SELECTED HEALTH CONDITIONS IN THE AMERICAS[1]: A GUIDE FOR HEALTH RESEARCH POLICY

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This presentation's aim is to provide general data on demography, life expectancy, and certain specific health problems that are relevant to health research and planning. In this manner it seeks to point up noteworthy features of the current health situation in the Americas and to suggest some possible points of intervention that could prove important in establishing health research priorities.

Introduction

It is fitting that a conference on health research policies[1] should begin with an overview of the health situation in this hemisphere—because we must know what is the situation now, what are the directions of change, and what are the possible points of intervention before we attempt to define the appropriate priority areas for a health research policy.

The Pan American Health Organization views health planning and research within the following contextual framework: in 1980, the XXVII Meeting of PAHO's Directing Council adopted a set of Regional Strategies *(1)* for attaining the goal of "health for all by the year 2000" and recommended several actions to its Member Governments that would be consonant with these strategies. The Council also recommended that a Plan of Action *(2)* be developed to implement the strategies; this was done, and the resulting plan was formally adopted by the XXVIII Meeting of the Directing Council in 1981.

As stated in the resolution approving the Plan of Action, the Council resolved "to emphasize that the Organization should concentrate its efforts and resources on the objectives and priorities contained in the Plan of Action." Thus, in discussing the conclusions and implications that can be derived from the available data on health conditions in the Americas, it seems appropriate to refer often to the Plan of Action, not only because the plan is central to PAHO's activities, but also because it is considered a guide to governments that indicates how they may frame any actions taken in light of identified priority problems.

This presentation cannot hope to describe in detail the health status of the individual countries involved. Instead it will discuss some aggregate data significant to health planning and health research, beginning with data on the demographic conditions that constitute a backdrop against which health conditions must be viewed. It will then discuss life expectancy in the Americas as an indication of health status, and will present some selected morbidity and mortality data that shed light on health conditions and certain major health problems of our Region.

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Demographic Data *(3, 4)*

The Region of the Americas had an estimated population of 615 million inhabitants in

1980, and it has been predicted that this figure will rise to 898 million by the year 2000. The approximate distribution of these actual and projected populations are shown in Table 1. The data presented suggest the amount of health services that will be needed and the kind of research that will be required to devise systems for the effective and efficient delivery of those services.

Partly because increasing population continues to pose problems, especially in developing countries, a considerable amount of research and training in human reproduction and fertility control is being done through one of the World Health Organization's special programs. The PAHO Plan of Action presents no specific population control program, but it does suggest that the family planning component of maternal and child health programs should be integrated into primary care systems.

In this vein, while we continue to be concerned about population growth, we should take note of the view that increasing population is not intrinsically undesirable, and that population growth has no long-run negative effect upon the standard of living or, by exten-

Table 1. The population of the Americas in 1980 and the population projected for the year 2000.

Area	Population in millions		% Increase
	1980	2000	
Latin America	*362*	*599*	*65.5*
Andean area[a]	73	121	65.8
Southern cone[b]	44	57	29.5
Brazil	127	213	67.7
Central America[c]	23	40	73.9
Mexico	70	132	88.6
Latin American Caribbean[d]	25	36	44.0
English-speaking Caribbean and smaller islands[e]	*7*	*9*	*28.6*
North America[f]	*246*	*290*	*17.9*
Total (all areas)	615	898	46.0

Source: Pan American Health Organization *(1)*.

[a]Andean area = Bolivia, Colombia, Ecuador, Peru, and Venezuela.

[b]Southern cone = Argentina, Chile, Paraguay, and Uruguay.

[c]Central America = Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

[d]Latin American Caribbean = Cuba, the Dominican Republic, Haiti, and Puerto Rico.

[e]English-speaking Caribbean and smaller islands = Antigua, the Bahamas, Barbados, Belize, the Cayman Islands, Dominica, French Guiana, Grenada, the Grenadines, Guadeloupe, Guyana, Jamaica, Martinique, Montserrat, the Netherlands Antilles, Nevis, St. Kitts, Saint Lucia, St. Vincent, Suriname, Trinidad and Tobago, the Turks and Caicos Islands, and the Virgin Islands.

[f]North America = Canada and the United States.

Table 2. Percentages of the population residing in urban areas in 1970 and 1980, and the percentages projected for 1990 and 2000, by area.

Area[a]	% of total population in:			
	1970	1980	1990	2000
Latin America	*57.6*	*64.5*	*70.9*	*72.6*
Andean area	57.4	64.8	71.0	73.8
Southern cone	75.4	79.6	83.0	85.9
Brazil	55.8	64.1	71.7	78.3
Central America	38.2	44.0	52.6	55.8
Mexico	58.9	66.4	73.1	79.0
Latin American Caribbean	46.3	52.0	57.3	62.0
English-speaking Caribbean and smaller islands	*38.7*	*44.9*	*51.1*	*57.2*
North America	*74.2*	*78.8*	*82.9*	*86.4*
Total (all areas)	64.8	70.0	75.0	76.9

Source: Pan American Health Organization *(1)*.

