



Social and economic determinants of mortality in Latin America

Determinantes económicos y sociales de la mortalidad en América Latina

Behm, Hugo¹

¹Centro Latinoamericano de Demografía (CELADE).

ABSTRACT This article by Hugo Behm, written in 1979, analyzes the determinants of mortality in Latin America. It was originally presented in the United Nations/World Health Organization meeting on the "Socio-Economic Determinants and Consequences of Mortality" held in Mexico City from June 19 to 25, 1979 and published in *Revista Centroamericana de Ciencias de la Salud*, No. 12, in 1979. This re-edition, as part of the section Foundational Texts, aims to honor the memory of the author and recover a text pioneering in its effort to demonstrate how the mortality differentials between countries and between different regions within the same country, as well as urban/rural differentials, can be explained by structural social and economic inequality which create mortality "excesses" by ethnicity, age group and social class.

KEY WORDS Mortality; Infant Mortality; Life Expectancy at Birth; Social Indicators; Socioeconomic Factors; Latin America.

RESUMEN Este artículo de Hugo Behm, escrito en 1979, realiza un análisis de los determinantes de la mortalidad en América Latina. Fue presentado, originalmente, en la reunión de Naciones Unidas/Organización Mundial de la Salud sobre "Determinantes socioeconómicos de la mortalidad y sus consecuencias" realizada en la Ciudad de México, entre el 19 y el 25 de junio de 1979, y publicado en la *Revista Centroamericana de Ciencias de la Salud*, No. 12, en 1979. Su reedición en la sección Textos Fundacionales apunta a honrar la memoria del autor y a recuperar un texto pionero en señalar cómo los diferenciales de mortalidad existentes entre países, al interior de los mismos y entre regiones, así como los diferenciales urbano-rural, se explican a partir de desigualdades sociales y económicas que son estructurales y actúan generando "excedentes" de mortalidad por etnia, por grupos de edades y por clases sociales.

PALABRAS CLAVE Mortalidad; Mortalidad Infantil; Esperanza de Vida al Nacer; Indicadores Sociales; Factores Socioeconómicos; América Latina.

Mortality in Latin America has experienced dramatic decreases in recent decades, although there continue to be excessive differences in comparison with the levels reached in more developed regions. The relationship between death and socioeconomic conditions is well known, although the action mechanisms and the relative importance of the different intervening factors are still unclear. Thus, it is convenient to analyze the existing knowledge regarding the characteristics and origins of the socioeconomic differentials in mortality in Latin America in order to better explain the present situation and its perspectives.

A BRIEF OVERVIEW OF THE SOCIAL AND ECONOMIC SITUATION IN LATIN AMERICA

This situation was studied by the Economic Commission for Latin America (CEPAL, from the Spanish Comisión Económica para la América Latina) in 1977, focusing on the period from 1950-1975. The report demonstrates that the development observed in the region has contradicted the 1950s idea that "continuous progress, based in industrialization and associated with particular socioeconomic reforms, would generate a social transformation with more egalitarian aims." There has been important economic progress. Despite the demographic increase, the growth rates of the gross domestic product (GDP) per capita reached 2.6% and sped to 3.7% during the period of 1966-1973. Industry has been the most dynamic sector, experiencing a five-fold increase in its product in the last 25 years, whereas the agricultural sector has fallen substantially behind. The State and transnational companies have been the most important agents of this process, with the latter abandoning the primary sector to move into industry and commerce. External financing has closely tied these countries (especially the largest ones) to the international financial market. The sum of foreign debt services that the region must face takes up an important part of its resources.

Such economic growth "has been accompanied by an unequal distribution of its

fruits, because both ownership of the means of production and the technical progress and modernization have tended to concentrate." By 1970, the sector considered "modern" (mainly the manufacturing and mining industry) generated 50% of the GDP, but accounted for only 12% of the labor force. At the other extreme, the "primitive" production sector constituted a third of the labor force and contributed only 5% to the GDP. This sector is made up of a working class population with low productivity and even lower incomes. The unequal income distribution remained unchanged between 1960 and 1970: the poorest 50% of the population receives 14% of the total income, whereas the richest 15% gets 74%. The production system shows an obvious inability to generate employment. According to estimates from the International Labor Organization (ILO) (2), made for a group of countries that make up 75% of the population in the region, 28% of the labor force is not utilized in the production process (open unemployment and underemployment). According to the same source, in 1973, 43% of the population (approximately 110 million people) lived in conditions of "severe poverty" and around 35% of the population did not have an income level sufficient to afford a minimum balanced diet.

In order to face this situation and as a palliative measure, countries have tended to extend their social services, among which education and health are the most successful. Nevertheless, "if indicators are considered by social groups, one can observe that the outstanding improvements within certain sectors (middle groups) leave the excluded groups in an even worse situation (especially the rural poor)." Thus concludes the summary of the main ideas from the CEPAL report relevant to this discussion.

Life expectancy at birth in Latin America was 61.4 years in 1970-1975, ranging from 46.8 to 69.8 years depending on the country (3). This was a significant improvement with respect to 1950-1955, a period in which these values were 52.1, 36.9, and 66.3 years, respectively. What is the relationship between this situation of mortality within the region and the socioeconomic context that has been summarized?

CONCEPTUAL FRAMEWORK OF THIS ANALYSIS

The mortality within a population is a function of the frequency with which a disease occurs (incidence) and the probability that a person suffering from the disease will die (lethal rate). Health and disease are two moments of a single dynamic process. Death, as an individual phenomenon, has biological determinants, whose mechanisms constitute the etiopathogeny of the disease. However, this biological conception in and of itself is not enough to explain mortality when considered at a collective level. The multicausal approach of epidemiology has been able to describe the distribution and the course of diseases within the population: according to this conception, health and disease represent a process resulting from the balance among man, diverse external pathogenic factors and the physical, biological and social environment. Many studies have shown the relationship between disease and death and variables such as economic income, diet, sanitation, education, medical care, etc. It has also been demonstrated that all these factors are in turn closely correlated to one another. However, in reality the unequal distribution within the population of all these components of life is nothing but the visible manifestation, the measurable link, of a causal chain arising from the social, economic and political organization.

Laurell (4), among others, has helped to promote and enhance a more comprehensive conceptualization of the genesis of the health-disease phenomenon at a collective level. In synthesis, this hypothesis sustains that, at this level, the phenomenon is socially determined and should be studied within the context of a social theory. The process is rooted in the way man appropriates and transforms natural resources and establishes relationships with other human beings in order to produce and appropriate the resulting products. This is, above all, a social process which manifests itself as a specific socioeconomic formation in the articulation between different means of production, of which one is dominant. In Latin American countries, for example, less-developed

and more-developed capitalist sectors coexist with subsistence or simple merchant economies. In this context, the degree of development of the productive forces is also important, as it determines, among other things, the efficiency with which man transforms nature for his own benefit. Thus, technological progress and improved working tools have helped man eliminate the risk of famine and epidemics in many countries. Lastly, the relative power of different groups within a society influences the portion each will receive of the goods and services produced. All other things being equal, an organized working class will obtain better salaries and the implementation of more egalitarian social policies. All of these elements, in addition to others, create different standards of living within the different social sectors of a country, which in turn influence the occurrence of disease and death. This is a historical and dynamic process, in the sense that in every society the social relationships of production continually change and regenerate throughout time.

By no means does this explanation ignore the existence of certain biological determinants in the health-disease-death process. What it attempts to do is articulate the biological elements within a social context with the idea that social causes can trigger and transform the biological factors. Thus, for instance, the higher infant mortality observed in children with mothers from either extreme of the age range, as well as the higher risk in children born after a large number of previous births, have a biological explanation. Nonetheless, it is the social determinants of fertility that condition women from the lowest socioeconomic groups to have an early, high and prolonged fertility, reason for which a higher proportion of births occur within the highest risk groups. The relative importance of social and biological factors depends on the historical stage of each social structure, as well as on the resulting rate and structure of the mortality. Socioeconomic factors play a more important role in the genesis of mortality in Latin American countries where high mortality rates prevail, especially during the first years of life, connected to such predictable causes as malnutrition, diarrhea and other infectious diseases.

