

Deaths and accidents: Analysis of deaths from occupational accidents in Brazil from 2012 to 2019



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ABSTRACT

Introduction: Work accidents are a major public health problem, Brazil occupies the fourth place in the world ranking of fatal work accidents. It is estimated that there are about 318 thousand deaths in the world, caused by occupational accidents, as well as 2 million diseases related to accidents. **Objective:** To analyze deaths from occupational accidents recorded in Brazil, identifying and describing their epidemiological profile from 2012 to 2019. **Method:** Cross-sectional epidemiological study of deaths from occupational accidents recorded in the Mortality Information System (SIM) of Brazil, from 2012 to 2019, analyzed in Microsoft Excel 2019® and the R 4.0.2 software. **Results:** There were 27,510 deaths due to occupational accidents, with a decreasing trend in the mortality rate; most of which occurred in the Southeast region (33.44%), in males (94.27%), in the age group between 30-39 years (24.06%), whites (49.43%), schooling (29.92%) of the individuals who evolved to death had from 8 to 11 studies, regarding the place of occurrence of occupational accidents (33.73%) of the deaths occurred in the hospital. **Conclusion:** It is evident the need for surveillance actions in workers' health, training, continuous training and public policies to cope with social determinants and conditioning, with the objective of reducing occupational accidents and consequently deaths.

Keywords: Deaths, Workers' health, Occupational health surveillance.



1 INTRODUCTION

Work accidents are considered a major public health problem in the world, and in Brazil it occupies the fourth place in the world *ranking* of fatal work accidents, second only to Russia, the United States and China (BATISTA *et al.*, 2019; ILO, 2013).

The fatal work accident is considered any death that occurred immediately after its occurrence or, subsequently, since the basic, immediate or intermediate cause of death is due to the accident (MINISTÉRIO DA SAÚDE, 2006).

It is estimated that there are about 318 thousand deaths in the world, caused by occupational accidents, as well as 2 million diseases related to accidents. Deaths from these accidents can cause social and psychological damage to the victims' families, directly reflecting on quality of life and social life (NERY *et al.*, 2022).

According to the Observatory of Safety and Health at Work from 2012 to 2022, in Brazil, there were 6.7 million occupational accidents and 25,500 deaths of workers with a formal contract.

Most countries do not have standardized sources of information on occupational diseases and occupational accidents and those with low to middle income show higher rates of underreporting (HAMALAINEN, 2009). However, according to Chagas (2011), Brazil has been showing improvement in its quality and data coverage, although its use for studies and surveillance is still considered incipient when compared to other themes.

Research shows that the availability of data on occupational accidents is not so well known, they have the limitation of not being simultaneously recorded by all information systems, requiring integration between them. This question highlights a methodological problem, of data accuracy and, mainly, political and social. It is necessary to understand that the levels of health care and social protection is paramount to refine the policies of prevention, promotion, attention to diseases and surveillance in occupational health (RODRIGUES *et al.*, 2019; FACCHINI, 2005).

Still in this context, it is essential to record information for proper planning and management, given that every death resulting from a preventable disease portrays failures in the policies and programs of its control (RODRIGUES *et al.*, 2019). Thus, this research aims to contribute to a greater knowledge about deaths from occupational accidents recorded in Brazil, identifying and describing their epidemiological profile in the period from 2012 to 2019.

2 METHODOLOGY

This is a cross-sectional epidemiological study of deaths from occupational accidents recorded in the Mortality Information System (SIM) of Brazil, in the period from 2012 to 2019.

