10 Años
DE PROTECCIÓN

ANRACI

EL GREMIO DE LA PROTECCIÓN CONTRA INCENDIOS


ANRACI
RESEARCH

Statistical Examination of the Incidence of Structural Fires in Colombia

A perspective based on urban population inference and international comparison.

ANRACI RESEARCH. FIRE PROTECTION RESEARCH CENTRE.

Authors: Dr. Jeffrey León-Pulido, Dr. Johanna Karina Solano Meza, MBA, Hugo Torres Bahamon, Eng. Alex Rodríguez.

ANRACI.

Executive Director: Hugo Torres Bahamón.

Chairman of the Board of Directors: Javier Sotelo Calderón, OSHO ENGINEERING.
Vice President: Arturo Castillo Pérez, TECNO FUEGO.

Board Member:
Alex Rodríguez Aparicio. AGNIS
Andrea Escobar. IMPLESEG
Francisco Unda Arango. SERIINCO.
Milena Zuleta. ITMCOL.
Mauricio Gutiérrez. SPCI.
William Estupiñan. INGSECOL.
Diego Correa RCI INGENIERÍA Y MONTAJES.

www.Anraci.org

Summary.

Colombia does not possess a national system for the systematic collection of data pertaining to structural fires. These incidents, which occur daily throughout the country in significant numbers throughout the nation, lack a reliable and standardized national statistical database, impeding thorough analysis.

This deficiency in information constrains a comprehensive understanding of fire risks at the national level and impedes the development of public policies designed for effective risk management by both public and private entities.

This article presents a statistical analysis grounded in primary data acquired directly from the official fire departments of the country's major cities. This data is compared with the partial records available at the national level and with international statistics published by the International Association of Fire and Rescue Services (CTIF).

Utilizing an urban population inference model, it is estimated that over 6,000 structural fires occur annually in Colombia, equating to a rate exceeding 12 structural fires per 100,000 inhabitants. These statistics are considerably higher than previously published official data and underscore the necessity for the implementation of targeted public policies on fire protection to adequately protect the Colombian population.

Keywords: structural fires, fire statistics, urban risk, Colombia, fire protection, Anraci.

Background – Summary.

Fire protection is recognized as an engineering discipline dedicated to the comprehensive fire risk management in structures, infrastructure, and manufacturing processes.

Its primary objectives are to protect human life, protect property and assets, and ensure business continuity through the coordinated implementation of prevention, detection, control, suppression, evacuation, and emergency response measures. In modern society, marked by escalating building complexity, heightened urban density, and significant technological reliance, the risk of fire is rising in both frequency and severity, necessitating increasingly stringent and specialized strategies.

Internationally, fire protection has evolved within a strong technical and regulatory framework, informed by lessons learned from major disasters that have resulted in considerable loss of life and property. Organizations such as the NFPA, FM, UL, the International Code Council (ICC), and ISO have established standards that govern materials, systems, processes, and professional competencies, which now serve as a global benchmark for the design, installation, inspection, and maintenance of fire protection systems.
In Colombia, fire protection is intricately connected to the construction sector and is predominantly regulated by the Colombian Seismic-Resistant Construction Code (NSR-10), specifically Titles J and K, along with Law 1575 of 2012, which acknowledges comprehensive fire risk management as a vital public service delivered by the State through fire departments. Nevertheless, the nation encounters considerable regulatory, technical, and operational deficiencies, stemming from outdated regulations and delays in updating standards inconsistent application of requirements, and insufficient coordination among the diverse stakeholders in the sector.

Fire protection should be regarded as a holistic system, consisting of various interrelated components: planning and engineering, fixed extinguishing systems, detection and alarm systems, passive fire protection, life safety, portable and wheeled fire extinguishers, the firefighting sector, and associated services. These components are interconnected within a complex value chain that includes manufacturers, distributors, consultants, designers, integrators, inspection, testing and maintenance firms, certification bodies, training providers, insurers, public institutions, and end users.

Despite the presence of this technical and business ecosystem, fire protection in Colombia encounters substantial structural challenges, including the informal market, the availability of products and services that fail to meet minimum standards, inadequate professionalization of personnel, and a limited public awareness of fire risk. These factors create a misleading sense of security and heighten the probability of critical system failures during actual emergencies.

In this context, it is essential to approach the analysis of structural fires and fire protection from a comprehensive and interdisciplinary perspective, one that transcends specific technologies and encompasses the full spectrum of technical, regulatory, operational, and institutional factors that affect the occurrence, management, and repercussions of fires. This holistic view enables us to appreciate the strategic significance of fire protection in public safety, sustainable urban development, and the resilience of critical infrastructure.

Goals.

Overall objective

To conduct a statistical analysis of the incidence of structural fires in Colombia, utilizing primary data sourced directly from official fire departments, while employing an urban population inference model and juxtaposing it with national and international records, to accurately estimate the true magnitude of this phenomenon within the country.

Specific objectives

- Consolidate essential statistical data on structural fires from municipal fire departments.
- To demonstrate the underreporting and distortions present in official national statistics inherent in official national statistics.
- Characterize the urban distribution of structural fires based on location, usage, and causation.
- Utilize an urban population inference model to assess the national prevalence.
- Estimate the annual incidence of structural fires per 100,000 residents in Colombia.
- Compare the results with international structural fire statistics on structural fires.

Introduction.

Structural fires constitute one of the most frequent and significant urban emergencies, profoundly impacting life, property, and built infrastructure.

Despite its prevalence, Colombia lacks a national information system capable of accurately assessing the true extent of this phenomenon.

The available official statistics reveal considerable gaps, inconsistencies, and notable discrepancies when compared to the operational data of local fire departments.

This scenario results in a consistent underappreciation of risk and obstructs the technical evaluation of structural fires at a national level.

In this context, the current research tackles the issue from a strictly statistical and empirical standpoint, utilizing verified primary data, with the aim of estimating the actual incidence of structural fires in Colombia through urban population inference tools and international comparisons.

Methodology.

Comprehensive methodology for the research.

This research employs a quantitative, descriptive, and inferential methodology, focused on the statistical analysis of the incidence of structural fires in Colombia.

The study relies on primary empirical data acquired directly from credible operational sources to mitigate biases related to underreporting and the fragmentation of official information accessible at the national level.

The study's objective is not to assess direct causality or the efficacy of specific protection systems; rather, it aims to estimate the true magnitude of the phenomenon on a national scale. To achieve this, it employs tools of descriptive statistics, comparative analysis, and modeling through urban population inference.

Methodology.

Sources of information and criteria for selection

The analyzed information originates from primary sources, provided directly by official and volunteer fire departments, along with territorial risk management agencies that have compiled operational records of emergency response.

The locations included in the study were chosen according to the following criteria:

Availability of verifiable operational records pertaining to structural fires.
Urban and demographic representativeness.
Institutional capacity for emergency response and documentation.
Temporal continuity of the information provided.

Based on these criteria, data from the following eleven locations were included: Bogotá, Medellín, Cali, Barranquilla, Pereira, Bucaramanga, Cartagena, Cúcuta, Ibagué, and the department of Antioquia.

Collectively, this sample accounts for approximately 55.05% of Colombia's urban population, providing a sufficiently robust statistical foundation for extrapolation processes.

Methodology.

Limitations and refinement of information

During the data collection process, notable structural limitations were identified regarding the quality of information available at the national level, among which the following are particularly prominent:

- Evident underreporting in national statistics compared to local operational data.
- A complete absence of information in certain capital cities, either resulting from institutional secrecy or the absence of consolidated databases.
- Methodological discrepancies in the classification of fires among entities.
- Absence of standardization in variables such as causation, building utilization, and event type.

In this scenario, the information underwent a rigorous process of data cleaning, cross-validation and critical analysis, prioritizing data directly linked to events attended and documented by the fire departments, while discarding inconsistent or unverifiable figures.

This process confirmed that the statistical issue in Colombia involves not only underreporting but also the fragmentation of the information system, rendering the construction of complete and homogeneous historical series unfeasible.

Methodology.

Rationale for the urban approach

The methodological model is grounded in a fundamental assumption: the risk of structural fires is primarily urban.

This assertion is substantiated by the evidence gathered during the analysis, which indicates that the highest concentration of events occurs in cities with:

- Elevated population density.
- Diverse land uses (residential, commercial, and industrial).
- Aging or inadequately constructed infrastructure.
- Intense economic and commercial engagement.

Consequently, the fundamental variable for statistical inference is the urban population, which constitutes approximately 78.70% of Colombia's total population. Utilizing the urban population as the denominator facilitates a more accurate modeling of structural risk compared to an approach based on the total population or the number of municipalities.

Methodology.

Development of the urban population inference model

Based on the analyzed sample, the daily average of structural fires reported by the eleven locations included in the study was determined. The resulting figure is 9.71 structural fires per day, a statistic corroborated by actual operational records.

Since this sample constitutes 55.05% of the national urban population, a proportional inference model was employed, articulated as follows:

National urban rate = Daily observed fires ÷ Urban population share represented by the sample

Utilizing this model, an estimated value of 17.64 structural fires per day in urban areas across the nation is derived, which is roughly equivalent to 6,440 structural fires annually.

This approach does not seek to determine an exact absolute figure; instead, it aims to provide a consistent statistical estimate that aligns with the available empirical evidence and is adapted to the structural limitations of the current information system.

Methodology.

Comparative analysis and international comparison

To contextualize the results, the obtained values were compared with international statistics published by the International Association of Fire and Rescue Services (CTIF).

This comparison enabled us to evaluate the credibility of the estimates and to demonstrate that Colombia's official historical figures are considerably lower than the ranges observed in countries with established information systems.

International contrast is not employed as a direct validation mechanism; rather, it serves as a comparative reference tool that reinforces the hypothesis of a systemic underestimation of structural risk within the country.

Methodology.

Scope and Limitations of the Model

The developed model is solely applicable to the analysis of structural fires within urban environments and excludes forest fires, vehicle fires, or other types of incidents.

Additionally, the results must be interpreted while taking into account the following restrictions:

- Reliance on the quality of the local report.
- Inability to incorporate cities lacking access to information.
- Temporal variability among the reference years of the sources.

Despite these limitations, the model serves as a valid and reasonable statistical instrument for approximating the true magnitude of the phenomenon, considering the current state of the information system in Colombia.

Preliminary considerations

Absence of unified national statistics:	The National Fire Department has not released updated data since 2020, hindering a comprehensive understanding of the country.
Fragmented and non-standardized data:	Each entity (DNBC, UNGRD, local fire departments) employs distinct methodologies for reporting, complicating analysis and comparison.
Publication is not mandatory.	There is no uniform format or regulatory requirement for reporting statistics, resulting in a lack of clarity and fragmentation of data.
Restricted access to information:	Data capture is intricate, and the structure lacks uniformity.
Low perception of fire risk:	Public awareness of fire risk remains low, as evidenced by regulatory non-compliance and hazardous practices.
Implications for Risk Management:	In the absence of reliable data, designing effective policies and preventive strategies becomes challenging.

