

# Standardized Mortality Analysis of Military Firefighters from 2000-2016 in Rio de Janeiro, Brazil

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## Research

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# Abstract

## Backgrounds

A military fireman's profession is of extreme importance since they perform a wide variety of work. However, these firefighters are constantly exposed to stressful situations and hazardous substances known to harm their health. To fully perform their functions, they should have good physical and mental health, which requires them to have periodic medical examinations and constant training. To the best of our knowledge, there is no study assessing the causes of mortality of members of the military fire brigade of Rio de Janeiro despite its relevance to future projections in relation to the health of these professionals.

## Methods

We conducted a retrospective mortality study on a cohort of military firefighters in the state of Rio de Janeiro from 2000 to 2016 and calculated the Standardized Mortality Ratio (SMR) of male firefighters who served in the corporation in this period. To obtain the SMR, everyone's participation time in years in the corporation was calculated, and the sum of the data set the person-time of this cohort. As a reference, we used the population of men over 19 years old in the state of Rio de Janeiro in 2010 according to the Demographic Census.

## Results

A total of 1,816 deaths were identified, corresponding to the lowest overall mortality expected for the general population (SMR: 64.6%; 95%CI: 61.6–67.6%), cardiovascular diseases (SMR: 64.4%; 95%CI: 58.8–69.9%) and external causes of mortality (SMR: 88.5%; 95%CI: 79.9–97.0%). However, in the external causes of death, there was a statistically significant mortality excess in the age groups from 40 to 49 and 50 to 59 years.

## Conclusion

The firefighters' group had the lowest overall mortality detected in both the general and the main chapters of the 10th Revision of the International Statistical Classification of Diseases.

## Background

The tasks of firefighters are extremely exhausting and often present risks to their own health. Their workplace, characterized by tense and dangerous environments, is considerably harmful to their own physical and mental integrity in the course of their lives.<sup>1,2</sup>

Firefighters are constantly exposed to strong emotional charges as they often experience dangerous situations, deal with death, and witness tragic scenes. Moreover, after attending to these circumstances, they return to their barracks to work without receiving any support to help them overcome these traumatic

situations that is part of their daily lives.<sup>3</sup> Besides that, they have a heavy workload, are often under tension, deal with human lives, and are exposed to dangerous agents. However, since these professionals need to be ready for new calls, they try to neutralize the stressful experiences brought about by these situations.<sup>3</sup>

There are inherent dangers in the firefighters' profession. They are exposed to physical risks because of the noise and the extreme temperatures, biological risks because of their exposure to microorganisms that are in contact with blood and organic fluids, and chemical risks because of their exposure to chemical substances.<sup>4</sup>

During their work, they face multiple challenging situations such as firefighting, rescuing people and animals, and landslides. They are also constantly exposed to combustion remains, smoke, carcinogenic substances that are volatile in the fire and pyrolysis or debris. These exposures have raised concerns on the increase in potential cancer cases among firefighters and stimulated epidemiological investigations to assess them.<sup>5</sup>

Firefighters are surprised by emergency calls that must be immediately answered during their shift; therefore, they need to have good physical conditioning. These professionals react to these calls with a significant increase in heart rate.<sup>6</sup> During fire suppression, they work with maximum load and their heart rate reaches high values.<sup>7</sup> According to studies, cardiac overload is aggravated by the use of heavy clothing for extended periods.<sup>8</sup> Moreover, heat stress and consequential fluid loss can result in decreased cardiac output despite the initial tachycardia.<sup>8</sup> Many deaths during service are precipitated by the inherent aid stress that occur to firefighters with underlying cardiovascular diseases.<sup>6-8</sup>

Furthermore, the mental health of these military personnel deserves full attention in order to recognize their health problems and its consequences early on. Studies on the subject indicate that these professionals have a high incidence to certain types of cancer<sup>9-11</sup> and deaths in service due to cardiovascular diseases.<sup>6-8</sup> To carry out this study, we identified the causes of death of these deceased firefighters, then compared it with the mortality rate of the general population in the state of Rio de Janeiro.

This study aimed to characterize the firefighters' mortality from 2000 to 2016 by using the 10th Revision of the International Statistical Classification of Diseases and Health Related Problems (ICD-10) and demographic variables; and comparing the observed distribution of deaths to those expected according to the mortality rate of the general population in the state of Rio de Janeiro.

