FACTS ON HEALTH PROGRESS

PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION

1968

GOALS IN THE
CHARTER OF PUNTA DEL ESTE

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Pan American Sanitary Bureau — Regional Office of the
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FOREWORD

Evaluation, in all human activity, is like conscience, that is, "the exact and reflective understanding of things".

When purposes are essentially humanitarian, evaluation is intended to measure actions that promote well-being and to define the latter.

Evaluation is not possible without preestablished and clearly specified objectives. With these as a foundation it is possible to follow the evolution of each problem and of each function in time until the proposed end is reached.

This is precisely the case of the Ten-Year Health Plan of the Charter of Punta del Este, in which goals are established which the Governments of the Americas proposed to reach within ten years beginning in August 1961. In that document the major health problems of the Americas are specified together with the methods with which to resolve them progressively. These fall within the framework of rational programming, efficient organization and administration of services, professional education, training of auxiliary personnel and basic and operational research.

The objective of this publication is the evaluation of events that have taken place in the process of fulfilling the health goals of the Charter of Punta del Este. This is the third in a series which contributes to portraying the natural history of a continental enterprise in which the Governments are the executors and the people, the protagonists and beneficiaries.

In the six years since the signing of the Charter progress has been evident in each of the fields of action; for this reason the title of the publication is "Facts on Health Progress". Analysis of the statistics derived from data made available to us by the Ministries of Health of the American nations makes this clear.

For some of the objectives it is possible to project trends to the end of the decade and predict if they will be reached with a continuation of present investments and achievements or if it will be necessary to increase these.

But at the same time, from this review there emerges clearly the picture of what remains to be done to serve the human beings included in each goal and those who are not, either because it refers only to a part of the population or because the population has increased.

Each fact in this publication reveals, in addition to the positive measurable effects in terms of fewer deaths and less disease, an experience which on repetition should lead to similar or better results. For one learns to avoid errors, to diminish waste, to improve structure and administration, to formulate programs more keenly, to evaluate them more exactly and above all to respect the irreplaceable value of the human condition including those in the most distant communities, when dealing with the common good, whether family or social.

In these six years there has been an increase in life expectancy in almost all the countries where it can be measured; a marked reduction in mortality of infants and children under 5 years, as well as mortality resulting from prevalent communicable diseases, both acute and chronic; a substantial increase in water systems and a lesser increase in those for sewerage; less malnutrition, although it is still excessive, especially in childhood with the underlying danger of mental retardation; an important increase in human resources, both professional and auxiliary, for the prevention and treatment of diseases; a slightly higher availability of hospitals and health centers as well as an improved accessibility to them. Malaria still prevails in certain countries of the Continent but the determination to eradicate it remains firm. This is also true of smallpox. Today it appears possible to reduce substantially poliomyelitis, measles and other infectious diseases of childhood.

These are only a few of the facts which reveal progress in the prevalent health problems of the Americas whose details are included in this publication.

We hope that its content may be useful to the Governments in determining their health policy and in formulating the appropriate plans and programs; to the Universities in the complex process of teaching and learning for the various professionals whose knowledge serves to protect, promote and restore health; to the International Organizations, both Governmental and private, in their cooperative efforts to this enterprise of welfare in the entire Continent, which is essential for the economic and social development of the people.

Abraham Horwitz
Director

GOALS IN THE CHARTER OF PUNTA DEL ESTE

FACTS ON HEALTH PROGRESS

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INTRODUCTION

The Declaration of the Presidents of America signed by 19 American Chiefs of State at Punta del Este, Uruguay on April 14, 1967, gives their formal recognition to the fundamental role of health in the economic and social development of Latin America. The Directing Council of the Pan American Health Organization meeting in Port-of-Spain, Trinidad in October 1967 resolved "to incorporate into the policy of the Organization the proposals in that document that are directly or indirectly related to health".

Health is present in all the chapters of the Declaration. Economic integration through multinational projects will be dependent on development of transportation, telecommunication and power systems as well as economic development of frontier regions and river basins. Techniques for prevention of the spread of disease and extension of life will be essential to the productivity and success of such projects. Epidemiological studies of health conditions and the creation of health services for the existing and the potential population of these areas will require priority action. Intraregional or foreign trade of foods and drugs also has obvious health aspects in attaining standards for quality and purity.

In the Declaration attention is directed particularly to health programs for the neediest sectors of the population including those in rural areas. A separate chapter of the Declaration promotes the modernization of rural life and increase of agricultural productivity, principally of food. Health has an important role in raising the standard of living, in improving the well-being of the individual and his productivity and in preventing malnutrition.

Scientific and technological advances already offer many instruments for the improvement of the health of the American people and the potential for the years ahead is great. Their efficient use will make possible the goals established in the health field. National health plans within the framework of general planning and the mobilization of all available internal and external resources will advance the progress toward goals.

The Charter of Punta del Este had established general objectives in health for the decade beginning in 1962. The Declaration of the Presidents reaffirms those goals and further stresses the expansion of programs for prevention, control or eradication of communicable diseases, the acceleration of programs for water supplies, sewerage and other environmental sanitation services, greater and more rapid progress in improving nutrition, promotion of intensive mother and child welfare programs, and priority for training of professional, technical, administrative and auxiliary personnel. The Declaration of the Presidents calls upon the Pan American Health Organization "to cooperate with the governments in the preparation of specific programs relating to these objectives." This Fact Book attempts to show the position of Latin America at the middle of the decade in relation to the goals of the Charter and the Declaration.

Population

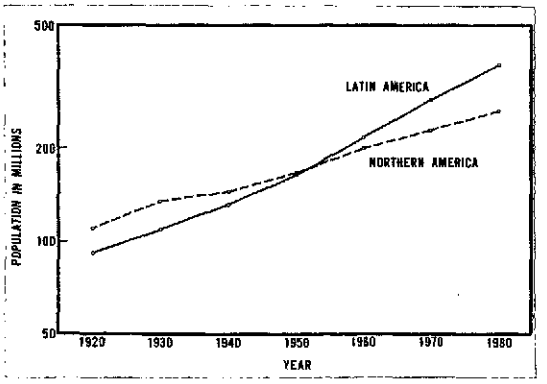
Growth

Population in Latin America is increasing by 2.9 per cent each year. The number of inhabitants reached 267 million in 1968, a figure 20 per cent higher than that of Northern America (223 million). Estimated populations for Latin America are 282 million for 1970 and 374 million for 1980. These predictions are based on assumptions that the growth rate reaches a peak between 1965-1970 with continuous decrease taking place in both birth rates and crude death rates from 1960 to the end of the century.

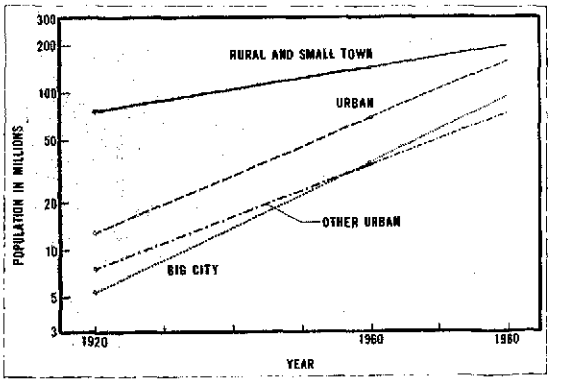
The structure of the population by age, its distribution in the country, educational status, employment and income are some of the factors which influence health conditions as well as the health services required and utilized.

A special characteristic of population growth in Latin America in the twentieth century has been the growth of large cities of 500,000 or more inhabitants. Only 6 per cent of the population in 1920 lived in such cities in contrast to 17 per cent in 1960. Urban centers of 20,000 or more inhabitants accounted for 14 per cent of the population in 1920 but for 33 per cent in 1960. Rural and small town populations have grown at slower rates, not quite doubling in the 40-year period. If the urban growth rates between 1920 and 1960 were to continue after 1960, the urban population in 1980, that is, in centers of 20,000 or more inhabitants, would nearly equal the population in rural areas and small towns. These data point to the versatile structure required for health services which can meet the health problems created by highly urbanized living and furnish adequate services to a large and widely dispersed rural population.

Growth of Population in Northern and Latin America



Growth of Urban and Rural Populations in Latin America



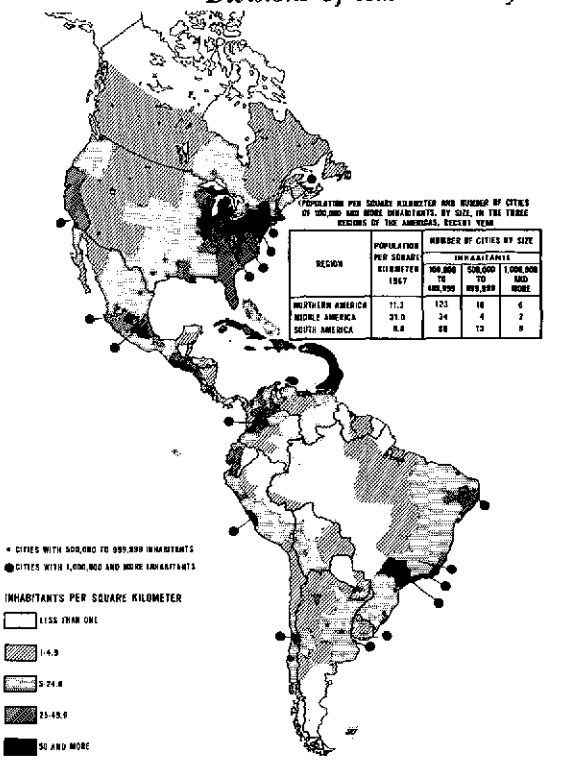
Density

In most countries of Latin America population density is low in relation to land area. Almost 58 per cent of the population lives in countries with fewer than 15 persons per square kilometer and another 30 per cent in countries with density over 15 but under 25. Only 6 per cent is in countries with 100 or more inhabitants per square kilometer. This latter group includes El Salvador, the Caribbean countries of Haiti, Jamaica and Trinidad and Tobago as well as most other Caribbean islands. In South America the density is highest along both the East and West coasts and no country has a density as high as 25 per square kilometer.

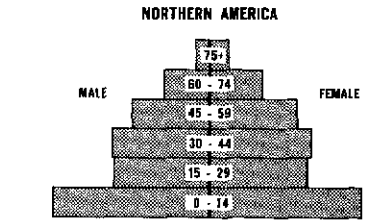
Age distribution

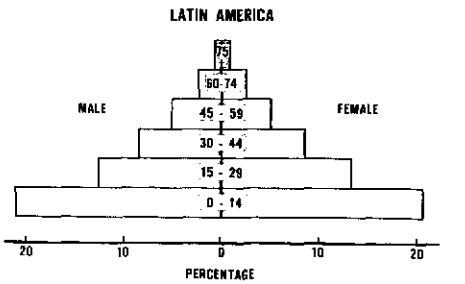
The health problems of a population and the resulting demand for health services are directly related to its age structure. The age distributions of populations in Northern America and Latin America are very different as are their health conditions. The age pyramid for Latin America has a broad base with 42 per cent of the population in the age group under 15 years in comparison with 31 per cent for Northern America. As age increases the population in the age groups in Latin America decreases. Only 5.7 per cent of the population is 60 years of age or older and only 1.2 is 75 years or older. In contrast, in Northern America the numbers in the age groups 15-29 and 30-44 are similar (19.6 per cent in the younger group and 20.1 per cent between 30-44 years). Thirteen per cent are 60 years or over and 3.1 per cent are 75 or over.

Population Density by Principal Political Divisions of Each Country



Percentage Distribution of Population of Northern and Latin America by Age and Sex, Last Censuses





The age pyramid for Northern America reflects the low birth rates in the decade of the 1930's and the low mortality rates in late childhood and early adult life while that for Latin America results from a low life expectancy, especially in previous decades, and from the present and past high birth rates and high child mortality.

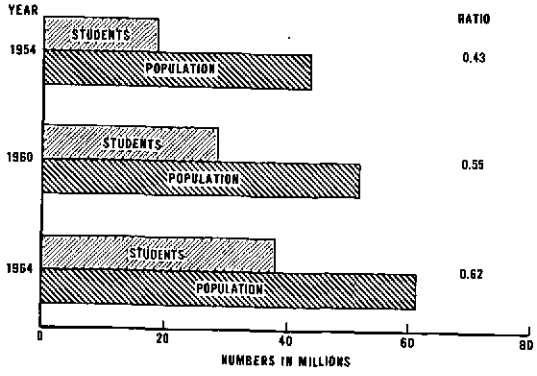
Educational level

Two indices frequently used to identify the educational level of a population are the percentage literate of the population 15 years of age and over and the ratio of the population attending primary or secondary school to the population 5-14 years of age. The latter reflects changes in the educational pattern sooner than the literacy index. Between 1954 and 1964 the number of children attending primary and secondary schools increased steadily and the ratio to the school age population rose from .43 in 1954 to .55 in 1960 and to .62 in 1964.

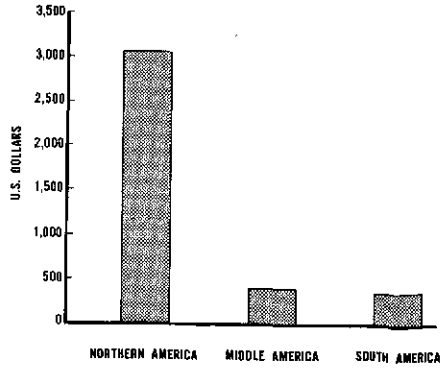
Income

Per capita national income remains low in most countries of Latin America. In contrast to the $3,058 per capita income in Northern America, the corresponding figures for 1966 in U. S. dollars for Middle and South America are $409 and $344. Comparisons between countries and regions are difficult because of the differing purchasing power of the dollar. In addition inflation destroys the interpretation of trends. However, several countries have shown growth in the economy. The economic growth rate was 5.0 per cent in 1967 compared to 4.3 per cent in 1966 and to an average of 4.7 per cent in the period 1961-1965. On a per capita basis the growth rate has been less, 1.8 per cent per annum or about two-thirds of the goal of 2.5 per cent established in the Charter of Punta del Este.

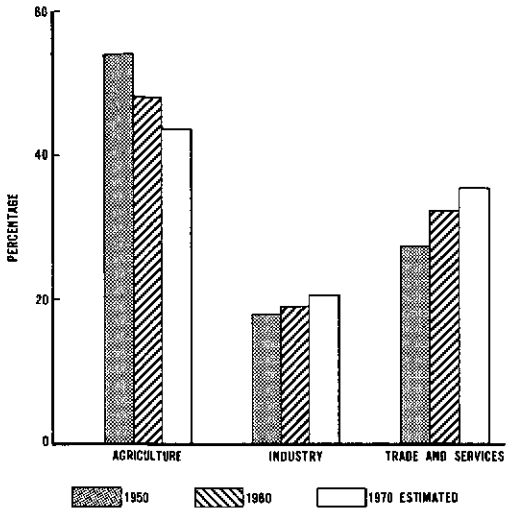
Students Attending Primary or Secondary Schools in Relation to Population in Age Group



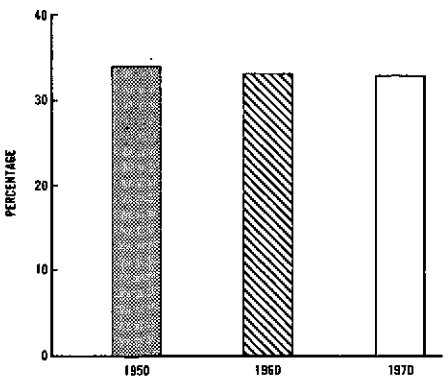
Per Capita National Income in the Three Regions of the Americas, 1966



Percentage Distribution of Labor Force by Sector in Latin America



Percentage of Population Economically Active in Latin America



Labor force

The low per capita income is directly related to the type of the economy and to the size of the labor force in relation to the population. In Latin America the largest proportions are working in agriculture, the sector in which individual income is lowest. However, there has been a gradual shift of workers from agriculture, mainly to trade and services. In 1950, 54 per cent of the labor force was in agriculture; by 1960 the percentage was 48 and the estimated figure for 1970 is 44 per cent. During the same period of time - 1950 to 1970 - the proportion in manufacturing is expected to change from 18 to 20 per cent and in trade and services from 28 to 36 per cent.

The economically active population in Latin America has a large dependent group for which to provide, an average of two additional persons for each worker. The proportion of economically active in the population has remained fairly constant and is not expected to change appreciably in the next few years. In 1950, 34 per cent of the population was economically active, 33 per cent in 1960 and an estimated 33 per cent will be in the labor force in 1970.

The health status of a population affects its potential for mental and physical well-being, determining the capacity for educational and occupational attainments and productivity.

CHILD HEALTH

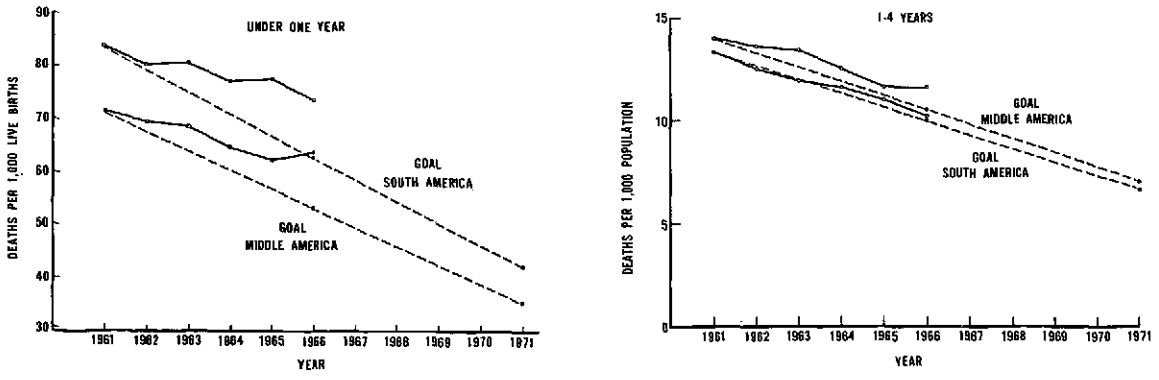
Goals for Decade

Morbidity and mortality in early childhood continue to stand out as a major problem area in Latin America. The goal of the Charter of Punta del Este to reduce mortality under 5 years by one-half in the decade 1961-1971 is closely related to and dependent on other objectives stated in the Charter, including those on communicable diseases, on environmental sanitation, on nutrition and on the development of health manpower and facilities. The need for promotion of intensive mother and child welfare programs was restated in the Declaration of the Presidents.

Deaths of children under 5 years of age account for 44 per cent of all deaths in Latin America as compared to 8 per cent in Northern America. Mortality under one year of age has decreased in the first half of the decade in both Middle and South America by 11 to 12 per cent or by less than half of the goal of 25 per cent for the five year period. Average annual death rates for 1960-1962 were 71.3 and 83.9 per 1,000 live births in Middle and South America, respectively. By 1966 the rates had declined to 63.4 and 73.6 per 1,000. Clearly infant mortality is not being decreased at a pace to meet the goals of the Charter of Punta del Este.

On the other hand, mortality in the age group 1-4 years has decreased rapidly, aproaching the goal of the Charter. Over 90 per cent of the recommended decrease in mortality in this age group was achieved in South America and two-thirds of the desired decrease was attained in Middle America. Average annual rates in 1960-1962 were 14.0 and 13.3 per 1,000 population in Middle and South America respectively. By 1966, the corresponding rates were 11.6 and 10.2 per 1,000.

