Epidemiological Bulletin

PAN AMERICAN HEALTH ORGANIZATION

Vol. 15, No. 2 July 1994

Mortality from accidents and violence in the Americas

The problem of accidents and violence is growing steadily worse in almost all regions of the world, including the Americas. In 1985 it was estimated that 7% of all deaths in both industrialized and developing countries were due to these causes[1]. WHO estimates that each year 1 out of every 4-9 people in the developing countries suffers disabling injury and that 2% of the world population is disabled as a result of injuries sustained through accidents or violence.[2] WHO also estimates that in 1989 such injuries were responsible for almost one-third of all hospital admissions, that the social and medical costs associated with these injuries exceeded US$ 500,000 million worldwide, and that the cost of treating persons injured in traffic accidents amounted to almost 1% of the GDP in many developing countries[3]. The tremendous economic burden this problem can pose, is illustrated by figures for the United States, where in 1985 it was estimated that the cost of treating injuries was approximately $317,000 for each fatal case, $34,000 for each hospitalized case, and $500 for each case of injury not requiring hospitalization.[4] According to the World Bank[5], external causes accounted for 15.3% of all years of potential life lost and cases of disability from all causes among males and 8.2% among females worldwide. For Latin America and the Caribbean, the corresponding figures are similar: 20.5% for males and 8.1% for females.

The analysis presented here is based on mortality data, which is the type of information most frequently known and recorded. There is a lack of information on the extent, type, and severity of accidents and acts of violence; the nonfatal injuries and disabilities resulting from them; the response of health care services to accidents and violence; and the legal aspects of the problem. The scarcity of information on the morbidity associated with violence makes it difficult to present a comprehensive view of the phenomenon. Although deficiencies in death records make international comparisons difficult, the information available does make it apparent that countries differ in terms of mortality from external causes, which points up the need to undertake special studies and apply measures aimed at promoting health and preventing accidents and violence. Cause-specific rates (for accidents, suicides, etc.) will not be used because, in addition to the problems noted above, in several countries a large portion of deaths from accidents and violence are attributed to "injuries unknown whether they were accidentally or purposely inflicted." This is true not just of countries with high underregistration of deaths or those which are undergoing periods of intense internal violence, but also in countries such as Chile, where over 50% of all mortality from external causes is classified under this broad heading owing to problems with medical certification of deaths.

Table 1 shows proportional mortality from external causes for various time periods since the early 1960s, calculated as a percentage of total registered deaths but excluding those attributed to ill-defined causes. With certain exceptions, the trend has been upward, particularly from the early 1960s through the early 1980s. This period was also characterized by a marked decline in overall mortality and a rise in life expectancy at birth owing to the reduction in deaths from communicable diseases in all age groups but especially among children under 5. Because communicable diseases accounted for a high percentage of deaths, the reduction in proportional mortality from that cause increased the relative importance of other causes without their absolute importance having necessarily increased. Thus, in those countries which by the early 1960s were well advanced in the demographic transition—Argentina, Barbados, Canada, Jamaica, Puerto Rico, Trinidad and Tobago, United States, and Uruguay—the proportion of deaths due to accidents and violence has changed very little, remaining at under 10%. However, in many countries, proportional mortality from these causes has more than doubled; notable examples are Colombia and El Salvador. In both those countries the proportion of deaths from external causes was over 20% in 1990, and in

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El Salvador it had reached almost one-third during the early 1980s. There are also other countries and territories in which external causes account for well over 10% of deaths and are of growing importance: Bahamas, Belize, Brazil, Cayman Islands, Chile, Costa Rica, Cuba, Ecuador, French Guiana, Guadeloupe, Guatemala, Honduras, Mexico, Nicaragua, Panama, Suriname, and Venezuela.

Table 1

Trends in the percentage of registered deaths due to external causes, 1960-1990

Country	Period			
	1960-1964	1980-1984	1985-1989	1990
Argentina	8.2	6.9	6.9	...
Bahamas	...	13.6	12.7	...
Barbados	3.0	5.0	4.8	...
Belize	4.2	7.6	12.1	...
Bermuda	6.0	...	...	...
Brazil	...	12.5	14.5	...
Canada	8.2	8.6	7.5	7.0
Colombia	8.7	17.8	22.5	25.4
Costa Rica	5.7	11.7	11.4	...
Cuba	7.4	11.5	11.9	11.8
Chile	7.9	13.5	13.3	...
Dominica	1.8	6.1	5.8	...
Dominican Republic	4.7	10.0	9.1	...
Ecuador	6.2	13.3	14.2	15.4
El Salvador	9.7	31.7	...	23.4
French Guyana	8.3	20.6	...	...
Grenada	4.1	6.9	5.8	...
Guadaloupe	10.8	22.1	...	...
Guatemala	3.4	13.7	...	...
Guyana	...	10.0	...	...
Honduras	11.0	17.3	...	...
Jamaica	4.5	4.1	3.3	...
Martinique	6.7	8.9	9.0	...
Mexico	7.8	16.6	15.5	14.3
Nicaragua	9.0	...	15.5	13.1
Panama	8.4	13.7	13.7	...
Paraguay	7.3	8.6	8.7	...
Peru	...	6.3	10.9	...
Puerto Rico	8.5	8.9	9.2	8.9
Saint Kitts and Nevis	...	2.4	3.3	...
Saint Lucia	3.2	6.5	7.9	...
St. Vicent and the Grenadines	0.9	7.1	7.3	...
Suriname	8.2	14.2	12.6	...
Trinidad y Tobago	6.1	9.0	8.6	...
Turks and Caicos Islands	...	4.4	1.0	...
Uruguay	6.4	6.7	6.4	6.8
United States	7.3	7.6	7.2	...
Venezuela	11.1	17.0	15.8	...

Note: Percentages are based on total deaths from defined causes. The group "external causes" comprises categories E800-E999 of the International Classification of Diseases, Ninth Revision.

Age and Sex Differentials

Table 2 presents information on 24 countries—which contain 98% of the population of the Americas— for which data were available on estimated mortality rates by sex and group of causes.[7] With regard to overall sex differences, the adjusted rates in Table 2 confirm one well-known distinction: regardless of the period or country analyzed, the rate is always much higher among males than among females. If the adjusted rate is considered a measure of the absolute rather than the relative importance of mortality from this cause, no single trend for all the countries can be identified, as it can for other causes, since the situation for males and females may be different. Of the 24 countries listed in Table 2, only Canada, Jamaica, and the United States show a clear downward trend for both sexes. These are also the countries which, with some exceptions, have had the lowest rates for both sexes during the entire period examined, and Jamaica is the country with the lowest recent rates. It is noteworthy that the various kinds of internal violence (guerrilla warfare and drug-related terrorism in Colombia, civil war in El Salvador and Guatemala) have had the greatest impact, in terms of mortality, on males. In Colombia, for example, the death rate among males increased from 188 per 100,000 in the period 1980 to 1984 to 237 per 100,000 in 1990 (an increase of almost 30% in an already high rate), whereas among females it rose from 37.5 to 41.1 (a 10% increase in a fairly low rate). In El Salvador, the country with the highest registered and estimated rate in the early 1980s, male mortality increased to a level unprecedented in the Region: 523.8 per 100,000 (an almost 350-point increase over the figure for 1960-1964), whereas female mortality rose 35 points, doubling its earlier value.

