U.S. Fire Administration
Working for a fire-safe America

Firefighter Fatalities in the United States in 2023

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FEMA

Firefighter Fatalities in the United States in 2023

Prepared by
U.S. Department of Homeland Security
Federal Emergency Management Agency
U.S. Fire Administration
National Fire Data Center
and
The National Fallen Firefighters Foundation
firehero.org

In memory of all firefighters who answered their last call in 2023.

To their families and friends.

For their service and sacrifice.

Mission Statement

We support and strengthen fire and emergency medical services and stakeholders to prepare for, prevent, mitigate and respond to all hazards.

U.S. Fire Administration

Working for a fire-safe America

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Acknowledgments

This study of firefighter fatalities would not have been possible without the cooperation and assistance of many members of the fire service across the United States. Members of individual fire departments; chief fire officers; wildland fire service organizations, including the U.S. Forest Service (USFS), the National Park Service (NPS), the Bureau of Land Management (BLM), the Bureau of Indian Affairs (BIA) and the U.S. Fish and Wildlife Service (FWS); the U.S. Department of Justice (DOJ); the National Fire Protection Association (NFPA); and many others contributed important information to this report.

The National Fallen Firefighters Foundation (NFFF) was responsible for compilation of a large portion of the information used in this report. Their cooperation and work toward reducing firefighter deaths is gratefully acknowledged.

2023 Executive Summary

The U.S. Fire Administration's (USFA's) 2023 firefighter fatalities report provides a comprehensive overview of the on-duty deaths among firefighters in the United States. This year's report identifies the cause of death, the nature of the fatal injury and key trends in 2023, as well as comparisons since 2014.

Key findings of 2023 on-duty firefighter fatalities:

1. Total fatalities:
    a. 93 firefighters died in 2023 based on USFA criteria.
        - The long-term trend (10-year) shows a 17% increase since 2014, with the fewest fatalities occurring in 2019.
        - The short-term trend (3 years) shows a 36% decrease since 2021.
        - When excluding COVID-19, there was a 12% decrease in the long-term trend (10-years) since 2014 and a 17% increase in the short-term trend (3 years) since 2021.
    b. 19 firefighters died under circumstances meeting the requirements of the Hometown Heroes Survivors Benefits Act.
    c. 1 firefighter died due to complications of COVID-19.
2. Leading cause of fatal injury:
    a. The leading cause of fatal injury was stress/overexertion (53%). Stress/overexertion was also the leading cause each year since 2014 except for 2020 when it tied with COVID-19 as the leading cause and 2021 when COVID-19 was the leading cause.
    b. Vehicle collisions were the second leading cause of death (20%). Vehicle collisions were the second or third leading cause each year since 2014.
    c. The third leading cause was caught or trapped (9%).
3. Leading nature of fatal injury:
    a. Cardiovascular events accounted for 49% of firefighter fatalities. Except for 2020 and 2021 when COVID-19 was a factor, cardiovascular event was the leading type of nature of fatal injury of firefighters every year from 2014 to 2023.
    b. The second leading nature of fatal injury was trauma at 31%, followed by asphyxiation at 9%.
4. Type of duty:
    a. 77% of firefighter fatalities occurred while operating at an incident, and 23% occurred during routine operations.
    b. The most common type of duty leading to a firefighter fatality was operating at a fireground (41%). During fireground operations, the most common type

of on-scene fire activity was advancing hoselines at 45%. The second and third most common types of activity during fireground operations were Incident Command and unknown activities, each at 13%.

   c. The second most common type of duty leading to a firefighter fatality was responding to or returning from incidents (19%).

5. Demographics:

   a. 51% of fatalities were volunteer firefighters, 40% were career firefighters, 5% were wildland firefighters and 4% were part-time firefighters.

   b. Firefighters ages 46 to 50 accounted for the most deaths at 16%, followed by those ages 51 to 55 (13%) and those ages 26 to 30 (10%).

   c. 91 firefighter fatalities (98%) were male and 2 (2%) were female.

Firefighters operate in inherently dangerous environments. Firefighter fatalities may occur because of external hazards or because of medical emergencies that are triggered by performing emergency operations. The USFA strives to increase awareness and education to reduce preventable causes of firefighter fatalities. The following recommendations are aimed at reducing the number of on-duty firefighter fatalities.

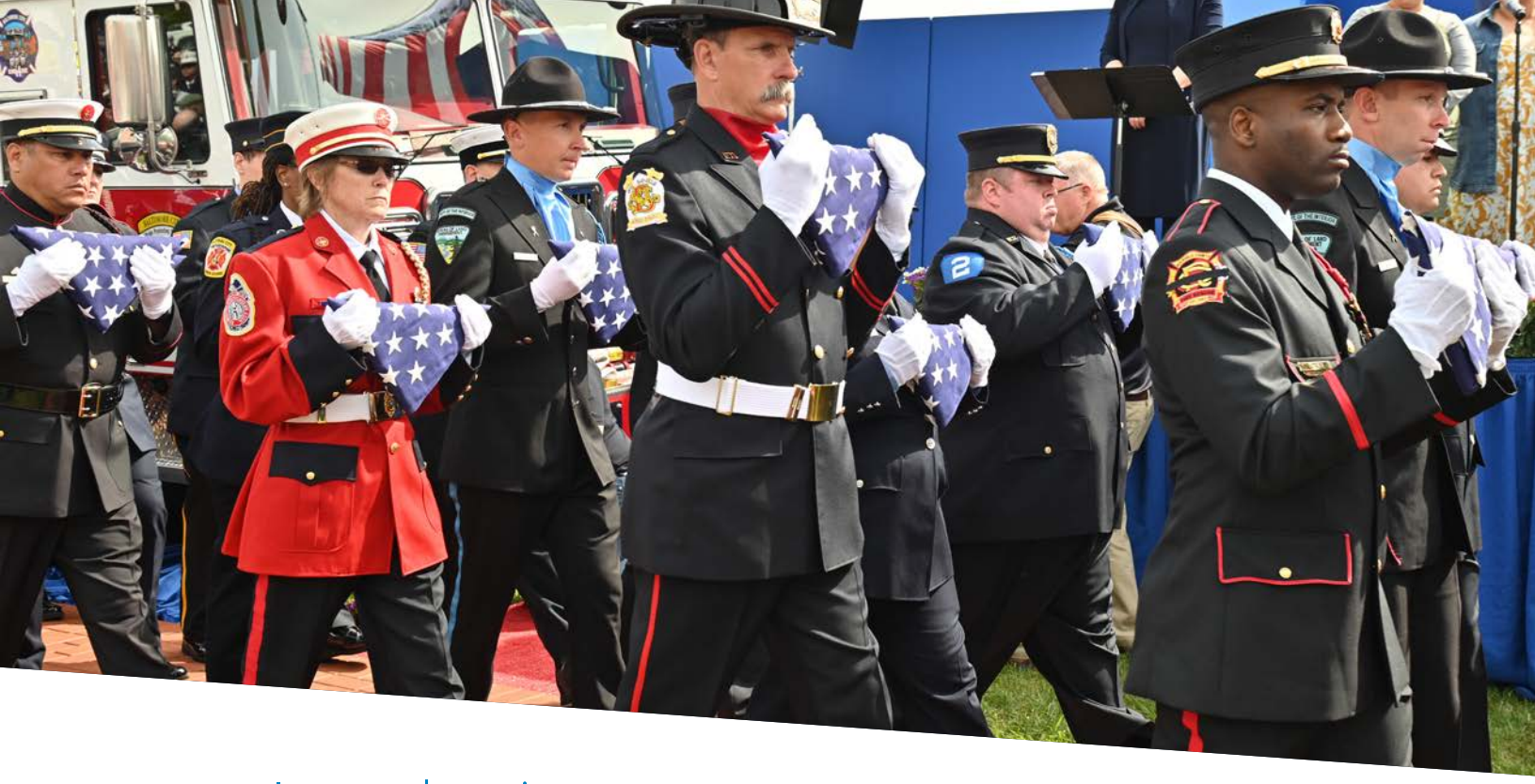
6. Recommendation #1: Increase cardiac-related screenings among firefighters, improve the quality of the screening, and ensure corrective actions are taken if risk factors are identified.

7. Recommendation #2: Increase awareness and training related to the importance of physical fitness, nutrition and adequate sleep for cardiac health (and cancer risk reduction).

8. Recommendation #3: Enhance situational awareness training, especially on escalating and dynamic events in an all-hazard environment.

9. Recommendation #4: Ensure emergency vehicle drivers are knowledgeable of and adhere to established fire department policies, procedures and guidelines related to the safe operation of vehicles. Emphasize the critical need for nonemergency vehicle drivers to properly maneuver through crash sites, providing education via license renewal tests, road warning signs and printed publications.

This 2023 firefighter fatality report is intended to serve as a critical resource for the fire service, policymakers and safety organizations to provide data analysis and resulting insights to enhance firefighter safety and prevent future on-duty deaths. It also examines historical trends as a means of understanding change over time and identifying new strategies to help prevent these fatalities from occurring in the future.



Introduction

Firefighting is an inherently dangerous job. Firefighters not only respond to fires, but other emergency incidents such as medical events, motor vehicle collisions and water rescue. When firefighters respond to calls, they are putting themselves at significant personal risk. A firefighter fatality has devastating effects on the firefighter's family, the fire department "family" and the community. This report is intended to honor those firefighters who have lost their lives, to analyze and learn about the circumstances surrounding each occurrence, and to learn from these losses to decrease the risk to all firefighters.

Since 1976, the USFA has tracked the number of firefighter fatalities and conducted an annual analysis of the information related to these fatalities. Through the collection and analysis of information on firefighter deaths, the USFA can focus on specific problems and direct efforts toward finding solutions to reduce firefighter fatalities in the future. This information is also used to measure the effectiveness of current programs directed toward firefighter health and safety. Several programs have been developed by the USFA in response to this annual report. For example, the USFA has sponsored research to create safer operational environments for firefighters by increasing awareness about emergency vehicle operations safety, the health and safety of the female emergency responder, fire service risk management, and fire station and roadway incident safety.

In addition to performing this analysis, the USFA, working in partnership with the NFFF, develops a list of all on-duty firefighter fatalities and associated documentation each year. If certain criteria are met, the fallen firefighter's next of kin, as well as members of the individual's fire department, are invited by the NFFF to the annual National Fallen Firefighters Memorial Service. The service is held at the National Emergency Training Center in Emmitsburg, Maryland, each year. The 44th Annual National Fallen Firefighters Memorial Weekend was held May 3-4, 2025, and families who lost loved ones in 2024 were invited to attend the ceremony. Additional information about the Memorial Weekend can be found at https://www.firehero.org/events/memorial-weekend/ or by calling the NFFF at 301-447-1365.

Other resources and information regarding firefighter fatalities, including current fatality notices, the National Fallen Firefighters Memorial database and links to the Public Safety Officer Benefits (PSOB) program, can be found at https://apps.usfa.fema.gov/firefighter-fatalities/.

Methodology

This study reports on firefighter fatalities in the United States for 2023 and analyzes that data to better understand the demographic trends and the leading cause and nature of fatalities. This work requires a uniform definition of a firefighter and standard determination of deaths that occur while on duty (or within a time frame that the injury/illness is presumed to have occurred while on duty or be associated with firefighting duties).

Who is a firefighter?

For this report, the term "firefighter" covers all members of organized fire departments with assigned fire suppression duties in all 50 states; the District of Columbia; and the territories of Puerto Rico, the Virgin Islands, American Samoa, the commonwealth of the Northern Mariana Islands and Guam. It includes career and volunteer firefighters; full-time public safety officers acting as firefighters; fire police; state, Native American tribal authorities and federal government fire service personnel; and privately employed firefighters, including employees of contract fire departments and trained members of industrial fire brigades, including full time or part time. It also includes contract personnel working as firefighters or assigned to work in direct support of fire service organizations (e.g., air-tanker crews).

Under this definition, the study includes not only local and municipal firefighters, but also seasonal and full-time employees of USFS, NPS, BLM, BIA, FWS and other federal agencies, as well as state wildland agencies. The definition also includes prison inmates serving on firefighting crews; firefighters employed by other governmental agencies, such as the U.S. Department of Energy (DOE); military personnel performing assigned fire suppression activities; and civilian firefighters working at military installations.

What constitutes an on-duty fatality?

An on-duty fatality includes any injury or illness that was sustained while on duty and proves fatal. The term "on duty" refers to being involved in operations at the scene of an incident, whether it is a fire, medical call for service or other non-fire incident; responding to or returning from an incident; performing other officially assigned duties such as training, maintenance, public education, inspection, investigations, court testimony or fundraising; and being on call, under orders or on standby duty (except at the individual's home or place of business). An individual who experiences a cardiovascular event (including sudden cardiac arrest) or other fatal injury at home while they prepare to respond to an emergency is considered on duty when the response begins. A firefighter who becomes ill while performing fire department duties and suffers a cardiovascular event shortly after the conclusion of the incident may be considered on duty since the inception of the cardiovascular event may have occurred while the firefighter was on duty.