[a]See Table 1, footnotes a-f.

sion, upon health status *(5)*. Our prime concern, as implied in our Strategies and Plan of Action, is the short and medium term availability of services capable of providing for these increasing numbers.

The other demographic trend with an important impact upon our health conditions is increasing urbanization (Table 2). It is true that populations within the traditional limits of certain Latin American cities may now be stable or declining; but it is also true that the urbanization process is spreading to other centers and is extending beyond the traditional limits of older cities *(6)*. The resulting net increase, produced by natural growth of the established urban population combined with migration from rural areas, will require that health systems deal with predominantly urban populations and urban problems.

It should also be noted that some of the migration to urban centers is occurring because rural dwellers feel the cities can afford them better access to things contributing to an improved standard of living—including health services. The Plan of Action for implementing the Regional Strategies points out that health for all will be sought by making health care accessible. Within this context, health organizations like PAHO and national health services should see the process of urbanization as a factor working toward improved accessibility. The challenge is to transform this expectation of improved health service accessibility into a reality.

Life Expectancy and Health

Health, in terms of the definition accepted by WHO, is very difficult to measure. However, in order to evaluate the effectiveness of interventions and to make comparisons between health in different times and places, some objective indicator of health status and health conditions is required.

Among the best indicators of health status is life expectancy at birth and at certain defined ages. Life expectancy at birth, which gives a projection based essentially upon the potentially damaging situations that a newborn may encounter over time, is also a very good indicator of social development. Indeed, highly significant correlations can be drawn between life expectancy at birth and per capita income *(7)*; and empirical models have been constructed to determine the effect of material and human resources on life expectancy *(8)*. Recently, a proxy indicator of living standards—known as the "physical quality of life index" (PQLI) consolidated three indicators: infant mortality, life expectancy at one year of age, and literacy *(9)*—thereby incorporating two health-based indicators involving life expectancy into an index of the quality of life.

The available data and projections currently being made show that life expectancy in the Region of the Americas is increasing (Table 3). Specifically, it appears that as of the last half of the 1970s, average life expectancy at birth within the Region as a whole was 67.0 years, with subregional averages ranging from 59.3 years in Central America to 71.7 years in North America. It also appears that the gap between life expectancy in Latin America and in North America is closing, and that by the year 2000 life expectancy in the Region as a whole will exceed 70 years.

On the other hand, the currently available data also indicate that the gap is closing more slowly than had been expected *(10)*, and that as life expectancy increases in Latin America, the rate of increase relative to the rate of increase in developed countries has tended to decline. The overall figures also conceal significant differences in the average figures for different countries and for different groups within the various countries. In some cases these differences may have socioeconomic origins, while in others uneven population coverage by various services, together with inequitable resource allocation and utilization, may be responsible. One study has shown that the probability of dying before two years of age in one country of the Region was five times greater in one socioeconomic class than in another *(11)*.

Table 3. Life expectancy at birth in the latter half of each decade since 1965, with projections to the year 2000, by area.

Area[a]	Life expectancy at birth (in years) during:			
	1965-1970	1975-1980	1985-1990	1995-2000
Latin America	*60.0*	*63.6*	*67.3*	*70.4*
Andean area	57.0	61.4	66.0	70.2
Southern cone	65.5	67.9	69.3	70.6
Brazil	59.7	63.6	67.7	71.1
Central America	53.9	59.3	63.8	68.2
Mexico	61.0	65.5	68.3	70.3
Latin American Caribbean	61.7	64.2	66.8	69.5
English-speaking Caribbean and smaller islands	*66.7*	*69.9*	*72.0*	*73.2*
North America	*70.6*	*71.7*	*72.2*	*72.5*
Total (all areas)	64.9	67.0	69.2	71.1

Source: Pan American Health Organization *(1)*.
[a]See Table 1, footnotes a-f.

At the same time, some developing countries have seen life expectancy increase much faster than GNP. This implies that selected interventions (some health-related) can directly affect life expectancy in those countries of our Region where average life expectancy is still relatively low.

The Plan of Action recognizes that a prime goal for the Region is to raise the average life expectancy at birth in each country to at least 70 years; and it recognizes that a fundamental reason for seeking "health for all by the year 2000" is to reduce inequalities between countries and human groups. It seems reasonable, therefore, that the first of the regional objectives set forth in the plan is to improve the equity, efficiency, and effectiveness of health service systems by reorganizing and expanding those systems. That is, the plan proposes a restructuring of the health sector and development of its service systems, first by increasing the sector's operating capacity and then by extending its installed capacity. If these actions are carried forward in the manner the plan describes, it is to be expected that they will make a major contribution to increasing life expectancy.

