# Epidemiological Bulletin

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## Infant Mortality in the Americas

In this century, the concept of health as the intersectoral product of a general process of development whose goal is the well-being of society has been endorsed by experts in the social sciences throughout the world. The close relationship between the traditionally used health indicators—in particular, infant mortality and socioeconomic factors—has been increasingly recognized, so much so that health indicators have become indicators of social development.

Infant mortality not only points to the occurrence of a biological phenomenon but also suggests conditions of housing, nutrition, education, environment, and other phenomena that characterize the style and quality of life of a particular society.

In recent years technologies have been developed that make it possible to prevent and successfully treat the diseases that cause the majority of infant deaths. Their use in the more advanced countries has brought about significant and steady declines in the mortality in the early age groups. In the developing countries, where deaths due to preventable diseases of early childhood account for more than 60 per cent of the total, it has thus become possible to reduce mortality through the use of appropriate technologies.

Although almost all the Latin American countries have seen their infant mortality rates decline, they have not been able to narrow the gap that exists between them and the developed countries.

In analyzing the various goals established for the Americas in the 1960's, the Pan American Health Organization found that, in regard to the goal of reducing infant mortality, only a third of the proposed reduction of 50 per cent had been attained.[1] In the 1970's there was also a downward trend in almost the entire Region, but few countries succeeded in reaching the goal (Table 1). Around 1977, only 17 out of a total of 32 countries had reduced their rates by 20 per cent or more, while two others showed slight increases.

An analysis of infant mortality rates shows that, in general, the limitations of underdevelopment affect registration systems. As a result, data are available for only 23 of 32 countries. It is also clear that some of the figures reflect substantial underregistration of vital events.

Table 2 shows the information PAHO has received from the countries in recent years. Neonatal mortality (which includes deaths in infants aged 28 days or under) is more connected with biological factors (endogenous mortality), while postneonatal mortality is connected with socioeconomic factors derived from adverse environmental conditions (exogenous mortality). This explains why neonatal mortality is considered more difficult to reduce, at least in the conditions prevailing in the Region of the Americas, since, to do so, major efforts are required in developing institutionalized services of greater complexity. Postneonatal mortality can be substantially reduced through the application of primary health care

[1] Pan American Health Organization. *Facts on Health Progress. 1971.* Scientific Publication 227. Washington, D.C., 1971.

IN THIS ISSUE . . .

**Table 1. Infant mortality rates per 1,000 live births, around 1960, 1969, 1977 and total and percentage variations.**

| Country | 1960 | 1969 | 1977[a] | Variation 1960-1977[a] | Variation % |
|---|---|---|---|---|---|
| Argentina | 62.4 | 61.1 | 44.9 | −17.5 | −28.0 |
| Canada | 27.3 | 19.3 | 11.9 | −14.9 | −54.6 |
| Chile | 120.3 | 78.7 | 47.5 | −72.8 | −60.5 |
| Colombia | 99.8 | 71.4 | 46.7 | −53.1 | −53.2 |
| Costa Rica | 68.6 | 67.1 | 27.8 | −40.8 | −59.5 |
| Cuba | 35.4 | 47.7 | 25.0 | −10.4 | −29.4 |
| Dominican Republic | 100.6 | 61.9 | 40.7 | −59.9 | −59.5 |
| El Salvador | 76.3 | 63.3 | 53.4 | −22.9 | −30.0 |
| Guatemala | 91.9 | 91.3 | 75.3 | −22.2 | −24.2 |
| Mexico | 74.2 | 66.7 | 54.7 | −27.6 | −37.2 |
| Nicaragua | 70.2 | 54.4 | 35.2 | −35.0 | −49.9 |
| Panama | 56.9 | 39.9 | 33.0 | −23.9 | −42.0 |
| Paraguay[b] | 90.7 | 91.1 | 95.2 | + 4.5 | + 5.0 |
| Peru | 92.1 | 68.9 | 72.4 | −30.7 | −33.3 |
| Puerto Rico | 43.7 | 29.7 | 20.9 | −22.8 | −52.2 |
| Trinidad and Tobago | 45.4 | 39.8 | 25.5 | −19.9 | −43.8 |
| United States of America | 26.0 | 20.9 | 14.1 | −11.9 | −45.8 |
| Uruguay | 47.4 | 48.7 | 40.8 | − 6.6 | −13.9 |
| Venezuela | 52.9 | 46.9 | 39.5 | 13.4 | −25.3 |

[a] Around 1977.
[b] Reporting area.

measures; accordingly, the study of this mortality is of interest in defining levels of infant health.

As may be seen from Table 2, in ten countries of the Americas neonatal mortality is still higher than postneonatal mortality. But this obviously does not mean that the greater efforts should now be concentrated on perinatal care.

Table 3 shows the leading causes of death by order of importance in infants under 1 year of age in the Americas in 1969 and 1975. The harmful environmental factors that cause deaths are expressed, inter alia, in diseases such as enteritis, diarrheal diseases, influenza, and pneumonia.

Deaths due to infectious and parasitic diseases fell from 693 per 100,000 population to 484 (30 per cent) between 1972 and 1975. This reduction was probably due in part to the lower mortality from enteritis and other diarrheal diseases, which are an important component of the group of infectious and parasitic diseases that are responsible for a high percentage of deaths in children under 1 year of age in many Latin American countries.

Mortality from respiratory diseases fell from 470 per 100.000 population in 1972 to 361 (23 per cent) in 1975. Those due to congenital anomalies and diseases of early childhood declined by 15 per cent during the same period (from 299 to 253 per 100,000 population). Mortality from ill-defined causes and the remaining diseases fell by 26 and 12 per cent, respectively.

**Table 2. Mortality rates in children under 1 year of age per 1,000 live births in 23 countries in the Americas (most recent year for which data are available).**

| Country/Year | Infant mortality | Postneonatal mortality | Neonatal mortality |
|---|---|---|---|
| Argentina (1977) | 44.9 | 21.5 | 23.4 |
| Canada (1977) | 11.9 | 3.9 | 8.0 |
| Chile (1977) | 47.5 | 26.6 | 20.9 |
| Colombia (1975) | 46.7 | 27.8 | 18.9 |
| Costa Rica (1976) | 33.3 | 15.8 | 17.5 |
| Cuba (1977) | 25.0 | 9.6 | 15.4 |
| Dominican Republic (1976) | 40.7 | 20.0 | 20.7 |
| Ecuador (1974) | 70.2 | 49.5 | 20.7 |
| El Salvador (1974) | 53.4 | ... | ... |
| Guatemala (1976) | 75.3 | 51.7 | 23.6 |
| Martinique (1975) | 22.8 | 13.0 | 9.8 |
| Mexico (1974) | 46.6 | 28.5 | 18.1 |
| Montserrat (1972) | 31.4 | ... | ... |
| Nicaragua (1977) | 35.2 | 27.3 | 7.9 |
| Panama (1974) | 33.0 | 15.3 | 17.7 |
| Paraguay (1977)[a] | 95.2 | ... | ... |
| Peru (1973) | 61.4 | 39.5 | 21.9 |
| Puerto Rico (1975) | 20.9 | 4.5 | 16.3 |
| Saint Kitts, Nevis, and Anguilla (1977) | 41.76 | 21.5 | 20.6 |
| Trinidad and Tobago (1976) | 25.5 | 11.2 | 14.2 |
| United States of America (1977) | 14.1 | 4.2 | 9.9 |
| Uruguay (1976) | 40.8 | 18.2 | 22.6 |
| Venezuela (1977) | 39.5 | 20.3 | 19.3 |

[a] Reporting area.
... No data available.

