



*Brazilian Association for
the Awareness on the
Dangers of Electronics*

The background of the entire page is a composite image. The lower half shows a dense cityscape at night, with numerous skyscrapers and buildings illuminated by their lights. The upper half of the image is dominated by a large, bright, orange and yellow fireball or explosion in the sky, with several long, glowing streaks trailing behind it. A yellow horizontal band is positioned across the middle of the image, containing the title text.

**STATISTICAL YEARBOOK OF ACCIDENTS OF
ELECTRIC ORIGIN 2023 - Base year 2022**

AT LEAL WE ARE ALWAYS CONNECTED TO SECURITY

When it comes to preventing electrical accidents, you can count on Leal.

We have been present in the sector for more than 50 years, creating and disseminating solutions against electrical accidents, promoting work environments free from unforeseen events and increasingly safer.



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Brazilian Association for Awareness of the Dangers
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INTRODUCTION

Every company must constantly review its strategic planning, and with associations, it is no different. Abracopel has been promoting changes in its way of acting since 2018, and studying the action plan, communication, management, and actions.

With Abracopel's mission well defined and the objectives outlined, we have faced adversities with a lot of dedication and work. In 2022, the second year of my administration, in addition to completing the entire program designed in 2021, we began a study for Abracopel to understand its role within the ESG guidelines and thus offer more assertive actions to all. At first, we hired a consulting company to locate Abracopel worldwide. We identified Abracopel as the "S" in ESG; that is, the actions that Abracopel carries out are socially oriented. Besides saving lives, they preserve the integrity of the people, making them available and able to produce, thus helping the entire production chain. Also, within these changes, we have identified that our actions reduce accidents, avoid costs with rescues, hospitals, and medicines, e reduce the cost to society, and allow these values to be invested in other actions.

Within this scenario, Abracopel is the only entity that operates in the electrical sector and can directly and positively impact the revenues of companies that work with products for and in electricity. In summary, Abracopel helps the country's economy and ensures the sustainability of society.

For 2023, we bring some more changes that will be known throughout the year, but one of them I can present. This document called the Statistical Yearbook of Accidents of Electrical Origin, which in 2022 won an English version, now also gains a Spanish version, thus allowing an easier understanding of how electricity and safety behave in Brazil. Our directors have taken this data to various Congresses such as the ESW - Electric Safety Workshop in the United States and the ICLP - International Conference on Lightning Protection in South Africa.

This edition of the Yearbook brings a special notebook celebrating the 30th anniversary of "Qualifio," an entity that is a partner of Abracopel and that has been doing a vital job, identifying and denouncing poor quality energy conductors, or worse, those with less copper and that harm society.

We hope that this document, the Yearbook, can provide the reader with an understanding of the problems that the misuse of electricity has caused in Brazil and allow changes, both in behavior and actions, to decrease accidents. improving safety in electrical installations and preparing and identifying risks when working with electricity can, and should, be non-negotiable premises.

Enjoy your reading!



VINICIUS AYRÃO FRANCO
President of Abracopel

READING GUIDE

Three essential criteria guide the structure of the Statistical Yearbook of Accidents of Electrical Origin 2022: 1) accidents involving electric shock (including electric arc); 2) accidents with fires of electrical origin (overload, short circuit, or electric arc); and 3) accidents with lightning (atmospheric discharges). The data were collected between January 1st and December 31st, 2022.

The information presented here is organized into five sections. The first theme presents the total number of accidents - with and without fatalities - due to accidents of electrical origin in Brazil: electric shocks, fires due to energy overload (short circuit), and lightning.

The second section presents data on electrical shocks, with regional clippings and the type of building or location where the accidents occurred. The statistics also point out the age group and class of occupation of the injured.

Similarly, the third section works with the information on overload and short-circuit fires.

A fourth section presents the accidents caused by lightning.

The fifth section presents the data that compiles the occurrences of accidents since the beginning of data computation by Abracopel. The data is called 'historical series', which emphasizes accidents with electric shock, fires due to power overload, and lightning strikes in a ten-year sequence (2013-2022). In this way, it is possible to draw comparisons and perspectives of increased or reduced accidents.

The relevant considerations about the panorama of accidents of electrical origin are manifested in the sixth section, presenting the actual information of accidents that occurred in the year 2022. The idea is to bring to light the discussions about what can be done by civil society, economic agents, and public power to prevent accidents with electricity that, unfortunately, still produce hundreds of victims.

The archive contains charts, tables, and infographics, prepared by the organizers of the Yearbook.



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MESSAGE FROM ABRACOPEL



After two years of isolation and being unable to hold face-to-face events, we resumed our actions with five seminars scheduled in Brazilian cities. We also continued with our virtual activities to generate content so that professionals and non-professionals in the areas of electricity and safety could understand the risks with electricity and create control methods to avoid accidents. There were several actions throughout the year with great success. One was the massive adhesion of students and teachers to the 11th edition of the **Abracopel Writing, Drawing, and Video Contest**, which had almost 15 thousand entries and awarded three hundred children and young people, becoming the biggest Abracopel project in 2022. The strategies used paid off, and we will move forward to 2023; our goal is to reach 25,000 entries.

Speaking of strategy, Abracopel has been promoting changes in its way of acting, seeking to increasingly meet our target audiences more directly and objectively. These changes are being made gradually and subtly, but they are critical. Within this context, Abracopel is working on the ESG (Environmental, Social, and Governance) guidelines. In this first moment, it has allowed us to promote adjustments in how we act, but mainly concerning what we can accomplish. Some of the initial changes were the transparency of Abracopel's actions, the publication of complete reports with goals, and the creation of the Strategic Planning Committee.

Creating projects aimed at specific audiences, such as the **Safe and Aware Electrician**, **Abracopel University**, and **Abracopel at Home**, intends to build more solid and more focused relationships making them autonomous with their targeted and specific communications. Meanwhile, Abracopel will manage these projects, taking charge of the edition and publication of the Statistical Yearbook of Accidents of Electrical Origin, which increasingly brings detailed data from expanded sources. Besides being published in English, Spanish, and Portuguese, it will make agreements with entities and educational institutions to develop projects of mutual interest and interact with the national and international markets to benchmark. We will continue to participate in technical and regulatory standards committees and work with the public authorities to cooperate in developing public policies.

In summary, there are several projects created and managed by Abracopel that form a network of information of good so that, one way or another, they can reach the entire Brazilian population.

Within this interaction with other countries, Abracopel, through its directors, was present in the last three editions (2021, 2022, and 2023) of the *ESW - Electric Safety Workshop* in the United States, presenting works with its content, especially the data from the Yearbook. Also, it was at the 2022 edition of the ICLP (*International Conference on Lightning Protection*) that took place in October in Cape Town, South Africa.

Our mission to “Promote a change in the electricity safety culture by raising the awareness of the population and training professionals” remains firm in its purpose to reduce accidents. , It is necessary to mobilize civil society, the economic agents, and public power. Without this help, the boat sinks.

The data presented in the 2023 edition brought us a little joy regarding the number of deaths from electrical shock but a huge concern with the gradual and significant increase in fires generated from overloading and short-circuiting in electrical installations. The use of - poor quality products, the hiring of untrained professionals, and the lack of electrical projects carried out by professionals contributed to this scenario. We need to be alert and change this reality. The loss of property in a fire is horrible, but the loss of life, as seen in the following data, is painful.

Our sincere thank you to the collaborators and the thousands of indirect and often anonymous ones. We go on for another year of actions to avoid accidents of electrical origin. #ABRACOPELSAVESLIVES



EDSON MARTINHO
Executive Director of Abracopel

- 
- ⦿ Thermography
 - ⦿ Energy Efficiency
 - ⦿ Documentation 'As Built'
 - ⦿ Training In Company
 - ⦿ SPDA Design and Evaluation
 - ⦿ Interlock Design
 - ⦿ Power Quality Solutions
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DATA COLLECTION METHODOLOGY

Abracopel has made use of electronic information available in the media to identify accidents of electrical origin that occur in the country. By spreading the news about the accidents that have happened in the region covered by their respective press vehicles, the media professionals - presenters, reporters, radio broadcasters, and articles, among other opinion makers - contribute to the records contained in the Abracopel Yearbook.

This source of information is incorporated into the news alert tool created by Google, which allows Abracopel to track several specific keywords of interest for data capture daily. Other collaborators, spread throughout the country, are the technical professionals of the electrical sector who also inform about the accidents in their regions of operation, sending the news to our team, thus expanding our database.

Every day, Abracopel registers more than 30 e-mails with news involving the keywords written in the Google Alert System. However, approximately 70% of the e-mails are excluded due to: i) duplicate alerts received, ii) alerts of subjects unrelated to electrical accidents, or iii) alerts without information related to accidents. Thus, we have an average of 400 news items per month.

The extracted data is segmented by date, state, city, gender, age group, occupation, and type of accident, among other treatment parameters considered for the consolidated record during the year. Thus, many times news from different communication vehicles are complementary and help to consolidate the data from the same accident of electrical origin. However, in some cases, report of accidents do not include all the information registered by Abracopel and are then discarded.

The steps involved in the research are represented in the flowchart of the methodology considering data collection, processing, and analysis, as shown below



But it is vital to affirm that we are still unable to demonstrate the actual scenario of the accidents of electrical origin in Brazil since a significant part of the accidents do not make the news or do not have enough information to be registered. Abracopel spares no effort in the search for numbers that represent, if not the actual data, then a credible and up-to-date clipping of the accidents caused by electricity in the country. Such data is unique, and it is used to improve legislation, regulations, or standards, develop new products, and in disseminating good practices. The recommended practices could include periodic reform of Brazilian electrical installations or work with electricity, thus preventing more people from dying in accidents of this nature. The most important of these data is that they direct the actions, projects, or even products to be developed, to ensure the reduction of accidents of this nature.

SECTION 1

OVERVIEW OF ACCIDENTS OF ELECTRICAL
ORIGIN IN BRAZIL 2022

The first section of the Yearbook presents the total number of accidents of electrical origin in the country that occurred in 2022 and breaks it down into three significant areas: Electric Shocks, Fires of electrical source, and Lightning Accidents.

The approach to each theme contemplates clippings by geographical region and state of the Federation, the age range of the victims, type of occupation, type of street where the accident occurred, and the monthly evolution of accidents. Part of the data is available in graphs and tables, with a brief discussion to explain the importance of the information to the reader.

TOTAL DE ACIDENTES DE ORIGEM ELÉTRICA – 2022

Accidents (and deaths) involving electricity in 2022

Deaths **39**

Accident **101**

Accidents caused by lightning

55

874

Fires of electrical origin

592

853

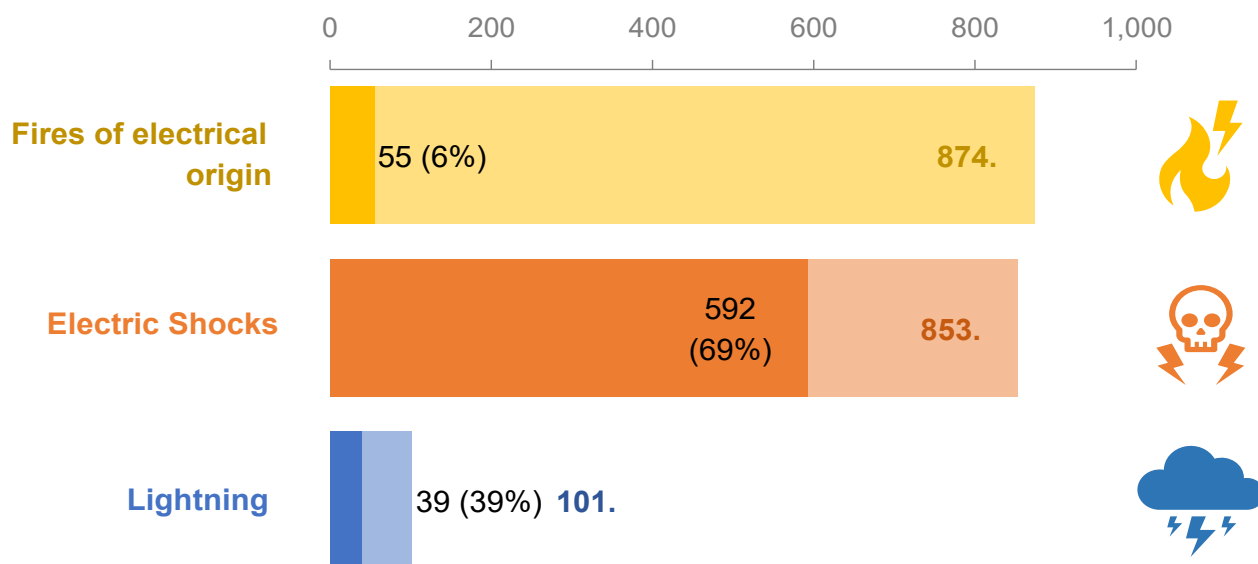
Accidents involving electric shock

Total

1828



Chart 1 Accidents of electrical origin 2022



Total fatalities: 686 (38.6%) of 1,828 accidents

Abracopel organizes accidents of electrical origin in three blocks: i) Electric shock (victims with burns caused by electric arc are also in this section); ii) Fires of electrical origin (can also be caused by electric arc); iii) Lightning.



Chart 1 presents the accidents of electrical origin identified by Abracopel that occurred in 2022, separated into the three highlighted groups, a and also separating accidents with fatal victims and accidents without fatality. In the case of lightning strikes, 37 accidents without victims were registered, but there was property damage, totaling 101 occurrences in this category in 2022.

From Chart 1 that the most significant number of accident records is caused by fires of electrical origin, totaling 874 occurrences with 55 fatalities. We also highlight that the same fire of electrical origin or lightning discharge can have more than one victim. In the case of electric shock, this situation is considered less common.

Other entities also publish data on accidents of electrical origin. The National Institute of Space Research – INPE (translated from Portuguese) publishes the number of lightning victims in Brazil periodically through the Atmospheric Electricity Group – ELAT (also translated from Portuguese). And the Department of Informatics of the Brazilian Unified Health System - DATASUS also makes available in its databases the number of deaths registered in the country by several possible causes.

SECTION 2

ELECTRICAL SHOCKS 2022

In this section, we present the numbers of accidents by electrical shock, bringing an overview of age groups, occupations, and activities at the time of the accident. We also present the occurrences stratified by region, state and classified month by month. In addition to the 2022 occurrences, we also show a variation of the last five years (2018-2022).

Chart 2 Fatal electric shocks by region of the country 2022

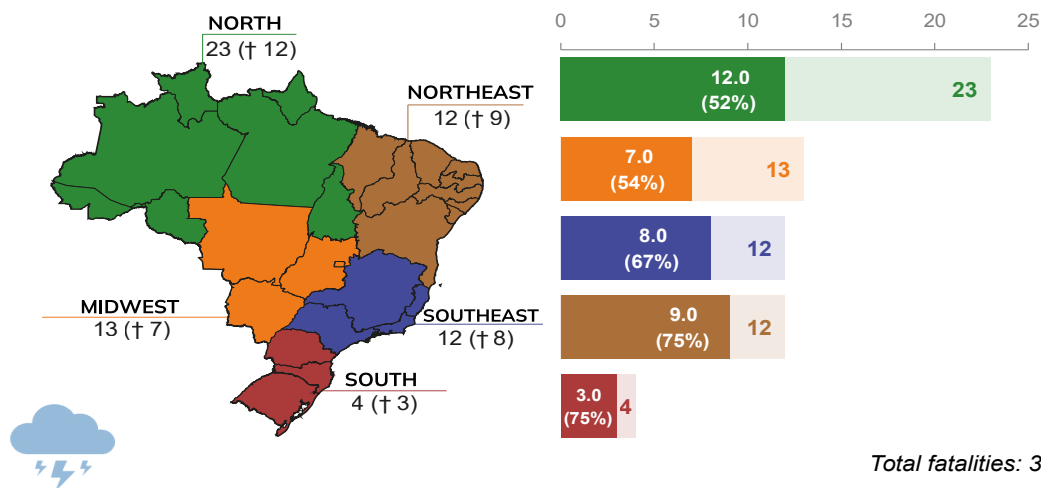


Chart 2 presents the number of fatal electric shock deaths in 2022 stratified by regions of Brazil.

CONEXÃO AUTOMÁTICA

Emenda Elétrica Perfeita

Garanta a segurança e qualidade das suas instalações elétricas com Conectores WAGO!

- ✓ Conecta e isola ao mesmo tempo
- ✓ Fácil manuseio pelas alavancas
- ✓ É reutilizável
- ✓ Design Compacto
- ✓ Ponto de teste para verificação de corrente

Certificação Internacional
ATENDE ÀS NORMAS | NBR5410 / NR10 / NR12



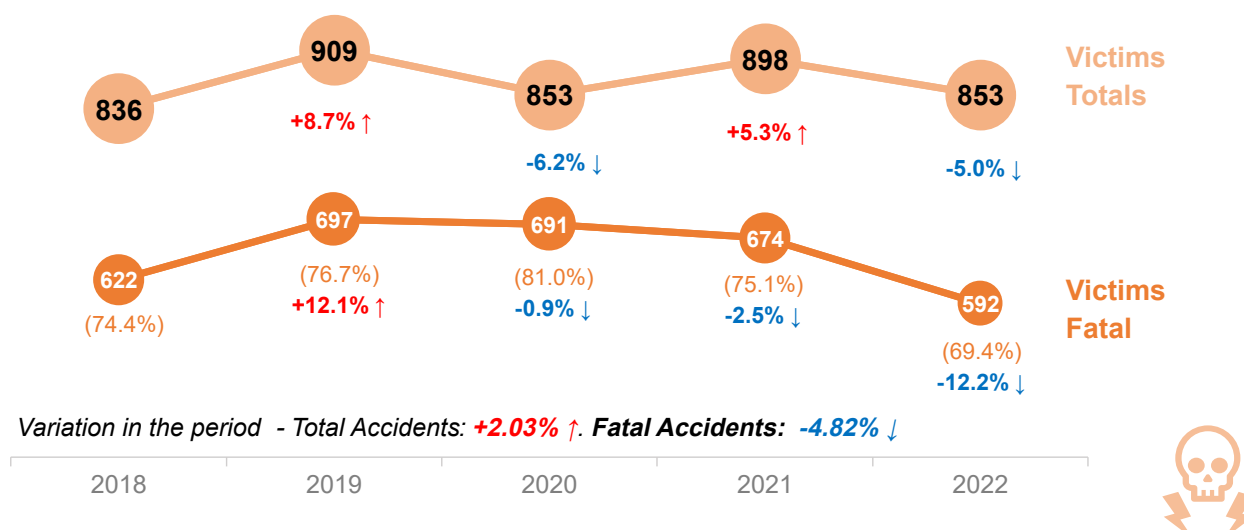
Economize até 30% no tempo das instalações elétricas



Fita isolante é coisa do passado



Chart 3 Total and fatal electric shocks (2018-2022)



As shown in Chart 3, one good news in this Yearbook is that the number of recorded deaths from electric shock has reduced by 12.2% compared to the previous year (2021). Cumulatively, in five years (2018-2022), a 4.82% reduction in fatalities was observed; however, a 2.03% increase in the total number of accidents.

Even with the slight reduction, this is not a reason for celebration, as the numbers remain high. The use of a Residual Differential Device (DR) in electrical installations – together with the existence of a functional grounding system, electrical protection conductors (ground wire), outlet points, and the electrical installation in general that meets the technical standards in force – are the essential elements required to ensure the minimum safety necessary for a low-voltage electrical installation, to reduce accidents caused by electrical shock inside buildings.

Work accidents with professionals, even if of a non-electrical nature (construction, for example) but in proximity to electricity, should be carried out with a Prior Risk Analysis (APR), including electrical risks. This practice is evident in Regulatory Standard No. 10 (NR-10) and ABNT NBR 16384:2020, which deals with Safety in Electricity – Recommendations and guidelines for safe work in electricity.

a. Deaths by Electric Shock X Region (2022)

Chart 4 Fatal electric shocks – Northeast Region 2022

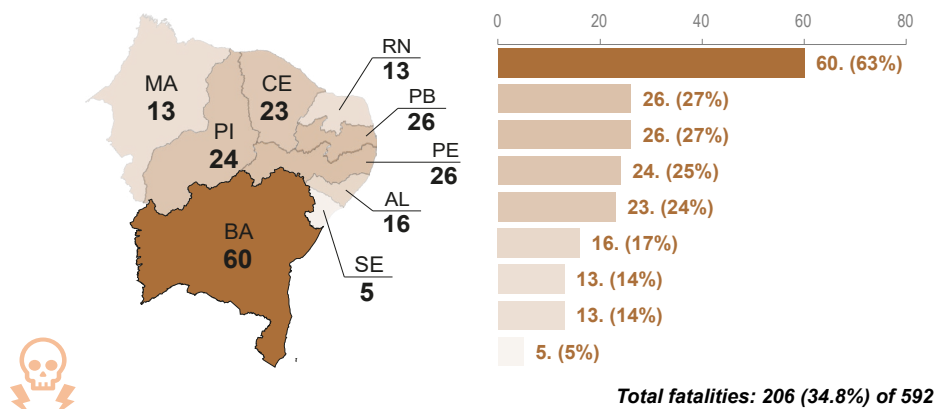


Chart 5 Fatal electric shocks – Southeast Region 2022

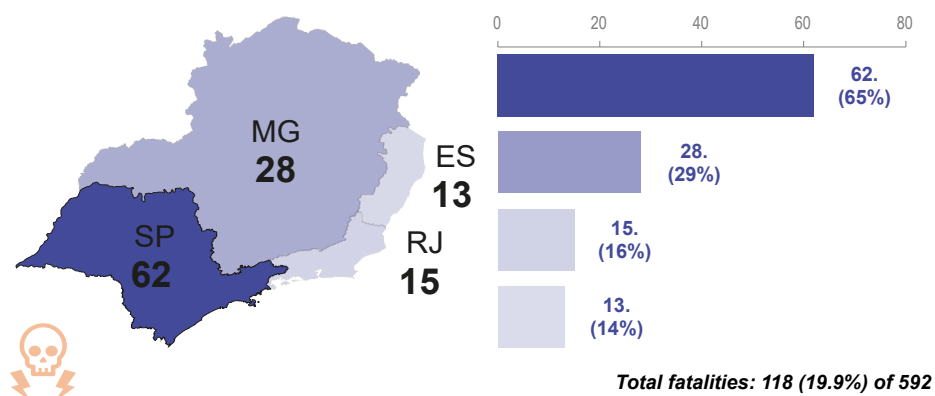


Chart 6 Fatal electric shocks – South Region 2022

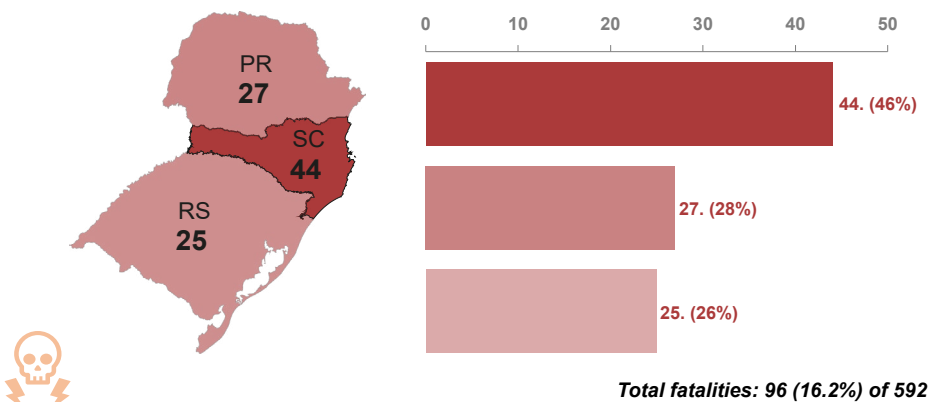


Chart 7 Fatal electric shocks – North Region 2022

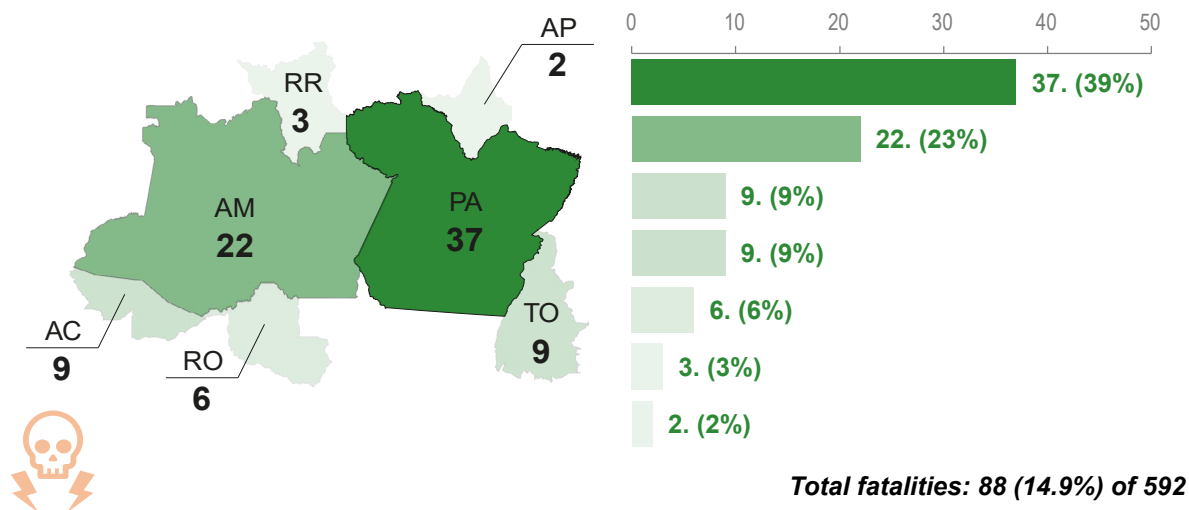
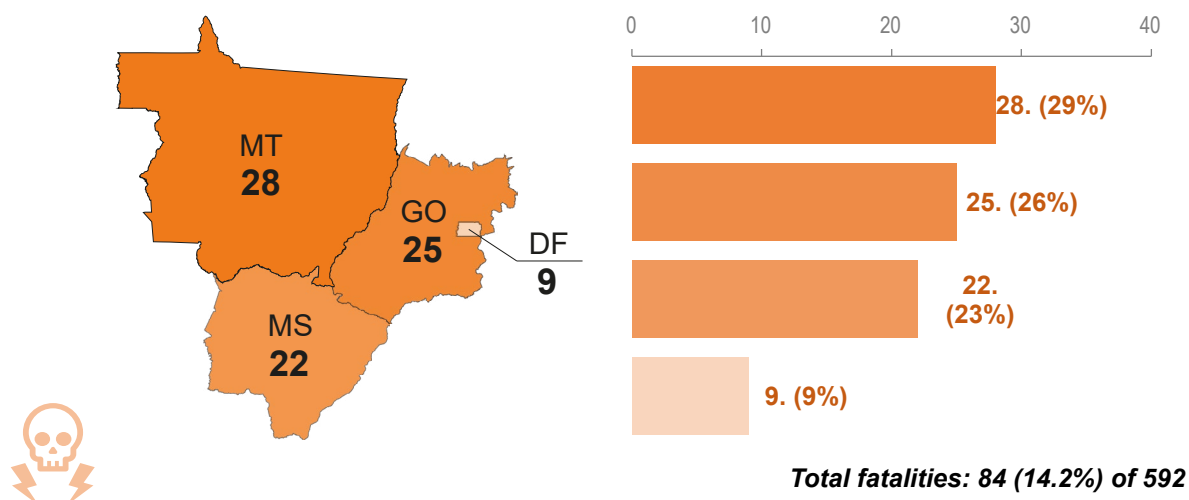