The Elderly

One implication of such increased life expectancy, all other things being equal, would be a relative increase in the elderly portion of the population. In this regard, the percentage of the regional population over 64 years of age was 6.9 in 1980. It is not expected that this percentage will increase greatly by the year 2000 (see Table 4), because the projected rate of population growth affecting younger age groups is relatively high. Nor is any drastic change expected in the elderly "dependency" ratio (the ratio of those over 64 to those between the ages of 15 and 64, as shown in Table 5). Nevertheless, because of an anticipated decline in the child "dependency" ratio, because the actual number of elderly people is expected to increase substantially, and because plans and programs for dealing with that increase are generally lacking, the Plan of Action has singled out the elderly as a "special group." Accordingly, that document stresses the need to study and assess the magnitudes of older people's health problems, to involve epidemiologists and social scientists in the study of such problems, and to develop

Table 4. Age distributions of the population of the Americas in 1970 and 1980, and projected age distributions for 1990 and 2000, by area.

Area[a]		% in each of the following age groups:			
		< 15 years	15-44 years	45-64 years	≥ 65 years
Latin America	1970	42.6	41.7	11.9	3.8
	1980	40.9	43.2	11.9	4.0
	1990	39.6	44.4	11.8	4.2
	2000	37.3	45.4	12.7	4.6
English-speaking Caribbean and smaller islands	1970	44.9	37.2	13.0	4.9
	1980	38.7	43.2	12.7	5.4
	1990	33.4	48.7	12.1	5.8
	2000	29.3	51.1	13.5	6.1
North America	1970	28.4	41.7	20.3	9.6
	1980	22.5	46.8	19.7	11.0
	1990	22.6	46.4	19.0	12.0
	2000	21.7	43.4	22.8	12.1
Total (all areas)	1970	36.6	41.6	15.7	6.1
	1980	33.5	44.6	15.0	6.9
	1990	33.4	45.1	14.4	7.1
	2000	32.2	44.8	16.0	7.0

Source: Pan American Health Organization *(1)*.
[a]See Table 1, footnotes a-f.

Table 5. The ratios of children and elderly people to members of the working-age population in 1980, and projections for the year 2000, by area.

Area[a]	Child dependency ratio[b]		Elderly dependency ratio[c]	
	1980	2000	1980	2000
Latin America	74:100	64:100	7:100	8:100
English-speaking Caribbean and smaller islands	69:100	45:100	10:100	10:100
North America	34:100	33:100	16:100	18:100

Source: Pan American Health Organization *(1)*.
[a]See Table 1, footnotes a-f.
[b]The number of children below age 15 per 100 persons between the ages of 15 and 64.
[c]The number of people age 65 or over per 100 people between the ages of 15 and 64.

comprehensive approaches to providing the elderly with appropriate health care.

Mortality Data

Mortality data probably represent the oldest form of health statistics, and despite various inherent shortcomings they remain an excellent tool for assessing health conditions. Among a host of other pu poses, the main purposes that such data serve today are those of ''descriptive epidemiology, retrospective studies, and the testing of hypotheses regarding causation in prospective studies'' *(12)*. Within the context of this presentation, mortality data will be used for the first purpose—as an epidemiologic tool to indicate the nature and relative importance of certain specific disease problems, and to point out critical requirements for remedial action.

Among the leading causes of death in the Americas are cardiovascular diseases, respiratory infections, enteritis and other diarrheal diseases, and traffic accidents. In reviewing the situation regarding each of these problems, it would seem appropriate to begin with respiratory infections and diarrheal diseases, which predominantly affect children.

Respiratory Infections and Diarrheal Diseases

General mortality among children under five years old, as well as mortality from acute respiratory infections and diarrheal diseases in this age group, is shown in Table 6. These data do not show the variations between countries, but they do demonstrate striking differences between the three distinct geographic areas involved. All three areas (Latin America, the English-speaking Caribbean and smaller islands, and North America) experienced noteworthy reductions in childhood mortality (including mortality from the diseases cited), but the rates in Latin America remained higher than in the other areas.

By and large, the risks of young children dying from respiratory infections or diarrheal diseases were far greater in Latin America and the Caribbean than they were in North America. For example, in 1978 one of every 10,000 children under five died of respiratory infections in North America, while some six of every 10,000 and 31 of every 10,000 died from that cause in the cited areas of the English-speaking Caribbean and Latin America, respectively (Table 6). The data also show that about one of every 20,000 children under five died of diarrheal diseases in North America in 1978, while 18 out of 20,000 did so in the included areas of the English-speaking Caribbean and 56 out of 20,000 did so in the cited areas of Latin America.

Regarding the relative importance of respiratory and diarrheal disease mortality in this age group, mortality from diarrheal diseases was roughly comparable with that from respiratory infections in the cited areas of both Latin America and the English-speaking Caribbean in 1968 and 1978. In North America, however, mortality from respiratory infections was considerably greater than that from diarrheal diseases, especially in 1968.