Reduction in Death Rates Under 5 Years of Age, 1961-1966, Compared with Goals for the Decade, 1961-1971



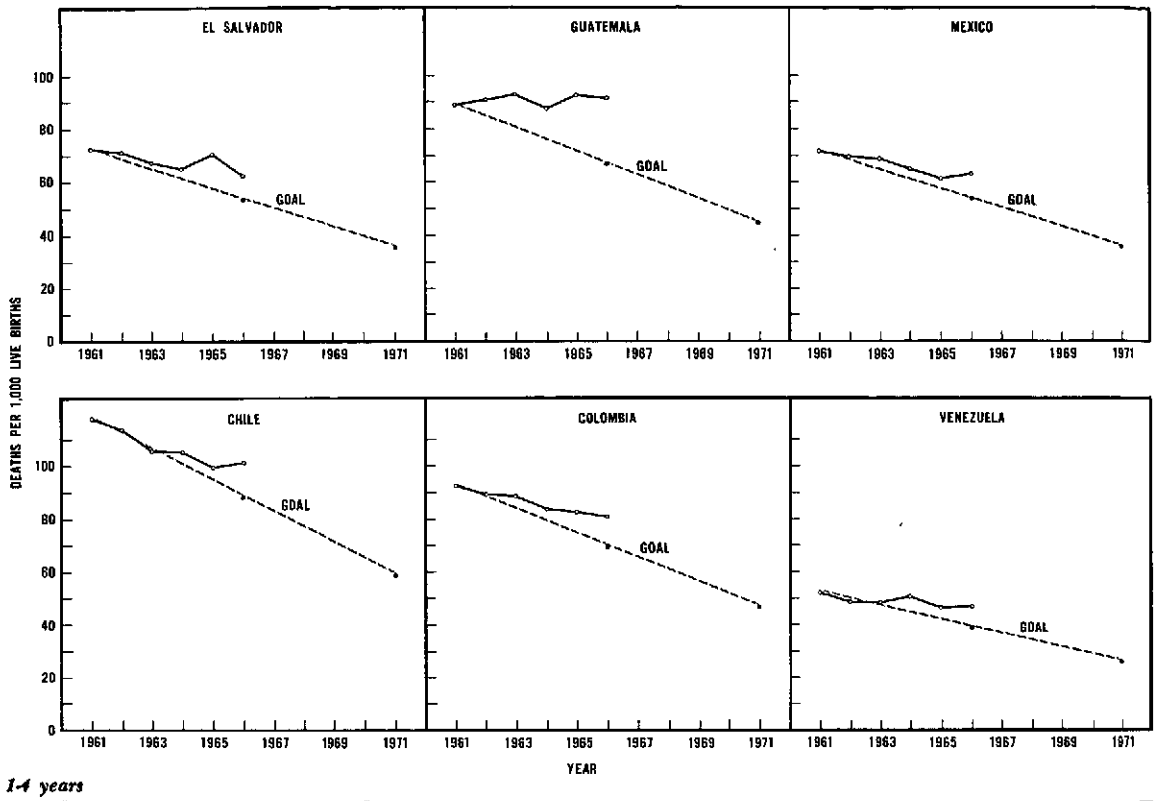
For each country in Latin America the goals and the current status in relation to the goal are shown below. Thirteen of 21 countries with data available achieved 75 per cent of the reduction desired in the age group 1-4 years and at the midpoint of the decade eight were keeping pace with the projected goal. However, only six of 21 countries recorded the accomplishment of 75 per cent of the goal in infant mortality and only three had achieved the goal for the middle of the decade in infant mortality. In all but five countries the progress was greater in the age group 1-4 years.

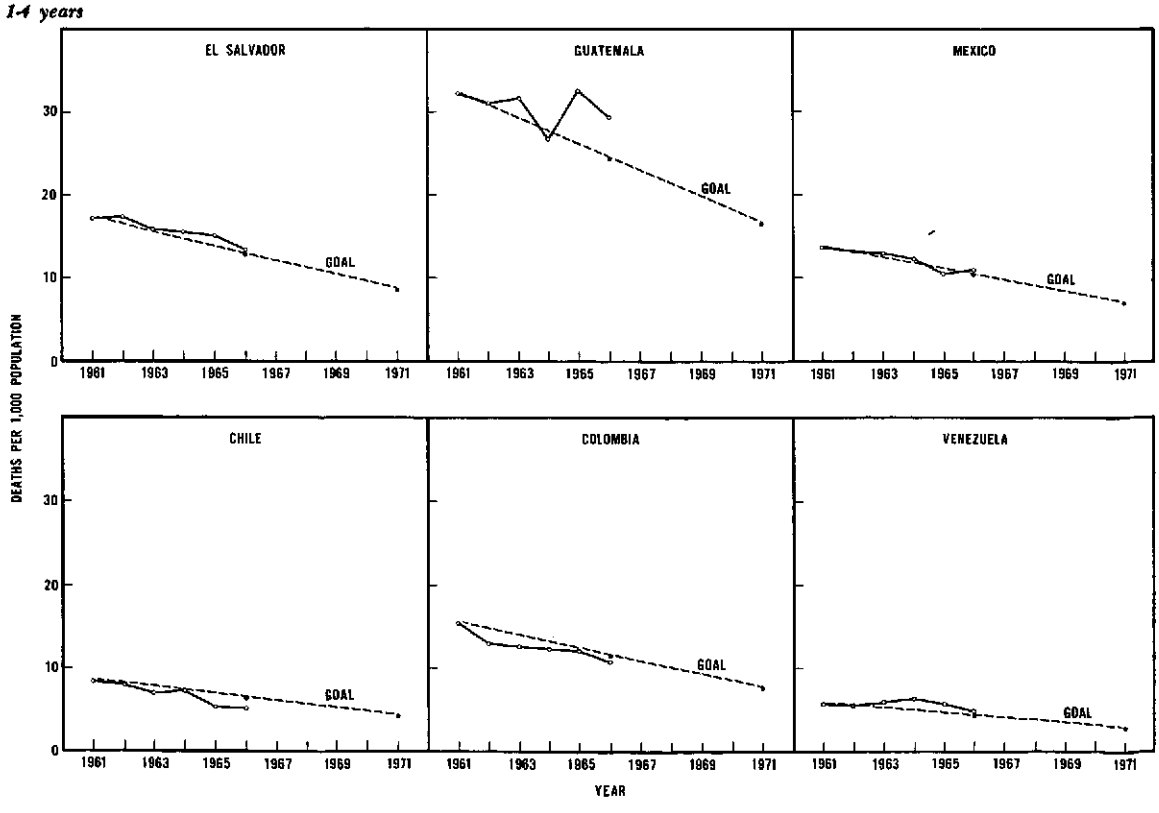
Achievements in Reducing Death Rates under 5 Years of Age in Relation to Goals of the Charter of Punta del Este

Country	Under one year				1-4 years			
	Death rate per 1,000 live births			Per cent of	Death rate per 1,000 population			Per cent of
	Average 1960-1962	1966	Goal 1966	decrease achieved	Average 1960-1962	1966	Goal 1966	decrease achieved
Middle America(a)	71.3	63.4	53.5	44	14.0	11.6	10.5	69
Barbados	65.9	47.7	49.4	110	3.7	2.2	2.8	167
Costa Rica	66.1	65.0	49.6	7	7.5	6.0	5.6	79
Cuba	38.0	b)37.7	b)30.4	4	2.3	c) 1.8	c) 2.0	167
Dominican Republic	94.1	81.1	70.6	55	10.4	7.3	7.8	119
El Salvador	72.5	62.1	54.4	57	17.1	13.5	12.8	84
Guatemala	89.3	91.4	67.0	-	32.4	29.5	24.3	36
Haiti	...	...	...	...	...	...	...	...
Honduras	48.4	36.7	36.3	97	14.1	12.4	10.6	49
Jamaica	49.1	35.4	36.8	111	6.8	4.7	5.1	124
Mexico	71.4	62.9	53.6	48	13.8	10.9	10.4	85
Nicaragua	63.1	47.9	47.3	96	8.6	7.5	6.4	50
Panama	51.1	45.0	38.3	48	7.9	8.0	5.9	-
Trinidad and Tobago	42.9	42.8	32.2	1	2.5	2.0	1.9	83
South America (a)	83.9	73.6	62.9	49	13.3	10.2	10.0	94
Argentina	61.0	59.3	45.8	11	4.3	2.4	3.2	173
Bolivia	103.0	108.2	77.2	-	16.8	14.0	12.6	67
Brazil	...	...	...	...	...	...	...	...
Chile	117.8	101.9	88.4	54	8.2	5.0	6.2	160
Colombia	92.8	81.2	69.6	50	15.4	10.8	11.6	121
Ecuador	99.4	90.4	74.6	36	22.2	17.0	16.6	90
Guyana	...	...	...	...	...	...	...	...
Paraguay	89.7	*69.6	67.3	90	9.4	8.5	6.4	30
Peru	92.9	*63.0	69.7	129	15.7	10.5	11.8	133
Uruguay	44.6	42.7	33.5	17	1.3	1.3	1.0	-
Venezuela	52.1	46.7	39.1	42	5.7	4.9	4.3	57

* Provisional. (a) Regional rates based on data for the same countries as included in *Facts on Progress*, PAHO Misc. Pub. No. 81. (b) For 1965. (c) For 1964.

Reduction in Death Rates Under 5 Years of Age, Six Countries, 1961-1966, and Goals for the Decade 1961-1971





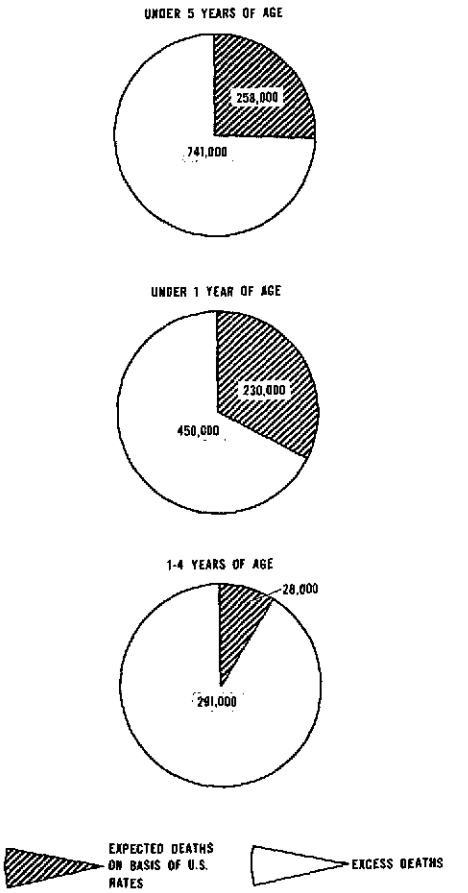
On the opposite page examples are given of the trends of mortality under one year and in the age group 1-4 years in six countries from 1961-1966 with goals for the decade ending in 1971. In five of the six the trend in infant mortality has been downward but in none has it been maintained at a pace sufficient to reach the goal of the Charter by the end of 1971. However, in four of the same six countries the death rate in the age group 1-4 years is progressively approaching the goals specified in the Charter of Punta del Este.

Preventable Deaths

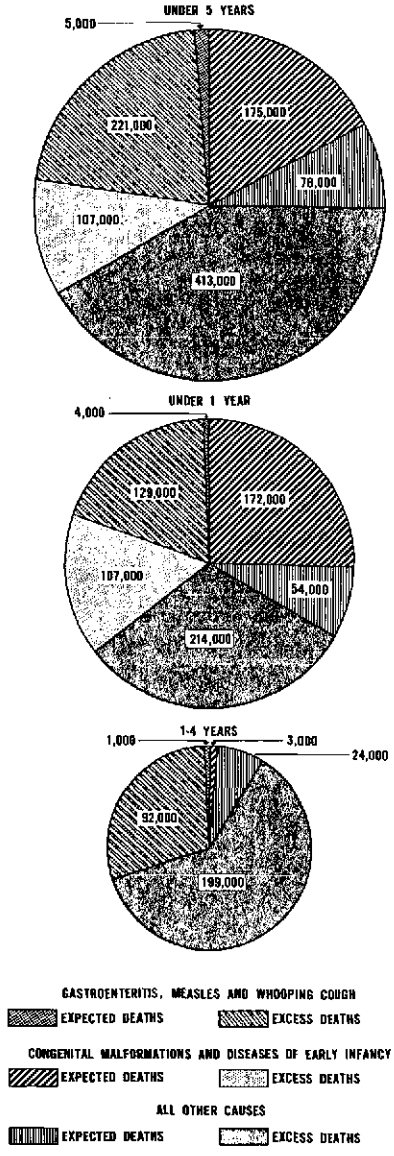
On the basis of registered birth and death rates under 5 years of age in Latin American countries with data available and the corresponding rates in the United States, estimates have been made of the total number of deaths in Latin America of children under 5 years of age and the deaths which would occur if mortality rates experienced in the United States prevailed. An estimated 999,000 children under 5 years of age die each year in Latin America, and of these only 258,000 would die if Latin America had death rates of the magnitude of the United States. The number of 999,000 is a minimum estimate of total deaths in Latin America since it is based on registered death rates which are presumably considerably below the real rates. Thus the excess deaths in Latin America -those which should be preventable- number at least 741,000 and may be considerably more.

Of the 999,000 deaths, 680,000 are under one year of age with 450,000 or two thirds appearing among the excess deaths. In the age group from 1-4 years an estimated 319,000 deaths occur of which 291,000 are excess. Over 90 per cent of the deaths in the age group 1-4 years might be prevented.

Estimated Deaths in Latin America Under 5 Years of Age and Expected Deaths on Basis of Rates of United States, 1966



Estimated Deaths in Latin America Under 5 Years of Age By Cause and Expected Deaths on Basis of Rates of United States, 1966



In Latin America diarrheal diseases, measles and whooping cough are responsible for an estimated 226,000 deaths of children under 5 years or for 23 per cent of deaths in this age group. If mortality rates from these three causes in Latin America were at the level of U.S. rates there would be only 5,000 deaths from this group of causes. Almost 98 per cent of these deaths could be prevented. Nutritional deficiencies are important associated causes for many of these deaths in Latin America and their role in mortality needs study. Diseases of early infancy and congenital malformations result in an estimated 282,000 deaths of children under 5 years in Latin America of which 38 per cent are excess. Remaining causes account for 491,000 deaths, of which 413,000 or over 80 per cent should not occur. Of these 413,000, 13 per cent or 53,000 were caused by infectious diseases other than measles or whooping cough. Influenza and pneumonia accounted for 131,000 of this large excess. Ill-defined deaths are also included in this grouping of diseases.

Under one year of age over 25 per cent of the excess deaths are from gastroenteritis, whooping cough and measles. Close to another 25 per cent of the 450,000 preventable deaths are attributed to diseases of early infancy and congenital malformations and almost another one-fourth to influenza and pneumonia.

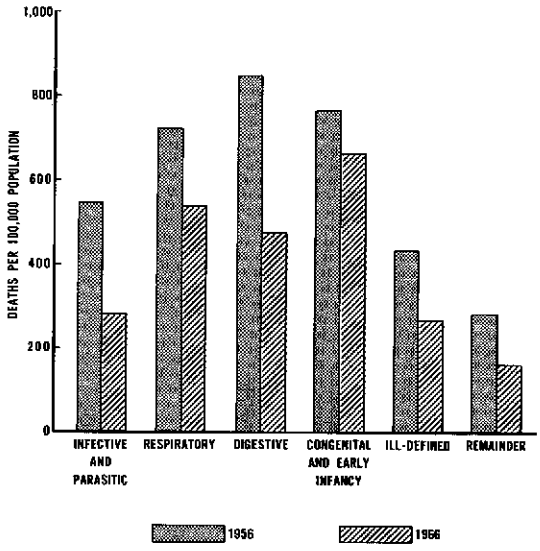
Between 1-4 years of age gastroenteritis, whooping cough and measles are responsible for almost one third of the deaths which might be prevented and the remaining infectious and parasitic diseases and influenza and pneumonia account for over one-fourth.

Despite the large excess of deaths in Latin America over the numbers which would be expected in this population of children at U.S. levels of mortality, considerable progress has been made in the past 10 years

from 1956 to 1966. The death rate from infective and parasitic diseases has decreased by 48 per cent, from respiratory diseases by 26 per cent, from diseases of the digestive system (in large part gastroenteritis) by 44 per cent and from ill-defined causes by 40 per cent. The progress has been achieved in controlling diseases related to environmental factors and diseases for which preventive measures are available.

The death rate from diseases of early infancy and congenital malformations showed only a 14 per cent decrease in the decade 1956 to 1966. This group of diseases contributes heavily to infant mortality in all countries of the world including those with relatively low infant death rates. Reduction of deaths from these causes has been slow. This is the group of diseases which makes the achievement of the goal to reduce infant mortality by 50 per cent a difficult task.

Deaths of Children Under 5 Years of Age per 100,000 Population by Groups of Causes, in Latin America

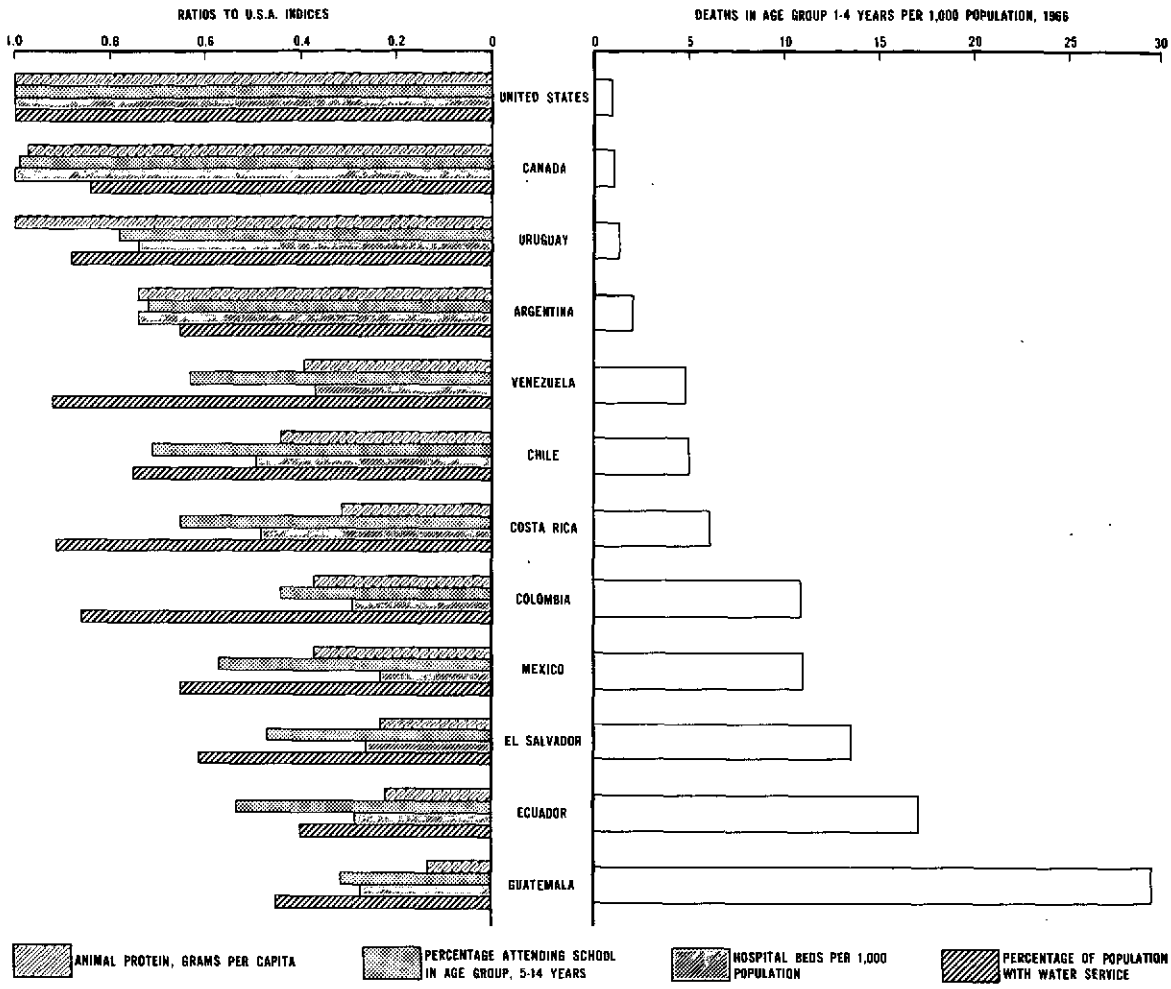


Estimates based on death rates from selected causes between 1961 and 1966 show that 34,000 fewer children under 5 years of age died in 1966 from gastroenteritis than would have been expected to die on the basis of 1961 death rates. Similarly the decrease in deaths from whooping cough resulting from the decline in the death rate between 1961 and 1966 was 7,400. Deaths attributed to avitaminosis and other nutritional deficiency states were 9,200 fewer in 1966 than expected on the basis of the 1961 rates.