Chart 8 Fatal Electric Shocks – Midwest Region 2022





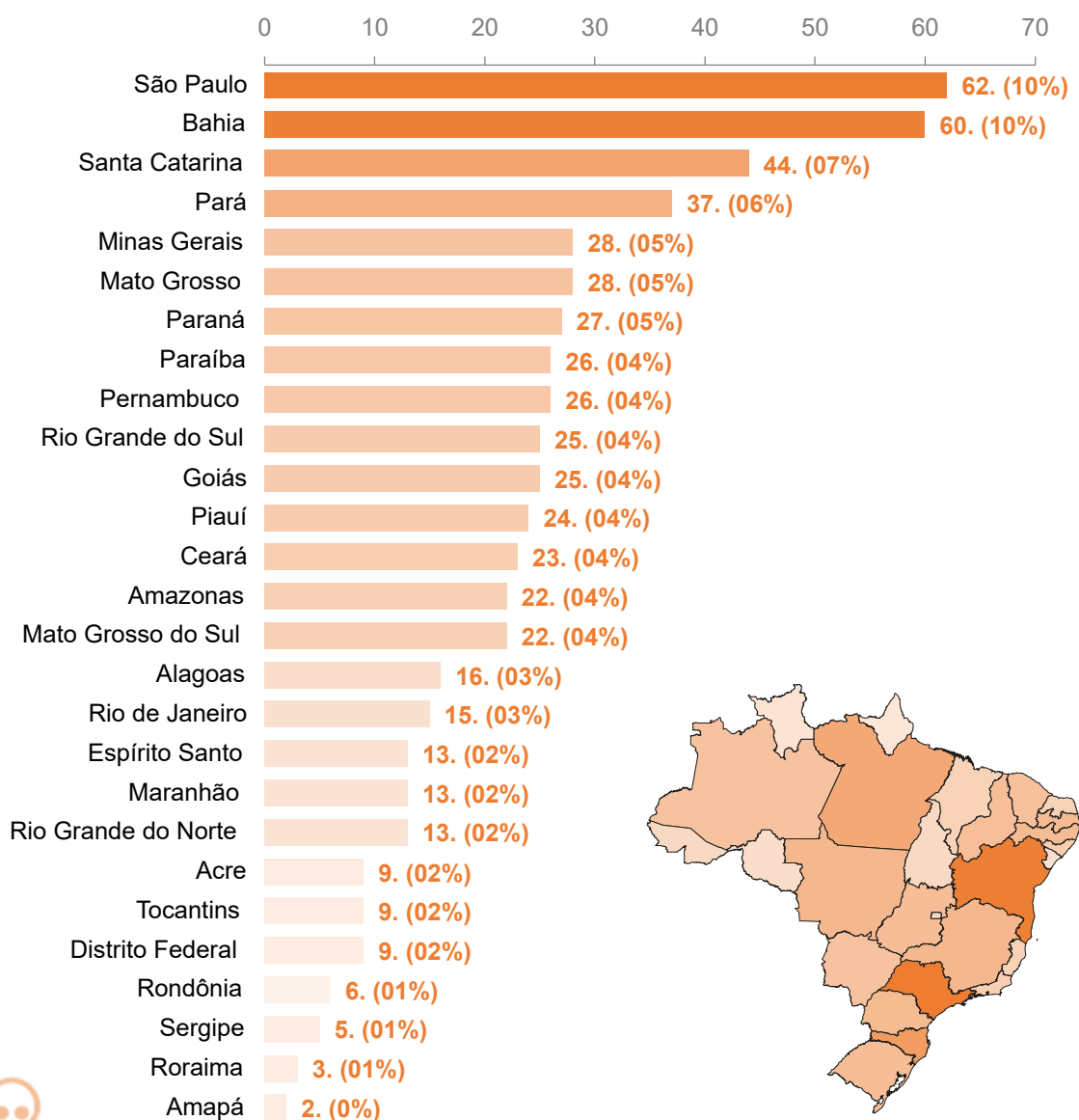
The Northeast region continues leading the absolute number of accidents involving electric shocks. The reasons for this situation represent a constant discussion on the part of the Abracopel team; one hypothesis already raised is the lack of supervision in the documentation of workers' training, and by the Councils, in the case of accidents in civil construction works. Accidents inside buildings could be avoided in great majority by the execution of a grounding system and the use of current leakage protection devices, such as the Residual Differential Device (DR), which is mandatory in Brazil by the technical norm ABNT NBR 5410:2008. However, according to the X-Ray of Brazilian Residential Electrical Installations, only 21% of Brazilian homes have DR, and only 52% have a protective conductor (grounding).

One of the reasons for the high number of work accidents with electricity is that companies or individuals often do not hire trained and qualified professionals. Also, people do not perform the basic steps for a service with electricity, which are the Preliminary Risk Analysis (APR) and the creation of standard work procedures.

To change the culture of electricity safety, Abracopel has, as one of its strategies acted at the base. Therefore, it has as one of its work fronts the Drawing, Essay, and Video Contest, which aims to develop the concept of safety with electricity among children and teenagers through schools all around the country. This practice has proven effective since children or teenagers usually take this learning into their homes and disseminate the information in their communities, organically spreading the concept of safe electricity.

B. NATIONAL RANKING OF DEATHS BY ELECTRIC SHOCK (2022)

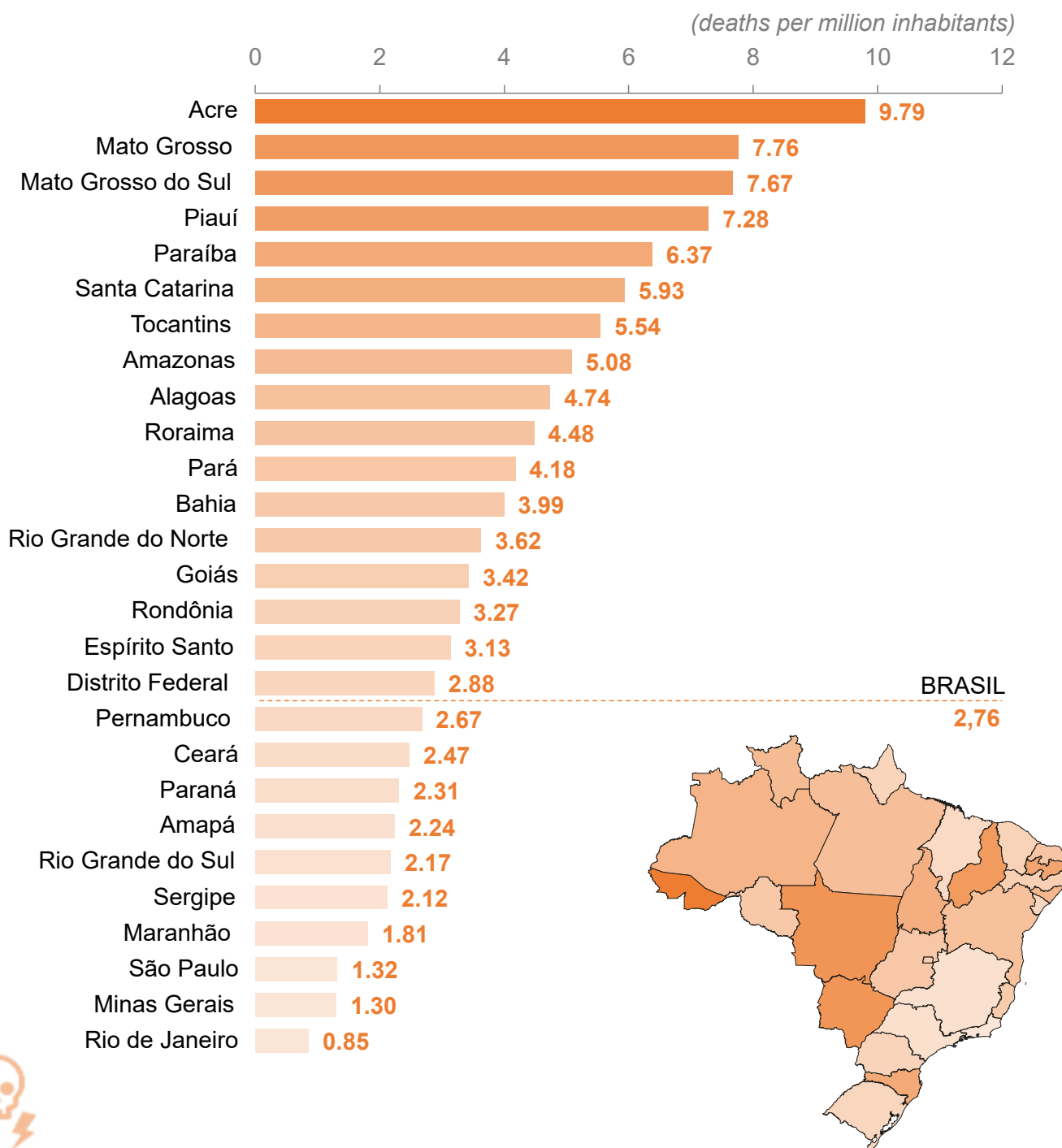
Chart 9 National ranking of deaths by electric shock 2022



Total fatalities: 592 (69.4%) of 853 accidents

Since 2021, the state of São Paulo has assumed the position of leader in fatal accidents with electric shock (for absolute values), a place that the state of Bahia held for almost a decade. Regardless of who is in the lead, Brazil has a significant number of accidents with electric shock, a situation that, most of the time, could be avoided with the execution of electrical projects and the installation of protective devices such as DR, the correct sizing of conductors, and the grounding system, in addition to protective measures in case of direct or indirect work with electricity. Another practice that should be followed is to review the electrical installation at least every five years, in the case of low voltage, because with this practice, it is possible to detect potential problems, making it possible to program the adjustments.

Chart 10 National ranking of deaths by electric shock per million inhabitants 2022





Since the edition of the Yearbook published in 2022, the base year 2021, Abracopel has discussed the rate of deaths by electric shock per million inhabitants and presented this data as a National Ranking. Knowing the absolute values is necessary to understand where the most significant amounts of a certain event occur, as in Chart 9, in which the national ranking of deaths by an electric shock is presented. However, it is known that where the population density is greater, statistically, the probability of an event occurring is greater, and vice-versa. For this reason, it is also necessary to discuss relative values, in which the events are placed on the same basis, so that only then can we make comparisons.

to calculate all the electrical accident death rates for the year 2022, we used data from the Brazilian Population Estimate, published in the latest Brazilian Population Density Survey, conducted in 2010 by the Brazilian Institute of Geography and Statistics – IBGE.

As can be noted in Chart 10, the state with the highest rate was Acre, with 9.79 deaths from electric shock per million inhabitants. The most populous state in Brazil, São Paulo, with a population of approximately 47 million people, achieved a death rate from electric shock in 2022 of only 1.32 deaths per million inhabitants.

Meanwhile, the Brazilian death rate from electric shock in 2022 was 2.76 which shows an improvement over the previous year's recorded rate of 3.16. Even with this reduction, the number remains exceptionally high. The United States had one death by electric shock per million inhabitants in 2002 (Cawley and Homce, 2006); in the case of Japan, between 2013 and 2015, the average was 0.89 death by electric shock per million inhabitants (Ichikawa, 2020).

C. Electric Shock Accidents by Age and Gender (2022)

Mortality from accidents with electricity is high and affects mainly certain population groups, such as men, having a higher incidence, proportionally to population size, in the Northeast, North, and Center-West regions.

It can also be observed in Chart 11 that the lethality is higher among accidents with children and the elderly. For example, 50 accidents by electrical shock were registered in men over 60 years old, and 44 were fatal, totaling 88% of fatal cases. In the case of men between the ages of 31 and 40, 65% of the patients were fatal. This is because these accidents do not usually occur in a work situation but rather at home. For this reason, help is often delayed, in addition to the natural fragility of being too young or old.

Chart 11 Accidents by electrical shock by age group and gender 2022

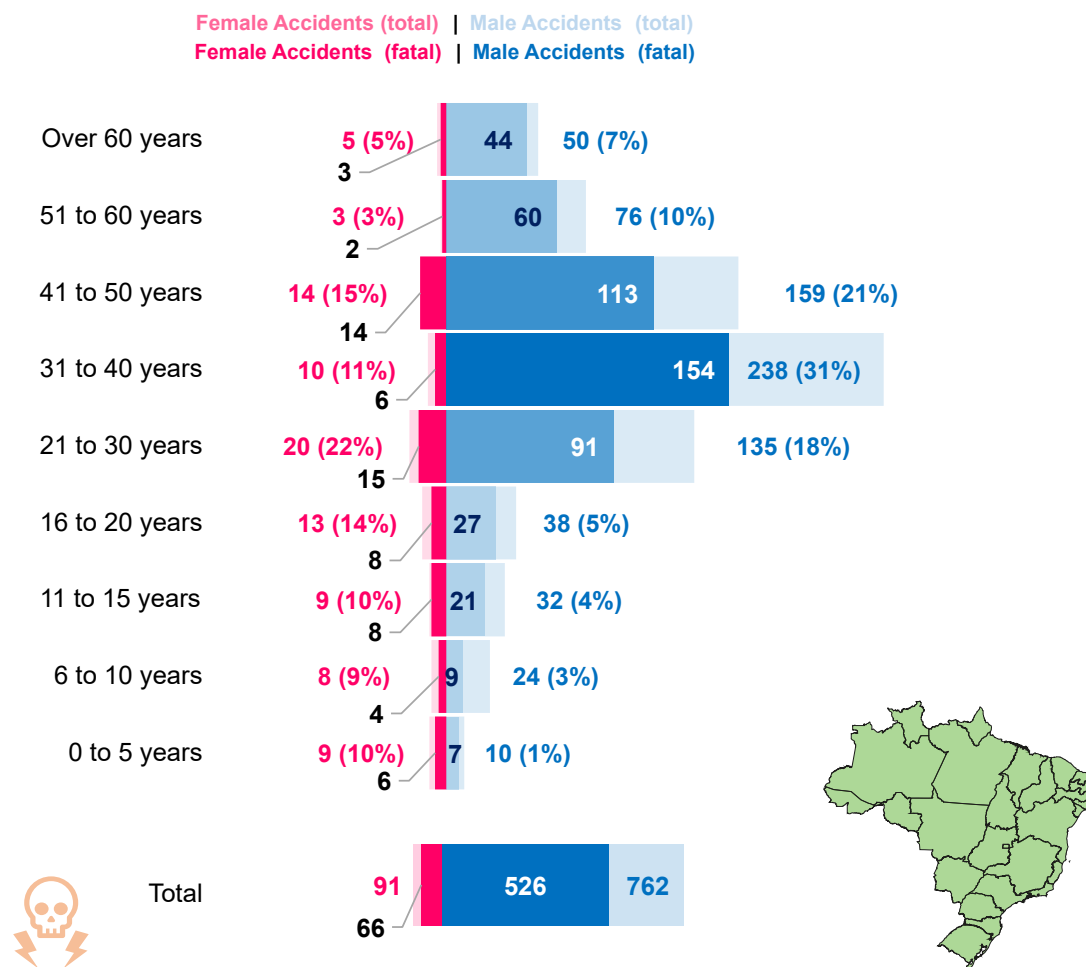
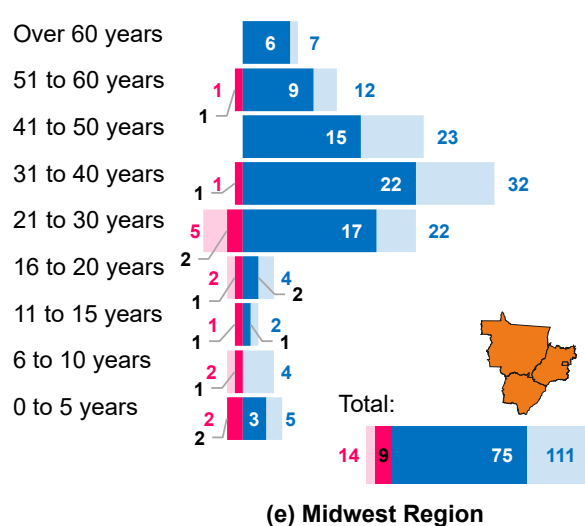
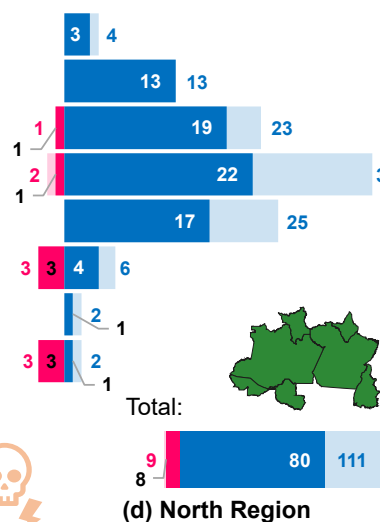
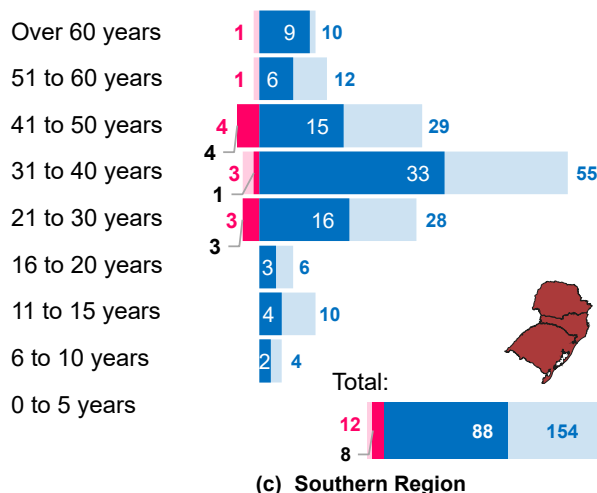
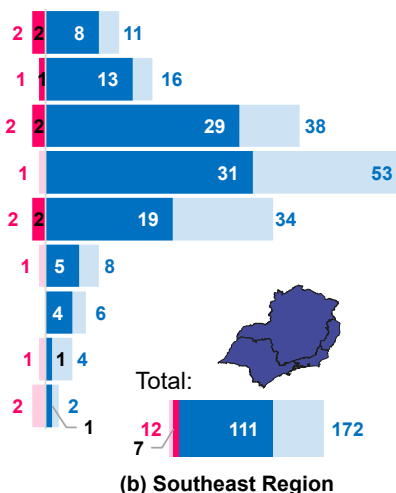
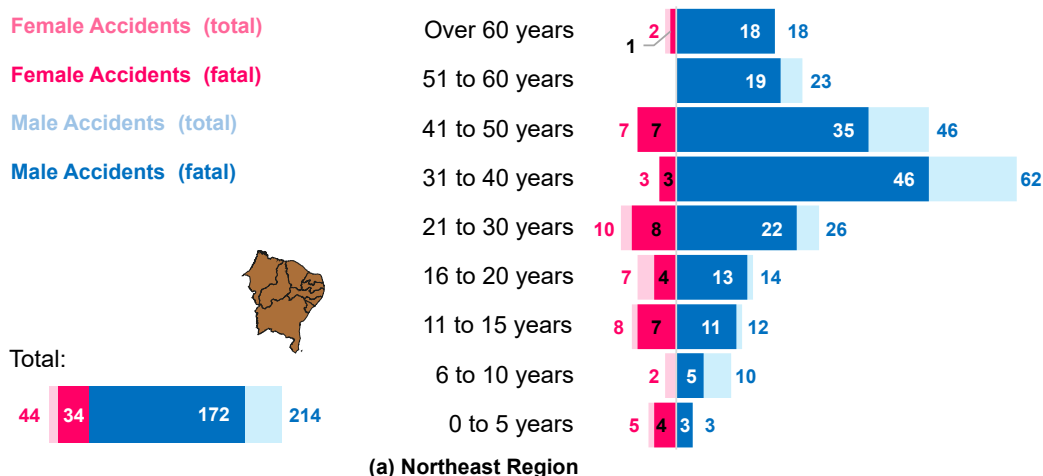


Chart 12 Accidents by electric shock Age group, region, and gender 2022



As shown in Chart 12, the age group that suffers the fatal accidents caused by an electric shock is the economically active age group, between 21 and 50 years old, with approximately 60% of the deaths by electric shock. These accidents, in several cases, occur in the work environment or work-related actions due to a lack of attention or ignorance of the risks involved in the activities.

In general, accidents at work victimize primarily men. This fact can be explained by the fact that the activities with the highest risk to life are performed by men, such as electricians, painters at heights or near the medium voltage network, civil construction jobs, etc.

One of the main reasons for deaths by electrical shock involving professionals who deal directly or indirectly with electricity is the lack of knowledge and disregard for the risk they run, not following the rules and regulations. It is very common for people to think that accidents will never happen to them and end up increasing the risk. Still, they forget that in most cases, electricity does not give them a second chance, and most cases, electricity does not give them a second chance, so they get injured.

Abracopel always emphasizes *never performing any work involving electricity if you are not aware of the risks it offers*. If you are a trained and qualified professional, always do the Preliminary Risk Analysis (APR) and prepare standard procedures for performing the service safely.

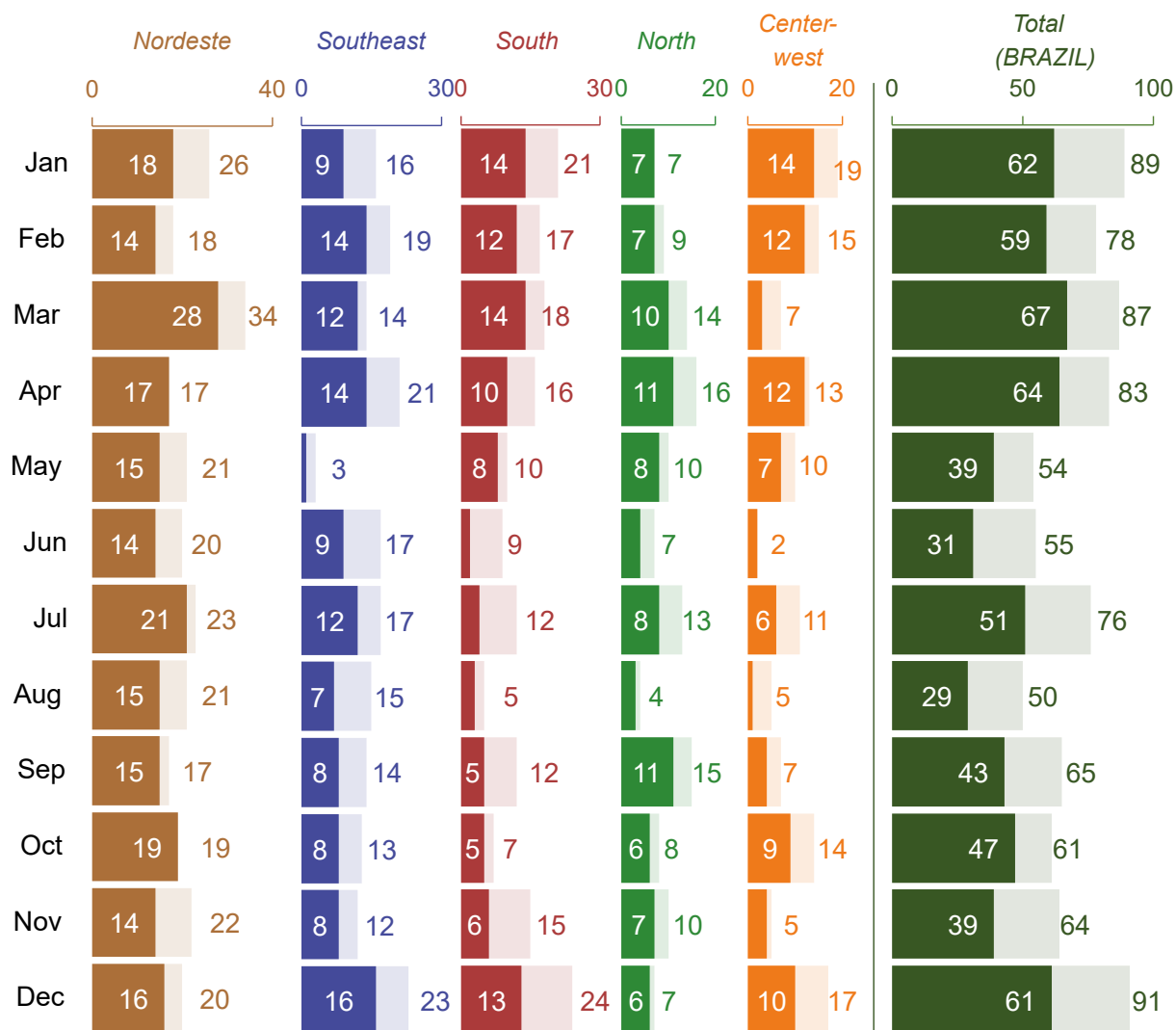
D. Electric Shock Accidents by month of occurrence and region of the country (2022)

In the Brazilian case, the deaths by electrical shock present slightly seasonal characteristics, as shown in Chart 13. It is observed annually that the number of accidents is greater in the rainiest months, and in the driest months, the accidents reduce slightly. This is because the contact resistance decreases in wet or humid places, and water usually contains conductive residues. Thus, the risk of electric shock is accentuated in humid or wet areas, and during periods of the year with a predominance of rain.

Most of the Brazilian territory is situated in the tropical zone, characterized by an average of six months of rain with summer in the center (October to March), followed by six months of scarce rain with winter in the center (April to September).

In the rainy season, problems in power distribution increase. In the case of Brazil, the urban power distribution system is 98% overhead. Aerial distribution networks are cheaper than underground ones, but the number of accidents involving electricity is significantly higher than underground networks. During the rainy season, an increase in the number of reports of accidents of electrical origin was observed, especially on rainy days with winds. Accidents involving vehicles, trees, and objects near the overhead power distribution network are constant.

