artigo

Biscola, G. A., Derin, V. N., Marques, F. R. D. M., Costa, A. B., Salci, M. A., Lígia Carreira, L., Fernandes, C. A. M.
Pro Health profile of motorcycle deaths in the state of Paraná-Brazil

Health profile of motorcycle deaths in the state of Paraná-Brazil

Perfil epidemiológico dos óbitos por motocicletas no estado do Paraná-Brasil
Perfil epidemiológico de las muertes en moto en el estado de Paraná-Brasil

RESUMO
Objetivo: Analisar os fatores associados para óbitos de motociclistas no estado do Paraná-Brasil, do ano de 2017 a 2019. Método: Trata-se de um estudo epidemiológico, transversal, analítico e retrospectivo, sobre as notificações dos casos de óbitos de motociclistas no estado do Paraná. Para análise foram calculadas medidas de frequência simples e relativas, posteriormente estimadas as medidas de associação por meio da Odds Ratio. Resultados: As características predominantes das vítimas eram ser de cor branca, ter 8 ou mais anos de estudo, não serem casadas e não irem a óbito em hospitais. Em contrapartida, as vítimas do sexo feminino apresentaram menor chance de irem a óbito quando tem menos de oito anos de estudo e de falecerem em locais que não sejam hospitalares. Conclusão: Foi possível identificar as características dos motociclistas que foram a óbito, sendo necessário que a partir das informações apresentadas, os gestores do estado realizem medidas de prevenção para este agravo, predominantemente nos grupos mais vulneráveis deste evento.
DESCRITORES: Acidentes de Trânsito; Motocicletas; Perfil epidemiológico.

ABSTRACT
Objective: To analyze the factors associated with motorcyclist deaths in the state of Paraná-Brazil, from the year 2017 to 2019. Method: This is an epidemiological, cross-sectional, analytical, and retrospective study on the notifications of cases of deaths of motorcyclists in the state of Paraná. For analysis, simple and relative frequency measures were calculated, subsequently association measures were estimated by means of Odds Ratio. Results: The predominant characteristics of the victims were being white, having 8 or more years of schooling, being unmarried and not dying in hospitals. In contrast, female victims were less likely to die if they had less than 8 years of schooling and if they died in places other than hospitals. Conclusion: It was possible to identify the characteristics of the motorcyclists who died, and it is necessary that, based on the information presented, the state managers carry out prevention measures for this grievance, predominantly in the most vulnerable groups of this event.
DESCRIPTORS: Accidents, Traffic; Motorcycles; Health Profile.

RESUMEN
Objetivo: Analizar los factores asociados a las muertes de motociclistas en el estado de Paraná-Brasil, desde el año 2017 hasta el 2019. Método: Se trata de un estudio epidemiológico, transversal, analítico y retrospectivo, sobre las notificaciones de casos de muertes de motociclistas en el estado de Paraná. Para el análisis se calcularon medidas de frecuencia simple y relativa, estimándose posteriormente las medidas de asociación mediante Odds Ratio. Resultados: Las características predominantes de las víctimas eran ser de raza blanca, tener 8 o más años de educación, ser soltero y no morir en hospitales. Por otro lado, las víctimas femeninas tenían menos probabilidades de morir cuando tenían menos de ocho años de escolarización y morían en lugares distintos de los hospitales. Conclusión: Ha sido posible identificar las características de los motociclistas que han sido víctimas, por lo que es necesario que, a partir de la información presentada, los gestores del estado tomen medidas de prevención de este problema, principalmente en los grupos más vulnerables de este evento.
DESCRIPTORES: Accidentes de tránsito; Motocicletas; Perfil Epidemiológico.

Guilherme Alda Biscola
Master's student in Nursing at the Postgraduate Program in Nursing at the State University of Maringá. Maringá, PR, Brazil.
ORCID: 0000-0002-8707-7419.

