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Map of traumatic suicide in Curitiba and other statistics

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SUMMARY

The study aimed to identify locations where suicide attempts or completed suicides occur most frequently in the city of Curitiba and to draw parallels with geographic, temporal, demographic, and financial particularities. The study was conducted through the analysis of statistical data generated by *sysbm,* the system responsible for managing all incident response for the Paraná Military Fire Department. Analysis of this data can identify locations where the need for prevention is most urgent, the most sensitive population, and the challenge of paradigms and myths surrounding suicide. An in-depth analysis of these statistics can guide the CBMPR in developing doctrines and policies for responding to this type of incident, as it is its responsibility, as defined by the Federal and State Constitutions, among other legislation. It can also generate consistent data for other agencies to leverage this work to prevent suicide, a problem that has become a global public health problem.

It was carried out according to a research methodology that involved: a) data collection within the *sysbm* over a 60-month period ending on December 5, 2023; b) statistical analysis of the data; c) selection of bibliography that provides a basis for the study; d) analysis with cross-referencing of the statistics and peculiarities already mentioned; e) conclusions reached.

Keywords: suicide, suicide attempt, fire department.

ABSTRACT

The present study was carried out with the objective of identifying places where suicide attempts or completed suicides occur most frequently in the city of Curitiba and drawing a parallel with geographical, temporal, demographic, and financial particularities. The importance of conducting the study lies in the analysis of statistical data generated in sysbm, the system responsible for managing all incident responses of the Military Fire Department of Paraná. The analysis of these data can indicate locations where prevention efforts are most necessary, vulnerable groups, as well as the confrontation of paradigms and myths about suicide. An in-depth analysis of these statistics can guide CBMPR in creating doctrines and policies for responding to this type of incident, since it is their duty as defined by the Federal and State constitutions, among other legislations, and generate consistent data so that other agencies may benefit from this work for the purpose of suicide prevention, a problem that has be worldwide issue.

proven to the public health

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The research was conducted following a methodology that involved: a) data collection within sysbm over a period of 60 months ending on December 5, 2023; b) statistical analysis of the data; c) selection of bibliography that provides theoretical support for the study; d) analysis with cross-referencing of statistics and the aforementioned particularities; e) conclusions reached.

Keywords: suicide, suicide attempt, fire department.

INTRODUCTION

This work, entitled “Map of Traumatic Suicide in Curitiba and Other Statistics,” aims to collect data from the Paraná Fire Department's incident management system and organize them in a way that makes it possible to better understand the phenomenon of attempted/traumatic suicide, more specifically in the typologies relevant to the intervention of the Fire Department.

Attempted suicide, a global public health problem, with multifactorial causes, and multifaceted when it comes to the method chosen by the subject to end his own life, some of these methods are legally competent for intervention by the Fire Department.

The work has as its object of study precisely the attempted suicides attended by the Fire Department, since according to guideline 005 it is the responsibility of the Fire Department to attend to attempted suicide when the subject is not in possession of a weapon, whether firearm or not.

For the work, in the theoretical framework, the legal competence of the Fire Department in responding to this type of occurrence was discussed, as well as a superficial presentation of what suicide is, in addition to statistics that support the need and importance of this study.

In the chapter called methodology, it was explained what SysBM is, the filters performed in the system to obtain the data and how they were selected to exclude from the search, duplication, false alarm or impossible to locate addresses. In addition, it will be explained how the correction of the addresses that are passed in a customary way to the service crew was carried out, but which does not make it possible to limit the position by the geolocation system.

In the results and discussion chapter, the graphs and maps obtained through the study were presented and analyzed considering similarities and discrepancies in order to better understand how the attempted/suicide phenomenon presents itself in the city of Curitiba.

The general objective of the research is to delimit places where traumatic suicide occurs most frequently in the city of Curitiba and to look for the existence of a temporal relationship between the occurrences.

DEVELOPMENT

The Military Fire Department's functional missions include: accident prevention, fire protection, search and rescue of people and objects, pre-hospital care, standardizing requirements for fire and panic protection and their properties, and fire analysis and inspection of buildings (NATIVIDADE, 2009; PARANÁ, 1989). Even with these demands defined and provided for by law, there is no consensus among the

scholars, when it establishes and defines that the activity of the Fire Department is a public safety activity, in a very broad sense.