Defining the thresholds of high mortality as values of 100 per 100,000 for males and 40 per 100,000 for females, by around 1990 six countries had high female mortality—Brazil (44), Colombia (41), Cuba (45), Ecuador (45), El Salvador (49), and Nicaragua (54)—and 10 countries had high male mortality-- Brazil (127), Chile (133), Ecuador (133), Mexico (170), Nicaragua (133), Panama (105), Puerto Rico (106), Venezuela (126), Colombia (237) and El Salvador (283). Even disregarding the internal phenomena that have led to spectacular increases in mortality, particularly among males in some years, all the countries except Canada, Jamaica, and the United States have seen mortality from external causes remain the same or increase. Some countries, including Brazil, Chile, Colombia, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Puerto Rico, and Venezuela, have shown high levels of male mortality for the past 30 years.

The country with the lowest ratio of male to female rates is Cuba, where in 1990 the ratio was 2:1 (91.3 versus 45.4). Bearing in mind the differences in the types of external causes associated with male and female mortality (accidents and homicide are much more common among men than women, for example), the explanation for the high overall female rate is the high suicide rate among women. Whereas suicide is generally much more common among males than females, in Cuba during 1991 the numbers were similar: 1,059 females committed suicide as compared to 1,237 males. By contrast, in Canada in 1990 there were 2,673 males suicides but only 706 female suicides.

When the specific rates by age group and sex are analyzed, the picture becomes more complex, given the high level of disaggregation that such an analysis implies. Thus, for example, of the three countries that showed clear downward trends in their adjusted rates for both sexes (Canada, Jamaica, and the United States), only Jamaica shows reductions in all age groups for both sexes, whereas the other two show a small increase followed by a small decrease for both sexes in the group aged 15 to 44. Of particular note are the high rates that are being or have been registered among males aged 15-64 in Colombia, El Salvador, Guatemala, and Nicaragua. The internal turmoil these countries are experiencing or have experienced explains the high proportion of violent deaths due to homicide or fights in these age groups. For all ages and time periods mortality from external causes is consistently higher among males than females. The male/female ratio (quotient of the rates) is lowest in the under-1 year age group and rises in subsequent age groups, reaching a maximum in the group aged 15-44; it then falls off among those aged 45-64 and 65 and over, although the rate is always much higher among males. The trends for age-specific mortality are not the same in all the countries; rather, they show some interesting differences. Among children under 1 year, a downward trend has been noted only in Canada, Peru, Puerto Rico, and the United States, whereas in most of the rest of the countries the rates have clearly risen. In some countries, such as Argentina, the rate has tripled. In Chile, not only has the rate risen but the most recent figure (for 1985-1989) is the highest recorded for the under-1-year age group among all the countries and during all the study periods—234 for both sexes, 258 for males, and 208 for females. It should be added that this was the highest female rate in all age groups in Chile during the period 1985-1989; among males, only the group aged 65 years and over showed a higher rate. An analysis of the specific causes of death from accidents and violence among children under 1 year in the countries in which the rates have risen reveals that most were classified as "other accidents." This means that these deaths were not assigned to motor vehicle or transport accidents, poisoning, drowning, fire, firearm accidents, or falls, but rather were classified under a nonspecific category. Among the group aged 65 and over a clear trend can be distinguished: the rates in this age group are consistently higher than those in all other age groups in all countries and periods (except in El Salvador and Guatemala during the period 1980-1984). This finding should be underscored, since there is a great tendency to emphasize the importance of external causes among adolescents and younger adults; however, these data indicate that the highest rates occur in the elderly population.

Table 2

Trends in age-adjusted deaths rates from external causes (per 100,000 population), by sex, 1960 - 1990

Country	Period							
	1960-1964		1980-1984		1985-1989		1990	
	M	F	M	F	M	F	M	F
Argentina	83.2	24.8	81.5	29.8	80.4	30.2	...	...
Barbados	42.8	12.7	54.7	16.1	53.9	17.4	...	...
Brazil	...	...	123.8	41.8	127.3	43.5	...	...
Canada	88.0	33.6	76.1	29.6	65.0	26.2	59.7	22.6
Colombia	152.7	37.3	188.0	37.5	211.0	39.7	237.1	41.1
Costa Rica	80.2	21.0	75.8	22.8	71.5	22.6	...	...
Cuba	*82.2	*42.5	82.5	47.1	79.1	45.0	91.3	45.4
Chile	152.7	38.6	125.9	33.9	133.1	34.9	...	...
Dominican Republic	86.8	24.7	92.4	31.9	93.8	29.7	...	....
Ecuador	116.3	33.7	134.8	44.5	133.0	43.5	133.4	44.6
El Salvador	177.2	32.8	523.8	67.5	...	...	282.9	49.0
Guatemala	94.2	19.8	202.1	39.8	...	...	...	...
Honduras	...	...	163.6	30.4	...	...	...	...
Jamaica	53.1	16.2	35.5	9.3	32.1	10.2	...	...
Mexico	133.5	29.7	177.5	40.8	158.4	36.4	149.8	36.7
Nicaragua	232.4	44.2	...	...	170.4	67.1	133.4	53.9
Panama	102.6	36.6	110.7	36.2	105.0	31.1	...	...
Paraguay	70.3	17.0	81.1	23.6	79.9	27.3	...	...
Peru	*128.7	*42.8	99.5	32.2	93.4	33.3	...	...
Puerto Rico	93.9	26.6	96.9	18.5	103.9	21.8	106.1	20.8
Trinidad and Tobago	79.7	24.5	93.8	29.5	87.5	27.9	...	...
Uruguay	72.0	23.9	74.7	28.9	73.6	28.4	79.4	29.0
United States	90.7	36.7	85.9	30.2	79.7	28.7	...	...
Venezuela	129.9	35.7	137.6	34.3	125.6	32.3	...	...

* 1965-1969

Note: The population used for standarizing rates was the standard world population given in: WHO, "World Health Statistics, Annual, 1992".

Mortality by Type of External Cause

In order to analyze mortality by type of external cause, the specific causes were grouped into four large categories: 1) Suicide and self-inflicted injury; 2) Homicide, legal interventions, and 3) operations of war Motor vehicle traffic accidents; 4) Other accidents.

Table 3 shows proportional mortality by type of external cause for the majority of countries in the Region, circa 1980 and 1990[8]. In calculating the percentages shown, deaths attributed to "injury unknown whether accidentally or purposely inflicted" were excluded; because this cause accounted for a large proportion of total mortality from external causes in several countries and years, any effort at comparative analysis based on specific reported causes is hindered. For the same reason, the specific rates for the various types of causes were not calculated, since to do so would have implied a significant underestimation of those specific rates—without being able to determine the extent of that underestimation—which would also have made comparisons between countries difficult.

