

# VIOLENT CHILDHOOD DEATHS IN BRAZIL<sup>1</sup>

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*Since introduction of a standard death certificate for all parts of Brazil in the 1970s, it has become feasible to collect childhood mortality data on a national scale. The purpose of this article is to examine patterns of childhood death from external causes (accidental deaths, suicides, and homicides) in Brazil and São Paulo, so as to help learn how such deaths can be prevented.*

## Introduction

Because of their inexperience and curiosity, children are frequently in danger of having accidents. Indeed, accidents are the leading cause of death among children between one and 15 years of age in some countries; and since such fatal accidents are greatly outnumbered by accidents that the victims survive, they are in fact only part of a considerably larger problem.

In this vein, research to date suggests that accident morbidity may be as much as 400 times higher than accident mortality (1). Many of these nonfatal accidents cause considerable losses in terms of the child's school attendance and parental work; many have important economic consequences in terms of medical care and hospital costs, among others; and a significant number cause incalculable physical and mental suffering to the affected children and their families (2).

It is important to study these accidents and other violent acts affecting children, because knowledge of them is essential for their prevention. That is, when information such as the distribution of particular kinds of accidents among

certain age groups becomes known, it becomes possible to design education programs to prevent them; and most kinds of accidents can be reduced sharply in this manner (2).

It is also important to recognize the significance of childhood mortality from accidents and violent acts in developing countries. Clearly, these causes of mortality are apt to play a lesser role in overall mortality than certain other causes, especially among infants and young children; and this role tends to vary from country to country. However, as other causes of death, such as malnutrition and infectious and parasitic diseases, are brought under control, the relative role of childhood accidents and other violent deaths in overall mortality increases. And while they may play a somewhat lesser role than certain leading causes of mortality in developing countries, there is no doubt that they pose an important threat to public health.

The review presented here defines a child as any person under 15 years of age; and it defines "accidents and violent acts" as those listed in the World Health Organization *International Classification of Diseases, Ninth Revision* under Chapter XVII, Injury and Poisoning, and the Supplementary Classification of External Causes of Injury and Poisoning (3). These listings, which deal with all external causes, include accidents of all kinds, suicides, and homicides.

The basic purpose of this article is to compare official data on violent childhood deaths in Brazil during 1979 (4) with data previously reported by one of us (Mello Jorge) on violent deaths in São Paulo Municipality between 1960

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and 1980 (2, 5-8). No attempt is made to assess morbidity, partly because it is inherently more difficult to judge and partly because the statistics reported on both morbidity and mortality in Brazil tend to be fragmented and widely scattered (4, 9-24).

### Basic Data on Violent Childhood Deaths in Brazil

The population of Brazil, which was under 20 million people at the turn of the century, has recently been growing at about 3% per year. According to the latest census (25), conducted in the fall of 1980, as of that time the country had 119,070,865 inhabitants. These were found to be distributed by age and sex as shown in Table 1, there being nearly equal numbers of each sex (987 males per 1,000 females) and a disproportionately large share of young people (about 40% of the population being under 15 years of age).

### National Data on Mortality from External Causes

Until quite recently, only mortality data for municipalities of state capitals were reported na-

**Table 1. The population of Brazil, by age group and sex, according to the 1980 census.**

Age group (in years)	No. of inhabitants		
	Males	Females	Total
0-4	8,461,485	8,187,650	16,649,135
5-9	7,230,024	7,041,758	14,271,782
10-14	6,806,534	6,743,129	13,549,663
15-19	6,488,217	6,789,445	13,277,662
20-24	5,655,982	5,970,440	11,626,422
25-29	4,805,866	4,947,676	9,753,542
30-34	3,955,372	3,914,751	7,870,123
35-39	3,180,813	3,230,817	6,411,630
40-44	2,884,050	2,843,298	5,727,348
45-49	2,294,596	2,405,698	4,700,294
50-54	2,043,282	2,112,747	4,156,029
55-59	1,637,233	1,672,678	3,309,911
60-64	1,230,397	1,333,400	2,563,797
65-69	1,064,426	1,130,689	2,195,115
≥ 70	1,372,224	1,567,932	2,940,156
Unknown	35,598	32,658	68,256
Total	59,146,099	59,924,766	119,070,865