Socio-economic and Health Indices

The deaths in the age group from 6 months through 4 years are to a large extent associated with the environment and result from causes which are preventable. Four indices have been selected to describe the socio-economic conditions in 12 countries of the Americas - (1) the per capita availability of animal protein to identify nutritional level, (2) the ratio of children attending primary and secondary schools to the total population 5-14 years of age to describe the educational level, (3) the number of hospitals beds per 1,000 population as an indicator of available medical attention and (4) the percentage of population with water service to show the level of sanitation.

Socio-economic and Health Indices in 12 Countries



On the right side of the Figure the death rates in the age group 1-4 years are shown for 12 countries in 1966, arranged in ascending order of rates from the United States with 0.9 deaths per 1,000 population to Guatemala with 29.5 deaths per 1,000.

On the left side the ratios of each of the four indices to the corresponding value for the United States are plotted for each country. In general, the bars for each index appear in descending order, all four indices showing an inverse relationship to the death rate. As the nutritional, educational, health and sanitation levels decrease, the death rates in the age group 1-4 years increase. The variable showing the poorest correlation with the death rates in the age group 1-4 years is the percentage of population with water service. Construction programs for water supplies have been expanded in many countries, not necessarily correlated with changes in social indices such as education and nutrition. The greatest benefit from improved sanitation may be attained when accompanying concomitant improvement in socio-economic fields.

COMMUNICABLE DISEASES

The goal of the Charter of Punta del Este "to eradicate malaria and smallpox from the Hemisphere and intensify the control of other common infectious diseases such as enteric ailments and tuberculosis" was reinforced by the statement of the Declaration of the Presidents of Americas calling for intensifying programs.

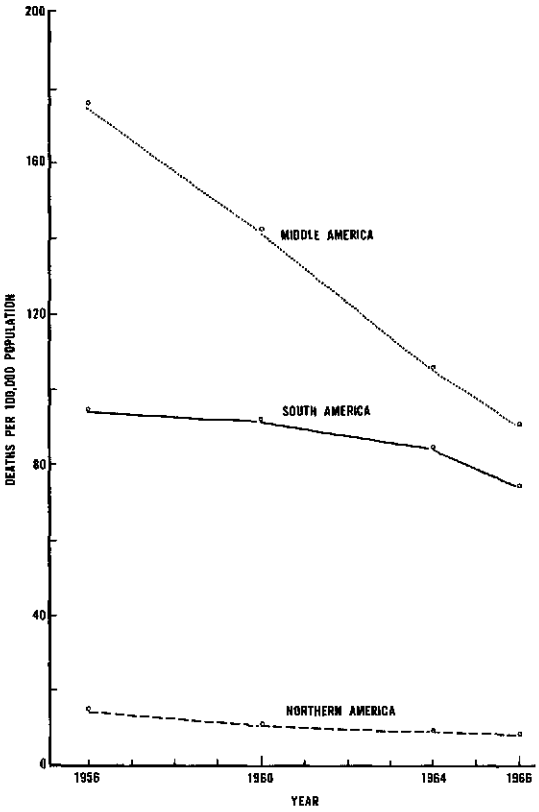
The level of morbidity and mortality from infectious diseases continues to be high in Latin America. These diseases contribute to the high child mortality and the low life expectancy. Despite the continuing high levels, the decline in death rates from these causes has been great. Between 1956 and 1966 the rates declined by 48 per cent in Middle America and 22 per cent in South America. Death rates, however, were 91.2 and 74.7 per 100,000 population in the two regions in 1966, or ten times greater than the rate in Northern America.

From the major epidemic diseases morbidity and mortality have been diminished but until eradication or control is achieved they remain a threat to the Hemisphere, affecting both the health of the people and economic development particularly of newly settled or developing areas. Eradication programs for smallpox, malaria and *Aedes aegypti*, the urban vector of yellow fever, have been intensified but greater investment is needed to complete their eradication. For many other infectious diseases, a more extensive application of existing scientific knowledge and preventive measures already available could effectively lower morbidity and mortality.

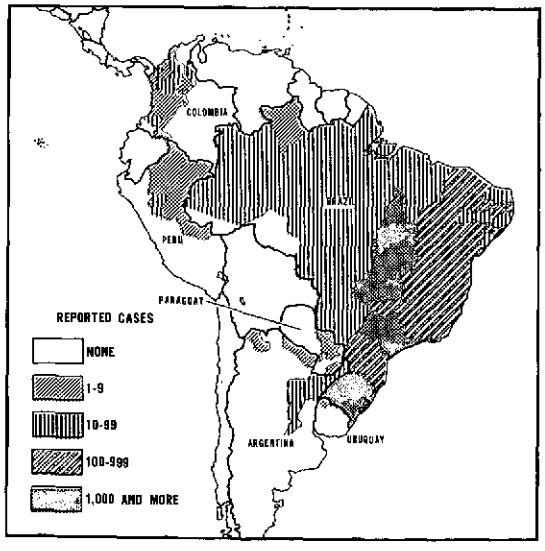
A group of diseases against which vaccines are available continues to produce considerable needless morbidity and mortality in Latin America. These include some of the common diseases of childhood such as whooping cough, measles, diphtheria and poliomyelitis. Others which might be added to this preventable group but which will not be presented here are tetanus and typhoid fever.

Other diseases for which measures are available for control could also be included. Schistosomiasis and Chagas' disease are examples of diseases which predominantly affect rural populations. They require campaigns using special techniques for vector control over wide areas. Both affect large numbers of persons in the Americas. An estimated 6 million people are believed to be infected with schistosomiasis in Brazil alone and over 7 million are estimated to be infected with Chagas' disease in Latin America. Both diseases have chronic debilitating effects and their control will represent significant advance for the health programs and rural development of Latin America. However, factual data on their prevalence and control are not available.

Reductions in Death Rates from Infective and Parasitic Diseases in the Three Regions of the Americas



Reported Cases of Smallpox by Major Political Divisions of Each Country, 1965-1967



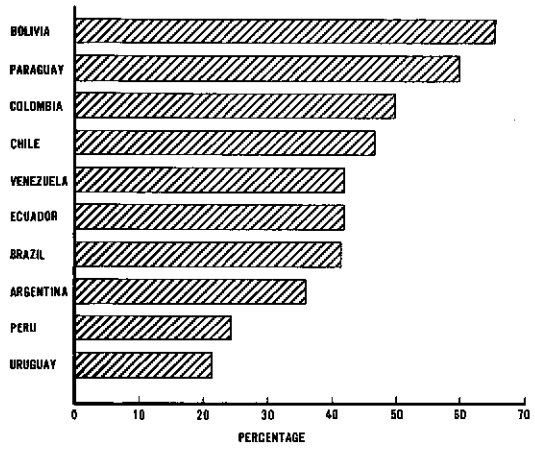
Smallpox

Prevention of smallpox has been possible since the end of the 18th century but smallpox continues to be a threat to all countries because of its existence in a few. In America smallpox cases in the decade of the 1960's have been limited to South America with the exception of one case imported into Canada in 1962. Only Chile, Guyana and Surinam on the South American continent have not reported cases in this decade. Of the 51,800 cases reported from 1960 to 1968 90 per cent occurred in Brazil.

In 1961, 9,065 cases were notified from five countries with 94 per cent in Brazil. By 1967 only 4,275 were reported and all but 23 were from Brazil. During the first eight months of 1968 only one of the reported cases (2,059) was outside Brazil. The map shows the geographical distribution of cases in the three year period 1965-1967.

Recent meetings of the World Health Organization and of the Pan American Health Organization have placed high priority on smallpox eradication. Countries are being provided assistance in the production of vaccine, in training of personnel, in supplies and equipment, and in the organization of eradication programs. First priority in the program has been placed on countries where smallpox exists and second to countries bordering infected countries, which need maintenance and epidemiological surveillance programs. The Nineteenth World Health Assembly (May 1966) allocated $787,776 in 1967 and $836,600 in 1968 to the eradication program in the Americas.

The accompanying bar chart shows for the countries of South America the number of vaccinations in the three-year period 1965-1967 in relation to population. These proportions varied from almost 66 per cent in Bolivia to 22 per cent in Uruguay. In Brazil, the focus of the problem in the Region, 41 per cent of the population had been vaccinated in the three-year period. From 1965 through 1967, 71 million persons in South America were vaccinated. In 1967 alone over 30 million persons in South America were vaccinated and of these 18 million were in Brazil. Eradication of smallpox is possible and can be achieved through systematic campaigns to administer smallpox vaccine. Failure in the past has been due to incomplete coverage of the population and economic and administrative difficulties.



Percentage of the Population Vaccinated Against Smallpox by Country in South America, 1965-1967.

Reported Cases of Smallpox in South America, 1960-1968

Country	Total	Year								
		1960	1961	1962	1963	1964	1965	1966	1967	1968 (a)
Total	51 800	8 532	9 065	9 851	7 348	3 621	3 484	3 565	4 275	2 059
Argentina	145	65	6	2	-	13	15	21	23	-
Bolivia	6	1	-	-	-	5	-	-	-	-
Brazil	46 753	6 018	8 546	9 583	6 433	3 076	3 269	3 518	4 252	2 058
Colombia	448	209	16	41	4	21	149	8	-	-
Ecuador	2 972	2 185	496	204	45	42	-	-	-	-
Paraguay	79	35	-	-	-	7	32	5	-	-
Peru	1 350	-	-	-	865	454	18	13	-	-
Uruguay	35	19	1	10	1	3	1	-	-	-
Venezuela	11	-	-	11	-	-	-	-	-	-
French Guiana	1	-	-	-	-	-	-	-	-	1

(a) To 9 September 1968.

Yellow Fever and *Aedes aegypti* Eradication

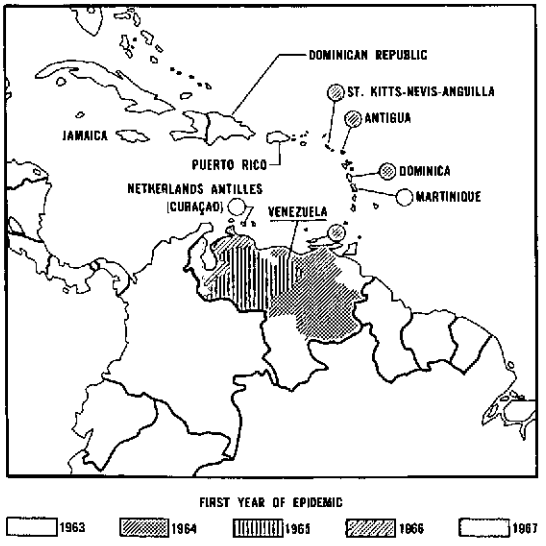
For many years only limited numbers of yellow fever cases, all of jungle origin, have been reported in the Americas. However the virus of yellow fever is endemic in the basins of the Amazon, Magdalena and Orinoco rivers in South America. Epizootic outbreaks occur from time to time and are followed by human infections. The presence of *Aëdes aegypti* infested areas near jungle infection and travel of infected persons to infested areas constitute the potential danger of outbreaks of yellow fever.

The number of cases reported in 1966 (304) was the largest since 1952. Following a pattern repeated several times in the past, during 1964, 1965 and 1966 yellow fever spread southward to the basin of the Paraná and Paraguay rivers. Yellow fever cases occurred in the States of Paraná, Santa Catarina and Rio Grande do Sul in Brazil and in the Provinces of Misiones and Corrientes in Argentina. In the absence of *Aëdes aegypti* in these areas there were no urban outbreaks.

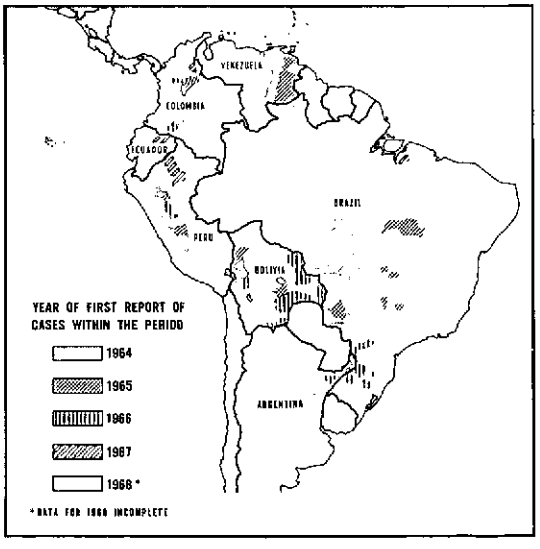
The continent-wide program against *Aëdes aegypti* initiated in 1947 had considerable success and by 1965 the vector was eliminated from all areas except Southern United States, the Caribbean Region, Venezuela, Surinam, Guyana, French Guiana and Cucutá in Colombia. However, campaigns in the Caribbean had begun to have difficulties with reinfestations and with resistance of the vector to the insecticide. Since that time additional areas have been reinfested including El Salvador, areas in Guatemala and Honduras and localized areas in Mexico and Brazil. The infestation in several was immediately eliminated. In others a large effort will be needed to reaccomplish eradication. Countries in which the vector had not been eliminated have been the main source of reinfestation.

Spread of Dengue and Yellow Fever

Dengue, 1963-1967



Yellow Fever, 1964-1968



Eradication of the vector is the only method to prevent urban outbreaks of the disease. Vaccination appears practical only for those exposed to the disease in jungle areas by the nature of their living conditions, work or travel. The enormous investment already made in terms of man-hours and supplies in inspecting and treating houses and buildings needs to be safeguarded by completing the eradication.

Aëdes aegypti also transmits other diseases such as dengue which has in recent years been epidemic in the Americas and the hemorrhagic fever which has been present recently in Asian areas with a high case fatality. The map shows the spread of dengue in the Caribbean Region from 1963 to 1967.

Reported Cases of Jungle Yellow Fever, by Country, 1960-1968

Country	Total	Year								
		1960	1961	1962	1963	1964	1965	1966	1967	1968 (a)
Total	844	34	82	52	141	98	87	304	12	34
Argentina	54	-	-	-	-	-	2	51	1	-
Bolivia	225	14	2	-	81	13	19	69	-	27
Brazil	202	1	2	1	-	13	14	167	2	2
Colombia	83	11	9	30	10	10	2	3	5	3
Ecuador	1	-	-	-	-	-	-	-	1	-
Guyana	2	-	2	-	-	-	-	-	-	-
Peru	247	6	53	20	49	60	45	9	3	2
Venezuela	30	2	14	1	1	2	5	5	-	-

(a) Reports received to 1 September 1968.

Malaria

The progress in the malaria eradication program since its beginning in 1956 and since the signing of the Charter of Punta del Este has been impressive.

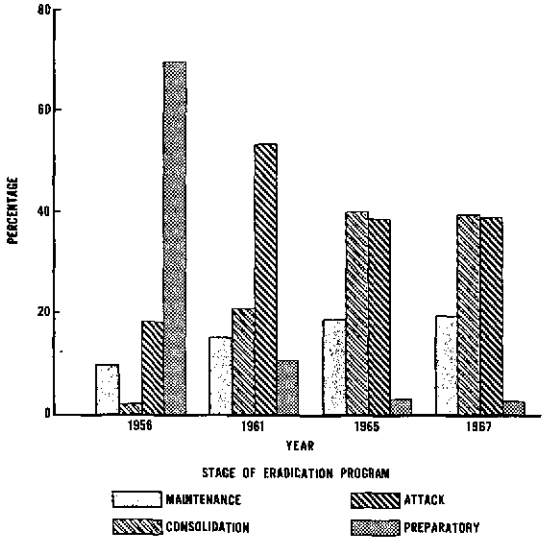
The figure shows for Latin America, excluding Brazil, the proportion of the population living in originally malarious areas by the phase of the program at four different periods, 1956, 1961, 1965 and 1967. In 1956 at the start of the systematic program for eradication, 10 per cent of this population lived in areas already in the maintenance stage and 2 per cent in areas in the consolidation stage. These percentages had increased to 16 and 21 by 1961 and to 19 and 40 by 1967. There was little change in the distribution between 1965 and 1967. By 1967, 59 per cent of the population of originally

malarious areas was no longer threatened with malaria. At the start of the program in 1956, 18 per cent of the population lived in areas in the attack stage and 70 per cent were in areas where plans were being made for a program. By 1967, 39 per cent were in areas in the attack phase and only 2 per cent in preparatory stages.

Thus in Latin America excluding Brazil 46 million persons now live in areas from which malaria has been eliminated and 33 million are still in malarious areas. In Brazil over 11 million have the advantages resulting from eradication but for 25 million this task has not been completed. Brazil has not been included in the comparison figures because of changes in definition of originally malarious areas over the period.