**Table 3. Leading causes of death in children under 1 year of age in North America, Middle America, and South America, around 1969 and 1975.**

1969

| North America | | Middle America | | South America | |
|---|---|---|---|---|---|
| Cause | % | Cause | % | Cause | % |
| 1 | 57.1 | 3 | 22.9 | 3 | 19.7 |
| 2 | 15.5 | 4 | 22.2 | 1 | 18.6 |
| 3 | 9.4 | 1 | 17.4 | 4 | 16.5 |
| 5 | 3.5 | 2 | 2.8 | 6 | 6.3 |
| 4 | 1.2 | 8 | 2.5 | 2 | 3.5 |
| 7 | 13.3 | 7 | 32.2 | 7 | 35.4 |
| Total | 100.0 | Total | 100.0 | Total | 100.0 |

1975

| North America | | Middle America | | South America | |
|---|---|---|---|---|---|
| Cause | % | Cause | % | Cause | % |
| 1 | 52.2 | 4 | 22.4 | 1 | 21.1 |
| 2 | 17.4 | 3 | 21.0 | 3 | 17.8 |
| 3 | 4.4 | 1 | 18.2 | 4 | 17.1 |
| 5 | 2.9 | 2 | 3.3 | 6 | 4.7 |
| 4 | 1.4 | 6 | 2.5 | 2 | 4.4 |
| 7 | 21.7 | 7 | 32.6 | 7 | 34.9 |
| Total | 100.0 | Total | 100.0 | Total | 100.0 |

1. Causes of perinatal mortality
2. Congenital anomalies
3. Influenza and pneumonia
4. Enteritis and other diarrheal diseases
5. Accidents
6. Bronchitis, emphysema and asthma
7. Other diseases
8. Avitaminosis and other nutritional deficiencies

*Source:* Pan American Health Organization. *Las condiciones de salud del niño en las Américas.* Scientific Publication 381. Washington, D.C., 1979.

In South America and Middle America deaths from infectious and parasitic diseases, expressed as percentages, were approximately seven times higher than in North America for the age group 0-1 year. The data are for around 1975 (Table 4). Adverse environmental effects and limited access to primary health care services are the probable direct causes of this excess of deaths.

Mortality from malnutrition is undoubtedly a determining cause that is often not identified as such but which underlies another final diagnosis of the cause of death.

Despite this obvious underregistration, it should be pointed out that malnutrition is among the five leading causes of death in 19 out of 29 countries in the Americas, according to data available for 1975 for the age group under 1 year.

Table 4 shows the deaths from this disease in three subregions of the Americas, based on data provided by 29 countries, around 1975.

The Inter-American Investigation of Mortality in Childhood[2] found that the rate for all types of nutritional deficiencies reached a peak in children aged 2-3 months of age and then declined in the older age groups. The frequency of protein malnutrition steadily increased and reached its peak in children aged 12-16 months, and then declined toward the end of the second year of life.

(*Source:* Maternal and Child Health Program, Division of Comprehensive Health Services, PAHO)

[2] Puffer, R.R. and C.V. Serrano. *Patterns of Mortality in Childhood.* PAHO Scientific Publication 262. Washington, D.C., 1973.

**Table 4. Number of deaths from infectious and parasitic diseases, avitaminosis and other nutritional deficiencies in children under 1 year of age, with rates per 100,000 population, and as a percentage of all deaths (around 1975).**

| | Infectious and parasitic diseases | | | | | | Avitaminosis and other nutritional deficiencies | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | | Rates | | Per cent | | Number | | Rates | | Per cent | |
| Area | All ages | Under 1 year | All ages | Under 1 year (A) | All ages | Under 1 year | All ages | Under 1 year | All ages | Under 1 year (A) | All ages | Under 1 year |
| North America | 16,958 | 2,225 | 7.2 | 63.5 | 0.8 | 4.0 | 2,791 | 110 | 1.2 | 3.1 | 0.1 | 0.2 |
| Middle America | 129,202 | 53,140 | 132.2 | 1,397.3 | 18.1 | 30.2 | 11,470 | 3,457 | 11.7 | 90.9 | 1.6 | 2.0 |
| South America | 92,991 | 31,751 | 97.5 | 1,585.7 | 12.8 | 27.0 | 13,300 | 4,174 | 13.9 | 208.5 | 1.8 | 3.5 |

*Source:* Pan American Health Organization. *Las condiciones de salud del niño las Américas. Op. Cit.*

# Diseases Subject to the International Health Regulations

## Cholera, yellow fever, and plague cases and deaths reported in the Region of the Americas up to 31 August 1980

| Country and administrative division | Cholera Cases | Yellow fever | | Plague Cases |
|---|---|---|---|---|
| | | Cases | Deaths | |
| BOLIVIA | — | 45 | 38 | — |
| Cochabamba | — | 12 | 8[a] | — |
| La Paz | — | 31 | 29 | — |
| Santa Cruz | — | 1 | 1 | — |
| Tarija | — | 1 | — | — |
| BRAZIL | — | 14 | 12 | 43 |
| Ceará | — | — | — | 43 |
| Goiás | | 12 | 12 | — |
| Maranhão | | 2 | — | — |
| CANADA | 1[b] | — | — | — |
| British Columbia | 1[b] | — | — | — |
| COLOMBIA | — | 3 | 3 | — |
| Cesar | — | 1 | 1 | — |
| Norte de Santander | — | 1 | 1 | — |
| Putumayo | — | 1 | 1 | — |
| ECUADOR | — | 1 | ... | — |
| Napo | — | 1 | ... | — |
| PERU | — | 22 | 19 | — |
| Ayacucho | — | 8 | 7 | — |
| Junín | — | 6 | 4 | — |
| San Martín | — | 7 | 7 | — |
| ... | — | 1 | 1 | — |
| UNITED STATES | 8 | — | — | 13 |
| California | 6 | — | — | 2 |
| Maryland | 1 | — | — | — |
| Nevada | — | — | — | 2 |
| New Mexico | — | — | — | 9 |
| Pennsylvania | 1 | — | — | — |
| VENEZUELA | — | 1 | 1 | — |
| Mérida | — | 1 | 1 | — |

— None.
... Data not available.
[a] Correction of data previously published.
[b] Imported case.