Source: Fundação IBGE (25).

tionally, and only certain states provided overall mortality figures. However, in 1976 the Ministry of Health introduced a standard death certificate form for the entire country. This measure, a pre-

**Table 2. General mortality in Brazil, by cause, in 1979, as reported by the Ministry of Health.**

Cause	No. of deaths	% of total	Rank
Infectious and parasitic diseases	73,054	10.26	3
Neoplasms	57,872	8.13	5
Endocrine glands, nutrition, and metabolism	25,275	3.55	8
Blood and blood-forming organs	2,909	0.41	13
Mental disorders	1,801	0.25	15
Nervous system and sense organs	9,599	1.35	10
Circulatory system	178,567	25.09	1
Respiratory system	57,500	8.09	6
Digestive system	23,397	3.29	9
Genitourinary system	9,533	1.34	11
Pregnancy, childbirth, and the puerperium	2,609	0.37	14
Skin and subcutaneous tissue	507	0.07	17
Musculoskeletal system	866	0.12	16
Congenital anomalies	8,649	1.21	12
Conditions originating in the perinatal period	51,000	7.15	7
Ill-defined symptoms, signs, and conditions	143,351	20.15	2
External causes	65,253	9.17	4
All causes	711,742	100	

Source: Ministério da Saúde (4).

liminary step in creating a national mortality reporting system, made it possible to establish both the number of deaths and their distribution in terms of certain features by state, and within each state for the state capital.

This article sets forth the initial mortality data reported for 1979 (4). According to the Health Ministry's estimate, these data are believed to account for about 70% of all deaths in Brazil that year. When broken down by category, they also indicate that external causes produced about 9% of the overall mortality in Brazil and ranked fourth among the causes of mortality—following diseases of the circulatory system; ill-defined signs, symptoms, and conditions; and infectious and parasitic diseases (Table 2).

Mortality coefficients (deaths per 100,000 inhabitants) have been derived from these data, even though it is recognized that not all deaths have been included, and that the derived rates are therefore apt to be underestimates. Fortunately, the reporting of deaths from external causes is likely to have been relatively complete, since many such deaths require official reporting by law enforcement authorities. Even so, the figures to be presented should be regarded as *minimum* rates of death from external causes in 1979.

### Childhood Mortality Data

A key point about deaths from external causes is that their importance relative to other causes is highly age-dependent. Thus, while they apparently accounted for some 9% of all deaths in 1979, they accounted for less than 1% of all infant deaths and for nearly half the deaths of those 15 to 19 years of age (Table 3). More specifically, within the childhood age groups listed, external causes accounted for 0.5% of the recorded deaths among infants (the major causes of death in this group being infectious diseases and perinatal causes), 7% among children 1-4 years old, 29% among those 5-9 years old, and 39% among those 10-14 years old. Overall, external causes were responsible for approximately 13% of all the deaths recorded among infants and children under 15 years of age. (For purposes of comparison, throughout this work the period of infancy—0 to 12 months of age—is included in the youngest—0 to 4 year—age group, except in cases where it has seemed advisable to assess the infant data separately.)

With regard to specific causes, motor vehicle accidents accounted for over a third of the recorded childhood deaths from external causes (Table 4). Suicides and homicides accounted for a relatively

**Table 3. Recorded deaths from all causes and deaths from external causes in Brazil in 1979, by age group, as reported by the Ministry of Health.**

Age group (in years)	Total recorded deaths	Recorded deaths from external causes		
		No.	(%)	Rank
<1	181,400	923	(0.5)	9
1-4	34,465	2,512	(7.3)	4
5-9	8,779	2,551	(29.1)	1
10-14	7,291	2,821	(38.7)	1
15-19	12,892	6,376	(49.5)	1
20-29	34,275	16,470	(48.1)	1
30-39	39,355	11,276	(28.7)	1
40-49	54,989	8,502	(15.5)	4
50-64	113,544	7,409	(6.5)	4
65-79	154,771	4,105	(2.7)	7
≥80	64,109	1,183	(1.9)	6
Unknown	5,872	1,122	(19.1)	3
Total	711,742	65,250	(9.2)	4

Source: Ministério da Saúde (4).