Percentage Distribution of Population of Originally Malarious Areas by Stage of Eradication Program

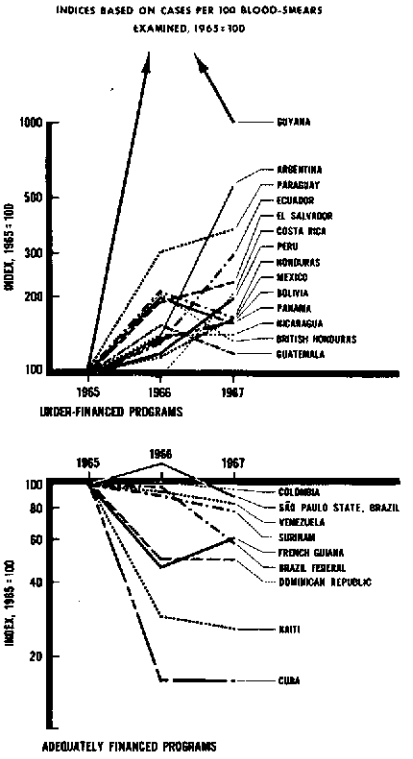
(Latin America excluding Brazil)



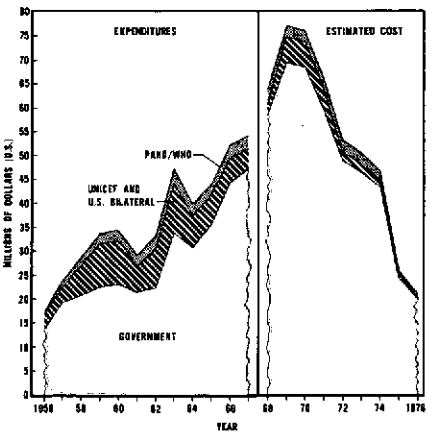
Difficulties in financing malaria programs in recent years together with the development of resistance of the vectors to insecticide have slowed the program in many countries. This detrimental effect is seen in the Figure which is divided into two sections, the lower showing data for countries with adequately financed programs, the upper data for countries with under-financed programs. Using the cases diagnosed per 100 blood smears examined as the index, in the eight countries in the former group the risk of infection decreased in 1967 below the 1965 level. In five of the eight countries the decrease was at least 25 per cent and was over 80 per cent in one. In 14 countries in the group with under-financed programs the cases per 100 blood smears increased between 1965 and 1967. The Figure clearly demonstrates the importance of maintaining adequate programs to bring about the eradication of the disease in the shortest time possible. Delays or postponement of activities serve only to promote the spread of disease and make eradication more difficult and costly.

The governments of the Americas have already made a large investment toward the eradication of malaria. Between 1956, the beginning of the eradication program, and 1967, national expenditures rose from 15 million dollars to 47 million. Contributions of UNICEF and bilateral U.S. assistance varied between 3 and 11 million dollars per year over the period. PAHO/WHO contributions have been 2 to 3 million dollars each year. Estimated costs to

Change in Malaria Incidence in 1966 and 1967 by Adequacy of Financing



Expenditures on Malaria Eradication



achieve eradication have been projected from 1968 through 1976. Under these projections needed government expenditures will rise to 70 million in 1969 and 1970.

The average annual cost for each person protected in the first ten years of the eradication program, from 1956 to 1965, was placed at 29 cents (U.S.). For 1968, due to the large increase in local funds, estimated cost is as follows:

Local costs	(U.S.)	52 cents
Imported commodities		2 cents
Advisory services		3 cents
Total		57 cents

Deaths from malaria provide another index for evaluating the contributions of the malaria eradication program. In the period 1950-1952 there was an average of 43,368 deaths each year from malaria in 13 countries of the Americas for which data were available. By 1960-1962 deaths had decreased to 10,833 per year. By 1964-1966 deaths averaged only 2,088 per year as shown below:

Year	Average annual deaths from malaria in 13 countries
1950-1952	43,368
1960-1962	10,833
1964	2,109
1965	2,141
1966	2,014

This reduction results not only from the elimination of risk of infection for many persons but from the improvements in diagnosis and medical certification of death and the availability of modern therapeutic measures. An eradication program creates added awareness of the disease, its diagnosis and the possibilities for prevention and treatment.

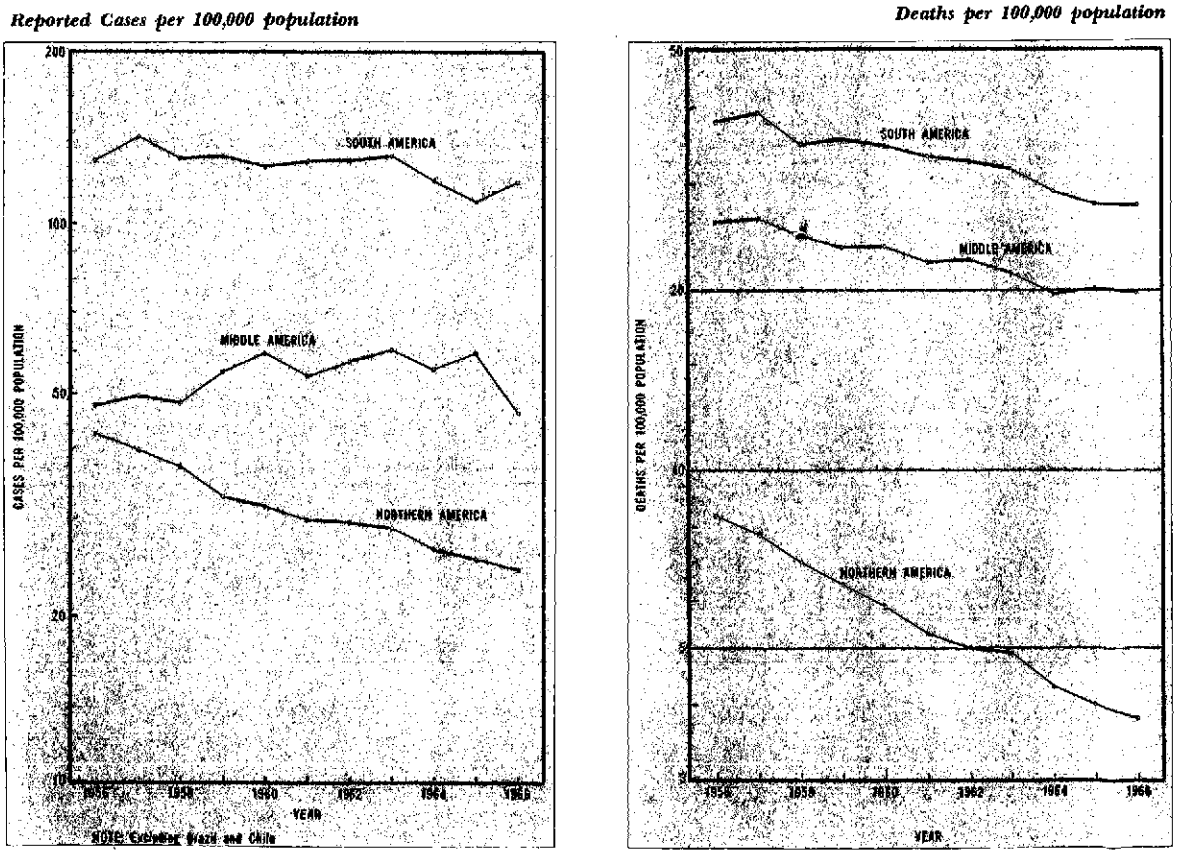
Tuberculosis

Tuberculosis programs have available to them the techniques not only to diagnose and treat cases of the disease, thus eliminating the active sources of infection, but also to raise the level of resistance in the susceptible population through BCG vaccination and through chemotherapeutic prophylaxis for contacts. The present low per capita cost of treating a case, in countries with basic health services, of $5 to $10, and the cost of 10 to 20 cents(U.S.) for a BCG vaccination makes it possible for every country to carry out an effective tuberculosis program.

Tuberculosis mortality has declined in all regions of the Americas since the introduction of antibiotics and chemotherapy in the period 1948-1954. Registered mortality rates are approximately one-third of those in 1946. By 1966 there were only 3.8 deaths per 100,000 population in Northern America, 19.8 in Middle America and 27.9 in South America. In the period 1961-1966 mortality rates decreased by 12 per cent in Middle America and by almost 20 per cent in South America.

Numbers of reported cases have declined in Northern America but have increased in Middle and South America, undoubtedly reflecting the improvement of case-finding and case reporting. In 1966 the reported cases per 100,000 population were 46.6 in Middle America and 118.2 in South America.

Tuberculosis in the Three Regions of the Americas



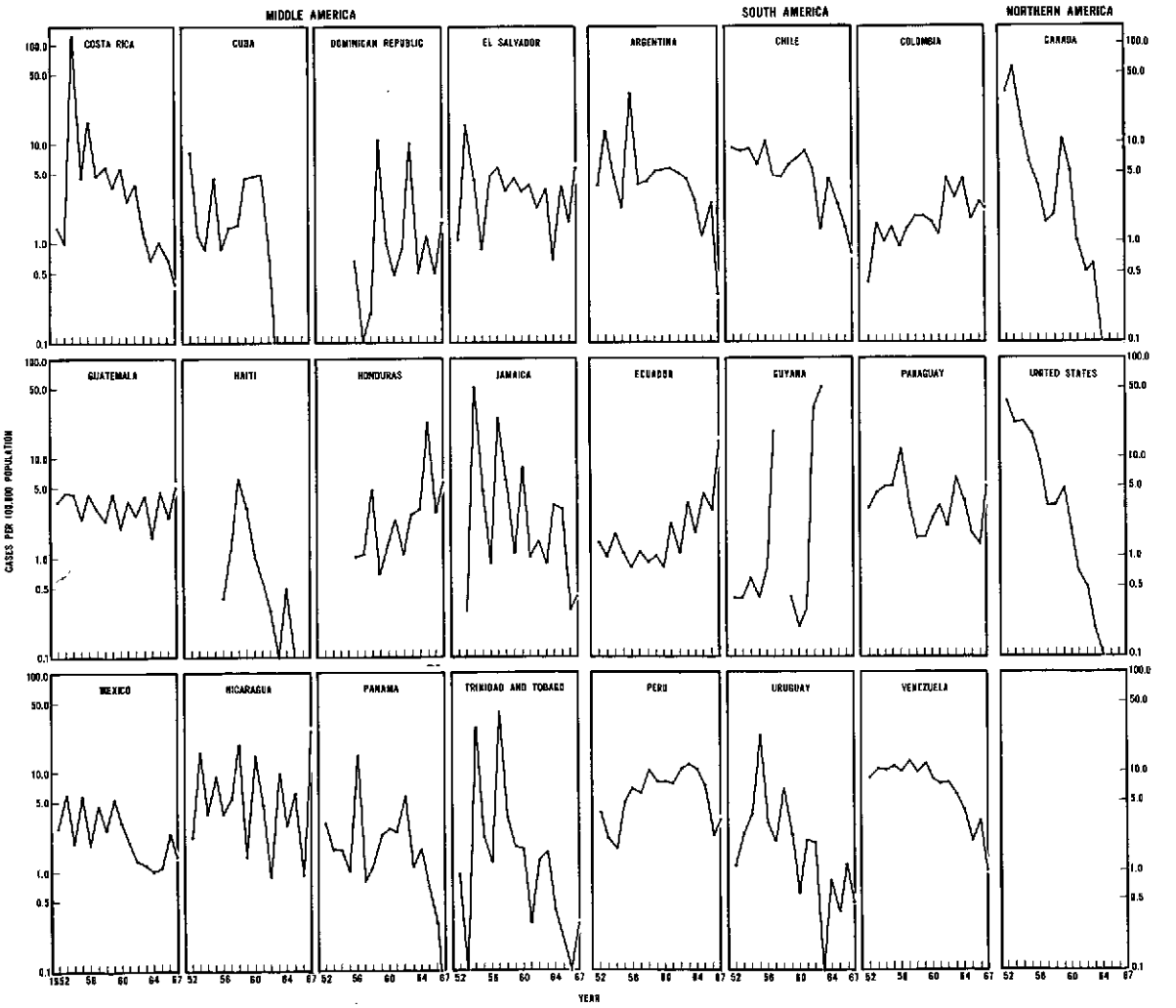
These morbidity and mortality rates, while indicating progress, also point out how much remains to be done. Over 115,000 new cases were reported in Latin America in 1966, a figure far lower than the true one.

Emphasis is being placed on reorienting tuberculosis services, that is, on investing less in hospital beds and treatment but expanding out-patient facilities to provide immunization, diagnosis and treatment.

Poliomyelitis

The trends of reported cases of poliomyelitis in countries with active immunization programs have clearly demonstrated the potential of vaccination in eliminating the disease. In Northern America (United States and Canada) there were over 60,000 cases reported in 1952. By 1966 only 102 were re-

Reported Cases of Poliomyelitis per 100,000 Population by Country



ported. The extensive use of inactivated polio vaccine beginning in 1955 and the added use of oral vaccine in later years have produced this reduction. A few other countries in the Region have had similar success. In Cuba where there was an intensive mass campaign with oral vaccine only two cases have been reported since 1962. Decreases have also been observed in Argentina, Chile, Costa Rica, Mexico, Uruguay and Venezuela where large numbers of the population have been vaccinated, but the decline has been less spectacular. However, epidemics have continued to occur in communities not protected or inadequately protected and many countries have shown no reduction and even increases.

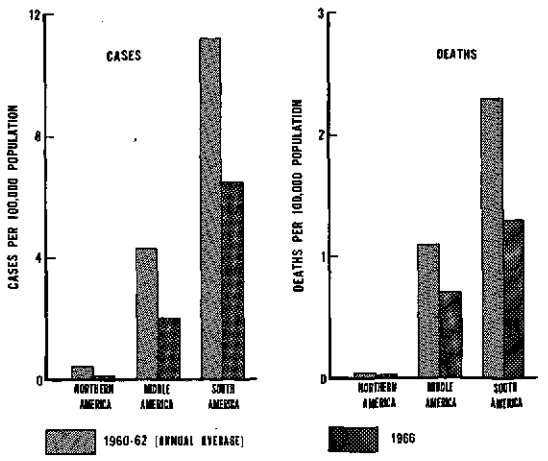
Polio vaccination should be systematically introduced and continued in all countries. Insufficient coverage, continuous migration of children from areas with high prevalence of polioviruses and failure to vaccinate children born after completion of campaigns have contributed to the continued occurrence of cases.

Recommendations have been formulated for production of vaccine of good quality, for diagnostic laboratories, for continuing vaccination programs and for epidemiological surveillance and epidemic preparedness.

Diphtheria

During the past five years reported cases of diphtheria have declined by 64 per cent in Northern America, 45 per cent in Middle America and 34 per cent in South America. Similarly deaths have decreased by 60, 36 and 32 per cent respectively in the three Regions. The relatively few cases and deaths in Northern America where in 1966 there was one case per million population and only one death per 10 million contrasts with Latin America where there were approximately 40 times as many cases and 100 times as many deaths, in relation to population.

Diphtheria in the Three Regions of the Americas



Immunizations against diphtheria in Latin America have increased by 17 per cent between 1961 and 1966. However, immunizations based on total numbers performed in relation to the number of children under 5 years of age range from 18 to 60 per cent in 13 of 15 countries with data available. In Argentina and Chile large numbers of children have been immunized in the past 5 years.

Whooping Cough

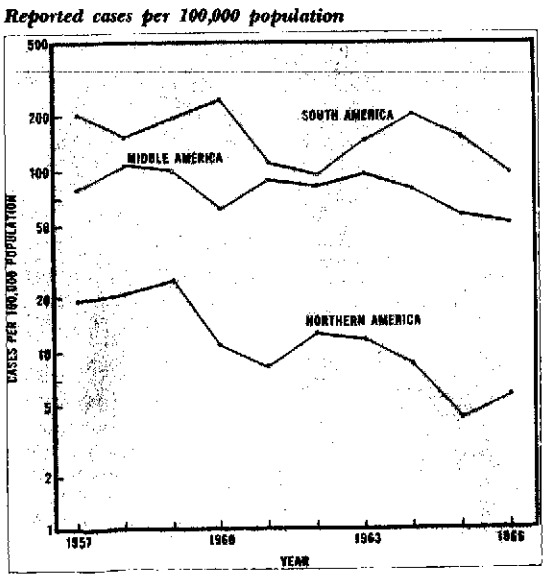
Most countries of the Americas have immunization programs against whooping cough but large numbers of children are not being protected. Measurement of trends in morbidity and mortality is difficult because of the epidemic nature of the disease. If the cases reported in the three-year period 1960-1962 are compared with those in the period 1964-1966 there was no decrease in Latin America as a whole. The reported cases per 100,000 population decreased in Middle America but remained at the same level in South America. Only two countries in Latin America show a steady decrease in morbidity which stands out despite the epidemic fluctuation of the disease.

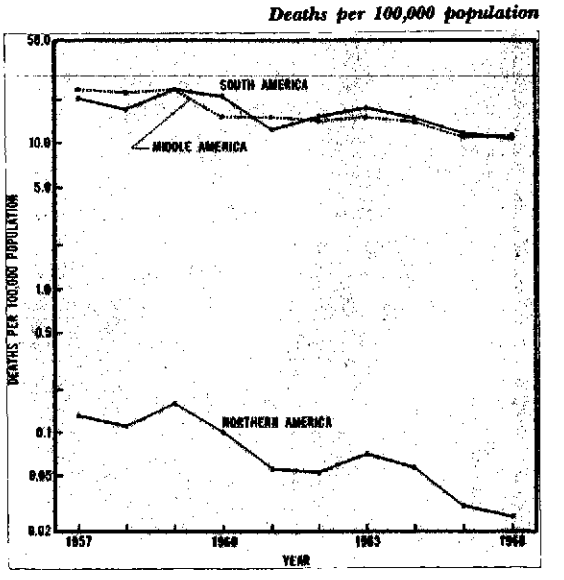
Reported Cases and Deaths from Whooping Cough with Rates per 100,000 Population

	Northern America		Middle America		South America	
	1960-62	1964-66	1960-62	1964-66	1960-62	1964-66
Cases (average annual)	21 191	13 166	53 555	48 909	89 306	103 511
Deaths (average annual)	136	79	9 603	8 866	6 940	6 070
Cases per 100,000	10.5	6.2	78.3	63.1	148.4	151.3
Deaths per 100,000	0.1	0.0	14.6	12.1	16.0	12.1

Note: Cases excluding Brazil and Ecuador; deaths excluding Argentina, Bolivia, Brazil and Haiti.

Whooping Cough in the Three Regions of the Americas





Deaths and death rates declined, the latter by 20 per cent between the two periods. The great excess both in reported morbidity and mortality when compared with Northern America stands out sharply.

As was shown for diphtheria, the immunizations against whooping cough in 13 of 15 countries with data available ranged from 18 to 60 per 100 children under 5 years of age. The very high ratios in the remaining two countries may be attributed to inclusion of immunizations of children 5 years and over, to repeated immunizations or additional doses. In spite of variations in completeness of reporting the following illustrates the higher case rates in countries with low immunization ratios:

Country	Whooping cough cases per 100,000 population	Immunizations per 100 children under 5 years
Chile	41.1	168.6
Argentina	78.2	105.1
Venezuela	145.5	59.0
Colombia	97.3	56.1
Peru	263.7	25.2
Paraguay	137.5	17.9

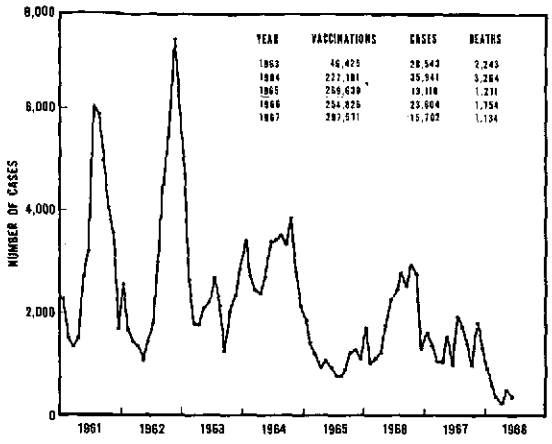
Measles

Vaccination against measles has been available for a shorter time than for the preceding three diseases in this group. The vaccine has been more expensive, and local and general reactions to the vaccine have created more difficulties than those for the other three diseases. Until the present, use in the Region has been very limited. The vaccine has been extensively used in the United States and Chile. The incidence curves from measles by month for these two countries demonstrate what can be achieved in reducing morbidity. The value of the vaccination program is enhanced in countries such as Chile which have experienced a very high mortality from the disease.

