

# Epidemiological Bulletin

PAN AMERICAN HEALTH ORGANIZATION

---

Vol. 13, No. 3

September 1992

---

## Health for All Second Evaluation in the Americas, 1991

*In 1991, the fourth stage of surveillance and evaluation was implemented, on progress attained towards reaching the goals of Health for All by the Year 2000 (HFA/2000). A regional report for the Americas was elaborated, to include the 28 national reports received by PAHO and the quantitative information of 11 countries and territories. The regional report was presented to and approved by PAHO Directing Council in September 1991. Following are the main conclusions.*

The data needed for monitoring and evaluation of the strategy of Primary Health Care (PHC) and HFA/2000 are obtained haphazardly, with serious retrieval problems and without the involvement of the principal authorities in the sector's institutions. Except for Canada, Cuba, and the United States, which have clearly evaluated their targets and progress and have proposed new objectives, the remaining reports are mere responses to a formal commitment to PAHO/WHO, rather than an analysis and reflection of what is happening. Among them are reports from a number of countries that have made substantial efforts: Bahamas, Belize, Bolivia, Costa Rica, Haiti, Honduras, and Mexico. In the overall picture, however, the prospects are not encouraging with respect to the future possibilities for monitoring and evaluating PHC and HFA/2000.

The information on vaccination coverage is up to date in almost all the countries, reflecting the effort to

eradicate wild polio virus. In addition, data on coverage of the population with basic water supply and sanitation services is available in most of the countries, although with problems of consistency, continuity, and accuracy. Reliable information, however, on nutritional status, low birthweight, coverage with basic health care and maternal and child health services, family planning, and expenditures on health and local care is not generally available. The data on referrals and back-referrals, mental and physical disabilities, oral health, and morbidity are practically nonexistent in most of the countries. Resources for neglected groups have been identified and obtained, however, a lack of focus and transparency of the projects have been a critical factor and a major obstacle for studying their impact.

As a consequence of the 1980 decade economic crisis, the countries have had to adopt economic policies of adjustment or reactivation that are characterized by a marked reduction in public spending for so-called

---

### IN THIS ISSUE . . .

- Health for All. Second Evaluation in the Americas, 1991
- Mortality in the Americas 1950-1990
- The Economic Impact of the Cholera Epidemic. Peru, 1991
- The Crisis of Public Health: Reflections for the Debate
- Cholera Situation in the Americas
- AIDS Surveillance in the Americas
- Diseases Subject to International Health Regulations

*non-productive activities* such as health and education. Application of these measures has led to a reduction or stagnation in the amount of resources available for developing and operating the health services. This can be seen in the limitations on capital investment for basic sanitation and for the replacement, maintenance, and conservation of equipment and the physical plant. In addition, the situation affected the capacity to maintain an adequate level of recurrent expenditures, which impeded normal program operations for dealing with prevalent problems and restricted administrative development and personnel training in the sector.

The economic crisis adversely affected the well-being of vast sectors of the population. At present, nearly a third of the population is below the absolute poverty level. This poverty is distributed unequally within the individual countries, contributing to the increased disparities observed in the Region. Of the 423 million inhabitants of Latin America and the Caribbean, some 130 million do not currently have permanent access to basic health services. Moreover, estimates of population growth indicate that during the period 1990-2000 there will be an additional 110 million inhabitants for whom adequate health care must be ensured. This represents the most important challenge for the health systems in the countries of the Region. It means that the services--which for the most part have so far been unable to serve the entire population with equity, effectiveness, and efficiency--will have to be reorganized and reoriented, not only in order to maintain their operations but also to close the current gap and respond to the health care needs of the new population.

The national health policies and strategies in all the countries and of the Region are verbally coherent and consistent with the strategy of PHC and HFA/2000. The adaptation of these policies and strategies has been curtailed by the limits on financial, material and human resources, and in some countries by political and social instability. Health development in the Region is directed toward achieving greater efficiency in the use of available resources through restructuring the health systems--a process that includes decentralization, strengthening of local health systems, administrative reform, mobilization of local resources, and inter institutional and intersectoral coordination. However, in many countries of Latin America and the Caribbean, long-term comprehensive strategies for the development of health and the socioeconomic situation as a whole are seen to be weak or entirely lacking, which makes it difficult to maintain the rate of improvement observed in the last 30 years.

Improved coordination between the institutions that make up the health sector in the countries of the Region is a goal shared by all. However, with few exceptions, this is reported to still be an incipient process, particularly with regard to coordination of the services

provided by social security institutions and the Ministries of Health.

Practically all the national sectors that participate in the overall development process have a direct or indirect impact on the health status of the population. Diverse institutional mechanisms have been established to ensure that the goals and activities of the various development sectors are coherent and mutually supportive, both in relation to overall development policy and between themselves. One of the goals in the effort to develop local health systems under a decentralized management scheme has been to encourage and facilitate the creation of operational mechanisms for joint programming and coordination among sectors at the local level. Other measures undertaken to improve this aspect of the PHC strategy range from the formulation of constitutional mandates for coordination among sectors to the formal participation of health sector authorities in the administration of other institutions linked to health.

The need to support and promote community participation as an essential component of the PHC strategy has been manifested as stated policy by all the countries of the Region. In most cases the community is involved in specific aspects of carrying out activities at the local level, especially through the mechanism of health collaborators or volunteers or by providing labor and funds for small local infrastructure projects. Community organizations participated in the formulation, execution, and evaluation of policies and programs at the national level; and some Ministries of Health created programs, offices, or departments responsible for promoting, coordinating, and standardizing community participation in health programs.

The sector's institutional, organic, and functional framework was reviewed and modified with a view to opening the way for new management designs. The normative, regulatory, and controlling role of central levels in the Ministries or Secretariats of Health was strengthened, and the executive functions and responsibilities of the peripheral arms of these institutions, or others involved in the delivery of services, were increased. There has been some success in defining the responsibilities and the scope of action of the different institutions that make up the sector as a step preceding greater coordination and eventual intrasectoral integration.

Steps were taken to formulate and implement instruments and legal standards for the decentralized management of the health sector and of other public services. Many Ministries of Health in the Region modified their technical and policy-making and administrative structures in accordance with the goal of decentralizing and facilitating the process of conducting and managing priority programs.

A health manpower plan for meeting needs under the PHC strategy was seldom found, and little progress was achieved in improving equity in the distribution of human resources, and even deterioration in equity was reported. The principal reasons cited to account for this situation are the economic crisis, the restriction of financial resources, and the resistance of health personnel to being located in less developed areas. Programs for the training of professional and middle-level health personnel were instituted or strengthened, using an approach that integrates teaching and service. Curriculum revisions in professional training programs were carried out in order to incorporate more elements of public health and the PHC strategy.

A national policy for selecting and using health technology is almost nonexistent. In general, coordination of the selection and use of health technology is only weakly developed. No explicit guidelines exist with regard to the identification and formulation of national policies on health research. The orientations that have been defined correspond to priorities derived from the epidemiological profile and the level of development of the health services. Several factors are impeding the effective preparation and application of policy on research and technology in the health field, such as the scarcity of financial resources, the lack of sufficient research personnel and of infrastructure, the weakness of mechanisms of inter institutional coordination, and the limited political will for promoting research as a development tool. The gap that is emerging between Latin America and the Caribbean, on the one hand, and the rest of the world (with the exception of Africa), on the other, with respect to the importance assigned and the resources being allocated for research and technology development is a critical negative element as far as the outlook for the future is concerned.

