3,170
	Brazil	2,930
	Venezuela	2,840
	Dominica	2,720
	Panama	2,600
	Belize	2,450
	Grenada	2,380
	Costa Rica	2,150
Saint Vincent and the Grenadines	2,120	
IV	Paraguay	1,510
	Peru	1,490
	Jamaica	1,440
	Colombia	1,400
	El Salvador	1,320
	Dominican Republic	1,230
	Ecuador	1,200
	Suriname	1,180
	Guatemala	1,100
	V	Bolivia
Honduras		600
Guyana		350
Nicaragua		340

Table 2 shows that 38.6% of the population of the Region of the Americas lives in the countries assigned to Group I, where the average per capita GNP is 3.4 times greater than for the countries in Group II and 48.3 times greater than that of the countries in Group V.

In examining the income ratios of those in the wealthiest 20% and those in the poorest 20% of the population within each country, a skewed trend is observed--the poorest countries have the highest ratios and the richest countries, the lowest (Figure 1).

According to data from *Health Situation in the Americas: Basic Indicators 1995*, in Canada, for example, the wealthiest 20% of the population has an income that is seven times greater than that of the poorest 20%. In the United States, the ratio is nine. Yet, in groups III and IV there are countries such as

Brazil with a ratio of 32, Guatemala with 31, Panama with 30. Honduras with 24, and Ecuador with a ratio of 20. When the average values of the incomes in the poorest quintile in the poorest countries are compared with those in the wealthiest, the incomes in countries such as Guatemala and Honduras are 60 times lower than those in countries such as the United States and Canada.

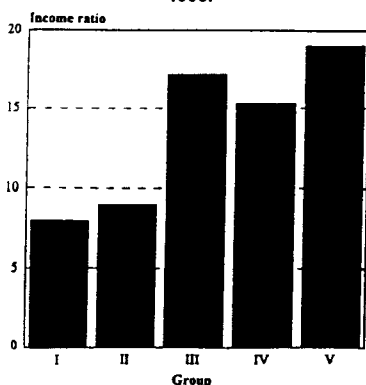
If the change in per capita GDP between 1991 and 1993 is considered (see Figure 2), the greatest growth is observed in group II and III countries: Argentina, 21.0%; Chile, 17.9%; and Panama, 17.4%. On the other hand, Group IV shows the smallest increase and Group V, the greatest decrease; these are the groups with countries that have lower GNPs (Haiti, -24.4%; Nicaragua, -11.0%; Suriname, -10.8%). By the same token, when group averages are compared, the poorer the country, the lower

**TABLE 2.** Total population (1995) and per capita GNP range and per capita GNP weighted average in US\$ (around 1993) in the Region of the Americas, by groups of countries.<sup>1</sup>

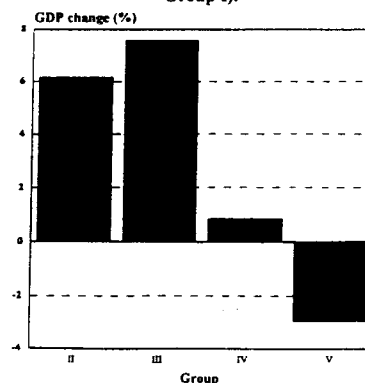
Group	Population (in thousands)	Per capita GNP(US\$)		
		Range		Weighted average
I	293,155	26,200	to 10,600	24,304
II	38,810	7,800	to 5,700	7,193
III	300,261	4,410	to 2,120	3,142
IV	102,383	1,510	to 1,100	1,355
V	25,516	760	to 280	503

<sup>1</sup> Groups of countries from Table 1.

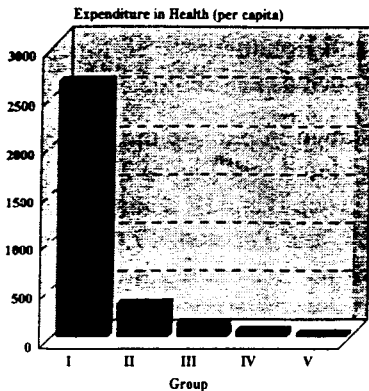
**Figure 1.** Income ratio (population with the highest 20%/population with the lowest 20%, average for each group of countries, around 1990).



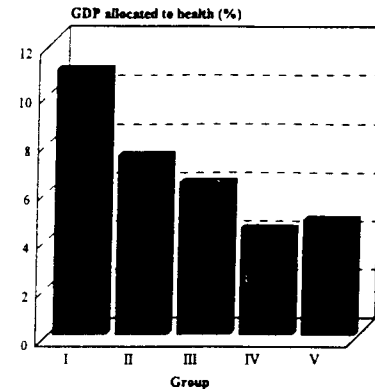
**Figure 2.** Percentage change in per capita (GDP) in the Region of the Americas, between 1991 and 1993, by groups of countries (except Group I).



**Figure 3. Per capita expenditure in health in the Region of the Americas, by groups of countries, 1990 (in 1988 US\$)**



**Figure 4. Percent gross domestic product (GDP) allocated to health in the Region of the Americas, by groups of countries, 1990.**



the growth (Group II, 6.15%; Group III, 7.57%; Group IV, 0.86%; and Group V, -2.94%).