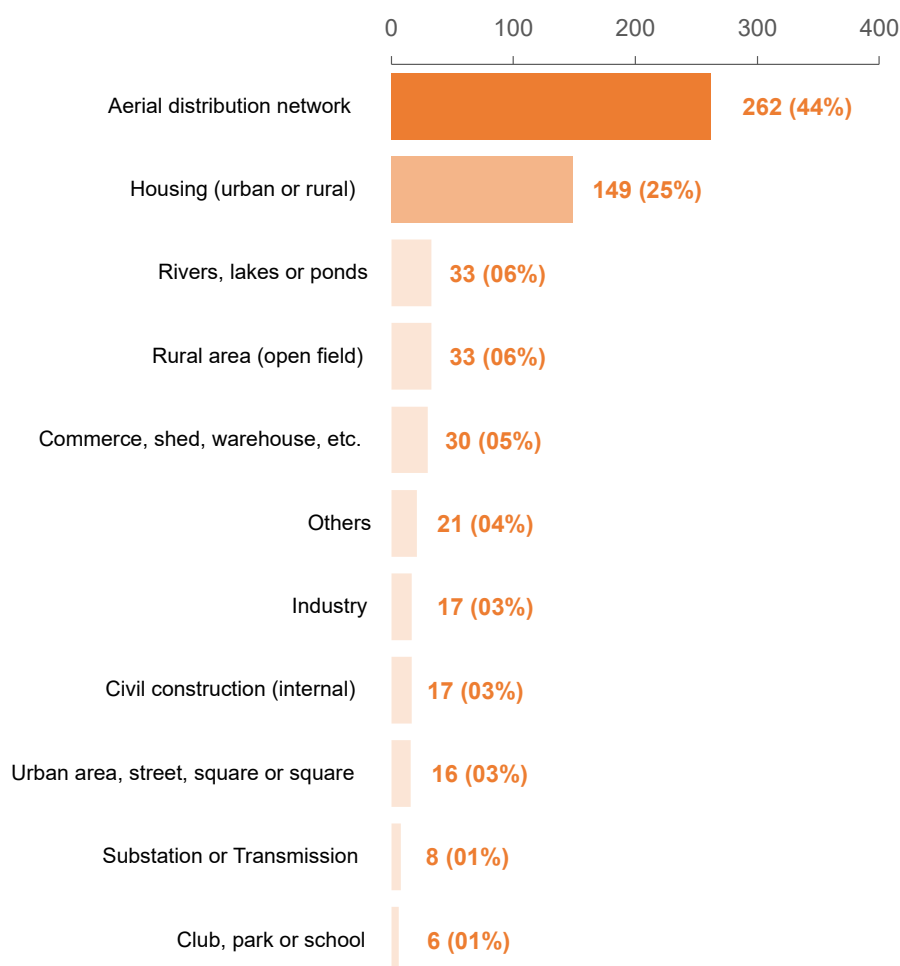
Chart 13 Accidents by electric shock by month of occurrence and region of the country 2022



Total fatalities: 592 (69.4%) of 853 accidents

E. Electric Shock Accidents by Place of Occurrence 2022

Chart 14 Accidents by electric shock by place of occurrence 2022



Total fatalities: 592 (69.4%) of 853 accidents

It can be seen in Chart 14 that the two conditions combined account for 69% of accidents. Together, overhead power distribution networks and residential environments were responsible for 411 deaths from electric shock in 2022.

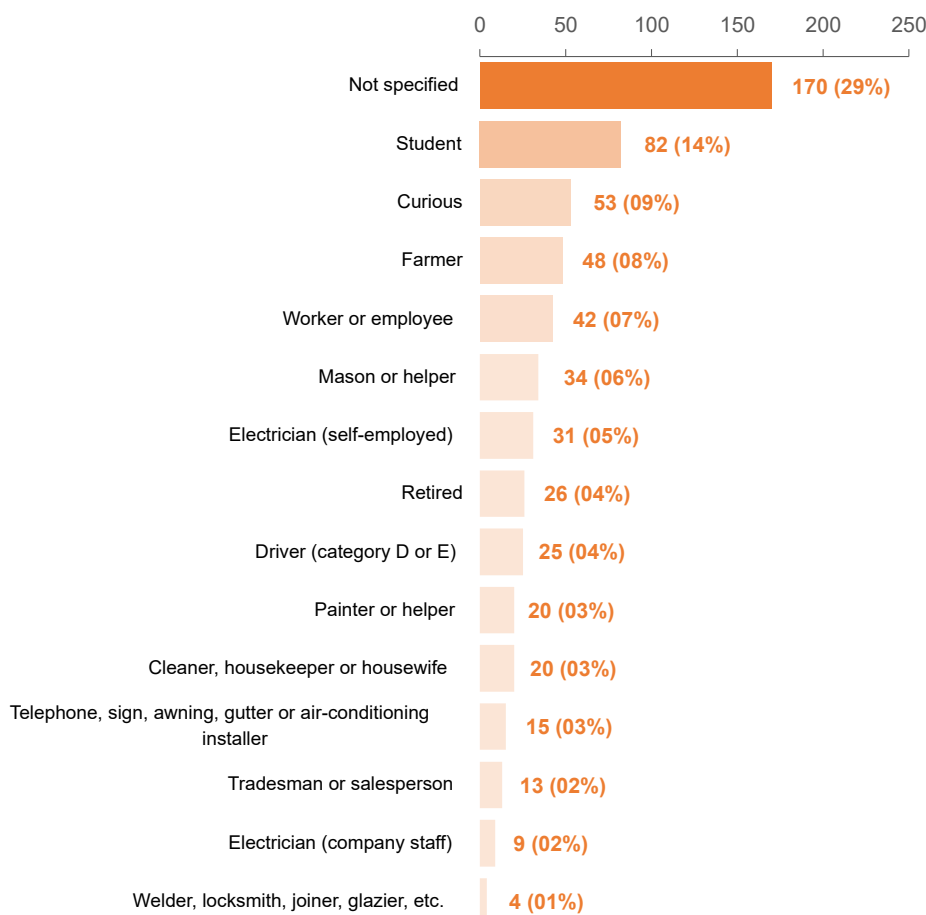
In the case of distribution networks, the high number occurs because the network is predominantly aerial in Brazil. Many accidents occur by accidentally touching energized electrical lines. A typical case is accidents that occur in civil construction sites in which the victim handles parts with metal near the overhead power distribution grid and ends up accidentally touching the circuit.

Also, in the case of deaths from electrical shock occurring in electrical power distribution networks, traffic accidents involving electric poles and mechanical shock from trees or other objects in electrical circuits have caused many victims in the analyzed period. The accidents were more concentrated in year when the number of storm was higher.

Inside residences, 149 deaths caused by electric shock were registered in 2022. These accidents, generally, are caused by the accidental energization of electrical equipment that has metallic wrapping, aging, and lack of maintenance of the equipment. The absence of electrical grounding and lack of Residual Differential devices (DR) are the main reasons for electric shocks inside residences, according to the data collected by the news.

F. Electric Shock Accidents and occupation 2022

Chart 15 Accidents by electric shock and occupation 2022

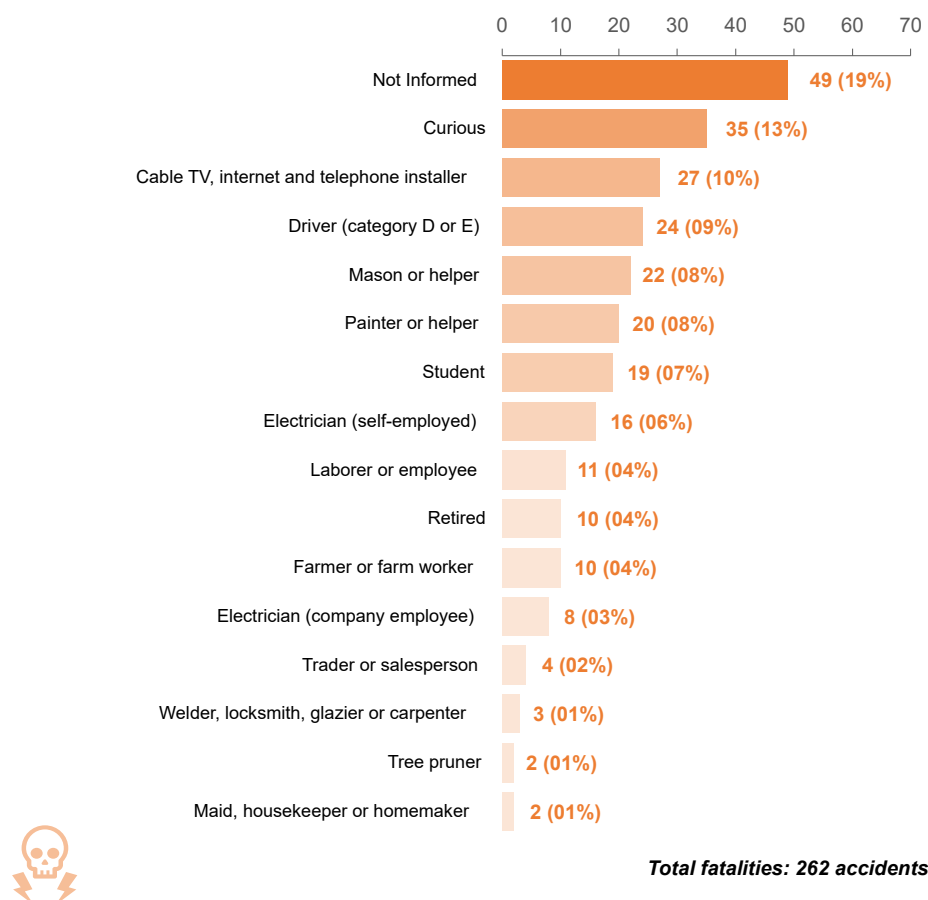


Total fatalities: 592 (69.4%) of 853 accidents



We can evaluate in Chart 15 that electricity reaches all strata of the population, regardless of profession. Still, it always draws our attention to the significant number of accidents involving professionals in electricity. There were 69 accidents with 40 deaths of professionals who, theoretically, are aware of the electrical risks, according to Regulatory Standard No. 10 (NR 10). Therefore, they are expected to follow the rules of prior risk analysis, safety procedures, adequate and quality equipment, products, and good safety practices.

Chart 16 Accidents by electric shock in the aerial distribution network and profession 2022

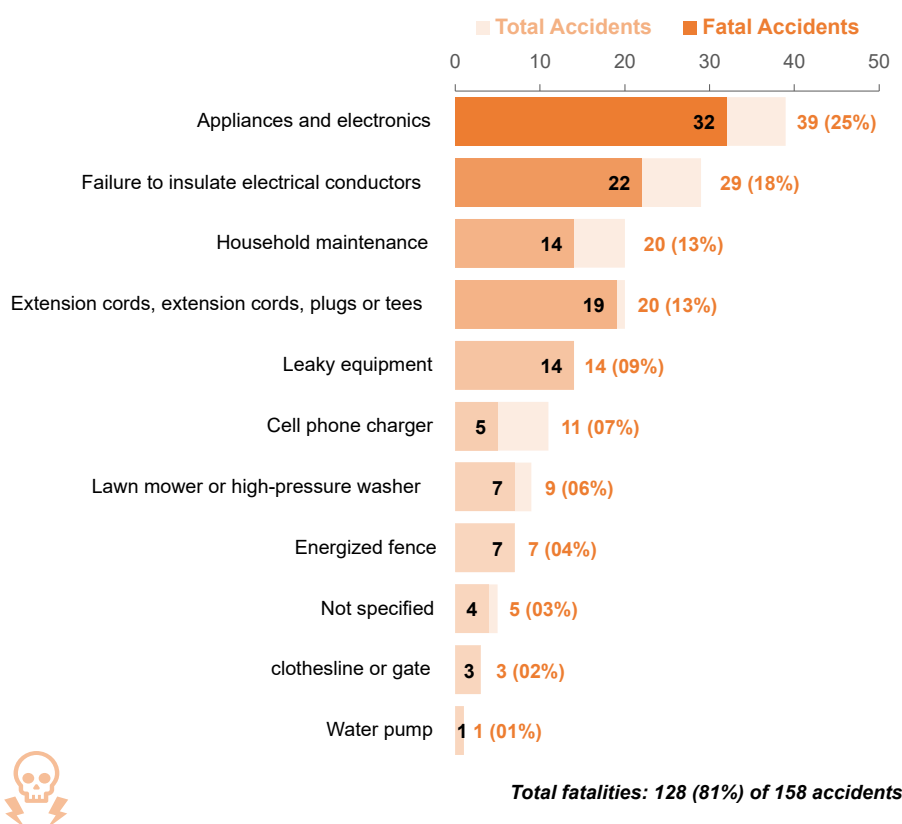


In Chart 16, the data presented are of the fatal accidents that occurred on the overhead distribution network concerning the profession of the victims (selected), usually the responsibility of the distributors and energy concessionaires throughout Brazil. These accidents show that the primary victims are bricklayers, painters, and their helpers, who work close to the grid without any protection. When handling hardware, they touch the grid, which in most cases has voltages above 13,800 volts.

Another category that has been a constant victim of these accidents is truck drivers, especially those driving vehicles with a lifting bucket. They don't realize how close they are, and when they lift the bucket, they touch the network and energize the truck. Desperate, they get down from the vehicle and immediately get an electric shock, almost always fatal. We must also mention, again, the professional electricians, who, in this type of accident, have totaled 24 fatalities. Once again, our concern with these deaths. Cultural change is a long and continuous work; that is why Abracopel exists and will continue to work.

G. Major causes of electric shock accidents in residential areas 2022

Chart 17 Major causes of electric shock accidents in residential areas 2022



It can be observed that the accidents with the highest number within residential environments are classified as “electrical appliances and electronics,” according to Chart 17 – mainly washing machines that victimized many people in 2022 because it is electrical equipment in which the person also deals with water. So, any current leakage can be fatal.

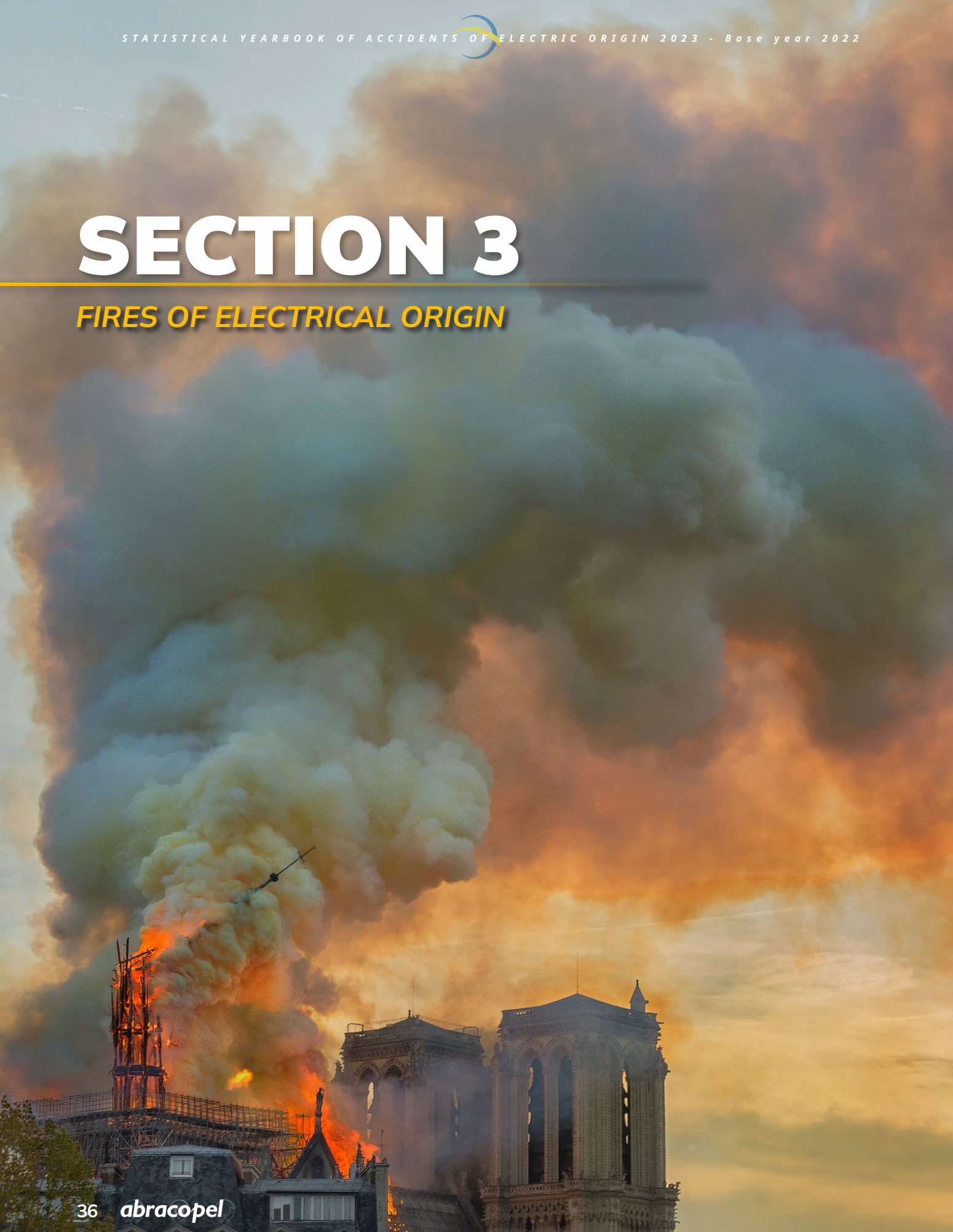
It is noted that the second largest number of accidents within residential environments are classified as “Failure to insulate electrical conductors,” - which deals with various situations of accidental touching of uninsulated wires, such as sockets and temporary installations.

Accidents with extension cords and power strips are significantly high. It is necessary to note that this equipment is not regular and, therefore not part of any quality control, so it needs to be avoided by users.

Refrigerators and washing machines have been the leading equipment in accidents with electrical appliances in a residential environment. Indeed, the absence of the Residual Differential Device (DR) combined with a grounding system, mandatory in the electrical installation but ignored by many, could have saved most of the victims. The lack of this device is motivated by the owner's ignorance of the residence and, sometimes, by the negligence of the professionals who should suggest the installation and explain the importance of this device in the electrical installations of a residence.

SECTION 3

FIRES OF ELECTRICAL ORIGIN



In this section, we bring the number of accidents generated from an overload or short circuit in the electrical installation and fatal shocks. It includes an overview of age groups, occupations, and activities at the time of the accident, divided by regions and states and classified month by month. This section presents the 2022 occurrences and an evaluation of the variations over the last five years (2018-2022).

Chart 18 Fires of electrical origin by region 2022

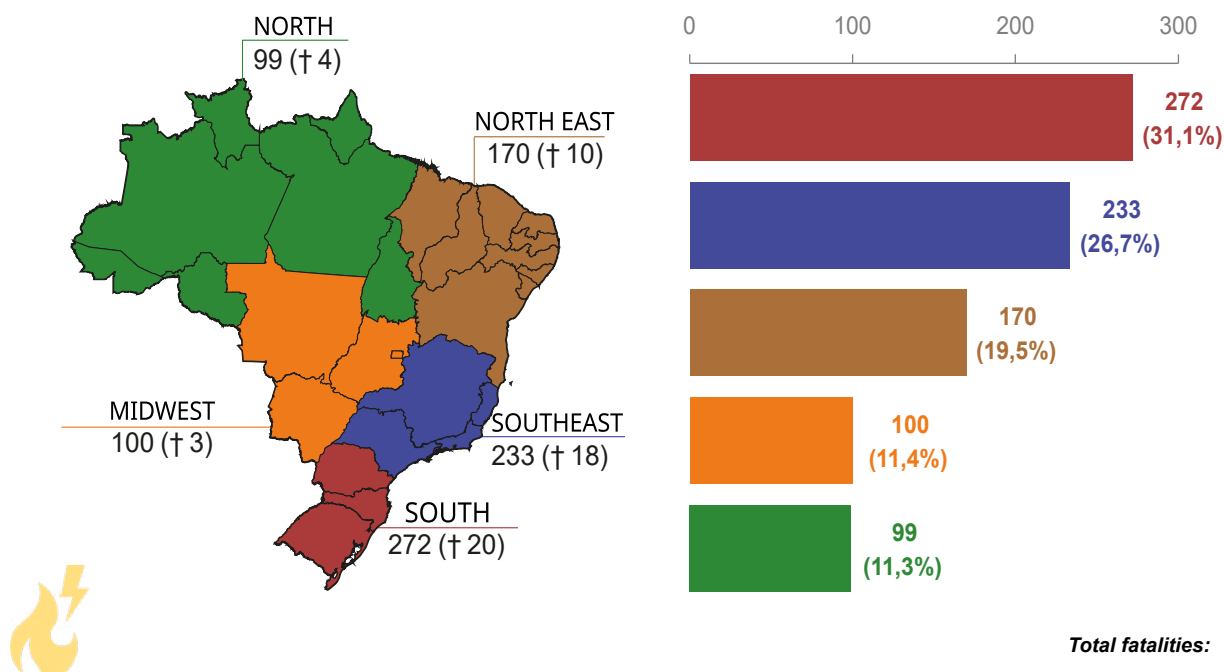


Chart 18 presents the number of accidents and deaths from fires caused by electricity occurring in 2022 and stratified by regions of Brazil.





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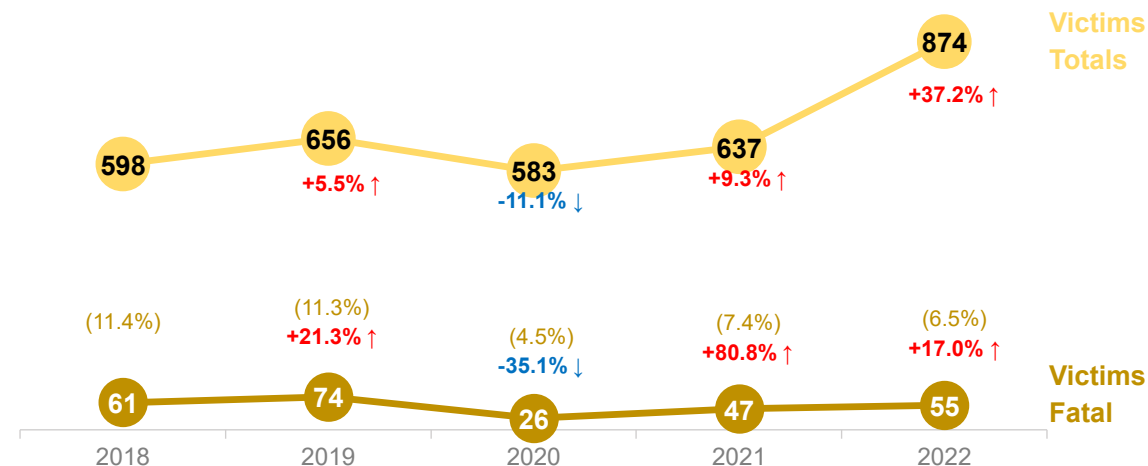


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Chart 19 Fires of electrical origin – 5 year comparative (2018-2022)



Variation in the period - Total Accidents: **+46.2% ↑**. Fatal Accidents: **-9.84% ↓**

As shown in Chart 19, one of the bad news we bring in this Yearbook is the increase in fires of electrical origin and the number of victims. A 32.3% increase in fires of electrical origin was recorded compared to the previous year (2021), totaling 874 records in 2022. In the cumulative period presented (2018-2022), a 57% increase in accidents was observed. However, fortunately, a reduction of approximately 10% in the number of deaths.