In terms of the trends observed in the Region regarding coverage of the population by components of the PHC strategy and to the overall health situation, the following stand out:

- Water and sanitation: moderate increase in coverage, from 72% of population covered with water in 1973 to 78% in 1988. There are major problems of access and quality, especially at the urban level, creating situations of serious risk, as witnessed by the cholera epidemic;

- Increased vaccination coverage of polio, DPT (diphtheria, pertussis and tetanus), and measles. For Latin America and the Caribbean levels of coverage in 1990 were 87% for polio, 76% for DPT and 77% for measles.
- Available information does not permit any firm conclusions on care provided for pregnant women, deliveries, and nursing infants, since only isolated and partial figures are available in most of the countries. In a majority of them the coverage is far from satisfactory, and for some countries the most recent data show a reduction in coverage. There are some coverage rates for pregnancy and delivery below 50%.
- Life expectancy at birth from 1950-1955 to 1970-1975 increased 2.4 years in Latin America and 2.7 years in the non-Latin Caribbean, and from 1970-1975 to 1985-1990 increased 1.8 years for both sub regions. The global fertility rate decreased from 4.0 children per woman in 1980-1985 to 3.6 in 1985-1990.
- A few regular systems of nutritional surveillance and isolated data from surveys and special studies, reveal the persistence of high levels of under nutrition in children, as well as low birthweight, in the Region. Ten of 18 countries that reported birth weight notified rates equal to or higher than 10% live born with weight less than 2,500 grams.

There must be concerted efforts over the next few years to establish and strengthen not only the mechanisms for monitoring and follow-up of the PHC and HFA/2000 strategy in the Region of the Americas but also the availability, coverage, and quality of the information. The current emphasis on the development of managerial and administrative schemes that are conducive to greater equity and efficiency in the utilization of resources should, in turn, stimulate consideration of the need to formulate and operationalize an information database for this purpose. Although some progress has been made, much remains to be done in the Region in this area.

(Source: Health Situation and Trend Assessment Program, PAHO.)

# Mortality in the Americas 1950-1990

Over the last 40 years there has been a generalized and substantial reduction in mortality in the Americas, although with very different starting points and trends in the sub regions. Latin American countries, as a group, gained 15 years in life expectancy at birth, starting from 51.8 years in 1950-1955; an average increase of approximately two years per five-year period took this figure to its current level of 66.6 years. The non-Latin Caribbean has made similar advances, with the difference that in 1950-1955 it already held an advantage of approximately 5 years of life, which continues to be the case up to the present, with life expectancy currently standing at 72.4 years. In North America, life expectancy at birth was already 69.1 years four decades ago. The subsequent advances have been smaller, as might be expected at this lower level of mortality, but in any case, life expectancy at birth reached 76.1 years in 1985-1990.

The different trends described have produced a substantial reduction in the mortality gap between the American sub regions, which have differing levels of development. For Latin America the difference with respect to North America declined from 17.3 to 9.5 years between 1950-1955 and 1985-1990, and for the non-Latin Caribbean, from 12.7 to only 3.7 years.

These advances notwithstanding, there still exists a need to accelerate reduction of mortality in Latin America, where the current level is equivalent to that which existed in the United States of America approximately 40 years ago (1945-1950). In addition, despite all the technological progress in the health field, the reduction in mortality over the last 35 years in Latin America is similar in magnitude to that which took place in the United States between 1910-1915 and 1945-1950--that is, in an equivalent time period and starting with the same life expectancy at birth, but before most modern advances in the prevention and treatment of many diseases had become available. In terms of the many other factors that bear on health--the health infrastructure; the quantity, quality, density, and distribution of health personnel; the general infrastructure (transportation, water, sanitation, communications, etc.); the degree and stability of the country's political organization and in particular the relative authority of the State (for example as regards legislation on public health); the amount and distribution of income; the educational level; the physical accessibility of services, housing, food, etc.--Latin America in 1990 still has levels that are lower, on average, than those that prevailed in the United States 40 years ago. In other words, progress in

reducing mortality has been relatively greater than progress in improving other aspects of living conditions. Reduced mortality, and thus increased life expectancy at birth, has occurred in all the countries of the Region despite the heterogeneity of their initial levels.

This assessment refers to each nation's total population, but within the different countries there are marked differences in survival among the various social groups. This does not mean that the gains have been concentrated exclusively in the privileged socioeconomic groups of society, leaving behind the majority of the population. On the contrary: wherever there has been a substantial gain in life expectancy at birth at the national level, the greatest advances have occurred precisely in those social groups that have lower standards of living, which comprise most of the population.

The evolution of life expectancy at birth discussed above is closely associated with the changes taking place in mortality among infants under 1 year of age. Since high mortality goes hand in hand with high fertility, the exposed populations are numerically important, and mortality in the first year of life becomes a significant component in the total number of deaths. In higher-mortality countries the deaths among children under 1 year may exceed 30% of all mortality. An analysis of past trends of infant mortality indicates that there have been considerable advances in the second half of the present century, although the sub regions are at different phases in their transition to greater survival after infancy. In Latin America the infant mortality rate fell from 127 per 1,000 live births to its current level of 55, with average drops of 10 points per five-year period, until recently, when the decline has begun to slow down.

In 1950-1955 fourteen of the 20 Latin American countries had infant mortality rates of 100 or more. In 1985-1990, the number of countries with a rate slightly higher than 100 dropped to 1.

The non-Latin Caribbean already held an advantage in 1950-1955, with a rate of 83 per 1,000 live births, which by 1970-1975 had fallen to one half of that value and now stands at 21 per 1,000. So far, very few countries in Latin America have reached this level. North America is at a very different stage in the process, and the figures for that sub region primarily reflect trends in infant mortality in the United States of America. The level in 1950-1955 was 29 per 1,000 live births; it declined only slowly during the 1950s (1 or 2 points every five years), but more rapidly in the 1960s and 1970s; in 1985-1990 the five-year rate is estimated

at 10 per 1,000, greater than that in some countries of other regions of the world.

The gap in infant mortality that existed between Latin America and North America has declined substantially in the last 40 years, from almost 100 to only 45 points. This is a notable achievement considering the periods of economic and social crisis which have occurred during this time. However, the gap that remains to be overcome is sizable. If current trends are maintained in the future, the infant mortality rate that Latin America is expected to achieve in the five-year period 2020-2025--that is, almost 35 years from now--is the rate that the United States of America had 30 years ago, in 1955-1960, representing a time lag of more than half a century. Thus it appears that the less developed countries in the Americas face the pressing task of speeding up their advances in infant survival--a task that is linked not only to the effectiveness of specific interventions but even more to the improvement in various aspects of economic and social development, where the time lag is also very large. Past experience suggests that even in those countries where the decline in infant mortality has been acceptable, the deterioration or stagnation of socioeconomic development might interrupt these advances in the medium or long term.

To facilitate the analysis of changes in the structure of mortality by age, a model has been prepared based on the historical experience of two Latin American countries in which life expectancy at birth has reached a high level (Costa Rica and Cuba). The model was constructed by estimating the rates by age in each of these countries when they achieved life expectancies at birth of 50, 55, 60, 65, 70, and 75 years. These rates were averaged, and it was verified that they accurately represent the age distribution of mortality observed in the countries of Latin America (Table 1).