Undoubtedly, the model which has been briefly described above requires a great deal more development, as Cordeiro (5) and others have noted, in order to explain in different historical conditions how the socioeconomic and biological determinants are articulated in the genesis of the level and distribution of mortality within a certain population and at a given time. All in all, the hypothesis has greater explicative value than simply affirming that mortality results from "poverty" or from a specific level of economic and social development. Certainly, the model needs to be validated empirically. Research based in this line of thought is quite scarce, among other reasons because the information necessary to establish adequate analytic categories is not often available.

In the text that follows, the information available in Latin America on socioeconomic differentials of mortality is systematically reviewed. The extent to which these differentials are consistent with the previously described conceptualization regarding the genesis of mortality will also be analyzed.

SOCIODEMOGRAPHIC DIFFERENTIALS OF MORTALITY

1. Contrasts among countries of the region

Table 1 shows mortality in children under two years of age in Latin American countries around 1958-1970. This age was selected because it is the period of life most sensitive to the living conditions of the population. According to these estimates, there are 952,000 deaths annually at this age that could have been avoided if Latin America had reached the level of mortality observed in the USA in 1970. The region shows great heterogeneity in the risk of dying, ranging from 202 per thousand live births in Bolivia to 38 per thousand in Uruguay. It is estimated that more than half the children born in Latin America are exposed to a mortality greater than 120 per thousand, that is, twelve times higher than the mortality rate in Sweden.

The relationship between the level of mortality in Latin American countries and some

characteristics of their social development has been studied by CEPAL (6). A group of four social indicators (hospital beds per 1,000 inhabitants, protein consumption, literacy and percentage of households with drinking water) has a high linear correlation with life expectancy at birth ($r = 0.94$). Studying mortality in each of the Latin American countries, in connection with the characteristics of its social and economic structure would be more significant, but lies far beyond the possibilities of the present work. Nonetheless, an expedited analysis of some countries with extreme mortality rates is quite suggestive.

Argentina is included among the countries with low mortality. In this country, capitalist development began earlier and advanced further than in other countries of the region (7). As there was no previous feudal structure, the development of a vast and modern agricultural export system was possible. The labor force benefited from an important wave of European immigration that was able to obtain favorable salary conditions and contributed its living and consumerism patterns. In Argentina, life expectancy at birth was 68.2 years in 1970-1975 and the indicators summarized in Table 2 are among the best in the region. Costa Rica is mainly an agrarian country, showing sustained economic growth. Due to a successful banana strike in the 1930s, a policy that considerably extended social benefits (education, health) was implemented. Life expectancy at birth also reached 68.2 years and the indicators are very favorable.

Honduras is included among the countries with a high mortality rate. Its economy has long been dominated by a foreign agro-exporting enclave (banana) which has distorted the progress of the rest of the country. Life expectancy at birth reaches only 53.5 years and the socioeconomic indicators are extremely unfavorable. Income distribution in Honduras is one of the most unequal within the region. In Haiti, the country bearing the highest mortality rate in Latin America, a subsistence economy and feudal production relationships prevail, with a barely incipient development of the capitalist sector.

Table 1. Probability of dying between birth and two years of age in Latin American countries around 1968-1970.

| Country | Period | Probability of dying (per thousand) ^a | Estimated live births ^b | | Estimated deaths in children under two years ^c | | | |
|----------------|-----------|--|------------------------------------|-------|---|----------|---------------------|----|
| | | | Thousands | % | Observed | Expected | Excess ^d | |
| | | | | | Number | % | | |
| Bolivia | 1971-1972 | 202 | | | | | | |
| Haiti | 1971 | 176 | 994 | 9.5 | 176,498 | 20,874 | 155,624 | 88 |
| Peru | 1967-1968 | 169 | | | | | | |
| Nicaragua | 1966-1977 | 149 | | | | | | |
| Guatemala | 1968-1969 | 149 | 611 | 5.8 | 89,261 | 12,831 | 76,430 | 86 |
| El Salvador | 1966-1967 | 145 | | | | | | |
| Honduras | 1969-1970 | 140 | | | | | | |
| Brazil | 1970 | 133 | | | | | | |
| Ecuador | 1969-1970 | 127 | 4,054 | 38.7 | 535,596 | 85,134 | 450,462 | 84 |
| Dominican Rep. | 1970-1971 | 123 | | | | | | |
| Chile | 1965-1966 | 91 | | | | | | |
| Colombia | 1968-1969 | 88 | 3,355 | 32.1 | 289,633 | 70,455 | 219,178 | 76 |
| Mexico | 1970 | 85 | | | | | | |
| Costa Rica | 1968-1969 | 81 | | | | | | |
| Paraguay | 1967-1968 | 75 | | | | | | |
| Argentina | 1965-1966 | 58 | | | | | | |
| Panama | 1970 | 58 | 1,451 | 13.9 | 81,047 | 30,471 | 50,576 | 62 |
| Venezuela | 1971 | 52 | | | | | | |
| Cuba | 1970 | 48 | | | | | | |
| Uruguay | 1970 | 38 | | | | | | |
| Latin America | | 112 | 10,465 | 100.0 | 1,172,035 | 219,765 | 952,270 | 81 |
| USA | 1970 | 21 | | | | | | |
| Sweden | 1972 | 11 | | | | | | |

Sources:

^aBehm H, et al. Mortalidad en los primeros años de vida en países de la América Latina. Santiago: CELADE; 1976-1978. Serie A, No. 2, 1024-1032, 1036-1039. Mexico, Panama, USA, and Sweden: Naciones Unidas, Anuario Demográfico 1973 y 1974. Brazil: estimates made using the Brass method with data from the 1970 census.

^bAverage estimates for the period 1965-1970 and 1970-1975 from: Somoza J. América Latina: situación demográfica alrededor de 1973 y perspectivas para el año 2000. Santiago: CELADE; 1975. Serie A, No. 128.

^cObserved deaths calculated by applying probability of dying (per thousand), to estimated live births. Expected deaths obtained by applying the probability of dying (per thousand) in the USA for the year 1970 (21 per thousand) to estimated live births.

^dObserved deaths minus expected deaths.

2. Regional differences within countries

The geographic differences of mortality within countries are of greater interest because they are the target of national policies and can be better interpreted within the socioeconomic

context of each country. In the case of Brazil, Carvalho (8) describes differences in life expectancy at birth for the period 1960-1970 that range from 44.2 years in the underdeveloped northeastern central region to 61.9 years in the southern region; these figures are related to

Table 2. Life expectancy at birth and some socioeconomic indicators in selected Latin American countries, 1970.

| Country | Life expectancy 1970-1975 ^a | GDP per capita ^b | GDP per capita growth rate 1966-1973 ^c | Percentage of income ^c | |
|------------|---|-----------------------------|---|-----------------------------------|-------------|
| | | | | Poorest 50% | Richest 50% |
| Argentina | 68.2 | 1,208 | 3.4 | 23.0 | 31.0 |
| Costa Rica | 68.2 | 656 | 4.1 | 19.0 | 41.0 |
| Honduras | 53.5 | 278 | 0.4 | 11.0 | 50.0 |
| Haiti | 47.5 | 112 | 1.4 | - | - |

| | EAP average ^d | | Percentage of population living in conditions of extreme poverty ^c | Percentage of population illiterate ^e | Percentage of population with water supply ^e |
|------------|--------------------------|---------------------------|---|--|---|
| | Agriculture | Manufacturing industry | | | |
| Argentina | 14.8 | 19.7 | 11.0 | 7.4 | 64.0 |
| Costa Rica | 36.4 | 11.9 | - | 11.6 | 78.0 |
| Honduras | 56.8 | 11.6 | 49.0 | 53.0 | 38.0 |
| Haiti | - | - | - | 81.2 | 11.0 |

Sources:

^aSomoza J. América Latina: situación demográfica alrededor de 1973 y perspectivas para el año 2000. Santiago: CELADE; 1975. Serie A, No. 128.^bCEPAL. Evolución de la economía regional en 1977. Notas sobre la economía y el desarrollo de América Latina. No. 274/275, July 1978.^cCEPAL. Tendencias y proyecciones a largo plazo del desarrollo económico de América Latina. Santiago: CEPAL; 1977. E/CEPAL/11027/Rev.1^dOIT. Anuario de estadísticas del trabajo. 1975.^eIASI. América en cifras, situación social. 1974.

income, as will be analyzed later on. In Mexico, Castillo *et al.* (9) find differentials in infant mortality rates (rectified by omission) in 1970 ranging from 124 per thousand in Chiapas to 43-44 per thousand in the major industrial centers of the Federal District and Nueva de León. In the entirety of the federative entities, the correlation with a socioeconomic index elaborated by the authors is -0.58. For the period 1973-1975, Taucher (10) describes infant mortality rates in Chile that range from 46 per thousand in Santiago (capital city of the country) to 122 per thousand in the province of Malleco, an agricultural region with sufficient lags in its development.