Example of Distortion in National Statistics – The Pereira Case.

Comparison between official DNBC statistics and local operational data:

DNBC (National Single Registry of Statistics – RUE 2018–2026):

- 134 structural fires over a span of 9 years
- Average: 15 annually

Official Fire Department of Pereira (2023–2025):

- 215 structural fires over a span of three years
- Average: 71 annually

Difference:
The actual figure is 4.7 times greater than that recorded in the national database.

Example of Distortion in National Statistics – The Barranquilla Case.

Comparison between official DNBC statistics and local operational data:

DNBC (National Single Registry of Statistics – RUE 2018–2026):

- Twenty-one structural fires reported over a span of nine years.
- Average of 2.3 fires annually

Official Fire Department of Barranquilla. (2024):

- 404 structural fires in a single year (2024)

Difference:

The actual figure for 2024 is 176 times greater than the projected annual figure from the DNBC.

Example of Distortion in National Statistics – Cúcuta Case.

Response from the Cúcuta Volunteer Fire Brigade:

- The institution asserts: “As an organization, we are committed to protecting the confidentiality and security of the technical information gathered during our interventions. This data constitutes a vital component of the municipality's risk and care statistics, which are governed by confidentiality protocols. Access to these records is limited to ensure the security and integrity of the city's official data.”
- In summary, it refuses to disclose operational statistics regarding structural fires.
- It argues that the information is subject to mandatory confidentiality and custody requirements.
- It signifies that the municipality's data is governed by confidentiality protocols.

Consequence for national assessment:

- Cúcuta, a city with a population exceeding 800,000 and serving as the capital of a department, lacks statistical data. Consequently, it is challenging to ascertain the precise extent of the structural risk.
- The absence of data constrains the quality of the national analysis and distinctly illustrates statistical fragmentation.

Limitations in the Quality of Information and the Statistical Methods Employed by ANRACI

Significant challenges in national data sources:

- Official statistics reveal considerable discrepancies, as illustrated by the cases presented, in which local records substantially surpass the data reported at the national level.
- The nation's statistical infrastructure significantly underrepresents the actual risk, constraining the ability to analyze and develop effective public policies.
- The lack of a cohesive, obligatory, and standardized reporting system results in significant deficiencies in the accessible information.
- The national statistical system exhibits significant structural deficiencies; even prominent cities fail to report or authorize the dissemination of information, as exemplified by Cúcuta.
- This scenario illustrates that the issue extends beyond mere underreporting, as seen in Pereira and Barranquilla; it also encompasses the absence of accessible data in certain cities, further exacerbating the fragmentation of the national landscape.

It is essential to manage the figures according to technical criteria.

- Given these limitations, it is crucial to interpret the figures with caution, taking into account the variability in report quality across different cities and regions.
- The data should be analyzed using a comparative approach while consistently verifying its alignment with operational reality.

Limitations in the Quality of Information and the Statistical Methods Employed by ANRACI

Data Cleaning and Statistical Modeling Process Conducted by ANRACI:

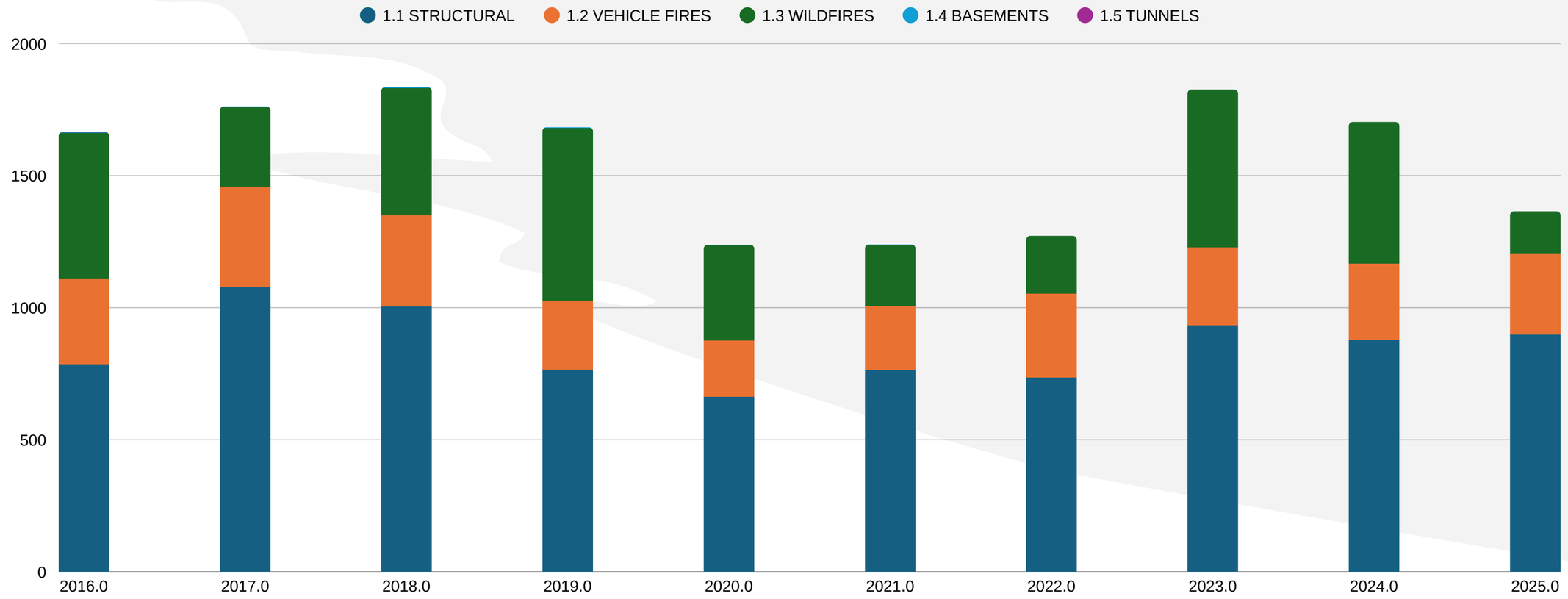
- ANRACI conducted a thorough process of comparison, validation and data cleaning, directly verifying the information with local fire departments.
- A proprietary statistical model was developed to address inconsistencies in national data, underpinned by credible primary sources.
- The analysis was constructed on the foundation of the urban population, where structural risk is significantly concentrated, employing a proportional approach grounded in observed data.

General interpretation of the statistical summary:

- The national statistical infrastructure significantly underrepresents the risk of structural fires by relevant magnitudes, as evidenced by the analyzed cases.
- The absence of standardized reporting hinders the compilation of comprehensive and trustworthy historical data series.
- Consequently, the methodological approach employed by ANRACI has been notably meticulous, honoring primary sources and engaging in comparative analysis with both national and international data, thereby ensuring that the final outcomes are coherent and aligned with the operational realities of the country.


Bogotá
899 structural fires in
2025.

Fire Behavior in Bogotá: 2016 - 2025



According to data from the Bogotá Fire Department.

Fires in Bogotá 2025

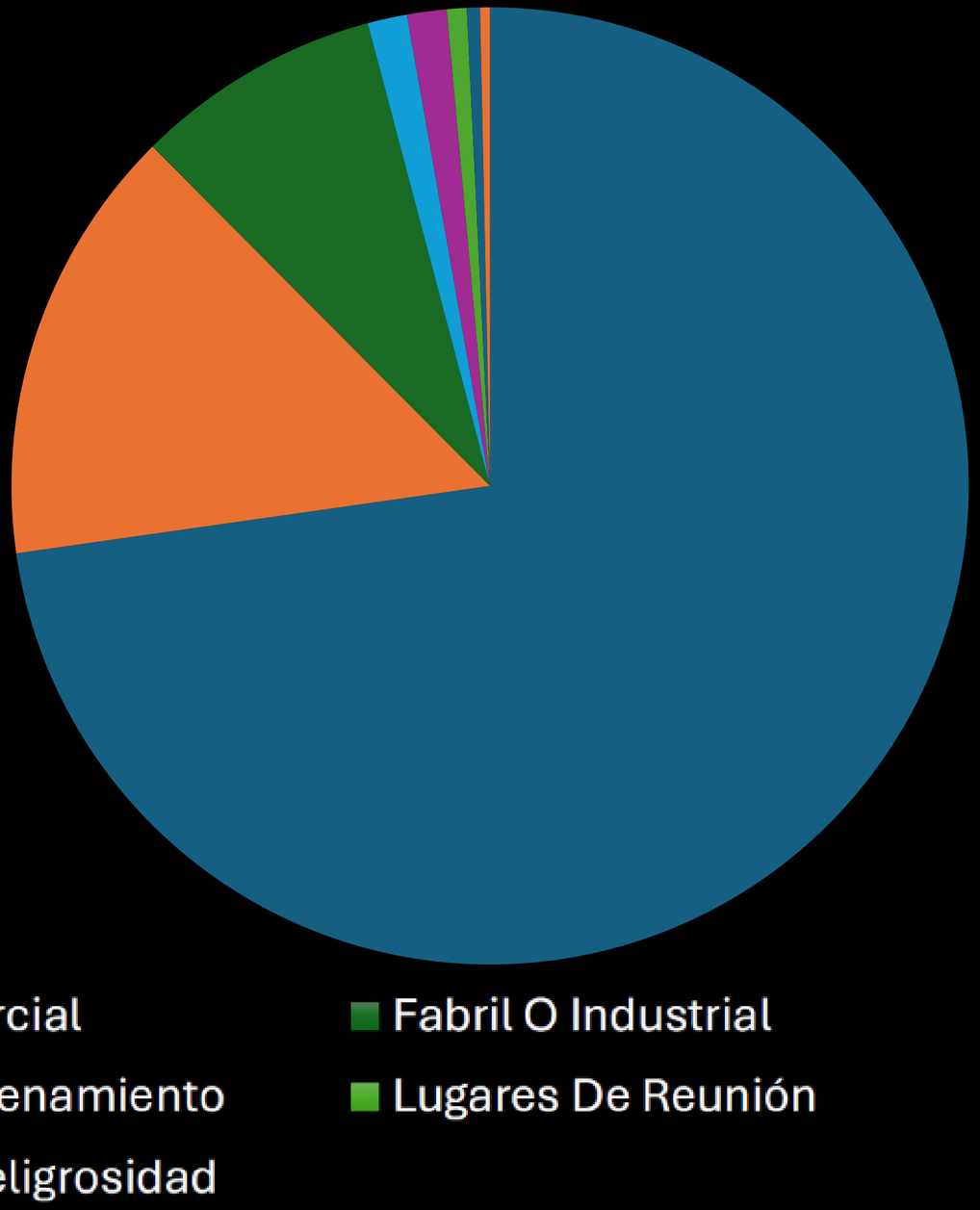
FIRE CLASSIFICATION	
Class	Number
Structural	899
Vehicular	308
Wildfires	158
Basements	2
Total	1367

According to data from the Bogotá Fire Department.