**Table 4. Recorded deaths from external causes among children in Brazil in 1979, by type of external cause and age group.**

External cause	Age group (in years)									Total		
	0-4			5-9			10-14					
	No.	(%)	Rate <sup>a</sup>	No.	(%)	Rate	No.	(%)	Rate	No.	(%)	Rate
Traffic accidents	806	(23.46)	4.98	1,228	(48.14)	8.85	1,030	(36.51)	7.82	3,064	(34.79)	7.09
Other accidents	1,830	(53.28)	11.31	826	(32.38)	5.96	1,026	(36.37)	7.79	3,682	(41.81)	8.52
<i>Drownings</i>	465			315			502			1,282		
<i>Fire-related</i>	347			104			57			508		
<i>Falls</i>	87			48			44			179		
<i>Accidental poisonings</i>	61			11			8			80		
<i>Food ingestion or aspiration</i>	161			5			3			169		
<i>Ingestion or aspiration of objects</i>	75			13			6			94		
<i>Accidental mechanical suffocation</i>	111			30			26			167		
<i>Others</i>	523			300			380			1,203		
Suicides	-	(-)	-	1	(0.04)	0.01	72	(2.55)		73	(0.83)	0.17
Homicides	74	(2.15)	0.46	39	(1.53)	0.28	137	(4.86)	1.04	250	(2.84)	0.58
Cause unspecified	725	(21.11)	4.48	457	(17.91)	3.29	556	(19.71)	4.22	1,738	(19.73)	4.02

Source: Ministério da Saúde (4) and Fundação IBGE (25).

<sup>a</sup>Deaths per 100,000 subjects. The rates given have been derived from population estimates published by the Ministry of Health (4) and age group proportions used in the 1980 census (25).

**Table 5. Mortality among children in Brazil in 1979 and São Paulo in 1960-1980, by sex and age group.**

Area	Sex	Mortality per 100,000 persons in the following age groups (in years)			Childhood mortality per 100,000
		0-4	5-9	10-14	
Brazil	Boys	24.21	23.00	29.74	25.50
	Girls	18.10	13.65	12.97	15.10
	Both sexes <sup>a</sup>	21.23	18.40	21.42	20.38
São Paulo	Boys	28.99	27.59	36.52	30.86
	Girls	17.53	12.85	15.43	15.24
	Both sexes	23.34	20.29	25.91	23.10

Source: Ministério da Saúde (4) and Mello Jorge (2).

<sup>a</sup>Includes a small number of instances in which the sex of the victim was not recorded.

small share of the total; but deaths whose external cause was uncertain (some of which could have been intentionally inflicted) accounted for a much larger share (20%) of the total. The remaining recorded deaths, due to a wide range of other specific external causes, accounted for roughly 42% of the total. Overall, children in Brazil appeared to experience a risk of at least 20.38 chances in 100,000 of dying from external causes in 1979, a rate that appears high when

compared to those prevailing in certain other areas (26).

As Table 5 shows, however, mortality from external causes was considerably higher among boys than among girls, especially in the older childhood age groups. This difference emerges clearly in both the national mortality data for 1979 previously cited and mortality data for the municipality of São Paulo during the period 1960-1980.

## Childhood Mortality from Specific External Causes

### Motor Vehicle Traffic Accidents

As previously noted, traffic accidents accounted for about 35% of the childhood deaths from external causes in 1979, the overall traffic accident mortality involved being 7.09 deaths per 100,000 children. Rates for specific age groups were 4.98 deaths per 100,000 in the 0-4 year group, 8.86 in the 5-9 year group, and 7.82 in the 10-14 year group—all rates considerably higher than similar rates reported in most other countries.