These marked contrasts are examples of the diversity of risks of dying that exist within these countries. However, determining the causes of these differences requires deeper analysis.

3. Urban-rural contrasts of mortality

The urban-rural dichotomy used for classification in censuses does not adequately express the range of living conditions existing between large cities and isolated rural communities. Behm and Rosero (11) were able to better disaggregate these categories in a study of mortality during the first two years of life (Table 3) in Ecuador in the period 1969-1970. Mortality has an inverse, non-linear relationship with the degree of urbanization. Risk in the rural population is 48% higher than in the urban population. In the latter, the mortality in large cities is 31% lower than in the rest of the urban sector. The dispersed rural population faces a risk 13% higher than the concentrated rural population.

Table 3. Mortality in children under two years of age according to degree of urbanization. Ecuador, 1969-1970.

| Geographic areas | Probability of dying (per thousand live births) |
|--------------------------|---|
| TOTAL | 127 |
| Urban population | 98 |
| Large cities | 80 |
| Mid-sized cities | 114 |
| Rest of urban population | 117 |
| Rural population | 145 |
| Concentrated rural | 134 |
| Dispersed rural | 151 |

Source: Behm H, Rosero L. La mortalidad en los primeros años de vida en Ecuador, 1969-1970. San José de Costa Rica: CELADE; 1977. Serie A, No. 1031.

Ortega *et al.* (12) describe in Honduras, for the period 1971-1972, net mortality excesses in the rural population, which has a life expectancy at birth 11.4 years less than the urban population. Rural excess mortality is found at all ages. The absolute differences are particularly marked for the first year of life and over 65 years of age (Table 4).

Behm *et al.* (13) studied the risk of dying in the first two years of life in the urban and rural populations of 12 Latin American countries,

deriving estimates from census data using the Brass method (Table 5). It should be noted that this method underestimates mortality in some rural areas; therefore, actual differences could be greater. In two thirds of the countries there is an excess of 30-60% in the rural risk of dying compared to the urban risk. In the countries with higher mortality, this means that of every 5-6 live births in rural areas, one dies before reaching two years of age. Such difference is especially significant considering that in the majority of these countries the rural population is more numerous, a fact that explains the high national mortality rate.

To what extent do the social relationships of production prevailing in agricultural Latin America serve to explain this excessive rural mortality? In a recent analysis of social development in rural areas of Latin America (14), ECLA and FAO argue that during the period 1950-1975 these problems have not been solved and more often than not they have gotten worse.

Problems regarding diet, employment, income and living conditions are neither due to an insufficient expansion of production nor to the existence of traditional agrarian structures. [...] They seem to be much more connected to the ways in which the transformation of the

Table 4. Mortality in urban and rural populations. Honduras, 1971-1972.

| Indicator | Population | | Rural/Urban mortality ratio |
|------------------------------------|------------|-------|-----------------------------|
| | Urban | Rural | |
| Life expectancy at birth | 61.5 | 50.1 | |
| Gross mortality rate ^a | 9.0 | 16.5 | 1.8 |
| Infant mortality rate ^b | 85.6 | 127.2 | 1.5 |
| Rates by age ^a | | | |
| 1-4 | 10.5 | 22.6 | 2.2 |
| 5-14 | 2.7 | 4.5 | 1.7 |
| 15-44 | 2.2 | 4.8 | 2.2 |
| 45-64 | 12.2 | 16.6 | 1.4 |
| 65 and over | 39.6 | 58.2 | 1.5 |

Source: Ortega A, Rincón M. Encuesta demográfica nacional de Honduras. Fascículo IV (Mortalidad). Santiago: CELADE; 1975. Serie A, No. 129.

Notes:

^aPer thousand inhabitants.

^bPer thousand live births.

agricultural socioeconomic structures is taking place. [...] This process tends to emphasize the capitalist character of the production system in this sector [...] with the expansion of a modern agricultural subsector made up of a relatively small number of medium and large-sized companies which are linked to the national and international market by commercial, agro-industrial and financial mechanisms. [...] The disintegration of traditional agriculture is brought about due to the concentration this process implies in terms of production, resources and income, with obvious implications in employment and living conditions for the rural population. [...] These are mechanisms for the expansion of mercantile production which rearrange the agrarian socioeconomic structures in order to fulfill the functions of providing food and cheap labor, functions essential to the process of capital accumulation within the economic system as a whole.

The report notes that, within this process, "the small producer has been connected to the wage-earner, making up the largest portion of rural workers with low income."

According to the report, the different attempts at reform and the agrarian revolutions of Latin America have been limited in character and have not yet reached their highest point. The

opponents of these efforts are the organizations representing agricultural and livestock companies, as rural peasants have not been able to organize themselves with sufficient force to defend their rights to the land. On the other hand, as a consequence of the concentration of resources in the export sector of the agrarian economy, the production for domestic consumption has not increased as expected, in circumstances defined by ECAC-FAO as an essential requisite for solving malnutrition issues in the population. Del Canto, Teller *et al.* (15) remark this situation has forced Central American countries to increasingly import food, fostering dependence on international markets and prices.

The above citations serve to show the true social, economic and political context of high rural mortality in Latin American countries. They also show that the "explanation" of these contrasts in mortality cannot be found in the analysis of conventional demographic variables (for example urban/rural) nor in certain socioeconomic indicators, but rather requires the use of categories that identify the insertion of individuals within the social process of production. Studies carried out in this sense can be found in the field of nutrition. Hernández (16) analyzed the socioeconomic changes in diet and nutrition that took place between 1958 and 1971 in Municipality of Conduacan (Mexico), due to

Table 5. Probability of dying between birth and two years of age in the urban and rural population. Selected Latin American countries, around 1968-1970.

| Country | Period | Probability of dying (per thousand) | | Percentage of rural excess mortality | Percentage of the population considered rural |
|------------------|-----------|--|-------|--|---|
| | | Urban | Rural | | |
| Bolivia | 1971-1972 | 166 | 224 | 34.9 | 62 |
| Peru | 1966-1967 | 132 | 213 | 61.4 | 40 |
| Nicaragua | 1966-1967 | 143 | 152 | 6.3 | 65 |
| Guatemala | 1968-1969 | 119 | 161 | 35.3 | 64 |
| El Salvador | 1966-1967 | 139 | 148 | 6.5 | 60 |
| Honduras | 1969-1970 | 113 | 150 | 32.7 | 69 |
| Ecuador | 1969-1970 | 98 | 145 | 48.0 | 59 |
| Dominican Repub. | 1970-1971 | 115 | 130 | 13.0 | 60 |
| Chile | 1965-1966 | 84 | 112 | 33.3 | 25 |
| Colombia | 1968-1969 | 75 | 109 | 45.3 | 36 |
| Costa Rica | 1968-1969 | 60 | 92 | 53.3 | 59 |
| Paraguay | 1967-1968 | 69 | 77 | 11.6 | 63 |

Source: Behm H, *et al.* Mortalidad en los primeros años de vida en países de América Latina. Santiago: CELADE; 1976-1978. Serie A, No. 1024-1032, 1036-1039.

the implementation of an agrarian development plan aimed at increasing export crops (sugar cane and banana). At the same time a Health Center and a secondary school were built and the electricity supply was extended.