Locality	Number
Kennedy	138
Suba	137
Ciudad Bolívar	130
Engativá	124
Bosa	115
San Cristóbal	85
Usaquén	82
Usme	81
Fontibón	70
Puente Aranda	65
Rafael Uribe	54
Los Mártires	52
Teusaquillo	42
Chapinero	42
Barrios Unidos	40
Tunjuelito	38
Santa Fe	36
Antonio Nariño	29
Candelaria	6
Outside Bogotá D.C.	1
Total	1367

Structural fires in Bogotá, 2025

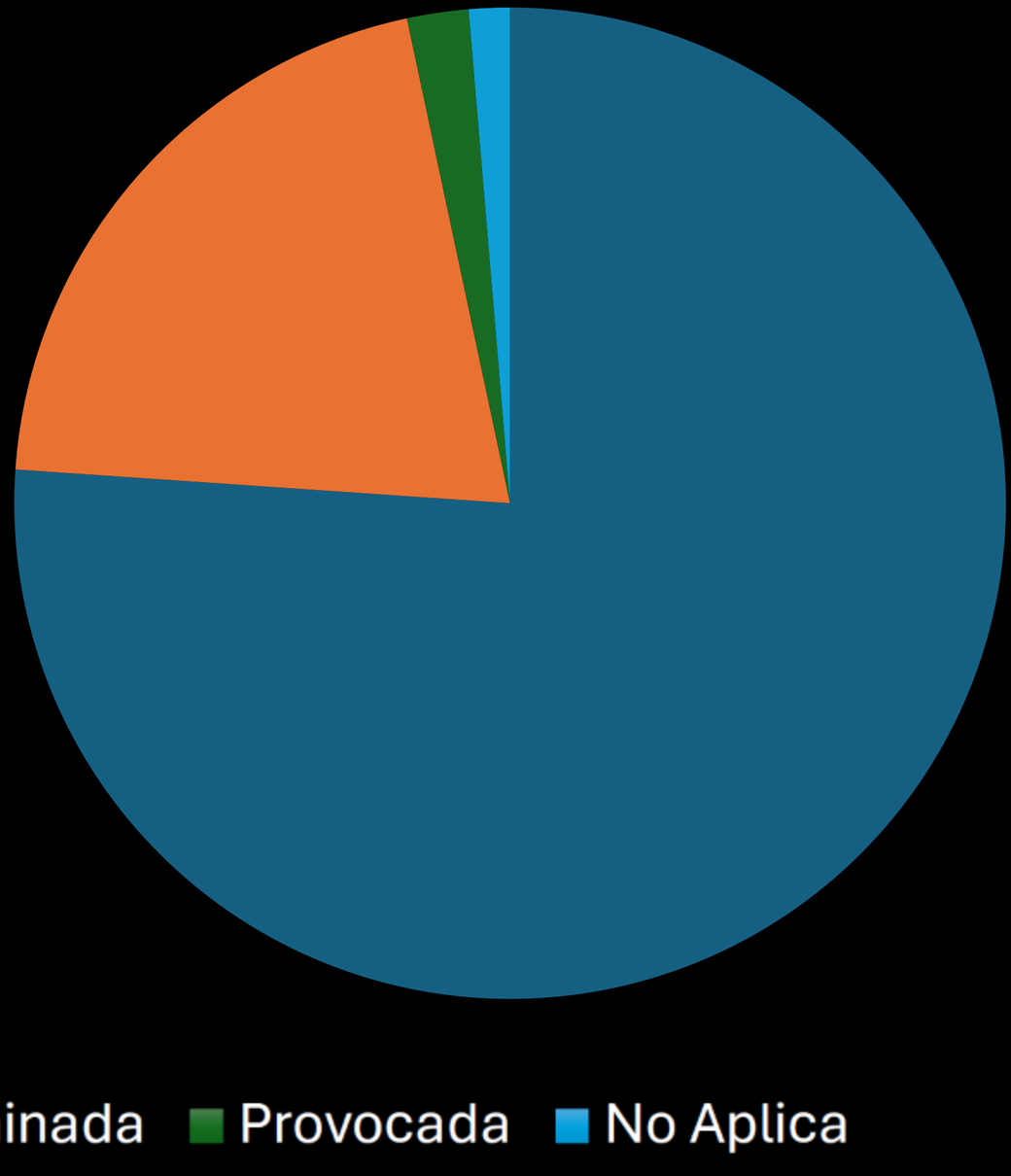
USE	AMOUNT
Residential	654
Commercial	133
Industrial	75
Institutional	12
Storage	12
Meeting Venues	6
Special Occupancies	4
High Hazard	3
Total	899



According to data from the Bogotá Fire Department.

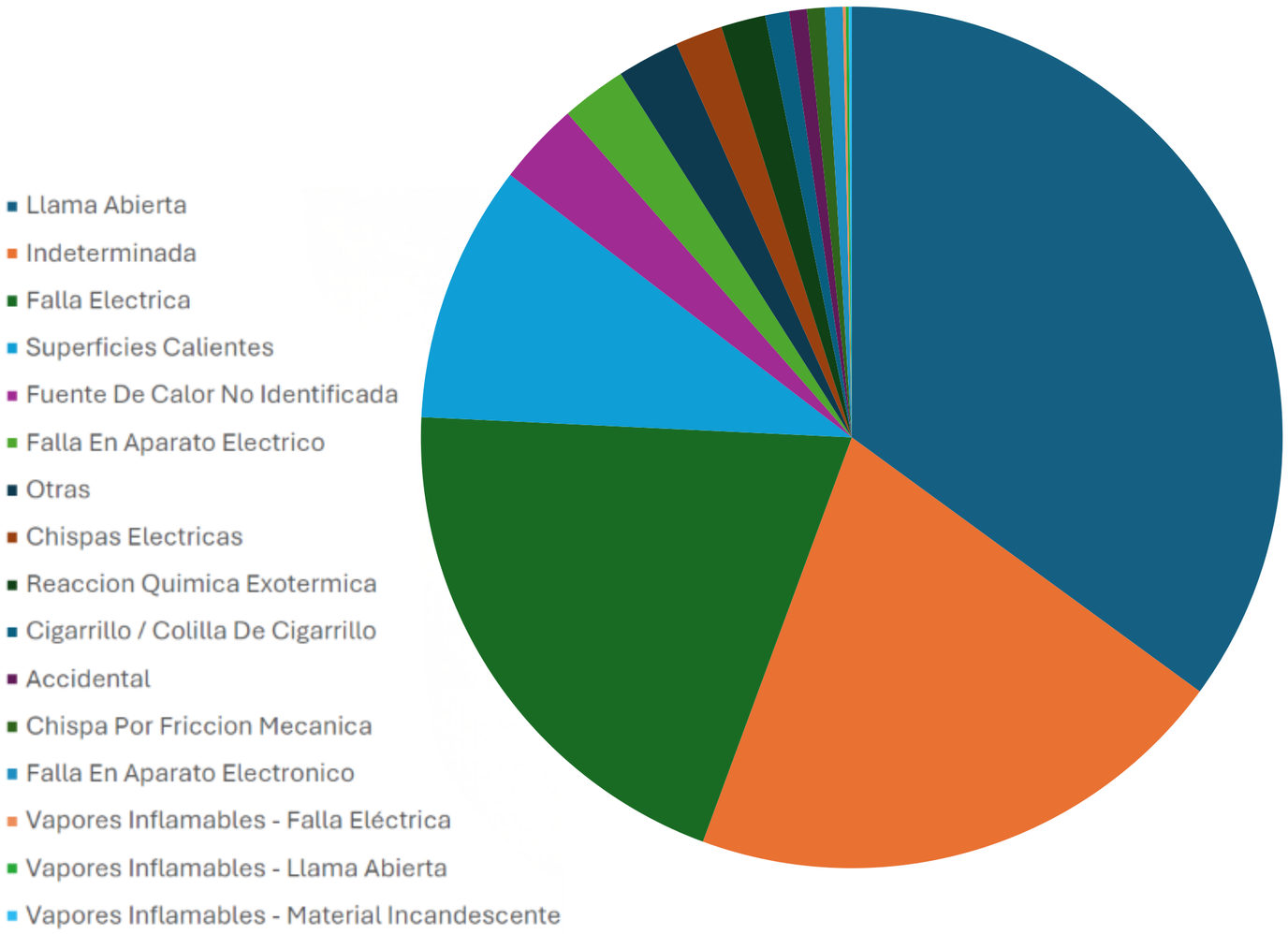
Structural fires in Bogotá, 2025

CAUSE	NUMBER
Accidental	684
Indeterminate	185
Intentional	18
Other	12
Total	899



According to data from the Bogotá Fire Department.