Vanessa Neckel Derin
Master's student in Nursing. Collaborating professor at the State University of Paraná – Campus de Paranavaí – nursing department. Paranavai, PR, Brazil.
ORCID: 0000-0002-3851- 538X.

artigo

Biscola, G. A., Derin, V. N., Marques, F. R. D. M., Costa, A. B., Salci, M. A., Lígia Carreira, L., Fernandes, C. A. M.
Pro Health profile of motorcycle deaths in the state of Paraná-Brazil

Francielle Renata Danielli Martins Marques
Doctoral student in Nursing at the Postgraduate Program in Nursing at the State University of Maringá. Maringá, PR, Brazil.
ORCID: 0000-0002-8578-9615

Aline Balandis Costa
Doctoral student in Nursing at the Postgraduate Program in Nursing at the State University of Maringá. Maringá, PR, Brazil.
ORCID: 0000-0003-4339-6204

Maria Aparecida Salci
Doctor in Nursing. Professor of the Postgraduate Program in Nursing at the State University of Maringá. Maringá, PR, Brazil.
ORCID: 0000-0002-6386-1962

Lígia Carreira
Post-Doctorate in Nursing. Professor of the Postgraduate Program in Nursing at the State University of Maringá. Maringá, PR, Brazil.
ORCID: 0000-0003-3891-4222

Carlos Alexandre Molena Fernandes
Doctor in Pharmaceutical Sciences. Professor of the Graduate Program in Nursing at the State University of Maringá. Maringá, PR, Brazil.
ORCID: 0000-0002-4019-8379

1.INTRODUÇÃO

In In the middle of the 21st century, our planet still suffers from a serious public health problem, which society of its great damages in ours still does not receive necessary attention, the Traffic Accidents. [1]

The main causes of traffic accidents in the world are linked to the non-use of safety devices in vehicles, drug use and lack of attention when driving transport vehicles. [2] Transport accidents can even mostly be considered predictable and avoidable, when public measures such as adequate road infrastructures are implemented. [3]

According to the World Health Organization (WHO), it is estimated that as a result of traffic accidents, 1.3 million deaths occur and on average leave 20 to 50 million people with sequelae annually worldwide. However, in 49% of the cases with fatalities, the victims are pedestrians, cyclists and motorcyclists [4], due to the vulnerability faced by these groups that do not have traffic protection, while modern cars have more and more technology for safety. [5]

Regarding traffic victims, motorcyclists stand out, who choose motorcycles as a means of transport, due to financial and time savings through this vehicle, whether or not they use it as a means of locomotion to generate income like motoboys [6], however, this vehicle can be highly dangerous, and according to DATASUS data, from 2010 to 2019, 118,198 drivers of these vehicles died, with the highest number of cases in the Northeast and then in the Southeast of Brazil. [7]

Despite the great damage already caused by the morbidity and mortality of TA in our society, studies point to an even more tragic future scenario, as TAs have a growing trend following this disease on the planet. [8,9] Among the causes that caused this phenomenon is the increase in the human population inhabiting urban areas, which will total 70% in the year 2050. [10]

Given the seriousness of the consequences caused by TA, it is necessary to study their characteristics, so that specific measures are created in order to contain them over the years, such as through advanced driver assistance systems, autonomous driving systems and traffic control systems [11], due to the fact that, on average, 67% of the TA are the result of human errors, being variable according to each population studied. [12]

Therefore, understanding the characteristics of motorcycle victims is essential for the development of more specific measures of intervention, prevention and public policies for this population. In this sense, it is possible that the current lack of knowledge of these victims in the state of Paraná-Brazil reflects the lack of effective measures of education, evaluation and inspection of the same and, consequently, allowing the increase of statistics for collisions and traffic deaths in the following years and decades.

Due to the lack of studies on the mortality of motorcyclists in traffic in the state of Paraná-PR, there was a need to identify the characteristics that determine this condition. In view of this, this study aimed to analyze the factors associated with death of motorcyclists in the state of Paraná-BRASIL, from 2017 to 2019.

METHOD

This is an epidemiological, analytical, cross-sectional and retrospective study, through the analysis of secondary data, on the notifications of death cases of motorcyclists in the state of Paraná, the period of time analyzed was from the year 2017 to 2019, corresponding to the last 3 years of motorcycle deaths, available in the system,

artigo

Biscola, G. A., Derin, V. N., Marques, F. R. D. M., Costa, A. B., Salci, M. A., Lígia Carreira, L., Fernandes, C. A. M.
Pro Health profile of motorcycle deaths in the state of Paraná-Brazil

in order to present a current overview of the profile of deaths.