## **Methods**

### ***Study design***

This study is about the mortality of active and inactive firefighters of Rio de Janeiro present in the payrolls of Rio de Janeiro State Military Firefighters (CBMERJ – Corpo de Bombeiros Militar do Estado do Rio de Janeiro) from 2000 to 2016. The population of this study consists of a cohort of male CBMERJ firefighters from January 2000 to December 2016, excluding those who worked for less than 12 months in the corporation. A database was also organized containing the data category of the deaths that occurred in the same period.

### ***Data source***

To establish the person-time of the cohort, we obtained the payrolls from 2000 to 2016 from the General Directorate of Finance (DGF).

Moreover, we collected the data of deceased firefighters through their death certificates, which is required for their pension concessions to dependents, from the Directorate of Personal Management's (DGP – *Diretoria Geral Pessoal*) occupational history and the Directorate of Inactive and Pensioners (DIP – *Diretoria de Inativos e Pensionistas*) of CBMERJ. With these death certificates, it was possible to access the underlying causes of death of 383 fatalities by directly searching the public and unrestricted database of the Mortality Information System (SIM – *Sistema de Informação sobre Mortalidade*).

Moreover, when the death certificates or the number of the deceased firefighters were not found in the DGP or DIP, we searched the Vital Data services of the Health Departments of the Municipality (SMS – *Secretaria Municipal de Saúde*) and the state (SES – *Secretaria Estadual de Saúde*) of Rio de Janeiro for their names and dates of death.

For information on the underlying causes of these deaths, we created a *linkage* between the data of the deceased firefighters and the database of the Municipal Health Department of Rio de Janeiro, whose methodology pursued the following steps:

- Cleaning and standardization of the variables of the Firefighters on Excel, filled with the data collected from CBMERJ and SIM from 2000 to 2016, using Stata 11.0. A unique identifier was created at the firefighters base to further merge them, building a single firefighters bank with the found and not found deaths;
- Probabilistic relationship (*linkage*) of databases using the OpenReclink (ORL) software;
- Probabilistic *linkage* (ORL):
  - Relationship variables: name, date of birth, and gender (for visual inspection).
  - Blockage:
  - Step 1: FBLOCK (first name) + LBLOCK (last name) + DB (date of birth) + gender
  - Parameters of the variables for the probabilistic relationship in the ORL:
  - Name: "Approximate" Type, "92" Correct, "1" Incorrect and "85" Threshold, according to the III Reclink Manual.

- Date of birth: "Character" Type, "90" Correct, "5" Incorrect and "65" Threshold, according to the III Reclink Manual.
- Gender: "Approximate" Type, "92" Correct, "1" Incorrect and "85" Threshold, according to the III Reclink Manual.
- Step 2: FBLOCK + DB
- Parameters of the variables for the probabilistic relationship in the ORL:
  - Name: "Approximate" Type, "92" Correct, "1" Incorrect and "85" Threshold, according to the III Reclink Manual.
  - Date of birth: "Character" Type, "90" Correct, "5" Incorrect and "65" Threshold, according to the III Reclink Manual.
- Construction of the final base where the found cases are contained after the manual non-pairs search.

In this initial linkage carried out with the SMS database of Rio de Janeiro, we found 1,131 pairs out of the 1,816 deaths recorded in the studied cohort of firefighters.

The deceased who were not found through this strategy were searched in the Database of the State Department of Health; identifying 256 more individuals.

However, the underlying cause of death of 46 firefighters was not obtained even though the records from CBMERJ showed that they were deceased. Thus, we classified them under "indeterminate cause of death" (R99.0).

### ***Data analysis***

To obtain the Standardized Mortality Ratio (SMR),<sup>12</sup> everyone's participation time in years in the corporation was calculated, and the sum of the data set the person-time of this cohort. As a reference, we used the population of men over 19 years old in the state of Rio de Janeiro in 2010 according to the Demographic Census, which brought more accurate information, in the intermediate period of the cohort.

The SMR was calculated by dividing the number of actual observed deaths in the cohort of military firefighters by the number of expected deaths, that is, those that would occur if the cohort was submitted to the same mortality rates per age group of the male population of the state of Rio de Janeiro in 2010. As indicated by the literature, specific SMRs were calculated for the most frequent pathological groups in the career of firefighters such as circulatory system disease, neoplasia, and death by external causes (accidents and by violence).<sup>6-10</sup> Lastly, the statistical analysis was performed using the Stata 20 program.

