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ORIGINAL ARTICLE

MORTALITY EPIDEMIOLOGY FOR EXTERNAL CAUSES IN THE PERIOD 2004 TO 2013

EPIDEMIOLOGIA DA MORTALIDADE POR CAUSAS EXTERNAS NO PERÍODO DE 2004 A 2013

EPIDEMIOLOGIA DE LA MORTALIDAD POR CAUSAS EXTERNAS EN EL PERÍODO DE 2004 A 2013

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ABSTRACT

Objective: to analyze the epidemiological profile of mortality due to external causes in the Southern Region of Brazil from 2004 to 2013. ***Method***: this is a quantitative, descriptive, exploratory, retrospective and cross-sectional study, based on data provided by the Mortality Information System. Data collection was performed on the website of the Department of Information Technology of the Unified Health System using a form. The sample consisted of 1,737,448 records of deaths due to external causes of morbidity and mortality, and the analysis was performed using descriptive statistics. ***Results***: data showed that most deaths were male (56.94%), aged 20 to 39 (42.73%), white (86.21%), unmarried (57.81%), with up to seven years of school (40.39%) and the hospital as the main place of occurrence (40.70%). ***Conclusion***: there was a progressive increase in the number of deaths due to external causes. The results obtained may provide subsidies for the formulation of effective public policies in the search for a decrease in death rates. ***Descriptors***: Mortality; Morbidity; External Causes; Information Systems; Epidemiology; Health Management.

RESUMO

Objetivo: analisar o perfil epidemiológico da mortalidade por causas externas na Região Sul do Brasil, no período de 2004 a 2013. ***Método:*** estudo quantitativo, descritivo, exploratório, retrospectivo e transversal, desenvolvido a partir dos dados disponibilizados pelo Sistema de Informações sobre Mortalidade. A coleta de dados foi realizada no *site* do Departamento de Informática do Sistema Único de Saúde utilizando-se um formulário. A amostra foi constituída pelos 1.737.448 registros de óbitos decorrentes de causas externas de morbidade e mortalidade e a análise foi realizada por meio de estatística descritiva. ***Resultados:*** os dados mostraram que a maior parte dos óbitos foi de indivíduos do sexo masculino (56,94%), com idade entre 20 e 39 anos (42,73%), de cor branca (86,21%), solteiros (57,81%), com até sete anos de estudos (40,39%) e o hospital como principal local de ocorrência (40,70%). ***Conclusão:*** constatou-se aumento progressivo do número de óbitos decorrentes de causas externas. Os resultados obtidos poderão fornecer subsídios para a formulação de políticas públicas eficazes na busca pela diminuição dos índices de mortes. ***Descritores:*** Mortalidade; Morbidade; Causas Externas; Sistemas de Informação; Epidemiologia; Gestão em Saúde.

RESUMEN

Objetivo: analizar el perfil epidemiológico de la mortalidad por causas externas en la Región Sur de Brasil en el período de 2004 a 2013. ***Método:*** estudio cuantitativo, descriptivo, exploratorio, retrospectivo y transversal, desarrollado a partir de los dados disponibilizados por el Sistema de Informaciones sobre Mortalidad. La recolección de datos fue realizada en el site del Departamento de Informática del Sistema Único de Salud utilizando un formulario. La muestra fue constituida por los 1.737.448 registros de óbitos decurrentes de causas externas de morbilidad y mortalidad y el análisis fue realizado por medio de estadística descriptiva. ***Resultados:*** los datos mostraron que la mayor parte de los óbitos fue de individuos del sexo masculino (56,94%), con edad entre los 20 a los 39 años (42,73%), de color blanca (86,21%), solteros (57,81%), con hasta siete años de estudios (40,39%) y el hospital como principal local de ocurrencia (40,70%). ***Conclusión:*** se constató aumento progresivo del número de óbitos decurrentes de causas externas. Los resultados obtenidos poderán fornecer subsidios para la formulación de políticas públicas eficaces en la búsqueda por la diminución de los índices de muertes. ***Descriptores***: Mortalidad; Morbilidad; Causas Externas; Sistemas de Información; Epidemiología; Gestión en Salud.