This type of research was chosen to determine the distribution of deaths, according to the place and its characteristics, and to be able to determine the existence of an association between the variables for deaths from motorcycle accidents. [13]

Death data were obtained from the Mortality Information System (MIS), made available by DATASUS. The MIS is a national epidemiological surveillance system, whose objective is to capture mortality data for all instances of the health system. The system's entry document is the Death Certificate (DC), standardized throughout the national territory. [14]

For the selection of deaths, the International Classification of Diseases (ICD) was used, under codes V20 to V29, which refer to deaths with motorcycles. The ICD is the basis for identifying health trends and statistics around the world and contains nearly 55,000 unique codes for injuries, illnesses and causes of death. The document provides a common language that allows healthcare professionals to share healthcare information at a global level. [15]

Information was collected on the number of deaths distributed in the 22 health regions of the state of Paraná-Brazil, the sociodemographic variables (gender, age group, color/race, education and marital status) and on the place of death, being presented in categories and later dichotomized to enable the implementation of inferential statistical analyses, when necessary.

The 22 health regions of the state of Paraná were presented, corresponding to all of the state; The gender of the victims was presented as female and male; The age group of the victims was presented as less than 1 year old, 1 to 4 years old, 5 to 9 years old, 10 to 14 years old, 15 to 19 years old, 20 to 29 years old, 30 to 39 years old, 40 to 49 years old, 40 to 59 years old, 60 to 69 years old, 70 to 79 years old, 80 years old and more, being later categorized as 0 to 19 years old, 20 to 59 years old, > 60 years old; Color/race was presented as white, black, yellow, brown, indigenous, being categorized as non-white and white; Schooling was

The main causes of traffic accidents in the world are linked to the non-use of safety devices in vehicles, drug use and lack of attention when driving transport vehicles

presented as none, 1 to 3 years, 4 to 7 years, 8 to 11 years, 12 years and over, 1 to 8 years, 9 to 11 years, being further categorized into < 8 years of schooling and > 8 years of schooling; The marital status was presented as single, married, widowed, legally separated and other, being categorized as unmarried and married; The place of occurrence was presented as hospital, other health establishment, home, public road and others, being categorized in other places and hospital.

The dependent variables were male and female. The independent variables were the Health Regions (HR), the sociodemographic variables and the place of death.

For analysis, data were tabulated in an Excel® spreadsheet and simple and relative frequency measures were calculated. Subsequently, measures of association were estimated using the Odds Ratio and statistical tests were performed using Pearson's Chi-square and Fisher's exact test when frequencies were less than 6 units. For all analyses, a confidence interval of 95% and a significance level of 5% were considered, performed with the aid of Epi-info software version 7.2.3.1.

The research did not require approval from the University Research Ethics Committee, as it is a public domain database, according to Resolution 466/12 of the National Health Council.

RESULTS

2095 death notifications were analyzed, resulting from motorcycle accidents from 2017 to 2019, in the state of Paraná-Brazil. Among the Health Regions (RS), those with the highest number of fatal cases caused by motorcycles were the 2nd RS (20.38%), followed by the 17th RS (9.64%) and the 15th RS (9.12%).

When comparing the risk of accidents between the sexes, there were no statistically significant results (p<0.05). Mortality in women was predominant in the 2nd RS (n=41), 15th RS (n=22) and 17th (n=19). While men died mainly in the 2nd RS (n=386), 17th (n=183) and 15th (n=169). And, the lowest numbers of dea-

artigo

Biscola, G. A., Derin, V. N., Marques, F. R. D. M., Costa, A. B., Salci, M. A., Lígia Carreira, L., Fernandes, C. A. M.
Pro Health profile of motorcycle deaths in the state of Paraná-Brazil

ths in women were in the 6th RS (n=1) and 18th RS (n=2), while men had lower rates in the 4th RS (n=19) and 6th RS (n=27).

When analyzing the sociodemographic variables, a predominance of victims between 20 and 59 years of age (82.67%) can be observed, in both genders. When performing the statistical test, it was found that women have a 78% lower chance of being killed by motorcycles, when they are 60 years of age or older (OR= 0.22; CI= 0.07-0.72; p= 0.0103).

Regarding the race/color of the mo-torcyclists, white victims predominated (78.81%). Regarding education, there was a predominance of victims with > 8 years of schooling (61.19%), when the statistical test was performed, it was observed that women with less than 8 years of schooling are 34% less likely to die in motorcycle accidents compared to men (OR= 0.66; CI= 0.49-0.89; p= 0.0087).