It also appears that North America and the included portions of the English-speaking Caribbean made major strides against respiratory infections during the decade in question; for as Table 7 shows, young child mortality from that cause fell by 83 and 71 per cent, respectively, in those areas. Progress was also made against respiratory infections in the cited areas of Latin America, where young child mortality from that cause fell by 46 per cent; and similar progress was made against diarrheal diseases in all three areas, where declines in young child mortality from diarrheal diseases ranged from 31 per cent in North America to 57 per cent in the included portions of the English-speaking Caribbean. By and large, however, neither diarrheal disease mortality in the three areas nor mortality from respiratory infections in Latin America declined much faster than general young child mortality in those areas during this period.

In weighing these figures, it seems remarkable that diarrheal disease mortality has not fallen faster than mortality from all causes. Perhaps it is too early to see the impact of the introduction of oral rehydration therapy upon deaths from diarrhea, but I would predict that over the next 10 years we will see this situation change. Should it fail to do so, that will reflect lack of coverage rather than lack of an appropriate form of therapy.

The figures presented also point up the importance of making a determined attack on acute respiratory infections, especially in the countries of Latin America. We do not have a form of therapy for respiratory infections as effective as oral rehydration is for diarrhea, but the data shown here indicate an urgent need to develop such a therapy.

Walsh and Warren *(13)* have proposed a system of targeting particular diseases for control by assessing their prevalence, morbidity

Table 6. Approximate mortality among children under five years old in 1968 and 1978 from all causes, acute respiratory infections, and diarrheal diseases, showing the percentage of mortality from all causes accounted for by respiratory and diarrheal diseases, by area.

Area[a]	Deaths per 1,000 children from:						% of mortality from all causes due to·			
	All causes		Acute respiratory infections[b]		Diarrheal diseases[c]		Acute respiratory infections[b]		Diarrheal diseases[c]	
	1968	1978	1968	1978	1968	1978	1968	1978	1968	1978
Latin America	*20.8*	*13.1*	*5.7*	*3.1*	*4.2*	*2.8*	*27.3*	*23.5*	*20.3*	*21.2*
Andean area[d]	21.0	12.4	5.8	3.1	3.7	2.7	27.6	25.2	17.6	22.0
Southern cone[e]	16.4	10.8	4.1	1.4	2.3	1.2	25.0	12.5	14.3	10.9
Brazil	–	–	–	–	–	–	–	–	–	–
Central America[f]	28.0	17.6	5.4	3.1	5.7	3.9	19.4	17.8	20.3	22.3
Mexico	23.0	15.0	7.5	4.2	5.8	3.6	32.7	28.3	25.1	24.1
Latin American Caribbean[g]	11.9	5.8	1.4	.7	2.1	.7	12.2	11.2	17.5	11.6
English-speaking Caribbean and smaller islands[h]	*11.1*	*5.6*	*2.1*	*.6*	*2.1*	*.9*	*19.0*	*11.3*	*16.1*	*14.3*
North America	*4.9*	*3.4*	*.6*	*.1*	*.070*	*.048*	*11.8*	*4.2*	*1.4*	*1.4*

[a]See Table 1, footnotes a-f.
[b]This category includes codes A-017, 078, 089-091, and 093 in the World Health Organization's *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death* (eighth revision), referred to hereafter as ICDA-8.
[c]This category includes codes 008-009 in ICDA-8.
[d]No data from Bolivia.
[e]No respiratory infection data from Paraguay.
[f]No data from Nicaragua; no diarrheal disease data from Guatemala or Honduras.
[g]No data from Haiti; no diarrheal disease data from Cuba.
[h]No data from the Bahamas, the Cayman Islands, French Guiana, Grenada, the Grenadines, Guadeloupe, Guyana, Jamaica, Montserrat, the Netherlands Antilles, Nevis, St. Kitts, St. Vincent, Suriname, Trinidad and Tobago, or the Turks and Caicos Islands. Areas providing data: Antigua, Barbados, Belize (no data on respiratory infections), Dominica, Martinique (no data on diarrhea), Saint Lucia (no data on diarrhea), the Virgin Islands (U.S.), and the Virgin Islands (U.K.—no data on diarrhea).

Table 7. Approximate declines in mortality among children under five from all causes, acute respiratory infections, and diarrheal diseases in 1968-1978, by area.

Area[a]	Percentage declines in mortality, 1968-1978, from:		
	All causes	Acute respiratory infections[b]	Diarrheal diseases[c]
Latin America	*37.0*	*45.6*	*33.3*
Andean area[d]	41.0	46.6	27.0
Southern cone[e]	34.1	65.9	47.8
Brazil	–	–	–
Central America[f]	37.1	42.6	31.6
Mexico	34.8	44.0	37.9
Latin American Caribbean[g]	51.3	50.0	66.7
English-speaking Caribbean and smaller islands[h]	*49.5*	*71.4*	*57.1*
North America	*30.6*	*83.3*	*31.4*

[a]See Table 1, footnotes a-f.   [e]See Table 6, footnote e.
[b]See Table 6, footnote b.   [f]See Table 6, footnote f.
[c]See Table 6, footnote c.   [g]See Table 6, footnote g.
[d]See Table 6, footnote d.   [h]See Table 6, footnote h.

or severity of disability, risk of mortality, and susceptibility to control. They have placed such diseases as malaria, diarrheas, measles, whooping cough, schistosomiasis, and neonatal tetanus in a "prime" group of diseases that should receive "highest priority for health care planning." Respiratory diseases were assigned a lower rank order by the authors because of the difficulties confronting their prevention and management; nevertheless, despite the possible importance of such difficulties in terms of immediate control, in terms of need for research the criteria cited above clearly place respiratory diseases very high on any list of priority problems.