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INTRODUCTION

External causes of morbidity and mortality are one of main causes of death in the world, especially in the young, economically active and male population, resulting in millions of deaths annually, thousands of hospitalizations and burdens on health services.[1-2]

Since 1980, there has been an increase in deaths from external causes in Brazil, where homicides and transportation accidents are among the main causes of death due to external causes, representing an economic precocious loss of human capital. Also, it has a great social impact on the life and health of the family and the population in general.[3-5]

The increase in deaths since 1980 has been mainly due to industrial development, where a series of new technologies were made available to the population. Also, the growth and development of cities and society, the increase in the circulation of vehicles, goods and people and the modification of social and political determinants of each region have boosted mortality from external causes[6], public health problem.

Deaths from external causes can be classified into intentional and unintentional causes. In this context, there are deaths resulting from traffic accidents, work, homicides, assaults, falls, drowning, trampling, poisonings, suicides, burns, injuries due to landslides, floods or catastrophes, as well as other mechanical, chemical, physical environmental conditions, thermal, electrical or radicalization.[7]

The 1980s represented the period in which external causes gained ground in the political, economic, social, and health scenario in Brazil. However, it was only in 1990 that the Pan American Health Organization (PAHO) and the World Health Organization (WHO) began the first discussions on the topic. Since then, several governmental strategies to reduce the high death rates due to external causes have been launched. However, they were introduced in a fragmented and progressive way in the Brazilian scenario.[8]

Knowledge about external causes gives subsidies for the development of prevention activities and the elaboration of coping strategies involving intersectoriality.[9] In this sense, it is important to note that Brazil has a great territorial extension and a wide cultural, demographic and socioeconomic, which justifies the need to verify the different regional contrasts that influence the life and health of the population, subsidizing planning and decision making on actions directed at the highest risk groups.[10]

In the scientific literature, there were no studies showing the mortality profile due to external causes of the general population in the South of Brazil, which pointed out the importance of the construction of this study, allowing the development of municipal or state public policies, which direct interventions focused on the conditioning factors of their diseases, for a confrontation at the local, regional, state or national level.[11] Therefore, the importance of this work is emphasized to provide data and promote reflections that assist professionals and health managers in the field of study, to reformulate the policies, actions, and activities inherent to the studied content.

OBJECTIVE

- To analyze the epidemiological profile of mortality from external causes in the Southern Region of Brazil, from 2004 to 2013.

METHOD

This is a quantitative, descriptive-exploratory, retrospective and cross-sectional study covering the states of Santa Catarina, Paraná, and Rio Grande do Sul. The region has a population of 27,386,891 inhabitants and 1,191 cities. The State of Rio Grande do Sul counts the largest population and the largest number of cities, representing 10,693,929 inhabitants distributed in 497 cities, followed by the State of Paraná, with a population of 10,444,526 inhabitants and with 399 cities and the State of Santa Catarina, with the lowest populous index and cities, with 295 cities and 6,248,436 inhabitants.[12]

The data were obtained from the consultation on the Mortality Information System (SIM), from the Department of Informatics of SUS (DATASUS). The origin of the data provided by the SIM is collected through the Declarations of Death (DD), based on the basic cause informed by the death certifying physician. Every day, the municipal and state health secretariats send their data to the Ministry of Health for availability on the basis of DATASUS, considered the national database.[13]

It should be emphasized that these data can only be available publicly after receiving data from all Brazilian Federal Units (UF). Thus, the time cut established for this study was the period from 2004 to 2013, since the data were collected in December 2015 and the information for 2014 and 2015 was not yet available.

Data from all deaths from the period 2004 to 2013 and the deaths resulting from Chapter

XX of the ICD-10 (External causes of morbidity and mortality) coded between V01 and Y98[14] were collected. After the data collection, data were classified according to their groups of causes presented by ICD-10, divided as follows: Accidents of transport, V01 - V99; Suicides, X60 - X84; Homicides, including legal interventions, X85 - Y09 and Y35 - Y36; Causes of undetermined intention, Y10 - Y34; and Other external causes, other codes of V01-Y98.

The data were collected through the computerized system TABNET, in the item "Vital Statistics",[14] using a specific form constructed with the following demographic variables: State of residence, year of death, gender, age group, color/race, marital status, education level and the place of death.