The explosive economic growth of the area benefited only a sector of the population. While the privileged sector began to consume larger quantities of meat, milk and other products, the agricultural working class remained in more or less the same conditions. [...] Malnutrition continued affecting the same proportion of children, with the same severity and undoubtedly with the same consequences. [...] Neither the changes in food production nor the economic growth triggered by the agrarian program were sufficient to prevent malnutrition.

On the other hand, a study of four rural villages in Guatemala conducted by Valverde *et al.* (17) reveals that the frequency of moderate malnutrition in children increases from 17% to 38% as the extension of land owned by a rural peasant decreases from more than five blocks to less than two.

In discussing the relationship between malnutrition and development, Beghin (18), from the Institute of Nutrition of Central America and Panama (INCAP), says that it is generally admitted that malnutrition depends on "poverty", which is

...the result of a complex and not yet fully understood set of circumstances in which exploitation, injustice in the distribution of economic and political power and inequalities in the distribution of the products of economic activities play a main role. [And he adds] There are no technocratic solutions for malnutrition. Nutritional interventions cannot be decontaminated; they cannot be freed from political considerations. Nutrition is not aseptic.

It is important to remark that in studies on malnutrition in Central America, Teller (19) has found that in Panama and Guatemala, between 1965 and 1975, prevalence of the most serious malnutrition (levels II and III) has increased in children under 5 years old while

mortality has decreased. In the aforementioned study by Hernandez (16), despite the conditions described, infant mortality rates decreased by half during the observed period. These facts show the complexity of the mechanisms by which the socioeconomic context affects the health-disease-death process. They also demonstrate that changes in lethality may to a certain extent modify the course of mortality in relation to the evolution of the morbidity that generates it. In general, they confirm that the development of the capitalist system is linked to a decrease in the mortality rates (as it is widely evidenced by the historical experience of more developed countries), whose scope will be determined by the characteristics with which this development inserts itself into each specific socioeconomic structure and the relationship it has with the central world economies. Ignoring this situation or supporting simplified explanations of a complex phenomenon are two errors that must be avoided when analyzing the real determinants of mortality.

We will consider now mortality in the urban environment. The precedents gathered (Table 5) show that although urban mortality remains high in Latin America, it is generally lower than mortality in the rural population. What is the situation in the major cities of these countries? These cities, generally the national capitals of their countries, are characterized by their great demographic growth, which is originated by a strong domestic migration. They are the seat of political and economic power and concentrate a large portion of the resources and social services of the public sector (including medical care). It is in these cities where the capitalist development of the economy originated and where it has reached a more advanced stage. The fact that industry prefers to install itself in these cities means that worker organization into unions occurs earlier and more strongly than in other cities.

Arruñada *et al.* (20) studied the distribution of the infant mortality rate in Buenos Aires in 1973. This rate tended to remain steady during that period at 30 per thousand. The results, summarized in Table 6, show considerable differences in mortality within a city with an important level of development and a relatively low infant mortality rate. The highest

rates are observed in region 1 where shantytowns, hotels, boarding houses and tenements predominate. These rates are associated with low socioeconomic level, mothers who are not legally married, and mothers who are migrants. When these conditions coincide, subpopulations which are especially at risk can be identified. In region 1, for instance, the group with the lowest socioeconomic level has an infant mortality rate of a 101 per thousand, and the rate for children of unwed mothers is 70 per thousand.

Table 7 shows mortality during the first two years of life in the capital cities of some Latin American countries around 1968-1970, according to the studies carried out by Behm *et al.* (21). The population studied does not correspond exactly to the capital city, but is chiefly made up of the city population.

The risk of dying faced by children living in the capital cities of these countries is lower (often substantially lower) than that of the entire country. However, when the mother's education level is used to identify subpopulations with different living conditions, mortality is shown to be very heterogeneous among these subpopulations. The sectors with the lowest level face a considerably higher risk, which can even

match the risk existing in the rural sector that was previously analyzed, indicating that risk is more associated with the way in which families are inserted into the socioeconomic structure than to their geographic place of residence. As will be shown later on, when differential mortality by social class in Costa Rica is analyzed, children from proletarian families – defined as wage-earners from the secondary and tertiary sectors – belong to this population at greater risk. Also included in this group are the so-called marginal populations, which do not participate in the production process, among other reasons because the labor market is unable to absorb fast-growing populations. Unemployment or underemployment conditions determined in this way are associated to low standards of living and, therefore, to higher mortality.

In summary, populations of major cities in Latin American countries show a lower mortality than the rest of the country, in relation with the improved living conditions that capitalist development, mainly focused in these cities, has in general originated. Nonetheless, at the present stage, the contradictions of the system create within cities important socioeconomic differences in mortality.

OTHER ASPECTS OF SOCIOECONOMIC DIFFERENTIALS OF MORTALITY

Table 6. Socioeconomic differentials of infant mortality. City of Buenos Aires, 1973.

| Categories of analysis | Rate per thousand |
|-------------------------------|-------------------|
| FEDERAL CAPITAL | 30 |
| Geographic region | |
| I | 45 |
| VI | 17 |
| Socioeconomic indicator | |
| 1 (lowest) | 68 |
| 4 (highest) | 16 |
| Mother's marital status | |
| Single or in consensual union | 42 |
| Married | 22 |
| Migration | |
| Migrant | 39 |
| Non-migrant | 20 |

Source: Arruñada M, Rothman A, Segre M. Diferenciales socioeconómicos de la mortalidad infantil en la Capital Federal, Argentina; 1976. (Inédito)

In this section, studies on differential mortality carried out by income level, education level, ethnic group and social class that were not considered previously will be analyzed.

1. Mortality and income level

Carvalho (8) has estimated life expectancy at birth in Brazil for different income levels, based on the childhood mortality estimated using the Brass method with 1970 census data. The life expectancy in the group with the lowest income level ($e=49.9$ years) is 12.1 years less than life expectancy in the group with highest income ($e=62$ years). Despite the heterogeneity of the mortality among regions,

Table 7. Mortality in the first two years of life in capital cities of Latin America around 1968-1970.

| Country | Area | Probability of dying (per thousand live births) | | | | | | |
|------------------|-----------------------------|---|---|------|------------------|-----------------|-----------------|-------------|
| | | Country total | In capital city, by mother's years of schooling | | | | | Rural total |
| | | | Total | None | 1-3 | 4-6 | 7 or more | |
| Bolivia | La Paz | 202 | 179 | - | 199 ^a | 202 | 96 | 224 |
| Peru | Metropolitan region | 169 | 93 | - | 123 ^b | 97 ^c | 86 ^d | 213 |
| Guatemala | Guatemala | 149 | 76 | 122 | 88 | 59 | 31 | 161 |
| Nicaragua | Managua, urban | 149 | 103 | 164 | 131 | 99 | 34 | 152 |
| El Salvador | San Salvador, urban | 145 | 118 | 184 | 136 | 98 | 37 | 148 |
| Honduras | Tegucigalpa | 140 | 97 | 117 | 91 | 64 | 31 | 121 |
| Ecuador | Quito and Guayaquil | 127 | 80 | 149 | 106 | 79 | 50 ^e | 145 |
| Dominican Repub. | National District | 123 | 109 | 162 | 132 | 99 | 70 | 130 |
| Chile | Large cities ^f | 91 | 72 | 138 | 83 | 77 | 52 | 112 |
| Colombia | Metropolitan area | 88 | 51 | 78 | 60 | 46 ^g | 32 ^d | 109 |
| Costa Rica | San Jose and Heredia, urban | 81 | 49 | - | 72 | 52 | 37 | 92 |
| Paraguay | Metropolitan region | 75 | 64 | - | 97 ^a | 57 | 25 | 152 |
| Argentina | Metropolitan region | 58 | 43 | - | 70 ^a | 48 | 30 | - |

Source: Behm H, et al. Mortalidad en los primeros años de vida en países de América Latina. Santiago: CELADE; 1976-1978. Serie A, No. 1024-1032, 1036-1039.