Structural fires in Bogotá, 2025



Cause	Number
Open Flame	315
Indeterminate	185
Electrical Malfunction	181
Hot Surfaces	87
Unidentified Thermal Source	28
Electrical Device Malfunction	22
Other	21
Electrical Sparks	16
Exothermic Reaction	15
Cigarette / Cigarette Remnant	8
Accidental	6
Spark from Mechanical Friction	6
Electronic Device Malfunction	6
Flammable Vapors - Electrical Malfunction	1
Flammable Vapors - Open Flame	1
Flammable Vapors - Smoldering Material	1

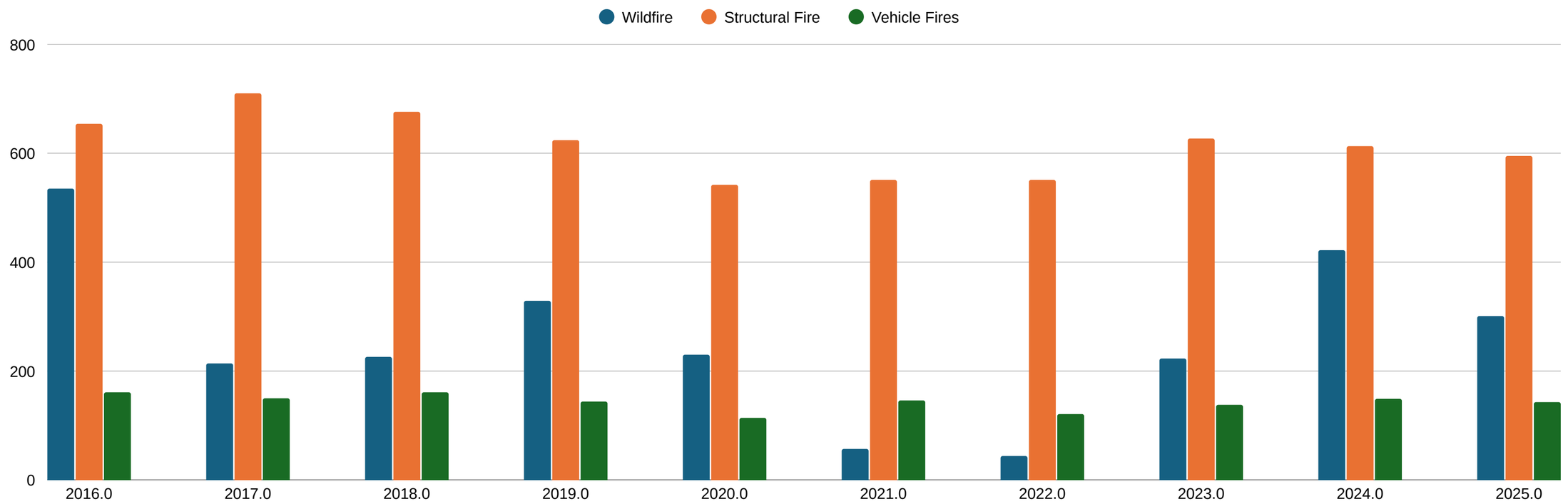
According to data from the Bogotá Fire Department.

Common characteristics of these areas.

- **Elevated population density:**
  - Kennedy, Suba, and Ciudad Bolívar are among the most densely populated localities in Bogotá.
- **Mixed land uses:**
  - Residential, commercial, and industrial zones coexist within compact areas.
- **Deteriorating infrastructure:**
  - In traditional neighborhoods, numerous structures are historic.
- I**ntense commercial activity:**
  - Certain locations exhibit a significant concentration of workshops, factories, and informal commerce.
- **Presence of informal settlements:**
  - In certain regions, such as Bosa and Kennedy, there exist structures that do not adhere to technical regulations.


Medellín
595 structural fires in
2025

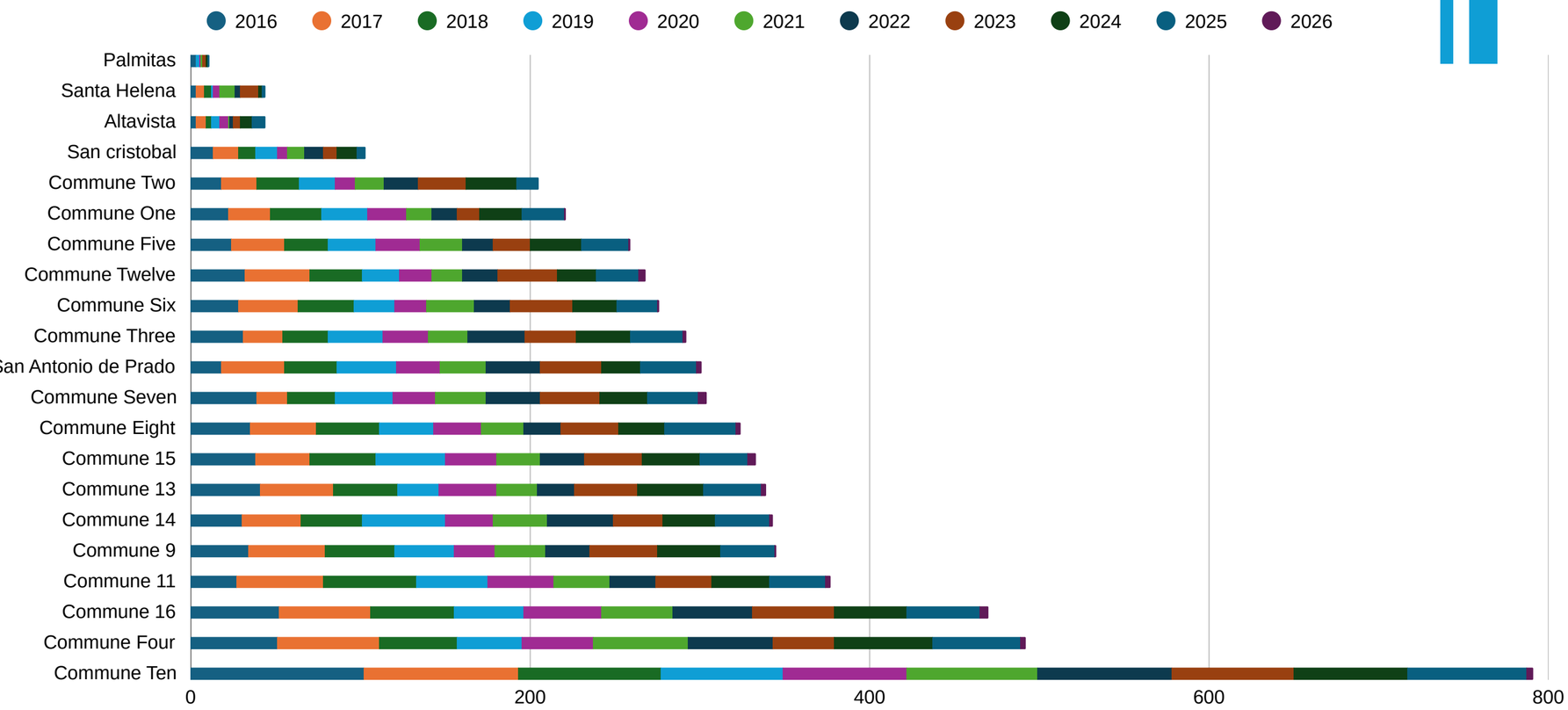
Fires in Medellín.



According to data from DAGRD.

Structural Fires in Medellín

Top 5 Communes with the Highest Impact	
District	**Total fires**
Commune 10	791
Commune 4	489
Commune 16	468
Commune 11	379
Commune 9	347



According to data from DAGRD.

Common traits of these communes.

- **Elevated urban and population density**
  - Comuna 10 (La Candelaria) and Comuna 4 (Aranjuez) are situated in the urban core of Medellín, characterized by a dense population and a vibrant array of commerce and services.
- **Aging or hybrid infrastructure.**
  - Numerous structures in these Commune are either aged or serve mixed purposes (residential-commercial), thereby heightening the risk associated with outdated or overburdened electrical systems.
- **Intensive commercial and institutional engagement.**
  - Comuna 10 encompasses the city center, featuring offices, shops, restaurants, and warehouses.
  - Comuna 11 (Laureles) and Comuna 9 (Buenos Aires) also boast vibrant commercial zones.
- **Presence of at-risk sectors.**
  - Commune 4 and Commune 16 (Belén) encompass neighborhoods characterized by varied socioeconomic conditions, which may result in limited access to fire prevention and control measures.
- **History of recurrent emergencies.**
  - These communes exhibit a significant annual recurrence, signifying enduring risk patterns.


Antioquia.
101 structural fires in
2024
Renunciamos & Viajamos

Panorama of Antioquia (Excluding Medellín)

Top 10 municipalities and their shared characteristics

Municipality	Structural Fires	Characterization
Bello	28	Elevated population density, swift urbanization, industrial operations
Caucasia	13	At-risk infrastructure, warm climate, regional commercial center
Itagüí	13	Industrial area, elevated urban density, vibrant commerce
Apartadó	12	Economic hub of Urabá, urban expansion, diverse socioeconomic conditions
Envigado	12	Accelerated urban development, residential and commercial zones
San Juan de Urabá	12	Coastal municipality, restricted access, limited institutional capacity
Puerto Triunfo	11	Tourist destination and rural region, constrained infrastructure, arid climate
Rionegro	11	Rapid urban expansion, commercial and residential zones
Turbo	11	Seaport, elevated commercial activity, structural susceptibility
Urrao	11	Rural municipality, recent urban development, mixed infrastructure

These municipalities exhibit a high population or urban density, thereby elevating exposure to risk.

Furthermore, they cultivate a robust economic activity—industrial, commercial, or tourist—that necessitates increased utilization of electrical installations, storage of flammable materials, and a concentration of individuals.

Institutional capacity for risk management and incident reporting differs across municipalities, potentially affecting the frequency and visibility of documented cases.

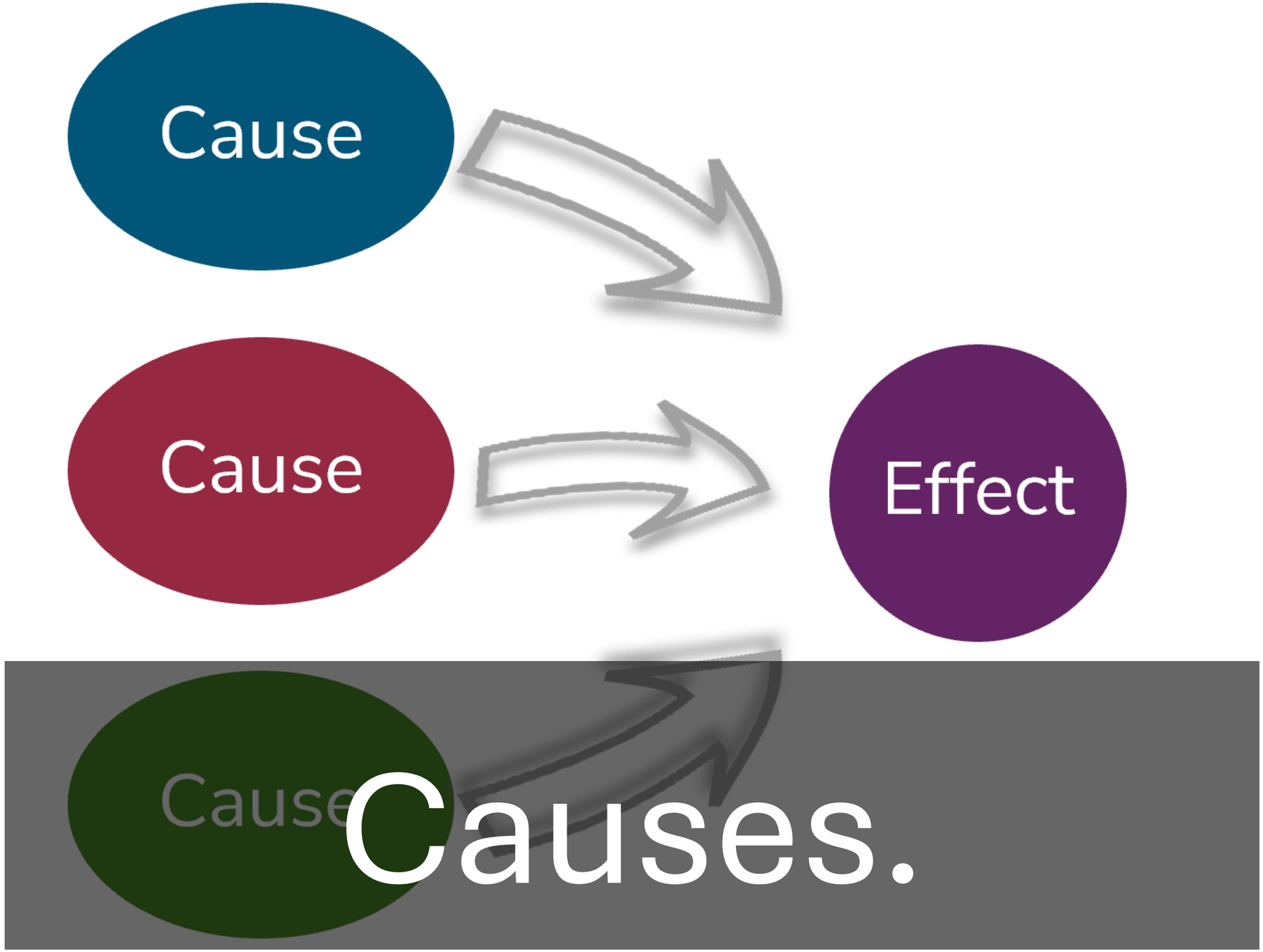
According to data from DAGRAN.