To characterize the epidemiological profile of deaths due to occupational accidents, the mortality rate for each year analyzed was calculated, multiplying the coefficient by the base of 100,000

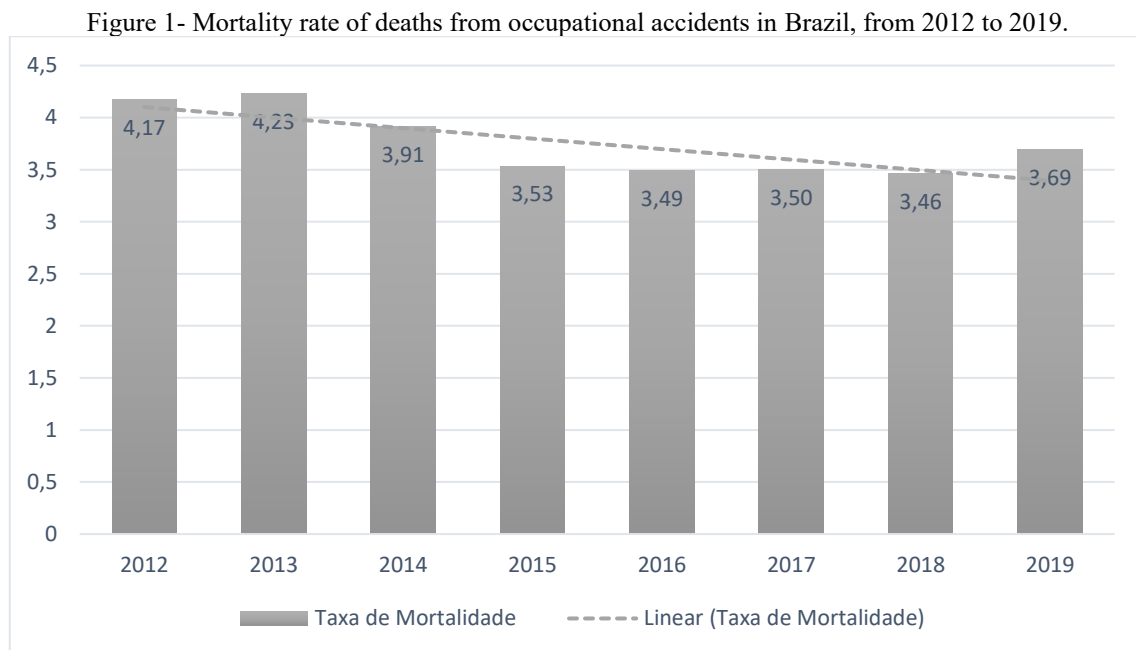


thousand inhabitants (inhab.). In the statistical analysis, the absolute (n) and relative (%) frequency of the variables were calculated by region of residence, sex, race/color, age group, education and place of occurrence of the accidents. For all tests performed, a statistical significance of 5% ($p < 0.05$) was adopted. Data were analyzed using Microsoft Excel 2019® spreadsheets and R 4.0.2 software.

Regarding the approval of the Research Ethics Committee, the study did not require to use data from the public domain, according to Resolution No. 510/2016 of the National Health Council (BRASIL, 2016)

3 FINDINGS

In Brazil, between 2012 and 2019, 27,510 deaths from occupational accidents were reported. There was a downward trend in the mortality rate in the years 2014, 2015, 2016 and 2018 and maintenance of the upward trend in cases in 2013, 2017 and 2019. In addition, it was observed that in 2013 it stood out with the highest mortality rate (4.23/100 thousand inhab.) and the year 2018 with the lowest (3.46/100 thousand inhab.) (Figure 1).



Source: Prepared by the authors. Data extracted from the Mortality Information System (SIM).

In the analysis by geographic region in Brazil, it was noted that deaths due to occupational accidents showed a higher increase in the Southeast (33.44%), followed by the South (26.23%), Northeast (15.82%), Midwest (12.40%) and North (12.11%). Regarding gender, 94.27% of the deaths occurred in males, mainly in people aged 30-39 years (24.06%), followed by 40-49 (22.18%), 20-29 (19.79%), 50-59 (17.81%) and 60 years and over (12.01%) (Table 1).