A study indicates that the Military Fire Departments do not carry out public safety missions, but rather, with regard to “Public Order”, taking care of the safety of the community, in their own duties as the main force - and not as an auxiliary force for anyone who is focused on preventing and extinguishing fires, as well as search and rescue...” (LAZZARINI, 1989).

The enactment of the 1988 Federal Constitution established that public safety, a duty of the State, a right, and a responsibility of all, would be exercised by a range of institutional bodies (LAZARRINI, 1989). According to Article 144 of the Constitution, the Military Fire Department is responsible for preserving public order and the safety of people and property. Although the Constitution is comprehensive, and due to the autonomy of the federative entities, each state regulates its own details, it is emphasized, however, that there is agreement that search and rescue activities are the responsibility of the Fire Departments.

Until December 14, 2022, the Paraná Fire Department (CBMPR) was part of the Military Police according to art. 46, sole paragraph of the Constitution of the state of Paraná:

> “Art. 46. Public Security, a duty of the State, a right and responsibility of all, is exercised, for the preservation of public order and the safety of people and property, by the following bodies:
> I - Civil Police;
> II - Military Police;
> Sole paragraph: The Fire Department is part of the Military Police.”

Still according to the State Constitution of Paraná in its art. 48, the Military Police of Paraná, represented by the Military Fire Department as its member, is responsible for, among other functions defined by law, the search and rescue and public assistance service.

> Art. 48. The Military Police, a state force, a permanent and regular institution, organized based on military hierarchy and discipline, is responsible for overt policing, preserving public order, carrying out civil defense activities, preventing and fighting fires, searches, rescues and public assistance, policing urban and road traffic, forests and water sources, in addition to other forms and functions defined by law.

The lack of consensus explained by Lazarrini is further reinforced by the recent emancipation of the Military Fire Departments from the Military Police in several Brazilian states. It is noteworthy that currently only the state of São Paulo remains integrated, whereas on December 14, 2022, constitutional amendment 53 granted independence to the Paraná Military Fire Department (CBMPR), providing greater financial and administrative autonomy. Therefore, the responsibility for search and rescue and public assistance services no longer falls to the Paraná Military Police, but to the CBMPR, as amended by constitutional amendment 53, art. 5:

> Art. 5 Adds art. 48A to the Constitution of the State of Paraná, with the following wording:

The new wording of article 48 of the Constitution of the state of Paraná determines the Body of Firefighters are responsible for public rescue and assistance, among other duties.

> Art. 48A. The Military Fire Department, a state force, a permanent and regular institution, organized on the basis of military hierarchy and discipline, is responsible for coordinating and executing civil defense activities, exercising administrative police power regarding fire and disaster prevention, fire and disaster fighting,

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prevention of accidents on the seashore and riverside, searches, rescues, public assistance and pre-hospital care, in addition to other duties defined by law.

Among search and rescue activities, Suicide Attempt Response stands out, in which the Fire Department will be involved, as this occurrence is typically known for involving multiple agencies. Within the specific field of occurrence, several typologies can occur, and the CBMPR's participation as responsible or supporting depends on the presence or absence of firearm involvement.

This criterion is defined by a normative guideline, which will regulate the use and attribution, as well as the responsibility for responding to this type of occurrence. Due to the current independence of the Fire Department, this standard was developed in partnership with, and regulated by, the Paraná Military Police, with general scope. Since there is currently no specific CBMPR standard, this standard remains valid. (GUIDELINE 005, revised).

The guideline emerged as a counterpoint to a culture of resolving incidents as quickly as possible, even if necessary with the use of force. Currently, with the advancement of techniques and knowledge in psychology and psychiatry, it is recognized that suicide must be combated through dialogue and understanding. Scenes of firefighters grappling with suicidal individuals, engaging in physical violence, are increasingly unacceptable, especially since such actions pose a risk to the firefighter, the victim, and others.