# Smallpox Eradication

During the ceremony commemorating the global eradication of smallpox held in Geneva, Switzerland on 8 May, 1980, Patricia Roberts Harris, Secretary of Health and Human Services, made the following remarks as the representative of the American Region:

"We are here today to mark an event of genuine historic significance: the elimination of one of the world's most vicious diseases.

We are here to celebrate the eradication of smallpox and to honor an international team of profes-

sionals and volunteers who cooperated in a global effort to achieve that objective.

But we are also here to set new goals, to pledge ourselves to further efforts to combat those diseases which still plague mankind.

When the World Health Organization launched its worldwide eradication program in the year 1967, 131,000 cases of smallpox were reported in 42 countries. The challenge to WHO was great, and everyone involved knew that meeting that challenge would require an international effort of unprecedented proportions.

In the Americas, a concerted campaign to eradicate smallpox dates back to 1950 when the XIII Pan American Sanitary Conference endorsed the decision of the Executive Committee to focus on the dreaded disease. Progress was steady, and in 1966 the Pan American Health Organization signed agreements with the Governments of Argentina, Bolivia, Brazil, Colombia, Paraguay, Peru, and Uruguay to cooperate in a final effort to eradicate the disease. Colombia, Paraguay, and Peru reported their last smallpox cases the next year. Uruguay reported its last case in 1969, and Argentina announced the end of the disease in that country in 1970.

Only Brazil remained. In 1970 it still reported 1,700 cases, a significant reduction from the nearly 5,000 cases reported in 1967. A dramatic, coordinated effort made the difference: more than 83 million of Brazil's estimated population of 94 million were vaccinated. By 1971 only 19 cases were reported.

Those were the last confirmed cases of smallpox in the Americas. After exhaustive studies failed to turn up any further evidence of the disease in Brazil, the report of the Commission for the Assessment of Smallpox Eradication concluded in 1973: 'To have eliminated widespread endemic smallpox in so short a time for so large a country through a national program is without parallel in the history of modern public health.'

Fortunately, a parallel achievement was soon to come, for in the wake of that success an even greater feat can now be celebrated. Through these past two years, for the first time in recorded history no naturally transmitted case of smallpox has been confirmed anywhere in the world.

The nations of the Americas join in celebrating the eradication of smallpox. But we are mindful that the elimination of one disease does not guarantee an acceptable level of health for millions in our Region or for people in other parts of the world. The victory we celebrate today is only a beginning, but it gives us confidence that together we can achieve far more in the years ahead.

In eradicating smallpox, we have demonstrated to all people that we can put aside our differences—religious, racial, national, and even political—to achieve a humanitarian goal. We have established a precedent for future cooperative efforts, and everyone understands the important task ahead.

As long as 700 million people are still malnourished, as long as the gap in life expectancy between the more developed and least developed countries is still 30 years, as long as diarrheal diseases still remain and kill millions of helpless children ... our job is unfinished.

That is the reason we have each endorsed WHO's goal of 'health for all by the year 2000,' and the reason we have committed ourselves to work individually and collectively to that end.

Today we close a chapter in the history of world health, but we begin immediately to write another. We must dedicate all the talent and energy we have to the effort to secure health for all in this century so that our generation can leave, as its legacy, a healthier world."

# Recent Influenza Activity

During the past year influenza has again been active throughout the world. Whereas parts of Asia, northern China, and the Soviet Union experienced small to moderate epidemics of influenza A(H3N2), Australia and Japan were affected mainly by influenza A(H1N1). In North America epidemics of influenza B occurred this year, as they have nearly every third year in the past two decades. Scattered isolations of A(H3N2) and

A(H1N1) were also observed in the United States. European countries appeared to receive some spread of influenza A(H3N2) from the Soviet Union through Scandinavia and eastern Europe, as well as limited occurrences of influenza B and/or influenza A(H1N1).

These observations show that for three consecutive seasons (1977-1978, 1978-1979, and 1979-1980), influenza A viruses of two subtypes have circulated in the world at the same time. Most young persons have now experienced an influenza A(H1N1) infection, according to results of serologic surveys, but the viruses may continue to circulate either by infecting the small proportion of previously uninfected youths, re-infecting persons originally infected in 1977 or 1978 who now have decreasing immunity, and/or undergoing major antigenic drift. So far the latter has not been detected as recent isolates have been quite similar to A/USSR/90/77, or more commonly A/Brazil/11/78, in hemagglutination-inhibition tests with ferret sera.

Antigenic drift does appear to be taking place in influenza A(H3N2) strains, as judged by the occasional identification of variants like A/Bangkok/1 and 2/79 which show differences from A/Texas/1/77 in reciprocal hemagglutination-inhibition tests. It has been more common, however, to find that recent isolates are "bridging strains" that react equally with A/Texas/1/77 and A/Bangkok/1/79. Some isolates have also been found to exhibit asymmetric antigenic drift from both A/Texas/1/77 and A/Bangkok/1/79, e.g. A/Arizona/2/79.

The epidemic of influenza B in the United States during the winter of 1979-1980 was also caused primarily by new antigenic variants which showed drift away from the B/Hong Kong/5/72 reference strain. Two distinct variants were identified in hemagglutination-inhibition tests with ferret sera; B/Singapore/222/79 exhibited asymmetric variation from B/HK/5/72, and B/Buenos Aires/37/79 differed markedly from the other strains in reciprocal tests. Identification of isolates was confounded, however, by the observation that a large proportion of viruses cross-reacted well with *both* the 1979 reference strains (e.g., B/Massachusetts/10/80). Because influenza B viruses were isolated more efficiently in tissue culture than in eggs, CDC routinely propagated the tissue culture isolates sent to the Center by growing them in MDCK cells. Analysis of the data has shown that cross-reactive influenza B viruses were very commonly found among MDCK cell-grown isolates but more rarely among egg-grown viruses. Thus, heterogeneity among influenza B strains may depend on both the virus and the host.

One unusual observation made in the United States has been the apparent production of hemagglutination-inhibition antibodies to influenza A(H1N1) strains in a proportion (up to 25 per cent) of individuals who experienced only influenza B infections as judged by confirmatory virus isolations and complement-fixation antibody titer rises. Thus, cases are seen of persons exhibiting antibody titer rises to influenza A(H1N1) and influenza B by hemagglutination-inhibition testing, but to only influenza B by complement-fixation testing. These observations have been made in the absence of recognized influenza A(H1N1) virus isolations in the community, and in older persons not normally infected with influenza A(H1N1) in recent years. Heterotypic antibody response to influenza A(H1N1) caused by influenza B infection therefore seems the most reasonable explanation, although this phenomenon is not known to have been previously reported for man.