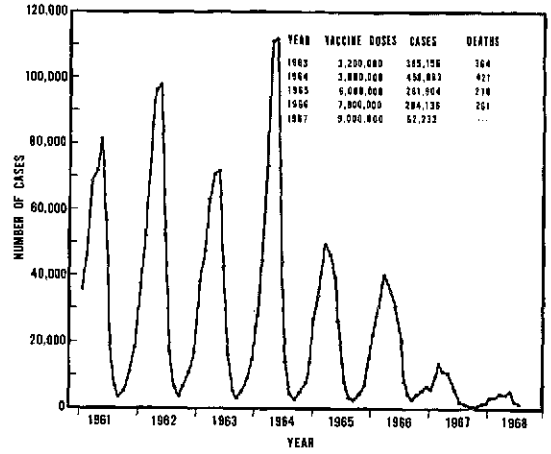
In Northern America reported morbidity rates were reduced by one-half from 1960-1961 to 1965-1966 and corresponding reductions occurred in mortality. However, in Middle America more cases were reported in the second period resulting also in a higher death rate. In South America rates for the two periods were similar.

Measles by Month in Chile and the United States

Chile



United States



The gain to be obtained from an immunization program in Latin America where mortality is high is clear. As production of the vaccine increases, the price per immunization will decrease and additional countries in the Region will be able to plan and carry out vaccination programs.

Reported Cases and Deaths from Measles with Rates per 100,000 Population

	Northern America		Middle America		South America	
	1960-61	1965-66	1960-61	1965-66	1960-61	1965-66
Cases (average annual)	433 130	233 371	64 883	89 346	127 262	143 234
Deaths (average annual)	482	329	9 438	13 598	6 520	7 751
Cases per 100,000	238.5	119.7	96.8	115.2	211.7	206.6
Deaths per 100,000	0.2	0.2	14.9	18.5	14.9	15.1

Note: Cases excluding Brazil, Canada and Ecuador; deaths excluding Argentina, Bolivia, Brazil and Haiti.

NUTRITION

A nutrition program requires coordination between health, agriculture and educational services. National food and nutrition policies must relate needs in population nutrition to food production and export-import patterns. Nutrition activities must be incorporated into national health programs.

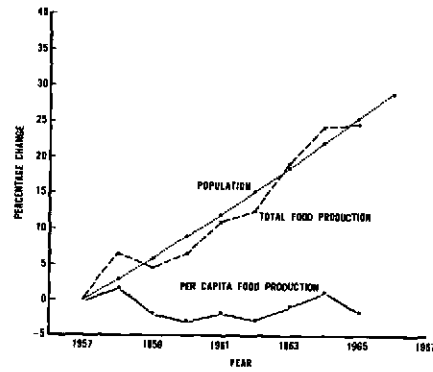
The major goal pertaining to nutrition in the Charter of Punta del Este was in the Resolution on health, "to make substantial improvements in the feeding and nutrition of the most vulnerable sectors of the community by increasing the consumption of animal or vegetable protein." In the Declaration of the Presidents increasing food production was emphasized in the chapter on modernization of rural life and increase of agricultural productivity, principally of food and the section on health calls for "greater and more rapid progress in improving nutrition of all the neediest groups of the population, taking advantage of all possibilities offered by national effort and international cooperation."

Food Consumption

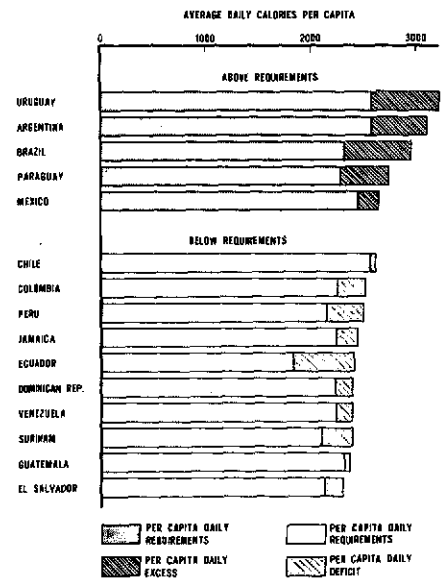
The chart summarizes the increase in food production and population between 1957 and 1966 and the trend in per capita food production over the same period in Latin America.

In Latin America food production and population have increased in the period, but population has risen at the faster rate. In 1965 there was no increase over total food production in 1964 and between 1965 and 1966 there was a

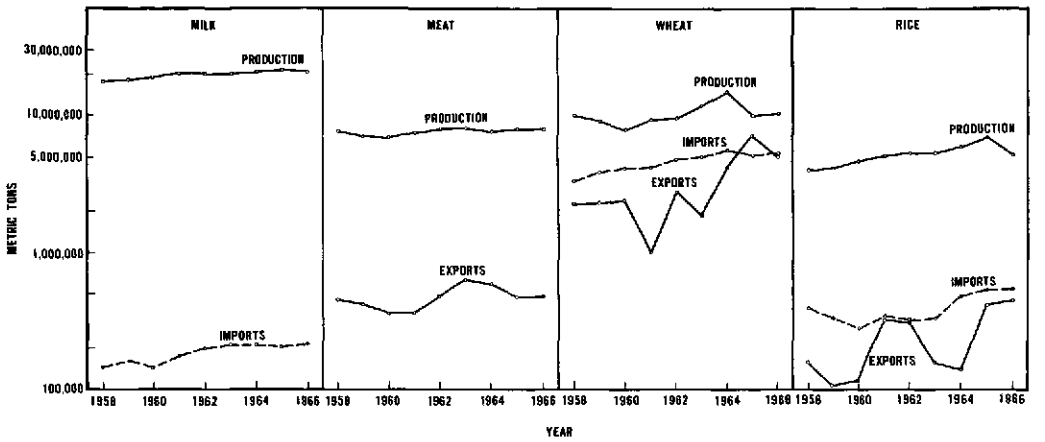
Percentage Change in Total and Per Capita Food Production and in Population in Latin America



Average Daily Calorie Requirements and Supplies by Country



Trends in Production, Import and Export of Four Basic Foods in Latin America



decrease. By 1966 per capita food production had decreased by 6 per cent from the 1957 level. Only in 1964 was food production per capita higher than in 1957. Preliminary data for 1967 indicate a rise of about 5 per cent in total food production over that for 1966.

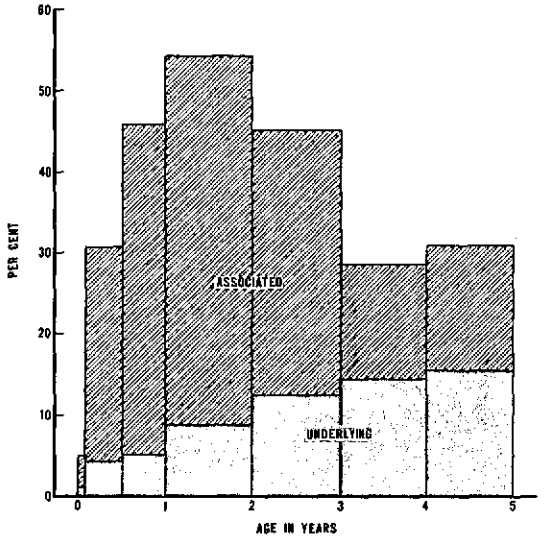
On the basis of the age and sex structure of the population the Food and Agriculture Organization (FAO) has estimated the daily per capita calorie requirements by country. In the chart, 15 countries of Latin America for which data are available are shown in two groups, those with daily averages above their estimated requirements and those with averages below. Only five countries are above their average requirements (Uruguay, Argentina, Brazil, Paraguay and Mexico). For one of the remaining 10 countries per capita food is almost 25 per cent below the requirements. Uneven distribution of food and purchasing power among population groups in a country further complicates the situation. These data illustrate that much more progress is needed to reach the goals of the Declaration for production for Latin America alone, without taking into consideration exports to other areas.

With the lack of growth in food production the need of food imports increases especially as populations increase and as incomes and levels of living improve. The imports are costly in terms of the economy. In the chart, trends of production, import and export during the period are shown for Latin America for four basic food products.

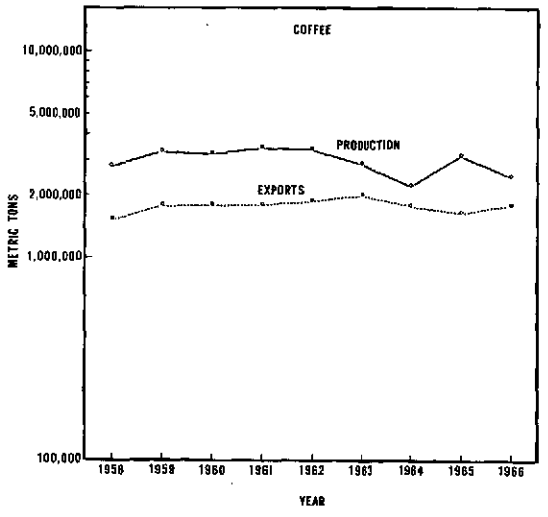
Total milk production increased between 1958 and 1965 with a decline in 1966, based on preliminary data, to the 1964 level. Imports, however, increased at a faster rate during the period. Meat production increased slightly and there was no significant volume of imports. However in the last 5 years of the period exports also were slightly higher. Both the production and import of wheat and rice rose. Exports however were irregular during the period reaching higher levels at the end of the period, which were close to the figures for imports. A similar chart is shown for coffee because of its importance to the economy of so many countries. The fluctuations in production are considerable from year to year but the volume of exports is reasonably stable, varying from 50 to 75 per cent of the annual production.

Mortality

Percentage of Deaths of Children with Nutrition as Underlying or Associated Cause



Production and Export of Coffee in Latin America



Even with sufficient food production, the shortage of essential foods, particularly of animal proteins, results in poor nutritional status. Other factors adding to the problem are the lack of purchasing power and the lack of knowledge of the nutritional value of different foods by large segments of the population.

Lack of protein especially in the early years of life, can produce physical disability, arrest growth, retard mental development and in severe cases can produce death. Occurring along with childhood infections and diarrheal and respiratory diseases the serious effects of malnutrition are added to produce serious illness and death.

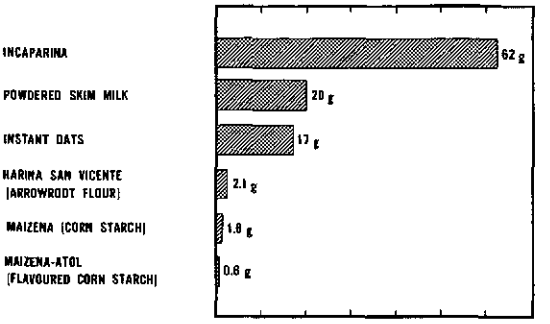
The official death statistics of a country usually fail to reveal the role of protein-calorie deficiency as a contributor to mortality. The pilot study of the Inter-American Investigation of Mortality in Childhood has indicated that nutritional deficiency as an underlying cause or an associated cause of death is responsible for a high proportion of deaths of young children in certain areas in Latin America. The analysis of 615 deaths from Recife and Ribeirão Prêto in Brazil, Candelaria and Florida in Colombia and Jamaica revealed that in nearly half of the deaths of children from 6 months through 2 years nutritional deficiency was an important factor in the death. For this age period it was the underlying cause in only 8 per cent but it was an associated cause in 41 per cent. Thus the collection of data in the Investigation of Mortality in Childhood to be conducted in 1968-1970 in which multiple causes will be studied will clarify the role of nutritional deficiency in terms of mortality.

Protein Products

The goal on nutrition in the Charter of Punta del Este urged the development of low cost preparations of good quality protein. Efforts have been made to increase the protein supply particularly for young children by developing protein-rich food in the laboratory. The Institute of Nutrition of Central America and Panama has developed a mixture, called Incaparina, made of corn flour (58 per cent), cotton seed flour (39 per cent), torula yeast, vitamins and minerals. Its content is 27.5 per cent protein. A far greater amount of protein is obtained by buying ten cents (U.S.) of Incaparina than by purchasing many other products with the equivalent sum of money. Incaparina is industrially produced in Guatemala and Colombia. Production has increased from 1.8 million pounds in 1964 to 3.4 million in 1965 and 5.2 million in 1967. Several other products have been developed in the Region using fish flour and soya.

Nutrition activities are being undertaken in local health services in every country. The majority include assessment of nutritional status, food supplementation and nutritional rehabilitation and education in dietary habits.

Quantity of Protein in Various Products Purchasable for Ten Cents (U.S.A.)



*Based on prices in Guatemala, January 1968.

ENVIRONMENTAL SANITATION

One of the most specific and direct goals of the Charter of Punta del Este is in the field of environmental sanitation, "to supply potable water and sewage disposal for at least 70 per cent of the urban population and 50 per cent of the rural population during the present decade, as a minimum." The importance of this goal for the health of the population and for the economic development of Latin America has been fully recognized. Continuous and growing efforts, as represented both by manpower and funds, have been directed to this activity since the signing of the Charter in 1961. The Declaration of the Presidents in 1967 further urged "acceleration of programs for providing drinking water supplies, sewerage and other services essential to environmental sanitation in rural and urban areas, giving preference to lower-income groups. On the basis of studies carried out and with the cooperation of international financing agencies, national revolving fund systems shall be used to assure the continuity of such programs."

Recognition of the problems produced by lack of potable water in health, in living conditions, in business and in industrial development has been given by Ministries of Health, by Ministries of Public Works, by Ministries of Economics, and by international health and lending agencies. An earlier section presented the deaths of children under 5 years of age due to gastroenteritis. Almost all these deaths are preventable and to a large extent can be controlled by a sufficient supply of water and cleanliness. Cases of other diseases transmitted by water are also preventable.

Coverage and Goals

Water supplies

The success in achieving the urban goal of 70 per cent in the decade has been remarkable. Sixty-one per cent of the urban population in 1960, based on summary data available at that time, had water service. By 1967, the percentage with easy access to water was 69 for urban Latin America. Those without house connections should of course receive connections and additional service will be needed to reach the goal of 70 per cent for the larger population estimated for 1971. Furthermore the remaining 30 per cent of the population should be provided water in their homes with the greatest speed possible.

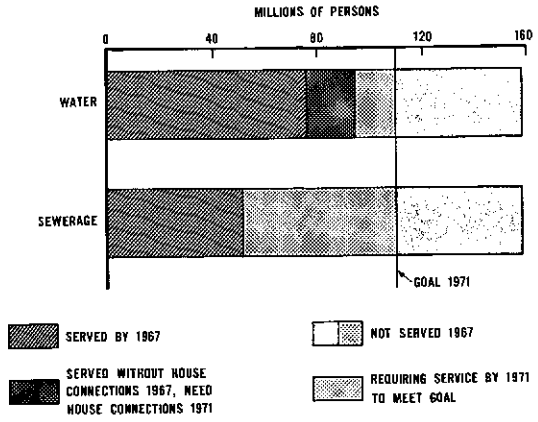
The chart shows the situation for the estimated urban population of 158 million in 1971. To fulfill the goal in 1971 for this population, 110 million should have water service in their homes. By 1967, 76 million already had water service through house connections; close to another 18 million had easy access to piped water. Thus by 1971 these 18 million should be provided with water in their homes and an additional estimated 16 million without water should receive service in order to meet the goal of 70 per cent. Plans of countries for construction for the four years 1968-1971 indicate that close to 35 million will have new service, thus achieving the objective of providing water in urban areas.

By 1967 in 18 of 24 countries, over 70 per cent of the urban population had easy access to piped water either in their houses or at nearby outside sources. In ten countries over 70 per cent of the urban population had piped water in their homes.

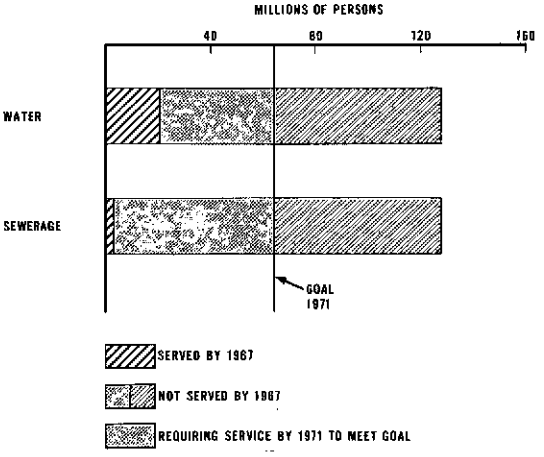
Providing water to a rural population has been a much more difficult task and has been falling short of the goal to have 50 per cent of the population with water service. With an estimated 128 million people in rural areas in 1971, the goal becomes 64 million. Of these, 19 million already have water, leaving 45 million still to be served. However plans for construction are not extensive enough, for by 1971 the countries have estimated that they will achieve coverage of another 10 million, far short of the needed 45 million. Only in five countries did 50 per cent or more of the population in rural areas have water in their houses or nearby.

The problems in rural areas are of course greater in terms of financing. The establishment of national revolving funds will help in the solution as will

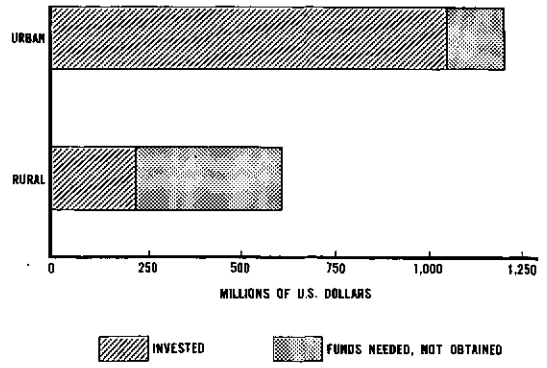
Urban Population in Latin America Served by Water and Sewerage Systems and Goals for 1971



Rural Population in Latin America Served by Water and Sewerage Systems and Goals for 1971



Estimated Funds Required and Invested for Construction of Urban and Rural Water Supplies in Latin America



cooperative endeavors using local resources of labor and money. Greater attention is to be directed to the rural areas in the four years 1968-1971, as recommended in the Declaration of the Presidents.

Sewerage

Progress in providing services of sewerage systems for Latin America have been much less than for those of water. Only 36 per cent of the 1967 population had these services. The data for sewerage are shown together with that for water on the charts. Of the 110 million persons in urban Latin America established as the goal for 1971, only 48 million have services of sewerage systems, leaving 62 million in need of services. Country construction plans provide for an additional 19 million to be served between 1968 and 1971. On this basis less than two-thirds of the goal would be achieved by 1971.

By 1967 only one country was close to the goal of 70 per cent for the urban population. The highest proportion of the population served was 68 per cent in Colombia and the lowest was zero in Barbados and Haiti. In four of 24 countries services were provided for over 50 per cent of the urban population and in ten for 30 to 49 per cent.

