Epidemiological Bulletin

PAN AMERICAN HEALTH ORGANIZATION

Vol. 15, No. 2 INDEXED 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

IN THIS ISSUE . . .

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.

References

1. A. D., López. Causes of Death in Industrial and Developing Countries: estimates for 1985-1990. In: *World Bank Disease Control Priorities in Developing Countries*. New York. Oxford University Press, 1993.

2. World Health Organization. Report of the Second Global Liaison Meeting on Accident and Injury. In: Stansfield, S., et al: Injury (Chapter 25) : 1986.

3. World Health Organization. Manifesto for Safe Communities. Geneva: World Health Organization, 1989.

4. Rice, D. P. Cost of Injury in the United States: a report to the Congress. In Stansfield, S. Washington, D.C., 1989.

5. World Bank. World Development Report 1993: Investing in Health. Washington, D.C. : World Bank, 1993.

6. Pan American Health Organization. Health Statistics from the Americas. Washington, D.C. : PAHO (Scientific Publication No. 542), Edition 1992.

7. Ibid 6

8. Organización Panamericana de la Salud. Las Condiciones de Salud de las Américas. Washington, D.C. : OPS, 1986. Ibid, 1990.

9. United States. Monthly Vital Statistics Report: Annual Summary of Births, Marriages, Divorces, and Deaths. Washington, D.C. : CDC/NCHS, September 28, 1993.

10. Paltiel, F. L. Mental Health of Women in the Americas. In: *Gender, Women, and Health in the Americas*. Washington, D.C. : PAHO (Scientific Publication No. 541.), 1993.

11. US. Department of Health and Human Services. Health United States 1991. Washington, D.C. : USDHHS, 1992.

12. Paltiel, F.L. Op. cit. 10

13. Franco, S. Violencia y salud en Colombia. Santa Fé de Bogotá: OPS, 1993.

14. Ortiz, L. P. La Violencia en las Regiones Metropolitanas del Brasil. Paper presented at the Seminar on Causes and Prevention of Adult Mortality in Developing Countries. Santiago, Chile, October 1991.

15. Jeanneret O., Sand E. A. Intentional Violence among adolescents and young adults: an epidemiologic perspective. *"World Health Statistics Quarterly"*, 46 (1) : 1993.

16. U.S. Dept of Health and Human Services. Op cit. 11

17. Op. cit. 6

18. In: United Nation Statistical Yearbook 38 ed. 1993 (vehicles data). In: Jeanneret, O. Op. Cit 15 (mortality data).

19. Henríquez-Mueller M.H. and Yunes J. Adolescencia: equivocaciones y esperanzas. In: OPS. *Género, mujer y salud en las Américas*, 1993.

20. Op. cit. 2

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