A fatality may be caused directly by an accidental or intentional injury in either emergency or nonemergency circumstances, or it may be attributed to an occupationally

related fatal illness. A common example of a fatal illness incurred on duty is a cardiovascular event. Fatalities attributed to occupational illnesses also include a communicable disease, such as COVID-19, contracted while on duty that proved fatal when the disease could be attributed to a documented occupational exposure.

Firefighter fatalities are included in this report even when death is considerably delayed after the original incident. When the incident and the death occur in different years, the analysis counts the fatality as having occurred in the year in which the death took place.[1]

At present, there is no established mechanism for USFA to identify fatalities that result from long-term illnesses, such as cancer, that develop over long periods of time and may be related to occupational exposure to hazardous materials or toxic products of combustion. Current state and federal laws linking on-the-job exposure to cancer in firefighters may better inform USFA tracking in the future.

Hometown Heroes Survivors Benefits Act of 2003

On Dec. 15, 2003, the president of the United States signed the Hometown Heroes Survivors Benefits Act of 2003[2] into law (P.L. 108-182). This law presumes that a cardiovascular event (heart attack) or stroke is in the line of duty if the firefighter was engaged in nonroutine, stressful or strenuous physical activity while on duty, and the firefighter became ill within 24 hours after engaging in such activity.

The inclusion criteria for defining an on-duty fatality have been affected by this change in the law. Before Dec. 15, 2003, firefighters who became ill as the result of a cardiovascular event or stroke after going off duty needed to register a complaint of not feeling well while still on duty to be included in this study. For firefighter fatalities after Dec. 15, 2003, firefighters are included in this report if they became ill as the result of a cardiovascular event or stroke within 24 hours of a training activity or emergency response. Firefighters who became ill after going off duty, where the activities while on duty were limited to tasks that did not involve physical or mental stress, are not included.

Cause of fatal injury vs. nature of fatal injury

The terms "cause of fatal injury" and "nature of fatal injury" are important to differentiate as they have precise medical meaning. Cause of fatal injury is a more specific categorization of the type of complication leading to the firefighter's death (i.e., stress/overexertion, vehicle collision, caught/trapped, exposure, struck by, building collapse, etc.). Stress/overexertion is a general cause category that implies that the physical work and/or psychological stress may be involved in triggering a medical or pathological event. Nature of fatal injury is a broader classification of the type of injury leading to the firefighter's death (i.e., trauma, cardiovascular event, burns,

[1] The USFA changed the analysis methodology beginning with its "Firefighter Fatalities in the United States in 2020" annual report. For the 2020 report and all subsequent annual firefighter fatality reports, firefighter fatalities are included in the total count and analyzed based on the date of death as opposed to previous annual reports where firefighter fatalities were included in the total count and analyzed based on the date of occurrence of the injury (that later resulted in death). All prior years in each graphic in this "Firefighter Fatalities in the United States in 2023" report, however, have been recalculated to reflect this change in methodology.

[2] Link to Hometown Heroes Survivors Benefits Act of 2003: https://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=108_cong_public_laws&docid=f:publ182.108.pdf

asphyxiation, etc.). For example, there may be several on-duty fatalities whose causes are all classified as stress/overexertion, however, their nature of fatal injury falls under different categories such as cardiovascular, heat exhaustion or cerebrovascular accident (CVA, a.k.a. stroke).

Data sources

As an integral part of its ongoing program to collect and analyze fire data, the USFA solicits information on firefighter fatalities directly from the fire service and from a wide range of other sources. These sources include the PSOB program administered by the DOJ, the National Institute for Occupational Safety and Health, the Occupational Safety and Health Administration (OSHA), the U.S. Department of Defense, the National Interagency Fire Center, and other federal agencies.

The USFA also receives notification of some deaths directly from fire departments and from such fire service organizations as the International Association of Fire Chiefs, the International Association of Fire Fighters, the National Volunteer Fire Council, state fire marshals, state fire training organizations, NFPA, other state and local organizations, fire service internet sites, news services, and fire service publications.

Findings

There were 93 on-duty firefighter fatalities in 2023. As with previous years, stress/overexertion leading to a cardiovascular event continues to be the greatest cause of on-duty deaths, with 46 deaths in 2023 (19 of these deaths qualified under the Hometown Heroes Survivors Benefits Act).

Figure 1 shows the firefighter fatality trend since 1977. From 1977 to 2023, on-duty firefighter fatalities have decreased by 29%.

There are a couple of notable landmarks within the data presented in Figure 1. The significant spike in 2001, shown in red, was due to the terrorist attacks on Sept. 11, 2001, which resulted in the deaths of 343 firefighters when the World Trade Center North and South Towers in New York City collapsed. In addition, in 2003, the USFA began tracking firefighter fatalities that qualified under the Hometown Heroes Survivors Benefits Act (shown in gray). Finally, in 2020, due to the global COVID-19 pandemic and the need for firefighters to respond to all types of incidents, to include medical emergencies, the USFA began tracking on-duty deaths that occurred from exposure to COVID-19 (shown in green). A COVID-19 death is determined by the firefighter's agency and generally understood to occur when the firefighter was exposed to COVID-19 while on-duty and passed away due to the virus or subsequent complications.

Figure 1. On-duty firefighter fatalities (1977-2023)

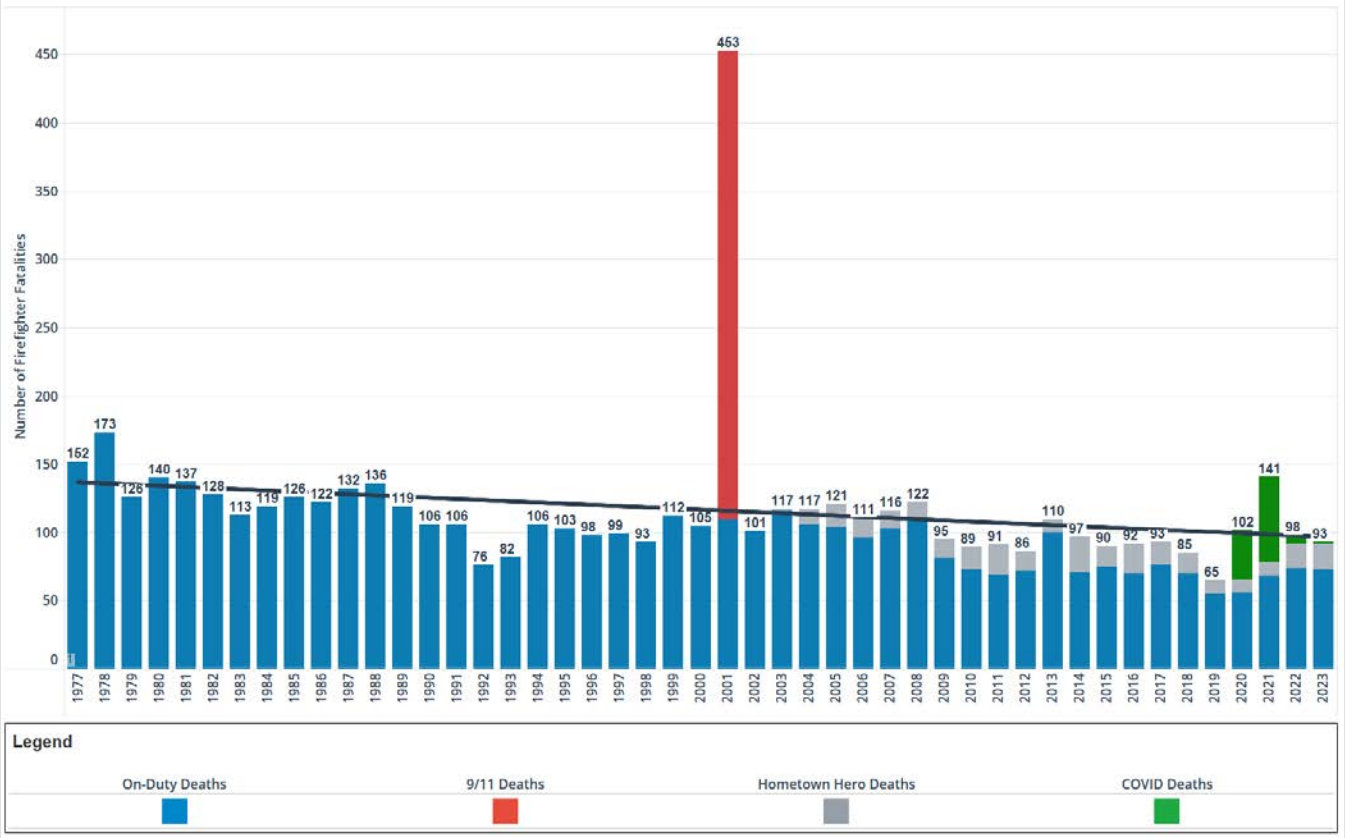
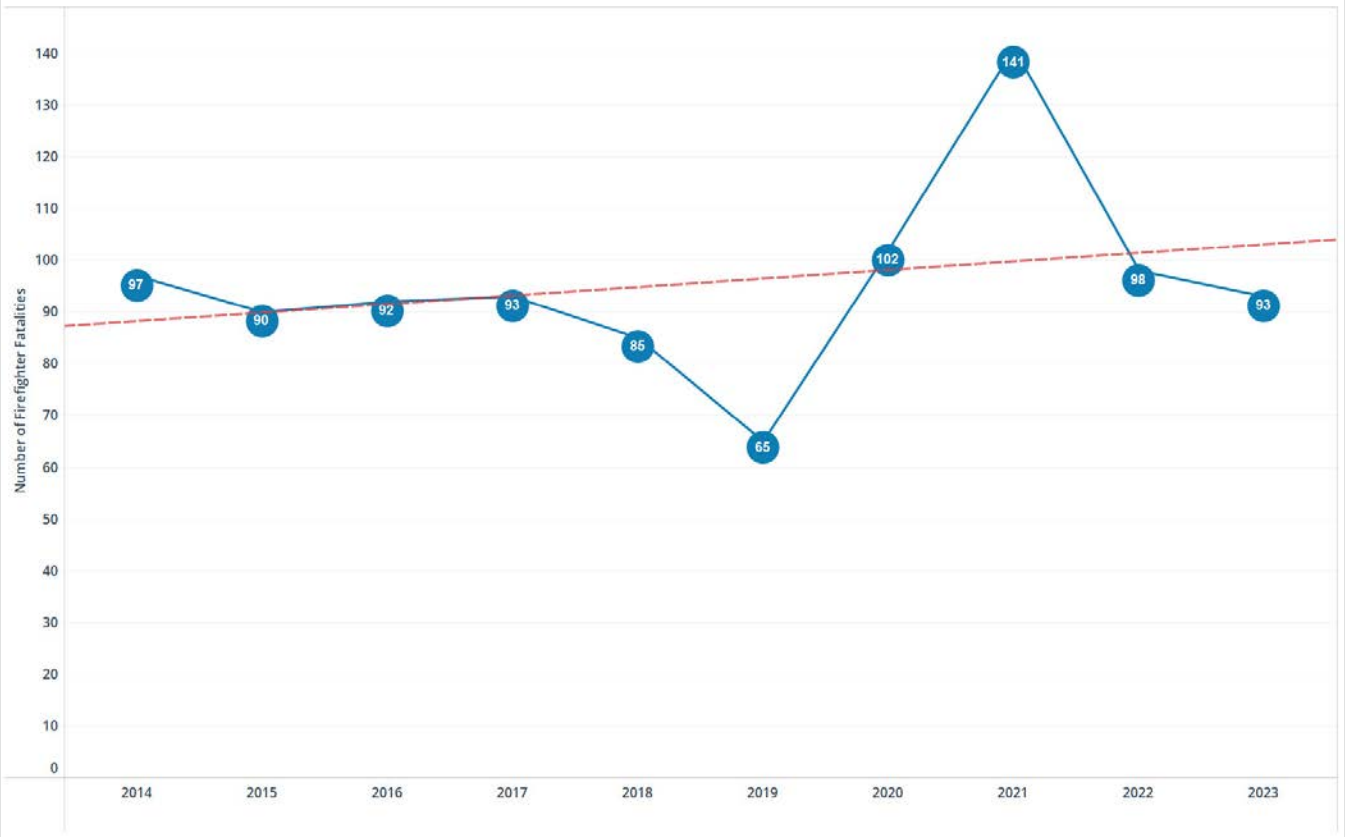


Figure 2 presents a historical trend for the 10-year period from 2014 to 2023. The 2023 report and analysis mark a change in the methodology and are inclusive of firefighter deaths that met the criteria established in the Hometown Heroes Survivors Benefits Act as well as those related to on-duty exposure to COVID-19 resulting in death, as reported by the member's fire department. With the inclusion of Hometown Hero and COVID-19 deaths, the long-term (10-year) trend shows an increase of 17% since 2014. This increase is due in part to the number of COVID-19-related deaths in 2020 (36), 2021 (63) and 2022 (6).