Notes:

^a0-3 years

^b0-4 years

^c5 years

^d6 or more years

^e7-9 years

^f90% corresponds to urban Santiago and Valparaiso.

^g4-5 years

mortality systematically decreases as income increases. When the regions are considered, the differences between subpopulations are extreme – life expectancy ranges from 42.8 years in the group with lowest income in the Central Northeastern region to 66.9 years in the groups with better income conditions in the Southern region, which is one of the most developed regions. The author points out that in regions with lower mortality, there tend to be greater absolute differences in life expectancy by income level.

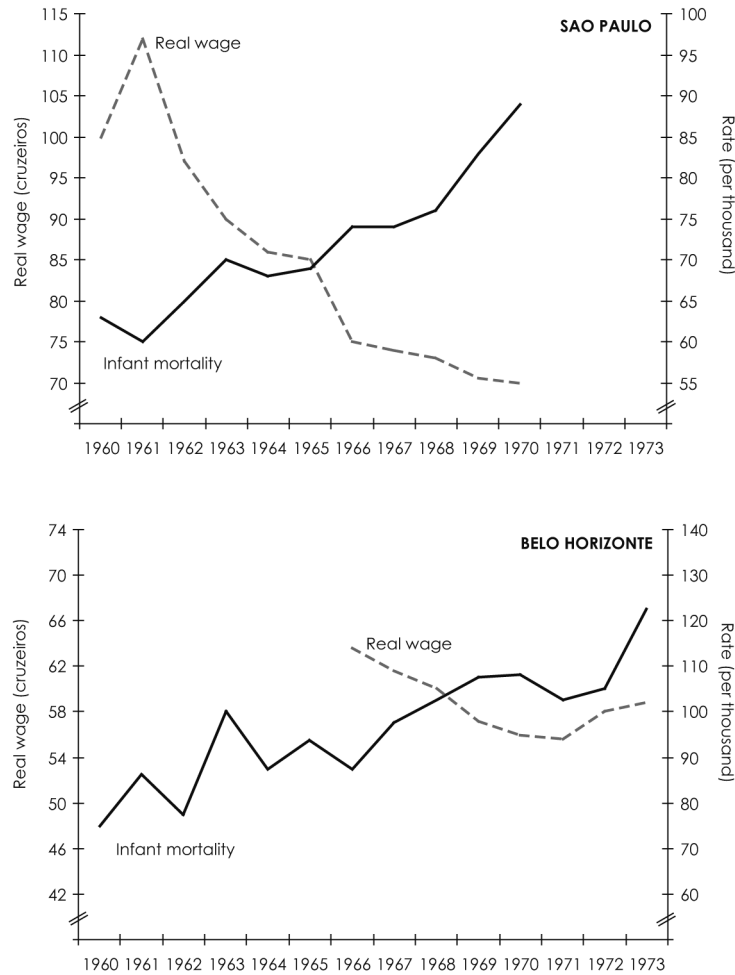
In the same country, Wood (22) studied the course of infant mortality in two major Brazilian cities (Chart 1). During the 60s, the rate increased by 40% in the period 1960-1970 in Sao Paulo and 68% in Belo Horizonte in the period 1960-1973. The increase persists even after correcting rates for errors in the residence recorded. In both cities (except for Sao Paulo in 1961), a decrease in the real minimum wage was also observed in both cities, which the author considers to be the cause of the increase in mortality. The proportion of the population with

an income below the minimum wage is estimated at 46% in Belo Horizonte and at 43% in Sao Paulo. Wood notes that Brazil's great economic development in the period of 1960-1970 has been accompanied by a regressive distribution of the income – the richest 5% of the population has increased its share to 72% in the total income, whereas the situation of the remaining three quarters of the population with lower incomes has not improved.

2. Mortality and level of education

The level of education reached by individuals within the formal education system is another variable widely used in the study of differential mortality. Preston (23), among other researchers, has calculated a multiple regression based on the cross-sectional study of 120 countries around 1970. This regression indicates that an increase of 10% in the proportion of the population that is literate is associated with a two-

Figure 1. Infant mortality and real salary. Sao Paulo and Belo Horizonte. Brazil, 1960-1973.



Source: Wood CH. Tendência da mortalidade infantil e distribuição de renda: estudo sobre Belo Horizonte e São Paulo. Simposio sobre o progresso da pesquisa demografica no Brasil. Rio de Janeiro, 7-9 jun 1976.

year increase in life expectancy at birth. Education has a direct effect on some determinants of mortality; for example, child mortality is influenced by the mother's beliefs and values related to care child and her behavior when the child is sick. However, above all, education is related to other indicators of living conditions, thus these differences express the unequal access of individuals to social and economic benefits, determined fundamentally by the social class to which that individual belongs.

Behm et al. (21) analyzed the risk of dying between birth and two years of age in 13

Latin American countries according to the mother's level of education. Some of the results are summarized in Table 8. There are large differences regarding mortality among countries, but in all countries the risk of dying in children at this age decreases considerably and consistently as the mother's level of education increases. Thus, the children of illiterate women face a risk 3.5 to 5 times higher than that of children whose mothers have had ten or more years of schooling. In the countries where mortality is higher, absolute differences of mortality between education groups are larger than those in the

Table 8. Mortality in children under two years of age by mother's level of education. Latin American countries, 1966-1971.

| Country | Probability of dying (per one thousand live births) | | | | | Mortality in group "None" over "10 or more" | |
|-----------------------|---|--|-----|-----|------------------|---|------------|
| | Country total | Mother's education (in years of schooling) | | | | | |
| | | None | 1-3 | 4-6 | 7-9 | | 10 or more |
| Bolivia | 202 | 245 | 209 | 176 | 110 ^a | - | |
| Peru ^b | 169 | 207 | 136 | 102 | 77 | 70 | 3.0 |
| Nicaragua | 149 | 168 | 142 | 115 | 73 | 48 | 3.5 |
| Guatemala | 149 | 169 | 135 | 85 | 58 | 44 | 3.8 |
| El Salvador | 145 | 158 | 142 | 111 | 58 | 30 | 5.3 |
| Honduras | 140 | 171 | 129 | 99 | 60 | 35 | 4.9 |
| Ecuador | 127 | 176 | 134 | 101 | 61 | 46 | 3.8 |
| Dominican Repub. | 123 | 172 | 130 | 106 | 81 | 54 | 3.2 |
| Chile | 91 | 131 | 108 | 92 | 66 | 46 | 2.0 |
| Colombia ^c | 88 | 126 | 95 | 63 | 42 | 32 | 3.9 |
| Costa Rica | 81 | 125 | 98 | 70 | 51 | 33 | 3.8 |
| Paraguay | 75 | 104 | 80 | 61 | 45 | 27 | 3.9 |
| Argentina | 58 | 96 | 75 | 59 | 39 | 26 | 3.7 |
| Cuba ^d | 41 | 46 | 45 | 34 | 29 | - | - |

Source: Behm H, Primante D. Mortalidad en los primeros años de vida en países de la América Latina. *Notas de Población*. 1978;6(16):23-44.

Notes:

^aData corresponds to the interval 7 or more

^bIntervals are as follows: 0-2, 3-4, 5, 6-9, 10 or more years.

^cIntervals are as follows: 0, 1-3, 4-5, 6-8, 9 or more years.

