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...
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, especially the reduction in deaths due to intestinal infectious diseases, 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

1This group includes all infectious and parasitic diseases, this is, all categories of Chapter 1, ICD-9, and also meningitis, acute respiratory infections, pneumonia and influenza.
2It 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.

<table>
<thead>
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<th>Life expectancy at birth</th>
<th>Mortality rates by age (per 1,000)</th>
<th>0-4</th>
<th>5-14</th>
<th>15-39</th>
<th>40-64</th>
<th>65 and more</th>
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<td>1.6</td>
<td>3.2</td>
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<tr>
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<tr>
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<td>3.9</td>
<td>0.3</td>
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<td>6.1</td>
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</table>


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
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:

![Figure 2. Proportional mortality by age, according to life expectancy at birth.](image-url)
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.


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