As a general rule, deaths among children tend to reflect the extent of primary care coverage and prevailing conditions. It is obvious, therefore, that mortality from acute respiratory disease reflects more than just the respiratory disease burden. From cohort and longitudinal studies it is known that the average child in North America and Latin America experiences approximately 6-10 respiratory infections per year *(14, 15)*. The difference is that in North America these infections cause mild illness, while in Latin America, as in other developing regions, they are more likely to cause pneumonia and death *(16)*.

The Plan of Action recognizes that the methods for controlling both acute respiratory infections and diarrheal diseases must be integrated into primary health care services. In the case of diarrheal diseases, it specifically sets out as one area of action the development of programming approaches that will ensure the integration of all diarrheal disease control program strategies (i.e., oral rehydration, nutrition, health education, food hygiene, and water and environmental sanitation) into national programs within the context of primary health care. Research programs directed at these diseases, especially respiratory diseases, must develop technologies for therapy that are appropriate and that act as entry points into the primary care system—providing care for the child as a whole and not restricting the intervention to disease-specific techniques.

Traffic Accidents

Data on mortality from motor vehicle traffic accidents in the Americas in 1968 and 1978 are shown in Table 8. Such mortality in-

Table 8. Approximate mortality from motor vehicle accidents
in 1968 and 1978, showing the percentages of all deaths
attributed to motor vehicle accident fatalities, by area.

Area[a]	Deaths from motor vehicle accidents[b] per 100,000 population in:		% of mortality from all causes due to motor vehicle accidents[b] in:	
	1968	1978	1968	1978
Latin America	*12.6*	*16.6*	*1.4*	*2.4*
Andean area	13.6	17.8	1.6	3.1
Southern cone	18.1	13.2	1.9	1.6
Brazil	–	–	–	–
Central America	10.6	16.5	1.3	1.6
Mexico	7.6	18.3	.8	2.5
Latin American Caribbean	11.6	11.2	1.7	2.2
English-speaking Caribbean and smaller islands	*8.3*	*9.6*	*1.1*	*1.5*
North America	*27.5*	*23.4*	*2.9*	*2.7*

[a]See Table 1, footnotes a-f.
[b]Codes E810 through E823 in the WHO *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death* (eighth revision).

creased in most countries of Latin America during that period, producing an overall increase in the reporting areas of 31.7 per cent. Conversely, in North America the rate fell slightly over the ten-year period, so that the share of deaths due to motor vehicle accidents in the reporting areas of Latin America (2.4 per cent) in 1978 appeared to be approaching that seen in North America (2.7 per cent). However, the age-specific death rates (not shown in the table) reveal a sharp mortality peak for those in their twenties in North America, a peak that is not so marked elsewhere in the hemisphere.

Of course, these figures deal only with deaths and do not provide a complete picture of traffic accident epidemiology. Unfortunately, recent data on traffic accident epidemiology are hard to obtain. However, one study has indicated that the number of licensed vehicles increased some 50 per cent between 1969 and 1975 in 18 of the 25 countries of the Americas for which data were available *(17)*. With respect to the number of accidents over this six-year period, only two of these countries showed small decreases, while at least three had increases of over 150 per cent.

The Plan of Action regards intersectoral cooperation as being essential for attainment of health goals. Nowhere is this more necessary than in programs seeking to reduce morbidity and mortality from traffic accidents; for clearly, such morbidity and mortality will not fall substantially without cooperation and intervention by sectors that deal with policies on such issues as alcohol, licensing, and road traffic laws.

Cardiovascular Diseases

As Table 9 indicates, mortality from cardiovascular diseases rose in relation to other causes of mortality in the cited areas of Latin America and the English-speaking Caribbean during the period 1968-1978. In North America, where mortality from this cause dropped by some 15 per cent, the reverse was true. This decline in cardiovascular disease mortality in North America is one of the recent success stories of preventive medicine.

It has been claimed that this latter decline has resulted from changes in life-styles and related risk factors brought about by a massive health education program conducted over the

Table 9. Approximate cardiovascular disease mortality in 1968 and 1978, showing the percentages of all deaths attributed to cardiovascular diseases, by area.