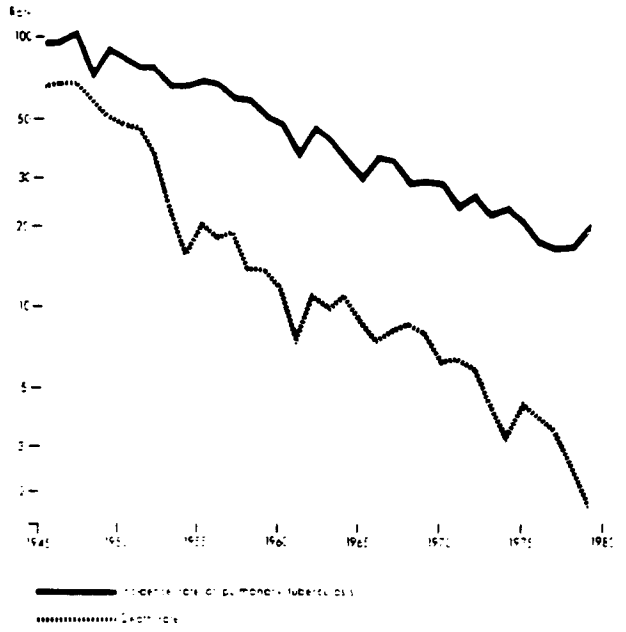
(*Source:* Noble, G.R., and A.P. Kendal, United States Center for Disease Control/WHO Collaborating Center for Influenza, Atlanta, Georgia)

# Tuberculosis in Costa Rica

Costa Rica has an estimated population of 2,312,000 inhabitants (1980). Children under 15 years of age account for 40.6 per cent of the total. Birth and infant mortality rates are low and life expectancy is high.

As may be seen in Figure 1, in the last 40 years the incidence of tuberculosis as well as tuberculosis mortality has steadily declined. The notified incidence/mortality ratio fell from 0.8 in 1945 to 0.1 in 1979. Although

**Figure 1. Incidence rates of pulmonary tuberculosis and of deaths due to tuberculosis per 100,000 population. Costa Rica, 1945-1979.**



this ratio is not really a case fatality rate since the data come from different sources—records of new cases of pulmonary tuberculosis, death certificates—it does indicate a lower risk of death in the general population and in the known cases of this disease. The impact of specific therapy became evident between 1951 and 1961; the stabilization in the following years could be interpreted as late mortality in chronic cases, which was delayed but not prevented by the therapy. The ratio (which in 1965 had been 0.3) continued to fall, which points to an increase in diagnostic coverage and in the quality of the treatment of the cases detected.

In recent years, the death rate has continued to decline, but the number of cases has increased, which may be due to more intensive case detection. Extrapulmonary tuberculosis increased during the course of the program: in 1945-1949, 10 cases were reported (0.3 per cent) as opposed to 157 cases (7.5 per cent) in 1973-1977. Tuberculosis incidence fell more rapidly in children under 15 years (from 29.7 per 100,000 population in 1950 to 1.2 in 1977) than in the age group 15-44 years and in the age group 45 years and over (137.2 to 24.0 and 119.4 to 40.6 per 100,000 population, respectively).

Each year the national control program prepares an annual work program, quantified by health service and by health region (five regions). For 1980, it provides for 22,000 sputum examinations for the purpose of detecting and treating 639 cases (515 on an outpatient basis). In 1980 short course treatment will be begun, including the administration of isoniazid, rifampicin, and pyrazinamide, with complete supervision in 255 cases.

In 1977 BCG vaccination, which was begun in 1966, covered 76.7 per cent of the newborn (88.8 per cent of those born in official institutions) and 81.3 per cent of the school population, according to studies of the prevalence of scars prior to vaccination in school.

(*Source:* Tuberculosis Program, Communicable Disease Control Unit, Disease Prevention and Control Division, PAHO)

# Status of Eastern Equine Encephalitis in Venezuela

Eastern equine encephalomyelitis (EEE) virus was first isolated in Venezuela in sentinel hamsters exposed to the infection in 1975 in the area of Catatumbo, Zulia State.[1] The virus was isolated at the Institute of Veterinary Research in Maracay in 1976 and in 1978, from autopsy materials taken from horses from Zulia[2] and Yaracuy States, respectively. Likewise, in 1978 the virus was found in sentinel hamsters in the swampy area at the end of Lake Maracaibo. In 1979 the virus was again recovered from horses that had died in Yaracuy. These findings

[1] Walder, R. and O.M. Suárez. Primera evidencia en Venezuela de la encefalitis equina del este (EEE) en circunstancias silentes. *Bol Div Maruliol y Suneum Ambiental* 16 (2):119-125, 1976.

[2] de Siger, J., N. Metter, and J. Castañeda. First isolation of eastern equine encephalomyelitis virus from a horse in Venezuela. 19th Annual Proceedings of the *American Association of Veterinary Laboratory Diagnosticians*. 229-236.

and those of the study of horse sera obtained between 1972 and 1979 in various states provide some idea of the distribution of EEE in Venezuela.

Figure 1 showing the political subdivisions of Venezuela indicates the areas where the sera were obtained.

Sera were subjected to hemagglutination-inhibition, complement-fixation, and neutralization tests using Venezuelan equine encephalitis (VEE) and EEE antigens. This report is based on the findings related to EEE. In each case a careful analysis was made to determine whether the findings could be attributed to EEE or VEE alone, to dual infection, or to serologic crossings. Sera

**Figure 1. Zones from which sera were collected to determine the presence of hemagglutination-inhibiting antibodies to eastern equine encephalitis in horses. Venezuela, 1972-1979.**