Other points addressed by the Guideline concern incidents involving high-altitude environments, risk of explosion or fire, the presence or absence of hostages and victims, and even energized environments such as high-voltage towers. The most important aspect of this standard is that it integrates multiple agencies into the same incident, defining, depending on the case, who will be responsible and who will provide support.

Still within the scope of the regulatory standards of procedures, in addition to the Crisis Negotiation Guideline in force at CBMPR, there are a series of Standardized Operating Procedures (SOPs) that seek to regulate the conduct of military firefighters when responding to these occurrences.

In the case of an incident involving a suicide, the SOP is No. 200.3 (First Intervention in a Suicide Attempt Crisis). This standardized procedure consists of 14 procedures that must be followed, so that the incident tends to end without the use of force, and with the suicidal person being peacefully transferred to specialized medical care.

This institutional change addressed with the creation and dissemination of the Guideline and the POP, can be seen in practice as beneficial, having observed success in occurrences, even with the increase in the number of services carried out by the Fire Department over time.

According to the Epidemiological Bulletin published by the Health Surveillance Secretariat of the Ministry of Health, in its volume 52 of September 2021, suicide is a global and multifactorial public health problem that affects the individual and the community, without distinguishing between sexes, races, classes, financial conditions or any other biopsychosocial nature inherent to the human condition, which causes more than 700 thousand deaths worldwide per year, being the fourth leading cause among young people aged 15 to 29.

Despite the expressiveness of these numbers, there is still a taboo surrounding suicide, which is characterized as the human act of self-inflicting the end of one's life. However, suicidal behavior can be considered as self-harm with the intention of ending one's life, but which does not materialize. The proximity between behavior

suicide and suicide itself is very sensitive, which activates an alarm in cases of self-harm or risky behavior, thus providing an opportunity for immediate preventive actions or intervention. (Teixeira, 2018).

The areas of effective intervention of the fire department revolve, mainly in gas-laden environments and suicide by falling from a high height, according to (BOTEGA, 2013), suicide among women occurs, in second place, by smoke/fire (9%) and precipitation from a height (6%), totaling 15% of suicides by women, and that for each suicide there are at least 10 suicide attempts, these, cases under the jurisdiction of the fire department.

The fine line between suicidal behavior and actual suicide highlights the need for trained and prepared professionals to respond to incidents involving people on the verge of committing suicide, even for legal reasons. As previously exemplified, one such professional is the military firefighter. The training of these professionals is not based solely on guidelines and regulations. Within the scope of the CBMPR, school curricula have been adapted so that newly trained firefighters are already capable of identifying and, at a minimum, responding to incidents of this nature. In this context, they undergo 20 hours of instruction in performing First Crisis Intervention (PIC), which is the initial response, primarily aimed at ensuring everyone's safety, isolating the scene, reducing the stress of the incident and the suicide victim, and establishing dialogue (PLADIS PIC CFP BM, 2022).

METHODOLOGY

This is quantitative research, and the comparative method was used to determine similarities and differences, allowing the analysis of concrete data on the phenomenon studied.
(MARCONI and LAKATOS, 2003, p. 106) following the steps and how they were developed as highlighted below.

the) Request for authorization from the CB commander to collect data;
b) Selection and processing of data collected in Sys BM New
w) Comparative analysis between the data collected for the purpose of establishing discussions and results;
d) Conclusions and considerations.

Each of the steps is detailed in the item that deals with the development of the work, as follows:

Data collection was performed using SYSBM, a system developed by the IT section of the 4th Fire Brigade of Cascavel to update the old SYSBM, which had been in operation since 2005, according to then-Major Amarildo. The new system was put into operation on August 2, 2017, and remains active to this day. It is worth noting that until the launch of the new SYSBM, the suicide/attempt subtype did not exist, so there was a steep increase in suicide/attempt statistics when compared to years prior to 2017. This difference is due to the possibility of data collection, not to an increase in occurrences.

For data collection, it is possible to perform some filters, with the aim of an analysis regionalized and periodic the following filters were applied.

