Fatal Occupational Accidents

Introduction

The indicators most usually employed to assess working conditions are occupational accidents. As a rule, they are easily identified, and their causes and effects can be clearly established. The degree of injury ranges between slight and fatal. Despite the relative ease with which such accidents are identified and recorded, there are not yet any reliable data on which to determine adequately the extent and epidemiology of the problem as it exists in the Region. Though much research and many studies are done on the epidemiology of occupational accidents, few focus specifically on those in which the worker dies.

This article draws attention to the importance of the problem in the Region, the significance of some epidemiological features that have been studied, and their implications for public health programs. It is based on three studies of fatal occupational accidents done in the State of Maryland, United States of America *(1)*; Department of Antioquia, Colombia *(2)*; and the city of Campinas, State of São Paulo, Brazil *(3)*.

Extent of the Problem

According to studies and data for the Region of the Americas, there are at least 10 million occupational accidents a year, more than 50,000 of them fatal *(4)*. The diversity of the institutions and recording procedures frustrates any possibility of detailed comparison of the absolute numbers of and mortality rates among workers at risk in different countries. Statistics frequently refer only to workers enrolled in the social security system, which in many cases does not include farm workers.

However, it has been estimated that, in the United States, for example, there are about 13,000 deaths due to occupational accidents a year, which results in losses of 245 million work days and US$25 billion in direct and indirect costs *(1)*. Between 1970 and 1982 the National Institute of Social Security (INPS) of Brazil recorded about 20 million occupational accidents, which resulted in approximately 50,000 deaths *(3)*. These data are broken down by years in Table 1.

A study done in the Department of Antioquia, Colombia, examined 505 fatal occupational injuries between 1965 and 1978. Table 2 presents the mortality rates per 100,000 workers and shows an uptrend that peaked at 28.9 in 1974 and dropped to 19.9 in 1978, the last year covered by the study. A progressive downtrend has been noted in the United States where the mortality rate has dropped from 39 to 13 per 100,000 workers over the last 25 years, and the Maryland study disclosed a rate of 7 per 100,000 workers. Table 1 indicates that in Brazil the rate has dropped steadily since 1975, reaching less than 20 in 1981 and 1982. Notable among the causes of the apparent decline are the recent registration of low-risk groups and amendments to legislation on occupational accidents.

Table 1. Occupational accidents in Brazil, from 1970 to 1982.

Year	Number of workers	Number of occupational accidents	Deaths in occupational accidents	Mortality rate per 100,000 workers
1970	7,284,022	1,220,111	2,232	30.6
1971	7,764,486	1,330,523	2,587	33.3
1972	8,148,987	1,504,723	2,805	34.4
1973	10,956,956	1,632,696	3,122	28.5
1974	11,537,024	1,796,761	3,764	32.6
1975	12,996,796	1,916,187	3,942	30.3
1976	14,945,489	1,743,825	3,900	26.1
1977	16,590,000	1,614,750	4,445	26.8
1978	18,500,000	1,564,380	4,342	23.5
1979	20,322,500	1,507,930	4,500[a]	22.1
1980	23,782,216	1,404,531	4,824	20.3
1981	24,448,118	1,215,539	4,808	19.7
1982	25,000,000[a]	1,117,832	4,496	18.0

[a]Estimate.
Source: National Institute of Social Security, Brazil.

Table 2. Fatal occupational accidents among persons covered by the Social Security Institute (ISS), Department of Antioquia, Colombia, from July 1965 to December 1978.

Year	Number of members of the ISS	Number of occupational accidents	Deaths in occupational accidents	Mortality rate per 100,000 workers
1965	120,139	8,975	3	1.7
1966	125,742	16,899	10	7.9
1967	127,498	17,508	8	6.3
1968	138,194	18,275	22	15.9
1969	151,046	20,459	19	12.6
1970	174,127	21,160	29	16.7
1971	193,566	24,786	41	21.2
1972	203,272	27,102	47	23.1
1973	219,323	28,944	30	13.7
1974	235,569	30,566	68	28.9
1975	238,949	32,192	62	25.9
1976	258,340	29,592	46	17.8
1977	283,064	35,417	60	21.2
1978	301,668	37,040	60	19.9

Source: Antioquia Health Service Fund, Colombia.

However, published data on Latin American and Caribbean countries almost never include occupational accidents in farm work since workers in this line are covered by other social security schemes and in many cases have no welfare entitlements.

Some Epidemiological Features

All three studies cited underscore that workers who die of occupational injuries are usually young males. This has far-reaching social and economic implications since the victims leave dependent wives and minor children, who in turn become burdens to society. In Colombia, the median age of death was 35 years and 65% of the workers were under 40. In the Brazilian study, 68.3% of the workers were under 40 and 9.7% under 20. In Maryland, the age ranged between 16 and 83 years; the age distribution of those dying in occupational accidents in that State is illustrated in Table 3.

Table 3. Age distribution of construction workers fatally injured in 1978 in the State of Maryland, United States of America.

Age (years)	Number of deaths	(%)	Number of workers	(%)
16-17	2	(1)	66,000	(3)
18-19	5	(4)	108,000	(6)
20-24	9	(7)	283,000	(15)
25-34	33	(25)	492,000	(25)
35-44	37	(28)	358,000	(18)
45-54 } 55-64 }	42	(32)	587,000	(30)
≥ 65	5	(4)	56,000	(3)
Total	133	(101)[a]	1,950,000	(100)

[a]Greater than 100 due to rounding.

Source: Adapted from the table in the *State Annual Planning Information Report*, Service Department, Human Resources, State of Maryland, United States of America.