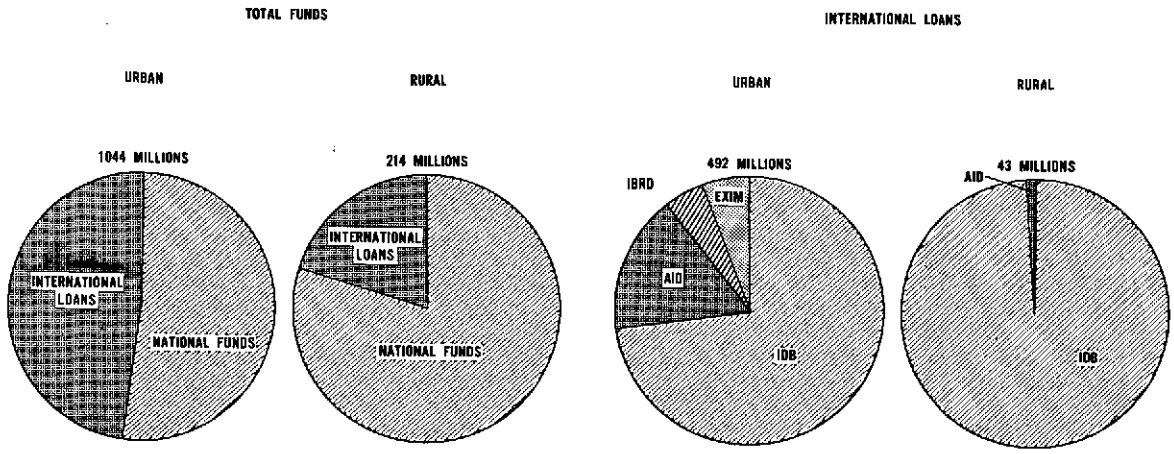
As might be expected, in the rural areas only a small part (2.5 million) of the goal of 64 million persons already have services. Plans by countries for construction are not extensive with only an estimated 1.3 million to be added in the next four years to those already served.

Investments in Water Supplies

Another comparison of the success may be presented in terms of funds required and funds invested in water programs in rural and urban areas. In 1962 estimates were made of the cost of the water program in the decade if the goals were to be reached by 1971. For the period 1961-1967 a sum of 1,200 million dollars was projected as the requirement for urban water supplies. From 1961-1967, 1,044 million have been invested. With these funds, the goal is being approached.

For rural construction an early estimate of the amount needed was 600 million for the period 1961-1967. In this period only 214 million have been invested, explaining in part the failure to attain sufficient progress.

Source of Funds Invested in Construction of Urban and Rural Water Supplies



The sources of funds for urban and rural construction during the period are also shown. Of the 1,044 million invested in urban construction, 57 per cent were national funds. Of the remaining 43 per cent obtained from international loans, 73 per cent were provided by the Inter-American Development Bank, 16 per cent by the Agency for International Development of the United States and the remaining 11 per cent by the International Bank for Reconstruction and Development and by the Export-Import Bank.

Eighty per cent of the money for rural construction has been provided by national sources. By far the largest part (98 per cent) of the remaining 20 per cent from international loans was obtained from the Inter-American Development Bank.

HEALTH SERVICES

The national, regional and local health services in a country form the structure through which specific objectives and recommendations in health can be achieved. Both the Charter and the Declaration have recommended the "preparation and implementation of national plans which will strengthen the infrastructure in the field of health."

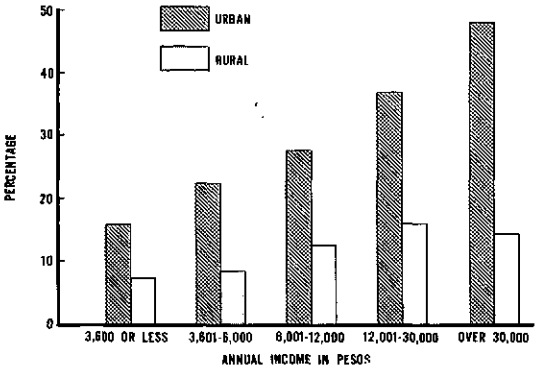
All but three of the Ministries of Health of the Region are preparing or implementing national health plans, and planning units have been established. In seven countries action is being taken based on the completed plans; and in ten, health plans are in an advanced stage. The plans are based on coordination of health resources of the area, both public and private, to achieve the maximum benefit. Priorities are established to utilize the limited funds for health in the best manner available. Most of the Ministries of Health have staff trained in the planning process. In six annual courses conducted by the Pan American Health Organization in collaboration with the Latin American Institute for Economic and Social Planning in Santiago, Chile, 195 persons from 20 countries have received training. In many countries training has also been provided in short courses for personnel at the local and provincial levels.

A Pan American Center for Health Planning is being established in Chile in close association with the Latin American Institute for Economic and Social Planning. The Center has the support of 14 countries of the Americas and has received funds from the United Nations Development Program. In addition to teaching functions the Center will carry on methodological research on relationships between health and components of developments and welfare.

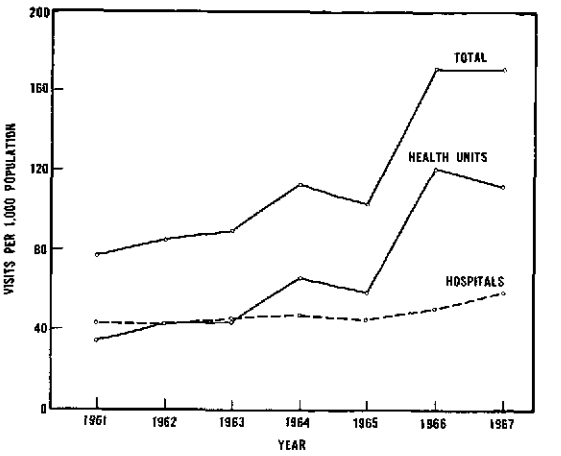
Health services, including hospitals and outpatient units, providing preventive and curative medicine are essential to the improvement of living conditions in both urban and rural areas. Progress has been made in the coverage of the population of Latin America with hospitals and other health units. Much remains to be done, however, since 50 per cent of the population lives in rural areas and for many facilities and health personnel are not easily accessible.

The morbidity survey carried out in Colombia as part of the Study of Human Resources and Medical Education showed that the rural population reported slightly more illness than the urban population. By income groups there was no consistent difference in the prevalence of illness in urban and rural populations. Comparison of medical attention for the urban and rural groups reporting illness was very different. The percentage consulting doctors in

Percentage of Ill Persons Seeking Medical Attention in Urban and Rural Areas in Colombia by Income



Trend in Visits to Outpatient Health Services in Guatemala



rural areas was only one-third that in urban areas. In both urban and rural areas those with the lower incomes received less medical attention, but for every income level medical attention received by the rural population was below that for the urban. The greater deficiency in rural areas is also related in part to the large proportions of the population in the very low income groups.

Health Centers

Data on the coverage of a population by health services are not available for all countries. Differing definitions make comparisons between countries or the summary of regional data difficult. In individual countries there is evidence of increase in services provided and utilized. The chart for Guatemala shows the rise from 1961 to 1967 in visits to outpatient units, both hospitals and health centers and other health units. This has been accomplished through the construction and operation of additional health units as well as from increased utilization.

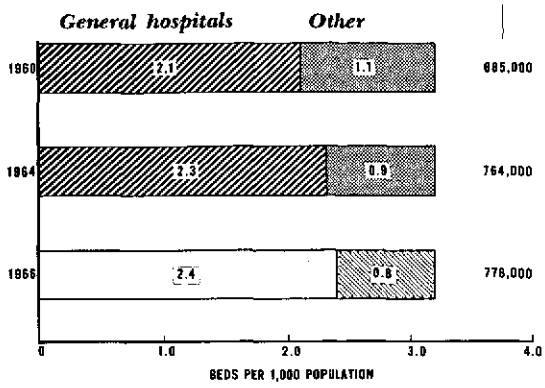
The following tables show for three Central American countries the increase in total health units:

	1962	1967
Costa Rica	86	112
El Salvador	62	143
Honduras	70	112

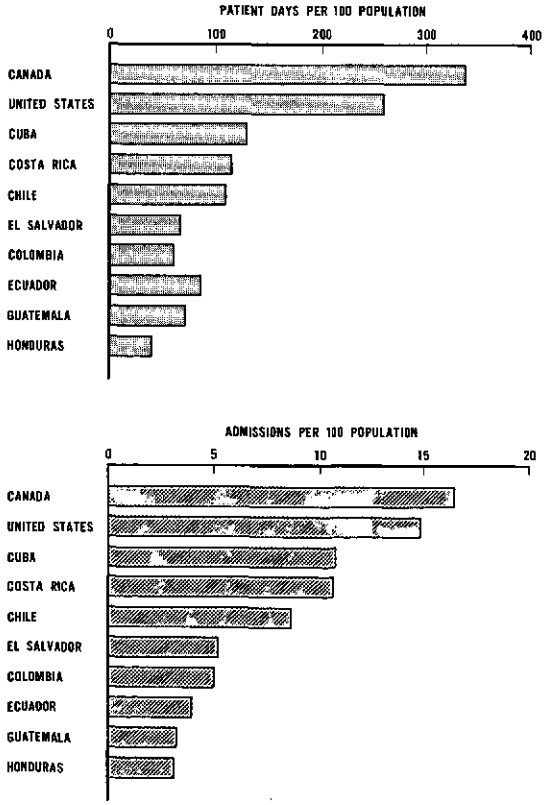
In ten countries with a population of 30 million there were 2,023 units to provide outpatient care or one unit for each 15,000 persons. During 1967, 117 new units were completed, an increase of 8 per cent. Plans are underway in many countries for large increases in health units, particularly in rural areas, where they are urgently needed.

Hospitals

Hospital Beds in Latin America



Admissions and Patient Days per 100 Population in 10 Countries



Distribution

Hospital beds have increased gradually in number in Latin America from 685,000 in 1960 to 764,000 in 1964 and 776,000 in 1966. Ratios of beds to population have remained at the same level throughout the six years, 3.2 per 1,000 population. Thus the increase in hospital beds has been barely sufficient to maintain the same level of attention for a larger population. An increase in the ratio in the years immediately ahead is advisable. Just to provide the present level of beds to population, 930,000 beds will be needed in 1971, over 154,000 more than in 1966. To increase the ratio to 4.5 per 1,000 population, 534,000 additional beds would be needed.

Beds in general hospitals - those providing care mainly for short term illnesses of various types and in other short term hospitals such as for the acute infectious diseases, maternity and pediatrics - have increased from 452,000 in 1960 to 590,000 in 1966 while beds in specialized hospitals (mainly for tuberculosis and mental diseases) decreased.

By country, ratios of beds to population ranged from 6.4 per 1,000 in Argentina and Uruguay to 0.7 in Haiti. In 13 of the 24 Latin American countries there are fewer than three beds per 1,000 population. Some of the areas in the Americas other than countries, have larger numbers of hospital beds in relation to population (Appendix Table A).

Distribution of hospital beds together with medical and nursing personnel needed to provide care is uneven within the countries. The table below shows the ratio of beds to population in nineteen countries of Latin America in capitals and large cities of 500,000 or more population or in departments or provinces in which these cities are located. Ratios ranged in the large cities from 14.7 per 1,000 population in Barbados to 2.4 in Bolivia. In the remaining areas of the 19 countries the ratios ranged from 0.8 in Honduras to 5.4 in Uruguay. The disparity between ratios for the highly urbanized and the rural areas indicates a greater problem for countries with a large percentage of population in rural areas.

Hospital Beds with Rates per 1,000 Population in Capitals and Large Cities and the Remainder of Nineteen Countries

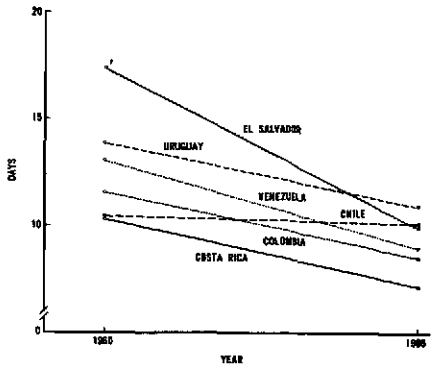
Country		Year	Total	Urban		Rural	
				Beds	Rate	Beds	Rate
Argentina	a)	1963	129435	57639	8.2	71796	5.0
Barbados	b)	1966	1615	1455	14.7	160	1.1
Bolivia	b)	1966	9461	2746	2.4	6715	2.6
Brazil	c)	1962	236930	69826	7.1	167104	2.6
Chile	b)	1966	31581	13119	4.5	18462	3.2
Colombia	a)	1966	46001	21124	2.9	24877	2.2
Costa Rica	b)	1966	5419	3314	6.1	2105	2.2
Dominican Republic	c)	1966	10620	5151	7.6	5469	1.8
Ecuador	a)	1966	13021	7804	4.2	5217	1.5
El Salvador	b)	1966	6496	3220	5.6	3276	1.3
Guatemala	b)	1966	11619	6312	7.3	5307	1.4
Guyana	b)	1966	3454	2138	12.3	1316	2.7
Honduras	b)	1966	3725	2024	5.7	1701	0.8
Jamaica	d)	1966	7571	5142	10.7	2429	1.8
Nicaragua	b)	1965	3822	1667	4.8	2155	1.6
Paraguay	b)	1965	4297	2528	4.4	1769	1.2
Trinidad and Tobago	b)	1965	4227	3173	7.4	1054	1.9
Uruguay	b)	1963	16935	9244	7.6	7691	5.4
Venezuela	d)	1966	28678	9236	6.2	19442	2.6

(a) Federal district and Departments or Provinces with cities of over 500,000 population. (b) Department or Province with capital city. (c) Federal District and cities of over 500,000 population. (d) Metropolitan area of capital city.

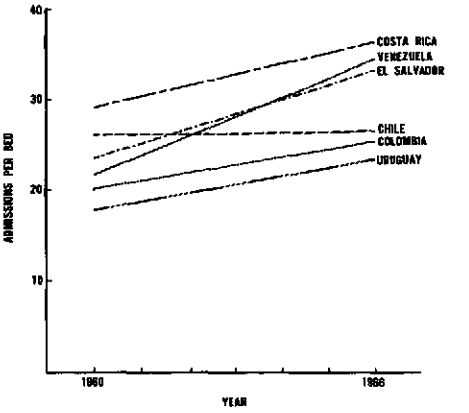
Utilization

The use of the hospital by the population of a country reflects many factors, among them the accessibility of hospitals, the cost and the quality of care available and the educational and cultural characteristics of the population. It is not possible to estimate this use if data are not available for all institutions or a high proportion of institutions providing care. In Canada and the United States in 1966, for every 100 people hospital admissions number 16 and 15 respectively per year. Moreover in Canada there are 337 hospital

Decrease in Average Length of Stay in Hospitals in Six Countries



Increase in Annual Admissions per Bed in Hospitals in Six Countries



days for every 100 persons each year and in the United States 261. Comparable data for selected countries of Latin America are shown in the chart. Hospital admissions per 100 persons for this group of 8 countries range from 3 to 11 per 100 populations. Patient days per 100 persons in the same group of countries range from 40 to 129. In three of five countries with data available the use of the hospital by the population increased between 1962 and 1966.

The goal in the Charter of Punta del Este calling for a better return for medical care services can be approached both through improvement of care and a better utilization of facilities. The existing hospital beds, though insufficient in number, can provide care for a larger number of patients by judicious decreases in average length of stay and through improvements in occupancy rates of existing hospitals.

The two graphs show what has been accomplished between 1960 and 1966 in general hospitals in six countries of Latin America. In all the average length of stay decreased, in one only slightly; the average in 1960 ranged from 10.3 days in Costa Rica to 17.4 in El Salvador. By 1966 the corresponding range of the index was from 7.1 in Costa Rica to 11.0 in Uruguay. A shorter average length of stay presumably makes it possible to care for more patients with the same number of beds. The second graph illustrates that in all six countries the turnover rate, that is, the number of hospital admissions per bed, increased between 1960 and 1966. In 1960 the range was from 18 admissions per bed in Uruguay to 29 in Costa Rica. By 1966 the figure for Uruguay had risen to 23 and in Costa Rica to 36. Values in other countries were intermediate to these.

Improvement of occupancy rates also may result in higher turnover rates. In 1960 occupancy of beds in hospitals in five countries ranged from 64 to 83 per cent, and for one was over 100. Both extremes are unsatisfactory. The occupancy rate which was over 100 was lowered to 91 by 1966. Decreases were also observed in three other countries. It would appear that the higher turnover rates resulted from decreasing the average lengths of of stay and not from increasing the occupancy of the hospitals.

HEALTH PERSONNEL

Priority is given in the health sector of the Declaration of the Presidents to basic and advanced training of professional, technical, administrative, and auxiliary health personnel and to the support of operational and administrative research in the field of health.

In several countries operational research on the distribution and activities of physicians, nurses or dentists has been conducted or is underway at present. Ministries of Health are supporting such research on at least one type of health personnel in Argentina, Chile, Colombia, Guatemala, Jamaica, Peru and Venezuela. The goals of these research programs are to analyze the existing situation in order that the most advantageous health services may be provided to the population and that educational facilities and the curricula may be directed to preparing personnel to meet the health problems of the countries.

In every phase of the health program trained personnel are needed including professionals, technicians, administrators and auxiliary workers. Background information on the numbers and distribution of these health personnel is essential for health planning. Data on physicians, nursing personnel and dentists reveal marked differences in their availability in the countries of the Americas. Such health personnel appear to be especially limited in rural areas in nearly all the countries for which data are available.

As technology advances, new techniques and skills are required both in preventive and curative medicine. Moreover, in each of the basic areas as well as in many new fields specialists are needed. The lack of qualified personnel has been a barrier in health as in other technical and scientific fields.

With growth in programs it is essential to know how many people are qualified in an area, how many more are needed, how best can the educational process be improved to prepare the necessary personnel and how can existing personnel be utilized to the fullest. The first steps are to determine the current numbers actively engaged in the profession, the numbers being trained and the numbers needed. Planned surveys, some general and others specific for a given type of personnel, have been designed to answer these questions.

Measurement of progress in the preparation and utilization of health personnel requires the establishment of registries which are maintained on a current basis with names of new graduates in a profession added and those of deaths or withdrawals due to migration or retirement deleted. For some of the countries and in certain specialties current information is not available.

The three professions selected for presentation, physicians, nurses and dentists, provide essential members of the health team. Large numbers are required of prepared personnel in these professions. Their limited number demands maximum utilization.

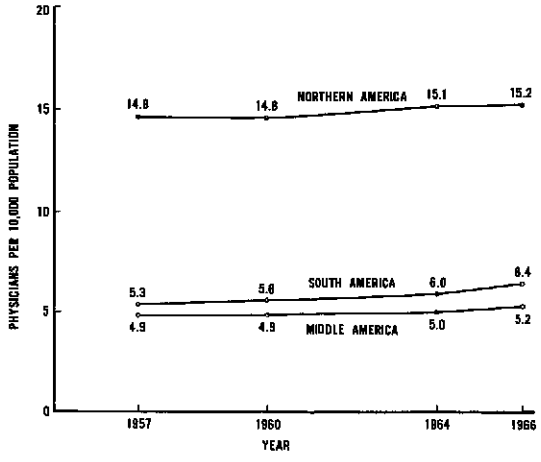
Physicians'

Distribution

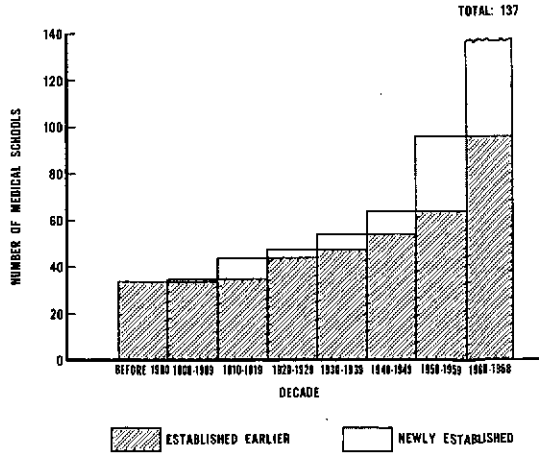
In Latin America in 1966 there were approximately 148,000 physicians or 6.0 for each 10,000 persons. In many areas of the world this would be considered a satisfactory ratio. However, no single ratio expresses the adequacy of the number of physicians. The numbers needed and utilized in a country vary with the structure of the medical care system, the health problems and the demand for services. By country the most recently available data for physicians show a variation from 16.4 per 10,000 in Argentina to as low a figure as 0.7 per 10,000 in Haiti (Appendix Table B). Only one country had fewer than two physicians per 10,000 but only four had more than the average of 6.0 (Argentina, Cuba, Uruguay and Venezuela), indicating the regional average has been raised by high numbers in a few countries.