**Inequities in the distribution of resources for health**

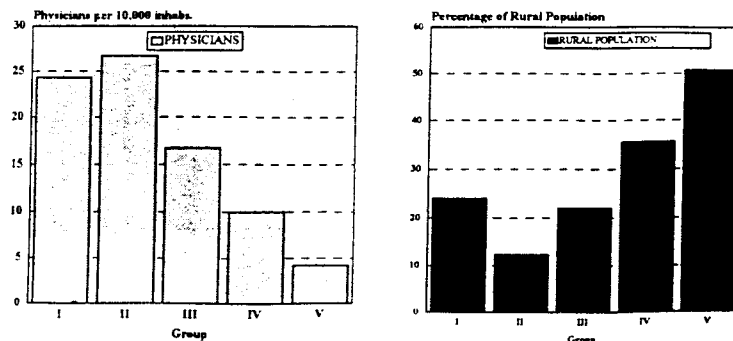
Vast differences exist among the five groups of countries in terms of expenditures in health. For example, countries in Group I spend 6.2 times more than those in group II and 80 times more than those in group V (Figure 3).

A disturbing trend is observed when the percentage of the GNP invested in health by the countries in each group is analyzed. Poorer countries tend to invest a lower percentage of their GNP (Figure 4), and this trend tends to widen inequities in availability and accessibility of health care.

For purposes of this analysis, the availability of physicians per inhabitants is being used as a proxy indicator of the availability of medical care and the proportion of population living in rural areas as an indicator of accessibility. Figure 5 shows the number of physicians per 10,000 inhabitants and the percentage of the population living in rural areas for each of the five groups of countries.

The data show that the availability of medical care decreases in the groups of countries where the per capita GNP decreases. On the contrary, the proportion of the population inhabiting rural areas increases in the groups of countries with lower GNPs. Therefore, based on these

**Figure 5. Physicians per 10,000 inhabitants and percent population living in rural areas in the Region of the Americas, by groups of countries, around 1992.**



two proxy indicators, both accessibility and availability decrease with lower GNPs.

In poorer countries, less money is available for health care. Concomitantly, one could say that the number of physicians per capita is lower and the problems associated with geographical access to health centers are greater.

### Inequities in the health status of the population

Inequities in the risk of becoming ill and dying prematurely correlate with inequities in the distribution of resources. This phenomenon is demonstrated in the infant mortality rates for countries in the Region, which range from 7 to 98 per 1,000 live births. Significant increases in this indicator are observed as important socioeconomic indicators decline. (Figure 6).

Infant mortality rates vary from country to country and within a given country. In Peru, for example, the city of Lima has an infant mortality rate of 50 per 1,000 live births, but some of the country's rural areas have rates as high as 140 infant deaths per 1,000 live births. In Panama, an indigenous infant is 3.5 times more likely to die than a non-indigenous infant. In Mexico City, the infant mortality rate ranges from 13.4 to 109.8 per 1,000 live births; the proportion of children with low birth weights tend to increase as poverty levels increase (Table 3).

A similar situation occurs with the proportion of

deaths due to acute diarrheal diseases among children under 5 years of age. Acute diarrheal diseases, long known to be preventable, kill more children in the countries with the lowest GNPs (Figure 7).

The emergence of new infectious diseases or the resurgence of others thought to have been controlled by public health measures also have significantly affected the health conditions of the countries of the Region. Two

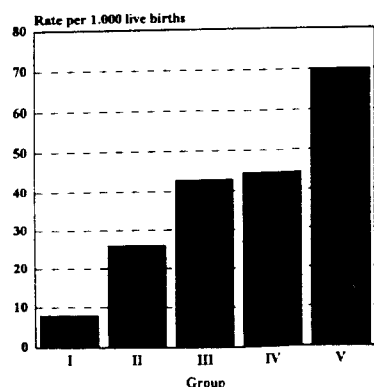
**TABLE 3.** Percentage of newborns with low birthweight (<2,500 g) of total births in the Region of the Americas, by groups of countries,<sup>1</sup> 1990.

Group	Newborns with low birthweight (<2,500 g), 1990 <sup>2</sup>
I	8.7
II	8.0
III	10.9
IV	12.0
V	13.2

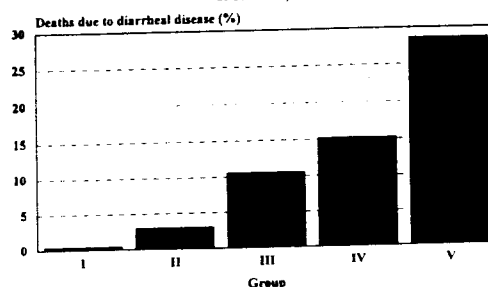
<sup>1</sup> Groups of countries from Table 1.

<sup>2</sup> Average of percentages of countries in each group.

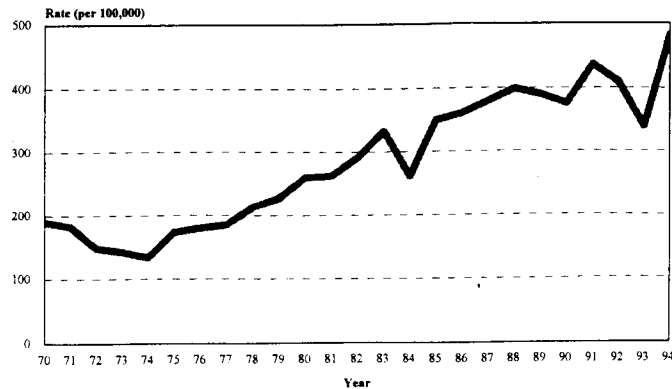
**Figure 6.** Infant mortality rate per 1,000 live births in the Region of the Americas, by groups of countries, 1994.