Table 3

Percentage distribution of mortality due to external causes, by type, circa 1980 and 1990

Country	Year	Accidents		Suicide	Homicide, legal interv. oper. of war	Year	Accidents		Suicide	Homicide legal interv. oper. of war
		MVTA	Rest				MVTA	Rest		
Argentina	1979-1980	26	54	12.9	6.7	1989	20	52	14.7	13.6
Bahamas	1980-1981	17	69	0.6	13.9	1987	35	43	2.2	19.4
Barbados	1979-1980	30	53	3.0	14.2	1988	28	43	11.8	17.6
Belize	1980-1981	3.6	92	4.8	...	1987	18	76	4.8	1.3
Brazil	1979-1980	38	33	6.8	23.2	1987	34	31	5.9	28.8
Canada	1980-1981	33	39	24.4	4.1	1990	29	41	26.4	4.4
Colombia	1981	21	33	3.8	42.2	1990	12	21	2.4	65.1
Costa Rica	1979-1980	37	45	8.5	9.3	1989	31	45	13.6	10.4
Cuba	1980	24	34	32.5	9.3	1989	29	33	26.7	11.8
Chile	1981	30	49	13.6	7.2	1989	21	55	16.0	8.3
Dominican Republic	1980-1981	33	43	8.4	16.0	1985	30	47	7.0	16.4
Ecuador	1979-1980	37	50	4.4	8.7	1990	31	46	6.9	16.2
El Salvador	1981	19	30	10.6	41.2	1990	20	28	10.7	43
Mexico	1981	25	55	1.7	18.3	1990	25	56	3.5	26
Nicaragua	1977	24	33	1.3	42.1	1990-1991	28	47	7.9	16.7
Panama	1979	35	57	3.4	4.5	1988-1989	28	41	7.2	**24.2
Paraguay	1979	34	42	4.7	19.9	1987	26	48	7.5	18.2
Peru	1978	26	60	6.8	7.0	1989	17	65	2.3	16.5
Puerto Rico	1981	30	22	17.4	31.2	1990	26	28	17.7	27.9
Suriname	1979-1980	28	40	23.5	8.6	1987	21	35	31.0	13.1
Trinidad & Tabago	1979	40	40	10.5	9.7	1989	22	29	29.1	19.7
Uruguay	1980-1981	20	60	15.0	4.5	1990	20	57	16.7	7.1
United States	1979-1980	33	34	17.3	15.0	1989	31	33	20.4	15.5
Venezuela	1979-1980	45	35	5.9	14.3	1989	36	33	8.4	22.6

* MVTA: Motor vehicles traffic accidents.
** In 1989 was 31.2% and 1988 was 17.2%.

Note: (1) Percentages are based on total deaths from defined external causes, i.e. excluding deaths from injury unknown whether accidentally or purposely inflicted.
(2) The ICD-9 categories included in each cause group are: Motor vehicle traffic accidents (E810-E819); suicide and self inflicted injury (E950-E819); suicide and self inflicted injury (E950-E959); homicide, legal intervention and operations of war (E960-E978) (990-E999); others accidents (E900-E909) (E911-E918) (E921) (E923-E929).

Suicide

In many countries, owing to religious biases or cultural habits, there is a tendency to classify deaths from suicide as unintentional or to indicate that it is not known whether the death was intentional or not. Suicide deaths may also be classified as deaths due to heart problems, thus averting the need to conduct an autopsy to determine the cause.

With some exceptions, particularly those countries in which the homicide rate increased significantly during the 1980s, the proportional importance of suicide among the external causes has increased. Of the 24 countries for which information is available for around 1990, suicide accounted for 20% or more of all deaths from external causes in five: Suriname (31%), Trinidad and Tobago (29%), Cuba (27%), Canada (26%), and the United States (20%). In another seven countries (Argentina, Barbados, Costa Rica, Chile, El Salvador, Puerto Rico, and Uruguay) the proportion was between 10% and 20%. In Cuba the number of suicides increased from 1,011 in 1970 to 2,280 in 1992.

The number of suicides is always higher among males. In Canada and the United States, more than 60% of all suicides by males and females occur in the 15-44 age group, decreasing after the age of 45, especially among women. In Argentina and Uruguay, the frequency of suicide varies little by age and sex. In Costa Rica, fewer than 10% of all suicides involve persons aged 65 and over.

Demographic patterns of suicide vary with marital status. The risk is always higher among persons who are widowed or divorced or who live alone. In the United States adjusted suicide rates among blacks have always been about half the rates registered among whites (6.4 versus 11.6 per 100,000, respectively, in 1992). However, this difference narrows considerably among young people aged 25-34, for both sexes. In that age group, the rates were 19.2 among black males and 4.8 among black females, as compared to 24.7 among white males and 5.0 among white females in 1992[9]. Another group that shows markedly different suicide rates is the indigenous population in Canada where the suicide rate among indigenous people in 1985 was 36 per 100,000 —triple the rate in the general population. Among adolescent indigenous women in Canada the number of attempted suicides is 11 times higher than among other women of the same age.[10]

Although little information exists about suicide methods or instruments, the data that are available help shed some light on the patterns of behavior. In the United States, for example, firearms have become the leading instrument used by women, their involvement increasing from 30% to 41% of cases during the period 1970-1989 and surpassing poisoning; among men, the proportion of suicides involving firearms rose from 58% to 65%, with hanging ranking as the second most common method[11]. In Trinidad and Tobago, a study conducted by PAHO in 1986 on suicides and attempted suicides found that the preferred method for both sexes was poisoning with pesticides, which proved fatal more often among men than among women.[12]

Homicide, Legal Interventions, and Operations of War

This is the highest-impact group of external causes of death, both because of their public visibility and their association with various issues related to development, including urbanization, drug trafficking and use, unemployment, racial and ethnic clashes, changes in family structure, armed conflicts, etc. With very few exceptions, in most countries this group accounts for over 10%—and over 20% in some countries—of all mortality from external causes. Taking into account that the male death rate from all types of accidents and violence has tended to increase in the Region and that this type of external cause is highly concentrated in the male population, it can be assumed, despite underregistration in many countries, that the real specific death rate from homicide is rising. With the exception of Canada and Chile, in which the number of reported homicides remained stable between 1985 and 1990 (slightly under 600 in Canada and around 400 in Chile), homicide has clearly increased in countries with good death registration coverage: in Costa Rica, from 110 to 130 between 1984 and 1989; in Cuba, from 623 to 1,085 between 1980 and 1991; in Puerto Rico, from 481 to 583 between 1984 and 1990; in Trinidad and Tobago, from 34 to 117 between 1982 and 1989; in the United States from 19,819 to 27,440 between 1984 and 1991; and in Uruguay from 85 to 136 between 1985 and 1990. In the countries with incomplete registration of deaths, the number of homicides also increased: in Brazil, from 17,416 to 23,106 between 1983 and 1987; in Colombia, from 9,363 to 24,054 between 1984 and 1990; in Ecuador, from 692 to 1,064 between 1982 and 1990; in Mexico, from 12,727 to 14,520 between 1983 and 1990; in Panama, from 122 to 363 between 1988 and 1989; in Peru, from 481 to 799 between 1983 and 1989; and in Venezuela from 1,834 to 2,445 between 1982 and 1989.