In most cases data on the specific types of traffic accidents responsible are not available, but it is clear that collision with pedestrians were commonly involved (Table 6), a finding that deserves attention. In all, known collisions with pedestrians accounted for about two deaths per 100,000 children in 1979, the highest death

rate (2.76 per 100,000) being found in the 5-9 year group and the second highest (2.13 per 100,000) in the 10-14 year group. Moreover, it appears that many of the accidents of an unspecified nature are likely to have involved pedestrian collisions, and so the actual rates may have been considerably higher than those given. Nevertheless, the data presented point out the high-risk childhood age groups in Brazil and attest to a need for education about traffic dangers as soon as possible during the preschool years, in order to reduce the number of children killed in this manner.

The overall 1979 childhood traffic mortality figure for Brazil (7.09 deaths per 100,000) can be compared to traffic mortality figures for the municipality of São Paulo, which especially in the years 1970-1975 was considered to have among the highest traffic accident mortality figures in the world (Table 7). These high São Paulo mortality figures, relative to the rest of Brazil, are related to urban São Paulo's high

**Table 6. Childhood deaths from motor vehicle traffic accidents in Brazil in 1979, by type of traffic accident and age group.**

Types of motor vehicle traffic accidents	Deaths among children in the following age groups.							
	0-4 years		5-9 years		10-14 years		Total	
	No.	%	No.	%	No.	%	No.	%
Collisions with pedestrians	210	26.05	383	31.39	281	27.28	874	28.52
Other specified accidents	26	3.23	36	2.93	36	3.50	98	3.20
Unspecified accidents	570	70.72	809	65.88	713	69.22	2,092	68.28
Total	806	100	1,228	100	1,030	100	3,064	100

Source: Ministério da Saúde (4).

**Table 7. Childhood mortality from motor vehicle traffic accidents in São Paulo in 1960-1980, by age group and year.**

Age group (in years)	Deaths per 100,000 in:				
	1960	1965	1970	1975	1980
0-4	5.30	4.65	9.38	5.80	6.09
5-9	5.29	7.01	11.96	11.17	9.31
10-14	7.00	6.51	11.14	13.29	9.36
Total	5.77	6.01	10.83	10.03	8.11

Sources: Mello Jorge (6) for 1960-1975 and Mello Jorge (unpublished data) for 1980.

degree of industrialization and high density of motor vehicles. Significantly, a majority of the traffic accident deaths in São Paulo resulted from collisions with pedestrians.<sup>4</sup>

It appears, however, that the worsening traffic accident trend in São Paulo had given way by 1980 to a decline in the number of accidents and a corresponding decline in mortality. This decline seems to have been brought about by the attention paid to traffic problems in recent years, and by resulting measures that have included better control of driving speeds, greater police surveillance, improved traffic engineering, and placement of more footbridges over principal thoroughfares (6).

#### *Accidental Poisoning*

Accidental poisonings are known to have caused 80 deaths among people under 15 years of age in Brazil in 1979. As Table 8 indicates, about a third of these deaths were caused by "drugs, medicaments, and biologicals," the rest being caused by other substances. Agricultural and horticultural preparations, as well as petroleum products, solvents, and their vapors, were implicated in a significant number of these deaths.

The fact that most fatal poisoning accidents of childhood (over three-quarters) killed children 0-4 years old highlights the importance of educating present and future parents of young children about the poisoning threat, so that fatal incidents of this kind can be avoided.

The studies done in São Paulo also showed a relatively high number of deaths in the 0-4 year age group. Overall, childhood mortality from poisonings in São Paulo was found to have de-

clined during the 1960-1980 study period. Unlike the 1979 nationwide data, however, the São Paulo data indicated that the leading cause of accidental poisoning resulting in death was ingestion of poisonous foods and plants (2).