**Figure 7.** Percentage of deaths from acute diarrheal disease in children under 5 years of age in the Region of the Americas, by groups of countries (data for latest year available between 1988-1993).



**Figure 8. Trend in malaria morbidity rates (annual parasite incidence) between 1970 and 1994 for 21 countries with transmission in the Region of the Americas.**



dramatic examples of the latter are malaria and dengue. In the case of malaria, morbidity rates (as measured by annual parasite incidence rates) began to steadily rise in the mid-1970s, and have stabilized at rates that more than double the rates recorded two decades ago (Figure 8). A similar trend can be observed in the resurgence of dengue and dengue hemorrhagic fever (Figure 9).

Over the past four years, a cholera epidemic has swept through most of the Region's countries, leaving a toll of more than a million cases and nearly 10,000 deaths. This constitutes yet another example of a disease that had been virtually eliminated and then returned with a vengeance, ravaging the population's poorer and more disadvantaged segments. As shown previously, these infectious diseases tend to present with higher incidence, mortality, and case fatality rates in the countries with

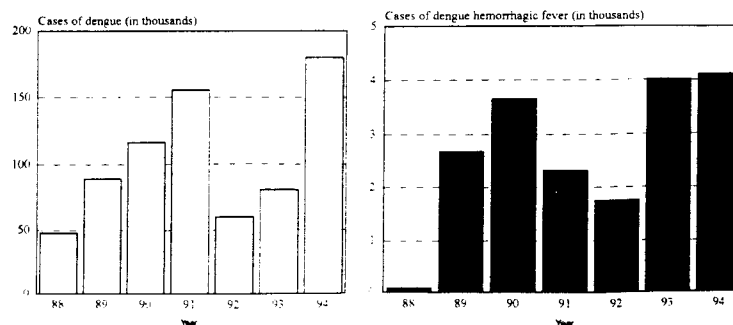
the lower GNPs.

Regarding tuberculosis, nine countries (representing 20% of the Region's population) present with incidence rates that reflect a serious situation for pulmonary tuberculosis, while eight countries (representing 67% of the population) present a less serious situation. An increase in the number of cases also is observed in these countries (Figure 10).

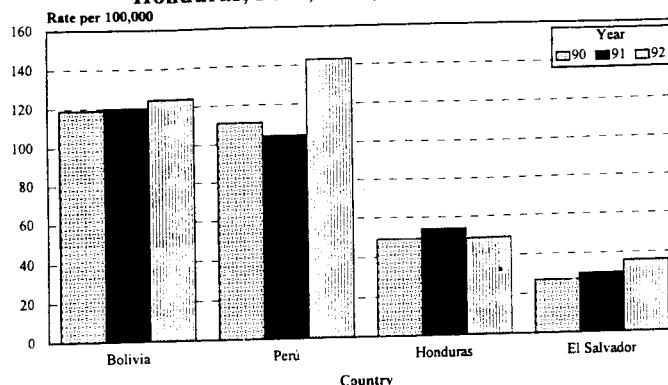
#### **Inequities in accessibility to the health services**

Even though every country in the Region is undergoing reform and adjustment processes, there are country-to-country differences in the stage of development of the health systems,

**Figure 9. Number of reported cases of dengue fever and dengue hemorrhagic fever in the Region of the Americas, by year, 1988 to 1994.**



**Figure 10. Annual incidence rates of confirmed cases of pulmonary tuberculosis (per 100,000 population) in Bolivia, El Salvador, Honduras, Peru, 1990, 1991, and 1992.**



especially in terms of accessibility and availability of health care resources.

The following indicators were used to assess the population's accessibility to the health services: percent of pregnant women receiving prenatal care and percentage of births attended by trained personnel. As shown in Table 4, coverage is lower for both indicators in countries with lower GNPs. The differences in both indicators among the countries in groups IV and V are worth noting. When the percentages for prenatal care in the countries in Group V are compared, they show variations that range from 95% in Guyana to 38% in Bolivia. The percentage of births attended by trained personnel within group IV ranges from 23% in Guatemala to 90% in Suriname.

### Bridging the gaps

Many countries are downsizing their health systems as rapidly changing as a consequence of health sector reforms, and resources available to finance social sector programs, including important health activities, are being reduced. Given this, the health sector faces an enormous challenge if it is to implement social and health policies directed at reducing inequities without unacceptably sacrificing other policy goals. In every country, the health reform process aims at searching for equity, defined as accessibility of services to those who need them, regardless of geographic location, social status, or the type of ailment affecting them. While equity does not imply absolute equality, it does carry a sense of justice-

-and all health sector reform processes ultimately strive to attain justice in the delivery of services.

As a first step in the search for equity, indicators that will make it possible to evaluate and assess the population's health conditions must be identified. The need to show the impact of the international technical cooperation process grows. The principal criterion for evaluating technical cooperation programs in health should be their impact on the health of the population, and the most important indicators of impact should be linked to changes in the equity of the delivery of the health services.

**TABLE 4. Percentage of pregnant women receiving prenatal care and percentage of live births attended by trained personnel, around 1990<sup>1</sup>.**

Group	Percentage prenatal care (average)	Percentage of births attended by trained personnel (average)
I	98.2	99.1
II	96.0	95.0
III	75.4	86.4
IV	56.8	45.5
V	58.4	40.5

<sup>1</sup> Groups of countries from Table 1.