Area[a]	Deaths from cardiovascular diseases[b] per 100,000 population in:		% of mortality from all causes due to cardiovascular diseases[b] in:	
	1968	1978	1968	1978
Latin America	*57.9*	*53.3*	*6.4*	*7.8*
Andean area	38.4	40.1	4.6	7.1
Southern cone	132.8	120.1	14.0	14.4
Brazil	–	–	–	–
Central America	23.1	25.5	2.8	4.4
Mexico	24.3	24.6	2.5	3.4
Latin American Caribbean	60.1	66.0	8.6	12.9
English-speaking Caribbean and smaller islands	*63.3*	*80.1*	*8.2*	*12.8*
North America	*341.0*	*289.2*	*36.1*	*33.9*

[a]See Table 1, footnotes a-f.
[b]Codes 390-429 and 430-438 in the WHO *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death* (eighth revision).

past 20 years *(18)*. However, it is possible that the decline in cardiovascular disease mortality began before the public health education program started. It is therefore essential to develop, as fast as possible, research that could determine the cause of this reduced mortality—so that effective techniques, appropriately modified, may be applied in Latin America and the Caribbean for the purpose of aborting those areas' progressive upward trends in death from cardiovascular disease.

In cases such as this, where the specific etiology is obscure, and where the results of intervention must be measured over a long period *(19)*, definitive research requires large population groups and long, carefully controlled studies. Such research is usually beyond the capacity of all but a few countries in the Americas today. However, the feasibility of performing such research is enormously enhanced if collaborative intercountry projects are undertaken, and if a process of information exchange through technical cooperation among developing countries is established.

Meanwhile, the Plan of Action urges governments to continue analyzing relevant cardiovascular disease incidence and prevalence data, and to attempt identification of etiopathogenic factors that could be used as a basis for applying control measures. It will also be necessary for the kinds of control measures advocated to date to be adapted, so as to permit their effective integration into the activities of the general health services involved.

Malaria

Besides examining mortality data relating to various disease categories, it would seem appropriate to focus upon a single disease affecting health conditions in the Americas. Malaria has been chosen, partly because the chances for its control or eradication appear to be diminishing, despite great efforts, while the number of cases reported in the Americas is increasing. In 1981 a report presented to PAHO's Directing Council described the

status of the malaria program in the Region *(20)*. That report indicated that the number of registered malaria cases was increasing steadily and had experienced a 68 per cent increase between 1975 and 1980. More specifically, the reported overall morbidity per 100,000 inhabitants in the Region reached a peak in 1967, registered a slow decline over the period 1968-1974, and then began a steady rise in 1975 that continued through 1980 (Figure 1). Unfortunately, the malarious areas of the Americas, where morbidity naturally tends to be higher, are areas where noteworthy population growth is occurring (Table 10).

In order to provide a more detailed geographic breakdown of the different morbidity patterns involved, the countries of the Region have traditionally been divided into four groups as indicated in Table 11. Those in Group I are the countries where local transmission was not demonstrated and most cases were classified as imported. At the other extreme, those countries in Group IV experienced high malaria endemicity, and the attack measures employed proved insufficient or ineffective. As may be seen, the Group I countries reported a 425 per cent increase in registered malaria cases over the four-year period covered, while the Group IV countries reported a 145 per cent increase. It should be noted, moreover, that these increases occurred despite a pattern of rising expenditures against malaria, especially during 1978-1980 (Figure 2).

If the morbidity data shown in Table 11 are combined with the various national population figures, it appears that the morbidity caused by registered cases in the Group I countries was 0.03 cases per 1,000 inhabitants in 1980, as compared to 8.7 cases per 1,000 inhabitants in the Group IV countries. It is clear, however, that these data deal only with reported cases and do not describe the unreported morbidity or economic loss caused by malaria. Regarding economic loss in particular, a classic study carried out by Conly in Paraguayan farmlands *(21)* has helped to demon-

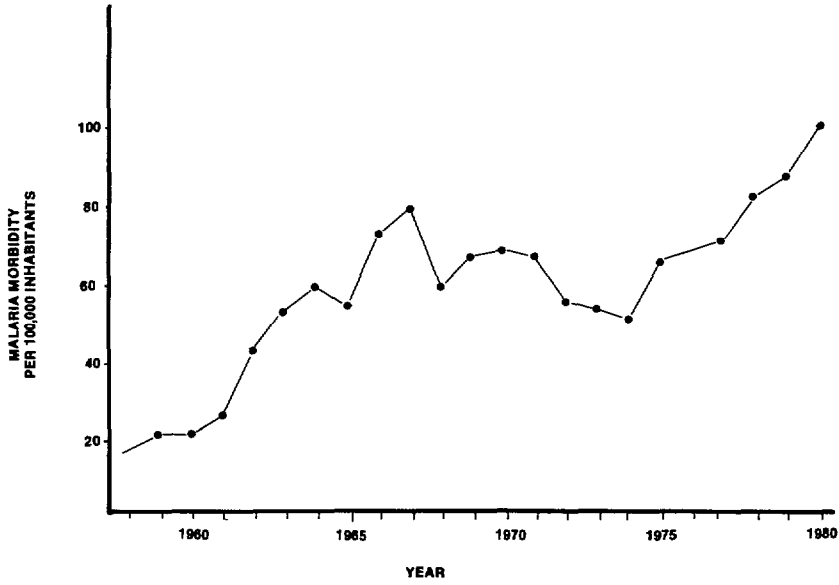Figure 1. Malaria morbidity per 100,000 inhabitants
in the Americas, 1958-1980.