Regarding marital status, there was a predominance of unmarried victims (73.60%), with results that show the same in both sexes (female=9.21%; male=64.39%).

Related to the place of death, most were in other places (55.85%), however, compared to the sexes, women died predominantly in hospitals (6.54%), and were 39% less likely to die in other places (OR=0.61; CI=0.47-0.80; p=0.003).

DISCUSSION

In the present study, a predominance of male victims was obtained, and similar results were found in a study carried out in the city of Maringá-PR [16], in a study car-

Variable	Female		Male		Total		OR	IC	p
	N	%	N	%	N	%			
Health Region (CIR)									
1st RS Paranaguá	10	0,48	38	1,81	48	2,29	1,98	(0,97-4,02)	0,0839
2nd RS Curitiba	41	1,96	386	18,42	427	20,38	0,74	(0,52-1,05)	0,1137
3rd RS Ponta Grossa	4	0,19	80	3,82	84	4,01	0,35	(0,13-0,98)	0,0380 §
4th RS Irati	4	0,19	19	0,91	23	1,10	1,56	(0,52-4,63)	0,3441 §
5th RS Guarapuava	7	0,33	58	2,77	65	3,10	0,88	(0,40-1,96)	0,9205
6th RS União da Vitória	1	0,05	27	1,29	28	1,34	0,27	(0,03-1,99)	0,2422 §
7th RS Pato Branco	6	0,29	45	2,15	51	2,43	0,98	(0,41-2,32)	1,0000 §
8th RS Francisco Beltrão	8	0,38	56	2,67	64	3,05	1,05	(0,49-2,24)	1,0000 §
9th RS Foz do Iguaçu	13	0,62	88	4,20	101	4,82	1,09	(0,60-1,99)	0,888
10th RS Cascavel	16	0,76	101	4,82	117	5,58	1,18	(0,68-2,03)	0,6516
11th RS Campo Mourão	17	0,81	97	4,63	114	5,44	1,31	(0,77-2,24)	0,3895
12th RS Umuarama	9	0,43	64	3,05	73	3,48	1,03	(0,51-2,11)	1,0000
13th RS Cianorte	8	0,38	34	1,62	42	2,00	1,76	(0,80-3,84)	0,2315
14th RS Paranavaí	12	0,57	68	3,25	80	3,82	1,31	(0,70-2,47)	0,4921
15th RS Maringá	22	1,05	169	8,07	191	9,12	0,95	(0,60-1,52)	0,9454
16th RS Apucarana	11	0,53	82	3,91	93	4,44	0,98	(0,51-1,88)	1,0000
17th RS Londrina	19	0,91	183	8,74	202	9,64	0,74	(0,45-1,22)	0,2930
18th RS Cornélio Procópio	2	0,10	36	1,72	38	1,81	0,4	(0,09-1,69)	0,3089 §
19th RS Jacarezinho	18	0,86	60	2,86	78	3,72	2,3	(1,33-3,97)	0,0035
20th RS Toledo	13	0,62	88	4,20	101	4,82	1,09	(0,60-1,99)	0,8880
21st RS Telêmaco Borba	5	0,24	29	1,38	34	1,62	1,27	(0,49-3,33)	0,5918 §
22nd RS Ivaiporã	4	0,19	37	1,77	41	1,96	0,79	(0,28-2,24)	0,8111 §

Table 1- Occurrence of deaths from motorcycle accidents, in the 22 health regions of the state of Paraná-Brazil , from 2017 to 2019

*OR- Odds ratio
**IC- Confidence Interval of 95%
***p- Descriptive level for Pearson's Chi-Square Test
§ - Descriptive level for Fisher's Exact Test
Source: DATASUS, 2022.

artigo

Biscola, G. A., Derin, V. N., Marques, F. R. D. M., Costa, A. B., Salci, M. A., Lígia Carreira, L., Fernandes, C. A. M.
Pro Health profile of motorcycle deaths in the state of Paraná-Brazil

