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ORIGINAL ARTICLE

ÓBITOS POR CAUSAS EXTERNAS RELACIONADAS AO TRABALHO

DEATHS DUE TO EXTERNAL CAUSES RELATED TO WORK

MUERTES POR CAUSAS EXTERNAS RELACIONADAS CON EL TRABAJO

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ABSTRACT

Objective: to describe the deaths due to external causes related to work. ***Method:*** this is a retrospective quantitative study of the ecological type, based on records of work-related injuries in Brazil, available in the Mortality Information System of the Department of Information Technology of the National Health System of the Ministry of Health, in the period from 1996 to 2015. The data was processed in Microsoft Office Excel 2010 software. The results were presented in tabular form. ***Results:*** 58,940 work-related deaths were registered in the investigation period, where 21,067 (35.74%) occurred in the Southeast region, with the male gender being the most affected in all regions, and in the North, Northeast and Center-West prevailed between 25 and 64 years of age and individuals of brown color. It is revealed that the main places of occurrence of deaths related to the work accident were the hospital and the public highway, and the highest number of deaths occurred between transportation accidents and other external causes of accident injuries. ***Conclusion:*** it is understood that there is a high mortality rate due to external causes in work environments in Brazil, and this demonstrates the need to develop worker protection and safety measures aimed at reducing the number of deaths due to work-related accidents in Brazil. ***Descriptors:*** Worker's Health; External causes; Epidemiology; Work Accidents; Information system; Mortality.

RESUMO

Objetivo*:** descrever os óbitos por causas externas relacionadas ao trabalho. ***Método*:** trata-se de um estudo quantitativo, retrospectivo, do tipo ecológico, baseado em registros de óbitos por acidentes de trabalho no Brasil disponíveis no Sistema de Informação sobre Mortalidade do Departamento de Informática do Sistema Único de Saúde do Ministério da Saúde, no período de 1996 a 2015. Processaram-se a analisaram-se os dados no *software Microsoft Office Excel* 2010. Apresentaram-se os resultados em forma de tabela. ***Resultados*:** registraram-se, no período investigado, 58.940 óbitos relacionados ao trabalho, onde 21.067 (35,74%) ocorreram na região Sudeste, sendo que o sexo masculino foi o mais acometido em todas as regiões e, nas regiões Norte, Nordeste e Centro-Oeste prevaleceram a faixa etária de 25 a 64 anos e indivíduos de cor parda. Revela-se que os principais locais de ocorrência dos óbitos relacionados ao acidente de trabalho foram o hospital e a via pública, e o maior número de óbitos ocorreu entre os acidentes de transporte e outras causas externas de lesões de acidente. ***Conclusão: entende-se que há um elevado índice de mortalidade por causas externas em ambientes de trabalho no Brasil, e isso demonstra a necessidade do desenvolvimento de ações de proteção e segurança ao trabalhador visando à redução do número de óbitos por acidentes de trabalho no país. ***Descritores*:** Saúde do Trabalhador; Causas Externas; Epidemiologia; Acidentes de Trabalho; Sistema de Informação; Mortalidade.

RESUMEN

Objetivo: describir las muertes por causas externas relacionadas con el trabajo. ***Método:*** se trata de un estudio cuantitativo, retrospectivo, del tipo ecológico, basado en registros de muertes por accidentes de trabajo en Brasil disponibles en el Sistema de Información sobre Mortalidad del Departamento de Informática del Sistema Único de Salud del Ministerio de Salud, en el período de 1996 a 2015. Se procesaron y se analizaron los datos en el software Microsoft Office Excel 2010. Se presentaron los resultados en forma de tabla. ***Resultados:*** en el período investigado, 58.940 muertes relacionadas al trabajo, donde 21.067 (35,74%) ocurrieron en la región Sudeste, siendo que el sexo masculino fue el más acometido en todas las regiones y, en las regiones Norte, Nordeste y Centro Oeste prevalecieron el grupo de edad de 25 a 64 años y los individuos de color parda. Se reveló que los principales lugares de ocurrencia de muertes relacionadas con el accidente de trabajo fueron el hospital y la vía pública, y el mayor número de muertes ocurrió entre los accidentes de transporte y otras causas externas de lesiones de accidente. ***Conclusión:*** se entiende que hay un elevado índice de mortalidad por causas externas en ambientes de trabajo en Brasil, y eso demuestra la necesidad del desarrollo de acciones de protección y seguridad al trabajador objetivando la reducción del número de muertes por accidentes de trabajo en el país. ***Descritores*:** La Salud del Trabajador; Causas Externas; Epidemiología; Accidentes en el Trabajo; Sistema de Informacion; Mortalidad.