Figure 2. On-duty firefighter fatalities (2014-2023)



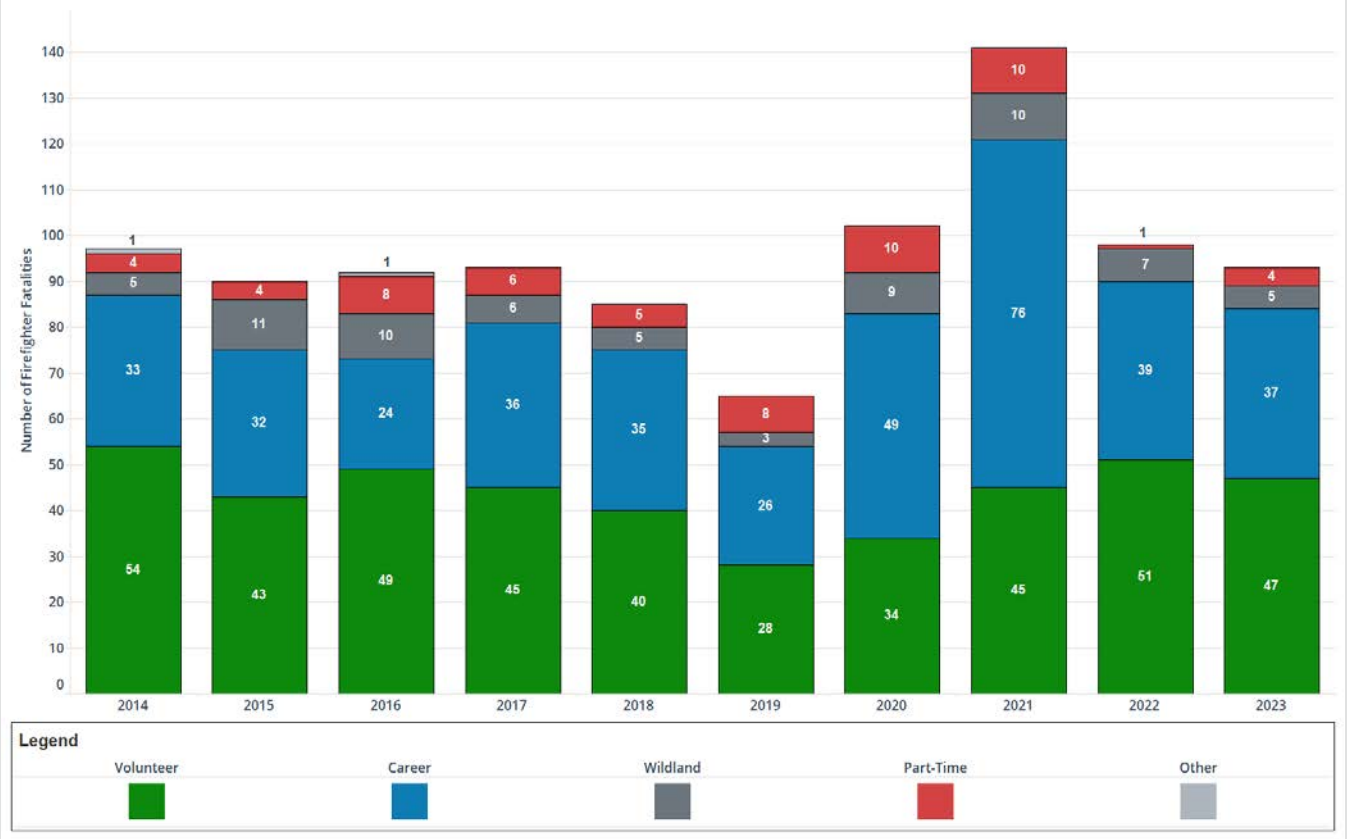
Career, volunteer and wildland agency fatalities

Tracking the **type** of firefighter (career, volunteer, part-time, wildland, other) when analyzing on-duty deaths is important because it may provide insight into differences in training, resources or operational environment that could impact overall health and safety. Understanding any identified trends could help agencies tailor their prevention, training, and/or command strategies and policies to the specific needs faced by each type of agency.

In 2023, the 93 firefighter fatalities included 47 volunteer firefighters (51%), 37 career firefighters (40%), 5 wildland firefighters (5%) and 4 part-time firefighters (4%) (Figure 3). Historically, from 2014 to 2023, volunteer firefighters have a higher percentage of on-duty deaths (46%) than other types of firefighters followed by career firefighters (40%). The remaining 14% of fatalities occurred in departments that represent a mix of part-time, part-time on-call, wildland-specific agencies and other (since 2014, the 2 on-duty fatalities in a department categorized as "other" were both classified as industrial firefighters).

It is important to note that, while historically, 46% of the on-duty fatalities were volunteer firefighters, it is estimated that 53% of the nation's firefighters are volunteer, while 34% are career. So, it is expected that the occurrence of volunteer on-duty firefighter fatalities is higher than career firefighters since there are more volunteer firefighters than career firefighters.

Figure 3. Career, volunteer, part-time and wildland firefighter fatalities (2014-2023)



Firefighter fatalities may also vary based upon the setting in which fire service is provided. The U.S. Census Bureau defines "urban" as a place having a population of at least 5,000 or having at least 2,000 housing units. "Rural" is any community that is not urban.[3] "Suburban" is not a census term, but may refer to any place, urban or rural, that lies within a metropolitan area defined by the Census Bureau, but not within one of the central cities of that metropolitan area.

Fire department areas of responsibility do not always conform to the boundaries used by the Census Bureau. For example, fire departments organized by counties or special fire protection districts may have both urban and rural coverage areas. In such cases, where it may not be possible to characterize the entire coverage area of the fire department as rural or urban, firefighter deaths were listed as urban or rural based on the community or location in which the fatality occurred.

As expected, when analyzing fatalities from 2014 to 2023, a large percentage (68%) of the firefighters who were covering rural areas were volunteers. In addition, 28% of volunteers were covering suburban areas, 3% were covering urban areas, and 1% were covering other areas. Of the career firefighter fatalities, 50% were in urban areas, 37% in suburban areas, 12% in rural areas and 1% were covering other areas. In 2023, as shown in Table 1, most volunteer firefighters covered rural areas (64%), and most career firefighters covered urban and suburban areas (86%).

[3] https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html

Table 1. Career, volunteer, part-time and wildland firefighter fatalities by coverage area type (2023)

	Urban/ suburban	Rural	Wildland	Not reported	Total
Volunteer	14	30	-	3	47
Career	32	5	-	-	37
Wildland	-	4	1	-	5
Paid-on-call	-	1	-	1	2
Part-time	1	1	-	-	2
Total	47	41	1	4	93

Multiple firefighter fatality incidents

The 93 firefighter deaths in 2023 resulted from a total of 89 fatal incidents. Of these 89 fatal incidents, 4 resulted in multiple firefighter deaths (Table 2).[4] While any incident resulting in a firefighter fatality is tragic, incidents where 2 or more firefighters are killed could be catastrophic to the fire department, incident operations and the community.

The 4 incidents in 2023 resulted in 10 firefighter fatalities. Of the 4 multiple firefighter fatality incidents in 2023, 1 was a structure fire where 2 firefighters perished, 1 was a vehicle fire onboard a ship resulting in 2 fatalities, 1 was a wildfire incident where a helicopter crashed killing the 3 occupants, and the fourth multi-fatality occurrence happened during station maintenance involving a mechanical lift killing 2 firefighters. The 2023 firefighter fatality study also required an update to a 2020 incident, now classifying it as a multiple firefighter fatality incident. In this incident, a firefighter succumbed to injuries sustained when they were stuck by a vehicle while working at the scene of a vehicle collision in 2020.

Table 2 reports on the incident type and cause of fatality for firefighters who died in multi-fatality events from 2014-2023. Importantly, more than 40% of multiple firefighter fatalities were due to motor vehicle crashes, where 25 firefighters died in total. This highlights the danger of emergency response and suggests that additional efforts should be made to focus on safety.

The categories of caught or trapped and collapse also account for more than 40% of multi-fire fatalities, clearly showing how rapid fire advance and structural collapse can lead to catastrophic losses in the fire service.

[4] 1 firefighter fatality in 2023 resulted from a multiple-fatality incident that occurred in 2020. This incident is counted in the multiple-fatality incident total for the year 2020.

Table 2. Incident type and cause of fatality for firefighters who died in multi-fatality incidents (2014-2023)

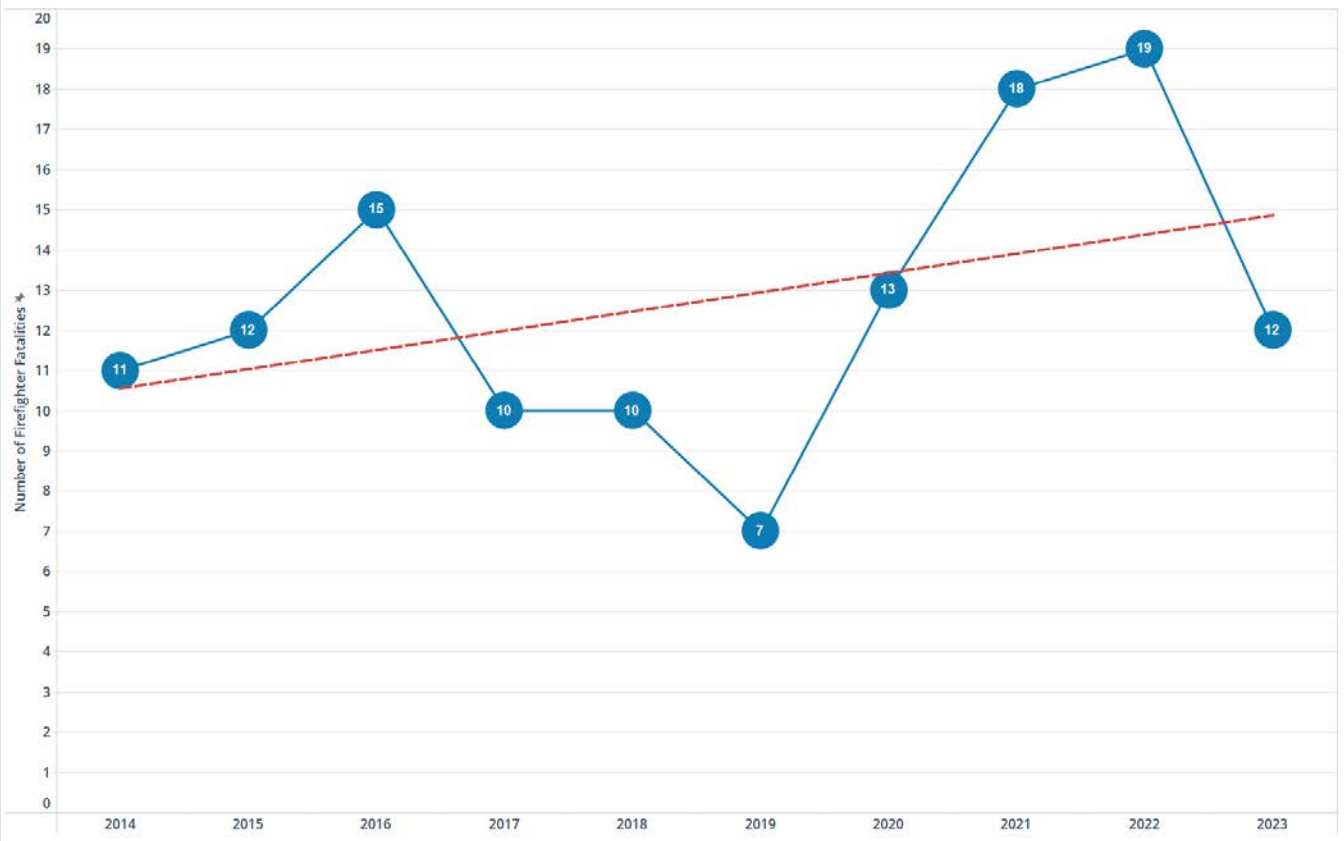
Incident Type	Cause of fatal injury	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Grand Total
Structure Fire	Caught/ Trapped	4			1					2	2	**9**
	Collapse		2	3		2			2	3		**12**
	Out of Air							2				**2**
	Vehicle Collision							2				**2**
	Total	**4**	**2**	**3**	**1**	**2**		**4**	**2**	**5**	**2**	**25**
Wildfire	Caught/ Trapped		3									**3**
	Vehicle Collision			2				2	2	4	3	**13**
	Total		**3**	**2**				**2**	**2**	**4**	**3**	**16**
MVA	Struck by				2			1			1	**4**
	Vehicle Collision					2				4		**6**
	Total				**2**	**2**		**1**		**4**	**1**	**10**
Not Incident Related	Fall										2	**2**
	Vehicle Collision		2	2								**4**
	Total		**2**	**2**							**2**	**6**
Other	Caught/ Trapped										2	**2**
	Total										**2**	**2**
Grand Total		**4**	**7**	**7**	**3**	**4**	**0**	**7**	**4**	**13**	**10**	**59**

Wildfire firefighting fatalities

Wildfire firefighting is different than structural firefighting in that firefighters are not fighting a contained fire. Instead, when operating on a wildfire or even in the wildland urban interface, firefighters often face widespread fires with no boundaries in rugged terrain that can present different types of hazards. These fires can also drastically change in an instant due to the wind, landscape and different types of fuel, potentially demanding prolonged physical exertion and sometimes leaving firefighters with no way to escape. Finally, as changing weather patterns continue to produce extreme weather events, such as drought and more dangerous heat, firefighters will be forced to confront more frequent and intense wildfires.