Variables	Female		Male		Total		OR	IC	p
	N	%	N	%	N	%			
Age group									
0 to 19 years	33	1,58	234	11,17	267	12,74	1,04	(0,70-1,54)	0,8973
20 to 59 years	214	10,21	1518	72,46	1732	82,67	1,28	(0,88-1,85)	0,2247
> 60 years	3	0,14	93	4,44	96	4,58	0,22	(0,07-0,72)	0,0103
Color/race									
Not White	43	2,05	380	18,14	423	20,19	0,79	(0,56-1,13)	0,2343
White	205	9,79	1.446	69,02	1651	78,81	1		
Ignored	2	0,10	19	0,91	21	1,00			
Education									
< 8 years of study	68	3,25	663	31,65	731	34,89	0,66	(0,49-0,89)	0,0087
> 8 years of study	171	8,16	1111	53,03	1282	61,19	1		
Ignored	11	0,53	71	3,39	82	3,91			
Marital Status									
Not married	68	3,25	663	31,65	731	34,89	0,66	(0,49-0,89)	0,0087
Married	171	8,16	1111	53,03	1282	61,19	1		
Ignored	11	0,53	71	3,39	82	3,91			
Place of occurrence									
Other places	113	5,39	1057	50,45	1170	55,85	0,61	0,47-0,80	0,0003
Hospital	137	6,54	788	37,61	925	44,15	1		

Table 2- Sociodemographic variables of deaths from motorcycle accidents in the state of Paraná-Brazil, from 2017 to 2019.

Source: DATASUS, 2022.

ried out in the state of Alagoas [17] and in a study carried out in the Federal District. [18] Among the factors that cause the largest number of male victims is related to the greater aggressiveness of these drivers and early contact with motorcycles by these users, who drive this type of vehicle even before reaching the mandatory age of 18 years. Other factors that may explain this discrepancy between the sexes are that men use this type of vehicle more, and women are more aware of driving motorcycles. [19]

Another predominant characteristic of the victims was white race/color, with opposite results being obtained in a study in the state of Bahia that evaluated the profile of victims hospitalized [20] and in a study carried out with data from assistance to accidents involving motorcyclists, in the Federal District and in 24 Brazilian capitals. [21]

Regarding the predominance of higher education of the victims, there were similar results [21], however, opposite results in a study carried out in a hospital in the city of Imperatriz-MA. [22] The higher level of education among the victims in the study can be explained by the fact that most victims are white and adults. According to the Brazilian Yearbook of Basic Education, in the state of Paraná, the population aged 20 to 29 years of age white in 2020 had an average of 12.5 years of study, in addition, for every 100 young people, 69 manage to complete high school by the age of 19 in the state. [23]

Unmarried victims were more susceptible to accidents, with greater exposure at night, in public environments and greater drug consumption. While married people tend to spend a greater proportion of their time at home and at work, exposing themselves less to the risk of accidents. [24]

Among the victims of traffic accidents, the female sex deserves to be highlighted, due to several factors, among them due to their physical and behavioral characteristics, which make them more vulnerable in multiple aspects, to the great damage produced in society with its morbidity and mortality as a result of accidents, since these women are often providers and caregivers of their families. [25]

As for the relationship of the highest proportion of female victims dying in hospitals, it may be related to safe motorcycle driving practices, such as the proper use of safety equipment such as a helmet [25], preventing death from occurring immediately at the scene of the accident in cases of serious collisions.

Regarding the ignored data from the research, training on the correct completion of the Death Certificate should be

artigo

Biscola, G. A., Derin, V. N., Marques, F. R. D. M., Costa, A. B., Salci, M. A., Lígia Carreira, L., Fernandes, C. A. M.
Pro Health profile of motorcycle deaths in the state of Paraná-Brazil

carried out for the health professionals who perform it, in order to make them aware of its importance for the population, as it is through it that data are supplied to the MIS, informing the population in quantitative terms about the deaths present in our society. [26]

CONCLUSION

From the present study, it was possible to identify the characteristics of motorcyclists who died in the state of Paraná, during the period studied, and it was found that the main characteristics of the victims were being white, having eight or more years of schooling, not being married and not dying in hospitals. On the other hand, female victims were less likely to die when they have less than eight years of schooling and to die in places other than hospitals.

In view of this information presented, it is necessary for state managers to carry out preventive measures for this disease, predominantly in the most vulnerable groups of this event, preventing the growth of the number of victims from these accidents, due to the serious consequences suffered in society.