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INTRODUCTION

It is believed that external causes are responsible for millions of deaths worldwide, generating dozens of hospitalizations, emergency care and outpatient consultations, especially covering individuals aged between 15 and 29 years.[1] It is known that in Brazil, this aggravation, in the last years, has remained in the second group of more frequent causes of death in the Brazilian population.[2]

External causes are defined as injuries, injuries or any other health problem, whether intentional or not, occurring suddenly in an immediate consequence by an act of violence or other exogenous cause. These include injuries sustained as a result of transport events, homicides, assaults, falls, drownings, poisonings, suicides, burns, slipping or flooding injuries, as well as other occurrences caused by environmental circumstances.[3]

It should be noted that work-related accidents and deaths should be discussed taking into account the phenomenon of violence.[2] Thus, occupational accidents are the scope of external causes, and mortality is therefore a major problem of public health.[2]

Work accident is defined as the sudden event that affects the worker during the execution of his work, which causes potential or immediate health damages, capable of causing bodily injury, functional disturbance, death, loss or reduction, permanent or capacity to work. In addition, any accident occurring in the course of residence for work or otherwise, as well as those occurring at the time the worker is representing the interests of the company or even defending the assets of this company.[4-5]

A fatal accident is defined as one whose death happened immediately after its occurrence or will occur later, at any time, "in a hospital environment or not, provided that the basic, intermediate or immediate cause of death is due to the accident".[4,15]

It is understood, as fundamental, the accomplishment of this study, with a view to contribute with the policies of promotion, prevention, attention to the aggravations and the health surveillance, especially with regard to the accidents of the work, considering the high occurrence of causes externalities in Brazil, especially fatal work accidents, which are a striking problem in the mortality of the population, generating great psychological, physical, family, social and economic repercussions.

The objective of this study was to describe the deaths due to external causes related to work in Brazil, from 1996 to 2015.

OBJECTIVE

- To describe the deaths due to external causes related to work.

METHOD

This is a quantitative, retrospective, ecological study that portrays deaths due to external causes related to work in Brazil and in the different Brazilian macro regions, from 1996 to 2015.

Data was obtained from the Mortality Information System (MIS), available on the website of the Department of Information of the National Health System (DATASUS) of the Ministry of Health.

The period of collection, from 1996 to 2015, is justified by the fact that, since 1996, the death certificate (DC) was inserted as the variable "work accident", causing the MIS to incorporate it, which made it possible to better evaluate the probable conditions in which the deaths occurred during the development of labor activities, thus enabling the expansion of research sources in the area. The availability of these data in the MIS at the time of collection was considered for the year 2015.

The study population consisted of all deaths with basic causes, accidents or violence categorized in the International Statistical Classification of Diseases and Related Health Problems in its 10th revision (ICD-10), as external causes of morbidity and mortality, under the codes V01 to Y98, which were classified as work-related event.[6]

The variables (gender, age, race/color, schooling, year of death, place of occurrence, month of occurrence, macroregion of occurrence and cause of death) were classified according to the categories of ICD-10 and grouped in this study as: ground transportation accidents (V01 to V89); other external causes of accidental injury (W00 to X59); voluntary self-harm (X60 to X84); aggressions (X85 to Y09); event whose intention is indeterminate (Y10 to Y39); legal intentions and war operations (Y35 to Y36); complications of medical or surgical care (Y40 to Y84) and sequelae of external causes (Y85 to Y89).