Panorama of Antioquia (Excluding Medellín)

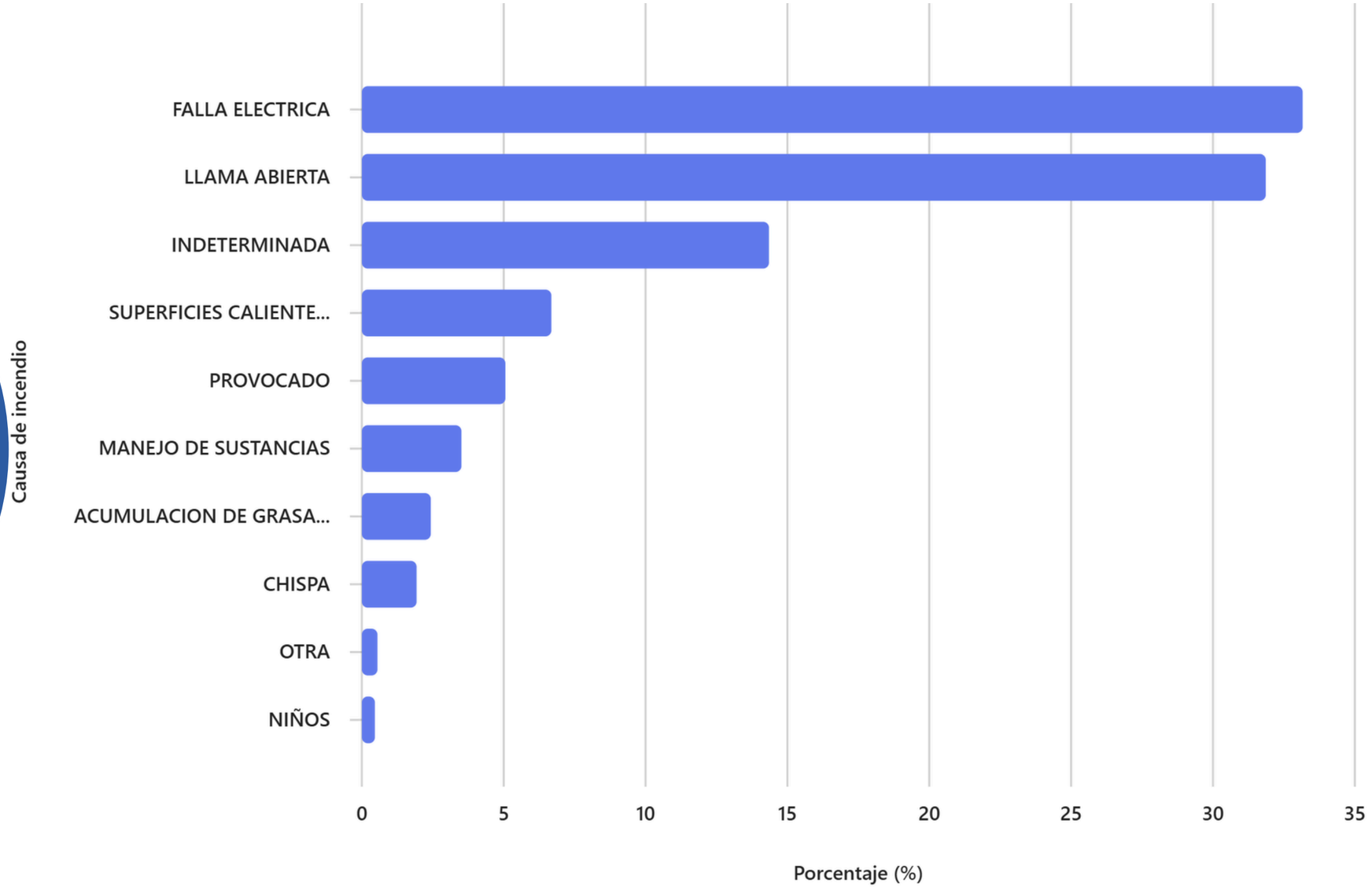
Over the past decade, reports have emerged from 104 municipalities, while 21 municipalities in the department have no recorded incidents of fires. This absence does not imply that no fires took place; rather, it may be attributed to structural factors that restrict the ability to record and report incidents. The municipalities lacking reports exhibit characteristics such as:

- **Low population:** numerous areas have fewer than 10,000 inhabitants.
- **Remote locations:** they are predominant in subregions such as the West, North, and Southwest.
- **Challenging access:** over fifty percent have restricted or inadequately maintained access routes.
- **Low or medium levels of development,** which may indicate reduced institutional capacity to report emergencies.

According to data from DAGRAN.

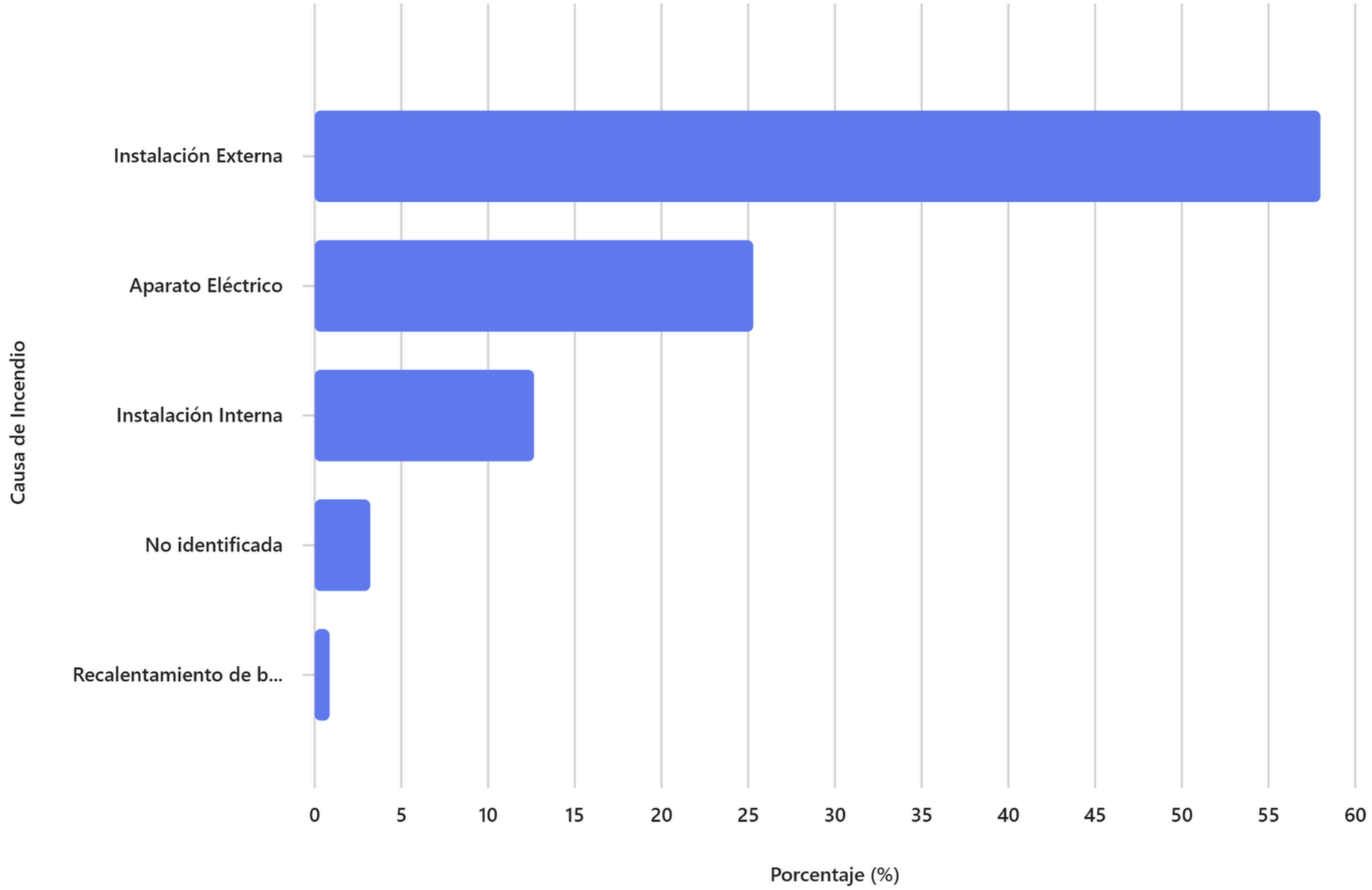

Cause
Cause
Effect
Cause
Causes.