The model shows the changes in age-specific death rates that accompany increases in life expectancy at birth. There is a general pattern characterized by greater mortality in infancy, a minimum rate in the 5-14 year age group, and finally a progressive increase, reaching its maximum in the group aged 65 and over. When life expectancy is low, all the death rates are high, especially among the youngest and oldest. As life expectancy increases, all ages experience a reduction in mortality, but the greatest gains are observed in children under 5. In this age group, when life expectancy rises from 50 to 75 years, the risk of dying is reduced from 40.8 to only 3.9 per 1,000 population. This represents a substantial reduction--namely, 90%. In other words, of 10 children who died before their fifth birthday when life expectancy at birth was 50 years, only one dies when life expectancy reaches 75. The under-5 age group is where the greatest absolute and relative reduction take place, but all the remaining age groups also show sizable

reductions, with different implications depending on their level of mortality. Thus the 5-14 year group also experiences a reduction of approximately 90%; the 15-39 year group, 80%; the 40-64 year group, 64%; and the elderly (65 and older), 34%. It is notable that this last age group is the one which, after the first (children under 5), shows the greatest absolute reduction, since the rate declines from 91 to 60 per 1,000.

The reduction of mortality in the elderly population implies that life expectancy at 65 years increases from 11 to 17 years, or a total of six years. On the other hand, a reduction in mortality before 65 years (between the models based on 50 and 75 years of life expectancy at birth) means that almost twice as many persons as before will live to the age of 65. This aging of the population is a critical factor in all countries of the Region. It varies in relative importance, but it must be reckoned with as an irreversible trend. It means that plans have to be made to provide health care to older age groups while at the same time not neglecting the rest of the population.

The rapidity of demographic change in Latin America becomes evident when comparing proportional mortality by age for different values of life expectancy. This is especially marked in children under 5. For this group proportional mortality continues to be much higher than in developed countries, with a life expectancy at birth of 75 years, due to the age distribution of the population. Thus Costa Rica, whose infant mortality rate is one of the lowest in the Region, but where 15% of total deaths occur before the fifth birthday, stands in contrast to Canada, where deaths in this age group do not reach 2%. An analogous but inverse situation occurs with proportional mortality in the group aged 65 and above. This should warn us of the possible problems of comparing proportional mortality structures, by age as well as by cause, when the population structure by age is different.

The cause groups accounting for most of the increase in life expectancy at birth belong to the category communicable diseases<sup>1</sup>, especially the reduction in deaths due to intestinal infectious diseases<sup>2</sup>, and respiratory diseases.

It has been seen that when life expectancy at birth rises from 50 to 75 years, mortality for children under 5 is reduced by 90%, so that if 1,000 died previously, now

<sup>1</sup>This group includes all infectious and parasitic diseases, this is, all categories of Chapter I, ICD-9, and also meningitis, acute respiratory infections, pneumonia and influenza.

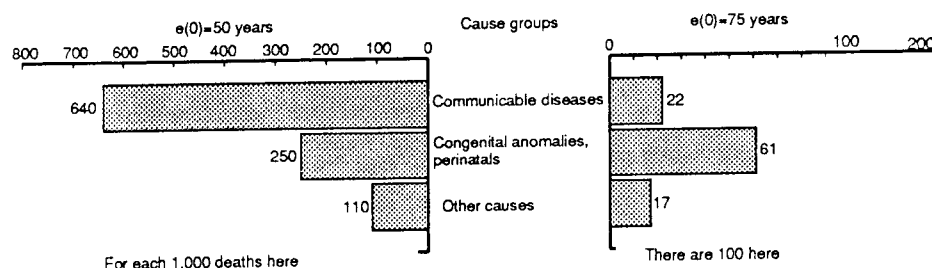
<sup>2</sup>It is estimated that between 1965 and 1990, in Latin America and the Caribbean there were more than 6 million deaths caused by intestinal infections (diarrhea), of which 80% occurred in children under 5. This cause alone accounted for 9% of total mortality. It can be estimated that the annual average of deaths due to diarrhea was more than 130,000 in the five-year period 1985-1990, a figure which underscores the persistent severity of the problem.

**Table 1. Mortality rates by age, according to life expectancy at birth, Cuba-Costa Rica model.**

| Life expectancy<br>at birth | Mortality rates by age (per 1,000) |      |       |       |             |
|-----------------------------|------------------------------------|------|-------|-------|-------------|
|                             | 0-4                                | 5-14 | 15-39 | 40-64 | 65 and more |
| 50                          | 40.8                               | 2.8  | 5.5   | 16.9  | 91.0        |
| 55                          | 33.5                               | 2.2  | 4.3   | 14.2  | 84.0        |
| 60                          | 26.2                               | 1.6  | 3.2   | 11.5  | 77.1        |
| 65                          | 18.5                               | 1.0  | 2.2   | 9.2   | 72.1        |
| 70                          | 10.6                               | 0.6  | 1.6   | 7.6   | 66.3        |
| 75                          | 3.9                                | 0.3  | 1.1   | 6.1   | 59.7        |

Source: CELADE, 1989.

**Figure 1. Mortality of children under 5 years of age, by broad cause groups, according to life expectancy at birth.**



100 die. The distribution of these deaths by broad groups of causes is shown in figure 1.

When observing these values, a relative decrease from 30 to 1 in mortality due to communicable diseases is noted; in other words, of every child under 5 years of age --with a 50-year life expectancy-- that died of those causes, only one dies because of those causes (from 640 to 22) when life expectancy increases to 75 years. The group of congenital anomalies and conditions originating in the perinatal period had a 4 to 1 relative drop (from 250 to 61). It should be noted though that at 50 years, mortality is mainly due to perinatal causes.

The changes in the age groups 5 to 14 and 15 to 39 years were due basically to a decrease in the mortality from communicable diseases, particularly diarrheal diseases, acute respiratory infections, malaria, TB and diseases preventable by vaccination. In the case of women, the decrease in maternal mortality is significant, having been reduced by more than 90%.

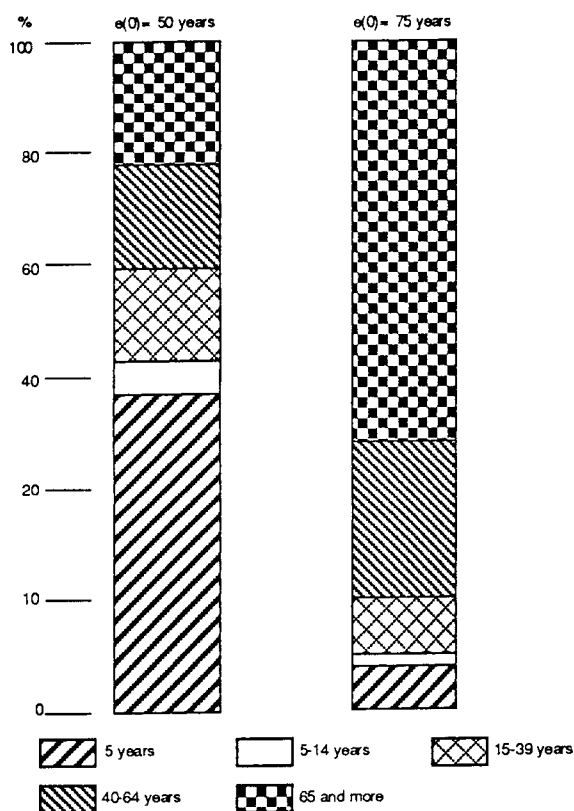
In fact, up to 40 years of age there was an actual decrease of the death rates from all types of causes, with

the exception of external causes (accidents, homicides, suicides, etc.) in some countries and some age groups, for several years these rates do not show a tendency to decrease, and sometimes increase.