In 2023, 12 firefighters (13%) were killed during activities involving brush, grass or wildfire firefighting (Figure 4). This total includes part-time and seasonal wildland firefighters, full-time wildland firefighters, and municipal or volunteer firefighters whose deaths were related to wildfires. The 10-year trend from 2014 to 2023 shows a 41% increase in on-duty wildland firefighter fatalities.

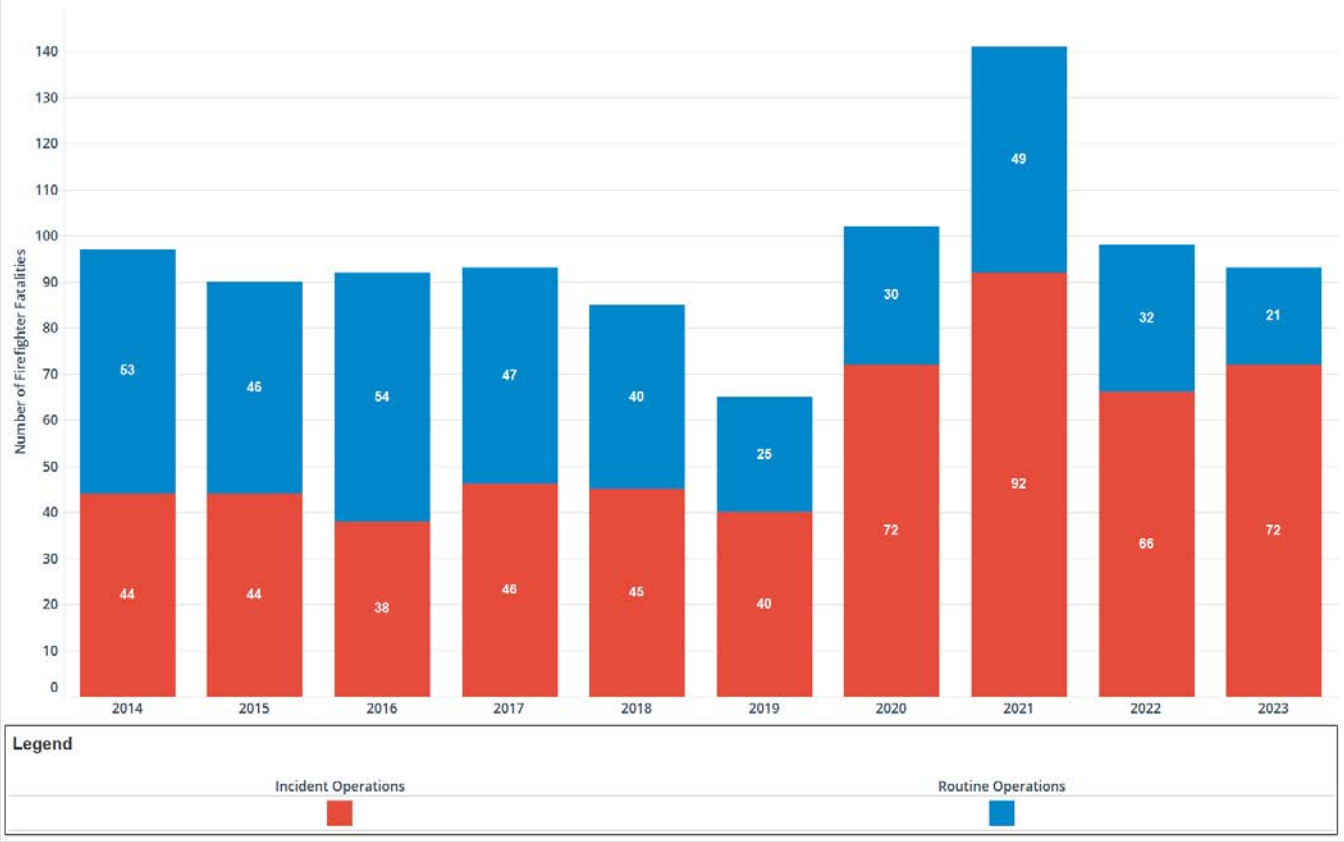
Figure 4. Wildfire firefighting fatalities (2014-2023)



Type of Duty

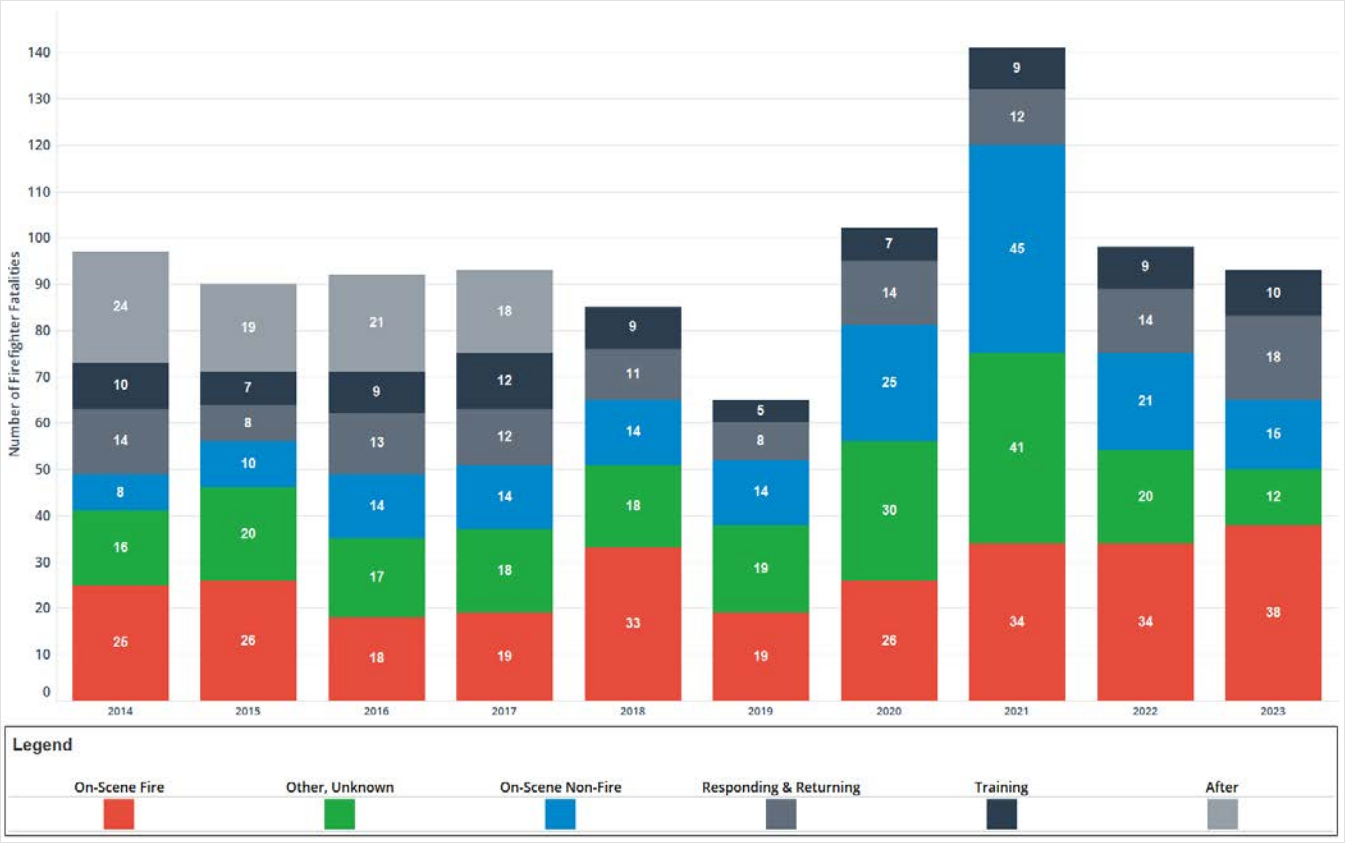
Firefighter fatalities are related to the type of duty that the firefighter is performing. Type of duty refers to incident operations and routine operations. For this analysis, incident operations are defined as responding to, operating at or returning from the scene of a call for service. Routine operations are everything else, to include, but are not limited to, training, public events, station maintenance and administrative duties. Figure 5 presents annual firefighter fatalities based on whether a firefighter was performing routine operations or operating at an incident. From 2014 to 2017, there were more fatalities during routine operations than during incident operations. This started to shift in 2018 and continued in subsequent years with more fatalities occurring during incident operations. In 2023, 72 firefighters (77%) died while operating at an incident and 21 firefighters (23%) died during routine operations.

Figure 5. Firefighter fatalities: Routine operations vs. operating at an incident (2014-2023)



The number of deaths by specific type of duty for 2014 to 2023 is shown in Figure 6. Each year, from 2014 to 2023, except for 2021 when COVID-19 was a factor, operating at a scene of a fire was the leading or second leading type of duty being performed. Other leading types of duty include operating at the scene at a non-fire and other on-duty operations. The fire service should work towards enhancing situational awareness training, especially on escalating and dynamic events in an all-hazard environment. While training is the type of duty category with the lowest percentage of firefighter fatalities, it is problematic that so many firefighters die during training when safety procedures should be paramount.

Figure 6. Firefighter fatalities by type of duty (2014-2023)



Fireground operations

Firefighters face many common but unpredictable dangers while operating at a fireground beyond coming into direct contact with fire. These include smoke inhalation and other respiratory hazards as well as dealing with unstable structures. In 2023, 38 firefighters (41%) experienced fatal injuries during fireground operations (on-scene fire). Of these fatalities, 24 (63%) were at the scene of a structure fire, 9 (24%) were at the scene of a wildfire or outside fire, 2 (5%) were at the scene of vehicle fires, 2 (5%) were at a scene categorized as "other," and 1 (3%) were at a false alarm.

As seen in Table 3, of those killed during fireground operations, 19 (50%) were career, 14 (37%) were volunteer, 4 (11%) were wildland firefighters and 1 (3%) was part-time (paid). The leading nature of fatal injury for 18 of the firefighter deaths that occurred during fireground operations was cardiovascular event (47%). The nature of fatal injury for the remaining 20 deaths were asphyxiation (21%), trauma (18%), crushed (5%), CVA (3%), electrocution (3%) and other (3%).