#### *Drownings*

After motor vehicle traffic accidents, drownings were the most common external cause of childhood death in Brazil in 1979 (Table 9). Their occurrence was commonest (5.62 per 100,000 population) in the 10-14 year age group—as compared to 3.43 drownings per 100,000 population among the 5-9 year group and 3.55 per 100,000 among children under five.

In São Paulo Municipality, where the 1975 rates were higher (4.52 and 9.26 drownings per 100,000 children in the 5-9 and 10-14 year age groups, respectively) the drownings occurred chiefly on the outskirts of towns—in lakes and streams. These rates were nearly three times higher than those prevailing in European countries (6).

#### *Falls*

Accidental falls caused 179 reported deaths in Brazil in 1979, and although the mortality incurred was not high, it was noteworthy because most of the deaths involved could have been prevented. A specific study of each type of fall in São Paulo Municipality showed that among infants these falls were chiefly from beds; among children 1-4 years old and 5-9 years old they were mainly from windows or into wells; and in the 10-14 year age group they were mostly from trees or roofs (6). These data show that many deaths from this cause can be prevented by measures designed to educate parents about such matters as providing better protection around windows (29).

The figures also draw attention to the fact that São Paulo, Brazil's most highly developed municipality, has large numbers of dwellings not served by the water supply and sewerage system, so that many people must rely on wells either as sources of water or as places to dispose

<sup>4</sup>Bicycle accidents have been included in the figures only when they involved motor vehicles. (The International Classification of Diseases includes them under the category of "other road vehicle accidents.") There do not appear to have been large numbers of such accidents, because bicycling is not very common in Brazil. Since the use of bicycles is generally limited to those under 15 years of age, however, their inclusion could be expected to raise the figures for childhood traffic accident mortality.

**Table 8. Childhood deaths from accidental poisonings in Brazil in 1979, by type of poison and age group (in years) of the victims.**

Type of poison	Deaths among children in the following age groups:			
	0-4 years	5-9 years	10-14 years	Total
<i>Drugs, medicaments, and biologicals:<sup>a</sup></i>	21	4	2	27
Analgesics, antipyretics, antirheumatics	3	—	—	3
Barbiturates	—	1	—	1
Other sedatives and hypnotic drugs	—	—	—	—
Tranquilizers	—	—	—	—
Other psychotropic agents	—	—	1	1
Other drugs acting on nervous system	2	—	1	3
Antibiotics	—	1	—	1
Antiinfectious substances	1	—	—	1
Other drugs	15	2	—	17
<i>Other solid and liquid substances, gases and vapors:<sup>b</sup></i>	40	7	6	53
Alcohol	2	—	—	2
Cleansing and polishing agents, disinfectants, paints, and varnishes	—	—	—	—
Petroleum products, other solvents, and their vapors	9	—	—	9
Agricultural and horticultural chemical and pharmaceutical preparations	11	1	2	14
Corrosive and caustic substances	4	—	—	4
Foodstuffs and poisonous plants	3	2	1	6
Other unspecified substances	8	1	2	11
Gas distributed by pipeline	—	—	1	1
Other utility gas and carbon monoxide	1	3	—	4
Other gases and vapors	2	—	—	2
Total	61	11	8	80

Source: Ministério da Saúde (4).

<sup>a</sup>ICD categories E850-E858 (3).

<sup>b</sup>ICD categories E860-E869 (3).

**Table 9. Childhood deaths from drownings in Brazil in 1979, by age group and sex.**

Age group (in years)	Sex					
	Boys		Girls		Total	
	No.	(%)	No.	(%)	No.	(%)
<1	18	(2.0)	14	(3.7)	32	(2.5)
1-4	274	(30.3)	159	(42.4)	433	(33.8)
5-9	241	(26.6)	74	(19.6)	315	(24.6)
10-14	372	(41.1)	130	(34.5)	502	(39.2)
Total	905	(100)	377	(100)	1,282	(100)

Source: Ministério da Saúde (4).

of refuse. The record of deaths from falls into wells among children under 15 years old in São Paulo (6) shows that 18 such deaths (1.60 per 100,000) occurred in 1960, 24 (1.55 per 100,000) in 1965, 31 (1.61 per 100,000) in 1970, and 27 (1.57 per 100,000) in 1975.