By the DATASUS system, from the commands, tables according to the variables mentioned above were generated and manipulated in the Microsoft Office Excel 2010 software and then converted to tables for the same software where the organization and descriptive analysis proceeded by means of absolute and relative frequencies.

It is reported that the study was not submitted to the Research Ethics Committee's analysis for dealing with secondary data from a public domain information bank available on the Internet, which has no identification of individuals.

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RESULTS

In the period 1996 to 2015, there were 58,940 deaths due to external causes related to work in Brazil, of which 35.74% occurred in the Southeast region; 28.28% in the South; 13.86% in the Northeast; 11.61% in the Midwest and 10.50% in the North. In the data presented in table 1, it can be seen that a greater number of deaths occurred in all regions of the country for males. In the North, Northeast and Midwest regions, the age range of 25 to 64 years and individuals of brown color were prevailed, and the main places of death were the hospital, the public highway and other localities.

Of note, 445 child deaths (children up to 14 years of age) related to work in Brazil are recorded, with the Northeast region accounting for 26.1% of these deaths. Attention is drawn to the registry in the information system of deaths occurring at work in a population under five years of age.

Table 1. Characterization of victims of fatal accidents according to sex, age/age, race/color, schooling and place of occurrence, by region of the country. Brazil, 1996-2015

Variables	North region		Northeast region		Southeast region		South region		Midwest region	
	n	%	N	%	N	%	n	%	n	%
Sex										
Male	5936	95.9	7735	94.6	20069	95.2	15755	94.5	6609	96.6
Female	252	4.1	434	5.3	986	4.7	913	5.4	232	3.3
Ignored	0	0.0	3	0.1	12	0.1	2	0.1	2	0.1
Age group										
1 to 4 years	13	0.2	12	0.1	17	0.1	9	0.1	5	0.1
5 to 14 years	70	1.1	104	1.3	79	0.4	98	0.6	38	0.6
15 to 24 years	1070	17.3	1428	17.5	3026	14.4	2740	16.4	1130	16.5
25 to 64 years	4793	77.5	6211	76.0	16969	80.5	13030	78.2	5399	78.9
65 or more	223	3.6	405	5.0	923	4.4	780	4.6	255	3.7
Ignored	19	0.3	12	0.1	53	0.2	13	0.1	16	0.2
Race/colour										
White	1255	20.4	1423	17.4	11722	55.6	13123	78.7	2577	37.6
Black	381	6.1	567	7.0	1409	6.7	436	2.6	392	5.7
Yellow	13	0.2	20	0.2	155	0.7	44	0.3	19	0.3
Brown	4037	65.2	5259	64.3	5604	26.6	1215	7.3	3354	49.0
Indígenous	46	0.7	10	0.2	12	0.1	5	0.1	9	0.1
Ignored	456	7.4	893	10.9	2165	10.3	1847	11.0	492	7.3
Education										
Nne	574	9.3	742	9.1	404	1.9	365	2.2	298	4.3
1 to 11 years	3820	61.7	4629	56.6	9519	45.2	9436	56.6	4080	59.6
12 years or more	245	4.0	320	3.9	910	4.3	808	4.8	374	5.4
Ignored	1549	25.0	2481	30.4	10234	48.6	6061	36.4	2100	30.7
Location of occurence										
Hospital	1648	26.6	2302	28.2	8443	40.1	5805	34.8	1918	28.0
Other establishment	35	0.7	32	0.4	510	2.4	71	0.4	61	1.0
Home	343	5.5	405	4.9	534	2.5	728	4.4	275	4.0
Public street	1576	25.5	3321	40.7	6448	30.6	5692	34.1	2260	33.0
Others	2508	40.5	2039	24.9	4920	23.4	3961	23.8	2293	33.5
Ignored	78	1.2	73	0.9	212	1.0	413	2.5	36	0.5

Source: MIS/Datasus, 2017.

It is observed that in all the variables presented in table 1 there is a sub-registration of the information, highlighting the schooling in the Southeast region.

It is noted that in all regions, the prevalence of fatal work-related accidents occurred among males, aged between 25 and 64 years and in workers who studied between one and 11 years.