Registration: not completed
OBM: all
Fraction: all
Municipality: all
Position: all
Nature: search and rescue
Subnature: suicide/attempt
Address: not filled in

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Victims: all **Date**

or period: range from December 5, 2017 to December 5, 2023

Relief officer: all

Status: approved

After performing the search with the aforementioned filters, 446 occurrences were found. To maintain victim confidentiality, RGO (General Incident Record) numbers were removed from the survey. Incidents were randomly reordered and assigned hexadecimal numbers, ranging from 1 to 1BE. This allows for logical data management and the preservation of victim confidentiality.

Considering that even with the application of filters there were data that deviated from the focus of the study, a case-by-case analysis was carried out in order to identify and exclude them from the research. As an example, we can have vehicles from Curitiba that served in other cities or addresses that are normally known to the crew on duty and are passed on by the radio operator as usual to the crew, making the exact location impossible to be identified by the author.

Therefore, the following cases were excluded from the research:

The following two cases were suppressed from the research because, despite being attended to by garrisons from Curitiba, are located in another municipality.

1E | 5D

Remaining 444 cases so far.

The following case was removed from the research due to duplication, an occurrence opened by two units, only case 72 was kept, it coincided, address in addition to a difference of only 8 minutes. 71

Remaining 443 cases so far.

The following 118 cases were registered in SYSBM with addresses that are passed on to service crews in a customary manner among BBMM, as these are already known locations and the location of the incident is more assertive. The usual method is to describe the location or indicate a landmark. Therefore, to ensure this data is not overlooked in the study, incidents were opened individually and the descriptions analyzed to identify the location and correct the address so that APP LOCKER can detect the location and create the heat map.

I emphasize the importance of maintaining this data for studies, they are repeated frequently and are points of interest for a more accurate overview.

	21	41	6A	96	CC	FD	11C
1	25	44	6D	9F	D3	107	12D
6	1BE	4E	70	A5	D6	108	12E
8	27	50	75	A9	D7	109	131
THE	28	54	78	AD	DB	10A	135
10	2A	5E	7B	B4	E2	10E	13F
16	2B	5F	7C	BB	E9	111	142
1A	37	61	7E	BF	EC	115	146
1C	38	64	80	C4	EF	118	147
1D	39	68	8B	C9	F9	11B	149

14A	167	18D	19C	1A2	104	148	193
154	16F	18F	19D	1A9	10C	162	1AF
155	175	190	19E	1AC	11A	16C	10D
160	17E	192	19F	1AE	120	171	163
161	180	19A	1A0	F6	124	18B	

One of the usual ways of passing on the address to the service crew is Rua “x” corner with Rua “y”, these cases were identified and corrected through the Google *Maps* service , as per table 1 attached.

After completing the cases with forwarded addresses located as "corner", the data processing with addresses on highway KM "x" was started. At this time, 65 cases were identified, as shown in table 2, attached, and corrected for the identification of the address by geolocation applications.

Furthermore, they were identified and discarded from the study due to false alarms, as stated in the description of the RGO the following four cases.

2B	7E		39

There are currently 438 valid cases remaining.

Additionally, the following three cases were identified and discarded as they were cancelled by the applicant.

5F	68	F9

Remaining to date 435 valid cases.

Finally, the following thirteen cases were identified and discarded from the study due to an imprecise location when opening the incident. I emphasize that this fact does not affect the response to the incident, as further information is passed on via radio to the crew.

96	160	1AC	180
BF	109	2A	21
A5	12E	1A	D3
E2			

Remaining for analysis are 423 valid cases that will be shown in the attached table.

The 423 valid cases used for the study can be seen in table 3, in attachment.

RESULTS AND DISCUSSIONS

Structuring the data in order to try to organize the information in a logical manner, it was observed the following.