*Fire-Related Accidents*

In 1943 the then Federal Biostatistical Service of the Ministry of Health drew attention to the fact that burns had been the chief cause of accidental deaths in children under five years of age in 1940 and 1942 (28).

Today, perhaps because of deficient information on death certificates, specifics about most deaths attributed to this cause are not available. Thus, it is known merely that 508 recorded childhood deaths followed accidents caused by fire in Brazil in 1979. The recorded mortality differed from one age group to another, as indicated in Table 10, but was almost the same for the two sexes, with 53.7% of the deaths occurring among boys and 46.3% among girls. It should also be noted that the figures given would be higher if deaths from burns caused by hot liquids and electricity (which the International Classification of Diseases lists separately) had been included.

*Other Accidents*

The category "others" in Table 4 is important, including 1,208 childhood deaths in 1979.

Notable proportions of the deaths in this category were caused by electricity and firearms—the former causing 93 deaths and the latter 73. In addition, significant numbers of infant deaths (144) were caused by "inhalation and ingestion of food causing obstruction of respiratory tract or suffocation" (ICD category E911) and also (in 38 cases) by "inhalation and ingestion of other object causing obstruction of respiratory tract or suffocation" (ICD category E912). By comparison, the number of deaths from these causes in the 1-14 age group (81 in all) was relatively small.

"Accidental mechanical suffocation" (ICD category E913) was the recorded cause of 167 deaths in Brazilian children under 15 in 1979. The study of mortality in São Paulo (2) showed that suffocation of this type at very young ages (there were 68 infant deaths in this category) often resulted from victims sleeping in the same beds with parents or older siblings. (This finding emerged only because the study was based on information provided by the Institute of Forensic Medicine and not just upon information recorded on death certificates.) Some other causes of accidental mechanical suffocation (2) occurred when earth fell on the victim, or when slopes or earth slips collapsed, or when dwellings were buried in rainy-season landslides.

*Suicides*

A total of 73 childhood suicides were registered in Brazil in 1979 (see Table 4), one in the

**Table 10. Childhood deaths from accidents caused by fire in Brazil in 1979, by age group and sex.**

Age group (in years)	Sex				Total	
	Boys		Girls		No.	(% )
	No.	(% )	No.	(% )		
<1	42	(15.4)	39	(16.6)	81	(16.0)
1-4	137	(50.8)	129	(54.9)	266	(52.4)
5-9	58	(21.3)	46	(19.6)	104	(20.5)
10-14	36	(13.2)	21	(8.9)	57	(11.2)
Total	273	(100)	235	(100)	508	(100)

Source: Ministério da Saúde (4).



5-9 age group and the remaining 72 in the 10-14 age group. Table 11 shows the distribution of these 72 suicides by sex and cause of death. Among other things, this indicates that the rate of suicide in the 10-14 year age group was higher among girls than among boys, the female:male ratio being 1.88:1. Also, the girls committing suicide showed a distinct preference for death by poison, while boys showed a relative preference for hanging.

### Homicides

Homicide has been receiving increased attention in recent years, though as far as children are concerned the percentage of overall mortality attributed to this cause is fairly small. Table 12 shows the distribution of 1979 childhood homicides in Brazil by age group and method. It is important to note that, although the method was not specified in an appreciable number of cases

