

TRAFFIC ACCIDENTS: A GROWING PUBLIC HEALTH PROBLEM¹

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The streets, roads, and highways of the Americas are being congested as never before, owing to the astounding increase in vehicular traffic. This contribution reviews the extent of the problem, certain approaches for attacking it, and some of its implications for public health.

Introduction

Traffic accidents are no longer a monopoly of the rich countries. They have become a worldwide epidemic that causes some seven million casualties and takes some 250,000 lives each year (1).

In the Region of the Americas, traffic accidents are the leading cause of death for the 14-25 age group in at least nine countries, and no less than the second most important cause of death for this age group in all the rest of the countries. To give some illustrative examples, 1975 traffic mortality in Argentina accounted for 2 per cent of all deaths; Ecuador recorded 14.7 traffic deaths per 1,000 vehicles in 1969 and 16.0 in 1975, these latter being the highest figures in the Region.

Traffic accidents generally have a disproportionate impact on teenagers and young adults in both developed and developing countries. For instance, in the United States 39 per cent of all deaths due to motor vehicle accidents in 1975 affected the 15 to 24 age group. It is worth noting,

however, that in Canada motor vehicle accidents are currently the leading cause of death in age groups spanning the 14-to-40 range.

There is no doubt that traffic accidents have become a grave public health problem throughout the Hemisphere. Their significance is brought out by their status as a leading cause of death, by their clear tendency to increase in both absolute and relative terms, and by their especially severe impact on adolescents and young adults entering their most productive years. Many of these accidents are the result of some defective social behavior on the part of drivers, pedestrians, or others. And many result in severe economic losses, considering not only the cost in lives, but also the time that permanent or temporary disability keeps victims out of work and the increasing costs of medical and rehabilitative care. For all of these reasons, the public health sector clearly has an urgent mandate to accelerate its efforts to prevent the death and disability that traffic accidents cause.

Current Data

Our understanding of the current motor vehicle accident situation depends on available statistics. Unfortunately, the data that can be obtained in the Latin American and

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Latin America's toll of traffic accidents, injuries, and deaths has grown in recent years and will probably keep rising.

These accidents are a particular threat to young people, being either the foremost or second leading cause of death among those 14 to 25 in every country.

Caribbean countries are far from uniform. Definitions vary, norms and procedures for recording differ, data collection systems and methods do not ensure completeness, and a certain amount of inaccuracy exists.

The problem of definitions, which is in fact a worldwide problem, is especially important. In regard to mortality, for example, most countries attribute a death occurring within 30 days of an accident to that accident. But other countries, such as Canada and the United States, extend the period up to one year, while in Mexico only those deaths occurring at the site of the accident are counted. Country-to-country variations of this kind make comparisons both difficult and inaccurate. This problem is compounded by the fact that the available statistical information does not cover a long enough time period to permit trends to be studied.

Despite these obstacles, Adriasola, et al. (2) gathered and published valuable information on this subject in 1972. Their work emphasized the need to regard traffic accidents as a serious public health problem.

The present article seeks to further update knowledge about this problem on the basis of information available for 1969 and 1975 or comparable years. The data obtained are shown in Table 1. It can be seen that during the period covered the

number of registered vehicles increased by at least 50% in 18 of the 25 countries involved, national increases ranging from 2% in the United States to 343% in Paraguay; other major increases occurred in the Dominican Republic (207%), Nicaragua (127%), Costa Rica (122%), and Bolivia (115%).

Regarding the number of accidents, these rose by over 100 per cent in three countries: Colombia (245%), Costa Rica (109%), and the Dominican Republic (106%). Only two countries showed any decrease in the number of accidents, these being Chile (-5%) and Peru (-3%). No explanations for these declines are available.

Along with the greater numbers of vehicles and accidents, nine of the ten countries yielding data showed an increase in the number of persons injured. The only exception to this upward trend was the United States, where there were roughly 100,000 fewer injuries in 1975 than there had been in 1969.