Causes of Structural Fires



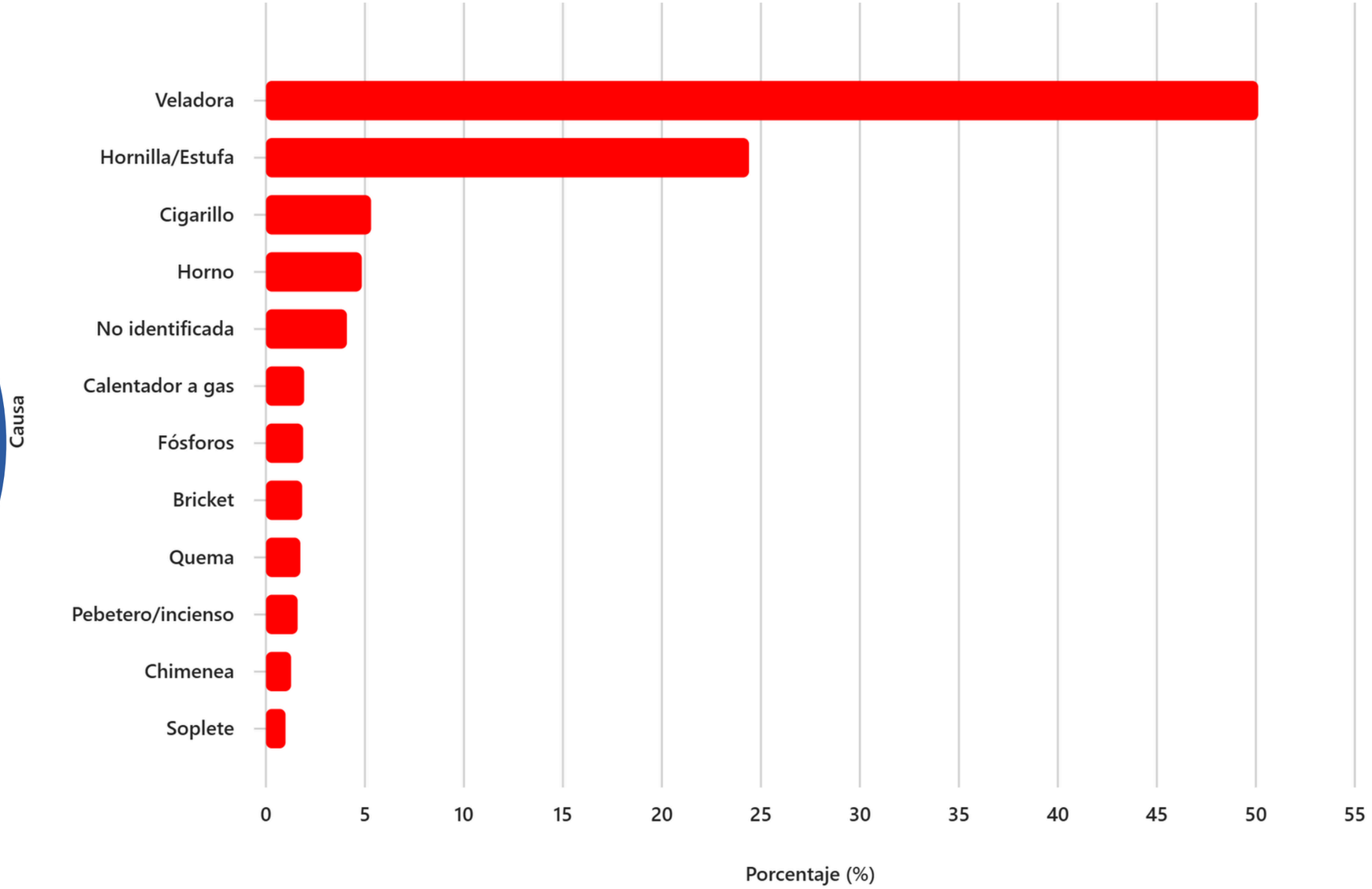
According to data from the study conducted by the Bogotá Fire Department, Characterization and Risk Scenarios: https://www.bomberosbogota.gov.co/caracterizacion-y-escenarios-riesgo

Structural fires resulting from electrical malfunctions



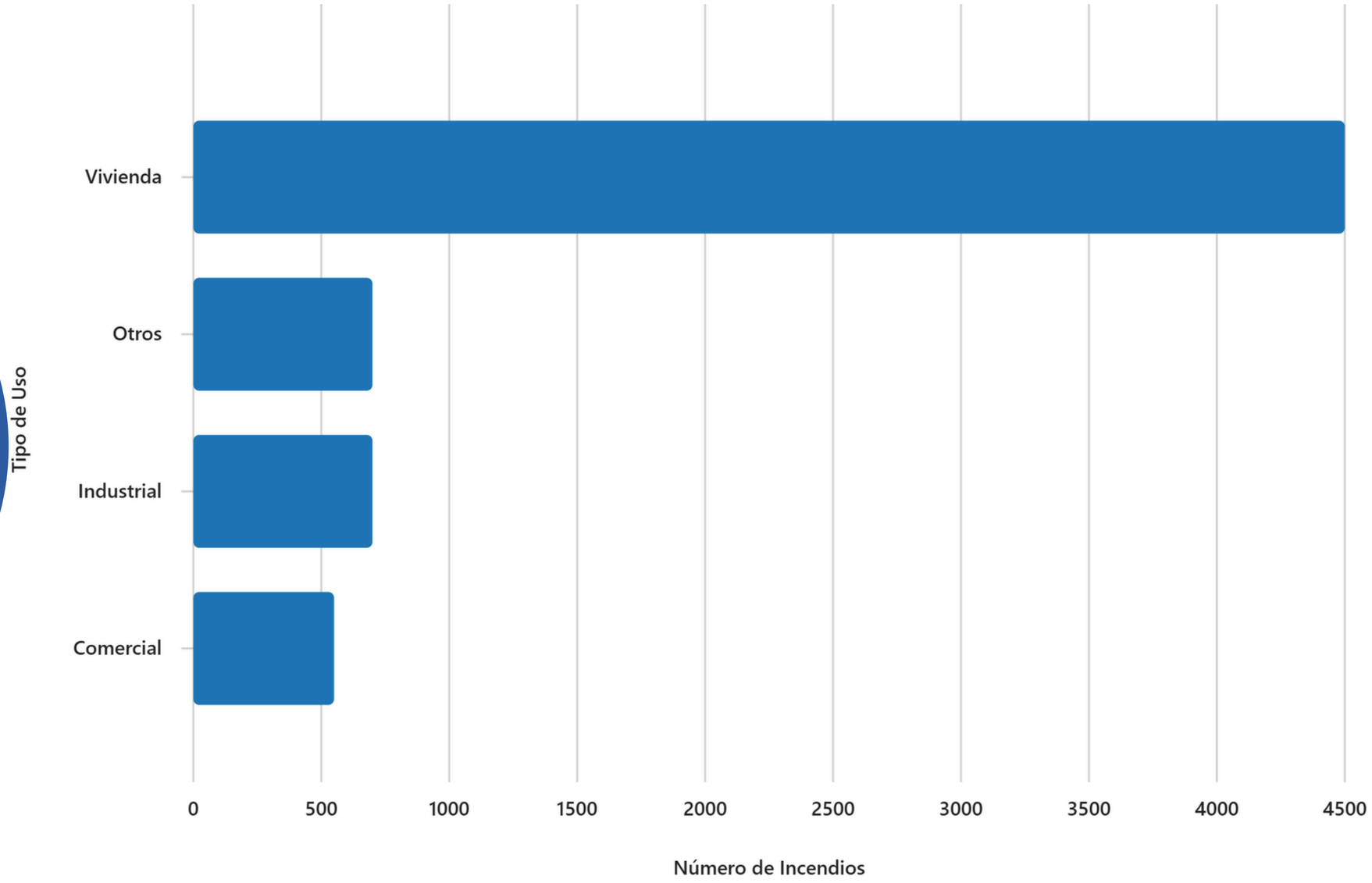
According to data from the study conducted by the Bogotá Fire Department, Characterization and Risk Scenarios: https://www.bomberosbogota.gov.co/caracterizacion-y-escenarios-riesgo

Structural fires resulting from open flames.



According to data from the study conducted by the Bogotá Fire Department, Characterization and Risk Scenarios: https://www.bomberosbogota.gov.co/caracterizacion-y-escenarios-riesgo

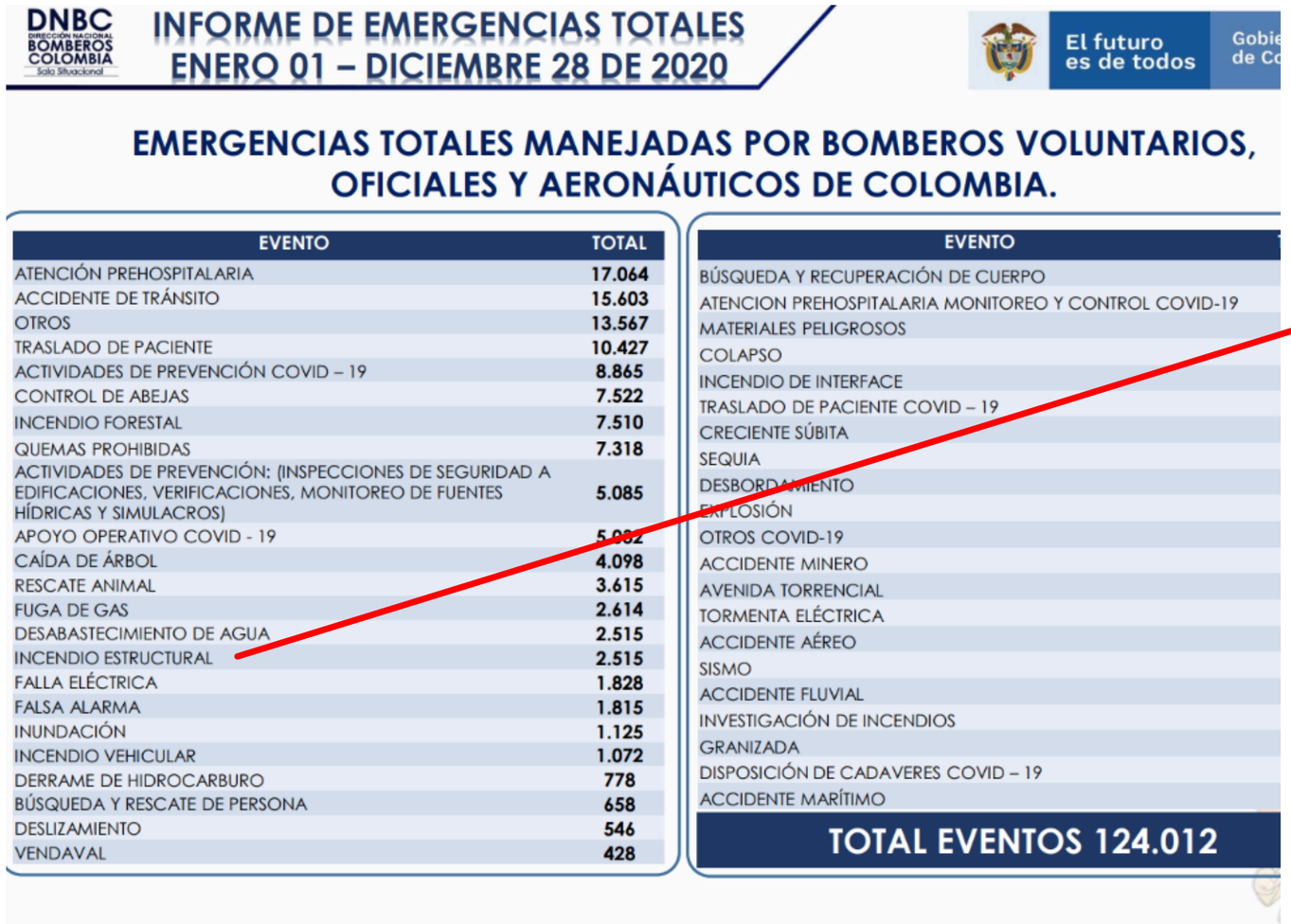
Fires by Building Occupancy Type.