**Table 11. Deaths from suicide among children 10-14 years of age in Brazil in 1979, by sex and method.**

Method	Boys		Girls		Total	
	No.	(%)	No.	(%)	No.	(%)
Poisoning by solid or liquid substances	7	(28.0)	24	(51.1)	31	(43.1)
Poisoning by gases in domestic use	—	—	—	—	—	—
Poisoning by other gases and vapors	—	—	—	—	—	—
Hanging, strangulation, suffocation	12	(48.0)	2	(4.3)	14	(19.4)
Submersion (drowning)	—	—	2	(4.3)	2	(2.8)
Use of firearms and explosives	5	(20.0)	7	(14.9)	12	(16.7)
Use of cutting and piercing instruments	—	—	—	—	—	—
Jumping from a high place	—	—	—	—	—	—
Other and unspecified methods	1	(4.0)	12	(25.5)	13	(18.1)
Late effects of self-inflicted injury	—	—	—	—	—	—
Total	25	(100)	47	(100)	72	(100)

Source: Ministério da Saúde (4).

**Table 12. Childhood deaths from homicide in Brazil in 1979, by age group and method.**

Type	Age group (in years)				Total	
	<1	1-4	5-9	10-14	No.	(%)
Fight, brawl, rape	1	1	—	1	3	(1.2)
Assault by corrosive or caustic substance	—	—	—	—	—	—
Assault by poisoning	—	—	1	—	1	(0.4)
Assault by hanging or strangulation	5	1	2	7	15	(6.0)
Assault by submersion (drowning)	1	1	—	2	4	(1.6)
Assault by firearms or explosives	5	10	15	60	90	(36.0)
Assault by cutting or piercing instruments	5	6	10	27	48	(19.2)
Child battering and other maltreatment	3	2	—	—	5	(2.0)
Assault by other and unspecified means	18	15	11	40	84	(33.6)
Late effects of injury intentionally inflicted by another	—	—	—	—	—	—
Total	38	36	39	137	250	(100)

Source: Ministério da Saúde (4).

(33.6%), a large share of the young victims (36% of the total) were killed with firearms, and another large portion (19.2%) were killed with cutting or piercing instruments. The ratio of male to female deaths from homicide was about 1:1 in the younger age groups, but changed to about 2:1 as the number of male victims rose in the 10-14 age group.

In São Paulo, the number of reported homicide victims under 15 years old has included relatively high numbers in the 0-4 year age group (eight of 13 childhood victims in 1960, six of 14 in 1965, nine of 14 in 1970, and 17 of 23 in 1975). This has been attributed partly to homicides of the newborn, to which could be added misclassified cases of babies born dead whose corpses were left on vacant land or put into rivers, wells, or garbage dumps as has already been described in an earlier paper (7). These cases attest to the gravity of some of the social problems confronting the country.

It should also be noted that a small number of fatal child-battering cases appear in the 1979 data for Brazil. Although the crime of child battering has been covered by Brazil's penal code since 1940, it does not appear in the records as a frequent crime. The reason for this is that it comes to the attention of authorities only when it is reported, or when severely injured children arrive at hospitals for treatment. Although the extent of the problem is not well-known in Brazil, in some countries the problem is known to be of such a magnitude that "child abuse prevention centers" have been established to combat it (2).

### **Violent Deaths from Unknown Causes**

Out of 8,807 violent childhood deaths reported for 1979, there were 1,738 cases (19.7% of the total) in which the death certificate did not specify whether the death was caused by an accident, suicide, or homicide; instead, it stated merely that the death was due to an unnatural cause. One likely reason that this figure is so high is because the Institute of Forensic Medicine (which performs autopsies to determine causes of death) has no offices in many parts of

the country. Another is that in some cases the death data on the document issued by the physician, who determines the nature of the fatal injury, may not include data from the case report drawn up by the police, who must describe the external cause which produced that injury.

### **Conclusions**

The purpose of this article has been to describe the causes of fatal physical injuries (accidents, suicides, and homicides) suffered by children in Brazil. The foregoing discussion of specific types of accidents and acts of violence from the epidemiologic standpoint helps to provide a perspective from which hypotheses may be derived. Findings made by studies in other countries have shown that many of the deaths involved could have been avoided. They also show that trial-and-error preventive measures are not enough, and that, to be truly effective, such measures should be based upon research. Especially where children are involved, effective data about which ones are at risk, the extent they are at risk, and what causes the risk must be obtained and used to guide all phases of preventive measures (6).