In our society, it should also be encouraged to carry out studies in the area of health, with the objectives of promoting, preventing and recovering victims, in order to reduce the consequences of traffic accidents, from specific measures, because only through such measures will it guarantee the reduction of the number of victims and generate lower expenses for the government, allowing a better quality of life for the population.

In the study, the main limitation was the disarticulation of the systems that record traffic accidents, causing the results to deviate from the real dimension of the accidents that occurred and, consequently, showing only a vestige of the serious problem present in our population.

REFERENCES

1.World Health Organization. Global status report on road safety 2018. Geneva: [s.n.], 2018. [Cited 2022 mar 1]. Available from: https://apps.who.int/iris/rest/bitstreams/1164010/retrieve.

2.World Health Organization. Global Status Report on Road Safety. Geneva: WHO. 2015.

3.Lopes ALC, Almeida AC, Couto KG, Santos NM, Ferreira JC, Silva ACR, et all. Prevalência dos atendimentos por acidentes de trânsito realizados pelo serviço de atendimento a urgências no município de Rio Verde, Goiás. 2018 [cited 2022 feb 1];16 (1): 1-7. Available from: http://dx.doi.org/10.5892/ruvrd.v16i1.3876.

4.Organização Pan-Americana de Saúde. Segurança no trânsito. 2022 feb 2; Brasília-DF, Brasil. Available from: https://www.paho.org/pt/topicos/seguranca-no-transito.

5.Vanlaar W, Mainegra Hing M, Brown S, McAteer H, Crain J, McFaull S. Fatal and serious injuries related to vulnerable road users in Canada. J Safety Res. 2016 [cited 2022 feb 15]; 58: 67-77. Available from: https://doi.org/10.1016/j.jsr.2016.07.001.

6.Santos FJ, Paes SR, Gomes JLS, Morais RLS. Motivação para a escolha da motocicleta: uma análise sob a perspectiva de motociclistas acidentados. Cad Saúde Colet, 2021[cited 2022 15 feb];29(2):260-270. Available from: https://doi.org/10.1590/14144 62X202129020056

7.Brasil, Ministério da Saúde, Departamento de Informática do Sistema Único de Saúde. Tabnet. 2022 feb 01. Available from:http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sim/cnv/obt10uf.def

8.Hyder AA, Paichadze N, Toroyan T, Peden MM. Monitoring the Decade of action for global road safety 2011-2020: An update. Públic Health, 2016 [cited 2022 jan 3]; 12(12):1492-1505. Available from: http://www.tandfonline.com/action/showCitFormats?doi=10.1080/17441692.2016.1169306.

9.Wang T, Wan Y, Xu T, Li L, Huo M, LI X, et all. Epidemiological and clinical characteristics of 3327 cases of traffic trauma deaths in Beijng from 2008 to 2017: A restrospective analyses. Medicine (Baltimore), 2020 [cited 2022 jan 5]; 99(1). Available from: https://doi.org/10.1097/md.0000000000018567.

10.Alvarez P, Lerga I, Serrano A, Faulin J. Considering congestions costs and driver behavior into route optimasation algorithms in smart cities. LNCS, 2017 [cited 2022 mar 01]; 10268(1):39-50. Available from: http://dx.doi.org/10.1007/978-3-319-59513-9_5.

11.Atchley P, Shi J, Yamamoto T. Cultural foundations of safety culture: A comparison of traffic safety culture in China, Japan and the United States. Rev. Transp. Res. Part Traffic Psychol. Behav. 2014 [cited 2022 jan 15]; 26(1):317-325. Available from: https://doi.org/10.1016/j.trf.2014.01.004.

12.Touahmia M. Identification of Risk Factors Influencing Road Traffic Accidents. Eng. Techmol, Appl. Sci. Res. 2018 [cited 2022 jan 20]; 8(1):2417-2421. Available from: http://doi.org/10.48084/etasr.1615.

13.Lima-Costa MF, Barreto, SM. Tipos de estudos epidemiológicos: conceitos básicos e aplicações na área do envelhecimento. 2003 [cited 2022 feb 5]; 12(4). Available from: http://dx.doi.org/10.5123/S1679-49742003000400003.

14.Brasil. Ministério da Saúde. Fundação Nacional de Saúde. Manual de procedimentos do sistema de informações sobre mortalidade. 2001 [cited 2022 jan 25]. Available from: https://bvsms.saude.gov.br/bvs/publicacoes/sis_mortalidade.pdf.