## **Results**

### ***Firefighters' characteristics***

From 2000 to 2016, 22,333 male firefighters served for at least one year in the Fire Department of the state of Rio de Janeiro, contributing 308.274 person-years.

It can be observed that the cohort is young since 42.9% of the total person-year is concentrated in the age group below 39 years (132,223), although the number of people-year above 70 years of age has increased, especially from 2010 (Table 1).

According to the data collected in the Funeral Assistance Processes of the General Directorates of Finance, Personnel, Inactive and Pensioners of CBMERJ, and the Social Security of Rio de Janeiro, 1,816 deaths were reported for male military firefighters in the state from January 2000 to December 2016. Its distribution by age group revealed that 55.5% were between 50 and 69 years, with the mean age of death occurrences at 55.7 years (standard deviation: 13.2) and median at 57 years. We observed 502 fatalities which correspond to 27.6% of the total deaths in active military personnel with an average of 40.0 years, and 1,314 fatalities (72.4%) in military personnel in the reserve with an average dying age of 61.6 years (Table 2).

### ***SMR for all deaths and for the main chapters***

The main chapters of ICD-10 observed in this study showed that the main causes of death were circulatory systems diseases (IX: 509; 28.0%), external mortality clauses (XX: 411; 22.5%), and neoplasms (II: 302; 16.6%).

Table 3 presents the SMR of 64.6% (95%CI: 61.6-67.6%) for all causes of death of firefighters, 72.8% (95%CI: 64.5-81.0%) for neoplasms, 64.4% (95%CI: 58.8-69.9%) for cardiovascular disease, and 88.5% (95%CI: 79.9-97.0%) for external causes. The SMR for external causes in the age group of 30 to 39 years approached 100, while the age group of 40 to 69 years was above 100, showing excess deaths due to this set of causes in relation to what would be expected if firefighters were submitted to the same mortality rate as the general population of the state of Rio de Janeiro.

For deaths by neoplasms, fatalities from prostate cancer stood out with SMR=94.0% in the age group of 50 to 59 years with SMR=149.0% (95%CI: 29.0-268.0%; not displayed data).

For deaths by external causes, an excess was detected for those by firearm projectile (CID-10: X93; X94 and X95), presenting 189% SMR which is increasing according to age group from 30 to 69 years. There was no death due to this cause for the age group over 69 years (Table 4).

## **Discussion**

This study was the first to evaluate mortality of military firefighters from the state of Rio de Janeiro, which had immense value for the entire corporation, being of great relevance to the issue and for future projections in relation to the health of these professionals. The study population was the cohort of male military firefighters from 2000 to 2016.

This is a young cohort since more than 40% of all people-years were under 40 years old. However, the increase of people-year over 69 years old, especially from 2010 onwards, reveals that the cohort is aging.

The observed causes of death in the cohort were concentrated in Chapters II, IX, and XX of the ICD-10, with percentage values of 16.6%, 28.0%, and 22.6% respectively. It is worth mentioning that this distribution differs from that presented in the population of the state of Rio de Janeiro in 2010, with 15.2%, 29.3%, and 13.8% respectively.<sup>13</sup>

The SMR for all causes of death in firefighters was 64.6% (95%CI: 61.6-67.6%). This favorable result to firefighters can be explained by the effect of healthy workers, rigorous selection on admission, periodic examinations in military environments with earlier detection of morbidities, and the practice of regular physical activity.<sup>13</sup> Other studies about firefighters corroborate this finding, with SMR for all causes of death ranging from 74% to 99%, which the authors also attribute to the effect of healthy workers, careful entry into the military units, and performance of physical capacity tests according to age in addition to admission exams.<sup>10,15-19.</sup>

Brice et al. (2015) studied mortality in firefighters from France and used SMR to make a comparison of the French male population between 1979 and 2008.<sup>19</sup> From 89 French administrative departments, 10,829 employed firefighters were included in the cohort in 1979. A total of 1,642 deaths were observed with SMR for all causes at 81% (95%CI: 77-85%), which is increasing with age but not exceeding 100%. They did not detect high SMR for any specific cause and this finding was related to the effect of healthy workers in the cohort.<sup>19</sup>