But it is in Colombia that violence, and the homicides associated with it, has escalated the most, especially in the cities. During the period 1987-1992 the number of registered deaths attributed to this cause totaled almost 130,000, as a result of which the crude homicide rate climbed from 36 to 86 per 100,000 population for the period. Homicide moved from ninth place among the leading causes of death in the 1960s to fourth place in the 1970s and first place in the late 1980s, with the problem affecting ever younger population groups. In Medellin the homicide rate in 1990 was 280 per 100,000 population. In addition, by the late 1980s between 45,000 and 50,000 children were being orphaned and between 13,000 and 15,000 persons were being widowed each year as a consequence of violence.[13]

In Brazil, for which data broken down by city are available, there has been a notable rise in the number of homicides among males. Between 1983 and 1987 the reported rates per 100,000 population increased from 53 to 68 in Recife, from 17 to 43 in Rio de Janeiro, and from 53 to 64 in Sao Paulo.[14] Almost all the countries of the Region lack data that would make it possible to analyze the problem of homicide in light of variables other than age, sex, and place of residence. For the United States, however, a breakdown of information by race is available. It reveals that the probability at birth of becoming a homicide victim is 1 in 240 for whites but 1 in 45 for blacks and other ethnic minorities. Between 1979 and 1989 the leading cause of death among young blacks aged 15-19 was homicide committed with a firearm.[15] In 1989, the homicide rate in the black population 15-34 years of age was 113 per 100,000, whereas among whites of the same age group it was 13 per 100,000.[16]

Motor Vehicle Traffic Accidents

In most countries this type of accident is the second most frequent cause of death among all the external causes, after the group "other accidents". The exceptions are those countries in which homicide has increased as a result of internal conflicts-- Colombia, El Salvador, and Nicaragua (the latter during the period 1980-1984). In another three countries (Mexico, Puerto Rico, and Trinidad and Tobago), traffic accidents and homicides account for similar numbers of deaths.

Like homicide, traffic accidents kill many more males than females, and adjusted rates for males are markedly higher than those for females: Argentina (1989), 13.8 and 4.6, respectively; Brazil, (1986) 40.6 and 11.3; Canada, (1990) 18.7 and 7.7; Costa Rica, (1989) 23.0 and 5.7; Mexico, (1990) 28.7 and 7.8; Puerto Rico, (1990) 23.5 and 5.9; Trinidad and Tobago, (1989) 19.0 and 3.2; United States, (1989) 25.2 and 10.9; and Uruguay, (1990) 15.3 and 6.4.

Deaths from this cause are concentrated in the 15-44 age group, in which more than 50% of the deaths occur. The frequency of traffic accident deaths begins to rise from the first years of life until reaching a maximum (with few exceptions) between 15 and 24 years of age; it diminishes slowly between 25 and 44 years of age and then falls more rapidly, although after 45 years of age the number remains much higher than in the first years of life[17].

The picture with regard to traffic accidents changes markedly when the number of deaths from this cause is examined in light of the number of motor vehicles in a country. Table 4 shows registered deaths from motor vehicle traffic accidents and rates per 100,000 vehicles for the last year for which information is available and for a previous period of time[18]. Both private and commercial vehicles were included in the calculation of rates. Although several of the countries listed in the table have high underregistration of mortality, it was considered important to include them because, even though the rates indicated for them underestimate the true level, the figures give a good idea of the differential risks. This rate is intended as an estimation of risk, although a better indicator would be a rate based on the distance traveled by the vehicles; however, that information is available only for Canada and the United States. The differences in the rates are sizable, the gap being as large as 25 to 1 in the case of Ecuador and Canada, where the rates are 555 and 23, respectively. Of the 25 countries, 14 have rates of over 100, which is almost five times the lowest rate. There is a clear negative correlation between the number of vehicles per 1,000 persons and the death rate per 100,000 vehicles: the greater the availability of vehicles the lower the rate, except in Jamaica (and to a lesser extent Paraguay and Peru), which has relatively few vehicles per 1,000 population and also a relatively low mortality rate. The two most developed countries in the Region, Canada and the United States, which have the greatest availability of vehicles, have rates that are the lowest and that are very similar—23 and 25, respectively. In contrast, the countries with fewer than 50 vehicles per 1,000 population (less than 10% of the number available in Canada and the United States), such as Belize, Colombia, Cuba, the Dominican Republic, Ecuador, El Salvador, and Nicaragua, have rates of over 300, which represents a relative risk of over 15 compared to those two countries.

In the countries for which data for different years are available, the general trend of the rate has been downward. The exceptions are Barbados, Brazil, the Dominican Republic, Suriname, and Uruguay. The availability of vehicles increased in all the countries, although this fact is not reflected in Table 7. The greatest reductions occurred in Ecuador, Mexico, Peru, and Puerto Rico. It should be emphasized that the death rates may be seriously underestimated, since in the countries with the highest death rates from motor vehicle traffic accidents, (with the exception of Cuba), mortality is greatly underregistered. Like other indicators, and contrary to what might be expected, mortality from motor vehicle accidents, as measured in relation to the total availability of vehicles in a country, is closely tied to the level of socioeconomic, political, and cultural development of the countries of the Region.

In recent decades the percentages of children and adolescents who drink alcoholic beverages has increased, as has the amount consumed and the frequency of drinking in these age groups. At the same time, the age at which individuals begin to drink has fallen. As a result, the risk of accidents, especially traffic accidents, has risen among young people. Heavy drinking has become an important part of the culture of adolescents, especially among adolescent males and particularly in the developing countries of the Americas. The rise in heavy drinking among young people is reflected in statistics such as the following: in Chile, of the deaths in the 15-24 age group between 1958 and 1981, 69% of the suicides and 71% of the traffic accidents were associated with blood alcohol levels of over 100 mg[19]; and in the United States, young people aged 16-24 accounted for 42% of all alcohol-related traffic fatalities in 1988, although they logged only 20% of the total miles driven[20]. It should also be noted that in the latter country, owing to the application of strict control measures and the imposition of stiff penalties, the percentage of fatal accidents involving drivers under the influence of alcohol decreased from 44% to 38% between 1982 and 1987. In contrast to the situation in the United States and Canada, the vast majority of Latin American and Caribbean countries lack legislation and strict measures aimed at controlling alcohol consumption among drivers. Moreover, the technology needed to rapidly measure blood alcohol levels is in short supply in these countries, which hinders detection of drunk drivers.