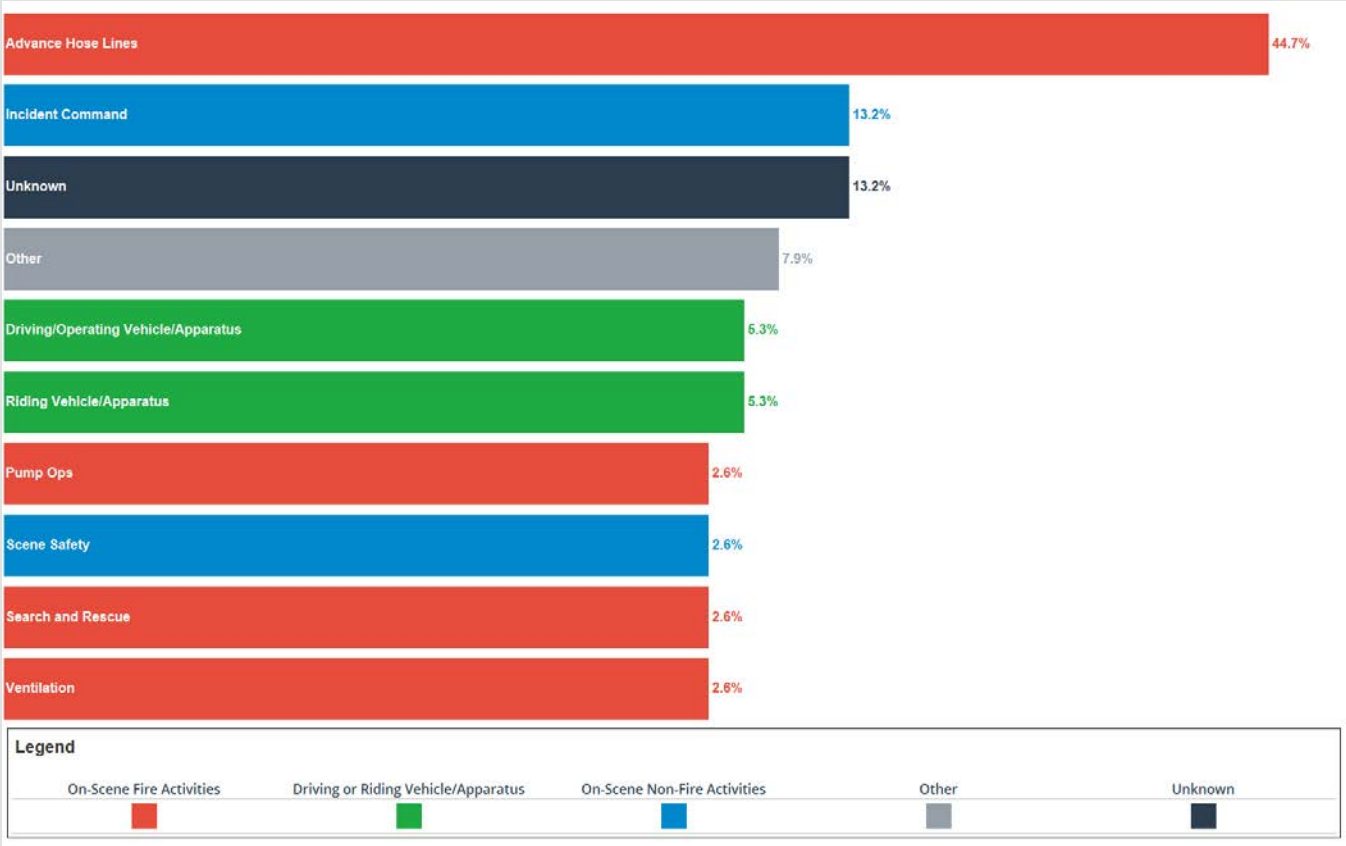
Table 3. Firefighter fatalities during fireground operations by nature (2023)

	Cardiovascular	Asphyxiation	Trauma	Crushed	CVA	Electrocution	Other	
Career	5	8	4	1	1			19
Volunteer	12		1			1		14
Wildland	1		2	1				4
Part-Time							1	1
	18	8	7	2	1	1	1	**Total 38**

Type of fireground activity during fireground operations

Figure 7 shows the types of fireground activities in which firefighters were engaged when they sustained their fatal injuries or illnesses during fireground operations in 2023. This total includes all firefighting duties on the fireground, including both wildfire firefighting and structural firefighting. In 2023, the most common type of on-scene fire activity was advancing hoselines at 45%. Additionally, advancing hoselines was the leading type of fireground activity for all years from 2014 to 2023. The second and third most common types of activity in 2023 were Incident Command and other unknown activities, each at 13%.

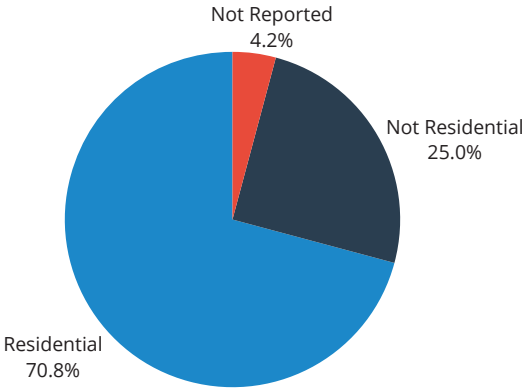
Figure 7. Fireground activity leading to fatal injury (2023)



Fixed property use for structural firefighting fatalities

Fire departments respond to a structure fire every 60 seconds.[5] In 2023, of the fatalities that occurred during fireground operations, 24 were firefighters who became ill or injured while on the scene of a structure fire. Of these fatalities, 17 (71%) occurred while on the scene of a residential structure fire while 6 (25%) occurred on the scene of a nonresidential structure (Figure 8). From 2014 to 2023, of the structure fires where firefighters died during fireground operations, residential structures were, by far, the leading type of fixed property use for all years.

Figure 8. Structural firefighting fatalities by fixed property use (2023)

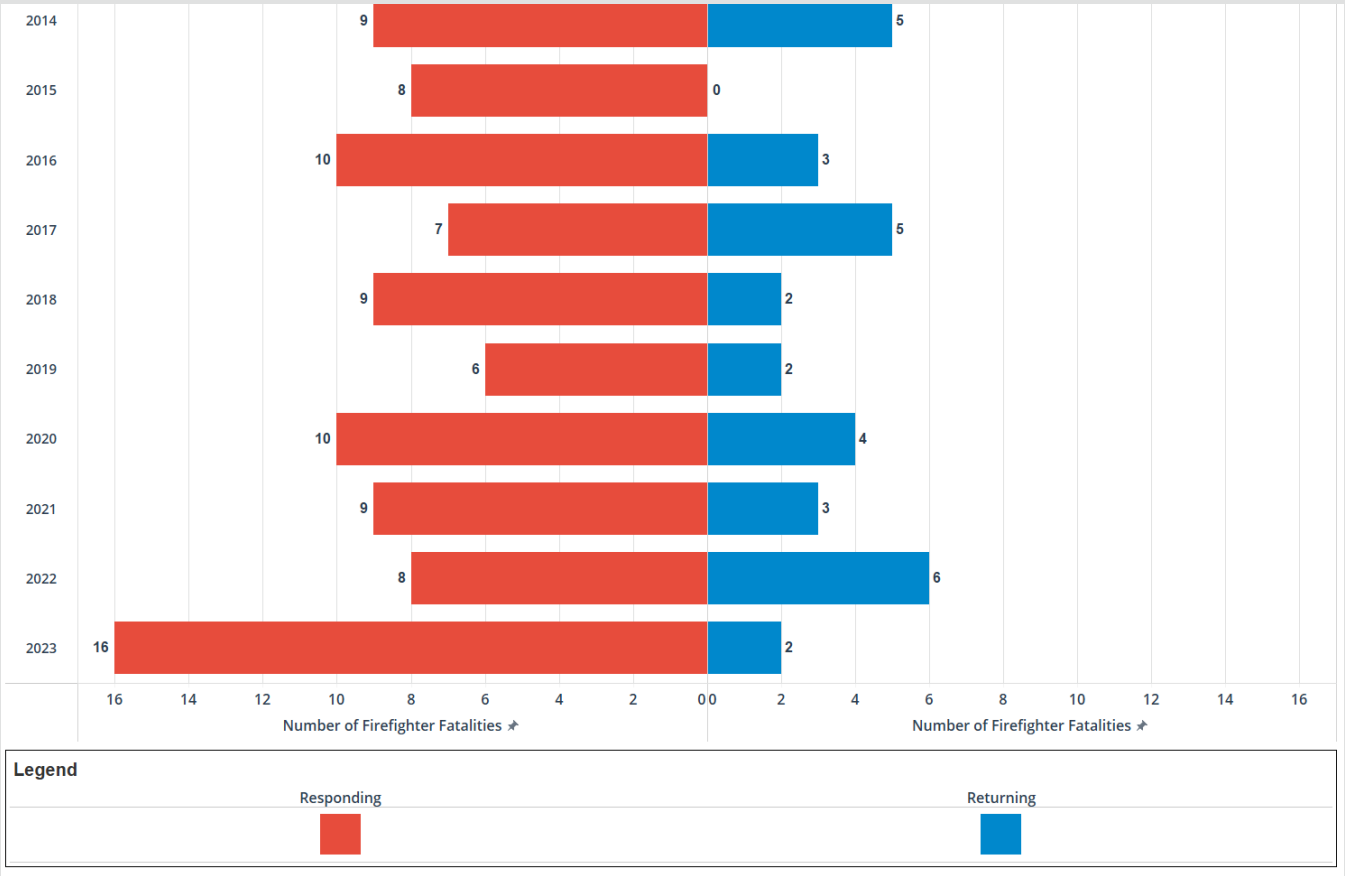


[5] NFPA, "Fire Loss in the United States," November 2023, https://www.nfpa.org/education-and-research/research/nfpa-research/fire-statistical-reports/fire-loss-in-the-united-states

Responding/returning

Firefighters face danger and assume significant responsibility not only during incident operations but also while responding and returning from these incidents. In 2023, as shown in Figure 9, 18 firefighters (19%) died or experienced an onset of symptoms while responding to or returning from incidents. Of these firefighters, 16 (89%) were responding to an incident and 2 (11%) were returning from an incident. For all years from 2014 to 2023, more firefighters died while responding to than returning from an incident. This was particularly true in 2023. In fact, the number of fatalities in 2023 that occurred while responding was double the annual average of those who died while responding in the previous years of 2014 to 2022. This analysis emphasizes the need for emergency vehicle drivers to both be knowledgeable of and adhere to established fire department policies, procedures and guidelines related to the safe emergency response, and to be medically cleared to ensure that the sympathetic nervous stimulation associated with emergency response and the physiological strain of emergency operations does not cause undue risk of cardiovascular event.

Figure 9. Firefighter fatalities while responding to or returning from an incident (2014-2023)



Training

Given the dynamic nature of emergency incidents, there is a certain level of inherent risk firefighters and first responders assume when they respond to a call for service. It is through training, repetition, skill assessments and after-action reviews that firefighters become more proficient in their craft, able to adjust to a fluid/ever-changing environment, and to reduce risks to both themselves and those they serve. The training ground should be a safe place for firefighters to practice and hone their skills. So, when incidents occur during or associated with training, it can be especially tragic and weigh even more heavily on the department and community.

In 2023, 10 firefighters (11%) died during training activities (Figure 10). However, unlike previous years when there were multiple causes, all these deaths were due to a cardiovascular event. Still, from 2014 to 2023, cardiovascular events are the primary nature (68%) of training-related firefighter deaths. While the lack of traumatic deaths associated with training is encouraging, the fire service still needs to be cognizant of the level of physical exertion expended during training and how it may affect its members.

Figure 10. Firefighter fatalities while engaged in training (2014-2023)

Cause of fatal injury	Nature of fatal injury	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Grand Total
Caught/Trapped	Asphyxiation							1				1
Exposure	COVID-19							2				2
	Heat exhaustion			1			2					3
Fall	Trauma			1	1			1		1		4
Other	Other			3	1	1			2			7
Stress/Overexertion	Cardiovascular event	9	7	2	9	8	3	2	5	4	10	59
	Cerebrovascular accident	1										1
	Heat exhaustion								1			1
	Other							1				1
Unknown	Unknown									3		3
Vehicle Collision	Trauma			2	1				1	1		5
Grand Total		10	7	9	12	9	5	7	9	9	10	87

In addition, from 2014 to 2023, of the firefighters who died during training, 8 (9%) were probationary firefighters, recruits or cadets (none of the deaths occurred in 2023). Because they are typically younger and lack experience, the fire service has a distinct responsibility to keep these types of firefighters safe and healthy.

Non-fire emergencies

Firefighters also face dangers while operating at non-fireground incidents such as being exposed to disease, getting struck by vehicles and confronting extreme weather. In 2023, 15 firefighters (16%) were killed during incident operations not related to fire. These responses included 6 motor vehicle collisions, 4 EMS incidents, 3 other non-fire emergencies, 1 hazmat incident and 1 weather/natural disaster-related incident. In addition, the nature of fatal injury for over half (8) of the 15 firefighters who died during non-fire emergencies was a cardiovascular event. Except for 2020 and 2021 when COVID-19 was a factor, cardiovascular event was the leading nature of injury for all years from 2014 to 2023.