Regarding race/color, most deaths occurred in individuals with white race/color (49.43%), mulatto (42.54%) and black (5.93%). For schooling, 29.92% of the individuals who progressed to death had 8 to 11 studies, followed by 4 to 7 years (26.56%), ignored (20.63%), 1 to 3 (14.17%), 12 years and more (5.18%) and none (3.53%). Regarding the place of occurrence, 33.73% of the deaths occurred in the hospital, followed by public roads (32.52%), others (27.55%) and home (4.08%) (Table 1).

As for the percentage variation of deaths, between 2012 and 2013 there was an increase of 3.26% in deaths. Already in 2013 to 2014, there was a decrease of 6.54% of deaths, occurring consecutive decreases in the following years until 2017, which compared to 2016, fatal cases increased by 2.36%. From 2017 to 2018, deaths fell again by 0.03%, however, between 2018 and 2019 there was a new increase of 8.66%. In an analysis during the entire period, 2012-2019, a decrease in deaths (-6.89%) was observed (Table 1).

By geographic region (2012-2019), it was noted that the North has the highest increase (14.40%) in deaths, while the Midwest region had the largest decrease (-22.49%), followed by the Northeast (-16.39%), South (-4.93%) and Southeast (-4.43%) (Table 1).

Table 1 - Characterization of deaths related to occupational accidents in Brazil, 2012-2019.

Variables	2012		2013		2014		2015		2016		2017		2018		2019		Total		P-value	Percent age Change - $\Delta\%$ - 2012-2019	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%			
Region of Residence																					
North	389	11,67	457	13,72	422	12,67	348	10,44	365	10,95	461	13,84	445	13,36	445	13,36	3,332	12,11	< 0,01	14,40%	
Northeast	592	13,60	622	14,29	624	14,33	517	11,88	476	10,93	491	11,28	536	12,31	495	11,37	4,353	15,82	< 0,01	-16,39%	
Southeast	1,332	14,48	1,301	14,14	1,157	12,58	1,053	11,45	1,005	10,93	1,043	11,34	1,035	11,25	1,273	13,84	9,199	33,44	< 0,01	-4,43%	
On	934	12,95	1,025	14,21	922	12,78	885	12,27	876	12,14	854	11,84	831	11,52	888	12,31	7,215	26,23	< 0,01	-4,93%	
Central-West	498	14,60	462	13,54	489	14,34	439	12,87	414	12,14	361	10,58	362	10,61	386	11,32	3,411	12,40	< 0,01	-22,49%	
Gender																					
Male	3,556	13,71	3,663	14,12	3,428	13,22	3,052	11,77	2,950	11,38	3,012	11,61	3,023	11,66	3,250	12,53	25,934	94,27	< 0,01	-8,61%	
Female	188	11,99	202	12,88	186	11,86	189	12,05	186	11,86	198	12,63	184	11,73	235	14,99	1,568	5,70	< 0,01	25,00%	
Ignored	1	12,50	2	25,00	-	0,00	1	12,50	-	0,00	-	0,00	2	25,00	2	25,00	8	0,03	< 0,01	100,00%	
Age group																					
Minor 1 year	3	25,00	1	8,33	2	16,67	2	16,67	-	0,00	2	16,67	1	8,33	1	8,33	12	0,04	< 0,01	-66,67%	
1 to 4 years	2	9,52	3	14,29	1	4,76	3	14,29	2	9,52	5	23,81	3	14,29	2	9,52	21	0,08	< 0,01	0,00%	
5 to 9 years	5	23,81	4	19,05	1	4,76	3	14,29	4	19,05	2	9,52	-	0,00	2	9,52	21	0,08	< 0,01	-60,00%	
10 to 14 years	6	10,17	15	25,42	14	23,73	8	13,56	5	8,47	3	5,08	6	10,17	2	3,39	59	0,21	< 0,01	-66,67%	