Table 4
Registered deaths from motor vehicle accidents and rate per 100,000 vehicles circa 1980 and 1990

Country	Year	Registered deaths	Vehicles per 1,000 population	Rate per 100,000 vehicles	Rate per 100,000 vehicles (circa 1980)	
Argentina	1989	3,103	179	54	1982	71
Bahamas	1987	47	295	66	1984	60
Barbados	1988	28	169	65	...	...
Belice	1987	15	23	373	...	...
Brazil	1987	27,638	88	218	1983	179
Canada	1990	3,645	595	23	1985	29
Colombia	1990	4,382	41	331	1984	401
Costa Rica	1989	389	81	163	1984	201
Cuba	1992	1,934	41	436	1980	483
Chile	1989	941	76	96	1984	101
Dominican Republic	1985	557	24	362	1982	343
Ecuador	1990	2,049	35	555	1982	730
El Salvador	1984	713	23	474	...	...
Jamaica	1983-1985	61	34	78	...	...
Mexico	1990	13,974	117	141	1983	223
Nicaragua	1990-1991	366	20	489	...	...
Panama	1989	320	68	199	1985	204
Paraguay	1987	225	38	151	1985	162
Peru	1989	809	29	132	1983	215
Puerto Rico	1990	548	436	36	1984	55
Suriname	1986-1989	41	114	91	1983-1984	52
Trinidad & Tobago	1985-1989	172	270	53	1980-1981	79
Uruguay	1990	376	139	87	1985	71
United States	1989	46,586	757	25	1984	27
Venezuela	1988	4,296	117	199	1982	188

Source: Deaths: PAHO. Health Situation Analysis Program. Mortality data base.
Vehicles (includes passenger and commercial): United Nations. *Statistical Yearbook, 38th Issue*, New York, 1993.

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Source: Health Situation Analysis Program, HDP/HDA, PAHO.

Dengue Fever in Costa Rica and Panama

In October and November 1993 Costa Rica and Panama detected indigenous transmission of dengue fever in their territories. The reappearance of the disease in these countries occurred after more than 40 years of absence in Costa Rica and more than 50 years in Panama. Consequently, there are no longer any continental Latin American tropical countries free from dengue fever. In the last 10 years, with the exception of Cuba, Bermuda, and the Cayman Islands, dengue fever has been reported by practically all the other Caribbean countries and territories.

The continued progress of dengue fever and of dengue hemorrhagic fever in the Region of the Americas is due to the dissemination and increase in the populations of Aedes aegypti and the consequent circulation of multiple serotypes of the dengue virus. This, in turn, reflects the failure of the program to eradicate Aedes aegypti in the Americas. This program achieved its greatest success at the beginning of the 1960s; however, due to several causes, it gradually disintegrated.

Reports prepared by the health authorities of Costa Rica and of Panama are presented herein describing the occurrence of dengue fever in these countries in 1993. It is noteworthy that the epidemic in Costa Rica was caused by dengue type 1 virus, while that in Panama was caused by dengue type 2 virus. Since they are neighboring countries it was to be expected that they would be affected by the same serotype of the virus.

As of April 1994, only 14 autochthonous cases were registered in Panama, in addition to one imported case. This apparent interruption of the transmission of dengue fever demonstrates the response capacity of the country's dengue surveillance and control program.

Panama

Panama is the only country that has detected autochthonous cases of dengue fever in the absence of an explosive epidemic, which is attributable to the active surveillance of dengue the country has maintained since 15 September 1988. Over a period of five consecutive years this system has documented seven imported cases of dengue that have led to investigation and the taking of appropriate control measures.

As part of the surveillance activities, during the last quarter of 1993, blood samples from 400 patients with a clinical picture similar to that of dengue fever were received: 50% came from the region of San Miguelito (7.25% from the Santa Librada sector), 35% from the Metropolitan Region, 7% from western Panama, 3.7% from Chiriquí, and 3.5% from the other six regions.

On 19 November 1993, eight years after reinfestation of the country with *Aedes aegypti*, the first case of indigenous dengue fever was confirmed since the last dengue epidemic in 1942. Subsequently, 12 cases were confirmed in four blocks of the Third Housing Complex of the Santa Librada sector, Belisario Porras Section, Special District of San Miguelito, Panama City; one case in the Valle de San Isidro four kilometers from Santa Librada; and one case imported from Colombia. The distribution by age group for the autochthonous cases was: three under 15 years of age, three between 15 and 24 years of age, one 37 years of age, and seven between 40 and 50 years of age; nine were females.

Two of the cases presented symptoms of dengue fever in October, 11 in November, and 1 in December 1993. The principal clinical symptoms registered were: fever 93%; chills, headache, or myalgia 71%; arthralgia 64%; retro-orbital pain 57%; and exanthema 43%. Between 7% and 36% of the patients had cough, pruritus, nausea or vomiting, diarrhea, coryza, sore throat, or lymphadenopathy. Eight of the cases sought treatment in a health facility, without any need for hospitalization. Nine of the cases took part in daily activities outside their areas of residence. None of the patients reported travel outside the country, and eight reported having had contact with persons with a similar disease. Eleven blood samples of convalescent patients were examined, and the diagnosis was confirmed solely by serological methods (IgM/IgG tests). In the three remaining patients who were examined in the first day of evolution of the disease, dengue type 2 virus was isolated.

In December 1993 samples of 27 asymptomatic residents of Santa Librada were examined that were found to be negative in the IgM/IgG tests for dengue. In January and February 1994 a study was made of 120 patients suspected of dengue fever from the region of San Miguelito (48%), the Metropolitan Region (45%), and western Panama (7%) in which infection by the dengue virus was ruled out.

These results, from a sector with an infestation index of 6%, should encourage other areas to remain active in their search for febrile patients who will make it possible to make early diagnosis of the disease and undertake appropriate control measures.

Costa Rica

The vector of dengue fever, the *Aedes aegypti* mosquito, was eradicated from Costa Rica in 1960. However, since 1971, frequent reinfestations have been detected, mainly in Puntarenas and Liberia on the Pacific coast and in Limón on the Atlantic coast. Success had been achieved in controlling infestation in these localities. Household entomological surveys carried out in the first half of 1993 again detected the presence of the mosquito, and a subsequent survey demonstrated infestation in all the health regions of the country.

On 9 October 1993 a 37-year-old man residing in the city of Puntarenas, Province of Puntarenas, consulted the health services for an illness characterized by fever and intense retro-orbital and muscular pain, without respiratory symptoms. The physician in attendance suspected dengue fever, and by means of subsequent visit of the patient's neighbors, detected 19 similar cases. In a survey carried out in the same neighborhood during the following two days, the health personnel detected 200 cases with similar symptoms. On 17 October the city of Liberia (Province of Guanacaste) reported the first case in that province, a man who that day had sought consultation in the hospital center.

The Ministry of Health expanded its system for reporting of cases, centered on hospitals and health centers, by including other information sources, such as pharmacies and community leaders.

As of 1 December 1993, 4,103 suspected cases of dengue fever were reported, of which 1,594 were in the Province of Puntarenas, 2,498 in the Province of Guanacaste, and 11 in two provinces in the central valley. These 11 cases were documented as cases imported from Puntarenas and Guanacaste, the only two provinces in which documented transmission of dengue fever has taken place thus far. The maximum peak in reporting of cases was observed in the last week of October, with nearly 100 cases per day. The attack rate for the Province of Puntarenas was 10.5 suspected cases per 1,000 population and for the Province of Guanacaste, 13.3 per 1,000.