Figure 2. Public funds invested to combat malaria
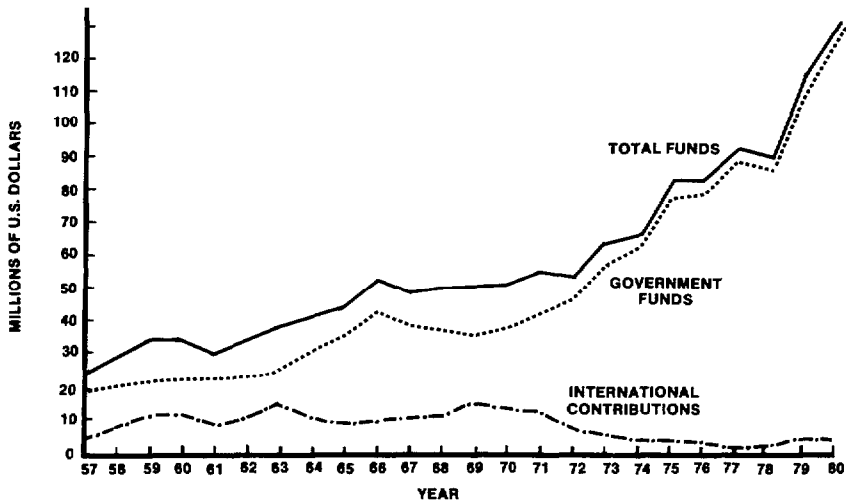in the Americas, 1957-1980 *(20)*.

Table 10. Registered malaria morbidity in the Americas, 1960-1980.

Year	Population of the Americas (in thousands)		Registered malaria cases per 100,000 population	
	Of all the countries	Of the malarious areas	In all the countries	In the malarious areas
1960	400,500	143,586	19.9	55.7
1965	455,527	146,389	53.0	165.0
1970	505,819	181,257	68.0	189.9
1975	555,676	205,872	64.2	173.3
1980	615,021	231,366	98.9	259.0

Source: Pan American Health Organization; Status of Malaria in the Americas, XXIX Report *(20)*.

Table 11. Malaria cases registered in 1977-1980
by four groups of countries and territories.

Groups	1980 Population of originally malarious areas (in millions)	Malaria cases registered			
		1977	1978	1979	1980
I[a]	72.8	531	718	1,161	2,249
II[b]	15.0	5,204	5,004	9,044	11,509
III[c]	101.7	140,859	156,413	182,428	219,048
IV[d]	41.9	252,231	302,620	322,459	365,788

Source: Pan American Health Organization; Status of Malaria in the Americas, XXIX Report *(20)*.
[a]Group I = Chile, Cuba, Curaçao, Dominica, Grenada, Guadeloupe, Jamaica, Martinique, Saint Lucia, Trinidad and Tobago, the United States, Puerto Rico, and the Virgin Islands.
[b]Group II = Argentina, Belize, Costa Rica, the Dominican Republic, French Guiana, Guyana, Panama, the Canal Zone, and Paraguay.
[c]Group III = Brazil, Ecuador, Mexico, Suriname, and Venezuela.
[d]Group IV = Bolivia, Colombia, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, and Peru.

strate the socioeconomic consequences of malaria. This study showed that the amount of land cleared was lower on farms with a high malaria prevalence than it was on malaria-free farms, and that during malaria epidemics farming activities were markedly reduced. Conversely, it has been shown outside of the Americas that malaria eradication in grain-producing areas is associated with increased grain yield *(22)*.

Another noteworthy point is that the problem is not one affecting a single country or some particular collection of countries. As the sharp increase of reported cases in the Group I countries demonstrates, the problem affects all countries in the Americas and is made more serious by the ease with which potentially infected people can travel rapidly from one place to another.

PAHO's Member Governments have reaffirmed that malaria eradication is their ultimate goal. With this end in mind, the Plan of Action calls for a variety of measures—among them careful field studies directed at acquiring

thorough epidemiologic knowledge of the disease. It also places increased stress on operational research and points out the critical job to be performed by intersectoral and intercountry collaboration. In this vein, it should be noted that malaria research will be directed not only at using newer technologies to eradicate the vector or protect the host, but also at periodic examinations of social and economic variables that may have a bearing on the success with which presently effective techniques can be applied. PAHO is actively collaborating with the WHO/UNDP/World Bank Special Program for Research and Training in Tropical Diseases on this disease, besides strongly supporting the efforts of its member countries to control malaria.