The data collected was organized into a spreadsheet and analyzed in the Microsoft Excel 2010® Program. For the data analysis, descriptive statistics were used by means of absolute and relative frequency calculations. Obtaining the mortality rate (MR) due to external causes in the States and periods analyzed was obtained by the ratio between the number of deaths per cause group occurred and the estimated population for each State in each year analyzed, being presented by 100 thousand inhabitants. The results obtained are presented in graphs and tables format.

Population data refer to the Demographic Census of the Brazilian Institute of Geography and Statistics (IBGE) of 1980, 1991, 2000 and 2010, as well as intersensorial projections (1981 to 2012). The data related to the missing years came from the projection of the population of the units of the federation by sex and age groups (2000-2030). It should be pointed out that these population data for the execution of the calculations of mortality rates were also obtained from DATASUS, in the item describing "Demographic and Socioeconomic" information.[15]

The formula used to obtain the gross mortality rates was as follows:

$$TM = \frac{Number\ of\ deaths\ by\ cause\ group}{Estimated\ population}\ x\ 100.000$$

The ratio between the total number of deaths from each cause group and the total number of deaths from external causes in the period was analyzed to obtain proportional mortality from external causes, and the data were presented per 100 inhabitants. It should be noted that all these data were also obtained through DATASUS.[14]

Proportional mortality was established using the following formula:

$$MP = \frac{Number\ of\ deaths\ by\ cause\ group}{Total\ number\ of\ deaths\ due\ to\ external\ causes}\ x\ 100$$

Regarding the ethical aspects, it is emphasized that all the collected data are of public domain, with unrestricted access and available by the worldwide network of computers. The bases consulted did not contain confidential information, so the appraisal of the project was dispensed by an ethics committee in research. The study was carried out in accordance with Resolution of the National Health Council (CNS) nº 466, of December 12, 2012.

RESULTS

From the data collection, a total of 1,737,448 deaths were recorded in the states of Santa Catarina, Paraná and Rio Grande do Sul in the period from 2004 to 2013. Of this total, 989,269 (56.94%) were from individuals 747.758 (43.04%) from female subjects and 421 (0.02%) cases from individuals in whom this information was not specified.

Of this total, Santa Catarina had the lowest number of deaths among the States analyzed, with 330,790 (19.04%) deaths, followed by the State of Paraná with 644,136 (37.07%) deaths and the State of Rio Grande do Sul, with the highest number of deaths, representing a total of 762,522 (43.89%) deaths.

Of the 1,737,448 deaths, 203,314 (11.70%) were due to external causes. Again Santa Catarina was responsible for the lower number of deaths due to this cause, with 40,523 (19.93%) cases, followed by the State of Rio Grande do Sul, with 72,726 (35.77%) cases of deaths. The State of Paraná was responsible for the highest number of deaths due to external causes, representing a total of 90,065 (44.30%) cases of death.

Table 1 shows the description of mortality due to external causes in the states of southern Brazil, considering all variables analyzed. The cases presented by the system as "Ignored, not informed and others" were disregarded justifying the different value of "n" in each variable.

Table 1. Mortality due to external causes in the southern region of Brazil according to variables analyzed in the period from 2004 to 2013. Florianópolis (SC), Brazil, 2016.

Variable	N	%
Year of death (n=203.314)		
2004	19.290	9.49
2005	19.235	9.46
2006	19.291	9.49
2007	20.062	9.87
2008	20.603	10.13
2009	20.683	10.17
2010	20.907	10.28
2011	20.788	10.22
2012	21.692	10.67
2013	20.763	10.21
Gender (n=203.152)		
Male	165.907	81.67
Female	37.245	18.33
Age group (n=201.484)		
Up to 19 years	29.705	14.74
20-39 years	86.089	42.73
40-59 years	51.161	25.39
60 years and over	34.529	17.14
Skin color/race (n=199.247)		
White	171.766	86.21
Black	8.147	4.09
Yellow	481	0.24
Brown	18.426	9.25
Indigenous	427	0.21
Marital status (n=181.699)		
Single	105.039	57.81
Married	54.058	29.75
Widow	12.870	7.08
Judicially separated	9.732	5.36
Education level (n=141.403)		
None	8.428	5.96
1 to 3 years	31.749	22.45
4 to 7 years	57.109	40.39
8 to 11 years	33.382	23.61
12 years or more	10.735	7.59
Place of occurrence (n=175.648)		
Hospital	71.480	40.70
Another health facility	1.629	0.93
Home	31.600	17.99
Public highway	70.939	40.39

Source: DATASUS (2016).[14]

Table 1 shows that during the analyzed period there were no significant fluctuations in the number of deaths, that is, deaths from external causes maintained a linear level in these years, with a difference of 1.21% between the year with the highest and fewer cases.