A. Fires of electrical origin X Region 2022

Chart 20 - Fires of electrical origin – South Region 2022

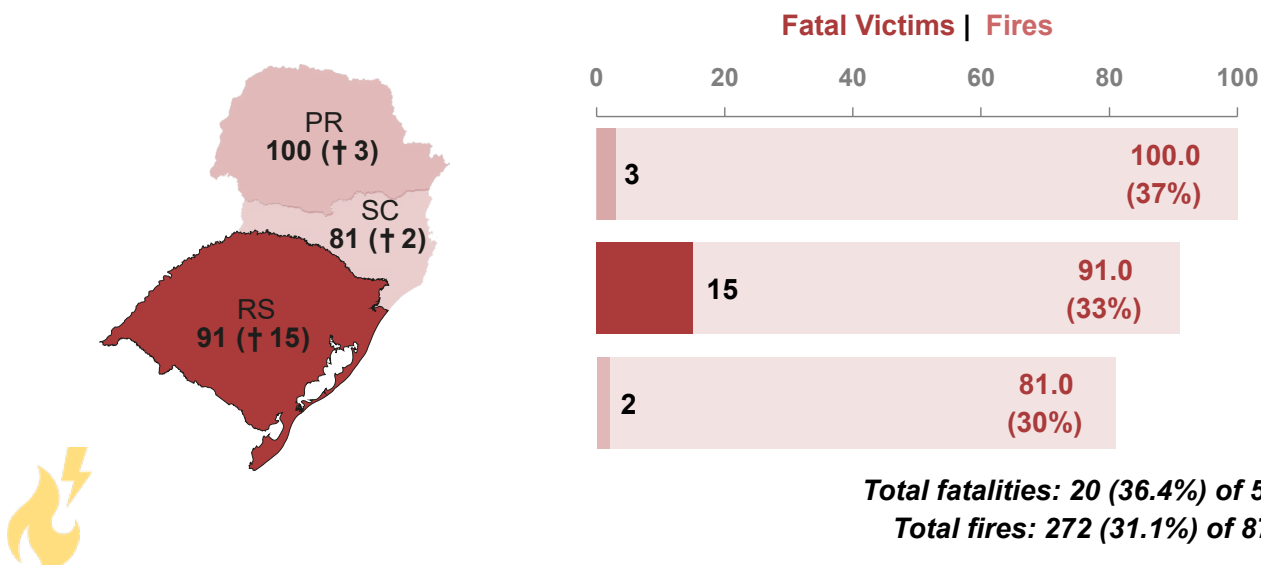


Chart 21 Fires of electrical origin – Southeast Region 2022

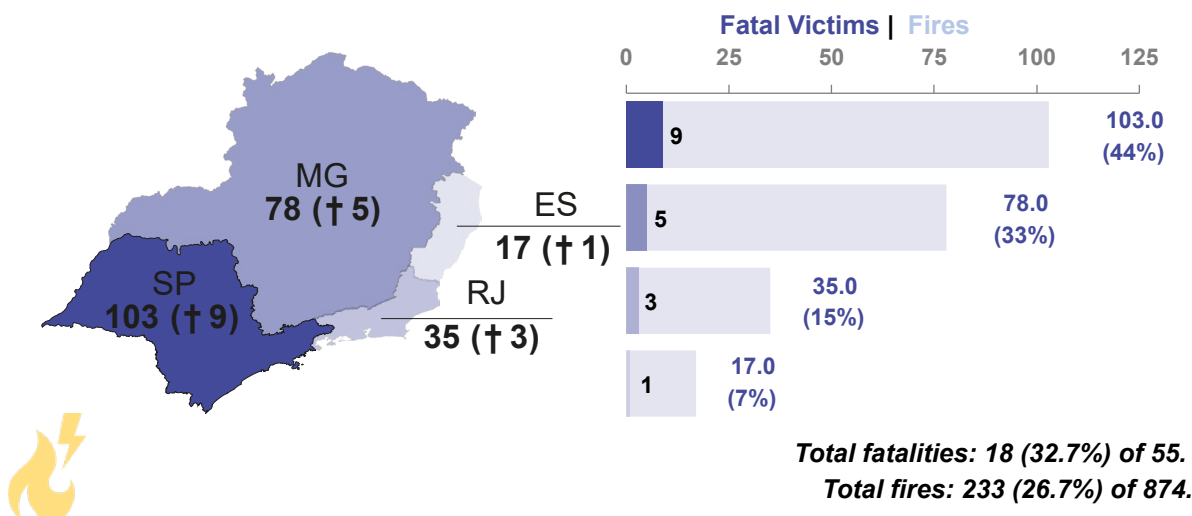


Chart 22 Fires of electrical origin – Northeast Region 2022

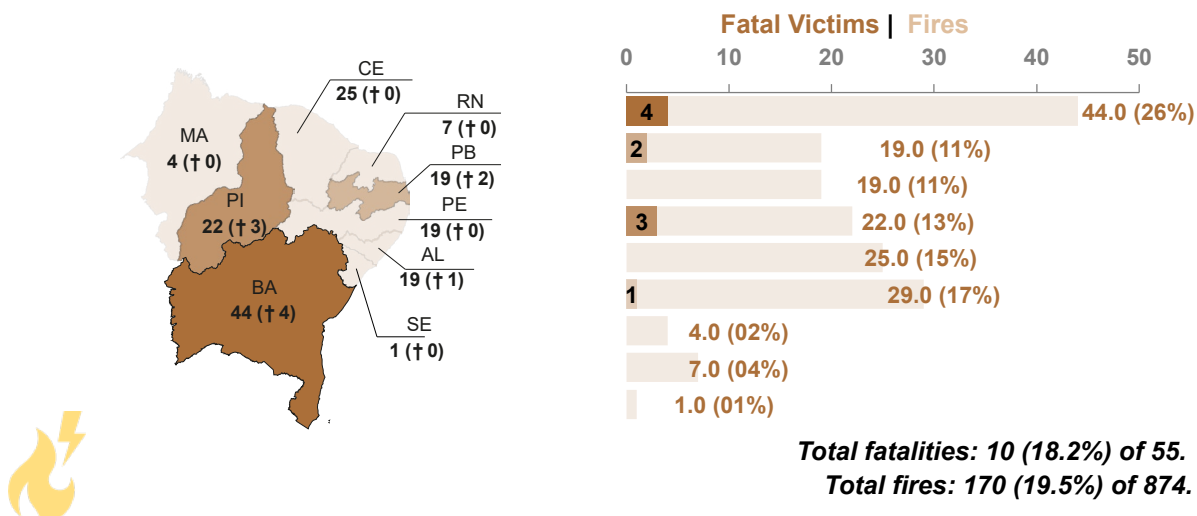


Chart 23 Fires of electrical origin – Midwest Region 2022

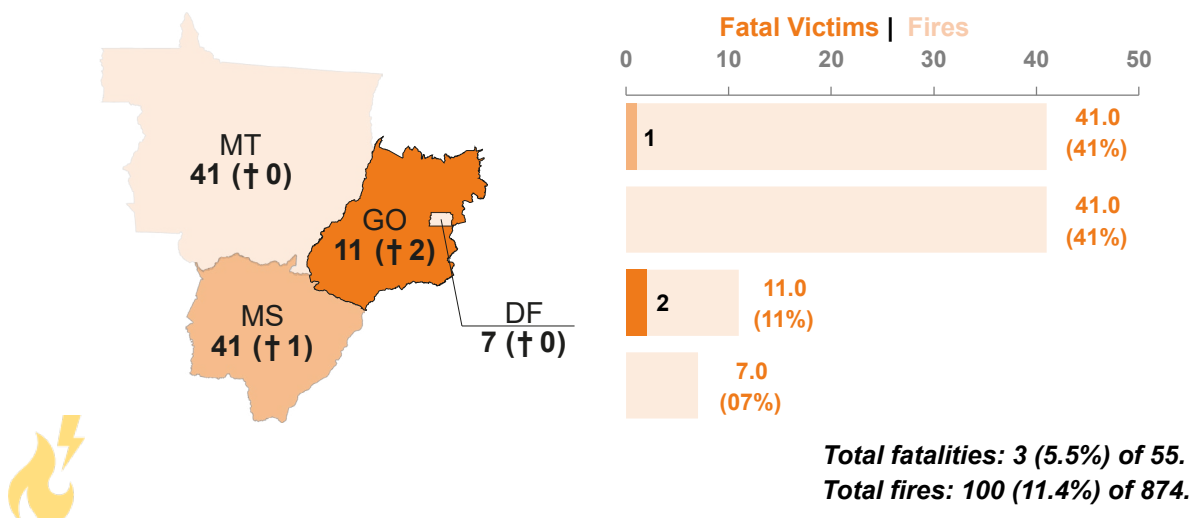
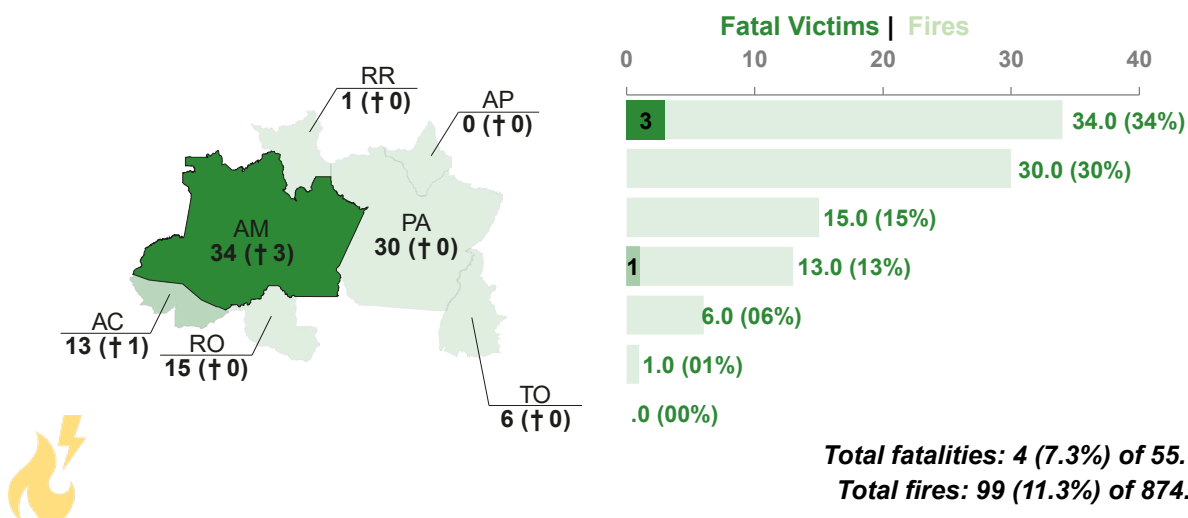


Chart 24 Fires of electrical origin – North Region 2022

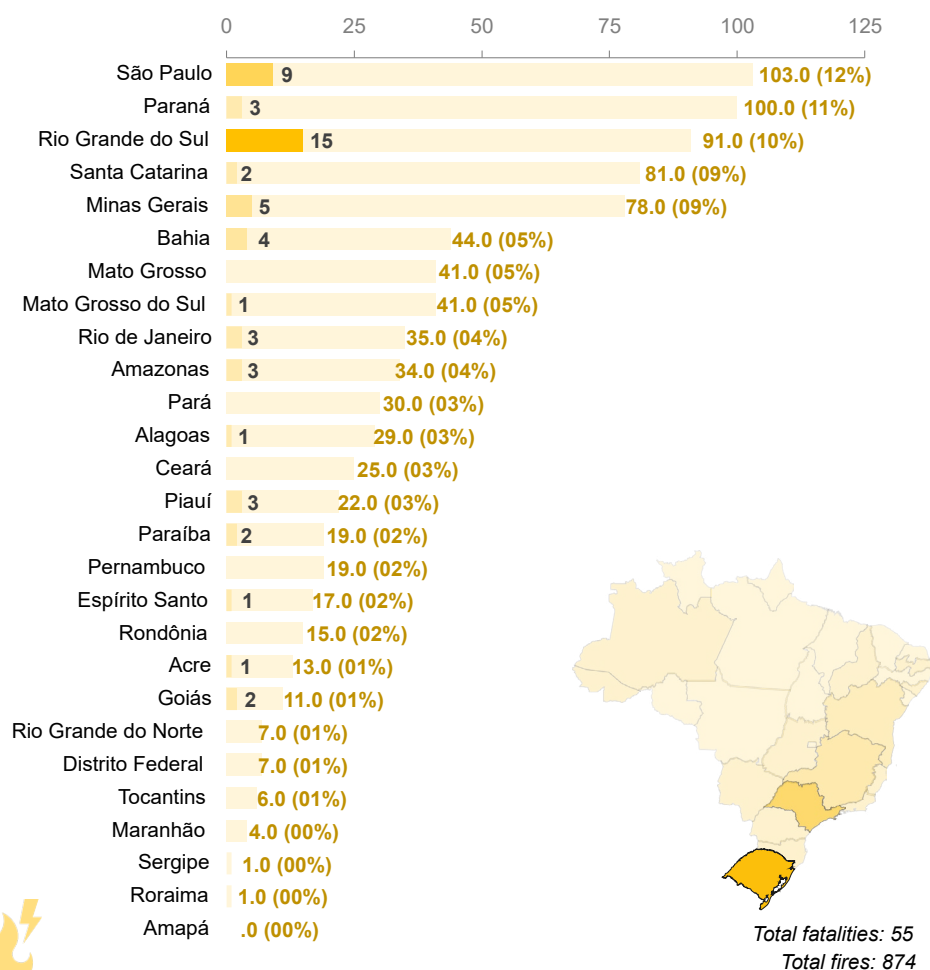


The accident by the fire of electrical origin presents a different scenario from the accident by electric shock. The South region took the unfortunate lead in 2021 and continues in 2022 with 272 fires, closely followed by the Southeast region with 233 accidents. As for the number of deaths from fires, the South region also leads with 20 deaths, closely followed by the Southeast region with 18 deaths. These accidents make us reflect that the electrical installations are “poorly sized” or do not undergo periodic reviews, leading to overload situations, and not being protected by the devices correctly.

A circuit breaker correctly sized for the conductor will not let the overload or short circuit develop into heating and subsequent fire outbreak. Abracopel offers various contents on the subject, including E-books to assist professionals.

B. National ranking of fires of electrical origin and fatalities by state 2022

Chart 25 National ranking of fires of electrical origin and fatalities by state 2022



Usually, the number of fires of electrical origin cases is higher in the Southeast region. This is because the region has the highest population density in the country, representing more than 40% of the total.

According to Chart 25, São Paulo continues to lead the country in the number of fires of electrical origin, and Rio Grande do Sul leads in the number of deaths.

Fires of electrical origin have as their initial element: the overheating of the electrical conductors, igniting the insulating coating, usually plastic, that protects them from contact with each other or even with the materials around them. By damaging the insulation due to high temperature, the lateral elements of the installation can combust and thus start an electrical fire.

The famous term short circuit often applied even wrongly, is a phenomenon in which there is an instantaneous dissipation of energy (overheating) that usually results in sparks and flares. Subsequently, the appearance of fire is caused by the high passage of electric current in a circuit with small electrical resistance, in this case, an electric conductor wire. As the conductor's insulation does not support the dissipation of the high temperature, and if the protection devices do not exist in the circuit or do not act properly, the insulation of the electrical wires and cables change their physical state and no longer protect the conductors, causing the fire.

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We should also warn against the use of non-standard conductors that, unfortunately, are available in the market at low prices and attract buyers, who unknowingly are taking conductors that can start a fire because they do not have the required amount of copper to conduct the necessary current. The insulation is of poor quality, catching fire and spreading the fire.

Still on this subject, poorly made splices or the lack of use of connectors, or even the use of connectors of dubious origin, are also reasons for fires.

C. Deaths in fires of electrical origin by age group and gender 2022

Chart 26 Deaths in fires of electrical origin by age group and gender 2022

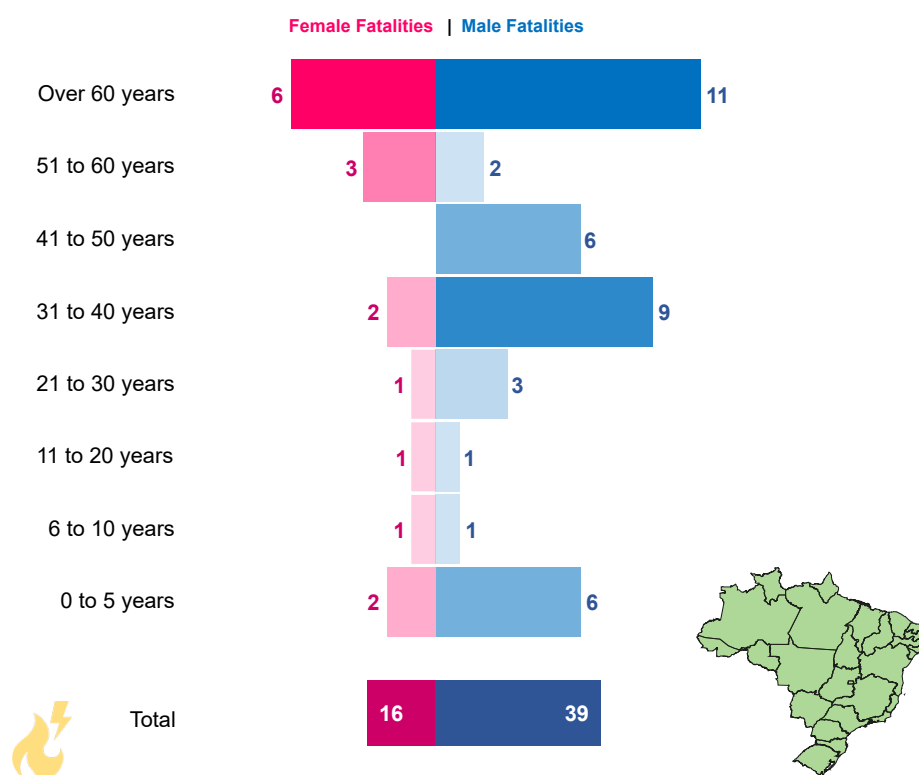
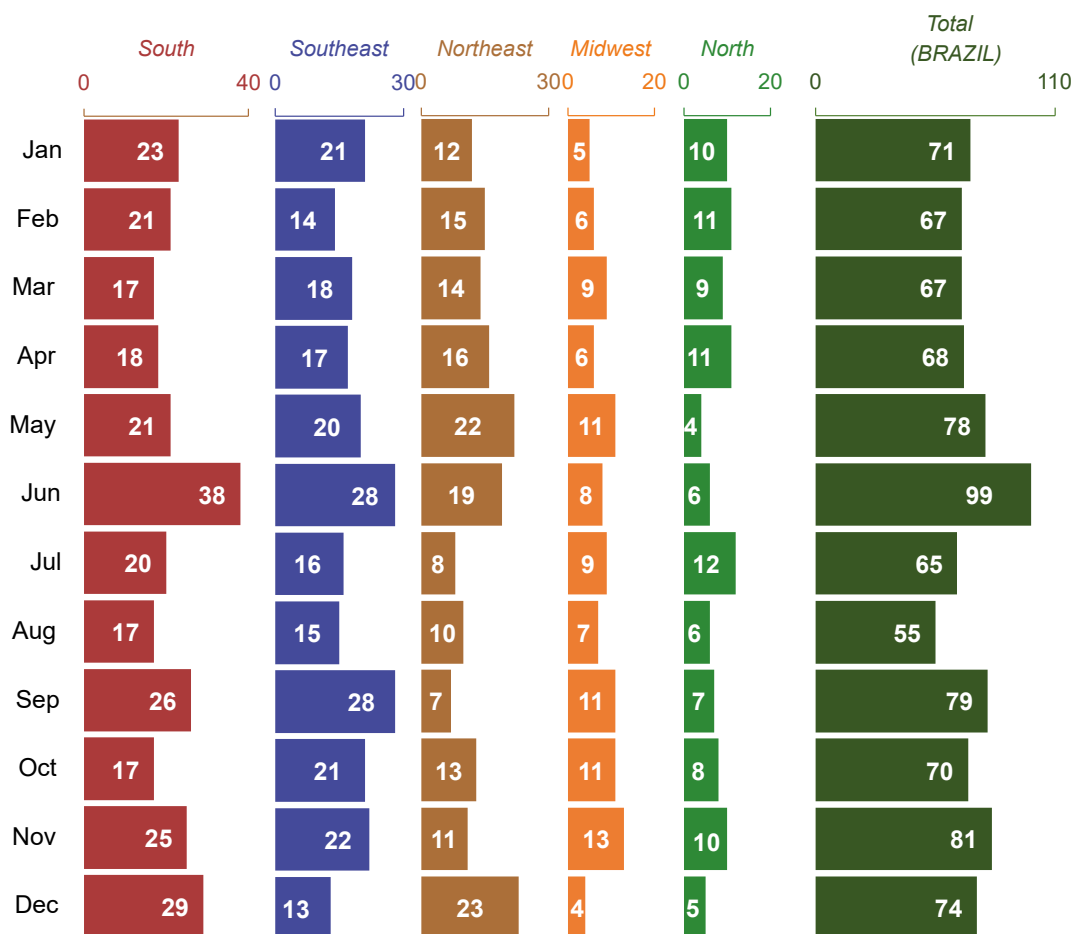


Chart 25 presents the 55 deaths caused by fires of electrical origin in 2022. It can be seen that young children (between 0 and 5 years old) and older people (over 60 years old) were the primary victims. After the analysis of the news reports it was observed that this occurred predominantly due to two factors: *i)* children do not have the decision power to leave the place of the fire, and in several cases they do not have control of mobility, *ii)* and the elderly have difficulties in locomotion.

It is necessary to point out that in cases of fires of electrical origin, the victims die from several factors, such as *i)* heat and burns, *ii)* intoxication, and *iii)* panic attacks.

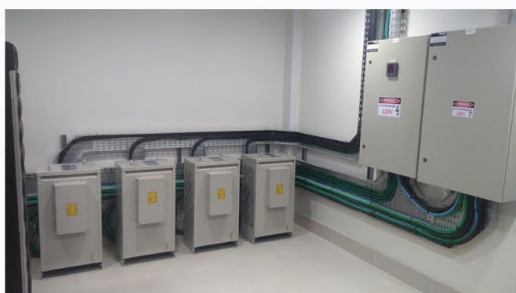
D. Occurrences of fires of electrical origin by region and month 2022

Chart 27 Fires of electrical origin by region and month 2022



Total fires: 874

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A CSE possui os Sistemas IT-Médicos mais tecnológicos do Brasil garantindo prevenção contra choques elétricos nos pacientes e incêndios nos ambientes críticos de ambientes de saúde em acordo com a NBR13534 e a RDC50 ANVISA.

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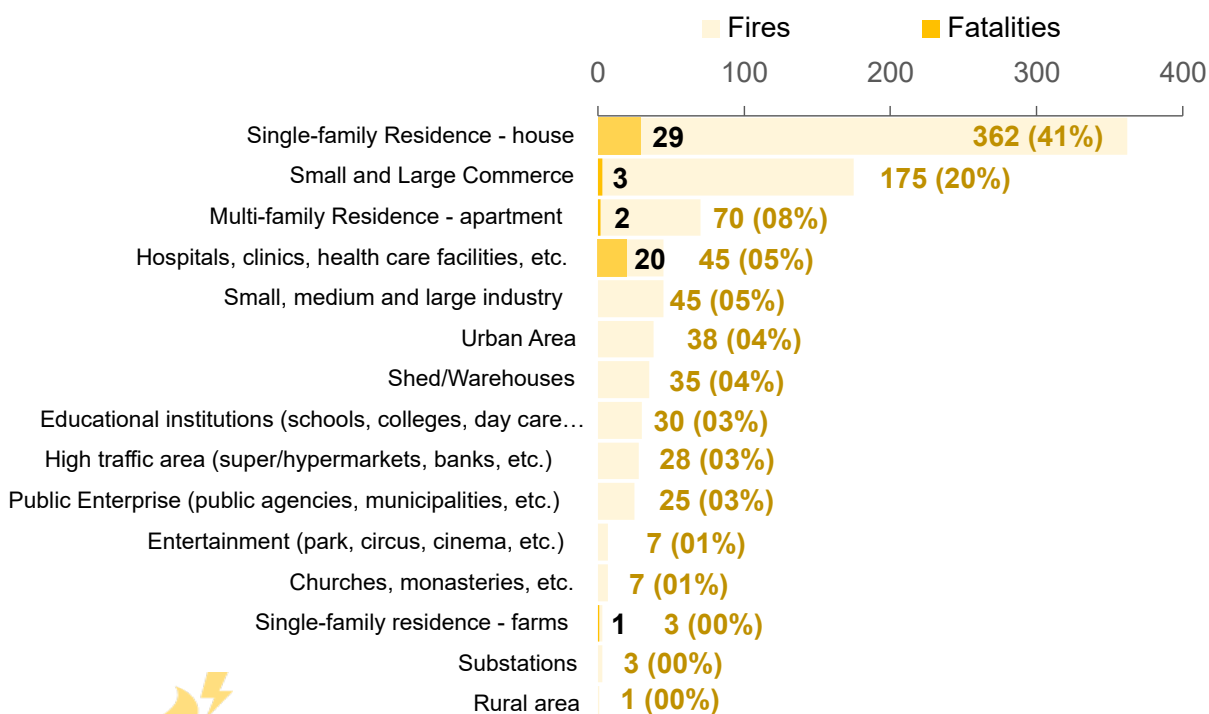
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In Chart 27, it is possible to observe the distribution of fires of electrical origin that occurred in Brazil, divided by the five regions of the country, and the total, in 2022, month by month. According to Chart 27, in the drier months (from July to September), the records show slightly higher accident values when compared to the rainy months. This occurs mainly because most of the fires of electrical origin recorded in the news occurred in the circuits of the air conditioners. The dry period is also the hottest period of the year in the Midwest, Northeast, and North regions of Brazil (tropical zone). Thus, in the drier periods, the demand for electrical energy required by the air conditioners is higher.

The Analyzes of the database containing information on accidents of electrical origin, it was observed that fans and air conditioners alone were responsible for approximately 11% of fires in 2022. The electrical circuits that feed the air conditioners is responsible for another 20%, thus representing the significant portion of this occurrence. Given the phenomenon of global warming, the demand for air conditioners tends to grow, which turns on the warning sign for Abracopel.

E. Fires of electrical origin by place of occurrence 2022

Chart 28 Fires of electrical origin by place of occurrence 2022



Total fatalities: 55

Total fires: 874

As shown in Chart 28, most fires occurred in residential environments (more than 50%), originating in various parts of the facility. Still, also a large number of accidents in hospitals (45) and in shops (172) draws our attention. In recent years, a lot has been demanded of hospitals, and therefore special attention is required of healthcare facilities. Every energization of equipment should require an evaluation of the electrical installation to confirm if it can hold them and if not, reform should be immediately initiated for adequacy. The absence of this evaluation practice should be protected by fuses and/or circuit breakers when the capacity of the conductors is exceeded.

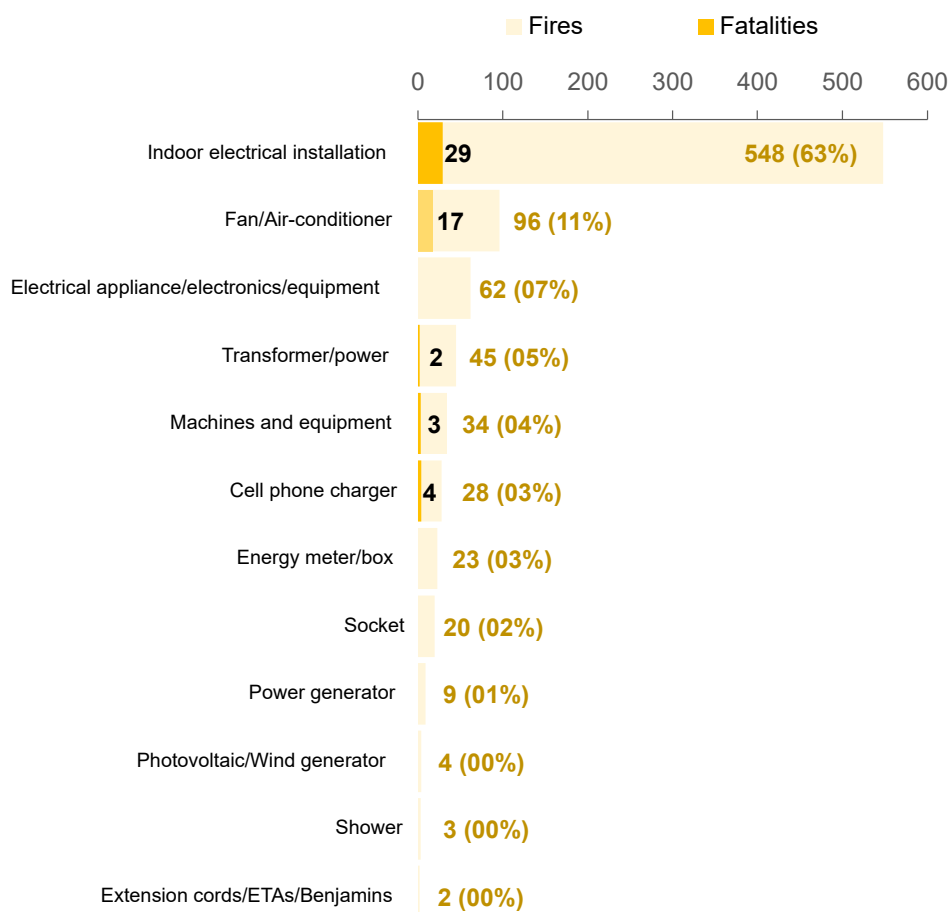
In this scenario, we also include the use of poor quality products, especially the conductors, which we have seen, have been “cheated” in the construction, reducing the current conduction area (copper), leaving the installation highly vulnerable.

Overcurrent protection devices (Circuit Breakers and Fuses) must be coordinated with the electrical conductors (wires) so that the electrical installation is turned off when the capacity of the conductors is exceeded. This act preserves the integrity of the conductors and ensures that they do not become hot enough to start a fire.



F. Fires of electrical origin by equipment 2022

Chart 29 Fires of electrical origin by equipment 2022



Total fatalities: 55

Total fires: 874

From Chart 29 that most fires happen in internal electrical installations when the protection devices (fuses and/or circuit breakers) do not work properly. This situation is typical when there is a bad installation dimensioning, not considering the coordination between the conductors and the devices. In this situation, the heating of the conductors can cause the combustion of materials near the installations or connections. And when it finds a spreading environment, such as a curtain, carpet, or another flammable atmosphere, it evolves into a fire.



It is also observed that electrical appliances, electronics, and especially fans and air conditioners, also have internal faults that can cause a fire. In the cases of internal occurrences in the equipment, it is observed that they can occur regardless of the quality of the electrical installations. For this reason, inspecting the equipment and respecting its life cycle is essential for the health of the electrical installation.

SECTION 4

LIGHTNING



In this section, we bring the numbers of accidents generated from lightning strikes, in the same way as electric shocks and fires, with an overview of age groups and occupations, among others, divided by regions, states and classified month by month. The occurrences of 2022 will be presented, and an evaluation of the variations in the last five years (2018-2022).