Other on duty

"Other on duty" refers to firefighters engaged in activities related to nonemergency situations, such as in-station duties, arson investigations and attending fire department-mandated meetings. In 2023, 12 firefighters (13%) died performing duties such as making fire station repairs, traveling as part of a convoy, examining the scene of a past collision, inspecting fire hydrants, attending a staff meeting, sleeping in the fire station dorm room and conducting other in-station duties.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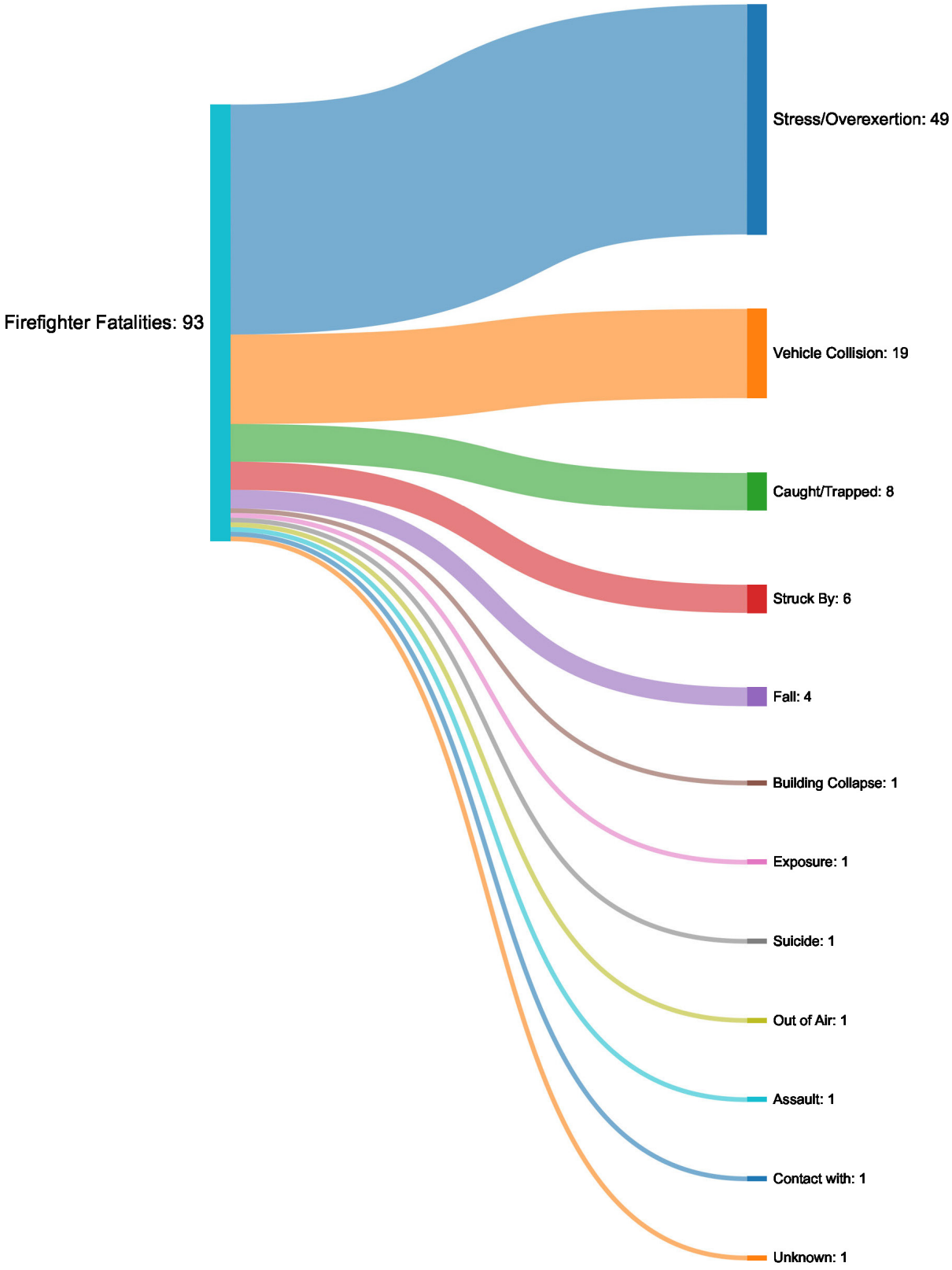
Cause of Fatal Injury

Firefighters face multiple hazards. Though the public often associates the greatest risk of firefighting with the fire itself, data reveals fatalities may have many causes.

The term “cause of fatal injury” refers to the action, lack of action or circumstances that directly resulted in the fatal injury. A fatal injury is usually the result of a chain of events, the first of which is recorded as the cause. Figure 11 shows the distribution of deaths by cause of fatal injury or illness in 2023. As in previous years, the leading cause of fatal injury in 2023 is, by far, stress/overexertion (53%). This broad term indicates that the work that was being done, and the physiological or pathological changes that resulted, were part of a cascading medical issue that resulted in a death. For example, almost all cardiovascular events are presumed to be “caused” by the work of firefighting (termed stress/overexertion). The next leading causes in 2023 were vehicle collisions (20%), caught or trapped (9%) and struck by (6%).

Figure 11. Firefighter fatalities by cause of fatal injury (2023)



Stress or overexertion

Firefighting can be extremely strenuous work; in fact, it can be one of the more physically demanding of human activities because it involves strenuous physical work while wearing heavy and encapsulating personal protective equipment and is performed in dangerous environments. Stress or overexertion is a general category of "cause" that is used to explain all firefighter deaths that are cardiac or cerebrovascular in nature, including sudden cardiac arrest and strokes, as well as other events, such as heat exhaustion and heat stroke. Classification of a firefighter fatality in this "cause of fatal injury" category does not necessarily indicate that a firefighter was in poor physical condition or that the work performed was extreme. Even fit individuals can suffer a cardiovascular or cerebrovascular event if they have underlying cardiovascular disease. And, as reported earlier, even the stress of responding to a call can provoke a cardiovascular event (which will be labeled as caused by stress/overexertion) in an individual with underlying cardiovascular disease.

The leading cause of fatal injuries for firefighters has historically been stress/overexertion. In fact, from 2014 to 2023, stress/overexertion was the leading cause of death every year except in 2020 when it tied with COVID-19 as the leading cause and 2021 when COVID-19 was the leading cause (Figure 12). In 2023, 49 firefighters (53%) died due to stress or overexertion. Of these 49 firefighters:

- 46 firefighters died due to cardiovascular events.
- 2 firefighters died due to CVAs.
- 1 firefighter died due to other unknown reasons.

Of the firefighter deaths that were attributed to stress or overexertion in 2023, 29 (59%) were volunteer firefighters, 17 (35%) were career firefighters, 2 (4%) were part-time (paid) or paid-on-call, and 1 (2%) was a wildland firefighter. 19 (39%) of the firefighter deaths attributed to stress or overexertion occurred after emergency operations were finished but were included as on-duty events because they met the inclusion criteria stipulated in the Hometown Heroes Survivors Benefits Act of 2003.

Figure 12. Firefighter fatalities by cause of fatal injury (2014-2023)

The data above serves as a call to increase awareness and training on the identification of signs of stress or overexertion cardiovascular incidents, getting adequate rest and recovery, and the criticality of nutritional and physical fitness for better cardiac health. In addition, the fire service should improve and increase cardiac-related screenings of firefighters.

Vehicle collisions

As previously stated, firefighters face danger and assume significant responsibility not only during incident operations but also while responding and returning from these incidents, whether in a fire department vehicle, personally owned vehicle or other type of vehicle such as aircraft. While responding, returning or on-scene, firefighters must always be aware of their surroundings, the speed at which they are traveling, weather conditions, and the safety of others to reduce the amount of risk of potential danger to themselves and others.

From 2014 through 2023, vehicle collisions were the second or third leading cause of fatal injury each year. In 2023, vehicle collisions were the second leading cause of fatal injury resulting in 19 firefighter deaths (20%). Of those who lost their lives due to vehicle collisions, 10 (53%) were volunteer, 5 (26%) were career, 3 (18%) were wildland and 1 (5%) was a part-time (paid) firefighter. Of these firefighters, 6 deaths involved fire

department engines or other apparatus, 5 deaths involved privately owned vehicles, 4 deaths involved helicopters, 1 death involved a tanker (water tender), 1 death involved a fire department brush truck, 1 involved a fire department staff/support vehicle and 1 involved an all-terrain vehicle (ATV).

This data further confirms that emergency vehicle drivers must become knowledgeable of and adhere to established fire department policies, procedures and guidelines related to the safe operation of vehicles while responding to, returning from, or on-scene.

The following incident descriptions of the vehicle collisions that resulted in the loss of 19 firefighters in 2023 are provided to highlight the range of scenarios that may lead to a firefighter fatality involving a vehicle accident:

- A safety officer was the driver and sole occupant of a pumper returning from a vehicle fire. The engine was equipped with a 1,000-gallon tank that was full at the time. The weather was clear, the blacktop road was narrow, straight and dry, and it was daylight. For unknown reasons, the apparatus drove off the right side of the road and rolled over. The safety officer was ejected from the engine and pinned underneath. Other firefighters returning from the same incident were on scene quickly and removed the safety officer from the collision scene. The safety officer suffered significant leg injuries in the collision and was flown to a regional medical care facility where he was treated for his injuries. He did not recover and died in the hospital.

- A fire chief responded to a structure fire on his motorcycle. Upon entering a left-hand curve, he lost control and drove off the right side of the roadway. He struck a culvert, and the motorcycle flipped and struck a second culvert. The fire chief was transported to the hospital but died as the result of injuries received in the collision. Speed was cited in the law enforcement report as a factor in the collision. The fire chief was wearing a motorcycle helmet at the time of the collision.

- A forestry technician was dispatched for a wildfire. Upon arrival, he used an agency ATV to determine the extent of the spread of the fire and to develop a suppression plan. After approximately 30 minutes of no radio contact, on-scene firefighters looked for the forestry technician. He was found under his overturned ATV in a remote area of the scene. On-scene emergency medical personnel determined that the forestry technician died. Fire department personnel transported the forestry technician to the roadside where the coroner confirmed the death. The forestry technician was also the fire chief of another fire department.

- A captain was the driver and sole occupant of an engine apparatus responding to set up a helicopter landing zone for an ATV collision that involved a child. As the apparatus responded, it left the right side of the roadway, went down a steep embankment, and rolled. The captain was killed in the collision and pronounced dead at the scene. The captain was wearing his seat belt at the time of the collision.

- An assistant chief was the driver of a 2,000-gallon tanker (tender). The apparatus was responding to a chicken coop fire. A firefighter rode in the passenger seat. As the apparatus completed a left-hand curve, the tanker went off the right side of the roadway and rolled, coming to rest on its passenger side. The assistant chief was killed in the collision and the passenger firefighter was trapped under the apparatus, extricated and transported to a medical facility. Neither the assistant chief nor the passenger firefighter was wearing a seat belt at the time of the collision.

- A firefighter was the passenger in a fire apparatus checking fire hydrants. The apparatus traveled off the roadway onto the shoulder and lost control. The vehicle then spun counterclockwise as it flipped across the roadway before hitting a tree and landing on its passenger side in the ditch. The firefighter was partially ejected and pronounced deceased at the scene. He was not wearing his seat belt at the time of the collision.

- A firefighter was the driver of a 2004 Ram 2500 responding to a motor vehicle collision. Another firefighter was a passenger in the vehicle. As they responded, the vehicle struck a cow in the road, the firefighter lost control of the vehicle, the vehicle rolled and a firefighter was ejected. Both firefighters were treated at the scene and transported to a local hospital. The driver died of traumatic injuries he sustained at the accident.

- A firefighter was the driver's side rear seat passenger in a 4-door F-350 truck. The vehicle was part of a convoy and had been on the road for approximately 2½ hours. The firefighter was asleep. The vehicle that the firefighter was riding in left the roadway and traveled down an embankment. The vehicle rolled and ended up against a tree with impact to the cab of the vehicle. He was killed in the collision. According to the law enforcement report on the collision, the driver may have fallen asleep. The firefighter was wearing his seat belt at the time of the collision.

- Sheriff's Office Department of Fire Rescue and Emergency Services flight crew members were dispatched to a medical call regarding a traffic collision with injuries. The pilot reported that during initial climb, about 300 to 400 feet above ground level, the pilot heard a bang from the rear of the helicopter and noticed that the turbine outlet temperature (TOT) was rising on the no. 1 engine. He set the no.1 engine throttle to idle, declared an emergency to air traffic control, and reversed direction to return to the airport. The pilot scanned the cockpit instrument panel and noticed that the no.1 engine fire button had illuminated. He pressed the button to activate the fire suppression system; however, the TOT continued to rise on the no. 1 engine. The pilot subsequently heard a second bang and was unable to control the helicopter. It spun and descended into an apartment building. A battalion chief died in the collision. An individual inside the apartment at the time of the collision was pronounced deceased at the scene. 2 other crew members and 2 civilians were taken to the hospital with non-life-threatening injuries.

- 2 firefighting helicopters, a Sikorsky S-64E and a Bell 407, collided while battling a wildfire. The fire was sparked by a nearby structure fire. While the Sikorsky S-64E helicopter was able to land safely, the Bell 407 crashed. All 3 occupants of this helicopter, an assistant chief, a captain and a contract pilot, were killed.

- A firefighter was riding in the officer's seat of an engine apparatus responding to a house fire. The weather conditions at the time were very bad with heavy storms and lots of standing water on roadways. As the apparatus entered a curve, the driver lost control, and the vehicle left the right side of the roadway and struck 2 trees. Although she was wearing her seat belt, the firefighter was partially ejected and was immediately transported to a local hospital. Later, she was transferred to a rehabilitation facility where she developed complications and died almost 2 months later.

- A firefighter was responding in his personal vehicle to a mutual aid request. The vehicle left the roadway and struck a culvert at the bottom of the ditch next to the road. The vehicle's airbag deployed. Initially law enforcement officers who responded to the collision found the firefighter alert and responsive. He told officers that he had looked down while driving to look for his radio and when he looked back up, he crashed. He became unresponsive about the time EMS arrived. He was airlifted to a local hospital for emergency surgery where he passed away 2 days later.