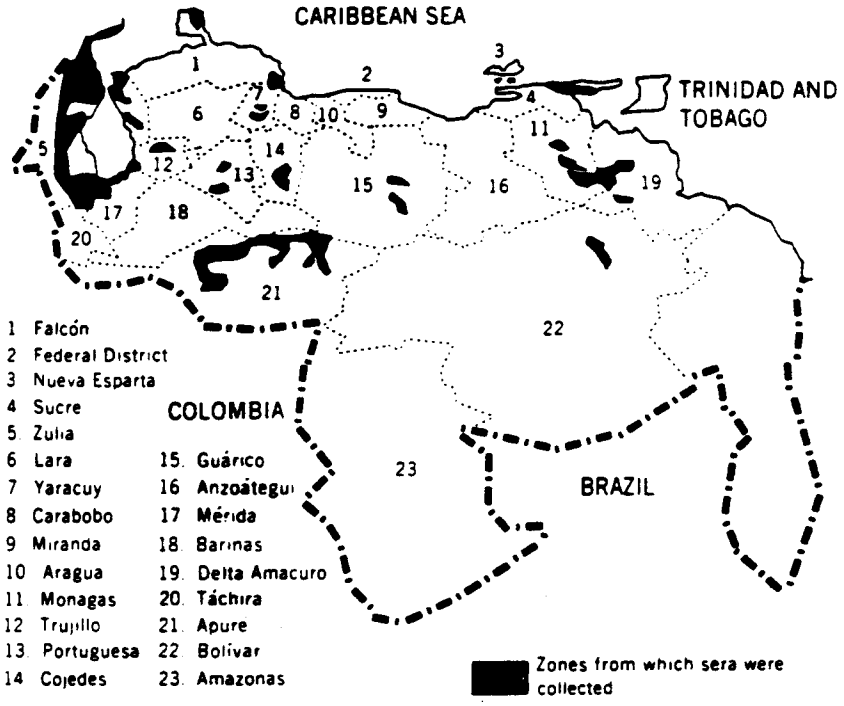



**Table 1. Findings of the serologic survey in states of Venezuela, 1972-1979.**

| State | Year | Isolation of the virus | Presence of antibodies | No. of serum samples tested | Endemicity |
|---|---|---|---|---|---|
| Bolívar | 1978 | — | — | 42 | — |
| Delta Amacuro | 1973 | — | [b] | 71 | High |
| Monagas | 1972, 1977 | — | [b] | 150 | Moderate |
| Sucre | 1972 | — | — | 76 | — |
| Guárico | 1976 | — | [b] | 79 | (Present and past activity) |
| Apure | 1975, 1978 | — | [b] | 220 | Low |
| Trujillo | 1979 | — | — | 43 | — |
| Portuguesa | 1975 | — | — | 4 | — |
| Cojedes | 1978 | — | [b] | 208 | (Presence of the virus) |
| Yaracuy | 1976, 1979 | — | [b] | 81 | (Present and past activity) |
| Mérida | 1978 | [a] | [b] | 17 | (Recent activity) |
| Táchira | 1978 | — | [b] | 107 | (Recent intense activity) |
| Falcón | 1972, 1979 | — | [b] | 69 | (In 1972 [59 samples] no activity) |
| Zulia | 1973, 1974 | — | [b] | ... | North, very high. West of Lake, high |
| | 1976, 1978 | [a] | [b] | 353 | East of Lake, moderate to intense |

[a] Isolated.
[b] Antibodies present.

from Zulia, Yaracuy, Apure, and Guárico were tested also with western equine encephalitis (WEE) antigen, but no antibodies against this virus were found.

Table 1 describes the EEE situation in the states that were visited for the purpose of conducting the serologic survey or establishing the etiology of cases of encephalitis in equines.

Predictably, the above information indicates that EEE activity is related to the presence of surface waters such as swamps, marshes, and ponds, and possibly to waterfowl and mosquito populations; this situation is observed in Delta Amacuro and in the southwestern part of Lake Maracaibo. The opposite occurs in semidesert areas, where stagnant surface waters, if they exist at all, are found only during brief periods in the short rainy season; the same is true along the Caribbean coastal area of Zulia and Falcón, where EEE does not exist.

Epidemiological differences between EEE and VEE are marked in these arid zones where recurrent and explosive VEE epidemics are observed. Between the two above-described extremes, a range of ecological combinations prevails with varying grades of EEE activity, which includes small local outbreaks. To date there is no evidence of EEE infection in man.

(*Source: Boletín Epidemiológico Semanal 7*, 1980. Ministry of Health and Social Welfare of Venezuela)

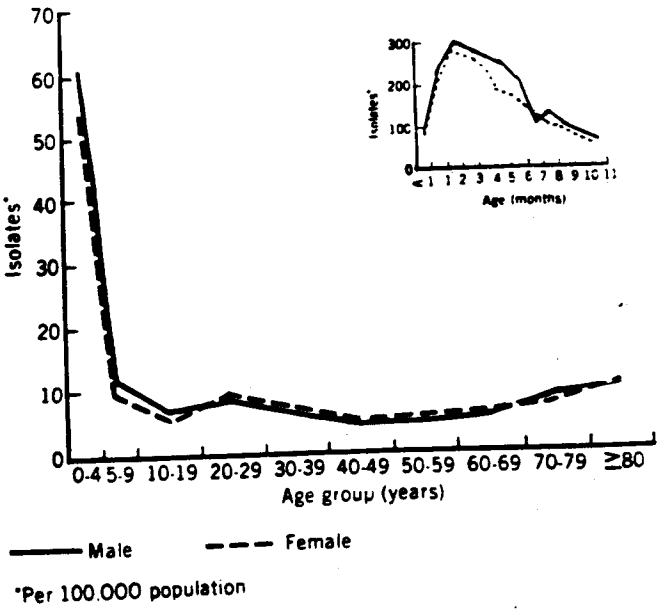
# Human *Salmonella* Isolates—United States, 1979

In 1979, 31,123 isolations of salmonellae (including *Salmonella typhi*) from humans were reported to CDC—an increase of 8.3 per cent over 1978.

The increase in isolates was not confined to one state or region. However, five states—Connecticut, Massachusetts, Maryland, Washington, and Illinois—accounted for two-thirds of the 8.3 per cent increase. *S. enteritidis* alone accounted for over one-fourth of the increase; most of this occurred in Connecticut and Massachusetts. *S. enteritidis*, *S. heidelberg*, *S. saint-paul*, and *S. infantis* accounted for almost two-thirds of the increase. These additional isolates were not concentrated in any single age group. The 10-19 year age group sustained the largest percentage increase, but increases were also seen for the age groups 30-39 years and 50-79 years.

The age distribution of persons from whom isolates were obtained (Figure 1) followed a well-established pattern: the rate was highest for infants approximately 2-3 months of age, decreased rapidly through early childhood, and then held fairly constant from approximately age 7 through the adult years. Isolation rates for those under 20 were higher for males than for females, but for

**Figure 1. Rate of reported isolates of *Salmonella*, by age, United States, 1979.**




*Per 100,000 population

**Table 1. The 10 *Salmonella* serotypes most frequently isolated in human beings, United States, 1979.**

| Serotype | Number | Percentage | Median age (years) |
|---|---|---|---|
| *S. typhimurium** | 10,153 | 32.6 | 9 |
| *S. enteritidis* | 2,633 | 8.5 | 19 |
| *S. heidelberg* | 2,490 | 8.0 | 4 |
| *S. newport* | 1,915 | 6.2 | 14 |
| *S. infantis* | 1,417 | 4.5 | 7 |
| *S. agona* | 1,103 | 3.5 | 3 |
| *S. saint-paul* | 856 | 2.8 | 19 |
| *S. typhi* | 647 | 2.1 | 26 |
| *S. montevideo* | 613 | 2.0 | 12 |
| *S. oranienburg* | 592 | 1.9 | 17 |
| Subtotal | 22,419 | 72.1 | 11 |
| Others | 8,704 | 27.9 | |
| Total | 31,123 | 100.0 | 11 |

*Includes *S. typhimurium* var. *copenhagen*.

persons from 21 through 74 years old, females showed a slightly higher reported isolation rate.