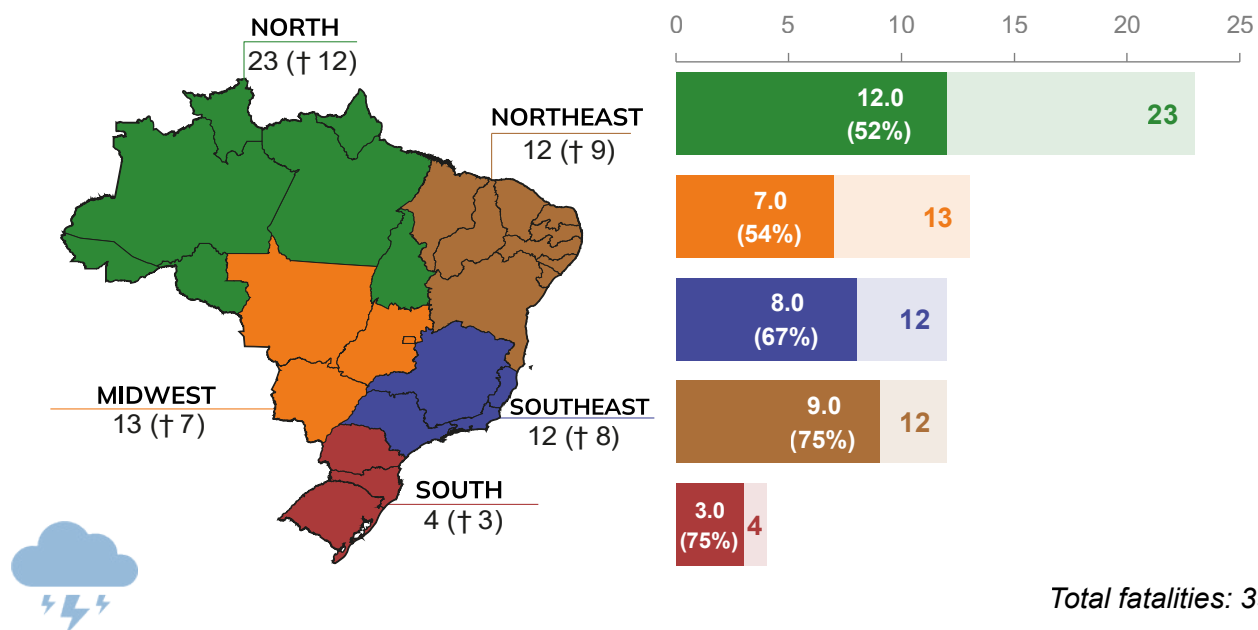
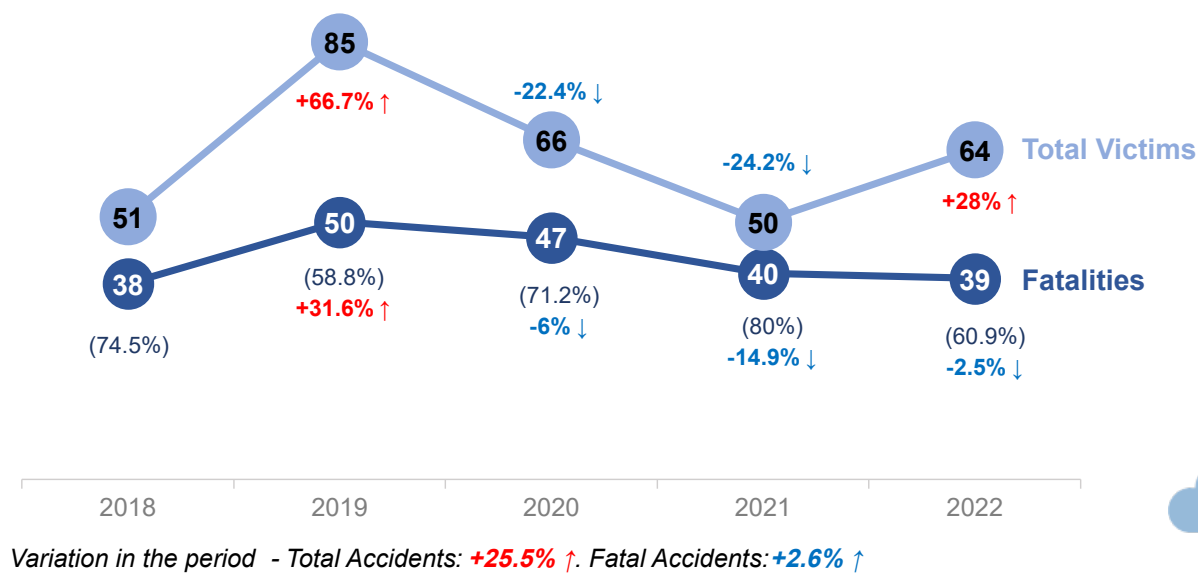


Chart 30 presents the number of accidents and deaths caused by lightning strikes in 2022, stratified by regions in Brazil.

Chart 31 Accidents with Lightning – 5 year comparative (2018-2022)



Lightning is one of the leading causes of weather-related mortality around the world. In the United States, lightning typically kills more people in a year than any other natural disaster except floods. Chart 31 shows that accident records involving lightning strikes increased by 25.5% in Brazil in the analyzed period (2018-2022).

In the case of Brazil, the annual number of lightning strikes is considered high, and this fact can be explained by the high density of lightning strikes to the ground (Ng) in large part of the Brazilian territory and by a significant percentage of the population involved in rural activities (approximately 35%).

It is also observed that deaths from lightning discharges are not always easy to identify, especially in cases that occur inside buildings and may be reported by the press in the news as conventional electric shocks or even cardiac arrest. For these reasons, the hypothesis is that the number of deaths from lightning in Brazil is significantly greater than the quantity cataloged in this research by the news.

37 accidents with lightning involved property loss without injuring people, totaling 101 records. However, in this section, only accidents with victims were addressed, whether fatal or not.

A. Accidents with lightning X Region 2022

Chart 32 Accidents by Lightning – North Region 2022

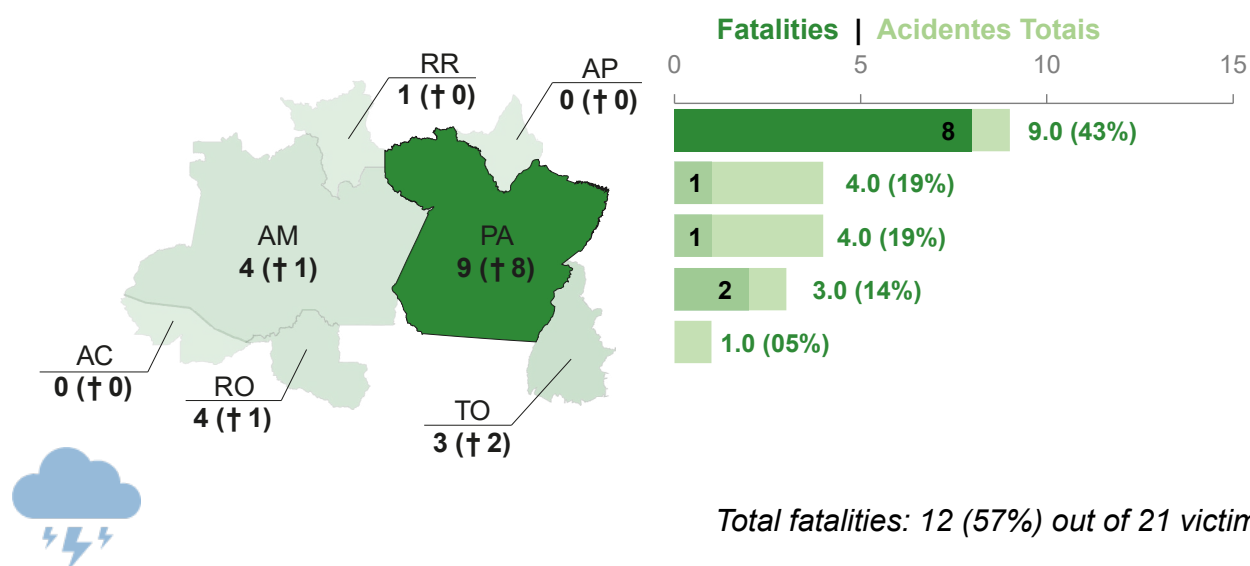
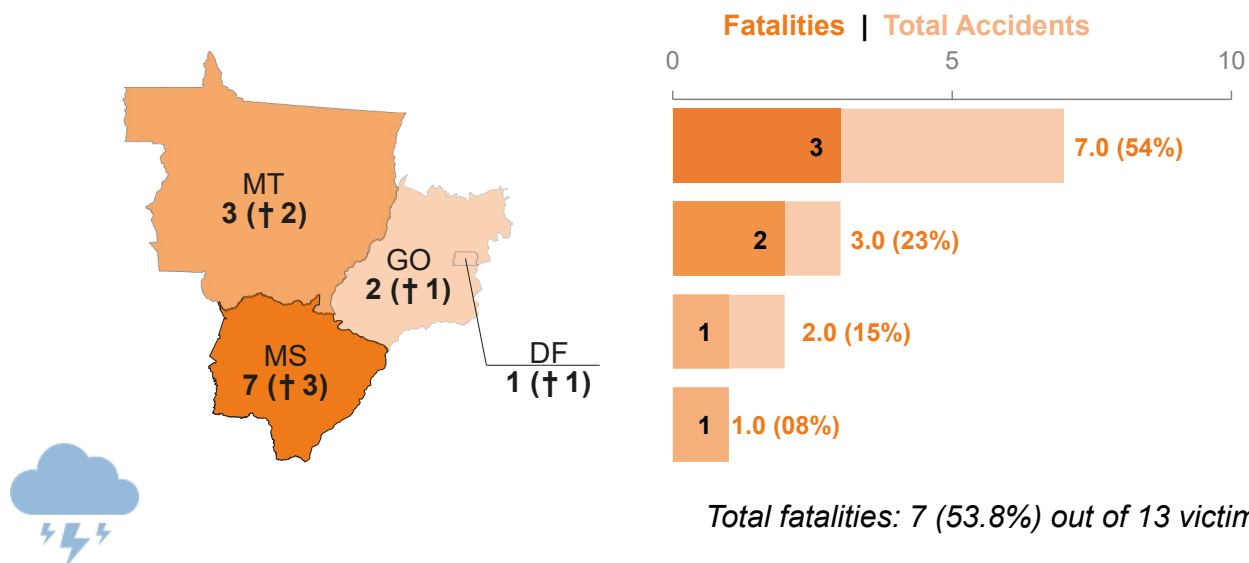


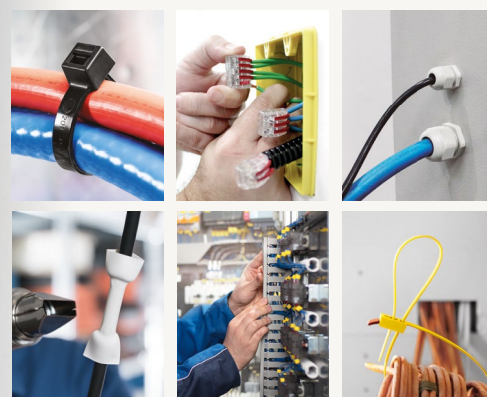
Chart 33 Accidents by Lightning – Midwest Region 2022



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Chart 34 Accidents by Lightning – Southeast Region 2022

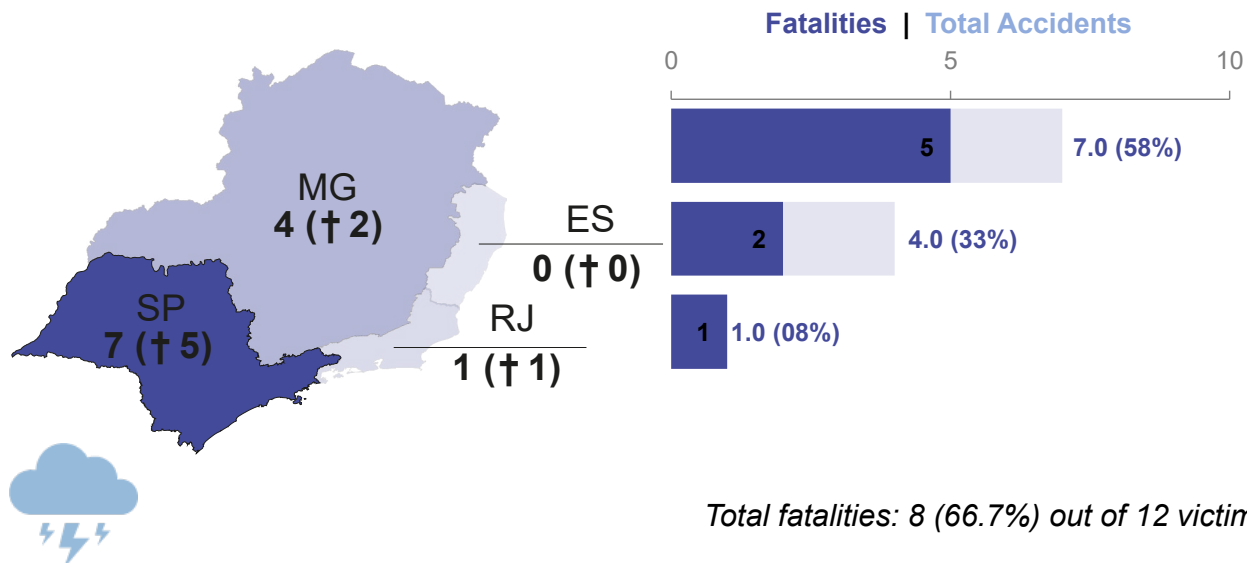


Chart 35 Accidents by Lightning – Northeast Region 2022

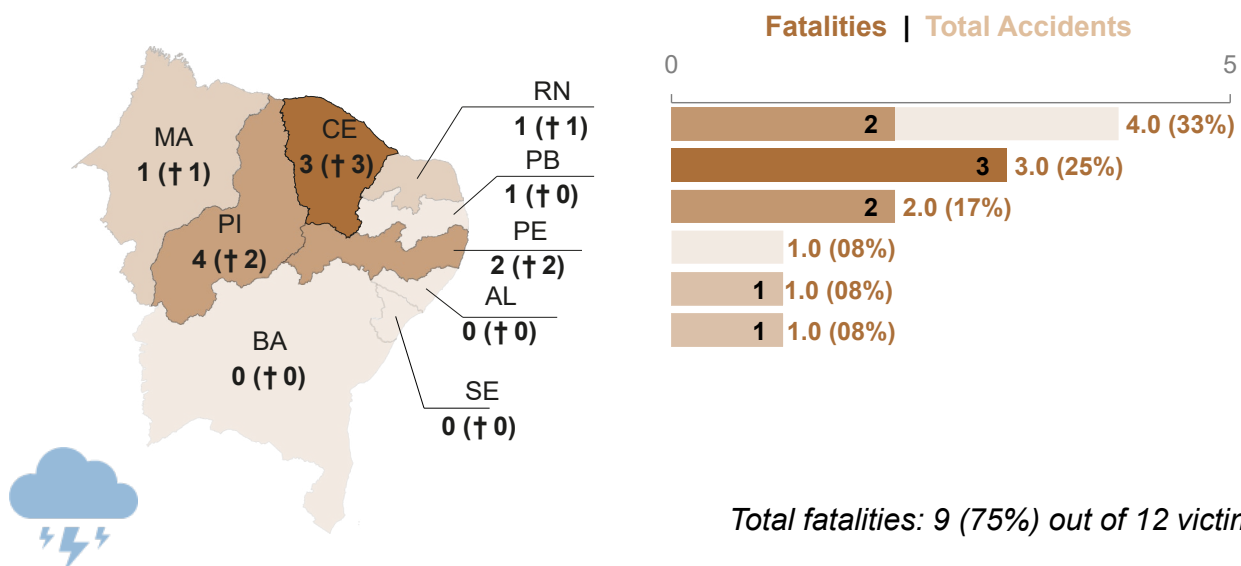
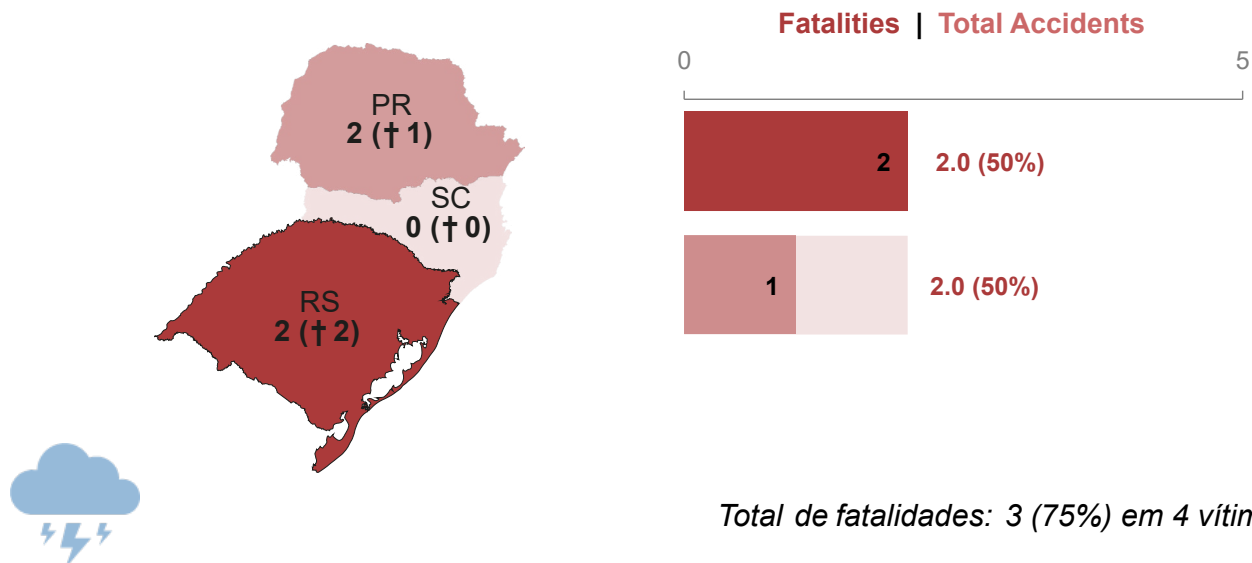


Chart 36 Accidents by Lightning – South Region 2022



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In the case of the Northern region of the country, where a high concentration of fatalities occurred, as can be seen in Chart 32, characterized mainly by three reasons.

- i. high rates of rainfall in the region (a large part is located in the Amazon rainforest);
- ii. by the distribution of rural activities; and
- iii. by the high number of rural communities in buildings without proper protection.

The ignorance of the types of actions to be taken during storms by the population in general (for example, taking shelter under trees or continuing with activities, whether these are leisure activities, such as playing soccer or fishing, or service activities, such as rural activities) contribute to this number of deaths by lightning strikes. In this sense, it is imperative to make the population more aware of the dangers of lightning strikes through news in the media, specific teachings in schools, and more active action of the government in this regard.

B. Accidents with Lightning by age group and gender 2022

Chart 37 Accidents by lightning strikes by age group and gender 2022

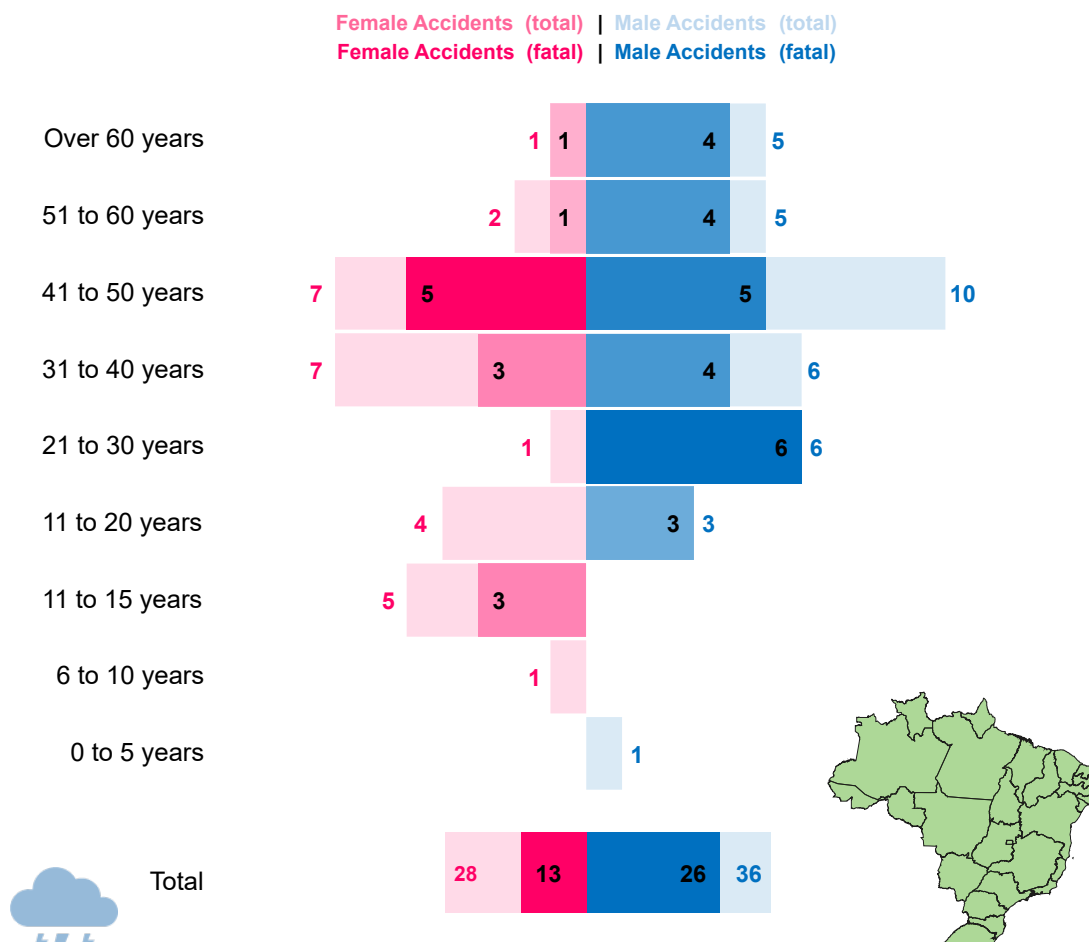
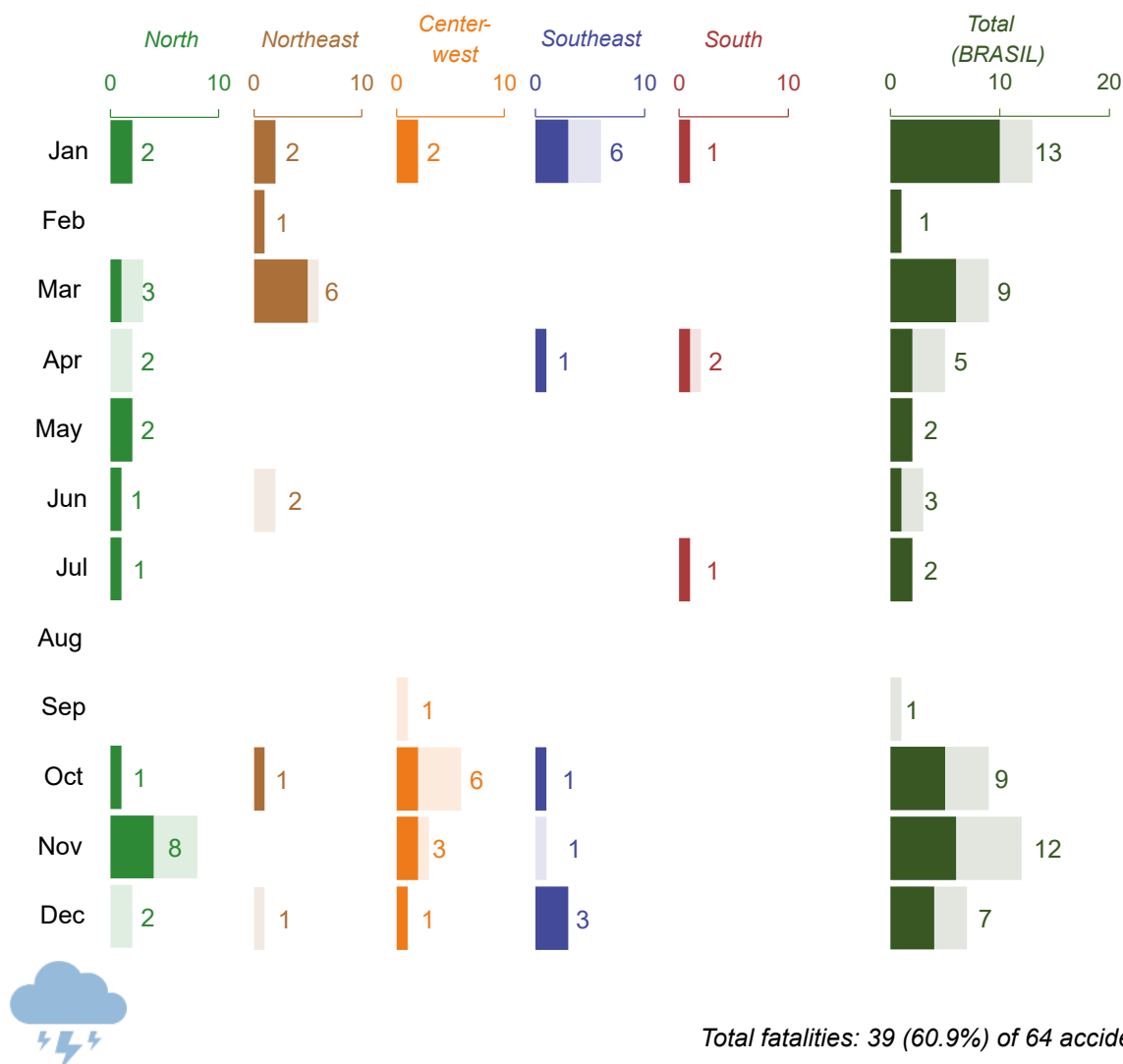




Chart 37 presents the distribution of deaths caused by lightning separated by age and gender. It is possible to observe that the death casualties are predominantly male, representing more than 80% of the fatalities. This is generally due to the role played by men in activities carried out in open areas, as in the case of farms and activities in the streets and avenues. It is also possible to observe that most of the deaths, 60%, are located between the most socially productive ages (20 and 59).

C. Accidents with Lightning by region and month 2022

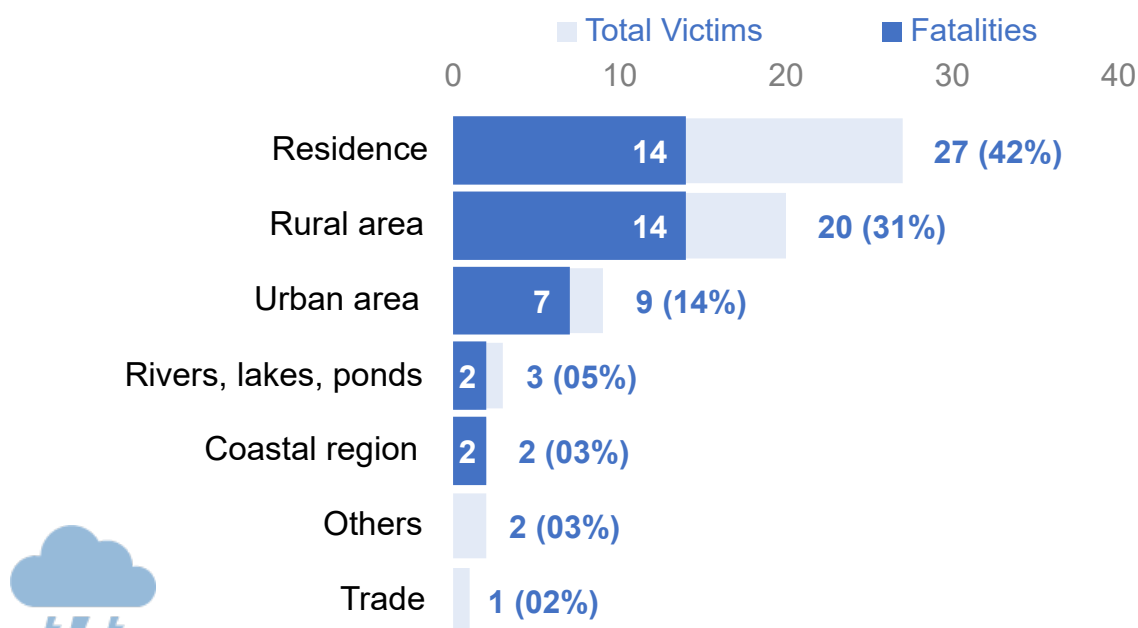
Chart 38 Accidents by lightning strikes by month and region 2022



The deaths by lightning strikes are strongly linked to the rainfall regime of the area. In Chart 38, it can be seen that the majority, approximately 50% of the fatalities, occurred in the summer (December to March). The curve represents a valley in the Brazilian winter, where rainfall is rarer (June to September).