Between 1970 and 2014, Petersen et al. (2018) conducted a study on mortality in a cohort of Danish firefighters.<sup>10</sup> A total of 11,775 firefighters representing 235,526 people-year were monitored. The authors used two reference populations to calculate the SMR: a sample of male workers' population (n= 262,168) and of military personnel (n= 396,739). They observed 1,017 deaths in the cohort, with low SMR for all causes of death when comparing both workers (SMR=74%; 95%CI: 69-78%) and military (SMR= 88%; 95%CI: 83-93%). Death from stomach cancer (SMR = 196%; 95%CI: 122-316%) was significantly higher in firefighters who served full-time, while the authors observed a significant increase in prostate cancer in the volunteers (SMR= 189%; 95%CI: 122-293%) as compared with the reference populations. The authors justified the SMR under 100 for all causes of death by citing the strict selection system upon entering the corporation, and the early diagnosis of certain pathologies that were referred to for treatment and for necessary follow-up.<sup>10</sup>

In this study, the chapter that concentrated the highest proportion of deaths in men over 20 years old in 2010 was circulatory system diseases (28.0%), a similar proportion to that of the general population of the state of Rio de Janeiro (29.4%) and Brazil (28.4%).<sup>13</sup>

A systematic literature review showed that studies in military firefighters highlighted a high incidence of heart disease, often related to a sedentary lifestyle and being overweight. Acute and chronic occupational

factors have also been related to the risk of heart disease among them. From the chronic factors, the long periods of sedentary lifestyle, exposure to smoke, noisy environments, shiftwork that impairs sleep quality, inadequate eating in military environments, occupational stress, and posttraumatic stress disorder (PTSD) are highlighted. Among the acute ones, the main factors are environments with high temperatures culminating in dehydration, response to alarms, exposure to gases and particles in the fire scenarios, and the execution of the activity itself.<sup>7</sup>

A study in Denmark on the incidence of cardiovascular diseases in firefighters showed an increased proportion in this occupational group, especially angina pectoris, acute myocardial infarction, and heart ischemic disease.<sup>20</sup>

In this study, the mean age of death occurrences from cardiovascular diseases was 45.4 years for active military firefighters and 62.4 years for the inactive ones. The SMR for cardiovascular diseases was 64.4% (95%CI: 58.8-68.9%), with acute myocardial infarction (I21 in ICD-10) being the most frequent basic cause of death in this chapter with SMR of 72.4%. This SMR below 100 can also be attributed to the effect of healthy workers and periodic tests that contribute to the detection of risk factors and early treatment.<sup>14</sup>

Regarding neoplasms, the SMR for all cancer types was 72.8% (95%CI: 64.5-81.0%). Anent primary location, prostate cancer presented 94.0% SMR, surpassing 100 in the age groups of 50-59 and 60-69 years. These values may be related to the performance of periodic tests because they allow greater diagnosis possibility than the general population.

Cancer mortality studies in firefighters report that there is a relationship between their profession and neoplasms, although the main locations vary from one study to another. Ma et al. (2005)<sup>21</sup> observed SMR=179% (95%CI: 98-300%) for bladder cancer in firefighters; Hansen (1990)<sup>2</sup> detected SMR=317% (95%CI: 117-691%) for lung cancer in the age group of 60-74 years; Pedersen et al. (2018)<sup>20</sup> identified SMR=196% (95%CI: 122-316%) for stomach cancer in firefighters who worked full-time, while they observed a significant increase in prostate cancer with SMR=189% (95%CI: 122-293%) in volunteers. This study detected SMR =149% (95%CI: 29.0-268.0%) for prostate cancer in the age group of 50-59 years.

Glass et al. (2017)<sup>9</sup> assessed mortality and incidence of cancer in volunteer firefighters in Australia. When compared to the male population of the country, they observed an incidence decrease for almost all types of cancer, with incidence increase found only for prostate cancer. This was the only firefighters' mortality study that related the causes of death to the accident types that the firefighters were called for (all accidents types, all fire types, fires in structures, fires in landscapes and fires in vehicles). An SMR of 183% was observed (95%CI: 110-286%) in deaths due to smoke, fire, and flames exposure.