It is exposed that the highest prevalence of these deaths was in the month of October (n = 1904) for the Southeast region; March for the South region (n = 1560); November for the Northeast region (n = 740); August for the North region (n = 680) and July for the Center-West region (n = 646), as shown in the figure 1.

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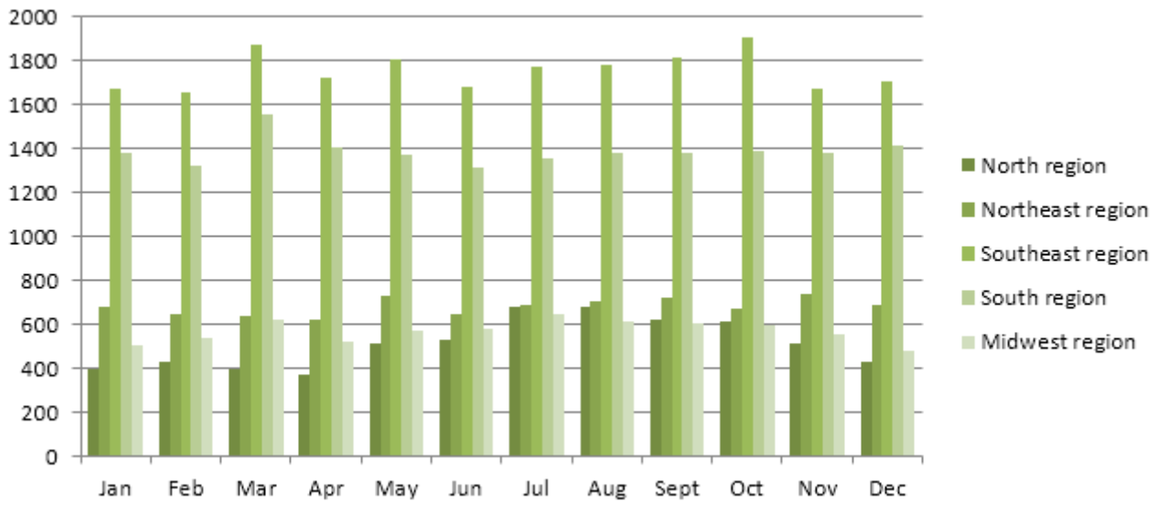

Figure 1. Deaths due to work accidents according to the month by region of the country. Brazil, 1996-2015. Source: MIS/Datasus, 2017.

It is described, according to figure 2, that the highest number of deaths in the Southeast region occurred in 2011 (6.5%), while in the Northeast it was in 2014 (7.6%); and in the South, North and Central-West regions the highest proportion was observed in 2013, with 6.15%, 7.46% and 7.30%, respectively. In the analyzed period, there was a reduction in the number of deaths due to accidents and violence related to work in all regions.

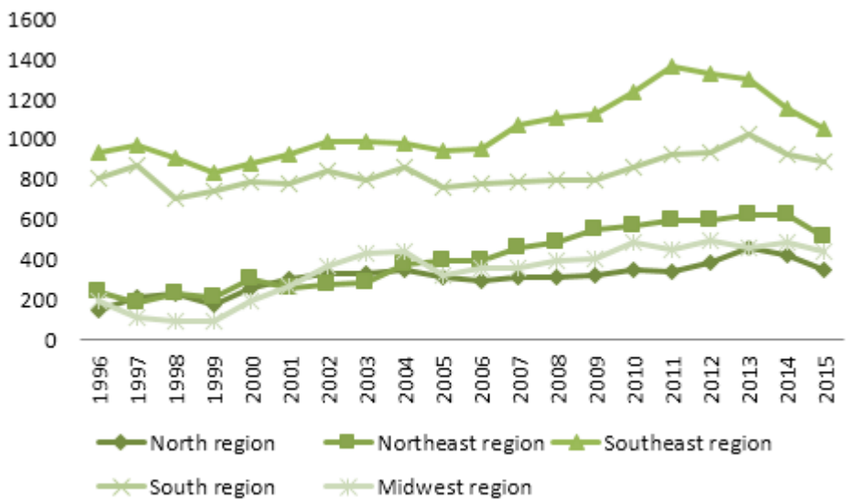

Figure 2. Evolution of the number of deaths due to occupational accidents in Brazil according to the region of the country. Brazil, 1996-2015

According to the ICD-10 categories, it was verified that, in the Northeast and South regions, transport accidents predominated, with 54.25% and 50.94%, respectively, while in the North, Southeastern and Central West regions, the main cause of death was the other external causes of accidental injuries, with 63.60%, 50.26% and 50.14%, respectively.