Between 40 and 64 years of age, the reduction was great but not for all causes. There is an important exception: malignant neoplasms, which show a worsening in the rate that continues until the end of life. The other important causal group, the circulatory system (heart and cerebrovascular diseases), becomes the main cause of death, even though the rates improved.

Analogous to the changes observed in the age structure of mortality are the overall changes in terms of the structure by cause of death. When life expectancy at birth was 50 years, almost two-thirds of the deaths were caused by communicable diseases and conditions originating in the perinatal period, whereas with a 75-year life expectancy a similar percentage is accounted for by malignant neoplasms, diseases of the circulatory system, cardiovascular diseases, and external causes. Proportional mortality by age also has

**Figure 2. Proportional mortality by age, according to life expectancy at birth.**



changed: with a 50 years life expectancy at birth, half of the deaths occur before 5 years of age, whereas with 75 years life expectancy, 60% occur starting at 65 years of age (See figure 2).

There is reason for concern in the increasing trend of death rates due to malignant neoplasms, especially in view of the fact that effective preventive measures now exist for several of these tumors. Death rates due to lung cancer are on the increase in almost all countries. They are much higher in Argentina, Canada, Cuba, United States, and Uruguay than in the remaining countries, and higher among males. For both sexes, death rates for malignant tumors of the stomach are unusually high in Barbados, Chile, Costa Rica, Ecuador and Venezuela. The highest mortality rates for tumors of the uterine cervix are concentrated in some countries of the English-speaking Caribbean, and the increase is most marked at younger ages, beginning at age 35. The highest mortality rates for malignant tumors of the

breast are recorded in Argentina, Barbados, Canada, United States, and Uruguay, and the rates rise with increasing age, being most marked after age 35.

Diseases of the circulatory system have come to constitute the most important cause of death in countries with an older age distribution, where they account for more than one-third, and in some cases more than two-fifths of total deaths from defined causes. This is true despite the fact that the rates due to this cause group are tending to decline.

In the countries that have succeeded in reducing their mortality rates, especially those that have already achieved a life expectancy at birth of 70 years or more, accidents and violence are the principal cause of death among school children and young adults, with a definite male predominance in the latter case. Prevention of this group of causes is another great challenge for public health.

The increase in proportional mortality from a specific cause does not necessarily imply that there has also been an increase in the death rate from that cause. In fact, that rate may have decreased, but then the reduction in the rates for other causes must have been even greater.

There are some specific peculiarities linked to the physical environment. Thus, for a 50-year life expectancy at birth, in those countries with more temperate climates, mortality due to respiratory diseases is higher than that from intestinal infections, whereas in countries with a tropical climate the reverse is true.

A clear numeric example of the burden of clearly excessive mortality in countries that are experiencing the previous transition, is that, of the 185,000 deaths registered in Canada (1987), 1,100 were due to infectious and parasitic diseases (0.6% of the total) and only 38 were due to intestinal infectious diseases, none of which occurred in infants under one year. By contrast, of the 811,000 deaths registered in Brazil (1986), 51,500 were due to infectious and parasitic diseases (6.4% of the total), that is, 10 times more, but there were also 24,200 deaths from intestinal infectious diseases, 18,000 of which occurred in infants under 1 year of age. Death rates due to pneumonia are only slightly higher in Mexico than in Canada (1987), but while in the latter country only 25 of the 5,800 deaths from that cause occurred in the first year of life (0.4%), in Mexico the proportion was 8,700 out of 20,500 (42.4%). There is a contrast that is not reflected in the rate: pneumonia is a cause of death at older ages in Canada, and at younger ages in Mexico.

Maternal mortality rates show a declining trend. However, complications of pregnancy, childbirth, and the puerperium still play an important role as a cause of death for women in all or some of the age groups within the 15-44 range. Available data for recent years in countries of the Region reveal significant variations:

high values of around 25 maternal deaths per 10,000 live births for Bolivia, Haiti, Honduras, and Peru, compared with a low rate of 0.6 for Canada. The figures should be interpreted with caution, however, given the considerable degree of underestimation due to under registration and assignment to other causes. Under

registration tends to be greatest in those countries where the problem is most serious, and has been estimated to exceed 50%.

(Source: Health Situation and Trend Assessment Program, PAHO.)

---

## The Crisis of Public Health: Reflections for the Debate

The development of public health in the social, economic, and political context of the Region of the Americas is central to the mission of the Pan American Health Organization. Although responsibility for this commitment is shared between the institution's various specific programs, on the whole the work of PAHO is geared toward gaining a better understanding of this field of social action and to working jointly with the countries in its different areas of concern. The priority that PAHO assigned to the theory and practice of public health in 1990 has led the Organization to take concrete steps that reflect its renewed interest in this area of study.

As reported in the *PAHO Epidemiological Bulletin*, vol. 12, no. 4, December 1991, the formulation of a proposal for the development of public health in the countries of the Americas has been defined as a multi-stage process. The first of these stages will culminate in the forthcoming book *La crisis de la salud pública: reflexiones para el debate* (The Crisis of Public Health: Reflections for the Debate).

The principal objective of *La crisis de la salud pública: reflexiones para el debate* is to engage professionals in deeper consideration of the issues in the hope of broadening the scope of analysis ("that which is being looked at") and enlisting comprehensive analytical traditions ("ways of looking at it"). Readers will realize that the book does not exhaust the current issues in public health but rather merely begins to raise them.

*La crisis de la salud pública: reflexiones para el debate* brings together important information about a process of analysis that has been promoted by PAHO over the last four years, first taking into account the program priorities established by its Governing Bodies and then exploring representative points of view from throughout the Americas, which might be regarded as the real crisis. These same contributions were also the subject of an initial debate held in New Orleans in October 1991, which is summarized in the book. The book concludes with a proposed agenda for future discussion at the country level.

The content is divided into three parts. The first section covers the PAHO initiative and its most recent antecedents. The second part outlines initial reflections on the project. The final chapter presents the future outlook as envisaged by the Advisory Group on Development of Public Health Theory and Practice in the Region of the Americas, which met in New Orleans on 21-24 October 1991, and suggests orientations to be adopted during the next stages of the project.

*La crisis de la salud pública: reflexiones para el debate*, 1992. Publicación Científica OPS, No. 540. 280 p. ISBN 92 75 31540 X. In press: *The Crisis of Public Health: Reflections for the Debate*.

The publication is available from: Pan American Health Organization, 525 Twenty-third Street, N.W., Washington, D.C. 20037. Attention: Distribution and Sales.