The national reference laboratory, INCIENSA, received blood samples for diagnosis of dengue fever from 13% of the suspected cases. Of the samples processed by the central reference laboratory, 17% were positive by IgM-ELISA. Three reference laboratories, the Central Virology Laboratory of the Teaching Hospital of Tegucigalpa, Honduras, the Gorgas Memorial Laboratory, Panama City, Panama, and the Centers for Disease Control and Prevention, Fort Collins, Colorado, United States, reconfirmed the diagnosis and isolated dengue serotype 1 virus from samples of cases sent by Costa Rica.

The predominant clinical characteristics during the epidemic were fever, headache, retro-orbital pain, myalgia, arthralgia, bitter flavor in the mouth (described as "rusty"), and prostration in bed in the most severe cases. In the Province of Puntarenas only one case (confirmed) was reported with hemorrhagic manifestations in a girl seven months of age with positive tourniquet test and petechiae on the palms of the hands and the soles of the feet. Nevertheless, her general state was not severely affected and she recovered rapidly. In the province of Guanacaste some suspected cases were reported with nasal bleeding, but with negative tourniquet tests. No case in the country has required hospitalization and no deaths have been reported related to dengue infection.

The Department of Control of Arthropods and Rodents implemented measures in the epidemic and high-risk areas for immediate reduction of the adult populations of the mosquito, combining chemical control methods and source reduction. At the same time a sustained educational campaign was organized at the national level. From 5 November to 5 December a clean-up campaign was carried out throughout the country, with the motto "Costa Rica can overcome dengue fever." With the support of the Ministry of Education, primary school students went from house-to-house on 25 November (declared National Day for the Elimination of Breeding Sites) to distribute information pamphlets and seek out the presence of breeding sites in homes. Mass dissemination of information on the prevention of dengue fever was carried out through educational radio and television spots, together with the distribution of posters in places of business and in public and private institutions.

In order to maintain active surveillance in the areas free of transmission but at high-risk for dengue fever (through entomological indicators and population movement), a surveillance system using sentinel sites has been set up, initially in the city of Limón, but with a view to extending it to all the other provinces. A seroprevalence study is being carried out in the Province of Puntarenas in order to determine the incidence and distribution of the disease among the population.

As of 15 December 1993 the reporting of cases had declined notably to an average of eight suspected cases per day.

Source: Ministry of Health, Costa Rica and Panama, and Communicable Diseases Program, Division of Communicable Disease Prevention and Control, HCT/HPC,PAHO.

Scientific Advisory Committee of the Caribbean Epidemiology Center

The XX meeting of the Scientific Advisory Cmmittee (SAC) of the Caribbean Epidemiology Center (CAREC) took place during 16-18 March at CAREC Headquarters in Port-of-Spain, Trinidad. The first technical item on the agenda was an analysis of the health situation presented by the Head, Epidemiology Division. Since a presentation on this subject was made at the 1993 SAC meeting, and changes occurring during one year would be relatively small, this year's presentation focused on the linkages between health and the economic situation and the need for information for priority setting, cost-benefit analyses, and decision making. This pointed to the need for CAREC to focus on the core priorities of disease surveillance and information development, including improvement of data quality and computer systems.

Other technical presentations were made on subjects such as surveillance development; new approaches and trends in sexually transmitted diseases including HIV/AIDS, as well as STD behavioral interventions; immunology research and development; tuberculosis status report; dengue review; and injury surveillance.

The CAREC Director made a short presentation on milestones, challenges and issues facing CAREC, as well as plans for 1994. Financial matters are of critical importance in this regard, and he reported that a record level of participation in quota payments was achieved in 1993 (18 countries by mid-November). Nonetheless, the Center continues to experience serious financial difficulties and 1993 ended with CAREC's first year-end deficit since 1987.

A number of working goup sessions were held, on: communications, behavioral interventions, health economics; quality assurance; surveillance development and disease control; health situation analysis; vector control; and AIDS/STD control.

SAC commended CAREC staff and their Director for the amount and quality of work undertaken during 1993. Dr. Harold White was elected as the new Chair, and SAC thanked the outgoing Chair, Dr. David Picou, for his dedication and leadership and for the invaluable service he has provided to CAREC. Recognizing that financial constraints are likely to continue, SAC recommended that it meet biennially instead of yearly, beginning in 1996, with more limited internal reviews in intervening years.

Many of the SAC reccommendations are of general interest, and are summarized below:

- CAREC should devise processes (with multi-sectoral input) that will facilitate the development of national and local capacity to collect and analyze surveillance data; it should also identify mechanisms to influence policy and decision makers to support commitments to surveillance.
- CAREC should continue to collect, adapt, and develop materials suitable for teaching required epidemiological and statistical skills at national, district, and local levels.
- Annual, joint meetings of laboratory directors and national epidemiologists should be hosted by CAREC, as financial resources permit.
- CAREC should review injury mortality profiles with its member countries, developing methodologies for handling data for countries with small populations, where rates are subject to wide fluctuations; it should also extend its activities to areas other than motor vehicle-related injuries, as indicated by the profiles; and it should assess the quality of injury mortality statistics, promoting the use of standard ICD-based classifications to ensure comparability.
- CAREC should assist member countries to undertake analysis of current health situations and promote application of uniform methodologies which will facilitate comparison over time and among localities. It should also assist member countries in the identification and acquisition of information needed to inform decision makers and undertake planning.
- In recognition of established goals and targets of the Caribbean Cooperation in Health initiative (CCH), and in connection with the subject of health situation analysis, SAC recommended that CAREC support its member countries in identification of options leading to achievement of priority objectives.
- CAREC should facilitate development of a laboratory testing quality assurance program for CAREC and its member countries, with the objective of putting effective quality assurance programs in place in public and private laboratories by the year 2000.
- CAREC should take an active role in facilitating implementation of the *PAHO Guidelines for the Prevention and Control of Dengue and DHF in the Region of the Americas*; it should develop mechanisms to continue insecticide sensitivity testing in CAREC member countries; and it should

use its communications expertise in support of community-based vector-control program development.

- A cost recovery policy for immunological services should be established for the Center, including a formula for computing total costs and charges for such services. A two-year pilot cost-recovery program for selected activities should be established, to test the feasibility of this strategy.

The CAREC Council met during 21-22 March, immediately following the SAC meeting. Their deliberations included consideration of SAC recommendations; all were accepted, with relatively minor modifications. Among other things, Council noted that surveillance and health situation analysis are closely linkec and should be integrated in CAREC member countries, and that skills in health economics should support and be incorporated into health situation analysis. The Council encouraged CAREC to seek ways of enabling Aruba and the Netherlands Antilles to access technical cooperation prior to their official entry as members (anticipated for January 1996).

Epi*Info* and Epi*Map*

Public Domain Software for Public Health

New versions and Spanish and Portuguese Translations

EpiInfo and **EpiMap** are public-domain software systems for IBM-PC-compatible micro-computers, produced by the U.S. Centers for Disease Control and Prevention, Atlanta, Georgia, with the support of the World Health Organization. The coordinator of the production of both packages is Dr. Andrew Dean. **EpiInfo** is a complete database and statistics system for making questionnaires and entering, processing and analyzing epidemiological data. **EpiMap** produces shaded or dot density maps to represent cases or other numeric values, using maps supplied with the system, or drawn by the user. Both packages are very user friendly and **EpiInfo** is possibly the best known and most disseminated package used by epidemiologists in the Latin American and Caribbean countries.