Concluding Remarks

This presentation has been deliberately eclectic. No mention has been made of such important matters as provision of potable water and sanitation services, or the problems posed by malnutrition and chronic debilitating diseases. The data presented—those dealing with current health conditions, as well as with trends and projections—are intended to indicate prime areas of research interest. It is hoped, at the national level, that such research will be within the scope and priorities of a national health research policy. With regard to formulating and implementing a national policy of this nature, it seems evident that no single approach will be applicable to all countries. However, within the context of the Regional Plan of Action, the Pan American Health Organization stands ready to cooperate with Member Governments to devise the research policies and strategies that will in turn permit development of the technology needed to address the critical health problems involved.

SUMMARY

This article does not seek to provide any sort of detailed description of health conditions in the many individual countries of the Americas; rather, it presents general data relevant to health planning and health research, starting with data on demography and life expectancy and proceeding to trends in mortality from respiratory infections, diarrheal diseases, cardiovascular diseases, traffic accidents, and malaria. In this manner it seeks to describe the current situation, some directions of change, and some possible points of intervention that could prove useful in setting priorities for future health research.

Two major demographic trends in the Americas today are significant population growth and urbanization. By the year 2000, the Region's 1980 population of about 615 million inhabitants is expected to reach something in the area of 898 million. Obviously, it will be necessary to provide for these increasing numbers. At the same time, as a result of natural growth of established city populations and migration to the cities from rural areas, health systems must be prepared to deal increasingly with urban populations, urban problems, and the expectations of recent immigrants to urban settings that their surroundings will afford them better access to health care.

Regarding life expectancy, it appears that average life expectancy in the Americas is increasing, and that the gap between life expectancy in North America and Latin America is closing, but also that this gap is closing less rapidly than had previously been predicted. Within this context, rapid life-expectancy gains in some developing countries suggest that selected interventions (including health-related interventions) can directly affect life expectancy in countries of the Region where average life expectancy is still relatively low.

Among the major causes of death in the Americas are diarrheal and respiratory diseases, cardiovascular diseases, and traffic accidents. The impact of diarrheal and respiratory diseases upon young children (the prime vulnerable group) diminished notably in 1968-1978, although mortality from these causes (as well as general mortality in children under five years old) remained many times higher in Latin America and the Caribbean than in North America. The available figures demonstrate the importance of making a determined attack on respiratory as well as enteric infections (especially in Latin

America), highlight the need for research to develop simple methods of respiratory disease prevention and management, and suggest that future diarrheal disease mortality data could be used to assess the extent of certain kinds of health service coverage.

Cardiovascular disease mortality has been rising in Latin America and the Caribbean at the same time that it has been falling in North America. It is therefore essential to determine the cause of the reduced mortality in North America, so that effective techniques, appropriately modified, can be applied in Latin America and the Caribbean to abort the upward trend in those areas.

A similar pattern of rising traffic accident mortality is also found in Latin America and the Caribbean. This underscores the need for cooperation between the health sector and other sectors that deal with policies on alcohol, licensing, and road laws to confront this growing problem.

Data on a single disease, malaria, show a 68 per cent increase in reported cases in the Americas between 1975 and 1980. Particularly sharp increases in the imported cases reported by countries free of the disease demonstrate that all countries are affected. PAHO's Plan of Action, adopted by the Directing Council in 1981, calls for a variety of antimalarial measures, places increased stress on operational research against the problem, and points out the critical need for intersectoral and intercountry collaboration. In this vein it should be noted that malaria research will be directed not only at using newer technologies to eradicate the vector or protect the host, but also at periodic examinations of socioeconomic variables that may have a bearing on the success with which presently effective techniques can be applied.

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IMPORTED HUMAN RABIES IN THE UNITED STATES

A United States national 30 years of age was exposed to rabies by a dog-bite in Nigeria in October 1983. He died in the U.S. on 28 January 1983, 28 days after the onset of symptoms. This was the first case of human rabies in the United States reported to the United States Centers for Disease Control since August 1981.

On 8 October the patient, who worked in Nigeria, was bitten on the right wrist by his pet doberman pinscher while attempting to free it from a trap. The dog died later that day and was buried without laboratory examination for rabies. The patient sought medical attention and received a tetanus immunization, but because the dog had recently been immunized against rabies, it was decided that postexposure prophylaxis was unnecessary.

Eleven weeks later the patient returned to the United States. He remained well until 1 January 1983, 85 days after the bite, when the first disease symptoms appeared. On 6 January, a day after he was admitted to the hospital, a diagnosis of rabies was considered and the patient was placed in strict isolation. On 8 January he was started on a systemic interferon treatment which was discontinued 17 days later.

A total of 132 persons were evaluated for potential contact with infectious secretions from the patient. Twenty-eight persons received rabies postexposure prophylaxis after the patient's death on 28 January, and 3 pathologists received preexposure prophylaxis before his death.

Source: United States Centers for Disease Control, *Morbidity and Mortality* 32(6), 1983.