# The Economic Impact of the Cholera Epidemic, Peru, 1991

*A summary is presented of some of the results of a study designed to determine the economic impact of the cholera epidemic in Peru. The study was carried out by economists Margarita Petrerá, principal investigator, and Maibí Montoya, assistant investigator, sponsored by PAHO/WHO upon request of the Peruvian Multisectoral Commission for the Campaign Against Cholera.*

## Background

In the epidemiological history of cholera, Peru is the country that presents the highest incidence during the current pandemic, and holds second place after Chad, African nation of extreme poverty, in reference to the world's cholera mortality rates. The high incidence and mortality makes one wonder about the Peruvian context that received cholera. The economic, social, and political crisis being faced by Peru is the longest and most serious of this century. The evaluation of the following indicators is used to illustrate this situation: per capita gross domestic product, family income, public spending on health, urban land use, housing conditions, and the incidence of acute diarrheal disease.

Peru's per capita gross domestic product (GDP) declined by 28% in the period from 1987 to 1990. This took place in the context of an acute inflationary process that culminated in hyperinflation on the order of a cumulative 7,650% in 1990. During this same period, the income distribution deteriorated: the percentage of minimum wage earners increased (from 23 to 54%) and the purchasing power of their income was drastically reduced. Whereas in 1986 a family of six required the work of two family members to cover its minimum food requirements, by 1990 the work of four members was required in order to satisfy the same needs.

At the same time, during the period from 1985 to 1989 public spending on health decreased in real terms by 52%, which implied a curtailment of services and a reduction in the development of infrastructure. During the same period, the population of 6.5 million in the metropolitan region of Lima who live in shantytowns, known in Peru as *pueblos jóvenes*, increased by 50%. With regard to sanitary conditions, it is estimated that 55% of the population of the country received water from public municipal systems and that the sewerage system covered 45% of the population. Water quality has been compromised by deficiencies in the distribution systems and the intermittent service provided. Under such circumstances it has been almost impossible to maintain acceptable quality, particularly with regard to disinfection.

Directly related to the situation described above is an indicator that links the health situation to these conditions--the incidence of acute diarrheal disease. In Peru, acute diarrhea has been the second-ranking cause

of morbidity in recent years, showing a distinctly rising trend from 919.8 to 1,320 per 100,000 population in the period from 1984 to 1989.

## Methodology

The study was carried out taking into account two complementary levels of analysis: sectoral and macroeconomic.

Sectoral analysis studied the dynamics within the sectors linked to cholera and was focused on the response of the agents (families, exporters, national producers and marketers, producers of health and sanitation services) to different types of costs, benefits, and changes in the structure of sectoral production that could have arisen as a result of the epidemic. The macroeconomic analysis showed the aggregate effect of the losses and possible benefits of the epidemic on present and future national production.

The methodology distinguished between direct cost--patient care costs--and indirect cost. The latter consisted of losses resulting from different restrictions on demand (external and internal) for Peruvian products supposedly contaminated by cholera; from the effect of these restrictions on the other sectors not directly linked to the epidemic, but which maintain economic interrelationships with those sectors; and from working days lost due to disease or death.

In addition to costs, the emergence of possible beneficiaries as a result of demand for certain drugs which was generated by the epidemic was also studied. The processes of sectoral regrouping stimulated by the epidemic were covered as well.

## Results

### *Fisheries, Vegetable and Fruit Exports*

The international fear of cholera in the early months of the epidemic was manifested by import bans on practically all Peruvian products of marine and plant origin. Some countries included fishmeal and preserves among the prohibitions. Microbiological quality control and the fumigation of ships and aircraft from Peru were required.

Exports affected were fisheries and agricultural products. Fisheries exports accounted for 15% (US\$503.2 million) of the total value of exports in 1990.

Furthermore, although export of vegetables and fruits represented only 4% of the total value of all exports, this activity was on the increase and its future prospects were good.

Total export losses amounted to US\$27.97 million. They included losses due to: 1) sale agreements not carried out (lost shipments); 2) the lower prices at which Peruvian products were sold on the international market; 3) higher export costs deriving from prolonged storage in foreign ports, due to delays in acceptance on the part of purchasing countries; 4) higher export costs deriving from more rigorous controls to ensure the absence of *V. cholerae*; 5) technical studies on the prevention of cholera and its dissemination, carried out by exporters in order to ensure safety and improve their image in the international community; 6) the impact on the remaining economic sectors associated with fisheries and agricultural exports. This estimate was made by applying the input-product table.

The demand by importers for a modernization of the production process took place in a context marked by a lack of incentives to export and a growing decline in the exchange rate that was harmful to export activities. Accordingly, it was to be expected that small producers could not face the higher costs of export and consequently had to abandon the market, which originated sectoral restructuring in the direction of centralization and concentration.

### *Tourism*

Tourism losses were estimated at US\$147.12 million, and the indirect cost was estimated at US\$62.32 million. The income in foreign exchange produced by tourism represented 12% of national exports in 1989. In estimating the losses caused by cholera, no account was taken of the descending trend in tourism in recent years that resulted from insecurity and from cost of living increases.

### *Domestic Fisheries and Street Food-Vending*

Losses from fishing for human consumption were estimated at US\$32.57 million. Between January and December 1991, consumption of fresh or frozen marine products had registered a decline of 33.65% compared with the same period in 1990.

According to a household survey conducted by the Ministry of Labor (1986), 5% of all informal workers were engaged in street food-vending. Taking into account the lack of data on the weight of the informal sector of the economy, the percentage share of 1989 GDP (16.45%) of the income of self-employed nonfarm workers was taken as an indicator. The direct cost to national production, of the fewer sales made by street food-vendors, was estimated at US\$15.85 million.

### *Pharmaceuticals and Cleaning Supplies*

These industries were considered possible beneficiaries of the cholera epidemic, and indeed, some companies in the pharmaceutical industry became major beneficiaries, particularly those that produced intravenous fluids. However, this benefit could not be generalized for the entire industry. Benefits on the order of US\$5.53 million were estimated in this regard. On the other hand, increased sales, and consequently increased profits, were not confirmed for companies producing cleaning supplies.

### *Health and Sanitation*

An important consequence for the health sector was the restructuring of service delivery. Inasmuch as public spending on health was shrinking, the provision of care for cholera patients during the peak of the epidemic (February-April 1991) curtailed the supply of other basic health care, which then had to be provided at home.

Considering the unit cost per consultation, the total cost to the health sector for cholera treatment in 1991 was US\$29.05 million. This figure also indicated the cost of public health services that had to be sacrificed and that the population had to provide for at its own expense. For this item--services not provided--estimates were based on a case study in La Caleta Hospital in the Department of Ancash.

The aggregate loss to the economy from all the workers affected by the disease, either from days not worked or death, was estimated at US\$17.59 and US\$242.05 million, respectively.

Direct benefit refers to the technical and financial cooperation that Peru received as a result of the epidemic. This benefit was estimated at approximately US\$12 million, although it was not possible to determine a truly comprehensive figure in this regard.

Sanitation activities refer to studies on water quality control and chlorination, with the corresponding inputs and equipment, and repair and maintenance activities. Expenditures on sanitation could not be considered a loss because they covered maintenance and other activities performed on a regular basis. One argument for including them in the economic impact was that these activities were carried out because of the presence of cholera and would not have been performed without the occurrence of the disease. The data for the city of Lima amounted to US\$767.74 for these expenditures.