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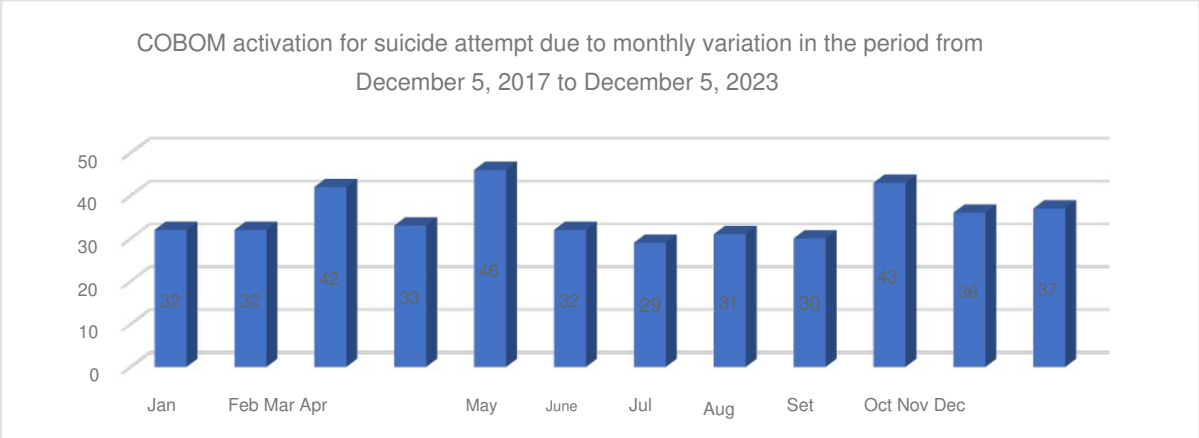
Chart 1

Analysis of data when organized by number of activations per month during the study period.

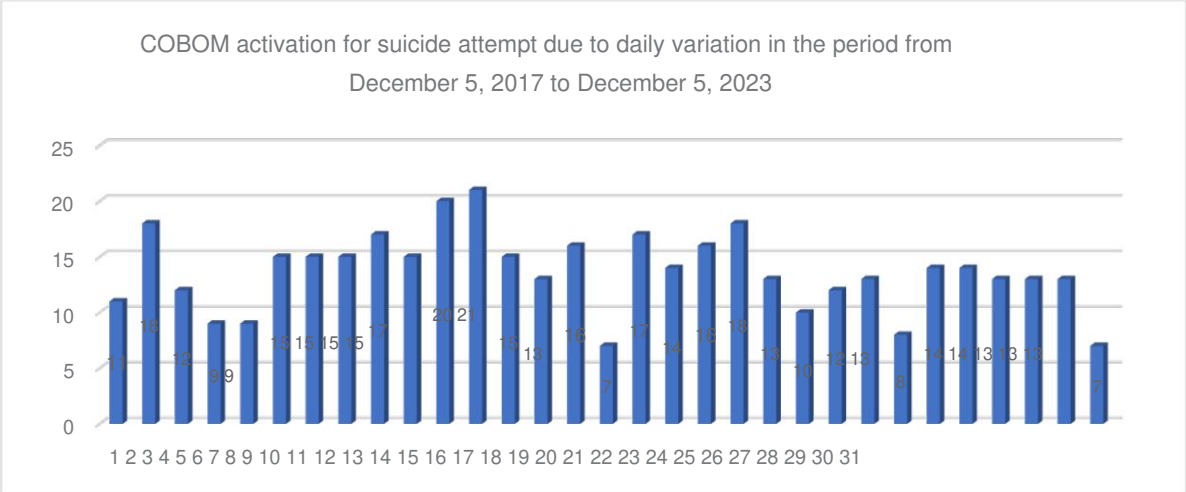


Note: Source: Source: Report prepared by the author with data extracted from the Sys BM system.

Through Graph **1,** it is possible to calculate an average of 35.25 activations per month and observe that the three months with the greatest positive discrepancy are May (46), October (43), and March (42). The analysis considering the percentile difference of the variation revealed an increase of 30.50% in May, 21.99% in October, and 19.15% in March compared to the average. However, the months with a negative trend are July (29), September (30), and August (31). The same analysis considering the percentile difference of the variation showed a decrease of 12.06% in August, 14.89% in September, and 17.73% in July compared to the average.

Graph 2

Analysis of data when organized in number of activations per day during the period of study.



Note: Source: Source: Report prepared by the author with data extracted from the Sys BM system.

Through **Graph 2** it is possible to calculate an average of 13.65 activations per day, and observe a surge on days twelve (21), eleven (20), two and twenty (18). The analysis considering the percentile difference of the variation showed an increase of 53.85% on day twelve, 46.52% on day eleven and 31.87% on days two and twenty in relation to the average. However, the days with a negative trend are sixteen and thirty-one (7), twenty-five (8) and four and five (9).