Deaths by external causes in this study represented the second most frequent cause, presenting an SMR of 88.5% (95%CI: 79.9-97.0%), highlighting deaths caused by firearm projectile (SMR=119.4%). It is noteworthy that studies in the literature on this underlying cause of death of firefighters were not found. A low SMR for firearm death was observed in the age group of 20 to 29 years, over 100 in age groups above

30 years, and even higher in the age group of 60-69 years when the military is no longer active in the corporation. The low SMR value observed in people under 30 years old may be related to the high mortality ratio of the general population of the state of Rio de Janeiro in this age group for the same cause, most often poor, black, and culturally and economically less favored.<sup>22</sup> Other hypotheses can be raised in this context because when the firefighters start their military lives, many begin to carry out other activities, seeking to maintain a better standard of living. Thus, it is possible that in the state of Rio de Janeiro, this financial complement is carried out in risky activities such as security. These may be the causes of the highest number of fatalities due to firearm death in this age group, considering the population of this state with the same gender and age.

It should be noted that Brazil has very high numbers of death by violence. Upon analyzing the country's male mortality rates from 2000 to 2016, it was observed that the external causes chapter always presented a magnitude higher than 115 deaths per 100,000 men, surpassed only by the circulatory system diseases chapter. Moreover, in the state of Rio de Janeiro, external causes had even higher rates, occupying the second place between 186 deaths per 100,000 men in 2002 and 126 deaths in 2015. Among deaths by external causes in this state, the main cause of male fatalities was aggression by firearm, although with a decreasing tendency from 45.8% in 2000 to 33.9% in 2016.<sup>13</sup>

However, this study presents some limitations. First, we did a retrospective design when the better approach would be a prospective study with risk factors quantification for occupational-related diseases and exposures, accurate diseases documentation, and life habits reports. Nevertheless, the results presented are unprecedented and offer a realistic overview of the mortality of the corporation. Second, the cohort follow-up period (from 2000 to 2016) was shorter than desired due to the unavailability of previous data. However, this restriction can be considered beneficial since it allowed analysis within the same ICD-10 at a time when the mortality system offers very good quality data.<sup>23</sup> Third, we collected data from death certificates, specifically the underlying cause of death, instead of data selected by a competent agency using its own application, which data are more trusted than those found on death certificates and corporation records.

This study allowed mortality evaluation, which is previously unknown, in this occupational group that performs services of excellence to the population of Rio de Janeiro. Its results may support the implementation of intervention programs in order to prevent the most frequent mortality causes in the future.

## Conclusions

This study showed high clinical and social relevance since the causes of death in this occupational group had never been addressed, especially with the discovery of many unknown results. Given the importance of the work of military firefighters and the dangerous situations they experience in their daily lives, knowing their main causes of death deserves full attention from researchers who are interested in the

subject. The data we discovered should be disclosed to all active and inactive firefighters of the Corporation.

The SMR was used to evaluate deaths in this occupational group. There is no report in national and international literature on the death excess due to firearm, but this mortality cause stood out in this study. Another relevant finding was the SMR for prostate cancer, which is above 100 in the age group of 50 to 69 years, although without statistical significance.

Finally, the results corroborate the importance of intensifying the use of protective equipment of firefighters in all scenarios, both in fire and other work conditions.

## Abbreviations

- SMR: Standardized Mortality Ratio
- ICD-10: International Statistical Classification of Diseases and Health Related Problems
- CBMERJ: Corpo de Bombeiros Militar do Estado do Rio de Janeiro.
- DGF: General Directorate of Finance.
- DGP: Directorate of Personal Management's.
- DIP: Directorate of Inactive and Pensioners.
- SIM: Mortality Information System.
- SMS: Health Departments of the Municipality.
- SES: Health Departments of the State.
- ORL: OpenRecLink
- FBLOCK: first name.
- LBLOCK: last name.
- DB: date of birth.
- R99.0: "Indeterminal cause of death"
- PTSD: posttraumatic disorder stress.

## Declarations

### Ethical approval

This study was submitted and approved by the Ethics and Research Committee of ENSP/Fiocruz under number 2,194,937. It was also approved by the Directorate of General Health of CBMERJ.

**Consent to participation:** not applicable.

**Consent of publication:** the authors are aware and authorize the publication.

**Availability of data and material:** data and materials are available

**Conflict of Interests:** the authors declared no conflicts of interest.

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**Contribution of the authors:** the two authors participated in the elaboration and development of the study, in the analysis and data interpretation, in the content's review, and in the final writing of the manuscript. RVM did all data collection.

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## Tables

**Table 1:** Distribution by people-time of the firefighters' cohort according to age groups. Fire Department of the State of Rio de Janeiro, 2000-2016.