The technical cooperation provided by an international agency specializing in health, such as PAHO, includes a wide spectrum of areas and projects that are determined by the countries' national priorities. Some health initiatives have easily quantifiable results, and the impact of PAHO's technical cooperation can be unequivocally demonstrated: for example, the projects associated with the goal of eradicating polio from the Region of the Americas. Without question, important improvements in the health of the population can be accomplished when targeted public health interventions such as these receive political and technical support and are undertaken with a common goal. Figure 11 shows that, notwithstanding the vast differences in health status previously analyzed in the five groups of countries, Oral Polio Vaccination (OPV3) and measles vaccination coverages are relatively stable and do not vary significantly. The low case fatality rates that have been maintained during the cholera epidemic also represent an example of how control measures can be successfully derived as a result of concerted efforts directed at proper environmental management and prompt and adequate treatment. The recent outbreak of plague in Peru also showed the efficacy of control through sound environmental management.

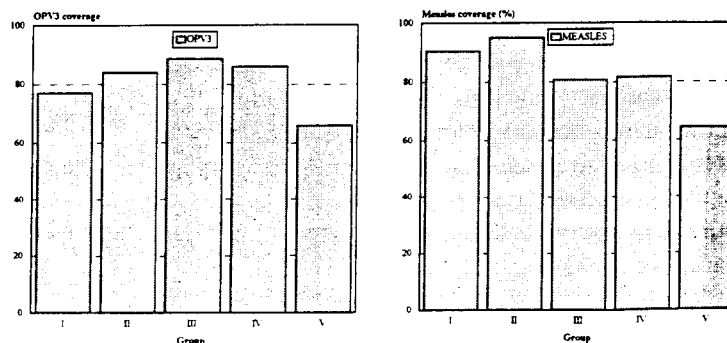
Other health initiatives, however, involve technical cooperation projects designed to have an effect on national processes such as health sector reform, decentralization, and poverty alleviation. These areas of technical cooperation are characterized by their intersectoral nature (meaning that, at times, even the role of the health sector needs to be advocated), by being of

interest to and influenced by a wide variety of actors, and by being sensitive to political processes. These projects, which fall within the more qualitative side of the spectrum, are the most difficult to evaluate. On the one hand, it is not easy to unequivocally establish causality and its direction; on the other, it is difficult to isolate the determinants of change and assign attribution to individual players.

Some memorable examples of efficient and effective interventions along this line are those that fall under the aegis of humanitarian assistance, whether in response to natural or man-made complex disasters, and those directed at health promotion, including healthy lifestyles and the promotion of a healthy environment. The Ministers of Health of Central America devised the concept of health as a "bridge for peace" during the days in which that area was wracked by conflict. It has been well-documented that the ability to come together to discuss and plan health initiatives galvanized the peace process by raising the moral and ethical aspects of health and the preservation of life. There was a clear perception of the mutual self-interest that could be served by adopting common approaches to health problems. In addition, the willingness of the health sector to establish joint activities caught the imagination of the international community and led to a channeling of substantial resources to that area. We now need to mobilize the same energy and build a "bridge for equity."

In using the indicators shown in this article to describe and analyze the Region's health situation, the effect of multiple socioeconomic processes on the health

**Figure 11. Oral polio vaccination coverage (OPV3) in children under 1 year of age and measles vaccination coverage in children under 5 years of age in the Region of the Americas, by groups of countries, 1994.**





status of populations becomes apparent. This kind of data-driven analysis facilitates the identification of important differences and gaps in health that exist in the Region. An understanding of the differential impact of various public and private sector interventions on the health and living conditions of the population also is paramount. However, the existing health conditions provide more than ample justification for the need to develop policies and programs that will help to bridge gaps in equity in health while searching for mechanisms to help to build a more equitable and sustainable health care delivery system.

The Organization is committed to work toward the consolidation of information systems in the Member Countries that will help document the impact of health interventions and also support the development of health policies that will lead the path to sustainable human

development. When the countries work in collaboration with international technical agencies to address health problems, significant achievements can be accomplished for population groups at risk.

### Reference

1. Pan American Health Organization. *Health Condition in the Americas. 1994 Edition*. Scientific Publication No. 549.
2. *Basic Indicators 1995. Health Situation in the Americas*. PAHO/HDP/HDA/95.03.

**Source:** Prepared by Health Situation Analysis Program, Division of Health and Human Development, for *The Search for Equity, Annual Report of the Director, 1995*, Official Document No. 277, PAHO/WHO.

## Third Evaluation of the Strategy for Health for All

In 1977 the Thirtieth World Health Assembly decided that the main social goal of governments and WHO in the coming decades should be the attainment by all people of the world by the year 2000 of a level of health that would permit them to lead a socially and economically productive life. This goal is known as Health for All by the Year 2000.

The global strategy for Health For All adopted by the Assembly in 1981 indicated the main principles to be respected and the broad means to be mobilized in order to reach the goal. It also included the commitment to evaluate periodically the effectiveness of the Strategy. This goal, these principles and their commitment remain as valid today as they were then. Most countries however have adapted them to their own situation and developed their

own national strategies and objectives towards HFA2000.

In early 1997 all Member States of the World Health Organization will carry out the third evaluation of the implementation of the strategy for health for all by the year 2000. Previous evaluations have been performed in 1985 and 1991.

A common framework to guide national health administration in this evaluation exercise prepared by WHO is now being distributed to the countries of the Region of the Americas. The conclusions of this third evaluation, being the last before the year 2000, will be instrumental in establishing the foundation of the renewed strategy for health for all, and the results will be presented to the Directing Council of the Pan American Health Organization in September 1997.