15 to 19 years	162	16,63	167	17,15	133	13,66	128	13,14	89	9,14	107	10,99	91	9,34	97	9,96	974	3,54	< 0.01	-40,12%	
20 to 29 years	830	15,25	882	16,20	765	14,05	606	11,13	593	10,89	574	10,55	579	10,64	614	11,28	5,443	19,79	< 0.01	-26,02%	
30 to 39 years	938	14,17	897	13,55	895	13,52	789	11,92	721	10,89	783	11,83	761	11,50	835	12,62	6,619	24,06	< 0.01	-10,98%	
40 to 49 years	828	13,57	854	13,99	743	12,17	722	11,83	726	11,90	686	11,24	721	11,81	823	13,49	6,103	22,18	< 0.01	-0,60%	
50 to 59 years	635	12,91	590	12,00	643	13,08	608	12,37	592	12,04	620	12,61	601	12,22	628	12,77	4,917	17,87	< 0.01	-1,10%	
60 years and over	330	9,99	446	13,50	411	12,44	366	11,08	402	12,17	428	12,96	441	13,35	479	14,50	3,303	12,01	< 0.01	45,15%	
Age ignored	6	15,79	8	21,05	6	15,79	7	18,42	2	5,26	-	0,00	5	13,16	4	10,53	38	0,14	< 0.01	-33,33%	
Color/race																					
White	1,901	13,98	1,928	14,18	1,760	12,94	1,583	11,64	1,650	12,14	1,571	11,55	1,552	11,41	1,652	12,15	13,597	49,43	< 0.01	-13,10%	
Black	227	13,93	234	14,36	208	12,76	190	11,66	179	10,98	205	12,58	183	11,23	204	12,52	1,630	5,93	< 0.01	-10,13%	
Yellow	15	20,83	15	20,83	5	6,94	7	9,72	4	5,56	3	4,17	10	13,89	13	18,06	72	0,26	< 0.01	-13,33%	
Pardon	1,504	12,85	1,606	13,72	1,555	13,29	1,407	12,02	1,258	10,75	1,379	11,78	1,427	12,19	1,568	13,40	11,704	42,54	< 0.01	4,26%	
Indigenous	4	7,14	8	14,29	12	21,43	5	8,93	5	8,93	10	17,86	7	12,50	5	8,93	56	0,20	< 0.01	25,00%	
Ignored	94	20,84	76	16,85	74	16,41	50	11,09	40	8,87	42	9,31	30	6,65	45	9,98	451	1,64	< 0.01	-52,13%	
Schooling																					
No	132	13,59	151	15,55	131	13,49	92	9,47	120	12,36	115	11,84	123	12,67	107	11,02	971	3,53	< 0.01	-18,94%	
1 to 3 years	569	14,60	569	14,60	575	14,75	490	12,57	449	11,52	455	11,67	405	10,39	386	9,90	3,898	14,17	< 0.01	-32,16%	
4 to 7 years	947	12,96	1,029	14,08	971	13,29	874	11,96	907	12,41	841	11,51	824	11,28	915	12,52	7,308	26,56	< 0.01	-3,38%	
8 to 11 years	988	12,00	1,003	12,18	993	12,06	914	11,10	950	11,54	1,053	12,79	1,058	12,85	1,273	15,46	8,232	29,92	< 0.01	28,85%	
12 years and over	196	13,75	177	12,42	155	10,88	151	10,60	162	11,37	161	11,30	162	11,37	261	18,32	1,425	5,18	< 0.01	33,16%	
Ignored	913	16,09	938	16,53	789	13,90	721	12,70	548	9,65	585	10,31	637	11,22	545	9,60	5,676	20,63	< 0.01	-40,31%	
Local Occurrence																					
Hospital	1,270	13,69	1,320	14,22	1,204	12,97	1,072	11,55	1,112	11,98	1,109	11,95	1,106	11,92	1,087	11,71	9,280	33,73	< 0.01	-14,41%	
Other health facility	62	11,95	73	14,07	60	11,56	72	13,87	70	13,49	54	10,40	63	12,14	65	12,52	519	1,89	< 0.01	4,84%	
Domicile	136	12,12	159	14,17	148	13,19	123	10,96	134	11,94	137	12,21	142	12,66	143	12,75	1,122	4,08	< 0.01	5,15%	
Public road	1,301	14,54	1,301	14,54	1,264	14,13	1,039	11,61	1,013	11,32	1,018	11,38	1,026	11,47	984	11,00	8,946	32,52	< 0.01	-24,37%	
Other	960	12,67	1,001	13,21	920	12,14	932	12,30	804	10,61	886	11,69	870	11,48	1,206	15,91	7,579	27,55	< 0.01	25,63%	
Ignored	16	25,00	13	20,31	18	28,13	4	6,25	3	4,69	6	9,38	2	3,13	2	3,13	64	0,23	< 0.01	-87,50%	
Total	3,745	13,61	3,867	14,06	3,614	13,14	3,242	11,78	3,136	11,40	3,210	11,67	3,209	11,66	3,487	12,68	27,510	100,00	< 0.01	-6,89%	