Regarding the gender, a great variation was observed among the victims of external causes. Overall, males were the most affected, with 81.67% of all deaths. Regarding the age group, it was evidenced that most deaths were of young people, aged between 20 and 39 years old, followed by people aged between 40 and 59 years old, representing,

respectively, 42.73% and 25.39% of deaths. Regarding skin color/race, it was found that 86.21% of the deaths were due to white people and in in the education level, 40.39% of the individuals had 4 to 7 years of education, followed by people with between 8 and 11 years of schooling with 23.61%.

Regarding the place of the occurrence, deaths occurred in the hospital and public highway, which represented, respectively, 40.70% and 40.39% of deaths. On the other hand, the deaths occurred in the victims' own home, represented a total of 17.99% of the total deaths.

Figure 1 below shows the evolution of mortality from external causes that occurred in southern Brazil between 2004 and 2013. The data will be presented by five major causes (transport accidents, suicides, homicides, including legal interventions Causes of undetermined intent, and Other external causes). It is noteworthy that these causes followed the division as presented in ICD-10.

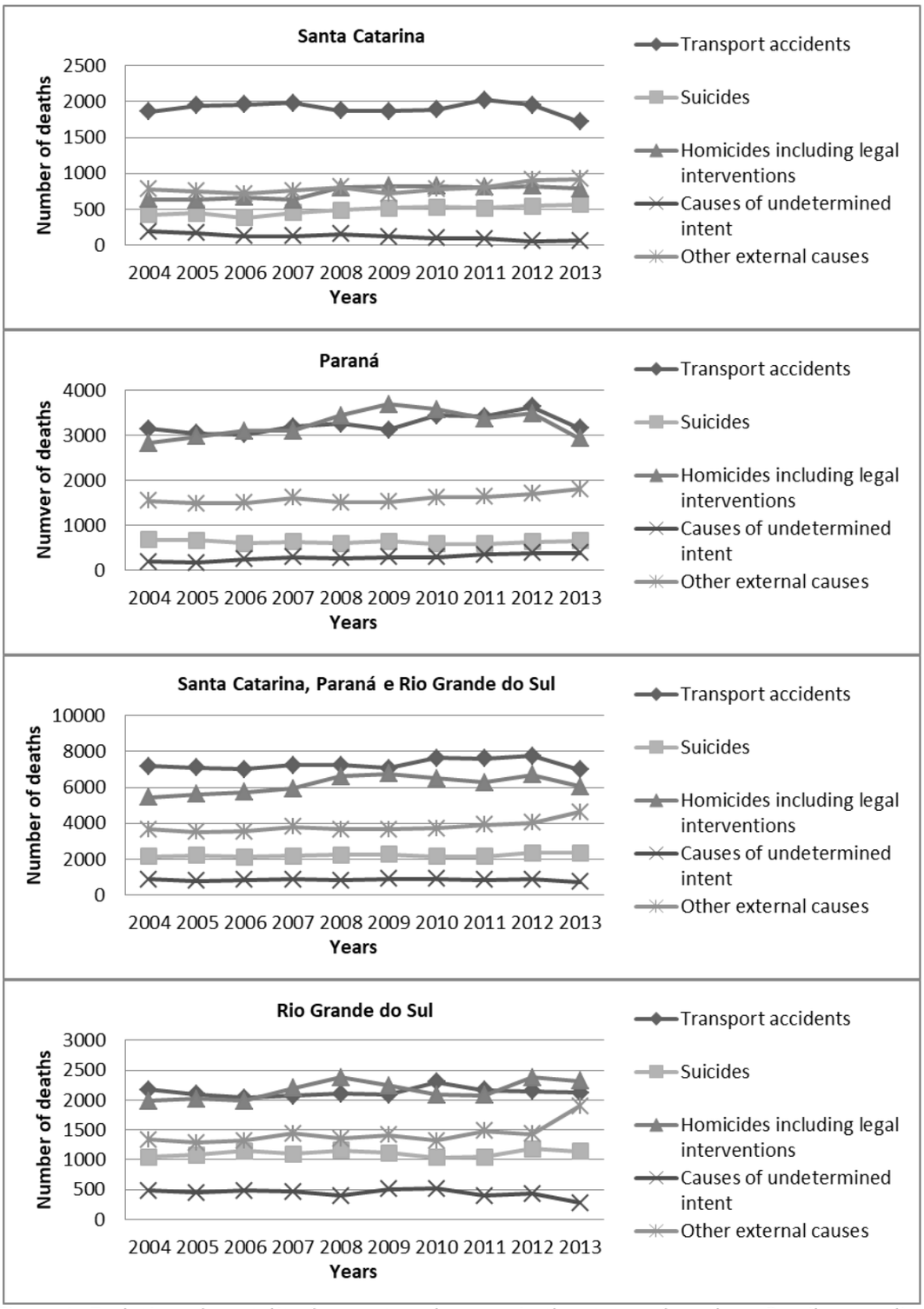

Figure 1. Evolution of mortality from external causes in the states of southern Brazil, according to groups of causes. Florianópolis (SC), Brazil, 2016. Source: DATASUS (2016).[14]

Figure 1 shows an overview of the evolution of mortality by cause group between the years and states analyzed. It can be seen that the States have some similarities, such as the

in the states of Rio Grande do Sul and Paraná, there are similarities in homicide cases, in which for a number of years, the number of deaths from this group of causes was higher than deaths due to transportation accidents. In general, it can be seen that there were no major changes, except for deaths due to transportation accidents and homicides, that in the years studied, there were some oscillations, remaining declining in the last year analyzed.

transport accidents as the group of cause with the greatest absolute number of deaths in all the States. Also,