## Centers for Disease Control (CDC) in the United States: 50 years

CDC, an Institution synonymous around the world with health, was 50 years old on July 1. The Communicable Disease Center was organized in Atlanta, Georgia, on July 1, 1946; its founder, Dr. Joseph W. Mountin, was a visionary public health leader who had high hopes for this small and comparatively insignificant branch of the Public Health Service (PHS). It occupied only one floor of the Volunteer Building on Peachtree Street and had fewer than 400 employees, most of whom were engineers and entomologists. Until the previous day, they had worked for Malaria Control in War Areas, the predecessor of CDC, which had successfully kept the southeastern states malaria-free during World War II and, for approximately 1 year, from murine typhus fever. The new institution would expand its interests to include all communicable diseases and would be the servant of the states, providing practical help whenever called.

Distinguished scientists soon filled CDC's laboratories, and many states and foreign countries sent their public health staffs to Atlanta for training. Any tropical disease with an insect vector and all those of zoological origin came within its purview. Dr. Mountin was not satisfied with this progress, and he impatiently pushed the staff to do more. He reminded them that except for tuberculosis and venereal disease, which had separate units in Washington, D.C., CDC was responsible for any communicable disease. To survive, it had to become a center for epidemiology.

Medical epidemiologists were scarce, and it was not until 1949 that Dr. Alexander Langmuir arrived to head the epidemiology branch. He saw CDC as "the promised land," full of possibilities. Within months, he launched the first-ever disease surveillance program, which confirmed his suspicion that malaria, on which CDC spent the largest portion of its budget, had long since disappeared. Subsequently, disease surveillance became the cornerstone on which CDC's mission of service to the states was built and, in time, changed the practice of public health.

The outbreak of the Korean War in 1950 was the impetus creating CDC's Epidemic Intelligence Service (EIS). The threat of biological warfare loomed, and Dr. Langmuir, the most knowledgeable person in PHS about this arcane subject, saw an

opportunity to train epidemiologist who would guard against ordinary threats to public health while watching out for alien germs. The first class of EIS officers arrived in Atlanta for training in 1951 and pledged to go wherever they were called for the next 2 years. These "disease detectives" quickly gained fame for "shoe-leather epidemiology" through which they ferreted out the cause of disease outbreaks.

The survival of CDC as an institution was not at all certain in the 1950s. In 1947, Emory University gave land on Clifton Road for a headquarters, but construction did not begin for more than a decade. PHS was so intent on research and the rapid growth of the National Institutes of Health that it showed little interest in what happened in Atlanta. Congress, despite the long delay in appropriating money for new buildings, was much more receptive to CDC's pleas for support than either PHS or the Bureau of the Budget.

Two major health crises in the mid-1950s established CDC's credibility and ensured its survival. In 1955, when poliomyelitis appeared in children who had received the recently approved Salk vaccine, the national inoculation program was stopped. The cases were traced to contaminated vaccine from a laboratory in California; the problem was corrected, and the inoculation program, at least for first and second graders, was resumed. The resistance of these 6- and 7-year-olds to polio, compared with that of older children, proved the effectiveness of the vaccine. Two years later, surveillance was used again to trace the course of a massive influenza epidemic. From the data gathered in 1957 and subsequent years, the national guidelines for influenza vaccine were developed.

CDC grew by acquisition. The venereal disease program came to Atlanta in 1957 and with it the first Public Health Advisors, nonscience college graduates destined to play an important role in making CDC's disease-control programs work. The tuberculosis program moved in 1960, immunization practices and the MMWR in 1961. The Foreign Quarantine Service, one of the oldest and most prestigious units of PHS, came in 1967; many of its positions were soon switched to other uses as better ways of doing the work of quarantine, primarily through overseas surveillance, were developed. The long-established

nutrition program also moved to CDC, as well as the National Institute for Occupational Safety and Health, and work of already established units increased. Immunization tackled measles and rubella control; epidemiology added family planning and surveillance of chronic diseases. When CDC joined the international malaria-eradication program and accepted responsibility for protecting the earth from moon germs and vice versa, CDC's mission stretched overseas and into space.

CDC played a key role in one of the greatest triumphs of public health: the eradication of smallpox. In 1962 it established a smallpox surveillance unit, and a year later tested a newly developed jet gun and vaccine in the Pacific Island nation of Tonga. After refining vaccination techniques in Brazil, CDC began work in Central and West Africa in 1966. When millions of people there had been vaccinated, CDC used surveillance to speed the work along. The World Health Organization used this "eradication escalation" technique elsewhere with such success that global eradication of smallpox was achieved by 1977. The United States spent only \$32 million on the project, about the cost of keeping smallpox at bay for 2 1/2 months.

CDC also achieved notable success at home tracking new and mysterious diseases outbreaks. In the mid-1970s and early 1980s, it found the cause of Legionnaires disease and toxic-shock syndrome. A fatal disease, subsequently named acquired immunodeficiency syndrome (AIDS), was first mentioned in the June 5, 1981, issue of MMWR. Since then, MMWR has published numerous follow-up articles about AIDS, and one of the largest portions of CDC's budget and staff is assigned to address this disease.