With regard to the number of deaths, comparable data were obtained for 20 countries. Eighteen of these showed increases, specific percentages varying from 6% in Paraguay to 263% in Guatemala. Only two countries were found to have fewer deaths in 1975 than in 1969. These

Table 1. Basic information relating to traffic accidents in 28 countries for 1969 and 1975 or the closest comparable years (see footnotes).

Country	Population (thousands)		Registered vehicles		Accidents		Persons injured		Deaths	
	1969	1975	1969	1975	1969	1975	1969	1975	1969	1975
Argentina	23,617	25,383	1,804,700	2,934,547 ^a	29,766	...	26,595	70,000	3,524	6,760 ^b
Barbados	247	245	14,700 ^c	22,000 ^a	2,432 ^d	...	981 ^k	...	36	44
Belize	120	140	5,500	9,061	...	760	...	336	1	...
Bolivia	4,680	5,634	39,400	84,682	3,378	6,186	...	3,448	...	664 ^f
Brazil	89,376	107,145	2,490,900	4,681,200 ^g	129,080	...	83,972 ^d	...	...	...
Canada	20,772	22,831	7,746,800 ^d	11,571,700	...	647,302	...	220,941	5,696	6,061 ^h
Chile	9,351	10,253	254,500	349,200 ^g	19,683	18,730 ^g	18,000	18,172 ^g	1,668	932
Colombia	19,825	23,542	264,300	450,000	9,872	34,078	7,622	11,735	2,026	3,274
Costa Rica	1,634	1,968	51,600	114,841 ^g	8,116	17,010 ^g	2,874	8,043 ^g	201	299 ^g
Cuba	7,631	9,330	265,700	...	...	...	...	...	850 ^d	928 ^g
Dominican Republic	4,029	4,697	51,400	158,191	7,846	16,233	5,042	7,066	286	452
Ecuador	5,695	6,733	56,300	84,500 ⁱ	5,975	...	...	...	837	1,350 ^g
El Salvador	3,266	4,007	47,200	80,070 ^g	6,484	7,583 ^g	3,011	4,444 ^g	296	568 ^g
Guatemala	4,717	5,828	52,800 ^c	96,648	...	2,389	...	5,499	261	984
Guyana	719	791	19,800	32,800 ^a	...	...	...	...	...	...
Haiti	4,160	4,575	16,418	17,708	3,179	5,931 ^a	412	496 ^a	...	...
Honduras	2,495	3,037	23,500	37,661 ^g	...	...	...	...	...	...
Jamaica	1,912	2,029	76,700	108,300 ⁱ	...	8,443	...	4,256	176	456
Mexico	47,267	60,145	1,465,800	2,634,642	72,419	113,290	52,724	...	...	8,887 ^g
Nicaragua	1,783	2,155	22,900	52,000 ^a	...	...	...	...	173	329 ^g
Panama	1,372	1,668	53,200	88,300 ^g	6,767	12,377 ^g	3,018	...	114	250 ^g
Paraguay	2,231	2,647	13,500	59,808	...	1,438	...	...	147 ^j	156
Peru	12,772	15,615	306,900	482,411	38,547	37,532	14,571	15,650	1,336 ^d	2,866 ^g
Trinidad and Tobago	1,021	1,080	86,400	111,700 ^g	15,514	...	...	...	148	217 ^g
United States	199,312	213,032	99,563,400	139,200,000	13,700,000	16,500,000	1,953,100	1,846,000	56,400	46,000
Uruguay	2,818	3,064	232,300	237,300 ^g	...	...	...	...	177	201
Venezuela	10,035	11,993	863,784	...	75,272	113,674	33,844	45,263	2,424	4,001

^aData for 1973.^bEstimate received from the National Commission for the Prevention of Traffic Accidents, Health Ministry of Argentina.^cData for 1966.^dData for 1968.^eData for 1967.^fData from the Bolivian Department of Technical Operations^gData for 1974.^hData from the Canadian Department of Transportation.ⁱData for 1972.^jData for areas with information.^kData from the Barbados Division of Highway Safety and Education.

... = Data not available.

were the United States and Chile, where respective decreases of 19% and 56% occurred.