### *Analysis of Family Cost*

In studying the costs incurred by families in dealing with the disease, a survey was made of a sample of families in urban and urban marginal areas in the cities of Lima and Chimbote. In summary, the families affected assumed part of the cost of the disease. A third

**Table 1. Loss and benefit caused by the cholera epidemic, Peru, 1991.**

| Loss  | Total loss<br>(US\$ million)            |
|---|---|
| <b>External market</b>                          | 175,325                                 |
| Exports   | 27,972                                  |
| Imports   | 233                                     |
| Tourism   | 147,120                                 |
| <b>Internal market</b>                          | 337,112                                 |
| Internal fisheries                              | 32,568                                  |
| Street food vendors                             | 15,850                                  |
| Cholera patients care                           | 29,053                                  |
| Absence from work due to illness                | 17,586                                  |
| Absence from work due to death 1991             | 8,292                                   |
| Future absence from work due to death           | 233,764                                 |
| <b>Benefits</b>                                 | <b>Total benefit<br/>(US\$ million)</b> |
| Manufacture (Pharmacy-chemical human use)       | 5,534                                   |
| International technical cooperation (Donations) | 11,602                                  |
| <b>Total benefits</b>                           | <b>17,136</b>                           |
| <b>Total Loss</b>                               | <b>495,302</b>                          |

of the families surveyed made some expenditures on drugs. The study also suggested that medical care in health establishments of high complexity, self-medication or use of informal health services, and delay in seeking treatment in institutional health establishments had the effect of raising the costs to families. Two-thirds of the families surveyed made substitutions in their normal consumption habits and sacrificed basic expenditures, such as on food and children's education, in order to face the costs

associated with the disease and to consume more water and fuel in combating it.

#### *Macroeconomic Analysis*

In aggregate terms, the total of direct and indirect benefits and losses amounted to a net loss of US\$495.30 million. The net loss in relation to the GDP for 1991 was US\$232.49 million, close to 1% of the GDP for that year, which did not take into account the loss of US\$233.76 million to affect production in future years.

# Development of Epidemiology in Central America

*The VIII Meeting of the Health Sector of Central America (RESSCA), held in San Salvador on 2-5 September 1992, was attended by representatives from Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama. Fourteen key resolutions were adopted on aspects related to health, among which is of special interest the Resolution on the Development of Epidemiology.*

## CONSIDERING:

1. Article 42 of the Declaration of Presidents signed at Managua and the resolutions of the meetings of the Ministers of Health (COMISCA), which call for coordinated action in the area of epidemiological surveillance;
2. The need for a joint effort by all the countries geared to gaining a better understanding in each case of the determining factors, the resources available, and the actions required in order to bring epidemics under control in the sub region;
3. The social, political, and economic consequences of the current cholera epidemic for the countries of the sub region,

## RESOLVES:

1. To approve the proposal presented by the national directors of epidemiology and officials responsible for cholera prevention and control programs at the Central American meeting for the implementation of a sub regional program to *support the development of epidemiology* in the countries of the area through the strengthening of epidemiological surveillance systems.
2. To designate a delegate from each country to serve on a Central American working group which, with the necessary support from PAHO/WHO, should be convened at the earliest possible date to develop the details of the program.

3. To report the Central American presidents at the next presidential summit, scheduled for December 1992, on the decision taken at the VIII RESSCA as well as the next steps to be taken toward implementation of this program.

The proposal approved at the VIII Meeting of the Health Sector of Central America was prepared in Guatemala on 20-22 August with a view to strengthening the capacity of health services at all levels to identify the geographical/population sectors most affected by cholera, diarrhea in general, and other health problems and to take such actions as: (1) developing hypotheses to account for the appearance or spread of the phenomenon in question (for example, cholera), and (2) undertaking research to confirm these hypotheses.

This approach should make it possible to determine the local importance of certain risk factors by comparing groups exposed to a given factor with those not exposed to it, to establish whether or not the frequency of the health problem in the exposed group is *significantly* greater, and to estimate the proportion of damage that could be reduced in the population under study. In other cases, different designs might be more appropriate. This approach would be a valuable step toward ensuring that prevention and control measures within the health sector are adopted and carried out more rationally and that those corresponding to other sectors are negotiated by public health leaders on a solid foundation.

---

## Epidemiological Activities in the Countries

### General Epidemiology Course in Paraguay

A course on general epidemiology was held in Asunción, Paraguay, from May to July 1992, under the coordination of the Ministry of Public Health and Social Welfare, and with technical cooperation of the "Dr. Juan H. Jara" National Institute of Epidemiology, Mar del

Plata, Argentina, and of the PAHO/WHO Country Office in Paraguay. The primary focus of the course was to insert the use of an epidemiological approach into the daily practice of health services personnel.

It had been recognized that the need to assist health services patients has required that personnel center their

activities in the sick individuals, therefore postponing a vision of collective health and the preventive aspects of their function. On the other hand, the practice of epidemiological research has been limited to specialists, with little or no participation of health services workers, thus limiting their development.

The course was based on the methodology of distance education using modular structures. Each modular structure consisted of modules with a central learning theme, each module was a study unit which included systematized information and learning activities. Partial evaluations were planned to be performed after each modular structure, and a final one at the course's end. This last evaluation was held during the only 40 hours of classroom attendance. Estimated duration of the course was of 320 hours.

The participants included 50 professionals from the Ministry of Health, municipalities and other institutions. The professional background of participants was as follows: 64% medicine, 22% nursing, and others (biochemistry, biology, psychology, architecture and odontology).

### **Third National Working Sessions on Epidemiology in Colombia**

The Colombian Society of Epidemiology announces the Third National Working Sessions on Epidemiology, to be held on 29-31 October 1992 in Rionegro, Antioquia.

The objectives of this event are: to promote the application of epidemiology to the development of local health systems, to promote epidemiological research for increased understanding of public health problems leading to their prevention and solution, and to bring together the community of professionals working in epidemiology in Colombia and other countries of the Hemisphere.

This meeting is sponsored by the National School of Public Health of the University of Antioquia, the Sectional Health Service of Antioquia, Metrosalud, and the Pan American Health Organization.

Through discussions, round tables, working groups, and poster sessions and through the participation of invited international attendees, the use of epidemiology will be discussed in:

- Strategic health services planning.
- Development of health promotion strategy at the local level.
- The clinic and its utilization in health services.
- Mental health.
- Research on AIDS and hepatitis.
- Epidemiological research under way in the country.

- Health policy formulation, planning, and health services administration.
- Health services economics.
- Analysis of the health situation.
- Situation of the epidemiologist.

Further information may be obtained from: Dr. Germán González Echeverri, Coordinator of the Scientific Committee, Apartado Aéreo 60253, Medellín, Colombia, telephone/fax 511-2506.

### **Congress of Health Services Administrators in Argentina**

The XII South American Congress of Health Services Administrators, organized by the Argentine Section of the South American Federation of Scientific Institutions for Health Administration, will be held on 18-20 November 1992 in Buenos Aires. Its theme will be *Living Conditions and Health Promotion*.

The profound economic, political, and social changes that have taken place in recent years at the international level, and in Latin America in particular, as well as those that have taken place in the organization, financing, and access to health services and in health promotion, prevention, and treatment, have contributed to a major breakdown in living conditions for broad sectors of the population and to a deepening of inequalities in terms of living conditions and health.

In view of this situation, health systems administrators have called attention to the need to re-think and discuss their active role in the development of substantive activities in health promotion with a view to contributing to improved living conditions in their communities.