An epidemiological procedure of fundamental importance is to determine the occupations in which fatal injuries most frequently occur. Construction work accounted for about 30% of all deaths recorded in the Campinas study and for 11.5% of those in the Department of Antioquia. Construction work involves a variety of operations (earth-moving, laying foundations, working at great depths and heights, specialized operations, etc.) involving a wide range of risks. Compared with other occupations, the duration of employment in this one is very short, which makes for little interest in the implementation of prevention programs and hampers proper supervision. Moreover, the labor force is usually unskilled and the work is done under precarious health, housing, and nutritional conditions. An additional factor is that different firms frequently operate at the same work site, which reduces the responsibility for accident prevention. Construction such as dams, highways, and other public works must often be carried out in extremely adverse geographic and climatic conditions on sites that are not covered by the traditional occupational safety programs promoted by the health sector. For these and other reasons, safety in construction work poses a difficult public health problem.

A close relationship between fatal occupational injuries and traffic accidents is a common denominator in all three studies which clearly emphasizes that the problem needs attention. In Maryland, traffic accidents account for 25% of all occupational fatalities, though accidents involving other vehicles (vessels and small civilian aircraft) raise the proportion to 41%. In Antioquia, 155 (30.7%) of the 505 deaths, were caused by motor vehicles. In Campinas, traffic accidents accounted for about 50% of all fatal injuries during the period considered. As is to be expected, in some occupational categories—drivers of commercial vehicles, for example—the proportion of traffic accidents is even higher.

An interesting epidemiological aspect that stands out in the Maryland and Antioquia studies is the high proportion of occupational homicides. In Antioquia, 135 (26.7%) of the 505 deaths were caused by firearms, knives, blunt instruments, and strangulation. The occupational group at greatest risk of homicide was building watchmen. In Maryland, 11% of the fatal injuries resulted from homicides. The authors identify the following groups of workers as particularly exposed to the risk of assault by virtue of their occupation: taxi drivers, policemen, and retail shop salespersons. Data on occupational accidents caused by homicides are of a highly particular nature; discrepancies result when comparisons are made among different countries, owing to frequent differences in classification criteria and no one single legal interpretation.

Some Implications for Public Health

Because most of their victims are young men and are entirely avoidable, occupational fatalities pose a major challenge that demands the attention of the public health authorities in a system-wide and intersectoral context. Together, the three studies cited point to the following recommendations:

• Occupational risk prevention programs should be revised in view of the findings of epidemiological studies on fatal occupational accidents. The Maryland study on deaths among truck drivers, for example, emphasizes that most occupational safety programs virtually ignore commercial vehicles, which account for close to 40% of all fatal occupational accidents. Even in the manufacturing industry, more workers' deaths are caused by freight vehicles than by fixed machinery. In framing policies for the prevention of occupational accidents, and especially serious and fatal ones, it is important to regard occupational and traffic accidents as inseparable when they occur in occupational situations (commercial drivers, transportation of workers, running over workers in the vicinity of the work site, etc.). In addition to the legal implications, the employer's responsibility in relation to his participation in prevention measures should be clearly spelled out.

• Epidemiological research of fatal occupational accidents shows without exception that some as yet unknown aspects should undergo epidemiological analysis. In Latin American and Caribbean countries, for example, there is not yet any understanding of the true extent of the problem, chiefly because of the limited social security coverage of large groups of workers, including, among others, those employed in agriculture.

• Occupational accidents should be included with a systematic and coordinated focus in the sphere of action of public health programs. In some countries this area is the jurisdiction of institutions and programs not properly coordinated with the health sector, and hence the problem is rarely addressed as a public health issue.

References

(1) Baker, S. P. [and others]. Fatal occupational injuries. *J Am Med Assoc* 248(6):692-697, 1982.

(2) Henao, S. Análisis de los accidentes de trabajo mortales ocurridos a los afiliados al ISS. Caja Seccional de Antioquia, julio 1 de 1965-diciembre 31 de 1978. Medellín, Colombia: 1979. 28 p.

(3) Ferreira, R. R. and Mendez, R. Alguns aspectos epidemiológicos dos acidentes de trabalho fatais ocorridos em Campinas, SP (Brasil), 1972-1978. *Rev Saúde Pública* 15:251-262, 1981.

(4) Pan American Health Organization. Occupational Health in Latin America and the Caribbean. Consideration on Some Problems, Alternatives, Trends and Challenges for its Promotion. Washington, D.C.: Pan American Health Organization, 1981. 32 p.

(Source: Worker's Health Program, Health Programs Development, PAHO.)

WHO Collaborating Centers for Tropical Diseases in the Americas

One of the purposes of the *Epidemiological Bulletin* is to provide information on national and international health institutions which are technical resources available to PAHO member countries in the Americas. The WHO Collaborating Centers—national institutions that function as reference centers for service, research, and training in the health field—are included in this group of institutions.

The *Epidemiological Bulletin* (Vol. 4, No. 3, 1983) published the list of WHO Collaborating Centers for Viral Diseases in the Americas. Table 1 below lists the WHO Collaborating Centers for Tropical Diseases.

Table 1. WHO Collaborating Centers for Tropical Diseases in the Americas.

Area of activity	Institution	Location
Diagnosis and research on Chagas' disease	Instituto Fatala Chaben	Avenida Paseo Colón 568 Buenos Aires 1063 Argentina
Research and training in the immunology of parasitic diseases	Oswaldo Cruz Foundation	Avenida Brasil 4365 Manguinhos, CEP 21040 Rio de Janeiro Brazil