Table 2. Characterization of fatal work accidents according to accident types. Brazil, 1996-2015.

Variables	North region		Northeast region		Southeast region		South region		Midwest region	
	N	%	n	%	n	%	n	%	n	%
Transport acidentes	2106	34.03	4163	50.94	9950	47.23	9043	54.25	3332	48.69
Other external causes of accident injury	3935	63.60	3771	46.14	10588	50.26	7530	45.17	3431	50.14
Voluntary self-harm	8	0.13	17	0.21	19	0.09	5	0.03	2	0.03
Agressions	67	1.08	125	1.53	196	0.93	26	0.16	30	0.44
Events whose intent is undetermined	59	0.95	81	0.99	284	1.36	47	0.28	42	0.61
Legal Interventions and War Operations	2	0.03	1	0.01	5	0.02	0	0.00	0	0.00
Complications of medical and surgical care	0	0.00	3	0.04	3	0.01	0	0.00	0	0.00
Side effects of external causes	11	0.18	11	0.14	22	0.10	19	0.11	6	0.09
Total	**6188**	**100**	**8172**	**100**	**21067**	**100**	**16670**	**100**	**6843**	**100**

Source: MIS/Datasus, 2017.

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In the analyzed period, there were 28,594 deaths due to work-related transportation accidents. Among the types of transport accidents in all regions, the category of other land transport accidents was highlighted, however, it is observed that accidents with occupants of heavy vehicles, motor vehicle accidents and motorcyclists also stand out in all regions (Figure 3).

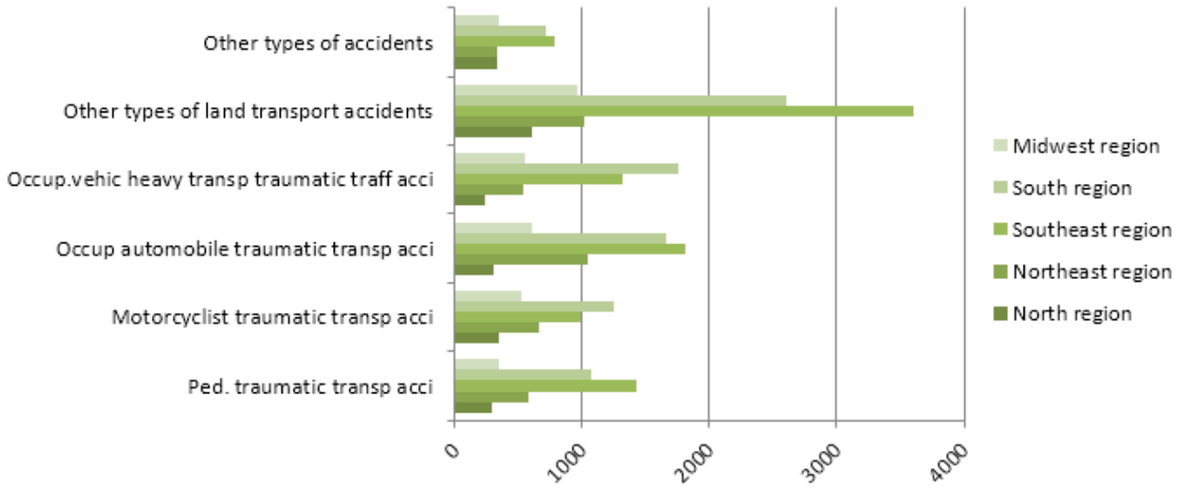

Figure 3. Deaths due to work accidents according to the type of transportation accidents by region of the country. Brazil, 1996-2015.