On the basis of this information, it was possible to estimate the death rates per 100,000 people in most countries, the number of inhabitants per vehicle, and the number of accidents, injuries and deaths per 1,000 vehicles. These data are shown in Table 2. As can be seen, traffic accident death rates per 100,000 population tripled in Guatemala, almost tripled in Jamaica, and almost doubled in Panama and Peru. Overall, 15 of 20 countries for which comparable data were available showed some increase in the death rate, and seven showed increases above 50%. The remaining five countries showed lower death rates per 100,000 inhabitants at the end of the period covered; the largest reductions occurred in Chile (-49%) and the United States (-24%). Smaller reductions were reported in Canada, Cuba, and Paraguay.

Another preliminary conclusion to be drawn from the Table 2 data is that the ratio of people to vehicles has fallen nearly everywhere except in Haiti and Uruguay. Some countries, such as Bolivia, the Dominican Republic, and Paraguay, have experienced such a dramatic rise in the number of vehicles that the ratio has dropped 50 to 75 per cent. This people-to-vehicle ratio is naturally lower in the more industrialized countries, there being two persons per vehicle in Canada and 1.5 in the United States. But if one considers the developing countries' rapidly growing populations and faster-growing accumulations of motor vehicles, it is clear that more and more people and vehicles are crowding onto the roads. And since accident prevention measures are generally inadequate or non-existent, the risk of accidental encounters is rising in direct proportion to the growing flood of road users.

A striking calculation has been made in the case of Mexico. In 1973 some 8,000 people died at the scene of traffic accidents

(3); this means nearly *one person an hour, day and night, every day of the year*. Yet this figure does not take into account the many who died later of accident-associated injuries or the thousands of persons—at a ratio of roughly 20 to 35 injuries for every death—who remained disabled, in one way or another, for the rest of their lives. The cost of these deaths and disabilities to individuals, to families, and to society, in both human and economic terms, was so great as to defy calculation.

PAHO's Role

The Pan American Health Organization has taken an increasingly active role in mobilizing Hemisphere efforts to deal with the problem of motor vehicle accidents. The XX Meeting of PAHO's Directing Council (Washington, D.C., 1971) included this matter on its agenda and gave serious consideration to data gathered on rates of injury, death rates, and total deaths (by age) attributed to vehicular accidents. Recognizing the problem as one of public health concern for the Americas, the Council called for continued and intensified collaboration with national, inter-governmental, and non-governmental organizations working in this field. Specifically, it requested that advice and assistance be given to countries in order to encourage epidemiologic studies of traffic accidents, uniform classification and reporting standards, adequate control measures, and training of specialized personnel. The Council also recommended that the Governments should give priority to developing coordinated prevention programs, establishing or improving services to provide victims with immediate and effective medical care, improving and extending drivers' education programs, revising procedures for granting drivers' licenses, strengthening traffic safety education programs, and revising existing legislation (4).

Over the next few years the Organization

Table 2. Rates calculated from data in Table 1: Deaths per 100,000 inhabitants; number of persons per vehicle; and accidents, injuries, and deaths per 1,000 vehicles.