^dProvisional data.

countries where mortality is lower. Additionally, the decrease in mortality by education level tends to be less pronounced at the highest levels of education. In the children of mothers with ten or more years of schooling, mortality differences between countries tend to be smaller (ranging from 26 per thousand in Argentina to 70 per thousand in Peru). In most of the countries, the children of illiterate or semi-illiterate women face a risk of dying higher than 100 per thousand live births. In eight of the fourteen countries, mortality is higher than 170 per thousand in the group with no education, reaching its peak in Bolivia where one out of four children dies before reaching two years of age. The magnitude of these excesses is evident if the fact that this risk in Sweden in 1970 was only 11 per thousand is considered.

Similar provisional estimates for Cuba have been added to this table. The information comes from the 1974 National Survey of Income and Expenditure. The figures reveal not only that the national level is significantly low (29 per

thousand), but also that the differences by education are much less, ranging from 29 to 46 per thousand live births.

The significance of the contrasts described depends on the relative proportion of live births in each country, being those exposed to the risk. To obtain an epidemiological view of under-two child mortality, different strata in each country were identified according to this mortality using geographic variables (regions of urban/rural population) and women's years of education. The number of live births annually was estimated in each stratum (based on the average number of children informed in the census) as well as the number of expected deaths during the first two years of life, in accordance with the risk of dying in each group. Table 9 shows the results for the group of 12 countries.

The study identifies a population stratum which shows a relatively low mortality rate for the region (27-37 per thousand) in these countries. This population is made up of the

Table 9. Strata according to risk of dying in children during the first two years of life in 12 Latin American countries, around 1968-1970.

| Mortality stratum | Probability of dying (per thousand) | Percentage of total included in the stratum | | | | |
|--|-------------------------------------|---|--------|------------------------------------|-------|-------------------------------|
| | | 15-49 year-old women | Births | Deaths in children under two years | | |
| TOTAL | | 100 | 100 | 100 | | |
| Low | Less than 40 | 5 | 3 | 1 | | |
| Medium | 40-79 | 28 | 20 | 10 | | |
| Medium-high | 80-119 | 26 | 27 | 22 | | |
| High | 120-159 | 19 | 22 | 24 | | |
| Very high | 160 or more | 22 | 28 | 43 | | |
| Characteristics of the live births in the stratum | | | | | | |
| | | Percentage by mother's education (in years) | | Percentage by area | | Percentage in country capital |
| | | 7 or more | 4-6 | 0-3 | Urban | |
| Low | 100 | - | - | 98 | 2 | 72 |
| Medium | 36 | 49 | 15 | 91 | 9 | 47 |
| Medium-high | 7 | 45 | 48 | 51 | 49 | 15 |
| High | - | 7 | 93 | 41 | 59 | 10 |
| Very high | - | 4 | 96 | 27 | 73 | 6 |

Source: Behm H, Primante D. Mortalidad en los primeros años de vida en países de la América Latina. *Notas de Población*. 1978;6(16):23-44.

Note: The countries included were the following: Bolivia, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, Peru and Dominican Republic.

children of women who have completed at least a middle or higher level of education, which is a privileged situation in a region where the levels of education are generally low. Almost all of these women live in urban areas and 72% live in the capital city of the country (or nearby). Given their level of education it must be assumed that they belong to middle and upper class social groups, with ample physical access (due to their residence in an urban area) as well as economic access (due to their social position) to the greater resources and services concentrated within large cities, including medical care. This group is a minority: only 5% of women aged 15-49 belong to this stratum. Due to its educational structure, fertility within this group is low; these women contribute only 3% of the total births in these countries. As they are exposed to a low mortality rate, these children account for only 1% of the total number of deaths in children under two

years old. The existence of this group serves to demonstrate that in Latin America, children born into privileged social groups have a probability of surviving similar to that observed in more advanced countries.

Unfortunately, this situation is an exception. The crux of the issue of high early childhood mortality in Latin America lies in the strata with high and very high mortality rates. The group with a mortality rate higher than 160 per thousand includes 22% of women of reproductive age. The same factors that determine a high mortality rate also make for higher fertility rates; women from this group account for 28% of the total number of births, within which 43% of the total number of deaths of children younger than 2 years old occur. There are no highly educated women within this stratum. Almost all are illiterate or semi-illiterate; 73% live in rural areas, while 6% live in the capital city of the country. This last

group likely corresponds to the sectors of the population marginalized from the production process in the urban region.

If the strata showing high and very high mortality rates are combined, they form a group that represents 41% of women in reproductive age. These women produce half of the total number of births, in which a mortality rate at least ten times higher than that of Sweden generates two thirds of all deaths in children under two years of age in the group of countries included in the study. The group is mostly made up of inhabitants from Bolivia, Peru, Ecuador, Guatemala, Nicaragua, Honduras and El Salvador. It is important to note that the study does not include, among others, the two largest countries in the region: Mexico and Brazil. It has already been mentioned that Brazil shows marked contrasts in mortality by family income.

3. Mortality and ethnic groups

In several countries of the region (Bolivia, Ecuador, Peru, and Guatemala), important numbers of indigenous populations continue to exist. Dispossessed of their best lands during and after the Spanish conquest, they were long subject to a slavish production system. At present, these populations maintain precapitalist forms of production or have been incorporated

into the market in generally precarious conditions, a situation which has not been significantly modified by agrarian reforms.

In the study by Behm *et al.* mentioned above, it was possible to identify these populations using census data, directly or indirectly, as shown in Table 10.

All these are countries in which mortality in children under two years of age is already high within the non-indigenous population. Nonetheless, the presumed indigenous population shows an excess mortality ranging from 35 to 73%, reaching probabilities of dying as extreme as 173-258 per thousand live births.

4. Mortality and social class

As has been previously discussed, observing differences of mortality according to multiple socioeconomic variables is not enough to explain these variations in a systematic and coherent way. In accordance with the hypothesis that the health-disease-death phenomenon is conditioned by the way individuals are inserted into the production process, the most logical path of analysis should be the identification of the prevailing production methods in a given society as well as the social classes they generate. This kind of analysis is carried out only exceptionally, among other reasons because of difficulties in identifying

Table 10. Mortality in children under two years of age by ethnic group. Selected Latin American countries, 1968-1972.

| Country | Total | Probability of dying (per thousand) | | |
|------------------------|-------|-------------------------------------|---------------------------|--|
| | | Indigenous population | Non-indigenous population | Excess mortality in indigenous population (percentage) |
| Guatemala ^a | 149 | 173 | 128 | 35.2 |
| Bolivia ^b | 202 | 258 | 149 | 73.2 |
| Ecuador ^c | - | 197 | 143 | 37.8 |

Source: Behm H, *et al.* Mortalidad en los primeros años de vida en países de la América Latina. San José: CELADE; 1977-1978. (Serie A, No. 1025, 1031 and 1037).

Notes:

^aVariable specified in the census as "indigenous" and "non-indigenous."

^bIndigenous population: population in which only an indigenous language is spoken (quechua, aymara). Non-indigenous population: population in which only Spanish is spoken.

^cIndigenous population: cantons of the mountain region with a predominantly indigenous population in the 1950 census. Non-indigenous population: cantons of the mountain region in which the indigenous population is a minority.

Table 11. Infant mortality by father's occupation and mother's educational level. Chile, 1972-1973.

| Education | Rates per thousand live births | | | | | |
|-------------------|--------------------------------|----------------------|-----------------------|----------------------|------------------------|----------------------|
| | Infant mortality | | Neonatal mortality | | Postneonatal mortality | |
| | Children of employees | Children of laborers | Children of employees | Children of laborers | Children of employees | Children of laborers |
| TOTAL | 29.8 | 66.9 | 16.8 | 25.6 | 12.9 | 41.2 |
| None | 86.2 | 108.6 | 35.0 | 38.0 | 51.3 | 70.6 |
| Primary | 38.1 | 62.7 | 18.3 | 24.1 | 19.7 | 38.6 |
| Secondary or more | 23.8 | 59.9 | 15.6 | 26.4 | 8.2 | 33.5 |

Source: Taucher E. Mortalidad Infantil en Chile: tendencia, diferenciales y causas. Santiago: CELADE; 1978.

the relevant variables within the population. The following part of this work summarizes two approaches to this type of analysis.