Although CDC succeeded more often than it failed, it did not escape criticism. For example, television and press reports about the Tuskegee study on long-term effects of untreated syphilis in black men created a storm of protest in 1972. This study had been initiated by PHS and other organizations in 1932 and was transferred to CDC in 1957. Although the effectiveness of penicillin as a therapy for syphilis had been established during the late 1940s, participants in this study remained untreated until the study was brought to public attention. CDC also was criticized because

of the 1976 effort to vaccinate the U.S. population against swine flu, the infamous killer of 1918-19. When some vaccinees developed Guillain-Barré syndrome, the campaign was stopped immediately; the epidemic never occurred.

As the scope of CDC's activities expanded far beyond communicable diseases, its name had to be changed. In 1970 it became the Center for Disease Control, and in 1981, after extensive reorganization, Center became Centers. The words "and Prevention" were added in 1992, but, by law, the well-known three-letter acronym was retained. In health emergencies CDC means an answer to SOS calls from anywhere in the world, such as the recent one from Zaire where Ebola fever raged.

Fifty years ago CDC's agenda was noncontroversial (hardly anyone objected to the pursuit of germs), and Atlanta was a backwater. In 1996, CDC's programs are often tied to economic, political, and social issues, and Atlanta is as near Washington as the tap of a keyboard.

**Adapted for MMWR by:** Elizabeth W. Etheridge, Ph.D., from her book, *Sentinel for Health: A History of the Centers for Disease Control*. Berkeley, California: University of California Press, 1992.

**Editorial Note:** When CDC's name changed in 1970, from the Communicable Disease Center to the Center for Disease Control, CDC scientists were poised to accept new challenges. The most notable of the agency's many achievements in the following 10 years was its role in global smallpox eradication, a program that finally succeeded because of the application of scientific principles of surveillance to a complex problem. In the realm of infectious diseases, CDC maintained its preeminence, identifying the Ebola virus and the sexual transmission of hepatitis B, and isolating the hepatitis C virus and the bacterium causing Legionnaires disease. The study of the Effectiveness of Nosocomial Infection Control (SENIC) was the most expensive study the agency had ever undertaken and proved for the first time the effectiveness of recommended infection-control practices. Other studies included identification of the association of Reye syndrome with aspirin use, the relation between

liver cancer and occupational exposure to vinyl chloride, and the harmful effects of the popular liquid protein diet.

The 1980s institutionalized what is considered to be a critically important scientific activity at CDC- the collaboration of laboratorians and epidemiologists. The decade began with the national epidemic of toxic-shock syndrome, documentation of the association with a particular brand of tampons, and the subsequent withdrawal of that brand from the market. CDC collaboration with the National Center for Health Statistics (NCHS) resulted in the removal of lead from gasoline, which in turn has markedly decreased this exposure in all segments of the population. The major public health event of the 1980s was the emergence of AIDS. CDC helped lead the response to this epidemic, including characterization of the syndrome and defining risk factors for disease.

CDC became involved in two very large epidemiologic studies during the 1980s. First, the Cancer and Steroid Hormone Study conducted in collaboration with the National Cancer Institute assessed the risks for breast, cervical, and ovarian cancers associated with both oral contraceptives and estrogen replacement therapy. Second, at the request of Congress, CDC undertook a series of studies of the health effects of service in Vietnam on veterans and their offspring, which led to a landmark contribution of the laboratory -the development of a serum test for dioxin able to measure the toxicant in parts per quadrillion. This decade also introduced scientifically based rapid assessment methods to disaster assistance and sentinel health event surveillance to occupational public health. Epi Info, a software system for the practice of applied

epidemiology, was introduced and now has been translated into 12 languages for tens of thousands of users globally. Finally, during the 1980s, NCHS was moved to CDC, further enhancing CDC's information capabilities to meet national needs.

The 1990s have been characterized by continuing applications of CDC's classic field-oriented epidemiology, as well as by the development of new methodologies. For example, the disciplines of health economics and decision sciences were merged to create a new area of emphasis -prevention effectiveness- as an approach for making more rational choices for public health interventions. In 1993, the investigation of hantavirus pulmonary syndrome required a melding between field epidemiology and the need for sensitivity to and involvement of American Indians and their culture. Similarly, the response to global problems with Ebola virus and plague underscore the importance of adapting these new methodologies. Other major CDC contributions to the world's health include global polio eradication efforts and efforts to prevent neural tube defects. Finally, in October 1992, Congress changed CDC's official name to the Centers for Disease Control and Prevention, to recognize CDC's leadership role in prevention. Today, CDC is both the nation's prevention agency and a global leader in public health. As the world enters the new millennium, CDC will remain the agency ready to address the challenges to its vision of healthy people in a healthy world through prevention.

**Editorial Note by:** Office of the Director, Epidemiology Program Office, Centers for Disease Control (CDC).

**Source:** MMWR, Vol. 45-No. 25, June 28, 1996.

## Elimination of Leprosy in the Americas

In 1990 the World Health Assembly adopted a Resolution to achieve the global elimination of leprosy as a public health problem by the year 2000, defining elimination as "the reduction of prevalence to a level below one case per 10,000 population." This target, therefore, does not signify the eradication of the disease or the interruption of transmission, but rather, a reduction in prevalence to very low levels in which the potential for transmission is considered very slight.

This Resolution is of enormous significance, however, considering that for many years leprosy was regarded as a disease that little could be done about, with very limited possibilities for action and little hope of its control.