The 10 most frequently isolated serotypes accounted for almost three-fourths of the total (Table 1). The variation in median age of persons from whom a particular serotype was isolated may indicate differences in the vehicles, the infectious dose, or other variable. For most serotypes, the median age of infected patients has been consistent for the 17 years during which surveillance records have been maintained. Of the 647 isolates of *S. typhi* in 1979, 50 were from carriers, 153 from infected patients, and the rest were undesignated. The median age of the carriers was 59 years; of the infected patients, 17 years; and of those unspecified, 22 years.

(*Source:* Center for Disease Control, *Morbidity and Mortality Weekly Report* 29(16):18, 1980.

# Cholera in the World in 1979

A total of 54,179 cases of cholera had been reported to WHO as of 29 April 1980. This figure represents a 27.4 per cent decrease compared with the 74,632 cases reported in 1978 (Table 1). Only two additional countries were infected in 1979 compared with eight in 1978.

The two additional countries affected were in *Africa:* Gabon and the Sudan, which reported 5 and 207 cases, respectively. All together, 18 African countries were affected, as many as in 1978. The total number of cases in Africa fell from 23,317 in 1978 to 18,996 in 1979.

**Table 1. World cholera situation, 1974–1979.**

| | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|
| Number of countries reporting cholera | 40 | 29 | 27 | 35 | 40 | 42 |
| Number of new infected countries | 4 | 1 | — | 3 | 8 | 2 |
| Number of cases | 110,890 | 92,123 | 66,020 | 58,087 | 74,632 | 54,179 |

which was due in part to a considerable improvement in the situation in Burundi, Rwanda, the United Republic of Tanzania, and Zambia. Cholera reappeared in the Ivory Coast, which had been free of the disease since 1971, and there was a large outbreak in 1979 in Mozambique, which had not been affected since 1977. In addition, four countries (Upper Volta, Benin, Malawi, and Togo), which had reported cases in 1978, did not report any in 1979.

The *Americas* remained free of cholera in 1979, except for one imported case in the United States of America.

In *Asia* the total number of cases fell from 50,765 in 1978 to 34,842 in 1979. All together, 20 countries and areas reported cholera, the same number as in 1978. Of those that had reported cholera in 1978, three (Iraq, Macao, and Maldives) were free of the disease in 1979. Jordan, the Syrian Arab Republic, and Vietnam, which had not reported cases in 1978, were again infected in 1979. Although in most of the countries, in particular India, there was a substantial reduction in the number of cases, considerable increases occurred in the Philippines, Indonesia, Iran, and the Democratic Yemen.

In *Europe* a total of 289 cases was reported in 1979. The disease reappeared in southern Europe, eight cases occurring in Italy (Cagliari) and 267 in Spain. Another three European countries reported imported cases.

In *Oceania*, the small number of cases that occurred in late 1978 in Nauru was brought under control in early 1979 and, despite close surveillance, no new cases were detected.

(WHO *Weekly Epidemiological Record* 55(18):129-130, 1980)

# Primary Resistance to Antituberculosis Drugs in Chile, 1978

The Tuberculosis Department of Chile's Bacteriology Institute, in its capacity as national reference laboratory in its field, contributes to epidemiologic surveys and periodically determines the primary resistance of *Mycobacterium tuberculosis* to the first-line antibacterial drugs.

In 1978, a total of 1,694 patients with recently diagnosed tuberculosis who had not been treated were subjected to sensitivity tests; 810 cases had been diagnosed in the metropolitan area and 884 in various health regions of the country.

The data on sensitivity and resistance to the standard

**Table 1. Primary resistance in 1,694 strains of *M. tuberculosis*, Chile, 1978.**

| Results of sensitivity tests | Metropolitan Zone | | Health regions | | Total | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Sensitive | 731 | 90.3 | 800 | 90.5 | 1,531 | 90.4 |
| R EM | 27 | 3.3 | 38 | 4.3 | 65 | 3.8 |
| R INH | 23 | 2.8 | 22 | 2.5 | 45 | 2.7 |
| R EM−INH | 29 | 3.6 | 21 | 2.4 | 50 | 2.95 |
| R EM+PAS | — | — | 1 | 0.1 | 1 | 0.05 |
| R EM+INH+$Tb_1$ | — | — | 2 | 0.2 | 2 | 0.10 |
| No. of strains studied | 810 | 100.0 | 884 | 100.0 | 1,694 | 100.0 |
| Total resistant strains | 79 | 9.7 | 84 | 9.5 | 163 | 9.6 |

R = Resistant
EM = Streptomycin
INH = Isoniazid
PAS = Para-aminosalicylic acid
$Tb_1$ = Thiacetazone

**Table 2. Evolution of primary resistance in Chile.**
(In percentages)

| | 1963-1964 | 1965-1966 | 1967-1968 | 1969 | 1970 | 1971 | 1975 | 1976 | 1978 |
|---|---|---|---|---|---|---|---|---|---|
| Sensitive strains | 80.1 | 85.1 | 86.4 | 88.6 | 87.2 | 88.6 | 89.9 | 88.3 | 90.4 |
| Total resistant strains | 19.9 | 14.9 | 13.6 | 13.4 | 12.8 | 11.4 | 10.1 | 11.7 | 9.6 |
| No. of strains studied | 176 | 403 | 358 | 356 | 451 | 1.352 | 1.206 | 925 | 1.694 |

first-line drugs (streptomycin, isoniazid-para-aminosalicylic acid, and thiacetazone) are shown in Table 1.

According to the results indicated above, no strains were found that were resistant only to PAS or to $TB_1$; nor was resistance detected to combinations of drugs other than those reported in Table 1.

Two strains were resistant to INH+PAS+$TB_1$, and four to the other four drugs (EM+INH+PAS+$TB_1$), but all were strains of atypical mycobacteria.

The figures for resistance ranged from 7.7 to 13.8 per cent in the various health regions and areas studied; however, it is important to note that these lower and upper limits corresponded in general to regions or areas from which a relatively small number of samples were analyzed. In areas from which the number of samples analyzed was 100 or more, the percentages of resistance were very close to the national average.