EpiInfo version 5 and **EpiMap** version 1 have been translated into Spanish, both the programs and the manuals, by Dr. Juan Carlos Fernandez-Merino of the Andalucian Department of Health, in Spain. The Spanish translation of **EpiMap** is now being field tested and will be available for distribution by the end of this year. Many Representatives of the Pan American Health Organization in Latin America and the Caribbean have been active in the distribution of **EpiInfo** both in English and in Spanish and in promoting training courses for Epidemiologists to use the package. **EpiInfo** in Spanish is also available from a distributor: USD, Inc. - 2075A West Park Place - Stone Mountain, GA 30087 U.S.A. - Telephone (404) 469-4098 - FAX (404) 469-0681.

A Portuguese Version of the manual of **EpiInfo** Version 5, is available from: Dr. José Cassio De Moraes, Professor, Department of Social Medicine, School of Medicine of Santa Casa de São Paulo, R. Cesario Motta 112, São Paulo Brasil.

The programs and manuals are not copyrighted and may be freely copied and distributed to others.

Vaccines Against Meningococcal Meningitis: Current Status

Etiologic Agents and the Vaccines

Virulent strains of *Neisseria meningitidis* cause sporadic cases and periodic outbreaks or epidemics of meningitis; the strains that belong to serogroups A, B, and C are responsible for 90% of the cases of meningococcal meningitis in the world. Serogroups B and C are generally associated with the endemic disease, whereas the incidence of serogroup A rises during epidemic periods. Countries such as Cuba, Brazil, Colombia, Chile, Argentina, Uruguay, and the Scandinavian countries recently have experienced increases in serogroup B meningitis, especially in children under five years of age, the group with the highest attack rates.

Polysaccharide-based vaccines proved to confer immunity against serogroups A, C, Y, and W135 in the 1960s (1) and 1970s, and have been available on the market since 1981. Their efficacy was age-dependent: the vaccine for serogroup A confers protection in children over 6 months and the vaccine for serogroup C is not effective in children under two years (2,3). The vaccines for serogroups Y and W135 act in a manner similar to that for serogroup A. Nonetheless, the polysaccharide vaccine for serogroup B is poorly immunogenic and does not protect against the disease. As a result, several alternatives are under study to develop vaccines for this serogroup based on the outer membrane protein of the *N. meningitidis* bacteria, serogroup B, and other surface antigens.

The alternatives under study include development of the serogroup B polysaccharide chemically modified to contain N-propionyl in place of N-acetyl groups coupled to tetanus toxoid (4), the *E. coli* K92 polysaccharide, which cross-reacts with serogroup B when conjugated with tetanus toxoid (5), cloning of the outer membrane protein incorporated into the liposomes, lipopolysaccharides (LPS)-depleted outer membranes or the outer membrane protein of the bacteria. In addition, use of the detoxified lipopolysaccharide or oligosaccharides derived from the LPS (synthetic in some cases) combined with outer membrane protein (OMP), or incorporated into liposomes, is also under study.

In the early 1980s the first vaccines were derived from the outer membrane protein of subgroup B, serotype 2 made of insoluble protein aggregates; they showed low immunogenicity. The more recent vaccines contain outer membrane protein, capsular polysaccharide to maintain solubility of the vaccine, and aluminum hydroxide adjuvant (6).

Efficacy Trials Published to Date

The most recent efficacy trials for several vaccines against meningococcal meningitis are the following:

Walter Reed Army Research Institute, Washington, D.C., USA: Vaccine prepared with the B:15:P1.3 strain, and containing lipopolysaccharide-free outer membrane protein, with serogroup C polysaccharide added, in an aluminum hydroxide adjuvant. The double-blind randomized case-control field trial, was conducted in Iquique, Chile from 1987 to 1989. Two doses of 100 ug protein were administered to 40,000 volunteers aged 1 to 21 years at an interval of 6 weeks. The subjects followed up for 20 months. Overall efficacy was 50%, but protection was age-dependent. Efficacy was 70% in the 5 to 21 year-old age group, whereas no protection was observed in children aged 1 to 4 years (7). Researchers at Walter Reed are continuing their work to develop another generation of the serogroup B vaccine.

National Institute of Public Health, Oslo, Norway: The vaccine contains the outer membrane protein depleted of lipopolysaccharide of the B:15:P1.16 strain, with 3% to 6% high molecular weight protein. It has no capsular meningococcal polysaccharide. To stabilize the protein 3% sucrose was added, and aluminum hydroxide was used as an adjuvant. The vaccine contains class 1, 3, 4, and 5 proteins and was formulated to contain 25 ug of protein per dose; it was administered in two injections at an interval of 6 weeks. The field study, done in 1988, was conducted as a randomized double-blind placebo-controlled trial with youths 13 to 15 years old. Epidemiologic surveillance continued for 29 months; the observed efficacy was 57%. The authors concluded that the vaccine's efficacy is too low to justify its use in vaccination programs (8).

Instituto Carlos Finlay, Cuba: The Cuban vaccine contains the outer membrane from the B:4:P1.15 strain with traces of lipopolysaccharides, polysaccharide from serogroup C, and high molecular weight protein complex. Aluminum hydroxide gel is used as an adjuvant. Each dose contains 50 ug of protein, 50 ug of polysaccharide, and 2 mg of aluminum hydroxide. The randomized double-blind placebo-controlled efficacy trial was conducted in Cuba in 1986-87 among 100,000 schoolchildren (9 to 14 years old). An efficacy of 83% was observed.

A case-control study in São Paulo, Brazil, in which 2.4 million children were vaccinated, demonstrated that the vaccine's efficacy was age-dependent. In children older than 48 months, the efficacy was 74% (confidence interval from 16% to 92%), whereas in children 24 to 47 months old it was 47% (confidence interval -72% to 84%) and in children under 24 months it was -37% (confidence interval less than -100% to 73%) (10).

Reactogenicity of the vaccine: Systemic adverse reactions were mild for all the vaccines studied. Fever, headache, or nausea may occur in up to 10% of persons vaccinated. Local reactions consisting of erythemas, with or without induration and soreness, were recorded in adult volunteers (11,12) but less frequently in children (13).

In Cuba the study of reactogenicity and immunogenicity in children 6 months to 12 years, carried out in 1987, found no significant adverse reactions. The maximum temperature registered among vaccinated groups and those who received the placebo was 37°C or less. The remaining adverse events were erythema and soreness at the point of injection; these were significantly greater in persons who received vaccine than these who received placebo (14).

The analysis of the Norway trial reported only rare and mild adverse reactions (8). None were reported in the Brazil trial (10).

Other Ongoing Studies

In view of the importance of meningococcal meningitis and the current context of scientific and technological development, the World Health Organization's Global Program on Vaccines is supporting a series of research projects that apply complex technologies, such as developing conjugated vaccines, cloning important bacterial proteins, and other technologies, in order to develop more efficacious vaccines for children less than 2 years old (16).