As the physicians have increased from 100,000 in 1957, the ratios to a growing population have been 5.2, 5.4, 5.7 and 6.0 per 10,000 in 1957,1960, 1964 and 1966. In the six years since 1960 the number of physicians has increased by 30 per cent and the ratio in relation to population by 11 per cent. In Northern America over the same six years the number of physicians has risen from 293,000 to 330,000 and the ratio from 14.8 to 15.2 per 10,000 population, an increase of only 13 per cent in number and 3 per cent in the ratio. For nine countries an increase was noted in the recent years between 1964 and 1966.

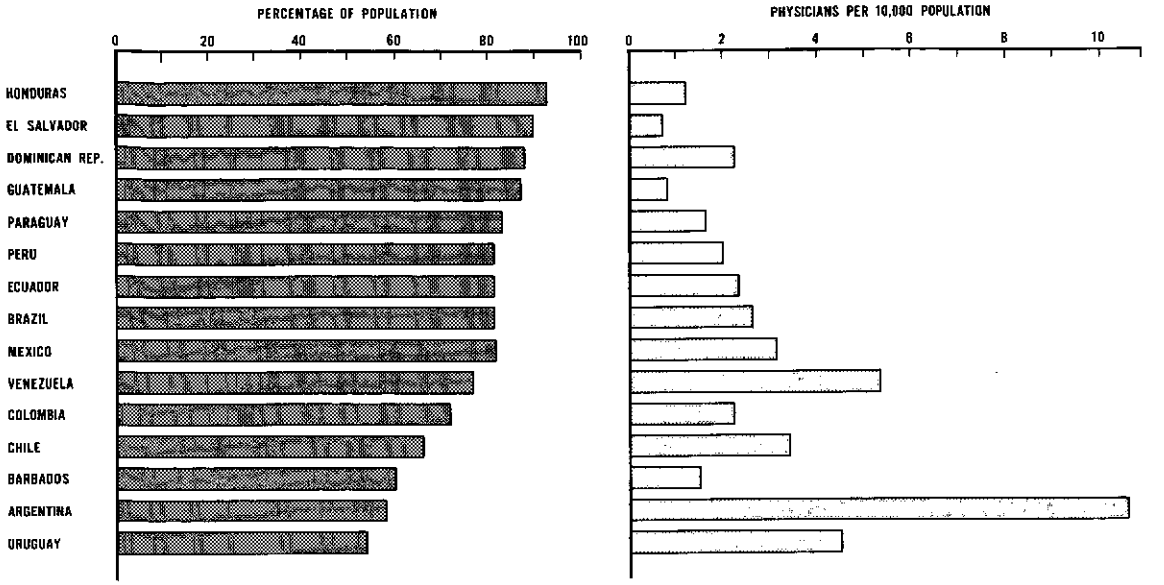
Increase in Ratios of Physicians to Population in Three Regions of the Americas



Medical Schools in Latin America by Decade Founded



Physicians per 10,000 Population Outside of Capitals and Large Cities by Country



The distribution of physicians within most countries is uneven since they tend to concentrate in capitals or large cities. The living conditions, poor communications, lack of hospitals and laboratories and the difficulty of obtaining sufficient income discourage physicians from remaining in rural areas. The accompanying bar chart shows on the left side the percentage of the population of a country living in cities under 100,000 population or in rural areas. The countries are arranged in decreasing order of these percentages. On the right side, for the countries arranged in the same order is shown the number of physicians per 10,000 population outside of capitals or very large cities. The countries with proportionately more of their population in less urbanized areas have relatively a smaller number of physicians to give service to these areas.

Medical education

By the middle of 1968 there were 137 medical schools in Latin America. Ninety-six had been founded before 1960, leaving 41 newly established schools. By 1967, 9,200 physicians were being graduated each year compared with 6,800 in the early 1960's. Many of the new schools have not yet graduated a class of physicians. The potential for increasing the ratio of physicians to population through these new schools and through the expansion of existing schools is great.

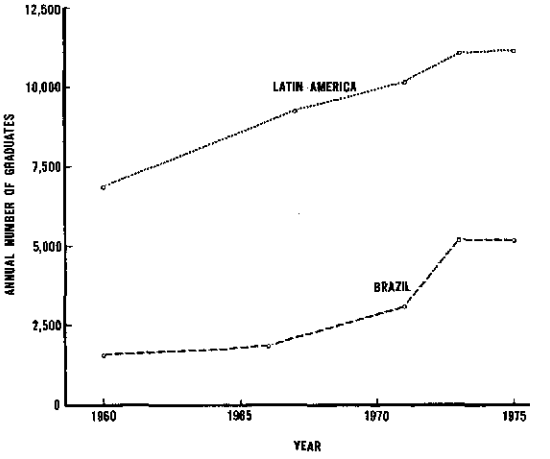
Assuming that the existing schools continue to prepare physicians at the same pace as at present and that on the average a new school will graduate each year the average per school for the country, by 1975 these 137 schools will be graduating 11,200 physicians a year. The 114,000 physicians in 1960 will have increased in number to 215,000 and the ratio will have risen from 5.4 per 10,000 population in 1960 to 6.6 per 10,000 in 1975. Allowances have been made for the withdrawal of physicians from the population as a result of retirement and death.

Of the 41 new schools founded since 1960, 70 per cent are in Brazil. The ratio of physicians to population in Brazil (4.0 per 10,000 population) was lower in 1960 than the average for Latin America. In 1960 around 1,500 physicians were being graduated each year. By 1975 this number may be over 5,200. As graduates increase the ratio of physicians per 10,000 population should increase from 4.0 to 5.3 in 1975.

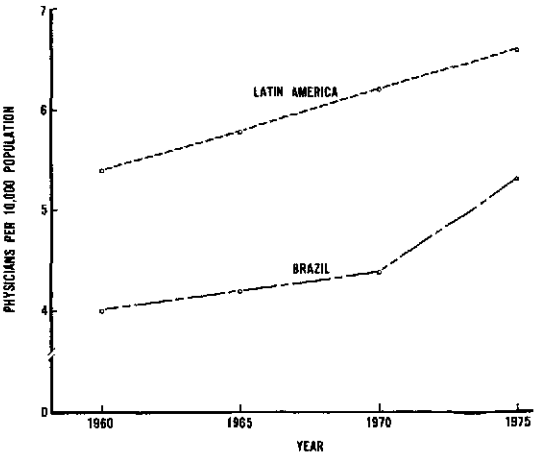
Efforts are being made to strengthen the quality of instruction and to broaden the curriculum in medical schools. Studies have been undertaken of the teaching of preventive medicine. Strengthening of the teaching methods has been encouraged as well as research developments. Special centers for research and research training are in the process of being organized in microbiology, pathology, immunology, and clinical medicine. A book program has been initiated to provide on a permanent or loan basis access for each student to basic texts. A library of medicine in São Paulo, Brazil, with the support of the Government of Brazil, the Commonwealth Fund, the National Library of Medicine of the United States, the Paulista School of Medicine and the Pan American Health Organization will be the center for a library reference service for Latin America.

Estimated Increases in Medical School Graduates and in Physicians in Latin America and Brazil

Medical School graduates



Physicians per 10,000 population



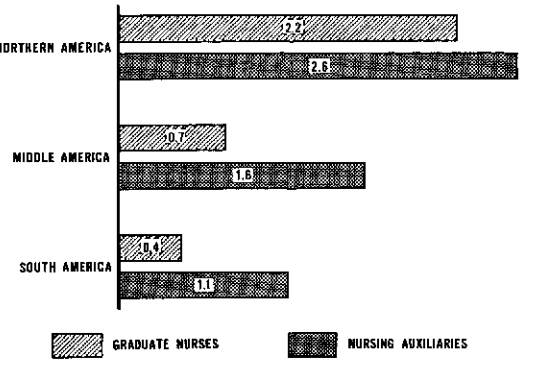
Nursing Personnel

Qualification and education of nurses and nursing auxiliaries are not comparable in all countries but classifications of each country have been used to measure their resources in nursing personnel. Appendix Table B shows the numbers of graduate nurses and nursing auxiliaries in Latin America around 1966. Over 73,000 graduate nurses and 182,000 nursing auxiliaries are reported. The ratio of 3.0 nurses per 10,000 population is less than one tenth that in the United States and Canada and the 7.6 auxiliaries per 10,000 represents less than one-fifth the ratio serving the population of Northern America. Nurses and auxiliary personnel do not compensate for the shortage of physicians in Latin America since graduate nurses are in fact in shorter supply. For every physician in Northern America there are 2.2 nurses and 2.6 nursing auxiliaries. In contrast in Middle America, where a much smaller number of physicians, in relation to population, provide medical care, there are only 0.7 nurse per physician and 1.6 auxiliaries or a total of 2.3 in the nursing field. In South America these ratios are even lower, 0.4 nurse and 1.1 auxiliaries per physician.

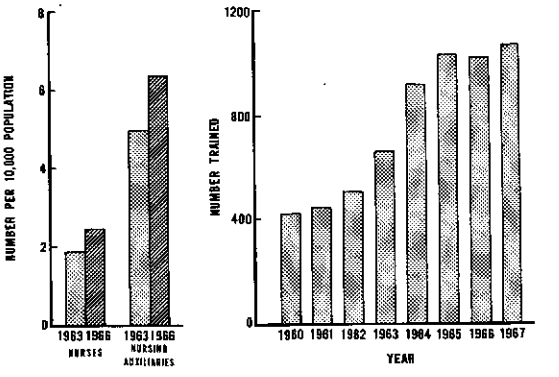
By country the number of nurses varies from 21.8 per 10,000 in Jamaica to 0.5 per 10,000 in Dominican Republic. Nursing auxiliaries range from 17.4 in Barbados to 1.7 in Haiti. Ratios of total nursing personnel per 10,000 population vary from 33.7 in Barbados to 2.8 in Haiti.

Data for the countries of Central America illustrate the gain in the past few years. Between 1963 and 1966 the number of nurses was increased from

Ratios of Nursing Personnel to Physicians in the Three Regions of the Americas



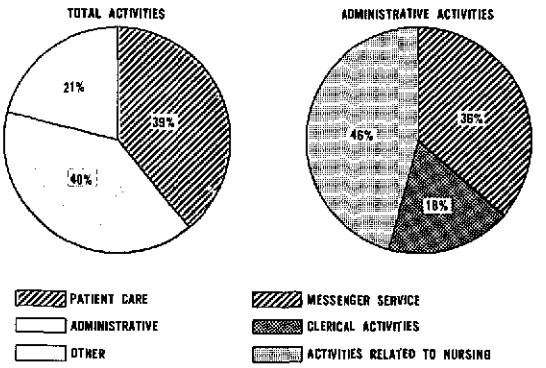
Increase in Nursing Personnel in Central America



1.9 to 2.5 per 10,000 population and trained auxiliairies from 5.0 to 6,4. The bar chart to the right shows the gradual increase since 1960 in the training of auxiliairies in this area.

The requirements for large numbers of trained nursing personnel combined with the relatively small numbers of graduate nurses in Latin America has raised considerable discussion as to the practical steps to be taken to meet the immediate demand. Education to prepare graduate nurses takes several years and must have as prerequisite sufficient elementary and secondary school preparation. The shortage of nursing personnel makes imperative the training of auxiliaries but raises the question of the numbers and the length and content of their training.

Until recently many nursing functions were being carried out by untrained nursing auxiliaries and even their number was not usually known. Since 1960 large numbers of auxiliaries have been trained and all countries have such training programs. Their preparation should be directly related to the functions they must carry out. Consequently the need for research on nursing activities has been recognized and in several countries the daily activities of nurses and nursing auxiliaries in both health centers and hospitals are being studied. The chart presents some results from the study in one country. The circle on the left is divided into three parts showing 39 per cent of activities directly related to patient care, an almost equal per cent of activities of an administrative nature (40 per cent) and a third section of other (21 per cent). This third part is not necessarily lost time but involves absences, personal activities, waiting periods, and to a small extent transportation. In the interest of conserving nursing time the administrative activities were analyzed for their relationship to nursing. The circle on the right side shows that 46 per cent were directly related to nursing functions, another 36 per cent were messenger services and 18 per cent clerical tasks. On the basis of the time spent in other activities and in messenger and clerical services the conclusion may be reached that approximately 42 per cent of the total nursing time, both of nurses and auxiliaries, could be better utilized, using lesser trained persons for some duties. Similar studies on nursing activities are being made in other places in relation to type and extent of training to plan for better utilization.



Classification of Nursing Activities

(Survey Findings)

Dentists

From year to year the numbers of dentists have increased slightly but not usually at a rate surpassing population growth. In 1960 there were 5,200 dentists or 0.8 per 10,000 population in Middle America; by 1964 there were reported to be 7,400 or 1.0 per 10,000 population and in 1966 only 0.9 per 10,000. In South America the number rose from 36,000 or 2.5 per 10,000 in 1960 to 44,000 or 2.8 in 1964 and to 46,000 or 2.9 per 10,000 in 1966. Northern America shows even less change maintaining a ratio of 5.4 over the six-year period. By country in Latin America ratios range from 0.3 in Honduras to 5.3 in Argentina (Appendix B). Twelve countries have fewer than one dentist per 10,000 population. Part of the apparent lack of growth between 1964 and 1966 may be due to lack of current information on numbers of dentists.

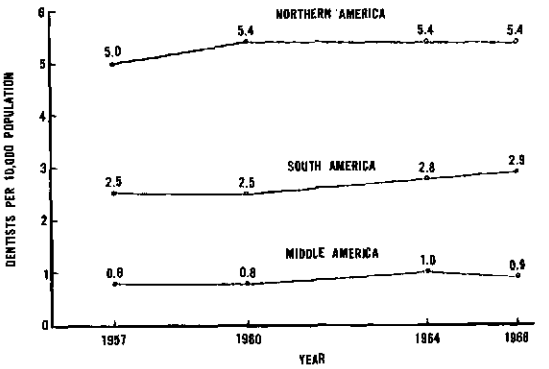
All but three countries - Jamaica, Panama and Trinidad and Tobago - have schools of dentistry. There are 89 dental schools in Latin America.

Most countries need to increase dental manpower since ratios are very low. The small increase observed can only provide services for the additional population in the Region without increasing the ratio to population. Requirements for dentists will vary by country. As with physicians the distribution within the country is uneven with rural areas lacking dental attention.

Surveys of dental manpower and dental education are a continuing need. Most schools are small with few graduates. Improvement and expansion of existing centers of dental education will help to meet the needs of the Region.

Public health dentistry offers an alternative to providing dental attention. Employing preventive measures, such as fluoridation of water or salt, will aid in prevention of dental caries, thus reducing the demands for dental care. Also the use of dental auxiliaries offers another method of meeting the needs. Surveys are being made to determine their numbers and the type of training.

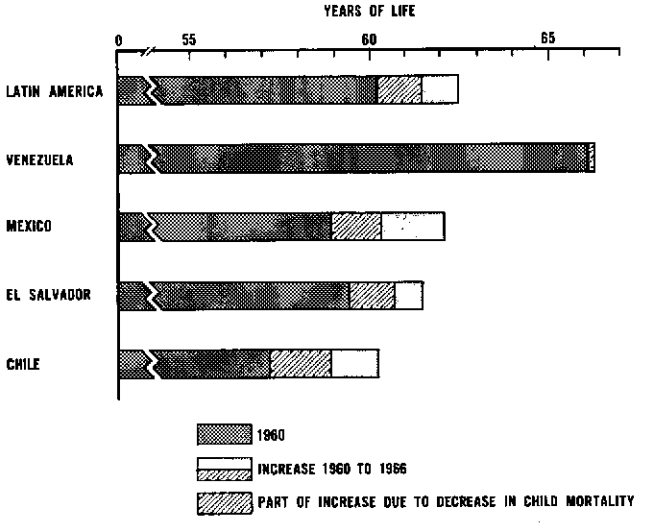
Dentists per 10,000 Population in Three Regions of the Americas



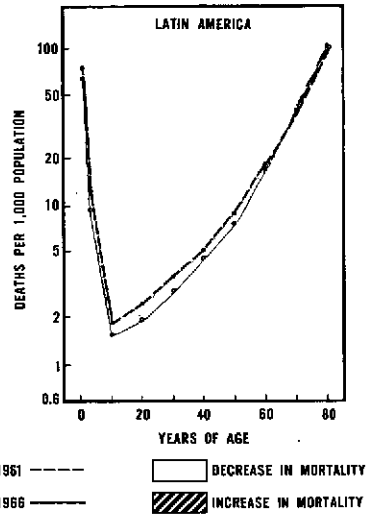
SUMMARY

Increase in Life Expectancy

Increases in Life Expectancy in Four Countries and in Latin America



Changes in Death Rates by Age in Latin America, 1961-1966



Life expectancy is a general index which will summarize part of the results of attaining many of the goals of the Charter of Punta del Este and the Declaration of the Presidents. The original goal was to increase life expectancy in the decade from 1961 to 1971 by 5 years.

Life expectancy for a country or area is calculated from age distributions of the number of deaths and the population. Registration of deaths is known to be incomplete in many countries and even in countries with a good level of registration there are often geographic areas - particularly rural areas - and age groups - such as infancy - in which there are deficiencies. Underregistration of deaths produces low death rates which when applied in the calculation of life tables produce an exaggerated life expectancy. Corrections can be made to the death rates if the degree of underregistration is known. Since registration has probably improved and not worsened in Latin America in recent years, life expectancy is compared without making corrections for underregistration for two periods, the first around 1960 and the second in 1966. While the average years of life may be overstated in both periods there appears no reason to expect the excess to be greater in the later period and for this reason increases observed are probably not unrealistically large.