The Mortality Rate (TM) and Proportional Mortality (MP) were calculated for external causes of the first and last year of study to carry out an in-depth analysis of the data, that is 2004 and 2013. Thus, Table 2 presents in detail the Mortality and Proportional Mortality Rates for external causes of the years 2004 and 2013 for the states of Santa Catarina, Paraná and Rio Grande do Sul.

Table 2. Mortality Rate (per 100,000 inhabitants) and Proportional Mortality by groups of causes from the years 2004 and 2013 in the states of southern Brazil. Florianópolis (SC) Brazil, 2016.

Causes group	Santa Catarina		Paraná		Rio Grande do Sul	
Ano	MR*	PM**	MR*	PM**	MR*	PM**
Transportation Accidents						
2004	32.74	47.87	31.42	37.56	20.50	30.99
2013	25.94	42.37	28.71	35.34	19.00	27.32
Suicídio						
2004	7.42	10.85	6.76	8.09	9.90	14.97
2013	8.56	13.98	5.95	7.33	10.22	14.71
Homicides, including legal intervention						
2004	11.21	16.40	28.21	33.73	18.67	28.23
2013	11.89	19.42	26.69	32.86	20.79	29.90
Causes of undetermined intent						
2004	3.35	4.91	1.86	2.23	4.52	6.84
2013	0.96	1.58	3.43	4.23	2.51	3.62
Other external causes						
2004	13.66	19.97	15.37	18.38	12.55	18.98
2013	13.86	22.65	16.44	20.24	17.00	24.45

*** Mortality Rate**

**** Proportional Mortality**

Source: DATASUS (2016).[14]

Table 2 shows that in Santa Catarina, transportation accidents accounted for almost 50% of all deaths due to external causes in 2004, showing a significantly higher value since in the same year the states of Paraná and Rio Grande respectively had 37.56% and 30.99%.

Regarding the mortality rate, transportation accidents showed a reduction in all States analyzed, when compared 2004 with 2013. This reduction was higher in the States of Santa Catarina and Paraná, where rates ranged from 32.74 to 25.94 and 31.42 for 28.71 deaths per 100 thousand inhabitants respectively.

Regarding the suicides, only the State of Paraná showed a reduction in the mortality rate between 2004 and 2013, from 6.76 to 5.75 deaths per 100,000 inhabitants. The other states increased from 7.42 to 8.56 in the State of Santa Catarina and from 9.90 to 10.22 deaths per 100,000 inhabitants in the state of Rio Grande do Sul.