Source: Mortality Information System (SIM). Prepared by the authors.

4 DISCUSSION

The findings of the present study demonstrate a decrease in deaths due to occupational accidents in the total study period in Brazil. Although the results allow us to observe such a decrease



in deaths, there are peaks of growth in certain years, as well as disparities in relation to the regions of the country, sex, age group, ethnic-racial characteristics, schooling and place of occurrence.

The decline in mortality estimates can be explained by the influence of the type of economic activity developed. The increase in the insertion of workers in the tertiary sector, trade and service activities, which offer a lower risk of accidents, improvement of working conditions, better rates of schooling and qualification of workers can impact on this decrease over the years (FERREIRA-DE-SOUSA; SANTANA, 2016; ALMEIDA; MORRONE; RIBEIRO, 2014).

Millions of people in the world die as a result of accidents at work. In Brazil, a study conducted in 2018 showed that the number of deaths in the country is high, in 2013 there were more than 2,500 deaths from occupational accidents. Whose region with the highest number of cases and deaths was the South, with 158,113 and 1,879, respectively (POSSEBOM; ALONÇO, 2018).

With regard to the Brazilian regions, it was observed in this study that the regions identified with the highest deaths were the Southeast and South, which corroborates with the studies by Malta et al., (2017) and Possebom; Alonço (2018), which show a higher frequency of these accidents in the Southeast, Northeast and South regions. The Northeast region occupied the third place in the numbers of deaths and the North the last. These results corroborate the study by Mascarenhas et al., (2015) who demonstrate lower numbers of work accidents in these regions, since such data coincide with the economic growth of the country, in which regions with a higher level of development (South and Southeast) have higher proportions of work-related accidents, due to the higher concentration of industries, and consequently manpower.

Regarding sociodemographic variables, the male sex prevailed, a data that corroborates the studies of Rankings (2020) that presented 85.6% in the male sex, as well as Cardim and Reis (2016), which showed that 96.2% of the workers who died were male. This may be related to the fact that men are more present in the productive sectors that present higher risks for fatal accidents, such as civil construction and transportation (MENEGON; MENEGON; KUPEK, 2021)

Regarding race/color, white prevailed with a considerably higher number, according to the study by Menegon and Kupek (2021), in which 17,290 (52%) of deaths occurred with white workers in Brazil, and in 2015, the mortality rate was 3.61/100 thousand in whites, 2.05/100 thousand among blacks and 3.37/100 thousand among browns.

Regarding the age group, it was observed that people aged between 20 and 49 years had a higher number of records for work accidents, which corroborates the study by Mascarenhas et al., (2015) who demonstrated a higher prevalence of occupational accidents in people between 30 and 59 years old in the capitals of Brazil.

In education, most deaths occurred in people with schooling between 8 to 11 studies, followed by 4 to 7 years, which reinforces the results of studies previously exposed by Cardim and Reis (2016),



with about 15.4% of workers who evolved to death had between 4 and 11 years of study. Corrêa et al., (2017), stated that those who have less than twelve years of education suffer more work accidents. Moreover, more than 60% of the workers who are present in informal work have a low level of education, that is, the higher the schooling, the better the insertion in the labor market and the lower the risks of fatal occupational accidents (MENEGON; MENEGON; KUPEK, 2021).