D. Accidents with Lightning and place of occurrence (2022)

Chart 39 Accidents by lightning strikes by place of occurrence 2022



Total fatalities: 39 (60.9%) of 64 accidents

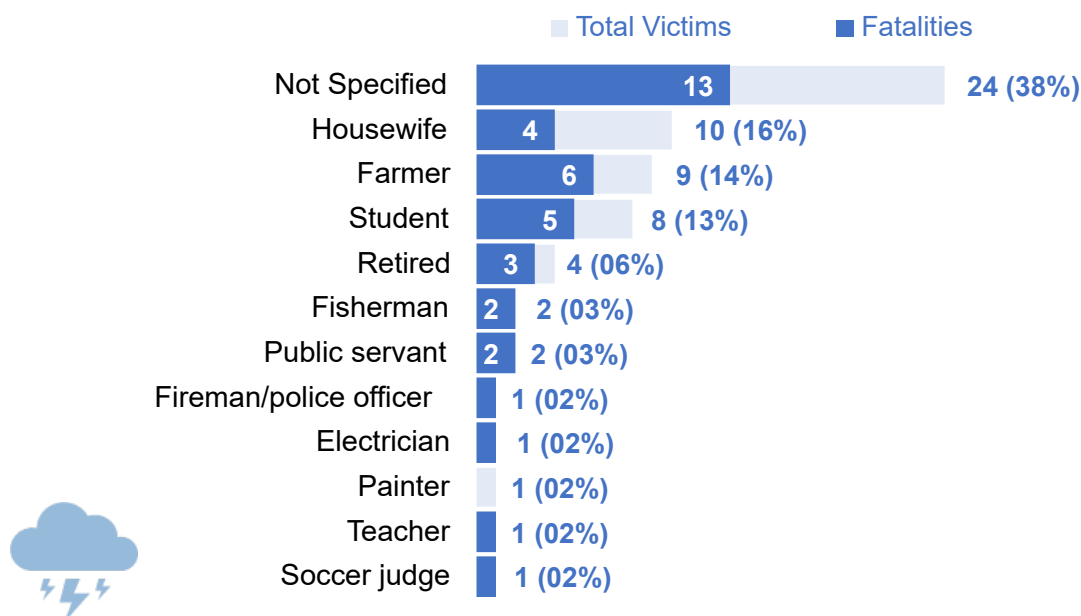
In Chart 39, it can be seen that, unfortunately, most accidents occurred in residences: 42.2%. The rural areas also registered many fatal lightning victims because they are large open territorial extensions and with agricultural cultivation, such as soy and corn. People and agricultural tractors end up being natural captors.

Many deaths have also occurred inside homes, where people should be safe. These deaths have mainly been caused by electrical lines that enter the structure, allowing the path of the electrical current into internal parts of the buildings, such as power lines, communication lines, gas, and water pipes, etc.

The most common circumstances of deaths by lightning, recorded inside homes, were: standing next to a wired phone or cell phone connected to the charger; near refrigerators, windows, and metal frames; and televisions and antennas. Small residences, made of wood or only masonry, when struck by lightning, can suffer significant damage, including fires and deaths of the occupants.

E. Accidents with Lightning and victim's occupation (2022)

Chart 40 Accidents by lightning strikes and victim's occupation 2022



Total fatalities: 39 (60.9%) of 64 accidents

In the streets, people are not protected in case of lightning strikes, even in big cities, where many buildings are nearby. About 14% of all accidents occurred in the street. Besides the possibility of direct discharges, touch voltages, step voltages, and potential transfers occur. In addition to the 64 accidents with injuries or deaths that occurred in 2022, Abracopel also recorded another 37 accidents of property loss due to lightning.

Deaths from lightning discharges are usually seen as fatalities, not work-related accidents. But, as seen in Chart 39, in 14.1% of the cases, the deaths occur while the individuals perform work activities. This brings to this discussion the possibility that this type of death is considered a work accident.



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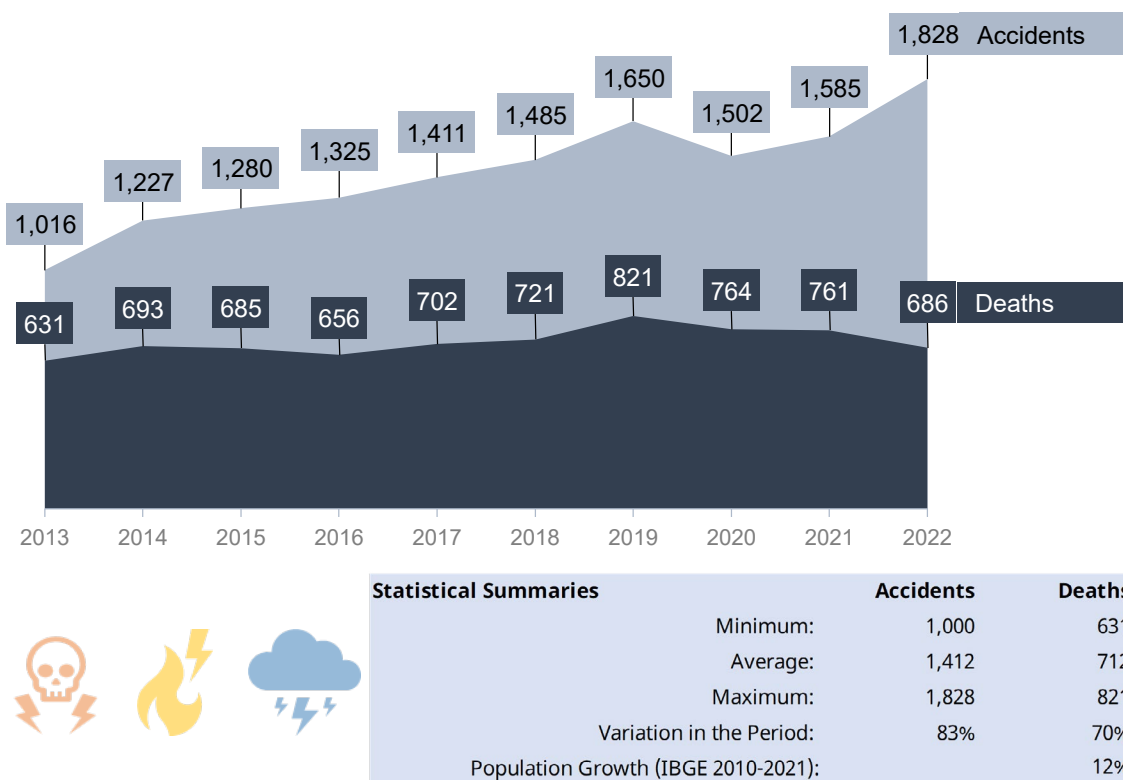
SECTION 5

HISTORICAL SERIES 10 YEARS - COMPARATIVE DATA

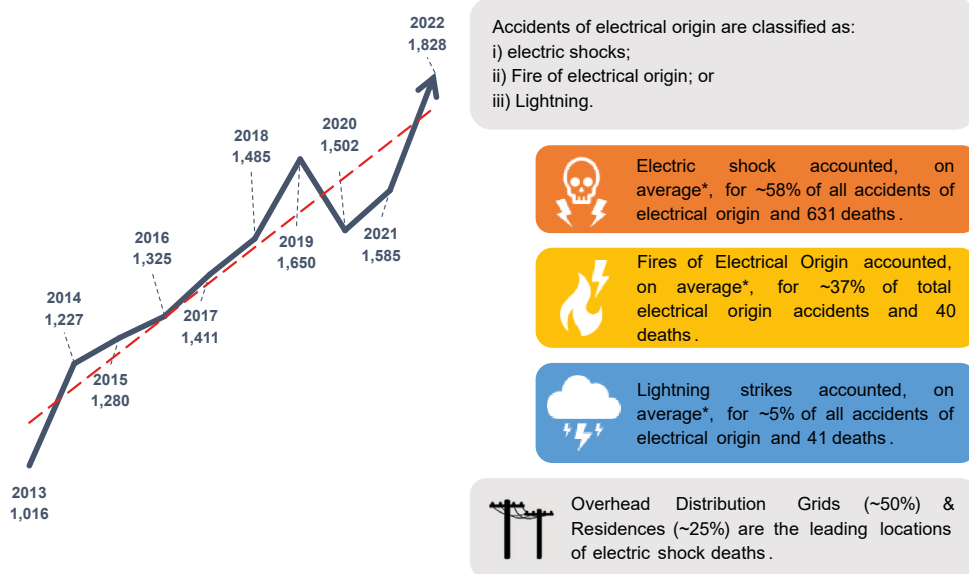


In this section, we have cut an analysis of the accumulated annual data from 2013, which was the beginning of the historical series, to the year 2022, for comparison purposes. These 10 years of data result in unprecedented statistics about this type of accident in Brazil. The method allows, easily, to understand the evolution of accidents of electrical origin based on the data collected by Abracopel.

Chart 41 Total number of accidents of electrical origin – Historical series 2013-2022



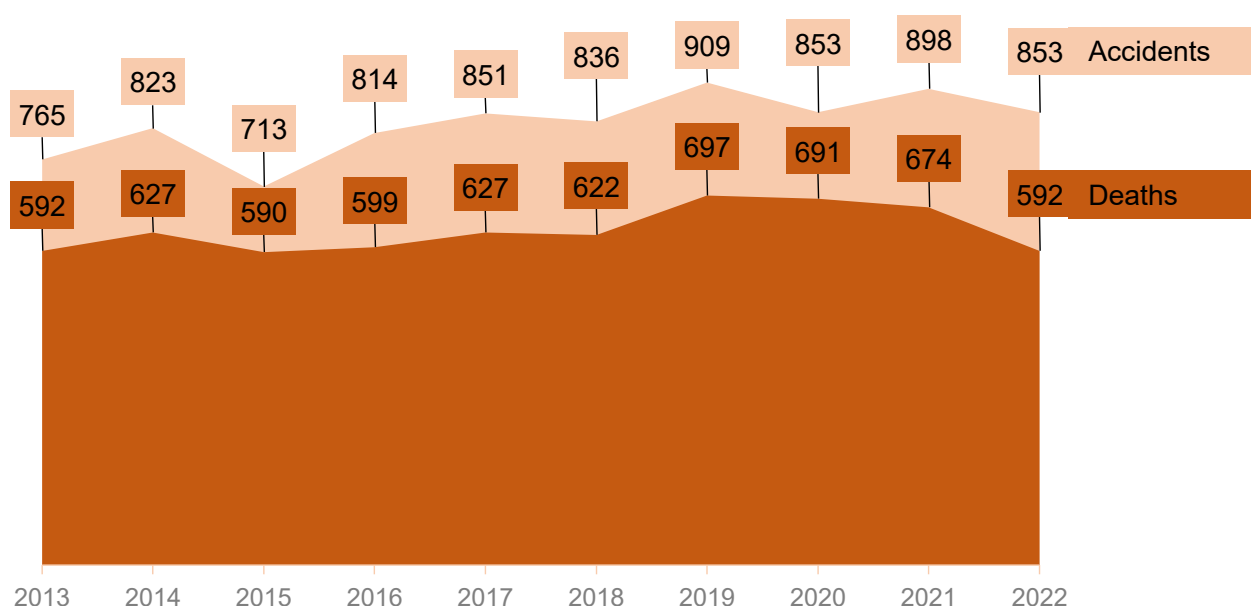
The number of accidents of electrical origin has been growing year by year, presenting an increase of approximately 82%. Despite a slight reduction in 2020, possibly due to the reduction of economic activities by the pandemic, and already resumed timidly in 2021.



The answer to this growth can be attributed to the greater dissemination of accidents, whether by traditional media or social networks, in which the Abracopel team can debug and catalog the data in a more straightforward way and, therefore, the data is not lost. This growth will bring the collected data closer to the real data of accidents that are not cataloged due to underreporting or lack of information regarding the nature of the accident. The fact is that the goal is to start reducing these numbers by inflecting the curve downward. In Chart 41, you can also see that in the last ten years, we have had 14,216 accidents, an average of 1,411.7 accidents per year. This figure represents about 3.87 accidents with electricity per day.

A. Electric Shock – Historical series (2013 – 2022)

Chart 42 Electric shock: general data (fatal and non-fatal) – Historical series 2013-2022

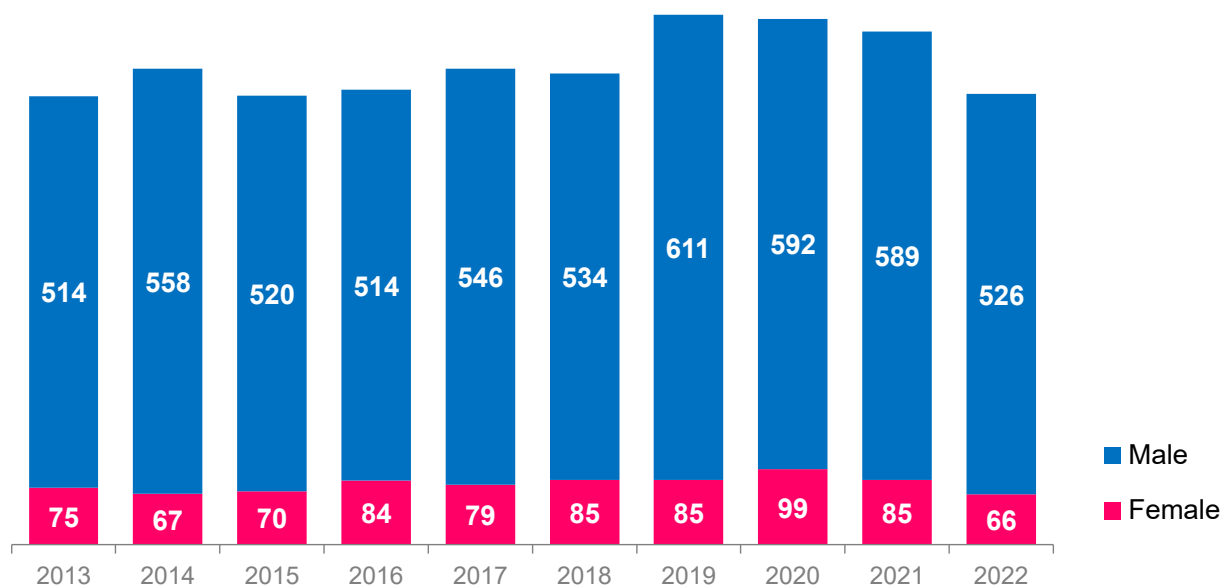


Statistical Summaries	Accidents	Deaths
Minimum:	713	590
Average:	832	631
Maximum:	909	697
Variation in the Period:	12%	0.3%
Population Growth (IBGE 2010-2021):	12%	



A slight reduction in accidents and the number of deaths from electric shock in the year 2022 can be seen in Chart 42. This can be considered positive news since the number of accidents in general rose in relation to the previous year (2021). Still, this data is not a reason to celebrate since the reduction was not very significant, and the number of accidents is still extremely high and, unfortunately, is growing. Similarly to the previous chart, it is possible to identify that 6,311 lives were lost due to electric shock, resulting in an average of 631.3 lives per year, representing about 1.73 fatal electric shock accidents per day.

Chart 43 Deaths by electric shock by gender – Historical series 2013-2022



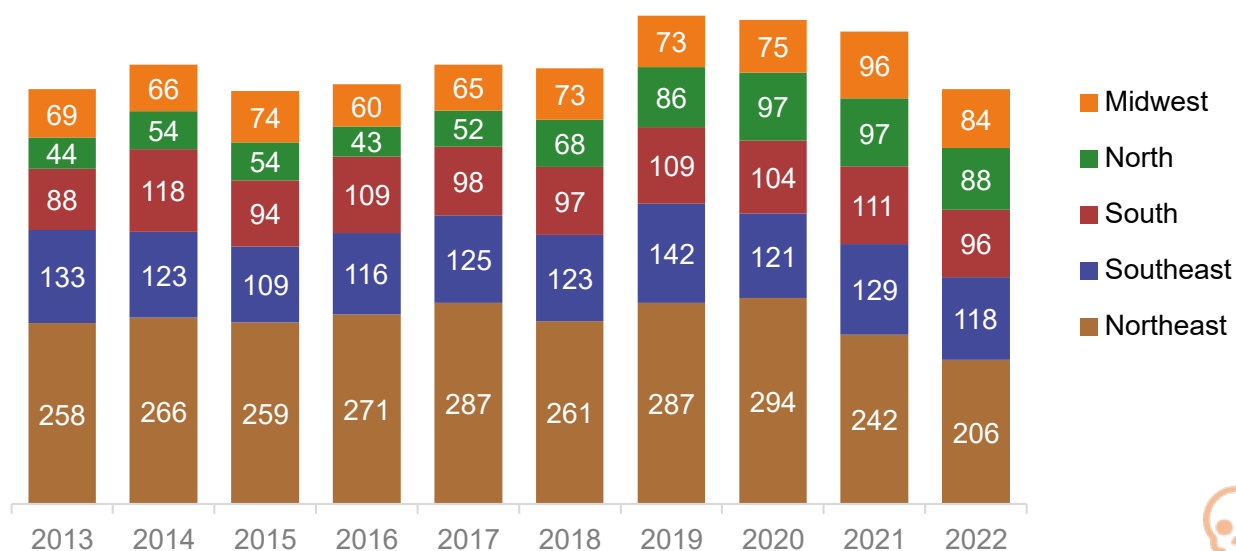
Statistical Abstract:

Female		Male	
Minimum:	66	Minimum:	514
Average:	80	Average:	550
Maximum:	99	Maximum:	611
Variation in the Period:	-12%	Variation in the Period:	2%
Population Growth (IBGE Estimated):		12%	



It can be seen that, on average, 87% of deaths from electric shock are of males and only 13% for females. This data occurs mainly because the workers who act directly and indirectly are male. As well as it is observed that in several cases, men, even without the proper training, try to solve cases involving electricity in which they are not effectively prepared. Women, on the other hand, are, in many cases, more cautious.



Chart 44 Deaths by electric shock by region – Historical series 2013-2022


The Northeast region has historically been the region with the most accidents involving electric shock in the ten years of the historical series, with 2,631 fatal accidents involving electric shock and an average of 263.1 accidents per year, representing about 45% of the accidents of this nature in Brazil.

Table 1 Deaths by electric shock by age group and North Region – Historical series 2013-2022

North	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0 to 5 years	2	5	2	0	0	1	1	3	0	0
6 to 10 years	1	1	0	1	2	2	4	1	1	4
11 to 15 years	5	1	3	3	1	2	4	10	1	1
16 to 20 years	3	1	1	2	3	5	6	5	5	7
21 to 30 years	10	15	14	4	12	19	12	20	13	17
31 to 40 years	13	15	14	15	17	19	27	29	38	23
41 to 50 years	7	8	14	9	8	14	20	15	20	20
Above 50 years	3	8	6	9	9	6	12	14	19	16
Total	44	54	54	43	52	68	86	97	97	88

Table 2 Deaths by electric shock by age group and Northeast Region – Historical series 2013-2022

Northeast	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0 to 5 years	18	10	20	9	21	13	17	8	16	7
6 to 10 years	10	8	9	11	9	8	6	9	5	5
11 to 15 years	22	18	19	20	18	20	14	12	15	18
16 to 20 years	13	18	17	16	14	18	21	22	17	17
21 to 30 years	67	65	51	50	60	55	54	62	38	30
31 to 40 years	66	61	52	65	80	57	83	80	66	49
41 to 50 years	30	43	53	46	47	49	50	47	42	42
Above 50 years	32	43	38	54	38	41	43	54	43	38
Total	258	266	259	271	287	261	288	294	242	206

Table 3 Deaths by electric shock by age group and Midwest Region – Historical series 2013-2022

Midwest	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0 to 5 years	1	0	5	3	2	3	3	1	2	5
6 to 10 years	1	0	0	1	1	0	3	1	1	1
11 to 15 years	2	2	4	2	3	3	1	1	5	2
16 to 20 years	5	2	7	4	3	6	3	2	5	3
21 to 30 years	20	14	16	15	5	15	16	16	17	19
31 to 40 years	17	23	16	17	22	15	17	24	33	23
41 to 50 years	9	14	12	8	15	12	22	9	18	15
Above 50 years	14	11	14	10	14	19	8	21	15	16
Total	69	66	74	60	65	73	73	75	96	84



Table 4 Deaths by electric shock by age group and Southeast Region – Historical series 2013-2022

Southeast	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0 to 5 years	3	3	3	2	3	2	0	1	2	1
6 to 10 years	3	5	3	4	4	3	3	3	1	1
11 to 15 years	8	8	3	4	8	6	5	7	2	4
16 to 20 years	13	7	2	7	10	4	9	9	5	5
21 to 30 years	40	38	22	18	23	27	23	25	26	21
31 to 40 years	32	36	38	39	43	42	44	34	43	31
41 to 50 years	22	11	26	24	20	16	31	21	26	31
Above 50 years	12	15	12	18	14	23	27	21	24	24
Total	133	123	109	116	125	123	142	121	129	118

Table 5 Deaths by electric shock by age group and e South Region – Historical series 2013-2022

South	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0 to 5 years	0	2	2	1	1	1	4	2	5	0
6 to 10 years	6	0	0	2	1	1	1	3	0	2
11 to 15 years	0	6	2	4	1	6	1	4	5	4
16 to 20 years	10	10	5	9	10	4	6	3	3	3
21 to 30 years	34	27	26	27	22	28	25	19	22	19
31 to 40 years	17	31	21	30	30	27	25	32	30	34
41 to 50 years	12	22	15	18	16	15	24	26	20	19
Above 50 years	9	20	23	18	17	15	23	15	25	15
Total	88	118	94	109	98	97	109	104	110	96



Table 6 Deaths by electric shock by Activity – Historical series 2013-2022

 Activity	Year								
	2014	2015	2016	2017	2018	2019	2020	2021	2022
Water Pump / Well / Suction	34	64	60	56	49	51	66	57	36
Bucket / Winch	7	11	14	15	18	26	18	20	23
Metal power box	10	11	8	0	5	10	4	4	6
Cell phone charger	0	0	0	2	23	17	19	16	7
Electric fence	20	35	38	26	28	36	31	25	18
Fruit picker	3	0	10	11	8	6	6	12	5
Lawn mower/washer	6	13	16	11	6	15	9	12	14
Flat iron/dryer/baby-liss	0	0	2	3	2	1	0	4	0
Electric appliance/electronic appliance	15	23	35	28	30	52	49	37	37
Extension cord/plugs/outlets etc.	89	37	30	28	23	25	20	33	24
Hardware in works (touch the grid)	49	41	40	11	21	19	29	30	23
Broken or uninsulated wire (internal)	44	85	84	98	90	85	69	52	42
The broken wire from the aerial distribution network	57	40	47	43	55	67	61	54	49
Improvised "workarounds"	13	12	7	3	7	6	11	24	8
Energized poles/grids	90	23	30	25	21	38	33	18	22
Farm equipment (touch the grid)	4	3	4	5	5	9	6	10	4
Home maintenance (roof, lamp, shower, etc.)	2	2	1	6	7	11	20	20	19
Leaky machinery	26	35	57	68	48	57	71	63	56
Painting (touch the grid)	21	13	14	13	23	26	12	17	20
Tree pruning	4	8	7	11	10	9	12	10	8
Aerial Network (tapping)	96	100	54	112	103	88	103	109	96
Kite rescue	6	6	4	7	6	3	9	3	3
Cable theft/theft	15	6	21	31	25	29	21	34	51
Powered clothesline/door	7	12	10	6	7	4	2	4	3
Other	9	10	6	8	2	7	10	6	18
TOTAL	627	590	599	627	622	697	691	674	592



Table 7 Deaths by electric shock by month – Historical series 2013-2022

 MÊS	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
January	44	66	71	70	46	65	69	86	72	62
February	54	70	63	60	78	79	69	65	69	59
March	65	58	52	56	57	62	59	60	53	67
April	51	55	45	61	62	58	72	54	56	64
May	55	41	50	32	50	40	52	41	61	39
June	55	64	39	42	50	44	53	46	48	31
July	48	32	44	40	41	38	47	43	44	51
August	28	29	29	36	49	31	35	39	44	29
September	33	33	45	39	35	32	53	56	74	43
October	36	62	44	50	59	42	55	51	65	47
November	45	64	54	41	35	57	77	78	47	39
December	78	53	54	72	65	66	56	72	65	61
Total	592	627	590	599	627	614	697	691	698	592

Table 8 Deaths by electric shock by place of occurrence – Historical series 2013-2022

 Location	Year								
	2013	2014	2015	2016	2017	2018	2019	2020	2021
Rural area	75	81	55	69	50	61	48	48	22
Urban area/streets/streets/parks	66	112	36	20	49	59	61	25	9
Commerce (small/large)	44	79	39	37	47	33	45	38	33
Construction (internal)	0	0	12	14	16	11	31	21	14
Club/park/school	5	4	3	8	4	9	10	6	5
Church/convent/hospitals	0	0	2	8	5	0	6	2	1
Industry	22	12	19	14	12	16	27	24	35
Aerial Distribution Network	170	109	213	218	181	172	206	237	297
Substations/Transmission	6	3	9	0	0	7	4	3	11
Housing: houses, apartments, farms	198	214	163	173	218	209	228	203	190
Rivers, lakes, ponds/beach	3	2	17	26	24	28	24	33	38
Others	3	11	22	12	21	9	7	51	43
Total	592	627	590	599	627	614	697	691	698

Historically, the main types of accidents with electrical shock are concentrated in residential environments and in the overhead power distribution network. The two places represent more than 65% of all accidents; therefore, the need to create public policies to make people aware of their risks is evident.

Energy distributors carry out various actions, some of them in partnership with Abracopel, precisely to take information about the risk that electricity can cause in their energy networks. Still, when the subject is the residence, only Abracopel carries out actions that seek to take this information.

We warn that the construction, revision, or maintenance of an electrical installation must always be carried out by qualified professionals who are up-to-date concerning both technology and standards.