Homicides, including legal interventions, had a mortality rate higher than the suicide rate in all southern states. Santa Catarina presented lower data when compared with the States of Paraná and Rio Grande do Sul since it presented a mortality rate that varied from 11.21 to 11.89 deaths per 100 thousand inhabitants, from 2004 to 2013. The increase can also be observed in the data column of Rio Grande do Sul, where the mortality rate went from 18.67 in 2004 to 20.79 deaths in 2013 per 100,000 inhabitants. In the State of Paraná, there is a reduction in the death rate from homicides, from 28.61 in 2004 to 26.69 deaths in 2013 per 100,000 inhabitants. Regarding proportional mortality, there was a reduction in the proportion of homicide deaths in the state of Paraná alone, while the other states presented an increase when we compared the data for 2004 and 2013.

Regarding the causes of undetermined intent, they were responsible for the lower mortality rate and also for the lower proportion of deaths in all southern states. There was a reduction in both mortality and proportional mortality rates in the states of Santa Catarina and Rio Grande do Sul, unlike in the State of Paraná, where the mortality

rate and proportional mortality rates were higher in the years analyzed.

In the analysis of the data in Table 2, it is possible to further define which cause groups are responsible for the highest proportion of deaths in each State. It was observed that the states of Paraná and Rio Grande do Sul presented similar data regarding the proportion of deaths by cause groups, with transport accidents at the top of the list, followed by homicides, other external causes, suicides, and causes of death. undetermined intent. On the other hand, the State of Santa Catarina presented an inversion of the position of the deaths due to other external causes and homicides, in which they presented respectively, in the second and third positions.

Table 3 highlights the three main causes of death in the states of Santa Catarina, Paraná, and Rio Grande do Sul, considering their cause groups, as well as their absolute numbers and the percentage of total deaths. The language used to describe the cause of death was maintained as presented by the data collection system.

Table 3. Description of the three main causes of death according to the causes groups of the Southern States of Brazil in the period from 2004 to 2013. Florianópolis (SC), Brazil, 2016.

State	N	%
Santa Catarina		
Transportation Accidents (n=19.090)		
V89 V*eic accident mot n-mot types of veic* NE	3.357	17,59
V23 Motocicl traum colission automov trucks Motorcycle traum colission car trucks	1.724	9,03
V09 Pedestrian trauma other transp accid and NE	1.301	6,82
Suicides (n=4.883)		
X70 Injury self-harm intentional hanging, strangulation, and suffocation injure	3.533	72,35
X74 Auto-intentional injury other fire gun and NE	328	6,72
X72 Intentional self-harm injury hand fire gun	161	3,30
Homicides, including legal interventions (n=7.435)		
X95 Aggression shot other fire gun and NE	3.078	41,40
X99 Sharp or penetrating object aggression	1.560	20,98
X93 Aggression hand firearm shot	1.313	17,66
Causes of undetermined intent (n=1.189)		
Y34 Facts or events NE and intent not determined	550	46,26
Y21 Intentional submersion drowning not determined	106	8,92
Y29 Contact with strong objection	102	8,58
Other external causes (n=7.926)		
W69 Drowning and submersion in natural waters	1.324	16,70
W18 Other falls on the same level	719	9,07
W19 Falls without specification	618	7,80
Paraná		
Transportation Accidents (n=32.459)		
V89 Acid vehicular mot n-mot types of vehicles NE	5.704	17,57
V09 Pedestrian trauma other transp accid and NE	3.994	12,30
V49 Occup car trauma other transp accid and NE	3.092	9,53
Suicídios (n=6.279)		
X70 Intentional self-harm hanging, strangulation, and suffocation injure	3.911	62,29
X74 Auto-intentional injury another fire gun NE	603	9,60
X68 Intentional pesticide self-poisoning	581	9,25
Homicides, including legal interventions (n=32.536)		
X95 Aggression shot other fire gun and NE	20.946	64,38
X99 Sharp or penetrating object aggression	5.125	15,75
X93 Aggression hand firearm shot	2.096	6,44
Causes of undetermined intent (n=2.857)		
Y29 Contact intentional intent object n determined	457	16,00
Y21 Intentional submersion drowning not determined	436	15,26
Y34 Facts or events NE and intentional not determined	420	14,70
Other external causes (n=15.934)		
W18 Other falls at the same level	2.262	14,20
W69 Drowning and submersion in natural waters	1.983	12,45
W19 Falls without specification	1.584	9,94
Rio Grande do Sul		
Transportation Accidents (n=21.306)		
V89 Vehicular accidents mot n-mot types of vehicles NE	6.138	28,81
V09 Pedestrian trauma other transp accid and NE	2.682	12,59
V03 Pedestrian traum colision car truck	1.063	4,99
Suicídios (n=11.057)		
X70 Intentional self-harm hanging, strangulation, and suffocation injure	7.507	67,89
X74 Intentional self-injuring shot other fire gun and NE	1.332	12,05