According to data from the study conducted by the Bogotá Fire Department, Characterization and Risk Scenarios: https://www.bomberosbogota.gov.co/caracterizacion-y-escenarios-riesgo


Colombia.

Overview from the National Fire Department of Colombia (2020)



DNBC DIRECCIÓN NACIONAL BOMBEROS COLOMBIA Sala Situacional

INFORME DE EMERGENCIAS TOTALES ENERO 01 – DICIEMBRE 28 DE 2020

El futuro es de todos

EMERGENCIAS TOTALES MANEJADAS POR BOMBEROS VOLUNTARIOS, OFICIALES Y AERONÁUTICOS DE COLOMBIA.

EVENTO	TOTAL
ATENCIÓN PREHOSPITALARIA	17.064
ACCIDENTE DE TRÁNSITO	15.603
OTROS	13.567
TRASLADO DE PACIENTE	10.427
ACTIVIDADES DE PREVENCIÓN COVID – 19	8.865
CONTROL DE ABEJAS	7.522
INCENDIO FORESTAL	7.510
QUEMAS PROHIBIDAS	7.318
ACTIVIDADES DE PREVENCIÓN: (INSPECCIONES DE SEGURIDAD A EDIFICACIONES, VERIFICACIONES, MONITOREO DE FUENTES HÍDRICAS Y SIMULACROS)	5.085
APOYO OPERATIVO COVID - 19	5.082
CAÍDA DE ÁRBOL	4.098
RESCATE ANIMAL	3.615
FUGA DE GAS	2.614
DESABASTECIMIENTO DE AGUA	2.515
INCENDIO ESTRUCTURAL	2.515
FALLA ELÉCTRICA	1.828
FALSA ALARMA	1.815
INUNDACIÓN	1.125
INCENDIO VEHICULAR	1.072
DERRAME DE HIDROCARBURO	778
BÚSQUEDA Y RESCATE DE PERSONA	658
DESLIZAMIENTO	546
VENDAVAL	428

EVENTO
BÚSQUEDA Y RECUPERACIÓN DE CUERPO
ATENCION PREHOSPITALARIA MONITOREO Y CONTROL COVID-19
MATERIALES PELIGROSOS
COLAPSO
INCENDIO DE INTERFACE
TRASLADO DE PACIENTE COVID – 19
CRECIENTE SÚBITA
SEQUIA
DESBORDAMIENTO
EXPLOSIÓN
OTROS COVID-19
ACCIDENTE MINERO
AVENIDA TORRENCIAL
TORMENTA ELÉCTRICA
ACCIDENTE AÉREO
SISMO
ACCIDENTE FLUVIAL
INVESTIGACIÓN DE INCENDIOS
GRANIZADA
DISPOSICIÓN DE CADAVERES COVID – 19
ACCIDENTE MARÍTIMO

TOTAL EVENTOS 124.012

DESABASTECIMIENTO DE AGUA 2.515
INCENDIO ESTRUCTURAL 2.515
FALLA ELÉCTRICA 1.828

Structural fires in 2020.

City – Population.	Structural Fires
Bogotá - 8,034,649	664
Medellín - 2,529,403	542
Cali - 2,471,474	442
Antioquia - 4,148,527	49
Colombia - 51.874.024	2.515
TOTAL Bogotá + Medellín + Cali + Antioquia	1697

This sample, representing 42.09% of the nation's urban population, documented 1,697 fires in 2020.

Projected at 100%, this indicates approximately 4,000 structural fires annually.

Recent data on structural fires.

Location	Population	Population Share	Reference year	Structural fires	Average daily fire incidents	Fires per 100,000 residents
Colombia	51.874.024	100,00%	2.020	2515	6,89	4,85
Bogotá	8.034.649	15,49%	2.025	899	2,46	11,19
Cali	2.471.474	4,76%	2.025	560	1,53	22,66
Medellín	2.529.403	4,88%	2.025	595	1,63	23,52
Antioquia	4.148.527	8,00%	2.024	101	0,28	2,43
Barranquilla	1.327.209	2,56%	2.025	497	1,36	37,45
Pereira	481.768	0,93%	2.024	83	0,23	17,23
Bucaramanga	607.428	1,17%	2.025	190	0,52	31,28
Cartagena de Indias	1.036.412	2,00%	2.025	244	0,67	23,54
Cúcuta	806.378	1,55%	2.022	95	0,26	11,78
Valledupar	490.075	0,94%	2.025	102	0,28	20,81
Ibagué	541.101	1,04%	2.025	179	0,49	33,08

An average of 9.71 fires occur daily in the cities within the sample.

National Overview of Structural Fires

The eleven locations examined collectively report an average of 9.71 structural fires daily.

It is confirmed that the majority of the risk is concentrated in urban centers.

Colombia comprises 1,103 municipalities, including departmental capitals, intermediate municipalities, and other populated centers, resulting in a risk that is distributed across the nation.

In rural regions, the risk of structural fires is diminished, yet it does not vanish entirely. Wildfires are more common in these locales.

National Overview of Structural Fires – Assessment.

Factors taken into account in the analysis:

- Territorial allocation
- Population density
- Degree of industrialization
- Accessible statistics
- Building typology

Assumptions and Methodology of the Calculation Framework:

- Structural fire risk is predominantly urban (Approximately 78.70% of the total Colombian population).
- The 11 localities examined account for approximately 55.05% of the national urban population.
- The sample produces 9.71 fires daily, a statistically sound figure for extrapolation.
- A proportional model grounded in population inference is utilized:

National Urban Structural Fire Rate = 9.71 fires/day ÷ 55.05% = **17.64 fires/day**

Final result:

Approximately 17.64 structural fires occur daily in urban areas, totaling around 6,440 structural fires annually.

National Overview of Structural Fires – Assessment.

Based on the constructed statistical model, which considers the urban population of Colombia (approximately 78.70%) and utilizes actual data from 11 locations representing 55.05% of this population, it is estimated that the national urban average is situated at:

≈ 17.64 structural fires daily

(equivalent to approximately 6,440 structural fires annually)

Results.

Availability and quality of statistical data

The initial significant finding of the research is the lack of a cohesive and dependable national system for structural fire statistics.

The examination of national sources reveals that the available information exhibits considerable temporal gaps, methodological discrepancies, and substantial underreporting. Notably, the National Fire Department of Colombia has not released updated statistics on structural fires since 2020, hindering ongoing and comparative analysis at the national level.

This situation stands in stark contrast to the operational data maintained by local fire departments, which systematically document the incidents they respond to within their respective jurisdictions. Similarly, instances were noted where certain capital cities fail to provide statistical information due to institutional or administrative constraints, as exemplified by the Volunteer Fire Department of Cúcuta.

This phenomenon creates a structural gap that restricts the capacity to comprehensively characterize risk at the national level.

Finding 1: The national statistical infrastructure underrepresents and fragments data on structural fires, rendering it impossible to accurately and consistently assess their actual incidence.

Results.

Evidence of underreporting in national statistics.

The disparity between national records and local operational data reveals notable variations in the reported incidence of structural fires.

In the case of Pereira, the national database documents 134 structural fires over a nine-year span, averaging 15 incidents per year. In contrast, operational data from the official fire department reveal 215 structural fires within a mere three-year period (2023–2025), resulting in an annual average of 71 incidents.

This indicates a disparity of 4.7 times in relation to the national figure.

Even more critically, national statistics indicate that Barranquilla experienced 21 structural fires over a span of nine years (averaging 2.3 fires annually), whereas the local fire department documented 404 structural fires within a single year (2024).

This disparity represents a factor of 176 between the implicit national figure and the operational reality.

Finding 2: There exists a significant and systematic underreporting of structural fires in national statistics, with discrepancies reaching orders of magnitude when compared to actual local records.

Results.

Behavior of structural fires in Bogotá

By 2025, the Official Fire Department of Bogotá documented 899 structural fires, which corresponds to a daily average of 2.46 incidents.

The temporal analysis of the period 2016–2025 reveals a consistent occurrence of structural fires, with annual figures ranging from 663 to 1,078 incidents. This indicates that these are not isolated occurrences but rather a persistent structural phenomenon.

From a territorial perspective, the areas with the highest incidence of structural fires in 2025 were Kennedy, Suba, Ciudad Bolívar, Engativá, and Bosa.

These localities exhibit shared characteristics, including elevated population density, diverse land uses, aging infrastructure, significant commercial activity, and the existence of informal settlements.

Finding 3: In Bogotá, structural fires exhibit a significant annual recurrence, predominantly occurring in areas characterized by high urban density and intricate construction conditions.

Results.

Distribution by building usage and causes in Bogotá

By 2025, 72.7% of structural fires in Bogotá took place in residential buildings (654 incidents), followed by commercial (133) and industrial (75) properties.

This confirms that structural risk primarily impacts homes that are permanently occupied.

Concerning the origin of the fires, the data indicates that the majority are attributed to accidental occurrences, particularly emphasizing: open flames, electrical malfunctions, and hot surfaces.

Electrical malfunctions and improper utilization of ignition sources frequently occur, underscoring the presence of enduring urban risk patterns.

Finding 4: Structural fires predominantly occur in residential buildings and are mainly linked to recurring accidental causes.

Results.

Behavior of structural fires in Medellín

By 2025, Medellín had documented 595 structural fires, exhibiting a consistent annual occurrence over the past decade.

The commune analysis reveals a more significant impact in commune 10 (La Candelaria), 4 (Aranjuez), 16 (Belén), 11 (Laureles), and 9 (Buenos Aires).

These communes are distinguished by a concentration of commercial, institutional, and residential activities, alongside mixed infrastructure and, in certain areas, aging buildings with overloaded electrical systems.

Finding 5: In Medellín, structural fires are predominantly located in central communes and those with high economic activity, exhibiting a consistent historical recurrence.