This important event will include discussions, round tables, workshops with experts, clinics, and open topic sessions. Presentations in the last-mentioned sessions will compete for an annual award granted by the Argentine Society for Hospital Administration and Medical Care and the Argentine Medical Association. The deadline for the presentation of proposals is 1 November 1992.

Further information may be obtained from: Dr. Jorge Daniel Lemus, Secretary General of the event, Avda. Santa Fe 1171, 1er piso, (1059) Buenos Aires, Argentina; telephones 41-1633, 801-0020, fax 54-1-814-0634.

### **International Course in Cuba**

The "Pedro Kouri" Institute of Tropical Medicine and the Cuban Ministry of Public Health announce an International Course on Advanced Quantitative Techniques in Epidemiology, to be held in January of each year in Havana.

The program will include conferences, seminars, practice classes, computer laboratory sessions, and demonstration visits. The topics to be covered will include:

- Approaches to the application of measurements in epidemiology.
- Measurement of frequency of association and potential impact.
- Causality in epidemiology.
- Design of a cohort study.
- Design of a controlled case study (with cases and controls); bias in controlled case studies.
- Sampling in the various types of epidemiological study design.

- Screening and evaluation of diagnostic tests.
- Evaluation of risk factors.
- Evaluation of risk factors adjusted for a single variable.
- Review of simple and multiple regression.
- Logistic regression: general principles and applications in epidemiology.

The official language of the course will be Spanish. Further information may be obtained from: Dr. Nereyda Cantelar, Subdirectora Docente, "Pedro Kouri" Institute of Tropical Medicine, Apartado Postal # 601, Zona Postal Area Marianao 13, Havana, Cuba. Telex 511902, 512341, telephones 204913, 204926, fax 5-37-215957.

## Cholera Situation in the Americas

Cases, hospitalized and deaths from cholera, reported in the last four reporting weeks, 1992.

| Country     | Date Report | 4 Week Period |           |        | Cumulative 1992 |           |        |
|-------------|-------------|---------------|-----------|--------|-----------------|-----------|--------|
|             |             | Cases         | Hospital. | Deaths | Cases           | Hospital. | Deaths |
| Argentina   | 8/02-8/29   | 0             | 0         | 0      | 451             | ...       | 0      |
| Belize      | 7/26-8/22   | 26            | 13        | 1      | 29              | 17        | 1      |
| Bolivia     | 7/26-8/22   | 764           | 222       | 0      | 19,934          | 9,103     | 339    |
| Brazil      | 8/16-9/12   | 1,534         | 1,387     | 19     | 18,718          | 14,640    | 228    |
| Chile       | 8/16-9/12   | 0             | 0         | 0      | 71              | 31        | 1      |
| Colombia    | 8/02-8/29   | 180           | ...       | ...    | 15,000          | ...       | ...    |
| Costa Rica  | 8/22-9/12   | 0             | 0         | 0      | 8               | 5         | 0      |
| Ecuador     | 7/26-8/22   | 288           | 251       | 2      | 30,242          | 27,256    | 198    |
| El Salvador | 8/16-9/12   | 711           | 35        | 3      | 7,144           | 2,852     | 41     |
| Guatemala   | 8/09-9/05   | 1,059         | 531       | 11     | 13,424          | 5,971     | 191    |
| Honduras    | 8/02-8/29   | 60            | 41        | 3      | 282             | 245       | 13     |
| Mexico      | 8/02-8/29   | 602           | 160       | 10     | 4,457           | 929       | 52     |
| Nicaragua   | 8/09-9/05   | 472           | 126       | 6      | 1,216           | 287       | 9      |
| Panama      | 8/09-9/05   | 351           | 201       | 17     | 1,360           | 592       | 31     |
| Peru        | 8/02-8/29   | 1,072         | 290       | 3      | 183,518         | 74,852    | 653    |
| Venezuela   | 7/26-8/22   | 997           | 398       | 24     | 2,117           | 924       | 47     |
| Total       |             | 8,116         | 3,655     | 99     | 297,971         | 137,704   | 1,804  |

... Data not received.

# AIDS Surveillance in the Americas

Number of reported cases by year, and cumulative cases and deaths, by country and subregion.  
As of 10 September 1992.