- 2 firefighters were responding to an automatic fire alarm in a personal vehicle. The weather at the time of their response included heavy rain. As they responded, the firefighter lost control of the vehicle, and it left the roadway and struck trees. He was fatally injured, and the other firefighter received significant injuries. Neither firefighter was wearing their seat belt at the time of the collision.

- A captain was responding to a cornfield fire in a 2006 Polaris Ranger ATV and was followed by an engine. As the vehicles responded, they encountered a farm tractor pulling a wagon in the right lane. The engine moved to the left lane and overtook the Ranger to pass the tractor. As the engine passed the Ranger, the Ranger sideswiped the engine. The Ranger rotated after impact and rolled, ejecting the captain. He was transported to a local hospital and then transferred to a regional care facility where he died of his traumatic injuries.

- A firefighter responded to an ATV collision with 2 people seriously injured, and helicopters were summoned for transport. As the apparatus she was riding was responding to the landing site, it slipped from the roadway, went down an embankment, and struck multiple structures. The firefighter was pinned under the vehicle. She died at the hospital due to the injuries sustained in the collision. Her eldest son was also in the vehicle. He had minor injuries and was treated and released from the hospital. None of the 3 firefighters on the apparatus were wearing their seat belts at the time of the collision.

- A master firefighter was an officer's seat passenger in an engine responding to an automatic fire alarm. During the response, the engine left the right-hand side of the roadway onto a soft and steep shoulder. It rolled onto the passenger side and struck 2 utility poles. Although he was wearing his seat belt, the master firefighter was partially ejected and pronounced dead at the scene.

- A lieutenant was responding to the fire station for an EMS incident. He was responding on a tricycle and was struck by a vehicle in a crosswalk. He suffered traumatic injuries and was transported to a local hospital. He did not recover from his injuries and died 2 days later.

Caught or trapped

Being caught or trapped includes firefighters operating at wildfires and structural fires who were unable to escape due to rapid fire progression and the byproducts of smoke, heat, toxic gas and flames or other type of hazard. This classification includes firefighters who may have drowned and those who were crushed as a result of being trapped. In 2023, 8 firefighters (9%) died from being caught or trapped during incident operations resulting in it being the third leading cause of fatalities for the year. The following are descriptions of the incidents where 8 firefighters became caught or trapped:

- A firefighter and his engine company crew were dispatched to assist a person trapped in their vehicle during heavy rain and flooding. When they arrived on-scene, they found the driver was not in need of emergency assistance. In the same area, the firefighter and his crew encountered a group of civilians attempting to remove debris from a fence that was blocking drainage and causing flooding to their land and home. Public works employees arrived on the scene and began to remove the fence to allow drainage. The firefighter retrieved a bolt cutter from his apparatus to assist the public works employees with the removal of clips and cable attaching the fence to its posts. As the firefighter delivered the tool, he fell into the water and did not resurface. When it became clear that the firefighter had been swept away through an underground drainage pipe, firefighters and public works employees responded to the pipe's outlet near the ocean. The firefighter was located and brought to shore. Emergency medical treatment began immediately utilizing an automated external defibrillator, CPR and advanced life support. The firefighter regained a pulse and was transported to a local hospital. He did not recover and died because of drowning. The depth and danger of the water was masked by still, muddy water on the surface and waterway boundaries under the surface of the water. In addition, a grate that had been positioned at the entrance to the underground drainage pipe was missing.

- A firefighter and members of his fire department were dispatched to a 3-story commercial building. Firefighters arrived on the scene and found smoke showing and a working fire to the rear of the structure. The firefighters entered the structure to fight the fire. The fire progressed rapidly, and an explosion or collapse occurred. An evacuation and switch to a defensive mode was ordered. The firefighter was not accounted for, and a mayday was declared. The firefighter was later discovered by other firefighters, but he was deceased. A press report stated that the firefighter had become entangled in a clothing rack and could not escape. Other firefighters attempted to free him but were forced to evacuate. His death was caused by smoke inhalation and thermal burns.

- 2 firefighters were on duty and were dispatched to a report of cars on fire aboard a ship. Arriving firefighters found a working fire, and firefighters commenced efforts to control it. During the fire fight, the 2 firefighters became separated from their crews. Their absences were noted, a mayday was called and rescue teams began a search. Both firefighters were located and removed from the ship. They were transported to the hospital but could not be revived.

- 2 fire department companies were dispatched to a report of a house on fire. An engine arrived on the scene and found fire showing from the rear of a 2-story wood frame residence. Firefighters advanced a 1¾ inch (preconnect) attack line into the

structure. Less than a minute later, another engine arrived on scene, and they also advanced a preconnect. Both companies began fire attack as a truck began truck operations. While companies were attacking the fire in the garage, the Incident Commander observed a partial collapse of the garage and advised all firefighters to exit the structure. As crews were attempting to exit the structure, more debris fell, knocking a firefighter assigned to the truck to the ground. 2 lieutenants grabbed the firefighter and began to pull him out. Before they could get out, the second floor above the garage gave way and trapped all 3 firefighters under the fallen structure. Rescue efforts began and numerous additional resources were requested. During the rescue efforts, one of the lieutenants was found under the fallen garage unconscious and not breathing. CPR was started immediately upon his removal. The remaining trapped firefighters were rescued successfully. There were 4 other firefighters transported to the burn center in noncritical condition. The lieutenant was transported as well but succumbed to his injuries. The fire was intentionally set in a large dumpster in the driveway that spread to the residence.

- A lieutenant's truck company was dispatched to a house fire. The fire was in the basement where the lieutenant entered as part of the search team. A mayday was called, and he was removed and transported to the nearest hospital due to burns and smoke inhalation. He died as a result of his injuries 17 days later in the intensive care unit. 3 other firefighters were injured in the incident.

- An engine and other fire department units were dispatched to a report of a building fire. The engine was the first fire department unit to arrive on the scene. A lieutenant reported a working fire, and the engine deployed a supply hose from a fire hydrant to the scene. When the engine stopped in front of the building, the lieutenant, a firefighter/emergency medical technician (EMT), and other firefighters deployed an attack line into the structure to attack the fire. As firefighters — including both the lieutenant and the firefighter/EMT — worked inside of the burning building, conditions changed rapidly and both firefighters became trapped. A mayday was declared and the firefighter/EMT was located by other firefighters and removed from the building. Unfortunately, he was pronounced dead at the scene due to injuries he received. The lieutenant was located by other firefighters and removed from the building. He was transported to a local hospital and treated for his injuries. Unfortunately, he did not recover from his injuries and died at the hospital 5 days later.

Struck by

Another potential hazard firefighters face is being struck by objects during incident operations, while on roadways and while performing routine duties. In 2023, 6 firefighters (6%) were killed by being struck at the scene of vehicle collisions, wildfires and while performing other duties. The following are descriptions of the incidents where 6 firefighters were struck by an object and killed:

- The fire department and Department of Public Safety (DPS) troopers were providing traffic control in the aftermath of a vehicle fire. The inside lane was shut down with traffic control devices, and a fire truck and 2 DPS patrol units were blocking the scene. A tractor trailer failed to yield and follow marked traffic paths and struck the fire apparatus, 2 DPS patrol units, and the original fire vehicle. 1 firefighter was struck. He was immediately transported to the hospital where he passed away a short time later from his injuries. 2 DPS officers were also injured in the incident.

- A forestry technician was fighting a wildfire when he was struck by a falling tree snag and killed. The fire was intentionally set, and a man was charged with wildfire arson and murder.

- A firefighter and members of his fire department responded to a report of a vehicle collision. Upon their arrival on the scene, firefighters found a disabled vehicle that had not been involved in a collision. Firefighters remained on the scene to assist as a tow truck was called. As the apparatus was repositioned on the scene, the firefighter was struck and injured. Emergency medical assistance was provided on the scene and the firefighter was transported to a local trauma center by medical helicopter. Despite these efforts, the firefighter died of his injuries. There is a possibility that the firefighter collapsed due to a medical emergency prior to being struck.

- 2 firefighters utilized the department's side-by-side ATV to examine the scene of a past collision. Both firefighters were on foot when the ATV began to roll. They attempted to access the driver's controls on the ATV to stop it from rolling but were dragged over an embankment and into the woods. One of the firefighters sustained fatal traumatic injuries.

- A fire police officer was assisting the state police, who were investigating a 2-vehicle collision, by directing traffic in the eastbound lanes. The fire apparatus that initially responded to the collision returned to quarters. A vehicle drove into the collision scene and struck the fire police officer. The impact sent him airborne approximately 15 to 20 feet before he hit the pavement. He was transported to a local hospital where he was pronounced deceased approximately 1 hour later. The driver of the vehicle that hit the fire police officer is reportedly facing multiple felony charges including homicide by vehicle, accidents involving death or injury while not licensed, driving while operator privileges suspended/revoked, driving without a license and reckless driving.

- A firefighter and the members of his fire company were dispatched to a vehicle collision on an interstate highway. While they were on the scene of the collision in the northbound lanes, a southbound vehicle lost control, crossed the median and struck the firefighter, a fire lieutenant and police officer. Firefighters on the scene treated the injured, and they were transported to the hospital. The fire lieutenant and police officer died that day. The firefighter remained in the hospital for 7 months and continued his recovery at home. He died suddenly and unexpectedly 3 years later as a result of his injuries.

Fall

Due to the force of gravity and unstable conditions, firefighters can accidentally fall to the ground during incident or routine operations. In 2023, 4 firefighters (4%) were killed from injuries sustained in falls. The following are incident descriptions that resulted in the 4 firefighter fatalities from falls:

- A firefighter and his crew responded to a mutual aid residential structure fire. The firefighter made entry into the structure with an attack crew to extinguish the fire. The floor of the residence failed, and the firefighter fell through the first floor into the basement. Other on-scene firefighters made rescue efforts but were blocked when a collapse of the structure impeded their access. The firefighter died because of traumatic injuries.

- Firefighters responded to a fire in a 4-story building for a report of a kitchen fire. The building housed a commercial occupancy on the ground floor and apartments on the upper floors. A firefighter/EMT was on the roof opening it for ventilation when he fell through a skylight shaft. He fell 4 stories and landed on his back. A mayday was called, and the firefighter was immediately located; however, firefighters needed to breach a wall to reach him. After being rescued, he was rushed to a local hospital where he died from the injuries he sustained in the fall.

- A chief and a captain were using a mechanical lift to make repairs to the radio tower at their fire station. As they worked, the lift fell to the ground, and both were ejected from the tower basket. The chief and captain were both pronounced deceased at the scene from the injuries they sustained in the fall.

Structural collapse

When internal load-bearing structural elements fail due to a fire, a building will collapse into itself with exterior walls being pulled into the falling structure.[6] In 2023, 1 firefighter (1%) was killed as a result of a structural collapse during an incident operation. The following is the description of the incident:

- Firefighters responded as part of an automatic aid response to an apartment building fire. While fighting the fire, a structural collapse occurred, and firefighters called maydays. 5 firefighters from 1 fire department and 1 from another fire department were rescued and taken to the hospital. 1 firefighter was trapped in the debris and later removed from the structure. Emergency responders at the scene immediately began CPR on the firefighter and continued the lifesaving efforts as they transported him to the hospital. Shortly after arrival, however, the firefighter was pronounced deceased from the injuries he sustained in the collapse.

Exposure

Exposure includes firefighters who come into contact with something that impacts the physiological function of the body and leads to death, such as infectious diseases. In 2023, 1 firefighter (1%) was killed when they were exposed to COVID-19. The following is the description of the incident:

- An assistant chief was exposed to COVID-19 during on-duty activities. He became ill and his health worsened. He died because of COVID-19 complications.

Other

In 2023, 4 firefighters (4%) died from a cause of fatal injury not listed in a specialized cause of fatal injury category listed above (such as stress/overexertion, struck by and vehicle collision). 1 firefighter was assaulted and shot, 1 came into contact with a power line, another ran out of air after a mayday was called, and the final firefighter died by suicide.

- A firefighter had just come on duty. He and other firefighters were conducting duties in the fire station. A gunman entered the fire station through an open bay door and fired multiple shots. 2 firefighters were struck. They were both transported to the

[6] "Structural Collapse Guide," OSHA, https://www.osha.gov/emergency-preparedness/guides/structural-collapse

hospital. 1 firefighter died because of his injuries. The other firefighter sustained serious injuries but survived. Law enforcement officials announced that a person of interest has been identified.

- A lieutenant and members of his fire department responded to an incident involving burning trees that resulted from an ice storm. While firefighters worked on the scene, a tree branch broke and caused a live power line to drop to the ground. The lieutenant encountered the power line and was electrocuted. He was transported to the hospital but did not survive.

- A fire department responded to a residential fire in a 2½ story residence. A firefighter/EMT and his crew advanced a hoseline into an exposure building next door. During the fire attack, at approximately 4:00 a.m., a mayday was called. The firefighter/EMT was located by his hoseline at about 4:10 a.m. He was immediately transported to the hospital where he passed away a short time later. 2 other firefighters were also injured and listed in stable condition. The fire is believed to have started in the attic of the home, which spread to its 2 neighboring buildings. The cause of death for the firefighter/EMT was listed as smoke.