This radical reversal of the strategy was made possible by the advent of multidrug therapy (MDT/WHO), an appropriate and robust treatment technology that has proven highly effective and feasible. The treatment scheme combines two or three drugs, depending on the clinical form of the disease, thus avoiding the development of resistant strains of *M. leprae* while eliminating the patient as the source of infection as soon as the first dose is administered. This treatment was recommended by the WHO Study Group on Chemotherapy of Leprosy for Control Programmes in 1981 and made it possible for the first time to state, with solid scientific backing, that leprosy is curable and that control activities can be managed and executed, like most communicable diseases, by the general health services.

One very important aspect is that leprosy ceased to be viewed as "a skin problem" and began to be considered a communicable disease. The strengthening of programs and increase in activities spurred by the advent of MDT, moreover, have prevented disabilities in more than 1 million patients through early diagnosis and timely treatment.

WHO took advantage of this technical and epidemiological opportunity to propose a concrete and feasible goal to the Member States, which the vast majority of endemic countries adopted, thus indicating the political will to tackle the problem. Activities to combat leprosy have increased and intensified worldwide, and significant progress has been made toward that goal.

Five years ago, the situation in the Region of the Americas was similar to that of the rest of the world. Therefore, grounded in the resolution of the World Health Assembly, the Hemispheric Conference on the Control of Leprosy was held in Mexico City in 1991, bringing together specialists from the countries with higher rates of endemicity. The Conference adopted the technical recommendations, obtaining a political commitment and defining the PAHO mandate to draft the Regional Plan of Elimination.

The central strategy of this Plan, which was launched in 1992, was **mass application of the MDT/WHO treatment**, associated with early detection of the disease. Its support strategy places emphasis on strengthening managerial capacity at the national and subnational level, through epidemiological and operational stratification, to ensure the preparation, execution, and evaluation of national and intermediate-level elimination plans and the supply of the specific drugs for MDT by WHO to all the countries that have requested it.

Once the countries' political commitment to the goal of elimination was obtained and a continuous supply of drugs for MDT guaranteed, achieving a rapid response to the Regional Plan demanded strategies to strengthen the programs at the various levels, through:

- Managerial training of the team at the various levels through utilization of the WHO Modules and the training of multipliers. Some 29 courses have been offered, one regional course in Buenos Aires and the rest at the national or intermediate level, which have trained over 600 multipliers.

- Preparation and execution of elimination plans (national, state, and at the current time, municipal as well), leading to the improvement and broadening of the stratification process for leprosy. At this time national elimination plans are being executed in all the countries that have yet to meet the target (Argentina, Bolivia, Brazil, Colombia, Paraguay, and Venezuela), while in Brazil, Colombia, Cuba, and Mexico plans are being executed at the subnational levels. The countries of Central America, the English-speaking Caribbean, Brazil, Cuba, the Dominican Republic, Ecuador, Mexico, and Uruguay are also developing post-elimination strategies.

- Promotion of decentralization (municipalization) of control

**TABLE 1**  
**LEPROSY: PREVALENCE, CASES DETECTED, AND MULTIDRUG THERAPY (MDT)**  
**COVERAGE IN THE LATIN AMERICAN COUNTRIES - 1995**

Country	Registered Cases	Prevalence x 10,000	Cases with MDT	MDT Coverage (%)	New Cases	Detection x 10,000
Argentina	3,797	1.10	3,649	96.1	509	0.15
Bolivia	864	1.17	859	99.4	86	0.12
Brazil	137,806	8.52	101,358	73.6	35,906	2.22
Colombia	4,738	1.35	4,738	100.0	692	0.20
Costa Rica	195	0.57	142	72.8	15	0.04
Cuba	684	0.62	648	94.7	252	0.23
Ecuador	518	0.45	518	100.0	115	0.10
El Salvador	21	0.04	17	81.0	0	--
Guatemala	106	0.10	25	23.6	7	0.01
Haiti	...	...	...	...	...	...
Honduras	83	0.15	83	100.0	3	0.01
Mexico	6,106	0.67	4,725	77.4	523	0.06
Nicaragua	82	0.18	53	65.0	36	0.08
Panama	54	0.21	14	25.9	0	--
Paraguay	828	1.66	817	98.7	401	0.81
Peru	240	0.10	240	100.0	90	0.04
Dominican Republic	528	0.67	486	92.0	229	0.29
Uruguay	118	0.37	101	85.6	20	0.06
Venezuela	3,954	1.81	3,285	83.1	490	0.22
Latin America	160,722	3.60	121,758	75.8	39,374	0.88

... No data

Source: Morbidity and MDT: SIL/OPS; Population: UN-World Population Prospects, 1994 revision.

measures and of their integration into the general health services--activities in which significant advances have also been made in most of the countries.

In the five years since the conference in Mexico, there have been significant positive changes have taken place as a result of the efforts to meet the goal of eliminating leprosy as a public health problem in the Americas.

At the Hemispheric Conference on the Elimination of Leprosy, held last May in Brasilia, the results of country efforts in the Region to meet this goal were

presented. The table below shows the prevalence and incidence rates, as well as the MDT/WHO coverage achieved in the Latin American countries by the end of 1995.

The prevalence rate (see map), which in 1991 was 8.1 per 10,000 population, was reduced to 3.6 by the end of 1995, a reduction of 55.6%. In the period analyzed, three countries (Cuba, the Dominican Republic, Mexico) were added to the list of those whose rates were already below 1 per 10,000 population (Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Peru, and Uruguay); considerable reductions in the prevalence rate were observed in the rest of the countries,

with most of them also approaching elimination (see table). Brazil, which accounts for 80% of the problem in the Region, also experienced a significant reduction in prevalence, which fell from 18.2 per 10,000 population to 8.5, a reduction of more than 50%.