<b>Year \ age group</b>	<b>20-29</b>	<b>30-39</b>	<b>40-49</b>	<b>50-59</b>	<b>60-69</b>	<b>70 and older</b>	<b>Total</b>
2000	4218	5455	4088	1920	806	68	16555
2001	3751	5694	4267	1836	990	76	16614
2002	4035	6074	4456	1804	1063	20	17452
2003	3555	6155	4553	1797	1272	27	17359
2004	3105	6339	4734	1948	1518	44	17688
2005	2498	6218	4790	2130	1589	63	17288
2006	1974	6089	5025	2439	1709	98	17334
2007	1464	5945	5059	2880	1800	149	17297
2008	2608	6009	5297	3231	1796	234	19175
2009	2381	5851	5393	3493	1692	329	19139
2010	2046	5615	5596	3891	1668	491	19307
2011	1631	5304	5861	4077	1608	657	19138
2012	1303	4918	5851	4112	1525	777	18486
2013	1110	4702	5953	4244	1519	948	18476
2014	1266	4549	6069	4361	1622	1095	18962
2015	1129	4252	6070	4489	1827	1213	18980
2016	1068	3912	5996	4686	2074	1288	19024
<b>Total</b>	<b>39142</b>	<b>93081</b>	<b>89058</b>	<b>53338</b>	<b>26078</b>	<b>7577</b>	<b>308274</b>

**Table 2:** Distribution of firefighters' deaths by age group, functional situation, and marital status. Fire Department of the State of Rio de Janeiro, 2000-2016.

<b>Variables</b>	<b>Categories</b>	<b>Total deaths</b>	<b>%</b>
Age group (years)	20-29	62	3.4
	30-39	188	10.4
	40-49	290	16.0
	50-59	490	27.0
	60-69	518	28.5
	70 and further	268	14.8
Functional situation	Active	502	27.6
	Inactive	1314	72.4
Marital status *	Single	403	22.2
	Married	1200	66.2
	Widow/widower	60	3.3
	Divorced	149	8.2
<b>Total</b>		<b>1816</b>	<b>100.0</b>

\* 4 deaths without marital status information

**Table 3:** Standardized Mortality Ratio (SMR) for all causes of death and for neoplasms, circulatory system diseases, and external causes. Fire Department of the State of Rio de Janeiro, 2000-2016.

Causes of Death	Observed	Expected	SMR:	95%CI
<b>Total</b>	<b>1,816</b>	2809.5	<b>64.6</b>	61.6-67.6
<b>Neoplasms</b>	<b>302</b>	<b>415.0</b>	<b>72.8</b>	64.5-81.0
Stomach Cancer	20	33.2	60.2	26.0-94.0
Prostate Cancer	36	38.3	94.0	63.3-124.0
Lung Cancer	46	64.6	71.0	50.4-91.5
<b>Circulatory System Diseases</b>	<b>509</b>	790.0	<b>64.4</b>	58.8-69.9
Acute Myocardial Infarction	183	252.8	72.4	61.5-82.4
Congestive Heart Failure	27	46.0	58.7	36.0-81.1
Myocardopathy	32	49.1	65.2	43.0-87.5
Ischemic Vascular Disease	23	30.5	75.4	45.0-107.0
<b>External Mortality Causes</b>	<b>411</b>	<b>464.3</b>	<b>88.5</b>	<b>79.9-97.0</b>
Firearm Projectile	190	159.2	119.4	120.0-136.0
Motorcycle Accident	18	22.1	81.5	44.0-120.0

SMR: Standardized Mortality Ratio

95%CI: 95% of Confidence Interval

**Table 4:** Number, percentage and SMR of firefighters' deaths, by age group, caused by firearm projectile from 2000 to 2016 in the state of Rio de Janeiro.

Age group (years)	N <sup>o</sup> (%)	SMR:	95%CI
20 to 29	17 (9.0)	36.6	18.7-53.2
30 to 39	83 (43.9)	123.8	121.2-126.5
40 to 49	60 (31.7)	193.3	144.3-242.2
50 to 59	21 (11.1)	207.1	118.4-295.3
60 to 69	8 (4.2)	271.9	84.8-457.5
<b>Total</b>	<b>189 (100.0)</b>	<b>119.6</b>	<b>102.3-136.2</b>

SMR: Standardized Mortality Ratio

95%CI: 95% of Confidence Interval