Results.

Overview of the Department of Antioquia.

In Antioquia (excluding Medellín), 101 structural fires were documented in 2024, spanning 104 municipalities. However, 21 municipalities were identified as having no reported fires, which does not indicate a lack of fires but rather constraints in reporting capabilities.

The municipalities with the highest number of events exhibit characteristics such as elevated local urban density, rapid growth, significant industrial or commercial activity, and constrained institutional capacities for managing reports.

Finding 6: The lack of records in municipalities should not be construed as an absence of risk, but rather as an institutional and statistical limitation.

Results.

National consolidation of the urban dataset.

The eleven locations examined collectively report an average of 9.71 structural fires daily, accounting for 55.05% of the nation's urban population.

This outcome affirms that structural risk is primarily concentrated in urban regions.

The geographical distribution of risk indicates that, while the frequency is reduced in rural regions, the phenomenon is not confined to major metropolitan areas and also encompasses intermediate municipalities.

Finding 7: Structural fires represent a prevalent urban issue, not merely a concern confined to major metropolitan areas.

Results.

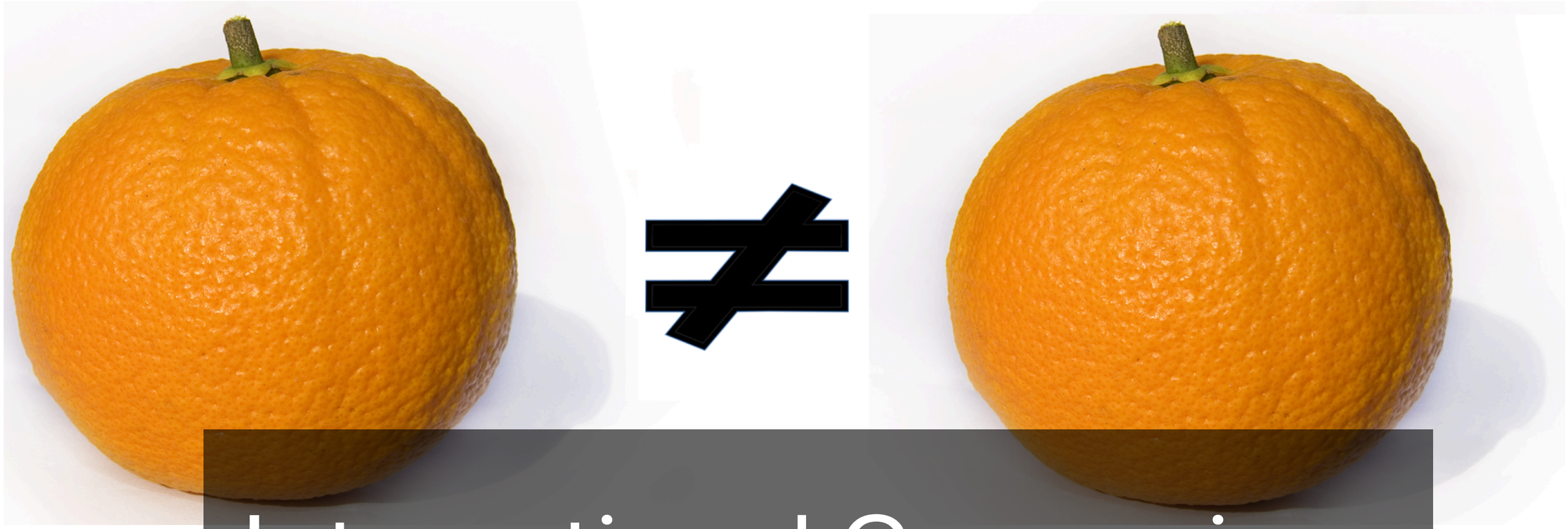
National estimation through urban inference

By utilizing the urban population inference model, an estimated average of 17.64 structural fires occur daily in urban areas across the nation.

This corresponds to roughly 6,440 structural fires annually.

The resulting rate is approximately 12 structural fires per 100,000 inhabitants, a figure that is considerably higher than what has been historically reported by official national statistics.

Finding 8: The actual incidence of structural fires in Colombia significantly surpasses official figures and aligns more closely with international standards once underreporting is addressed.



International Comparison

.

International Comparison.

When comparing the results obtained with international statistics, it is evident that the official values historically reported by Colombia are significantly lower than those of countries with more established information systems.

With the estimate formulated in this study, Colombia aligns more closely with the international ranges observed; however, significant disparities remain in comparison to countries such as the United States or the Czech Republic, where data collection is more rigorous and standardized.

Data for comparison, 2020 statistics.
(International Association of Fire and Rescue Services)

Country	Inhabitants	Area	Fires	Structural fires	Structural fires per 100,000 residents	Fires per 100,000 residents
USA	333.287.557	9.826.675	1.388.500	470.000	141	417
Czechia	10.526.073	78.866	34.226	5.066	48	325
Uruguay	3.422.794	176.215	24.701	N/D	N/D	722
Colombia (DNBC 2020)	51.874.024	1.141.748	18.675	2.515	5	36
Colombia (Anraci Statistics 2025)	51.874.024	1.141.748	22.600*	6.440	12	44

- Maintaining the same number of other fires (16,160) as reported by the DNBC for the year 2020.

Data for comparison.

World Firefighter Statistics from the International Association of Fire and Rescue Services. (2023)

USA.	12,592 emergency calls per 100,000 residents. 412 fires per 100,000 residents. (1,388,500 fires) 139 structural fires per 100,000 residents. (470,000 structural fires)
Czech Republic.	29,328 emergency calls per 100,000 residents. 316 fires per 100,000 residents. (34,226 fires) 46 structural fires per 100,000 residents (5,066 structural fires)
Uruguay.	722 fires per 100,000 inhabitants. (24,701 fires)
Colombia (DNBC data, 2020).	36 fires per 100,000 residents. (18,675 fires) 5 structural fires per 100,000 residents. (2,515 structural fires)

Results.

International comparison of outcomes

When comparing the results obtained with international statistics, it is evident that the developed estimate significantly narrows the gap between Colombia and countries with established statistical systems, such as the United States and the Czech Republic.

While official Colombian statistics indicate a rate of 5 structural fires per 100,000 inhabitants, estimates derived from actual data suggest the country experiences approximately 12 fires per 100,000 inhabitants, a figure that aligns more closely with international evidence.

Finding 9: International comparisons indicate that national historical figures do not accurately represent the true scale of the phenomenon.

Conclusions.

The current research has successfully demonstrated, utilizing primary data and a rigorous statistical methodology, that the incidence of structural fires in Colombia has historically been significantly underestimated.

The official statistics currently available do not accurately represent the true scale of the phenomenon, primarily due to the fragmentation of information, consistent underreporting, and the absence of a cohesive and standardized national reporting system.

A comparative analysis of national statistics and operational data from local fire departments revealed significant discrepancies, in some instances reaching orders of magnitude. Documented cases from cities such as Barranquilla and Pereira demonstrate that officially compiled information is inconsistent with the operational realities observed on the ground.

This finding enables us to conclude that the current statistical issue is not isolated or specific, but rather structural and pervasive.

Conclusions.

The findings for cities such as Bogotá and Medellín indicate that structural fires exhibit a consistent annual recurrence, highlighting that these incidents are not isolated occurrences but rather a persistent urban phenomenon.

The sustained prevalence of elevated figures over time substantiates that structural risk is embedded in the very dynamics of cities, especially those characterized by high population density, aging infrastructure, mixed land use development, and significant economic activity.

Similarly, the territorial analysis revealed that structural fires are concentrated in areas, communes, and municipalities with distinct urban characteristics.

In all the cases examined, patterns linked to high occupancy, the coexistence of residential and commercial uses, and diverse construction conditions are consistently observed.

This reinforces the conclusion that structural risk is primarily urban, and that its analysis should be conducted with consideration of these environmental variables.

Conclusions.

Research indicates that, in terms of building usage, the majority of structural fires take place in residential buildings.

This result is particularly significant, as it verifies that the phenomenon directly affects permanently inhabited areas, where individuals are consistently exposed.

The analysis of causes similarly reveals a distinct predominance of accidental events, primarily linked to open flames, electrical failures, and hot surfaces, indicating the presence of recurring and persistent risk patterns within the urban environment.

Conclusions.

At the departmental level, the analysis of Antioquia allowed for the conclusion that the lack of records in several municipalities should not be interpreted as a genuine absence of structural fires.

Conversely, research indicates that the absence of data often stems from limitations in institutional, operational, or reporting capacities.

This finding is significant, as it underscores that structural risk is also evident in intermediate municipalities and regions with lower statistical visibility.

Conclusions.

The consolidation of the examined urban sample, which accounts for over 55% of the national urban population, facilitated the implementation of a population inference model with adequate statistical robustness.

According to this model, it is estimated that approximately 6,440 structural fires occur each year in Colombia, which translates to an average of 17.64 structural fires daily in urban areas.

This figure markedly diverges from the historically reported official values and substantiates the central hypothesis of the study: the true magnitude of the phenomenon has been underestimated.

International comparisons bolster this conclusion.

Conclusions.

When comparing the results obtained with statistics published by international organizations, it is evident that the historical official figures for Colombia are significantly lower than the ranges documented in countries with established information systems.

The estimate produced in this research narrows this gap and positions Colombia within a range that aligns more closely with international evidence, even when accounting for the contextual differences among countries.

Conclusions.

This research illustrates that in situations where official information is fragmented, incomplete, or inadequate, the utilization of primary operational data and urban population inference serves as a valid statistical instrument for approximating the actual incidence of structural fires.

While the model does not seek to establish precise absolute figures, it offers coherent and consistent estimates that are well-supported by empirical evidence.

Conclusions.

In summary, the findings and conclusions of this study enable us to assert that structural fires in Colombia constitute a highly prevalent urban phenomenon, statistically underreported and extensively distributed across the territory.

Comprehending its true magnitude necessitates alternative analytical approaches, such as the one formulated in this research, which rely on operational data and statistical assumptions aligned with the urban realities of the country.

Sources.

Sources Consulted

National Fire Department of Colombia – DNBC.

Special Administrative Unit of the Official Fire Department of Bogotá.

Administrative Department of Disaster Risk Management of Medellín – DAGRD.

Meritorious Volunteer Fire Brigade of Cali.

Administrative Department of Risk Management of Antioquia (DAGRAN).

International Association of Fire and Rescue Services.

Special Administrative Unit of the Official Fire Department of Pereira.

Official Fire Department of Barranquilla.

ANRACI

EL GREMIO DE LA PROTECCIÓN CONTRA INCENDIOS

10 Años
DE PROTECCIÓN