X72 Injury self-harm intentional shotgun hand fire	645	5,83
Homicides, including legal interventions (n=21.673)		
X95 Aggression shot other fire gun and NE	11.277	52,03
X93 Aggression hand fire gunshot	4.480	20,67
X99 Sharp or penetrating object aggression	3.203	14,78
Causes of undetermined intent (n=4.416)		
Y34 Facts or events NE and intentional not determined	1.907	43,18
Y24 Fire gunshot and intentional NE not determined	547	12,39
Y21 Intentional submersion drowning not determined	457	10,35
Other external causes (n=14.274)		
W19 Falls without specification	2.085	14,61
W69 Drowning and submersion in natural waters	1.736	12,16
W18 Other falls at the same level	980	6,87

Source: DATASUS (2016).[14]

In table 3, transport accidents, fatalities resulting from V89 - Motor vehicle or non-motor vehicle accidents, type (s) of the unspecified vehicle (s) were the most prevalent in all States. For suicides, most deaths in all states are due to X70 - Intentionally self-inflicted injury by hanging, strangulation, and suffocation.

Regarding homicides, including legal interventions, deaths resulting from X95 - Aggression by firing another firearm or unspecified weapon was the most prevalent in all States analyzed. Regarding the causes of undetermined intent, it was observed that the main cause of mortality was not similar for all the States studied. The states of Santa Catarina and Rio Grande do Sul presented as the main cause of death due to causes of undetermined intent, the Y34 - Facts or events not specified and intention not determined, whereas in the State of Paraná, the main cause was the Y29 - Contact with the forceful object, the intention not determined.

Regarding the other external causes, no State showed similarity when analyzed the main cause of death by this group. For the State of Santa Catarina, the main cause of death of this group was due to W69 - Drowning and submersion in natural waters. As for the states of Paraná and Rio Grande do Sul, the main causes of deaths due to other external causes were, respectively, W18 - Other falls at the same level and W19 - Fall without specification.

DISCUSSION

Homicides and transportation accidents, including road accidents and traffic accidents, are currently the main causes of death are among deaths from external causes. Although their gross numbers are high in practically all epidemiological surveys, there are studies that indicate a decrease in death rates due to transportation accidents in recent years, associated mainly with the emergence of the Dry Law in 2008[16], as well as the appearance of laws which required the use of safety belts during the driving of motor vehicles and the compulsory use of children's seats for children under 6 years of age, as shown in a study conducted in Japan.[17]

The findings in this study are similar to results of previously published research, pointing out that the higher prevalence of deaths due to external causes is linked to the male population.[7,18] Such considerations also resemble international contexts, since, conducted in Mexico found that the highest mortality due to external causes was also among adolescents and young male adults in a given period.[19]

Brazil has revealed the greatest inequality of mortality between men and women in external causes. This inequality of mortality has been associated with the social and cultural behavior of the male population who are exposed too much to the risks, since men are generally more involved in aggression and arguments, usually drive at high speeds, are more involved in fights traffic, as well as, usually consume more alcohol compared to women.[16]

Regarding the age group of deaths due to external causes, previous studies have also identified data similar to those found in this study, with young people being the most affected by this type of death.[20-1] These results are believed to be related to the sensation of freedom and courage of the young people of today, interested in knowing and testing new limits, associating alcohol, direction and risky maneuvers.[22]

The educational variable in this study pointed to a higher death rate in the population with four and seven years of education. Differently, from the finding in this study, a study that presented gender inequalities in mortality from external causes in Brazil, evidenced a higher mortality from external causes in people with eight or more

years of education, inferring that the higher the schooling, the higher the risk of to die of external causes.[23] It is necessary to consider that in our study, there were a great number of cases in which this information was ignored, being able to favor an inexact description of the data. A study carried out in China points out that epidemiological data make it possible to create public policies to deal with the problem of external causes. However, the quality of the records has not helped in this task as evidenced in our study.[24]

The place of death presented data similar to those found in a study that evaluated the mortality of a city in the interior of Bahia, showing that most of the deaths also occurred in hospital institutions.[11] Deaths occurred on public roads were not presented by the study, but the deaths in the population´s home, represented a total of 11.01% of the total number of deaths, presenting data lower than those found in this study.