Regarding the place of occurrence of deaths, they occurred mainly in hospitals, which corroborates with the studies of Batista et al., (2019), which showed that hospital care activities present an ascending indication of work accidents, due to the issue of the activities developed in this sector require greater physical contact with infectious agents and piercing cutting instruments.

It is noteworthy that occupational accidents are preventable and predictable, that is, the deaths resulting from these accidents may reflect the violence felt, negligence of the employer, which may be associated with the authoritarian power relationship in order to increase productivity and profit (NERY *et al.*, 2022).

As limitations of this study, we can consider the absence of data due to issues of underreporting in the available records that could aggregate for greater accuracy in the study, such as in the variable age group and race/color (ignored). In addition, there is a need for more research that addresses this theme in order to add scientific knowledge to support the health surveillance of workers, the fiscal auditors of the Ministry of Labor and Social Security and the Public Ministry of Labor.

Although there has been an advance in the coverage of SIM (BRASIL, 2013), the problem of under-reporting of cases is still faced. Although this system offers information on formal and informal workers, it is common not to identify the work in death due to external causes, especially when it comes to informal workers (NOBRE; CARVALHO; KATO, 2010).

Finally, the results of this current study are important, as they show a decreasing trend in deaths from occupational accidents in Brazil in the period 2012-2019, and identify peaks of increase in deaths. In addition, it was noted that deaths due to occupational accidents in Brazil have established population groups such as men, white, brown with schooling from 8 to 11 years and who reside in the South, Southeast and Northeast regions, where there is a concentration of the main focuses of informal work.

Thus, the need for surveillance actions in workers' health, training, continuous training and public policies to cope with social determinants and conditioning factors is evidenced, with the objective of reducing occupational accidents and consequently deaths. As well, there is a need to fill out the notification forms properly, in order to subsidize actions to improve working conditions, reduce the risks of accidents and provide better safety conditions to workers' health.