Moreover, it should be pointed out that there was no difference in the total percentage of resistance between the metropolitan region and the health regions, in contrast with the findings in earlier years in which the figures for the health regions were higher.

However, the analysis of the resistance data is only of relative importance if the figures refer only to a given time, in this case 1978. Comparison of the figures for a number of years, as in Table 2, has much greater value.

The data in Table 2 support the following observations:

1. The percentage in 1978 was the lowest in the history of primary resistance in Chile.
2. Reduction of this proportion from the 1976 level was based essentially on the use of streptomycin and the combination EM-INH.
3. The reduction in 1978 would confirm the suggested hypothesis that the increase in 1976 was in keeping with normal fluctuations within this pattern of evolution, since the consistent downward trend from the first year of the graph is reversed in 1978.

(*Source: Vigilancia de enfermedades transmisibles y zoonosis* 6(4):1979. Ministry of Health of Chile.)

# Pan American Center for Human Ecology and Health

The Pan American Center for Human Ecology and Health (ECO) was officially established in Mexico in September 1975, under an agreement between PAHO and the Government of Mexico. It is a regional technical center of the Organization and comes under the Division of Environmental Health Protection. Its new headquarters have just been inaugurated in Metepec, about 80 km west of the Mexican capital.

The establishment of ECO was due to recent breakthroughs in knowledge and technology and the possibility of multidisciplinary intersectoral collaboration. The interaction of man with his physical and social environment and its repercussion on his health are the focus of the Center's technical program.

Multidisciplinary groups trained by the Center cooperate with the countries in developing and using local resources for making comprehensive ecological evaluations of health problems.

In addition, the ECO staff cooperates with governments and teaching institutions in preparing and con-

ducting courses and research projects on human ecology and environmental health.

One of the most important functions of the Center is to support the member countries of PAHO in preventing and reducing the adverse effects on human health of the pollution and environmental changes attendant upon economic development and industrialization.

The staff of the Center, together with United Nations experts, are preparing a series of guides and manuals for evaluating the environmental and health impact of specific development projects, for example, dam and reservoir construction and human settlements in new areas being opened up to resource development.

The chemical pollution of the environment is another concern of the countries of the Region. Therefore, ECO, in collaboration with national institutions, is supporting projects whose purpose is to determine the effect of this pollution on human health and to devise appropriate measures for preventing and controlling it.

ECO is continually receiving requests for cooperation from the member countries in designing methodologies and evaluating the impact of large-scale regional development projects on the environment, social welfare, and health. At the request of governments as well as academic and professional institutions, the staff of the Center has given a number of courses, lectures, and seminars on environmental health, human ecology, and evaluation of environmental impact.

At present, 18 countries of Latin America and the Caribbean are conducting projects in which the Center is participating.

The information service of the Center collects, processes, evaluates, and distributes information the member countries need in dealing with problems associated with environmental changes. In addition, it maintains an up-to-date list of specialized consultants in this field, classified by general professional skills and specific areas of expertise, who are available for meeting the special needs of the projects.

ECO and the Latin American Regional Office of the United Nations Environmental Program are cooperating with a view to establishing in Latin America a network or association of regional and national institutions interested in human ecology and environmental health. The purpose is to support and strengthen national institutions so as to enable them to develop human resources capable of working efficiently and ensuring that the objectives of development projects include the improvement of the environment and of health.

The institutions are to provide multidisciplinary training and to carry out research programs designed to improve the health status, the standard of living, and environmental conditions in underdeveloped areas.

A program of environmental epidemiology is already being developed. Three initial activities are being carried out in coordination with the Division of Disease Prevention and Control of PAHO:

- The preparation of an inventory of institutional and human resources in the field of epidemiology of diseases connected with the environment and toxicology applied to environmental problems in the member countries of PAHO.
- The development of training strategies in this field.
- Monitoring of environmental and epidemiological problems within the integrated network of collaborating institutions and agencies.

(*Source:* Environmental Health Protection Division, PAHO)

# Reports of Meetings and Seminars

### First Subregional Meeting on Epidemiological Surveillance

This meeting was held at the National Institute of Epidemiology in Mar del Plata, Argentina, from 7 to 10 November 1979, and was attended by representatives from that country, as well as from Bolivia, Brazil, and Paraguay.

The following topics were examined:

1. National systems of epidemiological surveillance.
2. Specific problems of epidemiological surveillance and of immunopreventable, acute respiratory, and enteric diseases.

3. New epidemiological situations created by man-made reservoirs.

With respect to epidemiological surveillance systems, the conclusions of the group were as follows:

*Detection of the phenomenon and production of data.* In the participating countries reporting systems and epidemiological surveillance activities differ according to whether they are the responsibility of the Government, welfare societies, mutual aid associations, or the private subsector. The reporting systems are backed by legal regulations, some unsatisfactory or outdated, but they usually cover only the public sector, and reporting by welfare societies and mutual aid associations is scanty.

*Sources of data—coverage and quality of information.* All the countries have morbi-mortality data, although their geographic coverage varies greatly, and as a rule there is considerable underregistration or morbidity in all the countries. The same applies to mortality except in Argentina and Chile. The list of notifiable diseases varies, and the quality of the information is impaired by a lack of diagnostic accuracy (due to insufficient use of laboratories and a lack of postmortem examinations), although the timeliness of the data is acceptable in most of the countries.

Only Argentina and Brazil have used absenteeism records in specific short-term programs and not systematically.

Epidemiological research is usually confined to the study of outbreaks. Except Chile, the other countries do not carry out nationwide sero-epidemiological studies.

The availability of demographic and environmental data varies in the participating countries, but usually the data are not satisfactorily used.

*Transmission, processing, analysis, and publication of information.* Data transmission is seriously affected by difficulties in processing and analyzing the information at the central level, but considerable progress has been made in publishing them in all participating countries (epidemiological bulletins).

*Conditioning factors.* The constraints on the present status of the reporting system are: lack of infrastructure at the local level, of coordination of the various sectors, of technical-political decisions, of personnel and continuity in technical and professional staff, of resources and their improper use, and, basically, of public health training of physicians at the undergraduate and graduate levels.

The following specific *recommendations* were made:

1. Emphasis should be put not only on the coverage and quality of disease reporting but also on the promotion of intensified surveillance of the diseases prevalent in each country or area, and accurate information should be given about residence, age, vaccination history, as well as about activities relating to surveillance and control.

2. For the selection of this minimal list of diseases subject to intensified surveillance, including those covered by the International Health Regulations, the size of the problem, its prevalence in the community, and the availability of adequate technology for control activities should be taken into account.

3. Information on mortality calls for improved coverage and quality of medical care in order to reduce the group of ill-defined diseases, as well as to promote training in filling out death certificates (in undergraduate studies and in subjects connected with public health, hygiene, and forensic medicine).