Country	Deaths per 100,000 population		No. of inhabitants per vehicle		Accidents per 1,000 vehicles		Injuries per 1,000 vehicles		Deaths per 1,000 vehicles	
	1969 ^a	1975 ^a	1969 ^a	1975 ^a	1969 ^a	1975 ^a	1969 ^a	1975 ^a	1969 ^a	1975 ^a
Argentina	14.9	26.7	13.1	8.6	16.5	...	14.7	23.8	2.0	2.3
Barbados	14.6	18.0	16.8	11.1	165.4	...	66.7	...	2.4	2.0
Belize	0.8	...	21.8	15.5	...	83.9	...	37.1	0.2	...
Bolivia	...	11.8	118.8	66.5	85.7	73.0	...	40.7	...	7.8
Brazil	...	...	35.9	23.0	51.8	...	33.7	...	...	...
Canada	27.4	26.5	2.7	2.0	...	55.9	...	18.2	0.7	0.5
Chile	17.8	9.1	36.7	29.4	77.3	53.6	70.7	52.0	6.6	2.7
Colombia	10.2	13.9	75.0	52.3	37.4	77.0	28.8	26.1	7.7	7.3
Costa Rica	12.3	16.6	31.7	17.0	157.3	148.0	55.7	70.0	3.9	2.6
Cuba	11.1	9.9	28.7	...	...	...	...	...	3.2	...
Dominican Republic	7.1	9.6	78.4	29.7	152.6	102.6	98.1	44.7	5.6	2.8
Ecuador	14.7	20.0	101.2	79.7	106.1	...	...	...	14.9	16.0
El Salvador	9.1	14.2	69.2	50.0	137.4	94.7	63.8	55.5	6.3	7.1
Guatemala	5.5	16.9	89.3	60.0	...	24.7	...	56.9	4.9	10.0
Guyana	...	...	36.3	24.0	...	...	...	...	...	...
Haiti	...	...	253.4	258.4	193.6	335.0	25.1	28.0	...	...
Honduras	...	...	106.2	80.6	...	...	...	...	...	...
Jamaica	9.2	22.5	24.9	18.7	...	77.9	...	39.3	2.3	4.2
Mexico	...	14.8	32.2	22.8	49.4	43.0	36.0	...	...	3.4
Nicaragua	9.7	15.3	77.9	41.4	...	...	...	...	7.6	6.3
Panama	8.3	15.0	25.8	19.0	127.2	140.2	56.7	...	2.1	2.8
Paraguay	6.6	5.9	165.3	44.2	...	24.0	...	...	10.9	2.6
Peru	10.5	18.4	41.6	32.4	125.6	77.8	47.5	32.6	4.4	6.0
Trinidad and Tobago	14.5	20.1	11.8	9.7	179.6	...	...	...	1.7	1.9
United States	28.3	21.6	2.0	1.5	137.6	118.5	19.6	13.3	0.6	0.3
Uruguay	6.3	6.6	12.1	13.0	...	...	...	...	0.8	0.8
Venezuela	24.2	33.4	11.6	...	87.1	...	39.2	...	2.8	...

^aOr nearest comparable year (see Table 1).

... = Data not available.

sponsored a series of seminars on such specific aspects of the problem as epidemiology, safety education, licensing, emergency medical services, alcoholism and drugs, legislation, and coordination among responsible agencies. Recommendations were formulated on each subject, and these have been implemented in some cases—with varying degrees of coverage and success.

Strategic Considerations

The growth of the traffic accident problem in recent years, and the expectation that modernization processes will cause this growth to continue, suggests the need for a more aggressive strategy—one that would make full and well-coordinated use of available (and potential) manpower and financial resources. Naturally, the main responsibility for implementing such a strategy and any actions that might be agreed to must rest with the Governments themselves. PAHO, together with other interested organizations, can only contribute within the limited ambit of its designated functions and responsibilities.

All in all, analysis of the problem to date indicates that important benefits can be gained by encouraging and supporting the following measures:

1) *Development and Utilization of Uniform Nomenclature and Statistical Systems*

This would promote correct recording of traffic accident information, thereby helping to make the available data more accurate and complete. It would also facilitate collection and interpretation of traffic statistics on a subregional or regional scale, actions which are needed in order to make valid comparisons between countries and to effectively promote preventive measures. In order for this uniform approach to succeed, of course, those responsible for recording accidents, gathering information, and producing statistics need to be adequately trained.

2) *Promotion and Implementation of Operational Epidemiologic Studies*

Such studies would permit better identification of the various factors involved in traffic accidents. Since many such accidents result from defective social behavior on the part of drivers or pedestrians, special attention should be given to psychosocial factors. The influence of alcohol is another key subject for this type of research. In the United States, for example, it has been estimated that drinking is a factor in at least 50 per cent of all fatal motor vehicle accidents (5). The influence of psychotropic drugs, alone or combined with alcohol, should also be studied—especially in terms of the sex, age, and other characteristics of those involved.