Regarding mortality rates due to transportation accidents, they were declining when compared to 2004 with 2013. A study carried out in 2010 presented mortality rates due to transportation accidents of all Brazilian Federative Units. Based on this survey, the State of Paraná had a mortality rate of 32.2 deaths per 100,000 inhabitants. Santa Catarina and Rio Grande do Sul represented 29.2 and 20.7 deaths per 100,000 inhabitants.[25] It can be seen from the data obtained in this study that mortality rates were even lower in 2013. A recent study conducted in Poland also pointed out that most European countries have shown a reduction in the mortality rate due to transport accidents and that this tendency is multifactorial, such as the compulsory use of seat belts, the use of car seats to carry children and the definition of a speed limit.[26]

The data pointed to an increase in the number of homicide deaths. This type of death represents an indicator of social violence in large and small cities, being related to social and economic inequality and the fragility of public security currently existing.[27] In a similar way to this study, a study aimed at describing the trend of mortality from homicides and traffic accidents in the city of Curitiba presented a reduction in mortality due to transportation accidents and an increase in mortality from homicides.[28] Differently, from the data found in this study, a study was carried out to quantify the magnitude of homicide deaths in Brazil. Colombia during the period from 2000 to 2011, showed that there was a decline in homicide deaths in that country during the period studied.[29]

Regarding self-harm, there was also an increase in the number of deaths, except for the State of Paraná. Discussions about suicide deaths are advancing in recent years but still, represent as a multifaceted issue.[27] Reducing their rates is a difficult practice, since their occurrence is directly linked to individual factors and the complexity of each being In a study carried out in Mexico in the period 2000-2013, it also pointed to an increase in the number of deaths due to suicide,[19] presenting similarities with the data found in the present study.

Regarding the causes of undetermined intent, the data obtained pointed to a reduction in the death rate with this classification, except for the State of Paraná. A study conducted in the State of Minas Gerais also showed a reduction in the number of deaths in this classification, from 28.4% in 1999 to 15.1% in 2008.[20] In our study, besides to the percentage reduction, excluding the State of Paraná, possible to perceive even lower values than those presented in the State of Minas Gerais.

This study shows the uncertainty of the accuracy of the data provided by the Mortality Information System as a limitation because it was performed based on secondary data. Despite the relevance of the analysis and interpretation of vital statistics, these are statistics generated from the information collected in the death certificates. The Ministry of Health does not have a regular evaluation plan for the monitoring of data quality of health information systems. Thus, the need for studies evaluating the quality and reliability of the information provided by the SIM is pointed out. Despite this, the study contributes to the advance in the production of scientific knowledge in nursing and health, evidencing the epidemiological profile of mortality due to external causes in a Brazilian region.

CONCLUSION

From this study and considering the proposed objective, a progressive increase in the number of deaths due to external causes was observed, being the majority of males and aged between 20 and 39 years old, white, single and having up to seven years of study. Also, reductions in mortality rates from external causes over the years in the States analyzed have been shown. Such reductions can be attributed to improvements in health, as well as the latest proposals and policies formulated, with prevention, treatment and

rehabilitation actions for individuals affected by external causes.

As theoretical and practical implications of the results, it is expected that the results obtained will be able to provide subsidies for the formulation of effective public policies, seeking to minimize the magnitude of the problem involving deaths from external causes. Thus, the importance of studies based on the analysis and interpretation of vital statistics for the planning and accomplishment of health and nursing care is highlighted. As future developments of this work for the advancement of scientific knowledge, it is suggested to carry out studies on the profile of morbidity and mortality from external causes in other regions of Brazil, as well as the monitoring of future statistics in the Southern Region.

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