4. The processing and analysis of information should be an essential element that provides a knowledge of the problem, defines the risk of the population, and makes it possible to take proper decisions for which epidemiologists must assume responsibility.

5. The development of local systems of epidemiological surveillance and the organization of a network of health laboratories by levels of complexity, including identification of a national reference laboratory and regional laboratories, must be promoted.

6. Absenteeism data will be useful for promptly detecting local outbreaks of diseases, and for diagnosis of specific situations sampling techniques in selected places should be used.

7. Research activities should be stepped up and extended to include the study of abnormal epidemiological situations and sero-epidemiological investigations in areas in which the diseases subject to control are more prevalent.

8. The epidemiological training of personnel at all levels should be fostered, especially that of general practitioners and those responsible for primary health care.

The *general recommendations* of the meeting were as follows:

1. To encourage the countries to exchange epidemiological information, conduct joint activities, and promote basic and advanced training of personnel in epidemiology.

2. To request the Pan American Health Organization to sponsor regular meetings of the countries of the Southern Cone of America (Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay) for the purpose of:

a) evaluating the extent to which the recommendations are implemented;

b) initiating new activities;

c) evaluating common epidemiological problems and the systems for their surveillance and control.

3. To interest policy- and decision-making levels in the conduct of cooperative studies in the area, especially research on the immunity status of the population (in particular with respect to measles) and the standardization of methods for the diagnosis of enteric diseases.

4. To study the possibility of obtaining financing for the medium- and long-term implementation of a system of common epidemiological surveillance in the Southern Cone.

**Short course in psychiatric epidemiology**

This short course was given in Caracas, Venezuela, in November 1979 on the occasion of the XI Latin American Psychiatric Conference and was attended by national guests and officials of the Organization.

The participants agreed on the following:

Psychiatric epidemiology is a method of studying mental health problems, their causes, and the effectiveness of their treatment and management. As such, it is an instrument that provides methodological support for the planning, execution, and evaluation of services.

It can be invaluable in identifying the necessary measures and strategies for offsetting the adverse mental health consequences of rapid socioeconomic development.

Psychiatric epidemiology should be integrated into health planning activities, plans for the education and in-service training of personnel, and health research.

In this regard the difficulties include:

- Lack of qualified personnel.
- Lack of coordination of the institutions and sectors responsible for mental health and behavioral problems.
- Deficiencies in or lack of data on general health and concomitant sociodemographic factors.
- Lack of access to appropriate technologies for epidemiological research.

The priority aspects of epidemiological research in Venezuela may be grouped into three broad categories:

- Problems connected with psychiatric disorders that exist in the country and are similar to those in any population (schizophrenia, neurosis, depression, psychosomatic conditions, mental retardation, brain damage, etc.).
- Psychosocial factors connected with accelerated socioeconomic and cultural development and its mental health consequences (migrations, juvenile delinquency, alcoholism, human factor in traffic accidents, violence, break-up of the family, maladaptation in infancy and youth, etc.).
- Operations research of services, including the role of general health services in the provision of mental health care.

The conclusion reached was that, to enable mental health care programs and services to be conducted, it was essential to establish appropriate channels for the use and application of epidemiological information.

**Seminar on Applications of Psychiatric Epidemiology in the Planning and Evaluation of Mental Health**

This seminar was held in Lima, Peru, from 22 to 28 August 1979. Its purpose was to examine the role of epidemiology as a method of psychiatric research and the application of the epidemiological method in the planning and evaluation of health programs with special attention to the following aspects:

a) Reliable diagnostic evaluation of patients;

b) Evaluation of institutions for the care of the mentally ill;

c) Collection of essential statistical information on patients and service use.

The recommendations of the seminar may be summarized as follows:

- Introduction of a simple method of registering consultations of inpatients and outpatients at the national level in the Andean Pact countries, as well as the promotion of basic epidemiological research in that area.
- Execution of an experimental pilot area project in those countries in order to plan and evaluate services.

# Calendar of Seminars and Courses

*Seminar on Rabies Surveillance and Control*
Santa Cruz, Bolivia, 26-28 August 1980

The seminar will be attended by physicians and veterinarians and its purpose will be to update knowledge on the epidemiological surveillance of rabies.

*Course in Immunology of Infectious Diseases*
Lausanne, Switzerland, 2 September-1 October 1980

This course is intended for scientists in the developing countries that take an active part in research on infectious diseases.

The following subjects will be dealt with in relation to mycobacterial diseases, malaria, trypanosomiasis, leishmaniasis, enterobacterial diseases, and viral infections caused by helminths and fungi: recent advances in basic immunology, defense mechanisms, immunopathology, immunological epidemiology, and immunoprophylaxis.

*Course in Standardization of the Immunofluorescence Method for Rabies Diagnosis*
Buenos Aires, Argentina, 15 September-3 October 1980

The purpose of the course is method standardization, bearing in mind the diversity of equipment available in the countries.

The technical part of the course will cover: the etiologic agent, pathogenesis, collection and dispatch of laboratory specimens, clinical diagnosis and laboratory methods, immunofluorescence (principles, equipment, reagents, and techniques), and laboratory safety (precautions, treatment of lesions, and preventive immunization).

The practical part will include the assembly, dismantling, and maintenance of varied fluorescence equipment; the preparation, evaluation, and standardization of conjugates; and routine diagnosis by direct and indirect methods.

*Course in Tuberculosis Epidemiology and Control*
Recreo, Santa Fe, Argentina, 23 September-1 November 1980

The candidates should be physicians or laboratory professionals whose functions include the direction or supervision of a tuberculosis control program, or teaching in a faculty of medicine.

The purpose of the course is to provide information on tuberculosis control techniques and training in their use with a view to the programming, organization, and evaluation of tuberculosis control as a program integrated into the activities of general health services.

*Regional Course in Tuberculosis Bacteriology*
CEPANZO, Buenos Aires, Argentina, 29 September-24 October 1980

The objectives of the course are to provide an introduction to bacteriology applicable to the laboratory diagnosis of human and animal tuberculosis; training in bacteriological diagnosis techniques and in methods of typing mycobacteria; and training in the programming and supervision of diagnostic activities in projects for the control of human tuberculosis and the eradication of animal tuberculosis.

*International Course in Rabies*
Piura, Peru, 6-7 October 1980

The course will be attended by professional personnel from Bolivia, Ecuador, and Peru, and its purpose is to update knowledge on rabies control.

*Course in Hydatidosis Control*
Puno, Peru, 20-24 October 1980

The objective of the course is to provide professional and auxiliary health workers continuing education on hydatidosis and procedures for controlling it. Topics to be examined include: epidemiology, control procedures, and planning of hydatidosis control activities.

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