Taucher (10) analyzed infant mortality in Chile, 1972-1973, comparing the children of "laborers" with the children of "employees." "Employers" and "self-employed" groups were excluded. The comparison is therefore among workers, separating those who are inserted in the process of production of goods itself doing manual labor from non-manual wage-earners situated mainly in the service sector and belonging to middle class groups. Even so, the contrasts are significant (Table 11).

The infant mortality rate in the children of laborers is double that of employees; this difference is even greater (3.2 times) in

postneonatal mortality. Among each occupational group, a higher level of education is associated with a lower mortality rate. However, in the group of children of laborers, the transition from primary education to a higher level of education is not accompanied by a significant decrease in the rate, suggesting that the effect of social class is of greater weight than that of education. Mortality in children of illiterate laborers (109 per thousand) is 8.6 times higher than mortality in children whose parents are employees with the highest level of education (23.8 per thousand). In a country with a relatively high level of education within the region, children born of illiterate mothers make up only 7% of the total live births, although 13% of infant deaths occur within this group. The most significant group is composed of the children of laborers with some education, making up 60% of all births and 69% of all deaths during the first year of life.

Taucher also studies the causes of death within the two occupational groups, presented in Table 12 for postneonatal mortality. It is shown that the greater mortality in the children of laborers is connected to evident excesses of causes considered partially or totally avoidable given the present level of medical development. These causes include infectious diseases (especially diarrhea), respiratory illnesses and malnutrition.

Behm *et al.* (24) obtained estimates of the probability of dying between birth and two years of age in Costa Rica, 1968-1969, using census data regarding the occupation and occupational category of the head of household. This information is not enough to identify exact social classes and subclasses, but it has been used

Table 12. Postneonatal mortality: causes of death according to father's occupational group. Chile, 1972-1973.

| Groups of causes of death | Rates per 100 thousand live births | | |
|---------------------------|------------------------------------|----------------------|---|
| | Children of employees | Children of laborers | Mortality in children of laborers / Morality in children of employees |
| Reducible mortality | 937 | 3,243 | 3.5 |
| Of infectious origin | 385 | 1,233 | 3.2 |
| Respiratory illnesses | 462 | 1,683 | 3.6 |
| Malnutrition | 41 | 227 | 5.6 |
| Accidents | 49 | 100 | 2.0 |
| Unavoidable mortality | 120 | 124 | 1.0 |
| Poorly defined | 136 | 589 | 4.3 |
| Other | 71 | 128 | 1.8 |
| TOTAL | 1,263 | 4,083 | 3.2 |

Source: Taucher E. Mortalidad Infantil en Chile: tendencia, diferenciales y causas. Santiago: CELADE; 1978.

Table 13. Probability of dying between birth and two years of age, by approximate "social classes." Costa Rica, 1968-1969.

| "Social classes" and their approximate composition | Probability of dying (per thousand) |
|--|-------------------------------------|
| COUNTRY TOTAL | 80 |
| Upper and upper-middle bourgeoisie Managerial and executive groups in the private financial, commercial and agricultural sector and the public sector. High-ranking professionals. Agricultural property owners. | 20 |
| Middle groups Office employees and salespeople. Teachers and other technical professionals. Retail store owners. | 39 |
| Proletariat (largely urban) Machine operators and day laborers from the secondary and tertiary sectors. Workers - likely qualified (7 or more years of education) | 80 46 |
| Workers - likely non-qualified with 4-6 years of education | 73 |
| with 0-3 years of education | 102 |
| Agricultural workers Agricultural proletarians. Semi-proletarian peasants. Small-scale property owners. with 4-6 years of education | 99 80 |
| with 0-3 years of education | 112 |

Source: Behm H, et al. Resultados provisionarios de un estudio de fecundidad mediante el método de hijos propios en Costa Rica. San José: CELADE; 1978.

as best as possible in order to estimate social class. It was necessary to exclude 37% of the households registered in the census because the head of household did not belong to an economically active population or was seeking work for the first time, or because the information on occupation was imprecise. It was also necessary to exclude some of the self-employed workers because of difficulties identifying their social class. Results are presented in Table 13.

The category "Upper and upper-middle bourgeoisie" has the following composition: 16% are owners of agricultural property or of the industrial or commercial sector, 36% are management personnel and 48% are high-ranking professionals. The group is not made up

exclusively of the owners of the means of production, but surely includes the most important of these. Mortality in children from this group is 20 per thousand, which is the same as that existing in the USA in 1970.

The "middle groups" are mostly made up of wage-earners who are indirectly connected to the production process and who in particular work in the service and commercial sectors where they perform non-manual activities. They have a relatively high level of education (61% have had 7 or more years of schooling). In this category, 47% are office employees and salespeople at stores or in the commercial sector and 35% are professionals or technicians not included in the previous category, most of them

primary teachers. Mortality in this group (39 per thousand) is twice that of the previous group.

The mainly urban "proletariat" is formed by workers and day laborers from the secondary and tertiary sectors. In general, this group more accurately represents a social class. Mortality in the children of this group (80 per thousand) is once again twice the mortality of the previous group. The level of education, which probably expresses qualification level in the labor force, differentiates subgroups with variable mortality ranging from 46 to 102 per thousand. This last subgroup thus reaches the highest level of mortality existing among rural workers.

The "agricultural workers" group is made up of 67% agricultural and livestock wage-earners, with a level of education substantially lower than that of the urban proletariat (22% are illiterate and 38% have had only 1-3-year years of schooling). The remaining third is made up of agricultural proletarians who are employees or self-employed workers with a level of education similar to that of agricultural wage earners. It was not possible to differentiate categories that could have been significant in the analysis (peasants owning small properties, peasants incorporated into the proletariat, proletarian and marginalized peasants). The group has the highest mortality in the country (99 per thousand), which increases to 112 per thousand in the illiterate or semi-illiterate subgroup. This represents a risk that is 5.6 times higher than that observed in the Upper and upper-middle bourgeoisie.

Despite the limitations that have been mentioned regarding this way of categorizing of social class, the results are significant. Costa Rica is a country with a relatively low mortality rate in the region, and has experienced important decreases in the last decades. Social policies have helped spread benefits, especially education and health, to most of the population. Even so, marked contrasts can be seen regarding mortality in the first years of life, the mortality most sensitive to living conditions. Direct producers have an under-two mortality rate 4-5 times higher than the most privileged group, where mortality rates reach levels found in the most advanced countries. Middle groups have benefited more than manual workers. The proletariat has a lower mortality rate than that of

the rural working class; the proletariat benefits from living mainly in urban areas where capitalist development is more advanced and where union organizing is likely more powerful than in a large part of the agrarian sector.

GENERAL REMARKS

There are several limitations to carrying out a global analysis of the socioeconomic determinants of mortality in Latin America. Countries in the region present clear differences depending on the stage of historical development in which their methods of production are found. There is also great heterogeneity in mortality rates among the different countries and among the different populations within each country. Finally, a review of the information available in the region indicates that this information is neither systematic nor complete, especially when it comes to the most important categories of analysis. Nonetheless, the available data allows us to draw some important conclusions.

No matter the indicator is used, the differentials detected show that around 1970 there were considerable socioeconomic contrasts in mortality in the region, with the highest-risk groups having rates 4-5 times greater than those in the less exposed groups. These differentials have been repeatedly described, even in the most advanced countries. What is important is that these differentials are currently more pronounced in Latin America than in industrialized countries and are similar to the differentials that existed in those countries in the past (25, 26). However, since these marked differentials exist in countries where mortality rates are still high, the most exposed groups have extremely high levels of risk. This means that well into the 20th century, in which spectacular progress has been made in techniques to reduce mortality, these populations are living in conditions similar to those existing in Europe a century ago. Even worse, these populations are not a minority; in many countries, they represent a significant portion of the total population.