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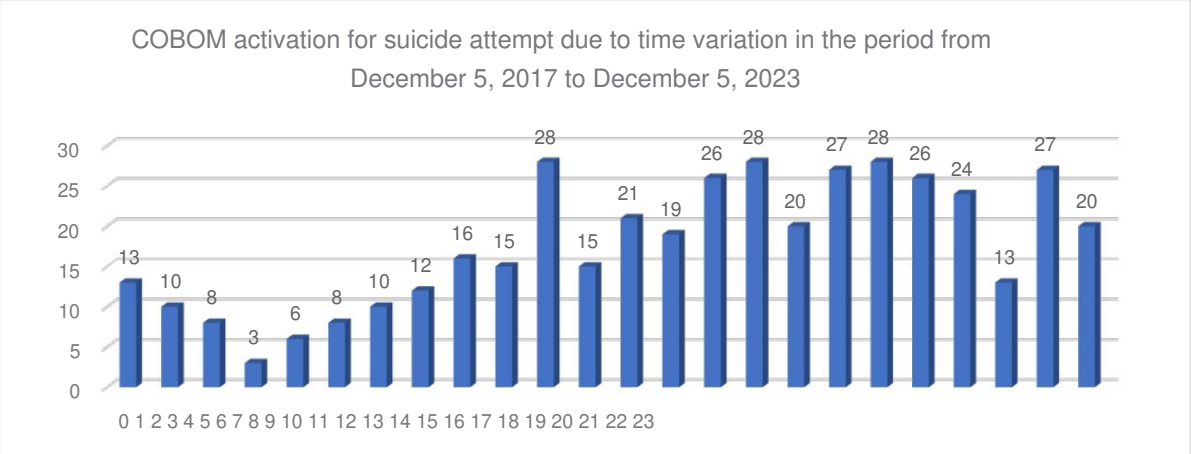
The same analysis, considering the percentile difference of the variation, showed a decrease of 48.72% on days sixteen and thirty-one, 41.39% on day twenty-five and 34.07% on days four and five in relation to the average.

Chart 3

Analysis of data when organized in number of activations per hour during the study period.

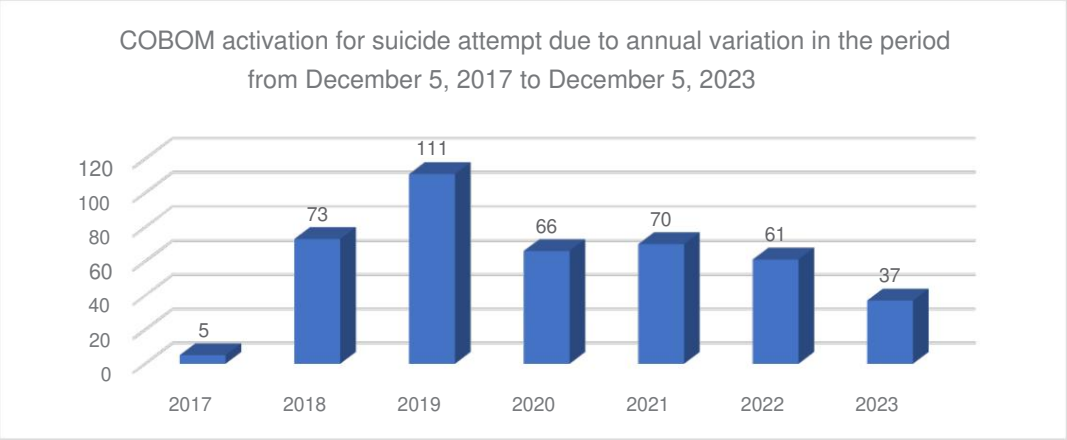


Note: Source: Source: Report prepared by the author with data extracted from the Sys BM system.