Among the other external causes of accidental injuries, it was emphasized that the fall was responsible for 30% of deaths, followed by exposure to mechanical forms (23%) and exposure to electric current, radiation and extreme temperature (18.3%), , and all of these death rates are concentrated in a higher percentage in the Southeast region, with 40.14%, 28.42% and 28.62%, respectively.

DISCUSSION

It was demonstrated by this study that the number of deaths due to accidents and violence related to work in Brazil is still high, reflecting a precariousness of working conditions[7] and a lack of supervision and intervention by the Ministry of Labor, working environments. It is also demonstrated that there is a failure of public health actions in relation to interventions in the field of worker health, [7] given the existence of health policies and programs aimed at all workers regardless of the type of work that they develop.

It was demonstrated, in a study comparing the number of work-related accidents in Brazil compared to the United States (USA), the mortality rate in Brazil is almost twice that of the USA.[8]

The Southeastern region stands out for the number of deaths, which can be explained by the fact that the region is the main investment hub of the country and, consequently, the one with the largest number of jobs.

Studies are reported on the underreporting and underreporting numbers related to fatal work accidents, so that the statistics that are disclosed do not express the real severity of mortality due to work-related accidents. It is estimated, however, that there are still many municipalities that present difficulties in reporting work-related accidents and/or diseases.[7,9-12] Emphasis is given to the importance of notification of occupational accidents, since, from these records, Worker Health Surveillance actions can be developed, as well as the supervision of work environments.[13]

It is understood that there is a need for inter-ministerial coordination, investment in capacity building, infrastructure and data collection in the service networks, aiming at improving the quality of the information system.[14]

Between 1996 and 2015, it was observed that the majority of deaths due to external causes related to work affected men, young people of productive age, as evidenced in other studies, [2,7,10,15,16] be explained by the number of young people entering the labor market and activities that generate greater risk, [16] differently from the female condition that is usually inserted in occupational activities with a lower probability of accidents that may lead to death.

Even with the progressive reduction of child labor in Brazil, almost two million children and adolescents from five to 15 years old work, developing their labor activities, especially in the North and Northeast regions, followed by the South, Midwest and Southeast, [17] which, consequently, justifies the highest number of deaths related to child labor concentrated in the Northeast region.

It is necessary to restrain the condition of child exploitation. It is necessary, therefore, the development of studies that direct the look at this specific population, which needs interventions, with severe punishment for those who contract or perform the exploitation of child labor.

Of particular note are the types of accidents that drove workers to death, transportation accidents and falls. It was emphasized, by authors, that transport accidents were responsible

for most of the deaths from the work accident, as well as a study carried out in Curitiba, at a worker's hospital, which showed that accidents involving collision with motor vehicles were the main cause, with 40% of fatal accidents, followed by falling levels, with 20%.[16,18]

In another study carried out in Bahia, related to work-related deaths, occurred in the period from 2007 to 2010, of which, of the 178 accidents, 42% were caused by traffic accidents, especially the collision, overturning and running over , while the fall was highlighted as to the type of accident that led to the death of workers.[19]

In this study, the use of secondary data from the MIS is presented as a limitation, considering the possibility of underreporting of cases and under-registration of information. It is known, however, of the seriousness of said system, since it is considered as an important management tool for the health area, since, from the analysis of the data, it is possible to improve the efficiency of the services.

CONCLUSION

This study was based on the secondary database that is fed through the death certificate. In the information collected, deaths from external causes related to work in Brazil, from 1996 to 2015, especially in the Southeast and South regions of the country, are reflected among male workers, who are brown and economically active.

It is observed that the high number of deaths in work environments is worrisome, considering that the accidents can be controlled through the adoption of preventive and educational actions that must be carried out through the implementation of public health policies of the worker. It is suggested, therefore, that worker protection and safety actions be developed with a view to reducing the number of deaths due to work accidents in Brazil.

It is therefore believed that the results of this study may contribute to the reflection of the issue, as well as demonstrate the need for measures to promote and prevent accidents and violence related to work in the country, especially with regard to transportation accidents.

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