At the request of the Government of Brazil, PAHO's Regional System for Vaccine Development (SIREVA) prepared the Master Plan for the development of an improved vaccine for serogroup B. At present this project includes the participation of three Brazilian institutions: the Instituto Adolfo Lutz and the Instituto Butantan in São Paulo, and Bio-Manguinhos/FIOCRUZ in Rio de Janeiro.

The World Health Organization recently organized a comparative trial, among 400 adolescents, on the immunogenicity and reactogenicity of 2 and 3 doses of the vaccines produced in Norway and Cuba. The trial is under way in Iceland, and is expected to conclude in July of this year.

In Chile, the health ministry undertook another comparative trial on the immunogenicity of these two vaccines, administering them to different age groups, including children under 1 year old and young adults.

The health ministry of Argentina is considering an efficacy trial of the vaccine in the province of Las Pampas.

Conclusions and Relevance for National Immunization Programs

The vaccine produced in Norway is stil considered experimental. The vaccine produced at Walter Reed Army Research Laboratory continues to be in the research and development phase. The vaccine produced in Cuba complies with Good Manufacturing Practices and has been registered in several countries of Eastern Europe and Africa, and in some countries of Latin America (Argentina, for use in persons over 4 years; Brazil, where it is registered on a provisional basis; Colombia, registered and licensed; Chile, in process; and Cuba).

Based on the knowledge and published data from the efficacy trials conducted to date, it may be concluded that the vaccine produced in Cuba is efficacious in the over-4-year old group. In one of the trials, low efficacy was observed among children aged 2 to 4 years and little or no efficacy was seen in those under 2 years, the group generally most affected by the disease. However, these trials results are inconclusive and somewhat contradictory. It is crucial therefore that research continue with a view to developing an improved vaccine against serogroup B of meningococcal meningitis, and that the development of case-control efficacy trials continue to determine with certainty, among other things, if the vaccine is efficacious among children under 4 years old.

In those countries or regions that are facing th problems that stem from the increased incidence of meningococcal meningitis, especially of serotype B, it is advisable that the decision to use the vaccine currently available takes into account the available data on attack rates, known age-specific efficacy, and the analysis of the prevalent serogroups and serotypes of *N. meningitidis*, in addition to its age specific cost-benefit.

PAHO is available to any country or subregion that intends to design efficacy trials, to assist in standardizing protocols and to follow up as needed for comparisons with similar studies.

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Source: This article was prepared collaboratively by the Expanded Program on Immunization, Special Program on Maternal and Child Health and Population, the Division of Communicable Disease Prevention and Control, and the Division of Health and Development.

Fundamental principles of official statistics

The Economic Commission for Europe (ECE), at its forty-seventh session (1992), adopted decision C (47) on the fundamental principles of official statistics in the ECE region. This decision had been proposed unanimously to the ECE in 1991 by the Conference of European Statisticians. The Conference was of the opinion that decision C (47) was of universal significance, and requested that its contents be communicated to the United Nations Statistical Commission and to the other regional commissions of the United Nations.

In 1992 the Statistical Division of the United Nations Secretariat circulated a copy of the decision to all members of the Statistical Commission, the regional commissions and a number of other international organizations. Those countries and organizations which responded expressed support for similar principles at the global level.

The fundamental principles were considered by the Statistical Commission's Working Group on International Statistical Programs and Coordination at its sixteenth session (1993). The results of these deliberations, as well as the fundamental principles, were considered by the Statistical Commission at its special session (1994). The principles were accepted verbatim by the Commission and are reproduced below in their entirety.

1. Official statistics provide an indispensable element in the information system of a democratic society, serving the government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honor citizens' entitlement to public information.

2. To retain trust in official statistics, the statistical agencies need to decide according to strictly professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.

3. To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics.

4. The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.

5. Data for statistical purposes may be drawn from all types of sources, be they statistical surveys or administrative records. Statistical agencies are to choose the source with regard to quality, timeliness, costs and the burden on respondents.

6. Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes.

7. The laws, regulations and measures under which the statistical systems operate are to be made public.

8. Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.

9. The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.

10. Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

Meetings, courses and seminaries

III Pan American Congress on Epidemiology, Córdoba, Argentina.

The Epidemiology Chapter of the Argentine Society for Hospital Administration and Medical Care, a branch of the Argentine Medical Association, and the School of Public Health of the School of Medical Sciences, National University of Córdoba, are promoting the III Pan American Congress on Epidemiology, to be held in the city of Córdoba, Argentina, 17-21 October 1994. The principal theme of the Congress is Epidemiology and the Organization and Evaluation of Health Services. Its main objective is to serve as a multidisciplinary and multi-institutional forum for the presentation, discussion, and dissemination of scientific papers and for sharing experiences in the field of epidemiology.
In addition, the aim is to strengthen epidemiological practice in the country, stimulate ideas with respect to the discipline, encourage the generation of knowledge about health, and promote the dissemination and utilization of this knowledge to define policies for reorienting national and international priorities in the organization and evaluation of health services. For additional information contact:

Escuela de Salud Pública
Pabellón Argentina, primer piso
Ciudad Universitaria, Córdoba, Argentina.
Telephone and Fax: 051-608812

The VII International Congress of the World Federation of Public Health ssociations

The VII International Congress of the World Federation of Public Health Associations will be held in Bali, Indonesia from 4-8 of December of 1994. The meeting is also sponsored by the World Health Organization, the Pan Americana Health Organization, the United Nations Childrens Fund, the United Nations Population Fund and the United Nations Development Programme.

The subject of the Congress will be Health, Economics and Development: Working Together for Change. For additional information contact:

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First Pan American Conference on Public Health Education

The Pan American Health Organization is sponsoring the I Pan American Conference on Public Health Education, joining together the efforts of the Latin American and Caribbean Association for Public Health Education (ALAESP) and the American Association of Schools of Public Health (ASPH). The Conference will be held in Rio de Janeiro, Brazil, 14-18 August 1994. This conference is part of several activities organized in commemoration of the fortieth anniversary of the Nacional School of Public Health of the Oswaldo Cruz Foundation in Rio. The Conference is based on the progress made through the PAHO/WHO project on "Development of the Theory and Practice of Public Health," and will be centered on the topic "Democracy and Equity: Rethinking Public Health." The contributions related to this initiative included the publication of the books "The Crisis of Public Health Reflections for the Debate" (1992) and " On the Theory and Practice of Public Health: One Debate, Several Perspectives" (1993), in addition to the reports on the national and subregional debates carried out in these subject fields in Latin America.
The agenda items include panel discussions on Contemporary Reforms in the Health Field: Proposals and Experiences, Current Approaches to the Theory and Practice of Public Health as well as presentations on specific thematic areas and group discussions on training in public health.

PAHO's Epidemiological Bulletin is published quarterly in English and Spanish.
Catalogued and indexed by the United States National Library of Medicine
Printed on acid-free paper.

PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION
525 Twenty-Third Street, N.W.
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