Through **Graph 3** it is possible to calculate an average of 17.63 activations per hour and observe a jump at 10 am, 3 pm and 6 pm (28), at 5 pm and 10 pm (27) and at 2 pm and 7 pm (26). The analysis considering the percentile difference of the variation showed an increase of 58.82% at 10 am, 3 pm and 6 pm, 53.15% at 5 pm and 10 pm and 47.48% at 2 pm and 7 pm in relation to the average. However, the hours with a negative trend are 3 am (3), 4 am (6), 2 am and 5 am (8) and 1 am and 6 am (10). The same analysis considering the percentile difference of the variation showed a decrease of 82.98% at 3 am, 65.97% at 4 am, 54.62% at 2 am and 5 am and 43.28% at 1 am and 10 am in relation to the average.

Chart 4

Analysis of data when organized by number of activations per hour during the study period



Note: Source: Report prepared by the author with data extracted from the Sys BM system.

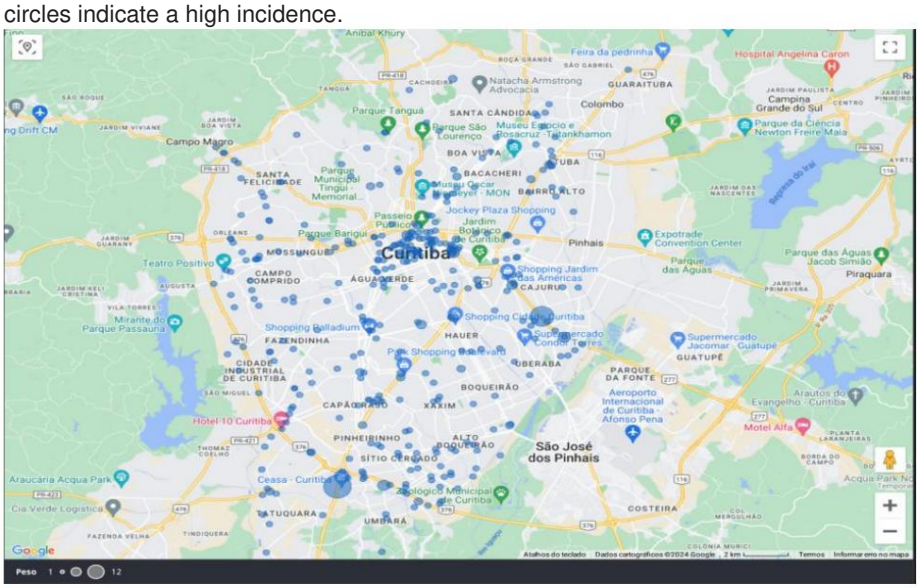
Graph **4** shows the number of COBOM calls due to suicide attempts in each year of the study. The year 2017 should be disregarded because only 27 days

of that year were present in the study, as for the year 2023 there were 26 days left to complete the year, therefore it can be considered taking this comment into account.

A high number of activations was observed in 2019 (111), while other years remain close to the average.

Image 1

COBOM activation for suicide attempts structured in the form of a bubble map, where larger circles indicate a high incidence.