Table 9 Deaths by electrical shock on the overhead distribution network by occupation (selected) – Historical series 2013-2022

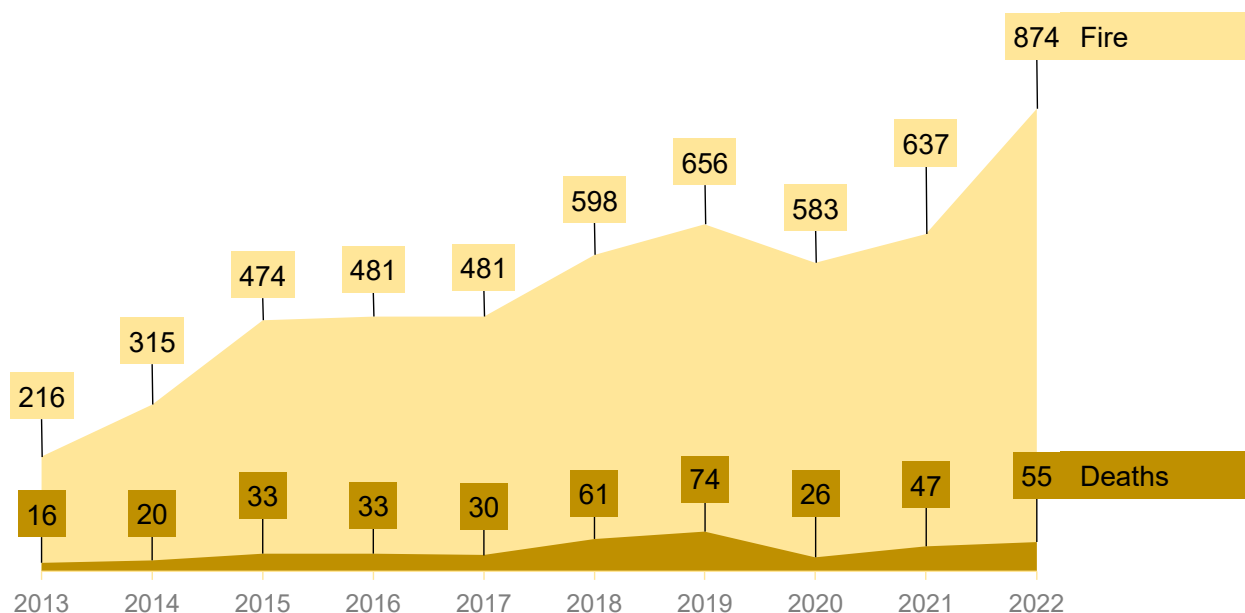
 Profession (selected)	Year								
	2013	2014	2015	2016	2017	2018	2019	2020	2021
Not specified	77	35	43	47	68	22	43	59	93
Retired or pensioner	0	0	11	10	11	9	5	6	5
Welder, locksmith, glazier, carpenter	0	0	3	4	3	0	1	0	4
Driver (categories D or E)	0	2	22	16	10	15	14	14	18
Curious or criminal	0	9	12	21	16	9	2	10	15
Rural producer	0	0	12	11	15	30	25	18	12
Painter or helper	6	8	14	13	15	23	22	12	18
Bricklayer, laborer, or helper	26	23	42	36	48	29	10	34	29
Cable TV, telephone, signage, awning, or gutter installer	13	8	6	13	5	8	12	23	18
Tree pruner	0	0	1	2	3	3	4	1	3
Domestic worker (paid or unpaid)	3	1	2	8	2	1	2	4	6
Student	22	23	16	17	11	13	24	25	15
Professional electrician for a company	12	9	14	15	13	4	8	19	15
Self-employed electrician or technician	28	20	17	11	9	10	28	15	13

Table 10 Deaths by electrical shock by occupation (general) – Historical series 2013-2022

 Profession	Year								
	2013	2014	2015	2016	2017	2018	2019	2020	2021
Retired	34	25	39	40	33	50	44	26	22
Welder, locksmith, glazier, carpenter	0	15	9	21	10	7	6	9	11
Driver (categories D or E)	0	2	24	20	14	16	25	17	19
Curious or criminal	0	33	17	31	30	40	39	25	21
Farmer/Farmer	0	0	56	90	72	105	82	80	52
Painter or helper	10	23	16	31	18	24	25	14	18
Bricklayer or helper	55	60	58	71	67	37	40	58	38
Installer of cable TV, telephone signs, awnings, or gutters	20	20	17	39	10	13	18	31	24
Domestic Worker, Housewife	72	41	33	40	37	56	37	38	36
Student	117	79	76	93	76	118	74	91	59
Professional electrician, company	29	16	22	33	18	5	11	20	17
Self-employed electrician or technician	71	54	61	59	45	57	69	44	31
Worker/employee	0	0	4	4	7	21	16	34	52
Trader/Salesman	0	0	1	2	3	4	14	6	20
TOTAL	592	627	590	599	627	622	697	691	674

B. Fire – Historical series (2013-2022)

Chart 45 Fire: General data (fatal and non-fatal) for fires of electrical origin – Historical series 2013-2022



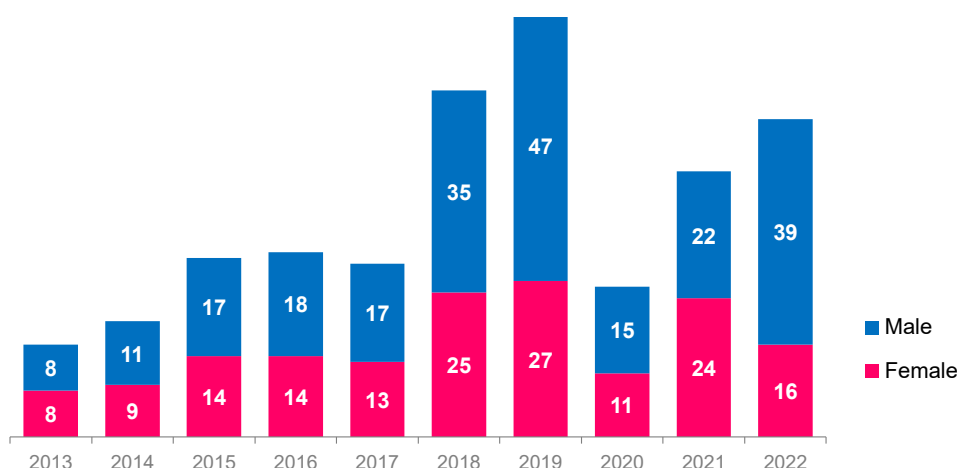
Statistical Summaries		Fires	Deaths
Minimum:		216	16
Average:		532	40
Maximum:		874	74
Variation in the Period:		305%	244%
Population Growth (IBGE 2010-2021):			12%



It is possible to observe that, different from the fatal accidents with electrical shock, the data from fires show an increasing tendency concerning previous years. Wrong or altered sizing of protection devices, and the use of poor-quality products and labor, resulted in this desolate scenario, knowing that most accidents happen in residential environments.

Unlike deaths from electric shock and lightning, in the case of fires of electrical origin, the number of male and female victims is closer, being slightly higher for males.

Chart 46 Deaths by the fire of electrical origin and gender – Historical series 2013-2022



Statistical Abstract:

Female		Male	
Minimum:	8	Minimum:	8
Average:	16	Average:	23
Maximum:	27	Maximum:	47
Variation in the Period:	100%	Variation in the Period:	388%
Population Growth (IBGE Estimated):		12%	



Chart 47 Deaths by fire of electrical origin by region – Historical series 2013-2022

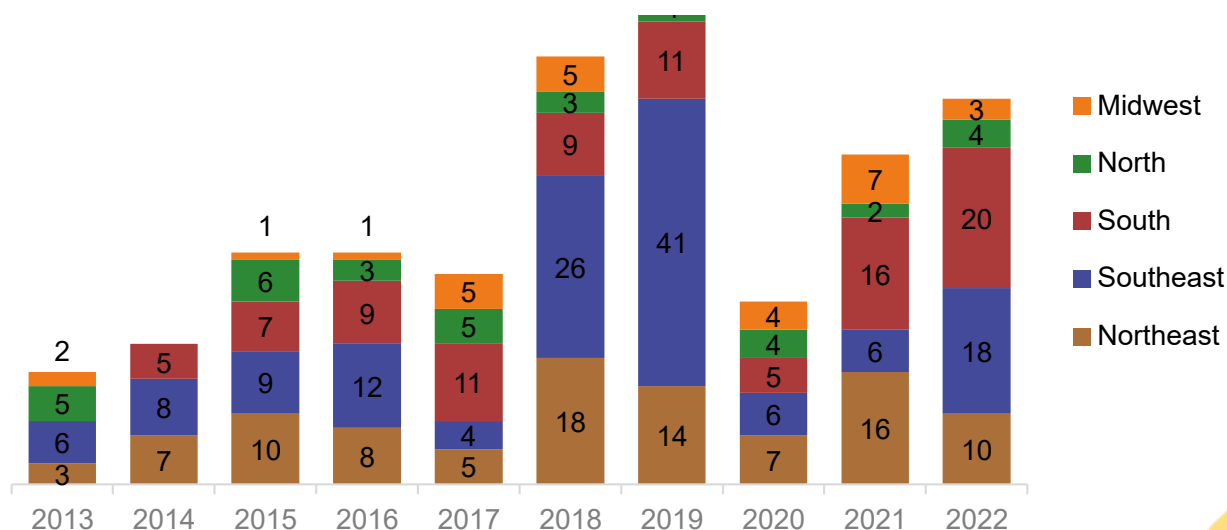




Table 11 Fires of electrical origin by location (selected) – Historical series 2013-2022

Local		Year									
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
House/Apartment/Plots/Farms	I ¹	77	136	199	212	215	252	320	312	343	435
	M ₂	14	20	31	30	21	58	29	23	40	32
Commerce (small and large)	I	75	104	149	104	135	130	178	132	138	175
	M	0	0	2	1	8	1	10	0	0	3
Public Enterprise	I	47	25	31	28	22	44	24	20	26	25
	M	0	0	0	1	0	1	0	1	1	0
Educational Institutions	I	11	14	23	28	18	29	41	12	17	30
	M	0	0	0	0	0	0	0	1	0	0
Hospitals/Clinics/Post Offices etc.	I	20	3	14	22	20	24	36	42	45	45
	M	0	0	0	0	1	0	23	0	6	20
Industries	I	8	9	13	21	22	46	27	48	39	45
	M	2	0	0	0	0	1	2	1	0	0
High circulation areas	I	8	3	8	12	15	8	18	15	12	28
	M	0	0	0	0	0	0	0	0	0	0
Others	I	4	4	4	21	4	4	12	0	17	91
	M	0	0	0	1	0	0	10	0	0	0
TOTAL	I	250	298	441	448	451	537	656	581	637	874
	M	16	20	33	33	30	61	74	26	47	55

¹ I: Fires. ² M: Deaths.

Table 12 Deaths in fires due to overload by age group – Historical series 2013-2022

AGE RATE	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
0 to 5 years	6	6	11	9	6	23	7	12	9	8
6 to 10 years	3	3	2	1	2	7	0	1	7	2
11 to 15 years	0	0	2	1	1	3	12	0	0	0
16 to 20 years	0	1	0	2	0	2	2	0	1	2
21 to 30 years	3	2	1	1	5	4	3	2	3	4
31 to 40 years	2	2	3	3	2	9	6	3	3	11
41 to 50 years	0	1	4	1	6	6	5	1	2	6
Above 50 years old	2	5	7	11	8	4	38	6	21	22
Unknown	0	0	3	4	1	3	1	1	1	0
TOTAL	16	20	33	33	31	61	74	26	47	55

Table 13 Accidents by fire of electrical origin by place of occurrence – Historical series 2013-2022

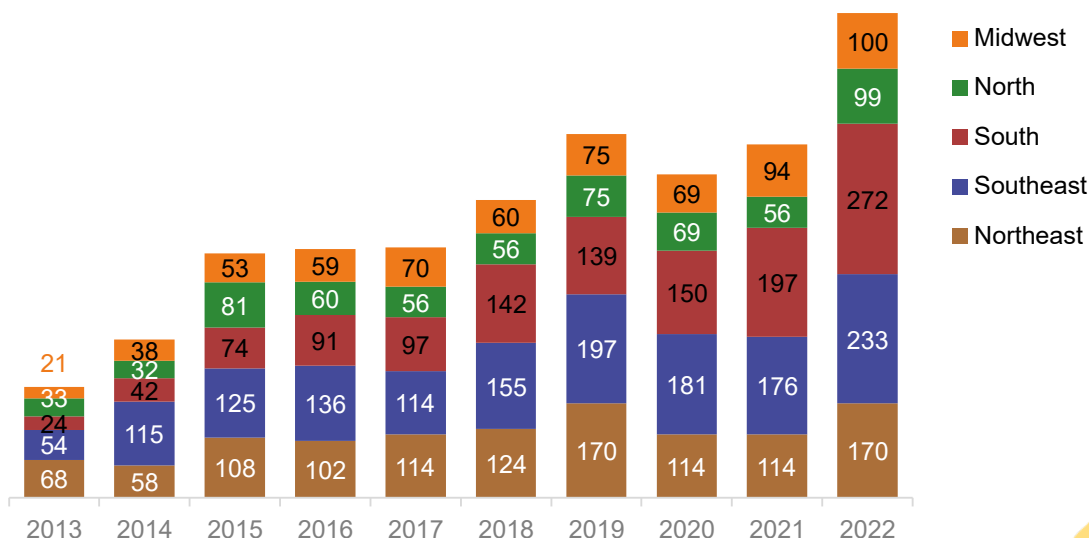
 Location		Year									
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
House, apartment, farm or ranch	I ¹	77	136	199	212	215	252	320	312	343	435
	M ²	14	20	31	30	21	58	29	23	40	32
Commercial area	I	75	104	149	104	135	130	178	132	138	175
	M	0	0	2	1	8	1	10	0	0	3
Public enterprise	I	47	25	31	28	22	44	24	20	26	25
	M	0	0	0	1	0	1	0	1	1	0
Educational Institutions	I	11	14	23	28	18	29	41	12	17	30
	M	0	0	0	0	0	0	0	1	0	0
Health care areas	I	20	3	14	22	20	24	36	42	45	45
	M	0	0	0	0	1	0	23	0	6	20
Industrial area	I	8	9	13	21	22	46	27	48	39	45
	M	2	0	0	0	0	1	2	1	0	0
High traffic areas	I	8	3	8	12	15	8	18	15	12	28
	M	0	0	0	0	0	0	0	0	0	0
Not specified	I	4	4	4	21	4	4	12	2	17	91
	M	0	0	0	1	0	0	10	0	0	0
Total	I	250	298	441	448	451	537	656	583	637	874
	M	16	20	33	33	30	61	74	26	47	55

¹ I: Fires. ² M: Deaths.



Accidents occur most often in residential settings, followed by commercial settings. But, historically, accidents in hospitals have been increasing in the last three years, reaching significant numbers (52) in 2022. The indiscriminate increase in equipment for the control of the pandemic without an adequate evaluation of the electrical installation may have been the reason for this increase. Still, the concern lies in the mistakes made in this adaptation without technical criteria.

Chart 48 Accidents by fire of electrical origin by region – Historical series 2013-2022



One of the big problems that cause fires of electrical origin is the low-quality products known as “unbitolized cables”. If the cable is not of quality, that is, unbitolized, besides not meeting the standards, it will not have the correct amount of copper and will cause heating and deterioration of the insulation. This can generate an increase in electric power consumption and a short circuit that can cause a fire.

Unfortunately, in Brazil, there are many substandard materials - unbitolized - with less copper than they should have, limiting their capacity to conduct energy. The wires and cables must be certified by the National Institute of Metrology, Quality, and Technology (Inmetro). However, some manufacturers disrespect the norms, even though they have the Inmetro seal and, on top of that, they produce unbitolated cables with lower costs because they use less copper than required and much more PVC, which ends up putting the consumer’s/user’s safety at risk.

Even with market surveillance and certifications, some companies continue to sell their poor quality products, risking the lives of all who use them.

Unfortunately, there is no guarantee that all products sold in the market, even with Inmetro certification, meet the standards.

Thus, one way to check the quality of low-voltage wires and cables is to find out if the manufacturer is listed on Qualifio’s list. Access the website through the link provided below:

<http://qualifio.org.br/>

SPECIAL SECTION

QUALIFIO

30 years monitoring the quality of electrical wires and cables in the market

Responsible for carrying electricity to thousands of Brazilian homes, the electrical installation must be considered as if it were a “vital organ” of a house.

In places such as stores, shopping malls, hospitals, and buildings, its importance is even greater since these are places where there is a large circulation of people.

In a country with such a vast territorial extension as Brazil, to inspect, inspecting, controlling, and monitoring the conditions of the wires and cables installed is a great challenge.

Even in the face of this enormity that is our country, 30 years ago QUALIFIO - Brazilian Association for the Quality of Electric Wires and Cables - accepted this challenge and has been tirelessly working to identify brands and manufacturers that operate illegitimately in the electric wires and cables market, selling products that can put the lives of many people at risk.

After 30 years of operation, we can affirm that if Qualifio didn't carry out this continuous monitoring work, indeed the reputable companies would have already left the low voltage electrical wiring and cable sector due to the lack of competitive equality in which irregular manufacturers bend the norms, hurting consumers who don't have adequate knowledge about the dangers of using irregular products.



Why is it necessary to monitor the quality of electrical wires and cables to avoid accidents with electricity?

The Brazilian Association for Awareness of the Dangers of Electricity (Abracopel) recorded 5122 fires of electrical origin, with 395 fatalities (8.2%) over 10 years (2013 to 2022), with a variation of 42.2% over the period. In other words, fires of electrical origin have followed an upward trend in recent years. Most fires happen in homes (49.7%) and . Some reasons are overheating of poorly sized electrical conductors and failures in the insulation of commercial and industrial buildings (31.5%). Some of the causes are overheating of poorly sized electrical conductors and failures in insulating electrical conductors.

In a country where an average of 660 fires of electrical origin occur every year, talking about the quality and reliability of electrical wires and cables is of paramount importance to ensure that electrical installations are safe and reliable.

One of the main criteria for sizing electrical conductors in an electrical installation is the thermal capacity for the conduction of electric current, according to ABNT NBR 5410:2008.

Using electrical conductors that should have a specific nominal section, but were undersized in the manufacturing process, puts the electrical installation at risk of a fire. , It prompts the probability of being subjected to electrical currents that may cause heating beyond the insulation of the wire/cable.

Since electrical conduits are a fundamental part of an electrical installation, the consumer or user of electricity becomes a key player in helping to ban non-compliant electrical conductors from the market and to prevent shocks, short circuits, overloading, and fires from happening.



How it all began...

On August 9, 1993, in the city of São Paulo, Qualifio was created to check the quality of the products found on the market, which at the time were growing exponentially in the quantity of brands.

Founded by renowned professionals in the electrical sector, who at the time worked for well-known companies in the market, such as Pirelli Cabos (currently Prysmian Group); FICAP; Alcoa, among others, QUALIFIO was created to monitor the quality of low voltage electrical wires and cables sold in the market.

Since its creation, Qualifio has always worked with organizations and associations with similar interests, which could add value and reinforce the actions carried out by the entity.

During these 30 years, many were the conquests achieved by the entity, among them the Compulsory Certification of Wires and Cables issued by INMETRO in 1997.

What is a compulsory product?

Compulsory is anything that possesses the capacity to compel, to obligate, in which there is an obligation, it is mandatory.

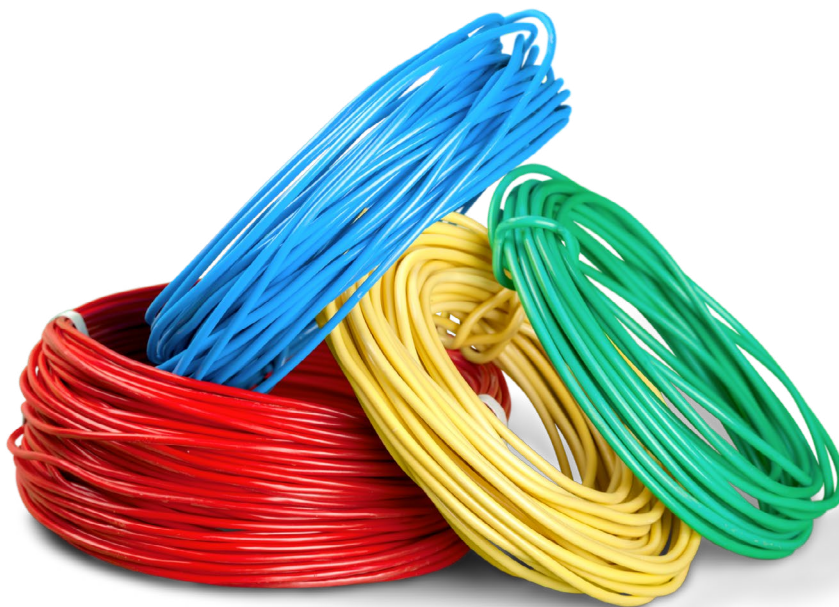
Therefore, it is of utmost importance to know if a product has some compulsory certification because this means that it should have been produced in accordance with the technical norms in force for its manufacture.

Through the monitoring data collected by Qualifio during the years 1993 and 1996, it was found that there were many poor-quality products on the market produced by companies that did not have any adequate technical conditions.



Thus, Qualifio, as a partner of INMETRO - one of the agencies responsible for the management of the Compliance Evaluation Programs - participated directly and actively in preparing the Ordinances that defined the products and the specific rules that made low voltage electrical wires and cables compulsory products.

How important is certification of electrical wires and cables?



Product Certification is one of the Conformity Assessment mechanisms that aim to protect consumers and society regarding safety, health, and the environment, promote fair competition, and strengthen the internal market, among others.

Over the last few years, Qualifio has been one of the great promoters and supporters of INMETRO's improvements to INMETRO's Ordinances for Conformity Assessment of Products.

Through its continuous participation in meetings at INMETRO, the entity contributed technical information that was used in the preparation of new Ordinances that defined the 11 product families of electrical wires and cables, all based on ABNT Standards.

As a result of this work, on March 23, 2022, INMETRO approved Ordinance 131, which defined the Technical Regulation on Quality and the Conformity Assessment Requirements for Electric Flexible Wires, Cables, and Cords - Consolidated.

Qualifio has developed many actions throughout its history...

Starting in 2016, Qualifio intensified its actions with IPEM, SINDICEL, and PROCON acting in actions to combat the illegal market through seizures of irregular wires and cables around Brazil, including training for IPEM's professional teams to support them in the fieldwork.

In 2019, the entity began an intense digital marketing effort. Through videos, live streams, articles, posts, e-books, and checklists, QUALIFIO has educated and instructed consumers and professionals about the importance of using compliant and safe wires and cables, also alerting them on how to identify an irregular electrical conductor.



After four years of digital actions, QUALIFIO has become an authority and reference for professionals and consumers who need information, instructions and technical support regarding electrical conductors.

Another relevant milestone in QUALIFIO's history is the laboratory's creation for electrical wires and cables analysis.

Since its inauguration in 2020, the testing of samples collected in the market is now performed in the entity's laboratory, increasing the number of samples tested.

Due to the excellent work that has been developed, the laboratory is moving towards obtaining its accreditation and certification in 2023.

The numbers prove it: Qualifio's actions must continue

Higher than specified electrical resistance and problems in the insulation resistance of the electrical conductor: these are two signs that warn that a specific electrical conductor has some irregularity.

The electrical resistance of a conductor is determined predominantly by the quantity and quality of the conductor material. Copper is the most commonly used material for making low-voltage cables. In Brazil, it is only allowed to use copper in low voltage cables for fixed electrical installations – residential.

Several elements are essential for an electrical conductor to be regular and of quality: flexibility, the roughness of the insulator, mass, metallic alloy, etc. However, the electrical resistance is one of the most relevant because it directly represents the electrical losses that will be registered.

In an attempt to obtain lower costs and more significant profit in the production of cables, many manufacturers end up using a lower amount of copper, causing the resistance of the conductor to be higher than the permitted value.

For consumers and electrical professionals to be able to identify these problems, the work done by Qualifio is what has made the difference so that more and more people learn to identify irregular wires and cables in the market.



How does Qualifio work?

Through the association's professionals, distributed throughout various parts of Brazil, samples of wires and cables sold in the market are collected and delivered to Qualifio.

Once the samples of the electric conductors with suspected problems are received, they are identified, registered, and electrical resistance, insulation, thickness, and identification tests are performed on them.

After performing the relevant tests and possessing the results obtained, QUALIFIO informs the competent organs, denouncing the manufacturers that are not acting following the current standards.

Over the past nine years, QUALIFIO has collected 6,144 samples of low-voltage electrical wires and cables with sections ranging from 1.00 mm² to 240 mm². Although the number of samples tested has grown systematically year by year, the samples in compliance with the ABNT-NBR-NM- 280 standard have not shown the expected improvements.

What does this mean?

The electric conductors manufactured are not following the ABNT NBR NM 280 norm, which specifies the standardized nominal sections from 0.5 mm² to 630 mm², as well as the number and diameters of wires and electric resistance values for electric cable conductors and flexible, insulated cords.

According to ABNT NBR NM 280, the electrical resistance of flexible cables, at 20 degrees Celsius, must not exceed predefined maximum values, according to the cable section.

Thus, the results show that, out of the number of samples tested in the last 9 years, 64% of them are Non-Conforming, meaning that they are not being manufactured according to the specifications of ABNT NBR NM 280..

Tabela 14 - Resumo das amostras ensaiadas pela Qualifio entre 2014 e 2022

Period (year): 2014- 2022	Quantity	%
TESTED electrical conductor SAMPLES	6,011	-
SAMPLES of electrical conductors IN CONFORMITY with the standard	2,190	36%
SAMPLES of electrical conductors NOT CONFORMING to the norm	3,821	64%
SAMPLES of electrical conductors tested from companies ASSOCIATED with Qualifio	1,858	-
SAMPLES of electrical conductors from companies NOT ASSOCIATED with Qualifio	4,153	-
AVERAGE ELECTRIC RESISTANCE VALUE ABOVE MAXIMUM ALLOWABLE (of total samples tested)	33%	-

The values found in the electrical resistance tests, for the case of Non-Conforming products, have presented values up to 33% higher than specified over the last few years.

The samples tested in cconformity with the Standard are mostly from companies associated with QUALIFIO, while the Non-Conforming samples are 90% from Non-associated companies.

The importance of a manufacturer being a Qualifio Associate

When a manufacturer of electrical wires and cables becomes a Qualifio Member, it demonstrates to society that safety and quality of electrical installations are manufacturer concerned with the.

It also demonstrates its transparency to the market since all Qualifio member companies are regularly monitored to ensure that they always meet the manufacturing standards for electrical conductors.

In these almost ten years, the number of companies associated with QUALIFIO has increased from 20 to 26 in the period, a significant increase, but still low, compared to the number of certified companies.

How so?

In the market today, there are about 160 companies manufacturing electrical conductors. Among this total, there is a vast number of electrical wires and cables trademarks registered in INMETRO.

Just to give you an idea, at the beginning of the last decade, there were a total of 234 brands registered at INMETRO, and today it has increased to 337 brands. This implies that many certified companies started to register around 4 to 5 brands, aiming to make it more difficult to collect samples in the market.

The increase in the number of registered trademarks shows the importance of the continuity of QUALIFIO's work to avoid the generalization of poor quality products, which do not allow honest competition.

Consumer awareness also needs to continue. It is necessary to alert the consumers that it is harmful to acquire an irregular electrical conductor. Besides paying more for his electric power bill at the end of the month, they also put their lives, family, and property at risk.

Avoiding property damage and saving lives through safe electrical installation is the purpose of Qualifio's existence.





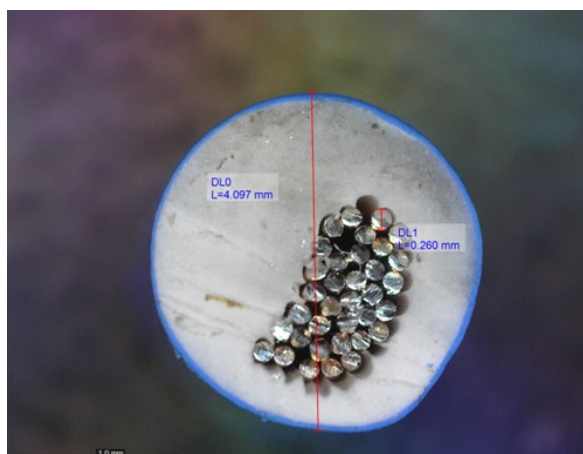
Coppered aluminum wire: another alert for society?