This situation has a marked influence in determining the present levels of mortality in the

region and in defining future perspectives. Reducing the mortality gap separating Latin America from the developed world will require that these socioeconomic contrasts be reduced drastically and mortality be substantially decreased in the vast sectors of population exposed to the highest levels of risk.

Although in the studies analyzed the social class variable is specified only as an exception, all evidence indicates that mortality is closely connected to social class. The groups facing the highest risk of dying are made up by the working class, related to the more precarious conditions in which they live. This situation has its origin in the system of social relationships of production that prevails in the area, which in turn generates within certain social sectors a process of concentration and accumulation of the means of production, of technological progress and of the value generated by work, to the detriment of the first group.

Despite this situation, the development of the capitalist system in Latin America (often referred to as the modernization process) is without a doubt linked to the reduction of mortality. This development is accentuated in the urban sector where mortality also tends to be lower. This process can have various explanations. The system on the one hand needs to create a domestic market and, on the other hand, requires the reproduction of the labor force. Thus, the development and modernization of the production system increases the supply and encourages the consumption of goods. At the same time, policies regarding salaries and social benefits (social security, health, education) relatively improve workers' living conditions. Strengthening workers' organizations also contribute to this improvement, as workers can thus exert pressure to gain more economic and social benefits.

Mortality is generally higher in the agrarian sector. As described in the CEPAL-FAO report, capitalist development in this sector is associated with the concentration of productive resources (especially land and technological modernization) at the expense of small property owners, which implies a progressive incorporation of peasants into the proletariat. On the other hand, the concentration of financial and technical

resources in the agro-export sector (essential for the economic development in some countries) takes away resources from the basic food production sector, made up mostly of small- and mid-scale farmers. As a result, the domestic food supply decreases and the need to import foodstuffs increases, generating a new form of dependency. This is another mechanism that hinders efforts to overcome the malnutrition that prevails in the rural population and influences mortality rates.

In the heart of this complex and dynamic process, mortality in Latin America has seen important and varied decreases. It is clear from the levels and differentials of mortality previously described that this improvement is insufficient. Other facts are also a source of concern over within this process of evolution. The Pan-American Health Organization (27) evaluated the achievement of goals set in the reduction of under-five mortality in the decade from 1961-1971 in the region. The PAHO found that the goals had been satisfactorily achieved in children from 1-4 years old, but that in infant mortality only 21% of the goal was achieved in Mesoamerica and 36% in South America. Montoya (28) carried out a projection of the trends in infant mortality observed in Latin American countries in 1950-1971. He found that a 50% reduction in mortality would take more than 25 years in six countries and between 11 and 25 years in another eleven countries. Accinelly and Muller (29) note with concern that the historical increase in life expectancy in Argentina stopped in the period 1960-1970 when life expectancy reached 66 years. An increase in the infant mortality rate in important Brazilian cities for the same decade has already been mentioned for the same decade.

Gwatkin (30) has analyzed the historical development of the average annual gains in life expectancy at birth in developed countries and in several regions of the Third World in relation with the level of life expectancy in different periods. When life expectancy is approximately 51-52 years, he finds that Latin America shows increases of 0.60 years which are higher than those observed in Eastern and Southern Europe (0.54 years) and in Western Europe (0.38 years). However, as life expectancy increases, the amount tends to decrease in Latin America (0.36

years when life expectancy reaches 57.7 years) whereas in Europe this amount tends to increase (0.71 years when life expectancy reaches 62.4 years in Southeastern Europe). In the most developed regions, a trend towards a slower-paced increase occurs only as life expectancy approaches 70 years. Gwatkin concludes that

...mortality, especially infant and child mortality, in large areas of the Third World now tends to decline progressively more slowly, and it is likely (and perhaps probable) that this decline is on the way to stagnation at rates significantly higher than those presently existing in the West.

He also notes that the marked decreases in mortality observed in some countries (Taiwan and South Korea, for example), seem to be exceptional situations.

In this comparison, it is useful to note the differences among the respective historical contexts. Advanced capitalist countries have achieved a spectacular reduction in mortality, among other reasons, because they have taken full advantage of the extraordinary technological progress in the prevention and treatment of diseases in the 20th century. The elevated standards of living in these countries has been favored by the domination of vast colonial empires and, in the present, by harboring powerful central economies. To the contrary, in Latin America, capitalist development is still, in some countries, at a stage when the process of accumulation is extremely crude (absolute extraction of surplus value) and, on the other hand, these are peripheral economies that depend on the central economies, with which they have to share their process of accumulation. The CEPAL report has highlighted the role of transnational companies in this regard (a).

What might be the role of medical care in the reduction of mortality given the conditions described? This aspect will be discussed at another point in the Meeting; we discuss it here simply in order to complete the global vision of the problem we intend to reach. Since the second half of the 40s, new and powerful means to prevent and treat a number of diseases, especially infectious diseases, have been made available, opening up enormous possibilities for controlling mortality.

The reductions observed in mortality in the Third World since 1950 made it possible to think that mortality had in some way been freed from its socioeconomic determinants and that the gap between underdeveloped and developed countries could be substantially reduced even without development reaching a progress similar to that reached in those areas. Time has proved these optimistic predictions wrong despite the undeniable advances achieved.

The reasons for this evolution can be found, first of all, in the limitations imposed on the effectiveness of health techniques by the persistence of conditions adverse to the health of man within his social and physical environment, such as those described previously for Latin America. However, apart from these limitations, the effectiveness of technology for the prevention and treatment of diseases depends on the extent to which these techniques can be effectively applied and on the extent to which health care coverage reaches the population. The health sector in Latin America, responsible for this task, is not exempt from the restrictions that the global system imposes on it. Thus, despite undeniable progress, the health systems of the region are concentrated in the major urban sectors, prioritize a hospital-based medicine (that is, late-acting and expensive) and distribute their benefits discriminatingly according to social class. Therefore, those populations most exposed to risks of getting sick and dying are those which receive more delayed and more deficient medical care, if indeed they get any care at all. The Meeting of Public Health Ministers of the Americas in 1972 (32) points out that:

Our problem is providing services to the 37% of inhabitants that currently do not receive any kind of care. Most of them live in rural areas or within the marginalized populations of big cities [...]. The task that awaits us in this new decade clearly indicates that without a substantial change in the traditional structures, it will not be possible to make health coverage for the entire population a reality. The right to health depends on extending this coverage.

Likewise, as Hansluwka (33) has remarked, once relative reductions in a high

mortality rate have been achieved through a low-cost health program, maintaining this progress not only requires a more complex health infrastructure, but also simultaneous improvements within social and economic sectors. "If the underlying socioeconomic environment continues, the rate of the following reductions may decrease or stagnate."

In summary, the analysis of the socioeconomic determinants of mortality in Latin America shows that, on one hand, it is necessary to foster the wide and efficient use of current knowledge in the health sector, overcoming the barriers that currently limit and marginalize this knowledge. However, the analysis also shows that the modification of social and economic structures is a decisive factor, as these are the origin of the high mortality rate existing in vast sectors of the population as well as of the limited progress made to date in this area.

The facts demonstrate that at a time when concern for human rights is widespread, in

Latin America the most basic human right, the right to life, is violated. It is appropriate to include here a citation of Antonovsky (26). In the sinking of the Titanic in 1912, 3% of the first class female passengers died, 16% of second class female passengers and 45% of third class female passengers. Latin America can be seen as an imaginary ship carrying 345 million passengers who are subject to differential risks according to their social class, risks as cruel as or crueler than those faced in the Titanic. Every year the bodies of almost a million children under five years are thrown overboard, with nothing indicating that they should have had to die; most of these children come from the "third class." It is our responsibility to demonstrate to the different levels of political decision-makers and to the people and populations themselves, objectively and with the power that science confers, the magnitude of this monstrous genocide and the profound causes giving rise to it.

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END NOTES

a. Belmar, using data based on a report to the US Senate, shows that in the period between 1960 and 1972, US net capital investments in Latin America reached 4 billion dollars, while the dividends obtained by the US in the same period amount to 13 billion dollars.

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