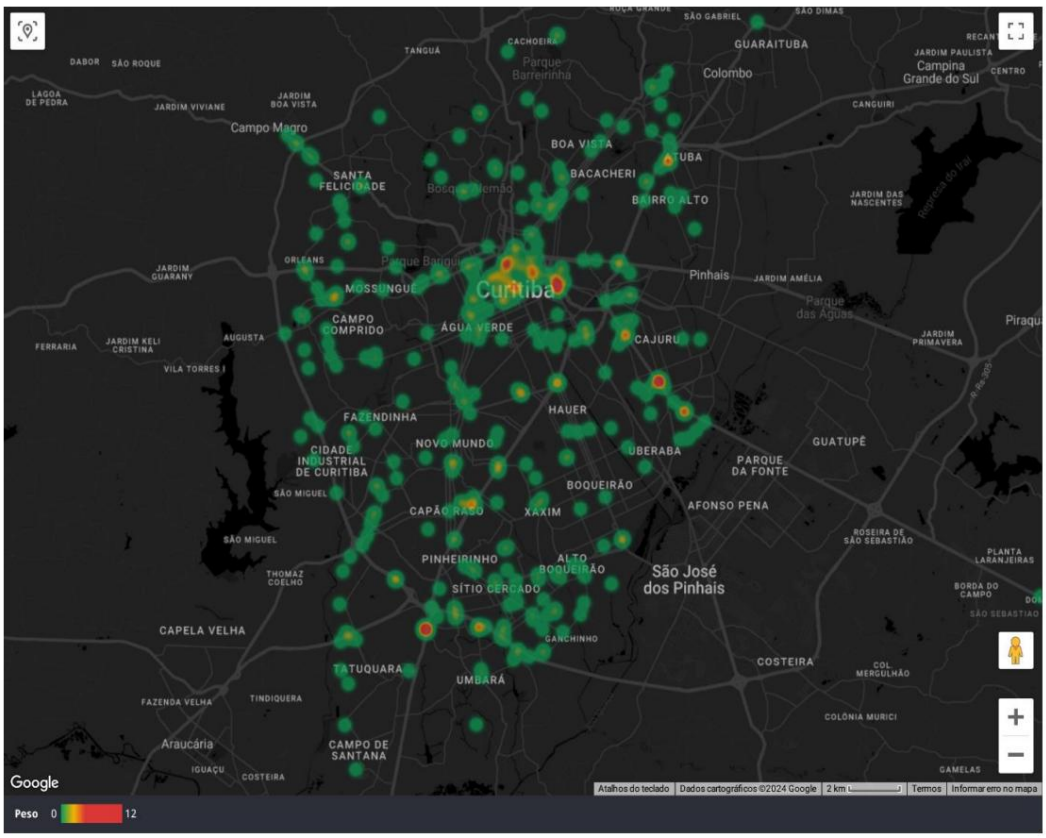


Note: Source: Data report extracted from Looker Studio using data obtained from the system. Sys BM.
https://lookerstudio.google.com/reporting/3f2b3351-11e5-4ef8-91ba-4a2252c90593

In **Image 1,** it is possible to observe, and in the link, to verify that the points with the most activations in the same location are BR 116, south of Curitiba, with 12 activations during the study period, and a footbridge on BR 277 near the Coca-Cola factory, with 10 activations. And that the central region concentrates a large number of activations, however, in different locations.

Image 2

Activation of COBOM for suicide attempts structured in the form of heat map, where red colors indicate greater concentration as per legend.



Note: Source: Data report extracted from Looker Studio using data obtained from the system. Sys BM.
https://lookerstudio.google.com/reporting/49c96979-837e-46ce-9345-451ce1490308

4 FINAL CONSIDERATIONS

The study's analysis allows us to statistically refute empirically derived myths of popular knowledge, such as commemorative dates, holidays, or seasons. Graph 1 shows an equal distribution with no significant discrepancies across all months of the year. Graph 2 shows that the 25th and 1st, two major holidays, have below-average attempts per day.

Considering graph 3, which shows the hourly evolution, the reduction in the night period is evident, more specifically after midnight, perhaps explained by the lower circulation of people.

Graph 4 shows the increase in response to incidents from 2018 to 2019, reaching the peak of the graph with 111 incidents per year.
After 2019, there is an apparent trend towards a reduction in calls, which may be confirmed in future studies.

The bubble map shows two locations where incidents are most common: an overpass on BR-116, with 12 incidents during the study period, and a footbridge on BR-277, with 10 incidents during the same period. The study suggests preventive measures in these two locations.

The heat map shows a greater predominance of occurrence in the region city center, future studies may contribute to the understanding of this phenomenon.

As explained in the abstract, this study aimed to structure and organize data collected in SysBM for the purpose of comparative analysis to relate

dates and places where the fire department intervenes in suicide attempts and enables prevention and more assertive interventions.

It was possible to identify locations with the highest number of attempts and times with the lowest frequency. The need for improvement and greater prevention in specific locations is ongoing. The use of data analysis methodologies like this can benefit the prevention process in the locations that use them.

Last but not least, it is worth highlighting the publication of Guideline 002/24 on Crisis Management Involving Unarmed Suicides, published in the QCG/CBMPR general bulletin No. 213 on November 4, 2024, which revises guideline 005.

I inform you that although the new guideline was in force when this article was published, it did not exist at the time of data collection for the study, therefore guideline 005 was considered in the legislation. New studies will be able to identify the effectiveness, success and applicability of the new guideline.

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