15.Brasil. Ministério da Saúde. Organização Mundial da Saúde divulga nova Classificação Internacional de Doenças. Biblioteca Virtual em Saúde. [cited 2022 mar 01]. Available from: https://bvsms.saude.gov.br/organizacao-mundial-da-saude-divulga-nova-classificacao-internacional-de-doencas/.

16.Barbosa Junior RDS, Golias ARC. Fraturas provocadas por acidentes de motocicleta. Revista UNINGÁ. 2021 [cited 2022 mar 01]; 58 (eUJ3756), 2021. Available from: doi.org/10.46311/2318-0579.58.eUJ3756

17.Souza CDF, Machado MF, Quirino TRL, Leal TC, Paiva JPS, Magalhães APN, et all. Padrões espaciais e temporais da mortalidade de motociclistas em estado do nordeste brasileiro no século xx1. Revista Ciênc. Saúde coletiva 2021[cited 2022 feb 27]; 26(4). Available from: https://doi.org/10.1590/1413-81232021264.09732019.

artigo

Biscola, G. A., Derin, V. N., Marques, F. R. D. M., Costa, A. B., Salci, M. A., Lígia Carreira, L., Fernandes, C. A. M.
Pro Health profile of motorcycle deaths in the state of Paraná-Brazil

18.Mendonça BMP, SOUZA, NKT, BORGES JHS, NETO JSA. Perfil do condutor de moto vítima de acidente de trânsito no Distrito Federal. Brasília Med, 2021 [cited 2022 mar 01] 58:1-6.

19.Rezende RBM, MACEDO JLS, ROSA SC, GALLI FS. Perfil epidemiológico e tratamento de perdas de substância por trauma em membros inferiores. Revista do Colégio Brasileiro de Cirurgiões. 2017 [cited 2022 jan 03], 44(5): 444-451.

20.Aguiar DG, Souza OC, Matos PVC, Santos FM, Lopes EP, Rodrigues RL, et all. Internação hospitalar de motociclistas acidentados no estado da Bahia. Braz. J. Hea. Rev. 2019; 2(2):1018-1038.

21.Mascarenhas MDM, Souto RMCV, Malta DC, Silva MMA, Lima CM, Montenegro MMS. Características de motociclistas envolvidos em acidentes de transporte atendidos em serviços públicos de urgência e emergência. Revista Ciência e Saúde Coletiva, 2016 [cited 2022 jan 18] 21(12):3661-3671. Available from: 10.1590/1413-812320152112.24332016

22.Chaves RRG, Ferreira APM, Ribeiro EDLM, Souza HWO, Fernandes OS, Ferreira WV. Acidentes de motocicleta: Perfil e caracterização das vítimas atendidas em um hospital público. Rev. Enfer. UFPE on line, 2015 [cited 2022 03 jan]; 9(4):7412-19. Available from: 10.5205/reuol.7275-62744-1-SM.0904201529

23.Todos pela Educação; Editora Moderna. Anuário Brasileiro de Educação Básica. 2022[cited 2022 jan 01]. Available from: https://todospelaeducacao.org.br/wordpress/wpcontent/uploads/2021/07/Anuario_21final.pdf

24.Marinho CSR, Santos JNA, Filho LAM, Valença CN, Santos EGO, Bay Júnior OG. Acidente de trânsito: análise dos casos de traumatismo cranioencefálico. Revista eletrônica trimestral de enfermaria, 2019 [cited 2022 jan 07]; 1 (54). Available from: https://scielo.isciii.es/pdf/eg/v18n54/pt_1695-6141-eg-18-54-323.pdf.

25. Davantel PP, Pelloso, Carvalho MDB, Oliveira NLB. A mulher e o acidente de trânsito: caracterização do evento em Maringá-PR. Rev. Bras. Epidemiol. 2009 [cited 2022 jan 2]; 12(3). Available from: https://doi.org/10.1590/S1415-790X2009000300006.

26.Maia MCW, GODOY CB, CAMARGO C, SOUZA SPS, OLIVEIRA JLC. Análise de óbitos residuais por causas externas em Cuiabá-MT. Rev. Saúde Coletiva. 2019 [cited 2022 feb 01]; 09(48). Available from: http://revistas.mpmcomunicacao.com.br/index.php/saudecoletiva/article/view/90/72.