3) *Development of Preventive Policies and Programs*

These would include broad measures seeking to influence public opinion and mobilize community resources to confront the mounting problem. Legislation that places the problem in its proper perspective should be promoted or improved. Assistance should be given to help formulate and implement action programs that deal with the three basic elements involved in an accident—the individual (pedestrian, cyclist, driver), the road, and the vehicle. Medical licensing standards should be revised so as to better specify the minimum mental and physical fitness required for issuance or validation of driving permits. Driver education programs should give greater emphasis to the concept that driving is not just a right but also a privilege—one which should be exercised with due respect for the life and property of others.

Even though it is not easy to substantiate, the fact remains that a very high proportion of traffic deaths could be prevented if adequate first aid were given at the site of the accident, within the first 30 minutes.

Perhaps one of the requirements for granting a driver's license should be some kind of training in first aid techniques. Such training should be especially mandatory for professional drivers.

There is also a need for better-qualified and better-equipped emergency medical services responsible for immediate treatment of accident victims. These could make substantial contributions by minimizing the victims' long-term impairments and disabilities.

4) *Coordination*

Coordination of work against traffic accidents should encourage a concerted effort by concerned individuals and institutions. A basic ingredient of good coordination is participation by official agencies—mainly those dealing with health, education, and transportation.

With regard to the death toll, traffic authorities, legislative bodies, private organizations, and other interested groups can and should contribute to reducing the number of lives taken by traffic accidents. Coordinated efforts are also essential for the successful planning, implementation, and evaluation of educational programs directed at individuals, family groups, and the community as a whole; it has been shown that these programs tend to influence both individual and collective behavior and to prevent the occurrence of traffic accidents.

Conclusions

To sum up, the comparative data available for 1969 and 1975, though incomplete, provide the basis for a number of general conclusions. Some of these are as follows:

With the exception of Chile and the United States, there has been a steady increase in the number of traffic accidents and traffic-related fatalities in all the countries for which comparative figures have been obtained.

Due to rapid population growth, modernization processes, and increasing numbers of vehicles, and also for lack of sufficiently improved accident prevention and control measures, the toll in traffic accidents, deaths, permanent injuries, and resulting economic consequences is expected to rise.

A better understanding of this large and growing problem will not be possible until more accurate, complete, and comparable information about the factors involved is obtained. This indicates a clear need to establish uniform nomenclature and statistical systems and to carry out practical epidemiologic studies.

The foregoing conclusions suggest that demonstration of greater interest in this problem by public officials could stimulate communities to participate actively in developing and implementing sound educational programs and control measures to prevent traffic accidents.

SUMMARY

There can no longer be any doubt that the burgeoning traffic accidents problem in developing parts of the Americas has come of age. Traffic accidents are currently the leading cause of death for those 14 to 25 years old in nine countries of the Americas, and at least the second most important cause of death for this group in all the rest. Everywhere, of course, accident-related injuries far exceed accident-related deaths.

Not only does this create a situation of

legitimate and vital concern to public health authorities, but there is also every reason to believe that this toll of economic losses, injuries, and deaths will continue to rise.

A comparison of two sets of traffic accident data—one for years around 1969 and the other for years around 1975—shows that the 1975 death rates per 100,000 inhabitants were higher in 15 of 20 Hemisphere countries. The most spectacular rises occurred in Panama and Peru, where the rate almost doubled; in Jamaica,

where it more than doubled; and in Guatemala, where it tripled. Slight reductions were noted in Canada, Cuba, and Paraguay, but the only substantial reductions occurred in Chile and the United States.

These data also indicate that despite fast-growing populations, the number of people per vehicle has fallen nearly everywhere except in Haiti and Uruguay. In effect, this means that more and more people and vehicles are crowding onto the roads; and since accident prevention measures are generally inadequate

or non-existent, the risk of accidental encounters is rising in direct proportion to the growing flood of road users.

All this suggests a need for a more aggressive strategy, one that can make full and well-coordinated use of available resources. In general, analysis of the problem to date indicates that much can be gained by adopting uniform nomenclature and statistical systems, implementing operational epidemiologic studies, developing preventive policies and programs, and encouraging improved coordination.

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