| SUBREGION<br>Country           | Number of Cases |        |        |        |        |        |        | Cumulative<br>total(a) | Total<br>deaths | Date of<br>last<br>report |
|--------------------------------|-----------------|--------|--------|--------|--------|--------|--------|------------------------|-----------------|---------------------------|
|                                | Through<br>1986 | 1987   | 1988   | 1989   | 1990   | 1991   | 1992   |                        |                 |                           |
| REGIONAL TOTAL                 | 45,536          | 33,485 | 42,802 | 49,907 | 54,519 | 54,889 | 15,740 | 296,711                | 182,148         |                           |
| LATIN AMERICA b)               | 3,286           | 4,528  | 7,206  | 9,236  | 12,712 | 14,162 | 5,049  | 56,200                 | 23,665          |                           |
| ANDEAN AREA                    | 235             | 387    | 690    | 912    | 1,347  | 1,366  | 425    | 5,362                  | 2,686           |                           |
| Bolivia                        | 3               | 3      | 10     | 2      | 7      | 16     | 6      | 47                     | 40              | 30/Jun/92                 |
| Colombia                       | 73              | 186    | 295    | 404    | 702    | 732    | 161    | 2,553                  | 1,256           | 30/Jun/92                 |
| Ecuador                        | 13              | 22     | 29     | 22     | 42     | 51     | 29     | 208                    | 140             | 30/Jun/92                 |
| Peru                           | 30              | 32     | 65     | 118    | 141    | 155    | 73     | 614                    | 216             | 31/Mar/92                 |
| Venezuela                      | 116             | 144    | 291    | 366    | 455    | 412    | 156    | 1,940                  | 1,034           | 30/Jun/92                 |
| SOUTHERN CONE                  | 118             | 130    | 267    | 349    | 601    | 748    | 330    | 2,543                  | 811             |                           |
| Argentina                      | 73              | 72     | 169    | 228    | 388    | 478    | 225    | 1,633                  | 380             | 30/Jun/92                 |
| Chile                          | 35              | 44     | 66     | 80     | 125    | 174    | 42     | 566                    | 242             | 30/Jun/92                 |
| Paraguay                       | 2               | 5      | 4      | 3      | 12     | 10     | 6      | 42                     | 31              | 30/Jun/92                 |
| Uruguay                        | 8               | 9      | 28     | 38     | 76     | 86     | 57     | 302                    | 158             | 10/Aug/92                 |
| BRAZIL                         | 1,677           | 2,292  | 3,825  | 5,025  | 6,614  | 7,789  | 2,422  | 29,644                 | 13,242          | 01/Aug/92                 |
| CENTRAL AMERICAN ISTHMUS       | 86              | 194    | 359    | 475    | 854    | 889    | 508    | 3,386                  | 1,320           |                           |
| Belize                         | 1               | 6      | 4      | 0      | 1      | 25     | ...    | 37                     | 37              | 31/Dec/91                 |
| Costa Rica                     | 20              | 23     | 52     | 57     | 69     | 90     | 59     | 370                    | 235             | 30/Jun/92                 |
| El Salvador                    | 7               | 16     | 34     | 72     | 54     | 109    | 41     | 333                    | 105             | 30/Jun/92                 |
| Guatemala                      | 15              | 16     | 18     | 17     | 76     | 94     | 37     | 273                    | 112             | 30/Jun/92                 |
| Honduras                       | 17              | 102    | 189    | 250    | 583    | 485    | 332    | 1,976                  | 571             | 30/Jun/92                 |
| Nicaragua                      | 0               | 0      | 2      | 2      | 7      | 13     | 3      | 28                     | 27              | 30/Jun/92                 |
| Panama                         | 26              | 31     | 60     | 77     | 64     | 73     | 36     | 369                    | 233             | 30/Jun/92                 |
| MEXICO                         | 245             | 804    | 964    | 1,499  | 2,395  | 3,166  | 1,284  | 10,357                 | 5,037           | 30/Jun/92                 |
| LATIN CARIBBEAN c)             | 925             | 721    | 1,101  | 976    | 901    | 204    | 80     | 4,908                  | 569             |                           |
| Cuba                           | 6               | 10     | 14     | 15     | 33     | 38     | 21     | 137                    | 72              | 30/Jun/92                 |
| Dominican Republic             | 124             | 234    | 356    | 508    | 238    | 166    | 59     | 1,685                  | 200             | 30/Jun/92                 |
| Haiti                          | 795             | 477    | 731    | 453    | 630    | ...    | ...    | 3,086                  | 297             | 31/Dec/90                 |
| CARIBBEAN c)                   | 465             | 374    | 489    | 725    | 702    | 847    | 403    | 4,017                  | 2,442           |                           |
| Anguilla                       | 0               | 0      | 1      | 2      | 1      | 1      | 1      | 6                      | 3               | 30/Jun/92                 |
| Antigua                        | 2               | 1      | 0      | 0      | 3      | ...    | ...    | 6                      | 5               | 31/Dec/90                 |
| Bahamas                        | 86              | 90     | 93     | 168    | 162    | 235    | 100    | 934                    | 574             | 30/Jun/92                 |
| Barbados                       | 32              | 24     | 15     | 40     | 61     | 80     | 48     | 300                    | 217             | 30/Jun/92                 |
| Cayman Islands                 | 2               | 1      | 1      | 1      | 2      | 3      | ...    | 10                     | 8               | 31/Mar/91                 |
| Dominica                       | 0               | 5      | 2      | 3      | 2      | ...    | ...    | 12                     | 11              | 30/Jun/90                 |
| French Guiana                  | 78              | 25     | 34     | 54     | 41     | ...    | ...    | 232                    | 144             | 30/Sep/90                 |
| Grenada                        | 3               | 5      | 3      | 8      | 5      | 7      | 1      | 32                     | 18              | 31/Mar/92                 |
| Guadeloupe                     | 47              | 41     | 47     | 47     | ...    | ...    | ...    | 182                    | 85              | 31/Dec/89                 |
| Guyana                         | 0               | 10     | 34     | 40     | 61     | 85     | 71     | 301                    | 94              | 30/Jun/92                 |
| Jamaica                        | 11              | 32     | 30     | 66     | 62     | 133    | 27     | 361                    | 243             | 31/Mar/92                 |
| Martinique                     | 25              | 23     | 30     | 51     | 45     | 27     | 14     | 215                    | 136             | 30/Jun/92                 |
| Montserrat                     | 0               | 0      | 0      | 1      | 0      | 0      | 0      | 1                      | 0               | 30/Jun/92                 |
| Netherlands Antilles           | 9               | 12     | 9      | 16     | 31     | ...    | ...    | 77                     | 16              | 31/Dec/90                 |
| Saint Lucia                    | 4               | 4      | 2      | 8      | 3      | 7      | 7      | 47                     | 23              | 30/Jun/92                 |
| St. Christopher-Nevis          | 6               | 4      | 9      | 5      | 8      | 1      | 1      | 34                     | 21              | 30/Jun/92                 |
| St. Vincent and the Grenadines | 2               | 5      | 8      | 6      | 4      | 14     | 2      | 41                     | 28              | 30/Jun/92                 |
| Suriname                       | 4               | 5      | 4      | 35     | 35     | 16     | 17     | 116                    | 91              | 30/Jun/92                 |
| Trinidad and Tobago            | 151             | 85     | 160    | 167    | 173    | 235    | 114    | 1,085                  | 706             | 30/Jun/92                 |
| Turks and Caicos Islands       | 3               | 2      | 6      | 7      | 1      | 2      | ...    | 21                     | 18              | 31/Dec/91                 |
| Virgin Islands (UK)            | 0               | 0      | 1      | 0      | 2      | 1      | 0      | 4                      | 1               | 31/Mar/92                 |
| NORTH AMERICA                  | 41,785          | 28,583 | 34,907 | 39,946 | 41,105 | 39,880 | 10,288 | 236,494                | 156,041         |                           |
| Bermuda                        | 51              | 21     | 28     | 35     | 33     | 23     | 8      | 199                    | 142             | 31/Mar/92                 |
| Canada                         | 1,185           | 867    | 1,017  | 1,169  | 1,050  | 788    | 40     | 6,116                  | 3,746           | 31/Mar/92                 |
| United States of America c)    | 40,549          | 27,695 | 33,862 | 38,742 | 40,022 | 39,069 | 10,240 | 230,179                | 152,153         | 30/Jun/92                 |

a) May include cases for year of diagnosis unknown.

b) French Guiana, Guyana, and Suriname included in Caribbean.

c) Puerto Rico and the U.S. Virgin Islands included in the United States of America.

# Diseases Subject to the International Health Regulations

**Yellow fever and plague cases and deaths reported in the Region of the Americas as of 30 September 1992.<sup>1</sup>**

| Country and administrative subdivision | Yellow fever |        | Plague cases |
|--|--------------|--------|--------------|
|  | Cases        | Deaths |              |
| BOLIVIA                                | 14           | 10     | -            |
| Cochabamba                             | 1            | 1      | -            |
| La Paz                                 | 8            | 8      | -            |
| Santa Cruz                             | 5            | 1      | -            |
| BRAZIL                                 | 10           | 6      | 8            |
| Bahia                                  | -            | -      | 8            |
| Mato Grosso                            | 8            | 4      | -            |
| Mato Grosso do Sul                     | 2            | 2      | -            |
| ECUADOR                                | 11           | 9      | -            |
| Napo                                   | 3            | 3      | -            |
| Pastaza                                | 4            | 3      | -            |
| Sucumbios                              | 3            | 2      | -            |
| -                                      | 1            | 1      | -            |
| UNITED STATES OF AMERICA               | -            | -      | 7            |
| Arizona                                | -            | -      | 3            |
| Nevada                                 | -            | -      | 1            |
| New Mexico                             | -            | -      | 2            |
| Utah                                   | -            | -      | 1            |

<sup>1</sup>For information on reported cholera cases and deaths, see table page 14 in this *Bulletin*.

PAHO's *Epidemiological Bulletin* is published quarterly in English and Spanish.  
Catalogued and indexed by the United States National Library of Medicine.  
Printed on acid-free paper.  
ISSN 0256-1859



**PAN AMERICAN HEALTH ORGANIZATION**  
Pan American Sanitary Office. Regional Office of the  
**WORLD HEALTH ORGANIZATION**  
525 Twenty-Third Street, N.W.  
Washington, D.C. 20037