As verified in samples collected in the market by Qualifio, there are electrical conductors manufactured in a totally inadequate way to meet Brazilian standards and for use in low voltage electrical installations.

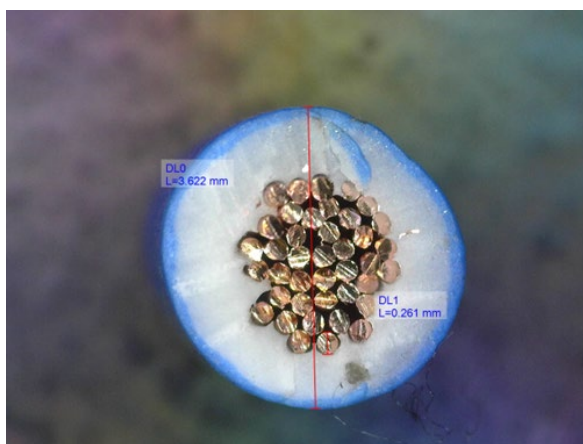
These conductors are popularly known as Alucobre, and are produced with coopered aluminum wire, presenting electrical resistance much higher than the maximum specified in the standard.

Besides this, there is usually non-conformity in the insulation of collected conductor samples, where excess PVC, less copper wire, decentralized formation, etc. are used.

Cross section of an ALUCOBRE cable, decentralized and with excess insulation (PVC).



Cross-section of a more evenly distributed copper cable with a uniform insulation layer



Qualifio Seal: an achievement that benefits everyone

Thinking precisely about the safety of consumers, buyers, electricians, and sellers, Qualifio recently launched the QUALIFIO SEAL, one more criterion that helps when choosing electrical wires and cables.

The QUALIFIO SEAL is present in QRCode format, printed on the manufacturer's label attested. Thus, at the time of purchase, you must scan the QRCode with your cell phone, and you will automatically be directed to the brand page of the wire/cable you want to buy.

This way, at the moment of purchase, the consumer or electrical professional already finds out if the cable they are acquiring is reliable, and if the manufacturer is a QUALIFIO member.

SELO QUALIFIO

Critério essencial para garantir que consumidores, vendedores, compradores e eletricitistas não sejam lesados no momento da compra de fios e cabos elétricos.



QUALIFIO

www.qualifio.org.br




/ @qualifiobr





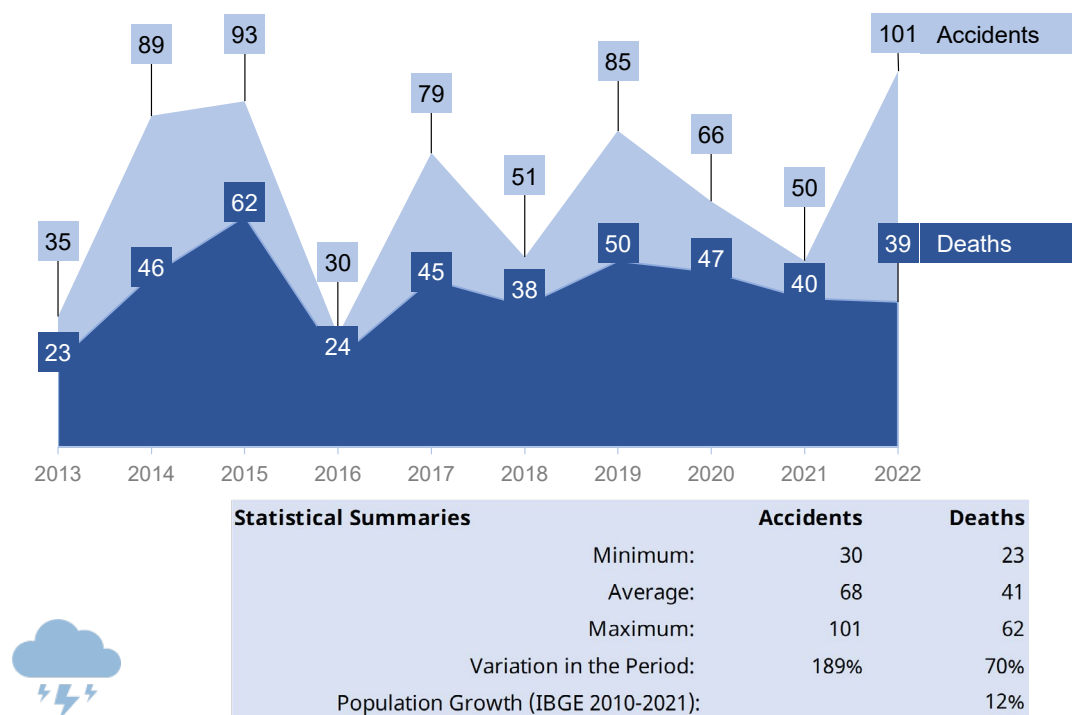
Now you know, if you are going to buy a cable for your electrical installation, check if it has the QUALIFIO SEAL, so you can be sure that the electrical conductor you are buying is reliable.

Text produced by MAP - Content Marketing



C. Lightning – Historical series (2013 – 2022)

Chart 49 Lightning strikes: (fatal and non-fatal) – Historical series 2013-2022

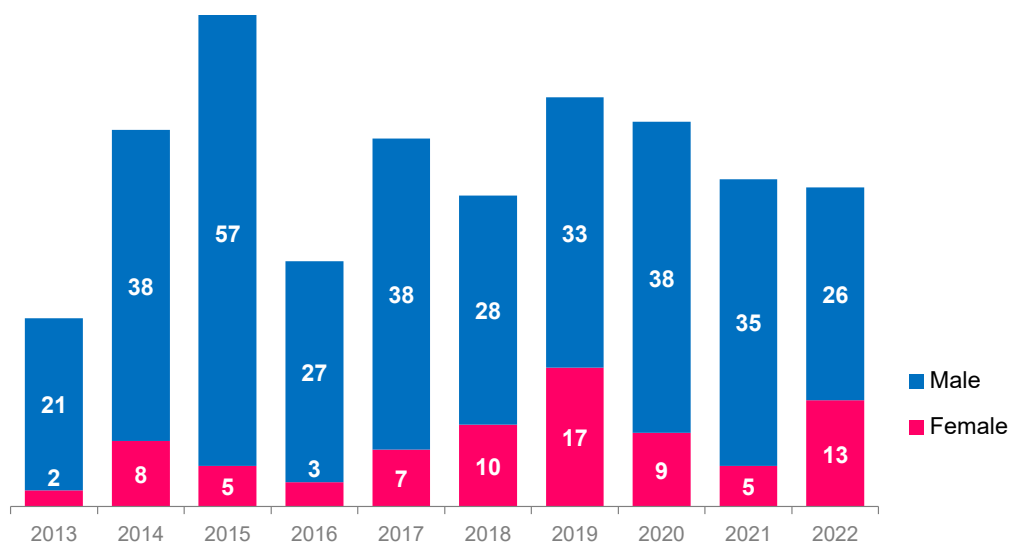


Lightning is one of the leading causes of weather-related mortality worldwide. In recent decades, an increase in the number of lightning strikes can be noted due to global warming.

Lightning destroys buildings and disrupts economic and social activities. The sectors affected include health, property insurance and hospitals; forestry; electricity generation, transmission, and distribution; agriculture; telecommunications; transportation; and tourism and leisure. One of the most significant economic losses as far as industry is concerned is downtime. A few hours of downtime rest from normal operation or the loss of important data stored in digital information systems can cause a company's economic loss of several million.

Lightning also causes human casualties directly and indirectly, as lightning can start fires that can reduce an entire building or house to ashes, injuring the people living or sheltering inside. In some cases, deaths are caused indirectly by lightning, such as in the case of forest fires.

Chart 50 Deaths by lightning strikes and gender – Historical series 2013-2022



Statistical Abstract:

Female		Male	
Minimum:	2	Minimum:	21
Average:	8	Average:	34
Maximum:	17	Maximum:	57
Variation in the Period:	550%	Variation in the Period:	24%
Population Growth (IBGE Estimated):		12%	



Deaths from lightning strikes are predominantly among males, as men are usually responsible for working in open areas. Such deaths fluctuate significantly, but fortunately, there has been a downward trend in recent years.

The techniques of protection against lightning strikes are already significantly mastered and expressed in ABNT NBR 5419:2018 in its four booklets. Solutions for protection in open areas are determined by NBR 16785 OF 09/2019. Protection against lightning strikes - Electrical storm warning systems, where there is the possibility of predicting the arrival or formation of an electrically charged cloud and thus warning and guiding people in the vicinity to search for shelter.

SECTION 6

FINAL CONSIDERATIONS

In this section, we will show real news of accidents of electrical origin (all of them were part of this yearbook), taking the reader to something that the numbers, in their hardness, do not show: emotion. It is essential to get away from the impersonality of numbers and data and understand that behind each number, there is a person who lost their life, a house that caught fire, and its residents lost almost or even all their possessions or even an industry or commerce that caught fire and took the heritage of years of struggle to ashes. Thus, we have a closer notion of the reality of the facts.

Additionally, we comment on what can be done to reduce the number of accidents with electricity in the country, aiming to improve the safety conditions of electrical installations in buildings. We also make a brief comparison with accident figures published in some papers and sites around the world so that we can have an idea of the Brazilian scenario concerning the world scenario.

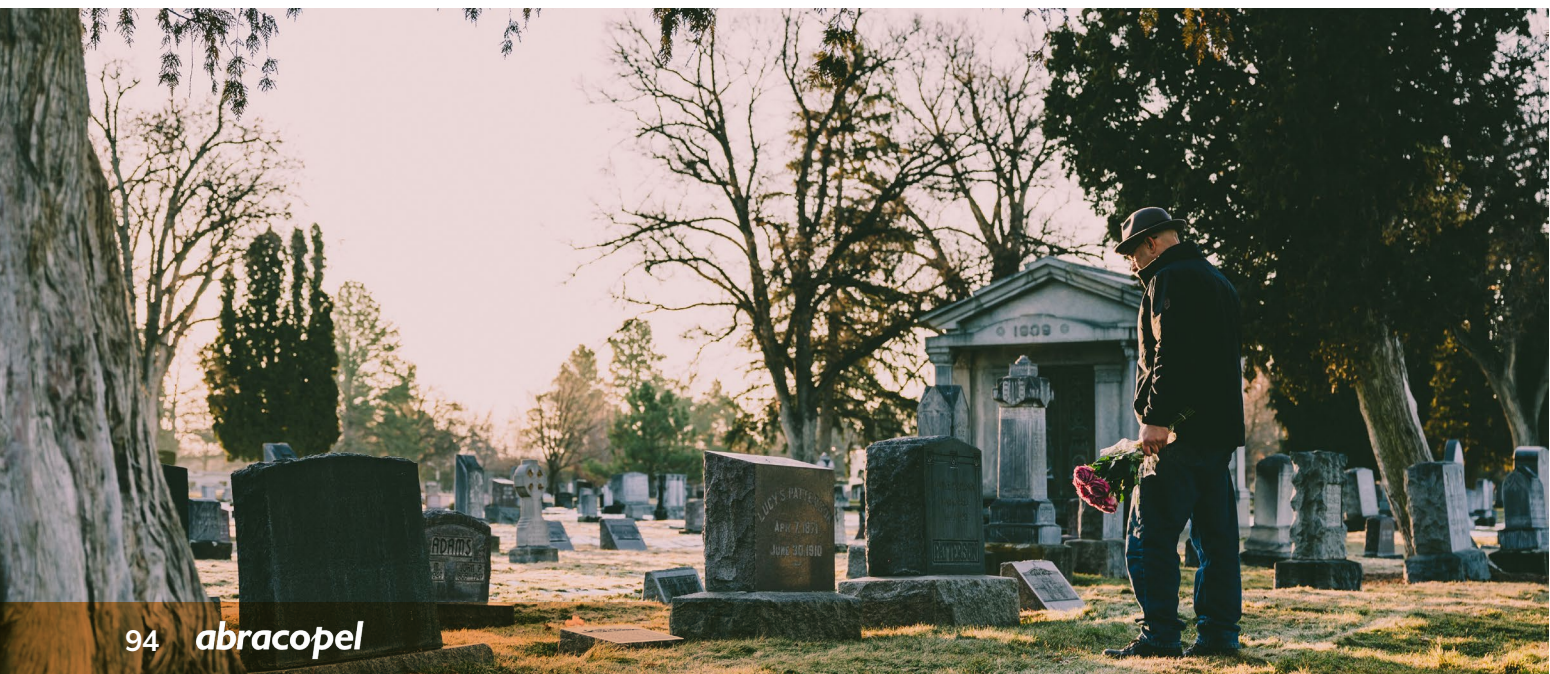
A. Global Data

This Yearbook brought data on accidents of electrical origin, but that we know is not the total of accidents due to underreporting, whether they are work or domestic accidents. These data are collected and treated by Abracopel with the help of professionals from various areas, including statistics so that we can have numbers with the best possible reliability. These data are being published in international works, such as the work presented in 2022 during the *ESW - Electric Safety Workshop* in Jacksonville in the United States of America, in which the work included an introductory comparison of accidents in other countries. For example, comparing the fire data based on the estimated fires published by the *USFA - United States Fire Administration* in 2019, we would compute 24,200 fires whose origin is an electrical malfunction. In these fires, there would be 225 deaths and 1050 injuries. These data are alarming because Brazil has registered a significant increase in fires originating in overload or short-circuit, and we know that the numbers calculated are below the actual figures. In this same work we compared the number of fires x the population of the two countries (USA x Brazil). By the USFA's estimation, Brazil would have on average 15,460 fires generated by electricity. The number of deaths and injuries would also rise, but with a lower proportion, there would be 144 deaths and 671 injuries. Scary, isn't it?.

Another comparison was using the data published by the *ESFI - Electric Safety Foundation International* with the data published by the *BLS - Bureau of Labor Statistics*, which present accidents with and without fatalities, mainly of workers. In 2019, Brazil showed 691 fatalities, and 162 people were injured without death in total (including domestic accidents), while the *ESFI* showed the number of 166 deaths being 1,900 non-fatal. We compared the data of electric shock accidents in 2019 with workers only, and the numbers are closer; in 2019, there were 237 fatalities with workers, 80 of which were with professional electricians.

The *ESFI* published data for accidents of electrical origin between 2011 and 2021, similar to ours, but with a 2-year lag.

We can see that there have been 1,201 worker fatalities when the publication is from *OSHA - Occupational Safety and Health Administration*, and 1,653 fatalities when the source is the BLS, as can be seen in the following infographic.



Electrical Fatalities in the Workplace

2011–2021

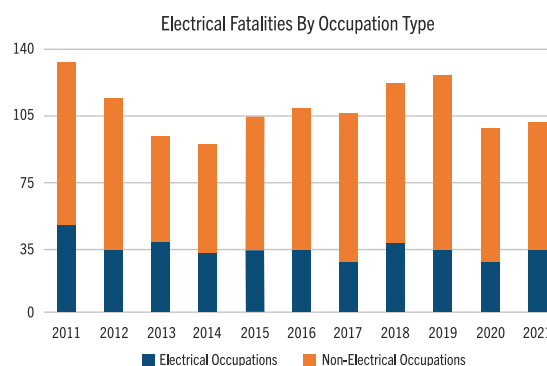
Contact with or exposure to **electricity** continues to be one of the **leading causes of workplace fatalities and injuries** in the United States. Between 2011 and 2021, there was a total of **1,201 workplace fatalities** involving electricity reported by the Occupational Safety and Health Administration (OSHA) and **1,653 electrical fatalities** reported by the Bureau of Labor Statistics. During this period, 69% of all electrically related fatalities happened in **non-electrically related occupations**.

Workplace Electrical Fatalities: Bureau of Labor Statistics and OSHA

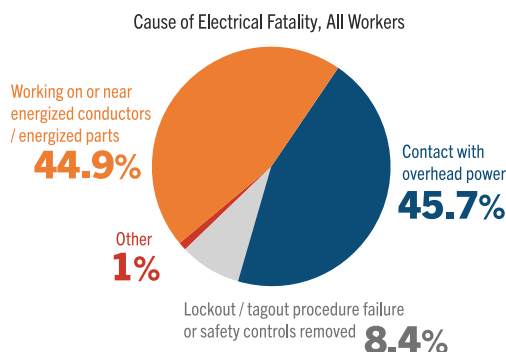
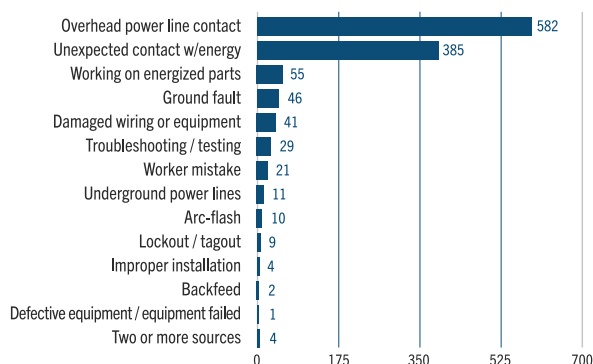


Top 10 Occupations Involved in Electrical Fatalities

Electricians **15.15%**
 Laborers, except construction **10.07%**
 Construction laborers **8.99%**
 Electrical power installers and repairers **8.49%**
 Tree trimming occupations **5.33%**
 Electricians' apprentices **3.25%**
 Heating, air conditioning, and refrig. mechanics **2.83%**
 Painters, construction and maintenance **2.75%**
 Roofers **2.16%**
 Truck drivers, heavy **1.92%**



Source of Electrical Fatalities, All Workers

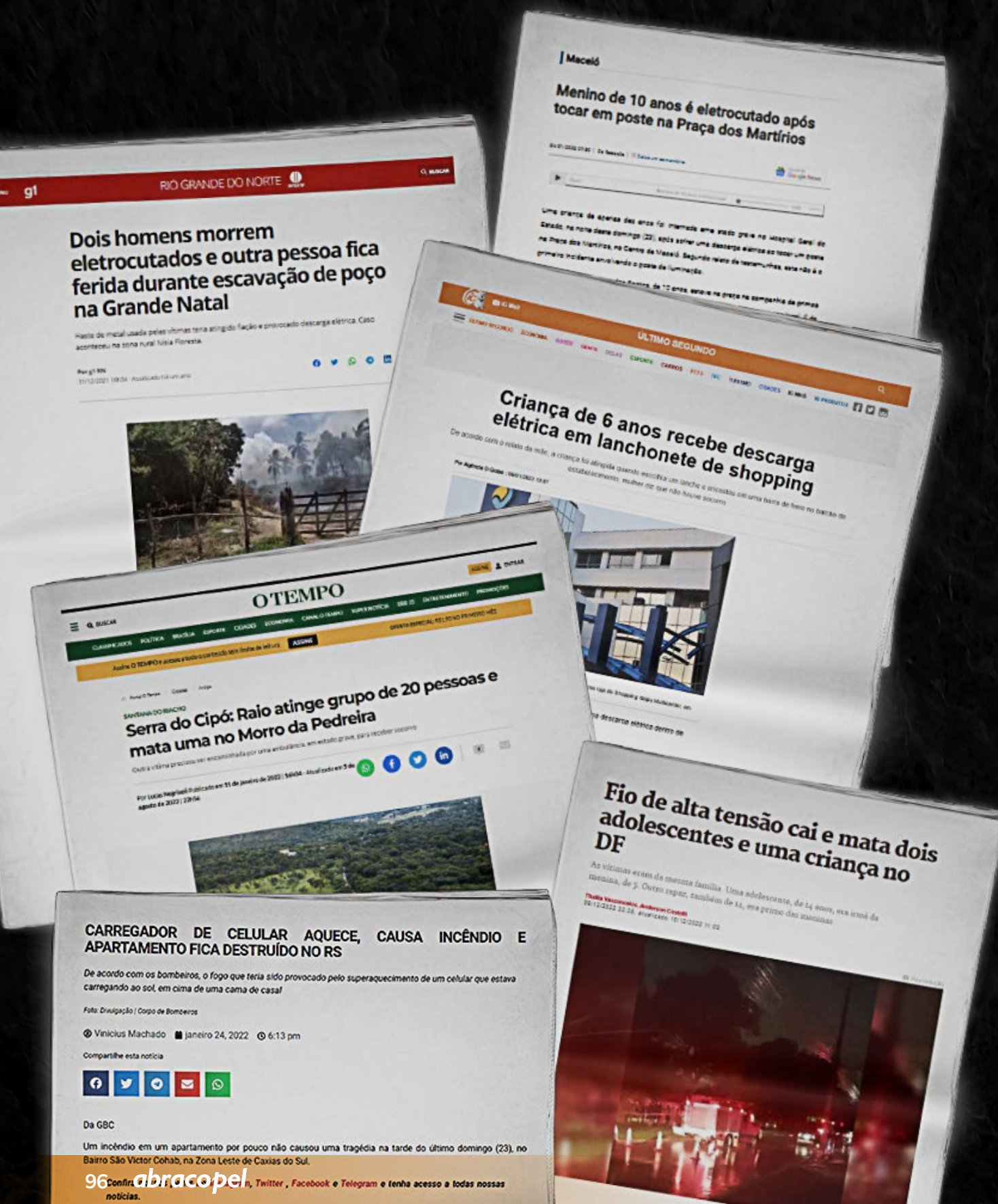


Please share this free resource to save lives

www.facebook.com/ESFI.org
www.twitter.com/ESFI.org
www.youtube.com/ESFI.org

As we can see, despite the lack of data on accidents of electrical origin, the available data do not always present numerical coincidences. Still, they can be used as guidelines for more assertive actions.

B. The news



BAND.
com.br | BAND VALE

Band Vale

Homem e mulher em moto morrem atingidos por raio na Via Dutra, em Caçapava

Vítimas chegaram a ser socorridas, mas não resistiram aos ferimentos

TRAGÉDIA

Bebê morre eletrocutado após se desequilibrar e agarrar em uma extensão, em Niquelândia

Após ouvir a avó da criança, de acordo com a Polícia Civil, tudo indica que o bebê deve ter se desequilibrado ao tentar emendar uma extensão

por Leonardo Calvete



Home / Notícias / Região / Mulher morre eletrocutada enquanto lavava roupas em Guairaçá

FATALIDADE

Mulher morre eletrocutada enquanto lavava roupas em Guairaçá

Situação aconteceu no fim da tarde desta sexta-feira (21), na região central da cidade. Vítima ainda conseguiu gritar, pedindo ajuda ao marido.

Publicado em 22/01/2022 às 11:07
Atualizado em 22/01/2022 às 13:08



Acidente foi na tarde desta sexta-feira (21). (Foto: Imagem Ilustrativa)

Uma mulher de 44 anos morreu eletrocutada enquanto lavava roupas em Guairaçá, no fim da tarde desta sexta-feira (21). As informações foram repassadas pelo Portal da Cidade Loanda.

A vítima relatou à Polícia Militar (PM) que ela estava na lavanderia quando recebeu uma descarga elétrica.

g1

ESPÍRITO SANTO

Mãe e filho são eletrocutados por cerca elétrica no ES

Vítimas morreram no mesmo local, em um intervalo de aproximadamente duas horas.

Por g1 e TV Gazeta

SOLICITAÇÃO: 199, em Afonso Claudio, na Região Serrana do Espírito Santo.

Mãe e filho foram eletrocutados por uma cerca elétrica, na tarde deste sábado (19), em Afonso Claudio, na Região Serrana do Espírito Santo.

As vítimas, Agilda Dias Cesconetto, de 63 anos, e seu filho, Augusto Cesconetto, que teria entre 40 e 41 anos, morreram em um intervalo de aproximadamente duas horas.

De acordo com a Defesa Civil do município, era por volta das 16h quando Agilda decidiu pescar no Rio Guandu. Cerca de duas horas depois, Augusto decidiu procurar a mãe e a encontrou desconhecida perto do rio. Ele não viu que no local havia uma cerca elétrica e foi eletrocutado também.



JORNAL DIGITAL

TRAGÉDIA

Adolescente de 14 anos morre após levar choque elétrico no portão de casa, no Cabo

Jovem foi socorrida por um vizinho, que o levou de carro até a UPA de cidade; Família não entende como o choque ocorreu e luta por respostas



Cadastado por
Emanuel Bento

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NOTÍCIA



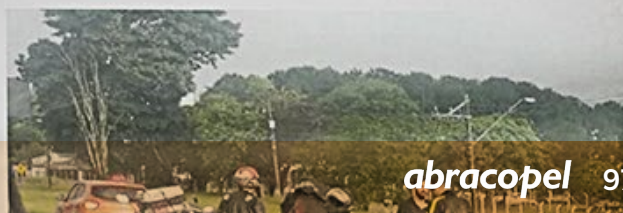
Band Vale

Homem e mulher em moto morrem atingidos por raio na Via Dutra, em Caçapava

Vítimas chegaram a ser socorridas, mas não resistiram aos ferimentos



Redação Band Vale
15/01/2022 - 10:17 - Atualizado em 15/01/2022 - 12:41



C. Awareness-raising and mobilization actions

Throughout its history, Abracopel has created initiatives to spread the word about safe electricity to the population and to technical professionals. These actions are briefly described in this document.

ABRACOPEL held several actions, such as technical updating seminars in five cities in Brazil, several technical updating seminars in the five regions of Brazil, as well as the 11th edition of the Abracopel Writing, Drawing, and Video Contest and the 16th edition of the Abracopel Journalism Award.

It created the Working Group that prepares the normative text on “Calculation of incident energy of the electric arc” under the ABNT. In addition to these, he participated in several other actions that were integrated as part of a nationwide awareness network for the dangers of electricity.

Another year of challenges, reinvention, creativity, and especially resilience, but the magnitude of Abracopel members were responsible for such significant achievements in such a challenging year for everyone.



Abracopel Portal: Exclusive Contents

Statistical Yearbook of Accidents of Electrical Origin

Abracopel University

National Writing, Drawing and Video Contest

Safe Electrician Program

Seminars, Workshops, Roadshow, Lecture

Regional: RJ, PE, BA, RN, AM, AL, MG, PR, CE, DF, MT



Each year we observe that this document called the Statistical Yearbook of Accidents of Electrical Origin, has been used as a consultation source by various society agents – professionals, companies, entities, and students. Frequently, the Yearbook is used by professionals to present to society the risks that can happen because of poorly done or poorly maintained electrical installations as a result of performing a service with electricity without risk analysis and standardized procedures.

Unfortunately, we cannot celebrate yet, because, as can be seen, the numbers are still high, and the Brazilian population must be aware of the risks electricity offers. This same perception we have when we carry out actions throughout Brazil. People still ignore the dangers of electricity and continue to take risks by using poor-quality products, hiring unprepared professionals, and performing poorly sized electrical installations without the proper protections; the result of this scenario is represented in this Yearbook using sad statistics.

The importance of this document is in showing this reality through the numbers presented and highlighting the need for a change in culture that prioritizes the safety of electrical installations to reduce exposure to accidents by shock or fire by overload.

We will change this scenario only with hard work, persistence, and resilience. We are sure that the union of society, economic agents, press agencies and the public power in the near future will result in fewer accidents of electrical origin. Updated professionals, quality products, and concerned contractors are the basis for achieving this goal.

***WE NEED YOU TO AMPLIFY OUR VOICES AND
REACH EVERYONE!***



*Associação Brasileira de
Conscientização para os
Perigos da Eletricidade*

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* Carência de 12 meses para acesso aos Benefícios Reembolsáveis.

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