Motor vehicle traffic accidents involving pedestrians are often caused by inadequate education or noneducation of the pedestrian—resulting in failure to obey traffic signals, failure to use footbridges, etc. The fact that such accidents strike the very young indicates that preventive education can and should begin during the preschool years, and should be continued as part of the primary school curriculum. Some studies have shown that children commonly cross the street without watching traffic. Therefore, it would appear that a significant number of childhood deaths could be prevented if this behavior were changed through effective educational efforts (6).

Regarding other accidental deaths, household accidents are obviously important. The prevalence of injurious or fatal childhood falls calls for continued vigilance by the parents and guardians of minor children. The data also show that a significant number of children have died from

falling out of windows or into uncovered wells, so that specific actions designed to prevent such falls might be encouraged. Drownings, which appear especially prevalent among boys 1-14 years old, might be reduced by such measures as swimming programs. In this vein, Mello Jorge (2) cites a study done in 1958 suggesting a gradual decline in the danger of drowning in Europe based on the fact that European children know how to swim by the time they leave school. It also seems evident that public authorities need to provide greater vigilance at places of recrea-

tion (reservoirs and swimming pools) and to establish more recreation centers.

In closing, it should be noted that the problem of violent death in childhood—and hence of childhood accidents and acts of violence—has been and remains an important public health problem in Brazil. There is thus an urgent need for continued research in this field, so that public health authorities can obtain the data which they need to draw up effective programs capable of reducing the current excess mortality to a minimum.

### SUMMARY

In the latter part of the 1970s, introduction of a uniform national death certificate in Brazil made it possible to collect nationwide mortality data. The purpose of this article is to examine childhood deaths from external causes (accidental deaths, homicides, and suicides) as indicated by these data and other sources, for the purpose of helping to learn how such deaths can be avoided.

One key point about deaths from external causes is that their role in overall mortality tends to be age-specific. For example, within the Brazilian age groups being considered (0-15 years), external causes were responsible for 0.5%, 7%, 29%, and 39% of the reported deaths among children under one, one through four, five through nine, and 10 through 14 years old, respectively. Also, a substantially larger number of such deaths tend to occur among boys than among girls, the ratio of reported male to female childhood fatalities in 1979 being 1.73:1. Overall, the average child in Brazil appeared to experience about two chances in 10,000 of dying from external causes in 1979—a rate that appears high when compared to those prevailing in certain other areas (26).

Regarding specific causes, accidents accounted for the lion's share of these deaths (76.6%), with homicides accounting for 2.8%, suicides for 0.8%, and deaths from "unspecified" external causes for 19.7%. Motor vehicles accounted for over a third (3,064) of the accidental childhood deaths attributed to specific

causes. Accidental drownings (1,282 deaths), fires (508 deaths), falls (179 deaths), ingestion or aspiration of food or objects (263 deaths), and mechanical suffocation (167 deaths) accounted for much of the remaining accident-related mortality.

Among other things, these data indicate a need for educating children about traffic dangers as soon as possible. In a similar vein, the fact that most childhood deaths from accidental poisoning occurred in the 0-4 year age group underscores the importance of educating present and future parents about the poisoning threat. And the fact that a good many children fell to their deaths out of windows (in the one to nine year age group) suggests that many such deaths can be prevented if parents are informed about the need to provide better protection around windows.

Of 8,807 childhood deaths from external causes reported for 1979, there were 1,738 cases (19.7% of the total) in which the death certificate failed to specify whether the death resulted from an accident, suicide, or homicide. This suggests a lack of coordination in these cases between death data recorded by the attending physician (who determines the nature of the fatal injury) and the case report drawn up by the police (who describe the external cause that produced that injury). It also reflects the limited coverage provided by the Institute of Forensic Medicine, which performs autopsies to determine causes of death, but which has no offices in many parts of the country.

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