It is important to point out that the results with regard to prevalence refer only to the subregion where the disease is considered endemic (Latin America). If the prevalence rate for the Americas as a whole is calculated, the figure is 2.2 per 10,000 population.

MDT coverage rose from 23.9% to 75.8%, representing a 51.9% increase for the period. In many countries the figure is over 90% (see map and table). Only in two countries is coverage less than 50% and in each of them the number of cases is limited. The 74% achieved by Brazil represents a 56% increase over 1991.

With regard to new case-finding, rates tended to be stable in this period, both in countries that have already achieved elimination and those currently working toward this goal. The reason for this is still not clear, but it may be the result of a complex set of epidemiological and operational factors in each local situation. During 1995, 39,374 new cases were detected, a rate of 0.9 per 10,000 population, 91% of which were diagnosed in Brazil.

To strengthen the activities geared toward the elimination of leprosy, brief targeted interventions are also being carried out in critical areas where access to MDT is difficult, among population pockets in urban and metropolitan areas where health care is lacking, and in areas considered to have hidden prevalence. Similarly, new technologies in information science are being employed, such as computerized geographical information systems (GIS) and drug inventories. Subregional initiatives are also being promoted in Central America, the Southern Cone, the English-speaking Caribbean, and the countries of the Amazon region.

In light of the above, the proposal to eliminate leprosy in the Americas by the year 2000 is considered to be absolutely feasible. Even taking into account only the Latin American subregion, a rate of 1 per 10,000 population (or approximately 52,000 cases) will be achieved with the projected population growth. At that point the prevalence rate for the Region of the Americas as a whole should be 0.6 per 10,000 population.

Thus, to reach the goal of eliminating leprosy in Latin America by the year 2000 it would be enough for Brazil to reduce its prevalence rate by 13% annually, a rate

similar to that already observed during the past four years, and for the rest of the countries of the subregion to reduce their rates by 15% a year, a figure lower than that observed for the period 1991-1995.

Work is currently under way not only to eliminate leprosy in the countries that have yet to meet that goal but also to reduce prevalence rates in countries where the rates are already under 1 per 10,000 population (that is, countries in the post-elimination stage). Activities are being carried out to verify and consolidate the results obtained and continue advancing toward new objectives.

Under this strategy, in addition to maintaining and strengthening the current lines of technical cooperation aimed at reducing prevalence, PAHO/WHO is supporting and cooperating in evaluation and monitoring initiatives, with a view to:

- Validating the state of elimination achieved
- Consolidating the process and making it sustainable
- Evaluating and incorporating technologies that can lead in the not too distant future to a new objective in the struggle against leprosy: interruption of transmission.

The successes of the leprosy elimination strategy around the world make it possible to foresee the eradication of this disease through interventions that could include:

- Differentiated activities targeted to persistent pockets of the disease even in countries in which elimination has already been achieved.
- Identification of areas in which endemicity was once high and residual cases may appear, in order to establish intensive surveillance that will permit early detection and treatment of the disease.
- Detection of people with subclinical infections that could maintain the transmission, in order to take preventive action. Here adequate tools for identifying such individuals are of the utmost importance.

At this time there is a need to evaluate and validate the available techniques that could permit diagnosis of the infection and to develop new techniques. However, there is a conviction that advances can continue in the struggle against leprosy, with the ultimate goal of definitively eradicating the disease.

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**Bibliography**

- Organización Panamericana de la Salud, OPS/OMS. Informe de la Conferencia para el Control de la Lepra de las Américas, Mexico 1991, PNSP-9213.

- Organización Panamericana de la Salud. OPS/OMS. Lepra al día, Boletín de la Eliminación de la Lepra de las Américas, Vol. 1 No. 1, November 1993.

- Organización Panamericana de la Salud, OPS/OMS. Lepra al día, Boletín de la Eliminación de la Lepra de las Américas, Vol. 1 No. 2, November 1994.

- World Health Organization. Report of the

International Conference on the Elimination of Leprosy, Hanoi-Viet Nam 1994, WHO/CTD/LEP/94.5.

- Organización Mundial de la Salud. Quimioterapia de la lepra. Informe de un Grupo de Estudio de la OMS, Serie de Informes Técnicos 847, Geneva 1994.

- Organización Panamericana de la Salud, OPS/OMS. Lepra al día, Boletín de la Eliminación de la Lepra de las Américas, Vol. 1 No. 3, Noviembre 1995.

- Organización Panamericana de la Salud, OPS/OMS. Guía para la Eliminación de la Lepra como Problema de Salud Pública, First Edition WHO/LEP/95.1.

- Noordeen, S.K. Eliminating leprosy as a public health problem - is the optimism justified?, World Health Forum, Volume 17, Number 2, 1996.

- Organización Mundial de la Salud, OPS/OMS. Informe de la Conferencia sobre la Eliminación de la Lepra de las Américas, Brazil 1996, (in publication)

**Source:** Division of Disease Prevention and Control, Communicable Diseases Program, HCP/HCT, PAHO.

**We regret to inform the international public health community of the death of Dr. José Luis Bobadilla, a Mexican public health policy specialist and epidemiologist, who died in the crash of the AeroPeru flight on October 2, 1996. Dr. Bobadilla worked with the Interamerican Development Bank and had a distinguished career in the development of public health policies in Latin America. To honor his memory, an initiative is under way to develop the "José Luis Bobadilla Memorial Fund" for public health policy which will promote innovations in research and policy development in public health in Latin America.**

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