Based on data from all countries for which information on deaths by age was available, the estimated life expectancy in Latin America increased from 60.2 years in 1960 to 62.5 in 1966, a gain of 2.3 years. To be proceeding

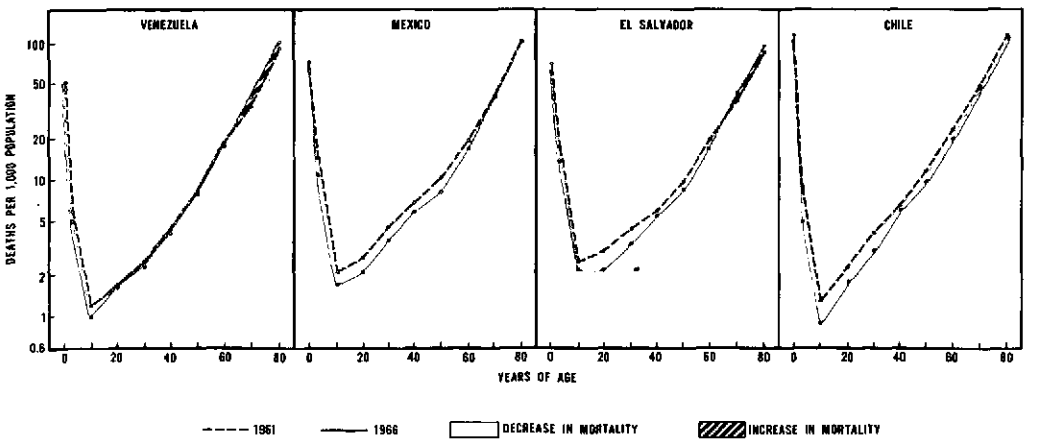
toward the goal of the Charter an increase of three years of life would be necessary in the six-year interval. Thus almost 80 per cent of the goal may have been achieved for this period. Also shown are data of life expectancy for four countries, Venezuela, Mexico, El Salvador and Chile. In Venezuela which had a high life expectancy at the beginning of the period only a small gain (0.2 year) was observed in the six-year period. The extension of life in Mexico was by 3.2 years and in Chile by 3.0 years; both, if continued further, would be sufficient to meet the objective of the Charter. In El Salvador the gain was by 2.1 years.

The goal on life expectancy was thought to depend in large part on the success of another general goal of the Charter, to reduce childhood mortality by 50 per cent. For that reason, on the chart each bar is divided to show the proportion of the increase which results from lowering child mortality. For Latin America, as a whole, 1.0 of the 2.3 years gained or 43 per cent resulted from the reduction in child mortality. In both El Salvador and Chile the gain by reducing child mortality was about 60 per cent of the total. In Mexico the reduction in childhood mortality was responsible for roughly 50 per cent. For Venezuela the situation was quite different. Reducing childhood mortality added 0.6 year but the increase in rates in the oldest age groups eliminated part of this gain, the net gain being only 0.2 year.

Reductions in Mortality

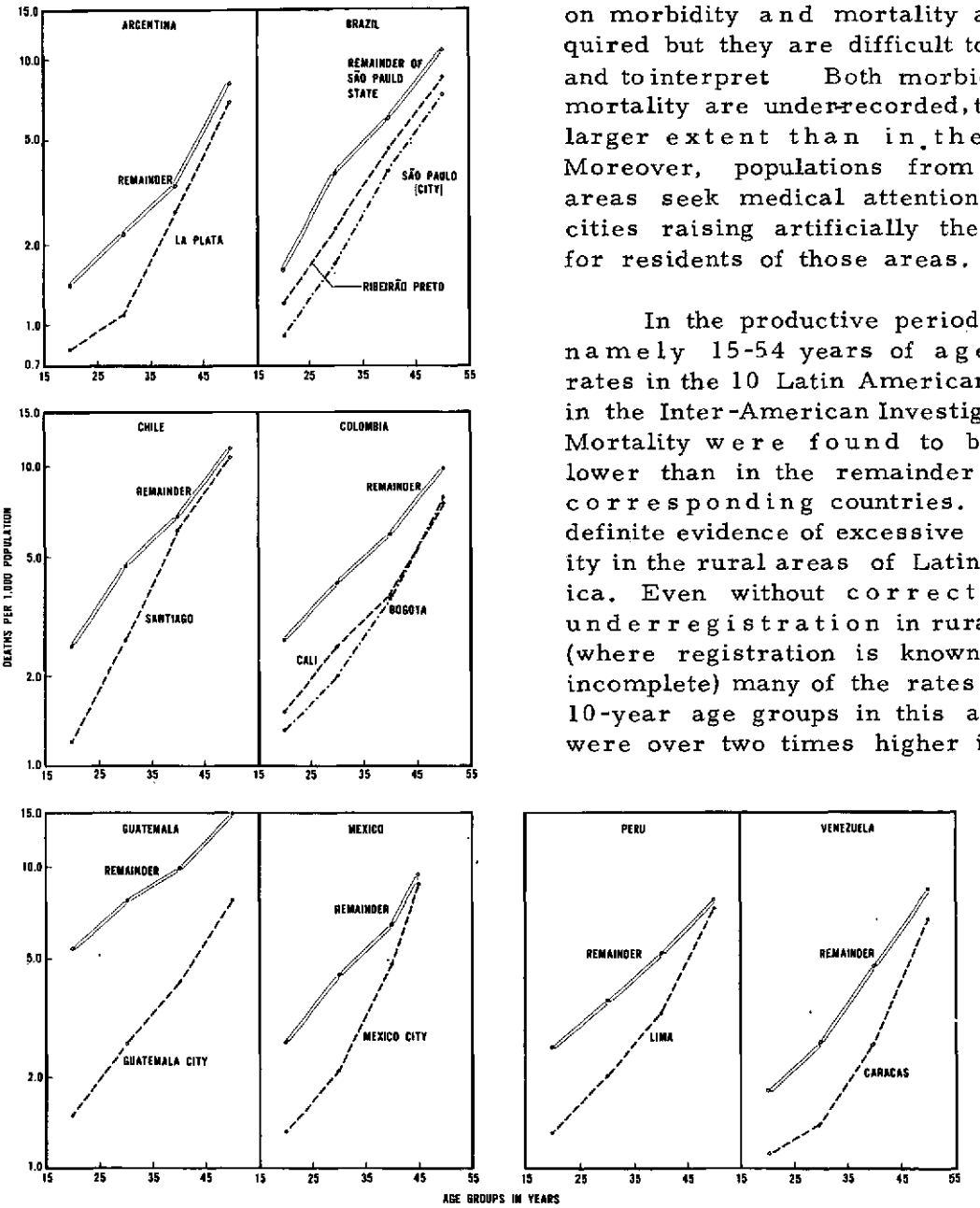
Since a large contribution to the increase in life expectancy came from age groups other than those of childhood, age specific death rates are shown for 1961 and 1966 for Latin America and for the same four countries. In all but Venezuela there is a sizeable reduction in death rates from 5 to 54 years of age. Added efforts to meet the goals for child mortality, particularly under one year of age, will assure the attainment of the desired increase in life expectancy. The decrease in mortality of young and middle-age adults is reassuring since it means a significant increase in the productive years of the labor force.

Changes in Death Rates by Age in Four Countries, 1961-1966



Differences between Urban and Rural Areas

Comparison of Death Rates by Age in 10 Cities and the Remainder of Corresponding Countries



To plan for the needs for health services of rural populations, and to evaluate rural health programs, data on morbidity and mortality are required but they are difficult to obtain and to interpret Both morbidity and mortality are under-recorded, to a far larger extent than in the cities. Moreover, populations from rural areas seek medical attention in the cities raising artificially the rates for residents of those areas.

In the productive period of life, namely 15-54 years of age, death rates in the 10 Latin American cities in the Inter-American Investigation of Mortality were found to be much lower than in the remainder of the corresponding countries. This is definite evidence of excessive mortality in the rural areas of Latin America. Even without correction for underregistration in rural areas (where registration is known to be incomplete) many of the rates for the 10-year age groups in this age span were over two times higher in rural

areas (remainder of countries) than in these cities in which deaths of residents received thorough investigation. A few of the rates were around three times those in the large city (for example, in Guatemala).

The excess was usually in the youngest group, namely of those 15-24 years of age. There is also marked variation in the levels of mortality in these cities and the difference in the patterns of mortality by cause has been shown.

A similar if not a greater excess in mortality in rural areas is known to occur in childhood, especially in children from birth through 14 years of age. The seriousness of health problems in rural areas is known to be great.

Lower mortality in these Latin American cities than in the remainder of the countries is probably due in part to the concentration of health resources such as physicians and nurses, hospitals and health centers, water supplies and sanitary services in large cities. Preventive action should be extended to rural areas, where more than half of the population lives.

Appendix A

Hospitals and Hospital Beds with Rates per 1,000 Population in the Americas, by Country, 1966

Country	Year	All hospitals			General hospitals			Other hospitals			
									Beds		
		Total	Beds	Beds per 1,000	Total	Beds	Beds per 1,000	Total	Mental diseases	Tuber-culosis	Other
Northern America		8 589	1 890 932	8.8	7 547	1 022 585	4.7				
Middle America		5 083	215 831	2.6	...	a) 169 083	2.1				
South America		8 450	560 667	3.4	...	a) 420 842	2.6				
Argentina	1964	3 353	141 170	6.4	2 824	102 054	4.6	529	25 000	6 652	7 464
Barbados	1966	10	1 629	6.6	6	789	3.2	4	801	-	39
Bolivia	1966	238	9 381	2.5	225	8 168	2.2	13	473	539	201
Brazil	1964	2 847	228 499	2.9	...	...		...	...	...	...
Canada	1965	1 424	211 751	10.8	1 057	116 308	5.9	367	70 726	5 789	18 928
Chile	1966	332	36 716	4.2	318	30 113	3.4	14	3 661	2 833	109
Colombia	1966	647	46 001	2.5	595	35 770	1.9	52	6 800	2 647	784
Costa Rica	1966	49	6 100	4.1	45	4 270	2.9	4	1 118	535	177
Cuba	1966	239	42 067	5.4	218	31 638	4.0	21	4 561	4 015	1 853
Dominican Republic	1966	275	10 620	2.8	271	9 227	2.5	4	576	691	126
Ecuador	1966	174	13 021	2.4	157	9 865	1.9	17	1 499	1 402	255
El Salvador	1966	56	6 557	2.2	46	4 913	1.6	10	506	966	172
Guatemala	1966	45	10 632	2.3	37	8 262	1.8	8	1 172	1 036	162
Guyana	1966	23	3 911	5.9	20	2 444	3.7	3	850	250	367
Haiti	1965	36	3 035	0.7	27	2 704	0.6	9	...	...	331
Honduras	1966	34	3 725	1.6	32	2 994	1.3	2	231	500	-
Jamaica	1966	27	7 571	4.1	24	4 049	2.2	3	3 115	222	185
Mexico	1966	b) 3 969	86 151	2.0	...	...		...	...	...	...
Nicaragua	1965	40	3 822	2.3	36	3 312	2.0	4	178	242	90
Panama	1964	28	3 804	3.2	26	2 513	2.1	2	971	320	-
Paraguay	1966	147	4 171	2.0	141	3 179	1.5	6	294	366	332
Peru	1967	283	29 616	2.4	...	...		...	...	...	...
Trinidad and Tobago	1966	27	5 252	5.3	24	2 281	2.3	3	1 568	...	c) 1 403
United States	1966	7 160	1 678 658	8.6	6 258	906 045	4.6	902	692 035	31 317	49 261
Uruguay	1963	78	16 935	6.4	72	11 867	4.5	6	2 984	2 084	-
Venezuela	1966	307	28 678	3.2	264	19 377	2.2	43	4 317	2 983	2 001
Antigua	1964	3	420	7.0	1	180	3.0	2	200	-	40
Bahamas	1964	4	782	5.8	1	450	3.4	3	200	-	132
Bermuda	1964	3	428	8.9	1	162	3.4	2	230	-	36
British Honduras	1966	11	514	4.7	9	340	3.1	2	122	52	-
Canal Zone	1966	4	888	15.9	2	515	9.2	2	253	-	120
Cayman Islands	1966	1	34	3.8	1	34	3.8	-	-	-	-
Dominica	1966	(7)	340	5.0	(5)	274	4.0	(2)	44	-	22
Falkland Islands	1966	1	32	16.0	1	32	16.0	-	-	-	-
French Guiana	1965	4	641	17.8	3	521	14.5	1	-	-	120
Grenada	1966	(8)	683	7.0	(4)	286	2.9	(4)	200	...	c) 197
Guadeloupe	1966	20	2 924	9.2	18	2 134	6.7	2	670	-	120
Martinique	1966	(17)	2 691	8.2	(15)	1 430	4.4	(2)	360	...	c) 901
Montserrat	1966	1	69	4.9	1	69	4.9	-	-	-	-
Netherlands Antilles	1964	10	1 821	8.9	8	1 391	6.8	2	400	-	30
Puerto Rico	1966	138	12 278	4.6	123	7 644	2.9	15	2 238	2 077	319
St. Kitts-Nevis and Anguilla	1966	4	213	3.5	4	213	3.5	-	-	-	-
St. Lucia	1966	6	528	5.1	4	328	3.2	2	150	50	-
St. Pierre and Miquelon	1966	2	95	19.0	1	70	14.0	1	-	25	-
St. Vincent	1966	(6)	394	4.4	(2)	236	2.6	(4)	88	...	c) 70
Surinam	1966	16	1 895	5.3	14	1 285	3.7	2	375	-	235
Turks and Caicos Is.	1964	4	32	5.3	4	32	5.3	-	-	-	-
Virgin Islands (UK)	1965	1	35	3.9	1	35	3.9	-	-	-	-
Virgin Islands (US)	1966	3	220	4.4	3	220	4.4	-	-	-	-

(a) Estimates included for Brazil, Mexico and Peru. (b) Includes a large number of health centers with beds.
(c) Infectious and chronic diseases. ( ) No current data on number of hospitals; number in an earlier year shown.
... Data not available.

Appendix B

Number of Physicians, Dentists, Graduate Nurses, and Nursing Auxiliaries with Ratios per 10,000 Population, by Country, 1966

Country	Physicians			Dentists			Graduate Nurses			Nursing Auxiliaries		
	Year	Number	Ratio	Year	Number	Ratio	Year	Number	Ratio	Year	Number	Ratio
Northern America		330,467	15.2		115,723	5.4		736 994	34.2		844,607	39.4
Middle America		42,841	5.2		7,436	0.9		28,690	3.5		67,233	8.4
South America		105,118	6.4		46,280	2.9		44,941	2.7		114,846	7.2
Argentina	1967	37,732	16.4	1963	11,584	5.3	1964	22,903	10.4	1964	7,429	3.4
Barbados	1966	103	4.2	1966	17	0.7	1964	393	16.3	1964 a)	420	17.4
Bolivia	1966	1,187	3.2	1966	692	1.8	1964	411	1.1	1964	1,148	3.1
Brazil	1964	34,251	4.4	1964 b)	22.000	2.8	1966	8,212	1.0	1963	55,664	7.3
Canada	1965	23,990	12.2	1965	6,396	3.3	1964	115,818	60.1	1961	62.553	34.2
Chile	1964	4,842	5.8	1964	2,974	3.5	1965	1.780	2.1	1965	13,260	15.4
Colombia	1966	8.100	4.4	1962	3,400	2.1	1965	1,259	0.7	1965	10,818	6.0
Costa Rica	1967	858	5.4	1967	125	0.8	1967	787	4.9	1967	1,976	12.4
Cuba	1966	6,862	8.8	1966	1,451	1.9	1966	4,112	5.2	1966	5,663	7.2
Dominican Republic	1966	1,935	5.2	1964	479	1.4	1967	183	0.5	1967	2,172	5.6
Ecuador	1965	1,698	3.3	1964	518	1.0	1965	364	0.7	1965	1,849	3.6
El Salvador	1966	652	2.1	1966	194	0.6	1966 a)	715	2.4	1966 a)	1,680	5.5
Guatemala	1966	1,005	2.2	1966	281	0.6	1966	576	1.3	1965	2 289	5.2
Guyana	1966 c)	197	3.0	1966 c)	36	0.5	1966	929	14.0	1966	564	8.5
Haiti	1967	302	0.7	1967	169	0.4	1968 b)	521	1.1	1968 b)	771	1.7
Honduras	1966 a)	466	2.0	1966 a)	78	0.3	1966 a)	251	1.1	1966 a)	1,288	5.4
Jamaica	1964	854	4.9	1966	143	0.8	1964	3,799	21.8	1964	611	3.5
Mexico	1966	24,342	5.5	1965	3,463	0.8	1965	8,252	1.9	1965	40,000	9.4
Nicaragua	1965	698	4.2	1965	196	1.2	1965	353	2.1	1965	1,047	6.3
Panama	1964	628	5.2	1964	106	0.9	1967	875	6.6	1965	1,113	8.9
Paraguay	1966	1,119	5.3	1966	362	1.7	1966	226	1.1	1965	1,471	7.2
Peru	1964	5,262	4.7	1964	1,655	1.5	1965	3.600	3.1	1965	5,783	5.0
Trinidad and Tobago	1967	387	3.8	1965 a)	76	0.8	1967	1,240	12.1	1967	493	4.8
United States	1967	306,424	15.5	1965	109,301	5.6	1966	621,000	31.7	1966	782,000	39.9
Uruguay	1964	3,051	11.4	1962	1,250	4.8	1964	496	1.8	1964	3,756	14.0
Venezuela	1966	7,497	8.4	1966	1,779	2.0	1966	4.342	4.9	1966	12,574	14.1
Antigua	1967	17	2.8	1964	4	0.7	1967	88	14.4	1967	60	9.8
Bahama Islands	1966	99	7.1	1964	17	1.3	1964	144	10.7	1964	190	14.2
Bermuda	1967	48	9.4	1964	25	5.2	1964	165	34.4	1964	49	10.2
British Honduras	1966	33	3.0	1966	5	0.5	1966	94	8.6	1967	68	6.0
Canal Zone	1967	100	17.9	1966	17	3.0	1966	233	41.6	1966	273	48.8
Cayman Islands	1967	2	2.2	1964	1	1.1	1967	6	6.7	1967	8	8.9
Dominica	1967	11	1.6	1963	2	0.3	1967	87	12.6	1967	13	1.9
Falkland Islands	1966	4	20.0	1966	2	10.0	1962	4	20.0	1966	4	20.0
French Guiana	1966	23	6.2	1965	7	1.9	1965	60	16.7	1965	71	19.7
Grenada	1967	18	1.8	1962	4	0.4	1967	105	10.6	1967	83	8.4
Guadeloupe	1966	149	4.7	1966	39	1.2	1966	269	8.4		...	...
Martinique	1967	167	5.0	1962	59	2.0	1967	381	11.4	1967	151	4.5
Montserrat	1966	6	4.3	1966	1	0.7	1966	32	22.9	1964	-	-
Netherlands Antilles	1964	141	6.9	1964	31	1.5	1964	96	4.7	1964	60	2.9
Puerto Rico	1966	2,886	10.8	1966	455	1.7	1966	4,776	17.9	1966	6,653	24.9
St. Kitts-Nevis and Anguilla	1966	16	2.6	1966	3	0.5	1966	79	13.0	1966	5	0.8
St. Lucia	1966	17	1.7	1966	2	0.2	1966	65	6.3		...	...
St. Pierre and Miquelon	1966	5	10.0	1966	1	2.0	1966	11	22.0	1966	5	10.0
St. Vincent	1967	12	1.3	1962	3	0.4	1967	64	6.9		...	...
Surinam	1966	155	4.4	1966	21	0.6	1966	355	10.1	1966	455	13.0
Turks and Caicos Islands	1962	2	3.3	1963	1	1.7	1963	23	38.3	1963	15	25.0
Virgin Islands (UK)	1966	5	5.6	1966	1	1.1	1966	5	5.6	1966	15	16.7
Virgin Islands (US)	1967	68	13.3	1963	13	3.2	1963	86	21.5	1963	116	29.0

(a) Government only. (b) Estimate. (c) Government and private hospitals.