REFERENCES

- ALMEIDA, F.S.S, MORRONE, L.C ; RIBEIRO K.B. Tendências na incidência e mortalidade por acidentes de trabalho no Brasil, 1998 e 2008. *Cad Saude Publica* 2014; 30(9):1957-1964.
- BATISTA, A.G; SANTANA, V.S; FERRITE, S.. Registro de dados sobre acidentes de trabalho fatais em sistemas de informação no Brasil. *Ciência & Saúde Coletiva*, v. 24, p. 693-704, 2019.
- BRASIL. Ministério da Saúde (BR), Secretaria de Atenção à Saúde, Departamento de Ações Programáticas Estratégicas. Notificação de acidentes do trabalho fatais, graves e com crianças e adolescentes [Internet]. ; 2006
- BRASIL. Ministério Público do Trabalho. Observatório de Segurança e Saúde no Trabalho [internet]. 2020 [acesso em 2023 jul 27]. Disponível em: <https://smartlabbr.org/sst/localidade/4104808>.
- BRASIL. Resolução nº 510, de 07 de abril de 2016. Dispõe sobre as normas aplicáveis a pesquisas em Ciências Humanas e Sociais. Diário Oficial [da] República Federativa do Brasil, Brasília, DF, 24 maio 2016. Disponível em: <Disponível em: <http://bit.ly/2fmmKeD> >. Acesso em: 06 set. 2022.
- CARDIM, A.; PESSOA DOS REIS, A. L. P. MORTALIDADE POR ACIDENTES DE TRABALHO NA MACRORREGIÃO EXTREMO SUL DA BAHIA. *Revista Enfermagem Contemporânea*, v. 5, n. 2, 2016. DOI: 10.17267/2317-3378rec.v5i2.1098.
- CHAGAS, A.M.R; SERVO, L.M.S; SALIM, C.A. Indicadores da saúde e segurança no trabalho: fontes de dados e aplicações. In: Instituto de Pesquisa Econômica Aplicada (IPEA). *Saúde e Segurança no Brasil: aspectos institucionais, sistemas de informação e indicadores*. Brasília: IPEA; 2011. p. 289-328
- CORRÊA, L.B.D. *et al.* Fatores associados ao uso de equipamentos de proteção individual por profissionais de saúde acidentados com material biológico no Estado do Maranhão. *Rev Bras MedTrab.*,2017; 15: 340-9.
- FACCHINI, L.A. Sistema de informação em saúde do trabalhador: desafios e perspectivas para o SUS. *Ciência & Saúde Coletiva* 2005; 10(4):857-867.
- FERREIRA, D. N.S., et al. Acidentes de trabalho no Brasil: revisão bibliográfica no âmbito hospitalar. *Cadernos de aula do LEA*. n.6, 2017.
- FERREIRA-DE-SOUSA, F. N.; SANTANA, V. S.. Mortalidade por acidentes de trabalho entre trabalhadores da agropecuária no Brasil, 2000-2010. *Cadernos de Saúde Pública*, v. 32, n. 4, p. e00071914, 2016.
- GOMEZ, C. M.; VASCONCELLOS, L. C. F. DE .; MACHADO, J. M. H.. Saúde do trabalhador: aspectos históricos, avanços e desafios no Sistema Único de Saúde. *Ciência & Saúde Coletiva*, v. 23, n. 6, p. 1963–1970, jun. 2018.
- HAMALAINEN,P. The effect of globalization on occupational accidents. *Saf Sci* [Internet]. 2009 [citado em 22 mar 2023];47(6):73342. Disponível em: <http://www.sciencedirect.com/science/article/pii/S0925753508000301>
- MALTA, D.C. *et al.*. Acidentes de trabalho autorreferidos pela população adulta brasileira, segundo dados da Pesquisa Nacional de Saúde, 2013. *Ciência & saúde coletiva* . 2017Jan;22(1):169–78. Available from: <https://doi.org/10.1590/1413-81232017221.17862015>



MASCARENHAS, M.D.M. *et al.* Atendimentos de emergência por lesões relacionadas ao trabalho: características e fatores associados – Capitais e Distrito Federal, Brasil, 2011. *Ciência & Saúde Coletiva*, 20(3):667-678, 2015.

MENEGON, L. da S; MENEGON, F.A; KUPEK, E. Mortalidade por acidentes de trabalho no Brasil: análise de tendência temporal, 2006-2015. *Revista Brasileira de Saúde Ocupacional*, v. 46, p. 1-15, mar. 2021. FapUNIFESP (SciELO). <http://dx.doi.org/10.1590/2317-6369000025219>.

NERY, F. S. D. *et al.* Tendência temporal dos anos potenciais de vida perdidos por acidentes de trabalho fatais segundo raça/cor da pele na Bahia, 2000-2019. *Revista Brasileira de Saúde Ocupacional*, [S.L.], v. 47, p. 1-10, 2022. FapUNIFESP (SciELO). <http://dx.doi.org/10.1590/2317-6369/18719pt2022v47e1>.

OBSERVATÓRIO DIGITAL DE SAÚDE E SEGURANÇA NO TRABALHO. 2019, on-line. Disponível em: <https://smartlabbr.org/sst>.

OIY-Organización Internacional del Trabajo. La prevención de las enfermedades profesionales. Geneva; 2013.

POSSEBOM, G ; ALONÇO A.S. Panorama dos acidentes de trabalho no Brasil. *Nucleus* [internet]. 2018 [acesso em 2020 jan 30]; 15(2):15-22. Disponível em: <http://nucleus.feituverava.com.br/index.php/nucleus/article/view/2691>.

RODRIGUES, A. B; SANTANA, V. S. Acidentes de trabalho fatais em Palmas, Tocantins, Brasil: oportunidades perdidas de informação. *Revista Brasileira de Saúde Ocupacional*, v. 44, 2019.