- An engineer/EMT was on duty at his fire station. The engineer/EMT's company officer saw him go to bed in the evening. Sometime during the night, the engineer/EMT went to his personal vehicle and shot himself. Fellow firefighters noticed that the engineer/EMT missed roll call in the morning. They discovered him severely injured from a self-inflicted gunshot wound. He was immediately transported to a medical center where he passed away later that day.

Unknown

There are a number of factors that may have contributed to the cause of fatal injury being classified as unknown, such as a lack of an autopsy at the time of death or that the cause of fatal injury was still being investigated at the time this report was published. In 2023, 1 firefighter fatality (1%) had a cause of fatal injury that was unknown. The following is a description of the incident:

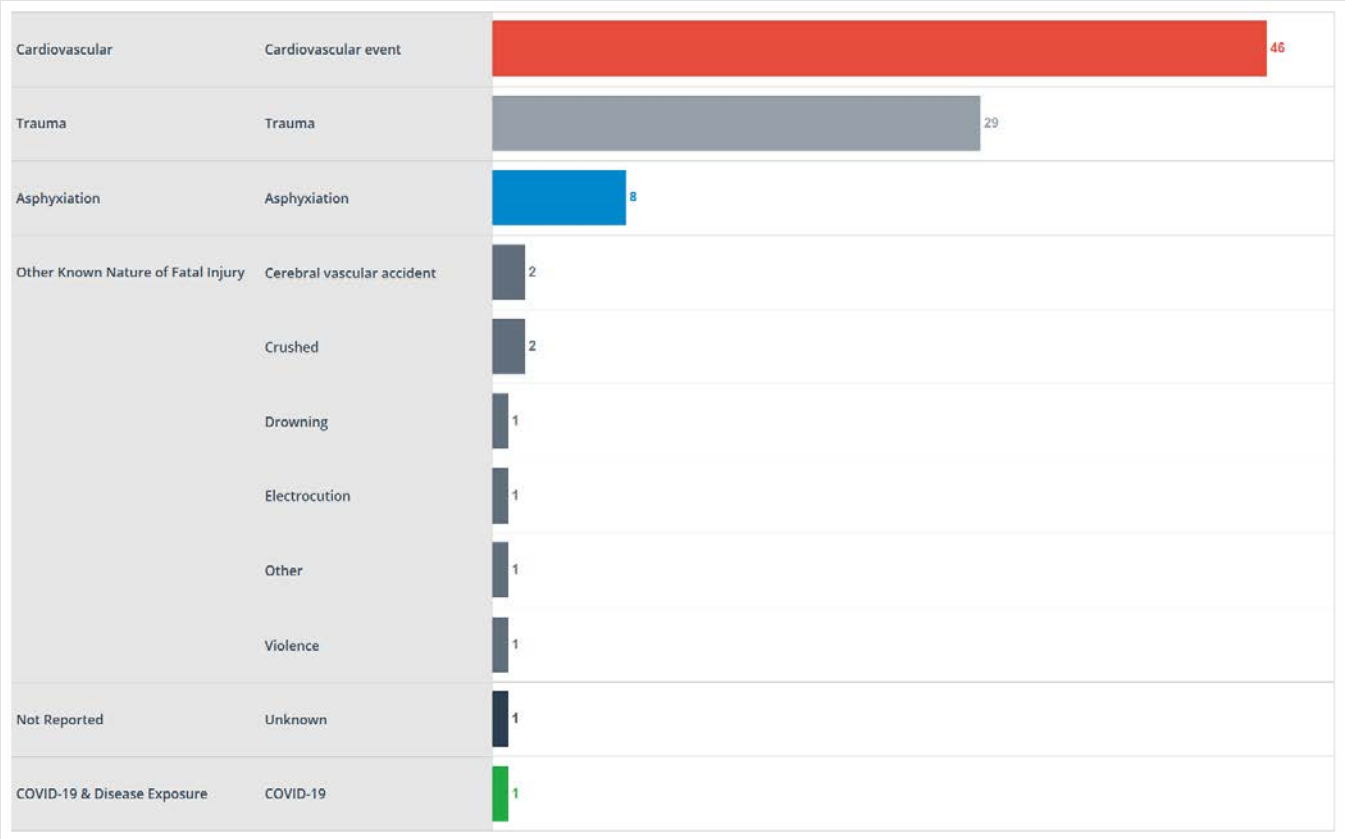
- A firefighter was performing traffic control duties at the scene of a motor vehicle collision when he suffered a medical emergency. Responders immediately began lifesaving efforts, and the firefighter was transported to a local hospital where he passed away a short time later. The cause of his death has yet to be disclosed.

Nature of Fatal Injury

The term "nature of fatal injury" refers to the medical cause of the fatal injury or illness, which is often referred to as the physiological cause of death. Learning about the nature of fatal injury will help the fire service identify how firefighters are dying, enable the fire service to better develop educational and awareness programs, and support the need for specific prevention and screening programs.

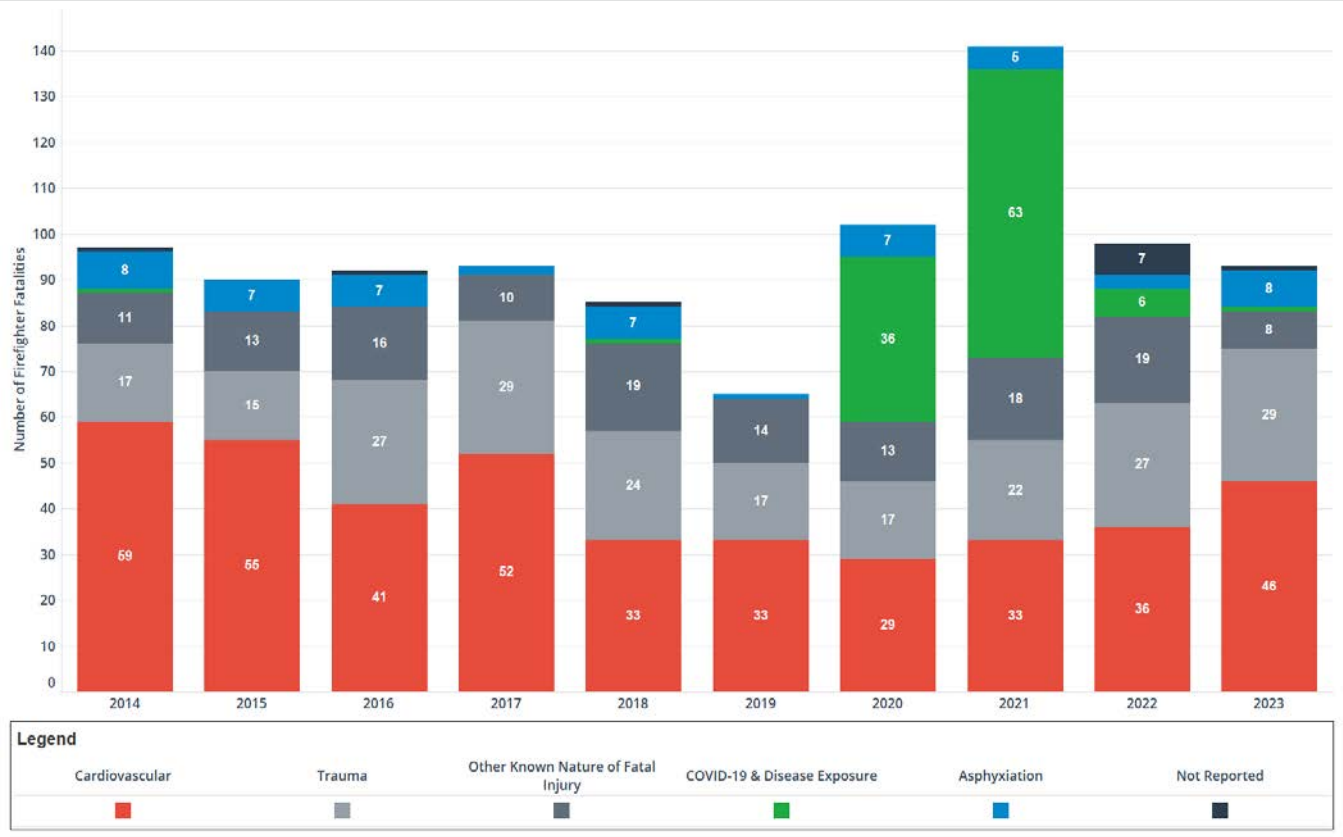
Figure 13 shows the distribution of the 93 firefighter deaths that occurred in 2023 by the medical nature of the fatal injury or illness. In 2023, cardiovascular event led to the deaths of 46 firefighters and was the leading type of nature of fatal injury, by far, at 49%. The second leading type of nature of fatal injury was trauma at 31% followed by asphyxiation at 9%.

Figure 13. Firefighter fatalities by nature of fatal injury (2023)



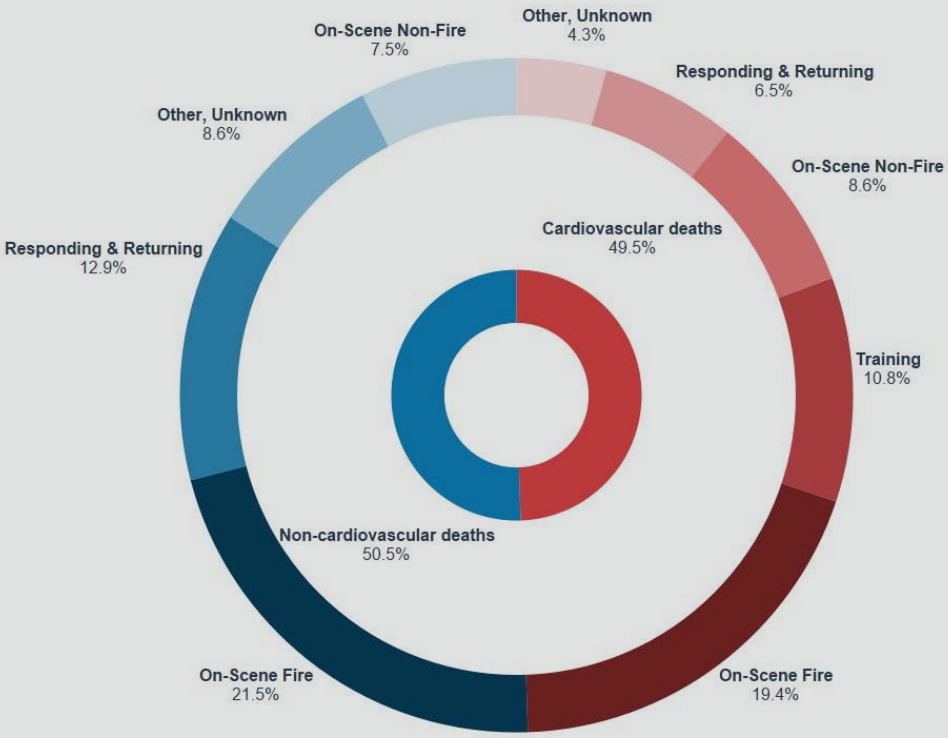
Cardiovascular events, such as sudden cardiac arrest, are historically the number 1 nature of fatal injury with firefighters. Except for 2020 and 2021 when COVID-19 was a factor, cardiovascular event was the leading type of nature of fatal injury of firefighters every year from 2014 to 2023 (Figure 14).

Figure 14. Firefighter fatalities by nature of fatal injury (2014-2023)



By understanding the type of duty where firefighters experienced a cardiovascular event, the fire service will know where to most frequently look for warning signs, understand where an increase in personnel may be needed to lower prolonged exertion, and can possibly consider changes in incident or routine operations. Figure 15 shows the type of duty involved for the 46 firefighters who died due to a cardiovascular event in 2023 and compares it to the type of duty involved for the firefighters who died of all other types of nature of fatal injury. Being at the scene of a fire was the leading type of duty by firefighters who died from a cardiovascular incident as well as firefighters who died from all other nature of fatal injuries. Note, however, that no firefighter deaths that occurred during training happened due to any other nature of fatal injury besides cardiovascular event.

Figure 15. Cardiovascular events by type of duty (2023)



Like stress or overexertion under the cause of injury, the data in the graphics above also serves as a call to the fire service to increase awareness and training on the identification of signs of stress/overexertion, getting adequate rest and recovery, and the criticality of nutritional and physical fitness for better cardiac health. In addition, the fire service should improve and increase cardiac-related screenings of firefighters.


FIREFIGHTER
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Firefighter Ages

Tracking firefighter ages for on-duty fatalities can help identify patterns or risk factors associated with different age groups. This data could also guide policy decisions to enhance firefighter safety and well-being to reduce fatalities across all age demographics.

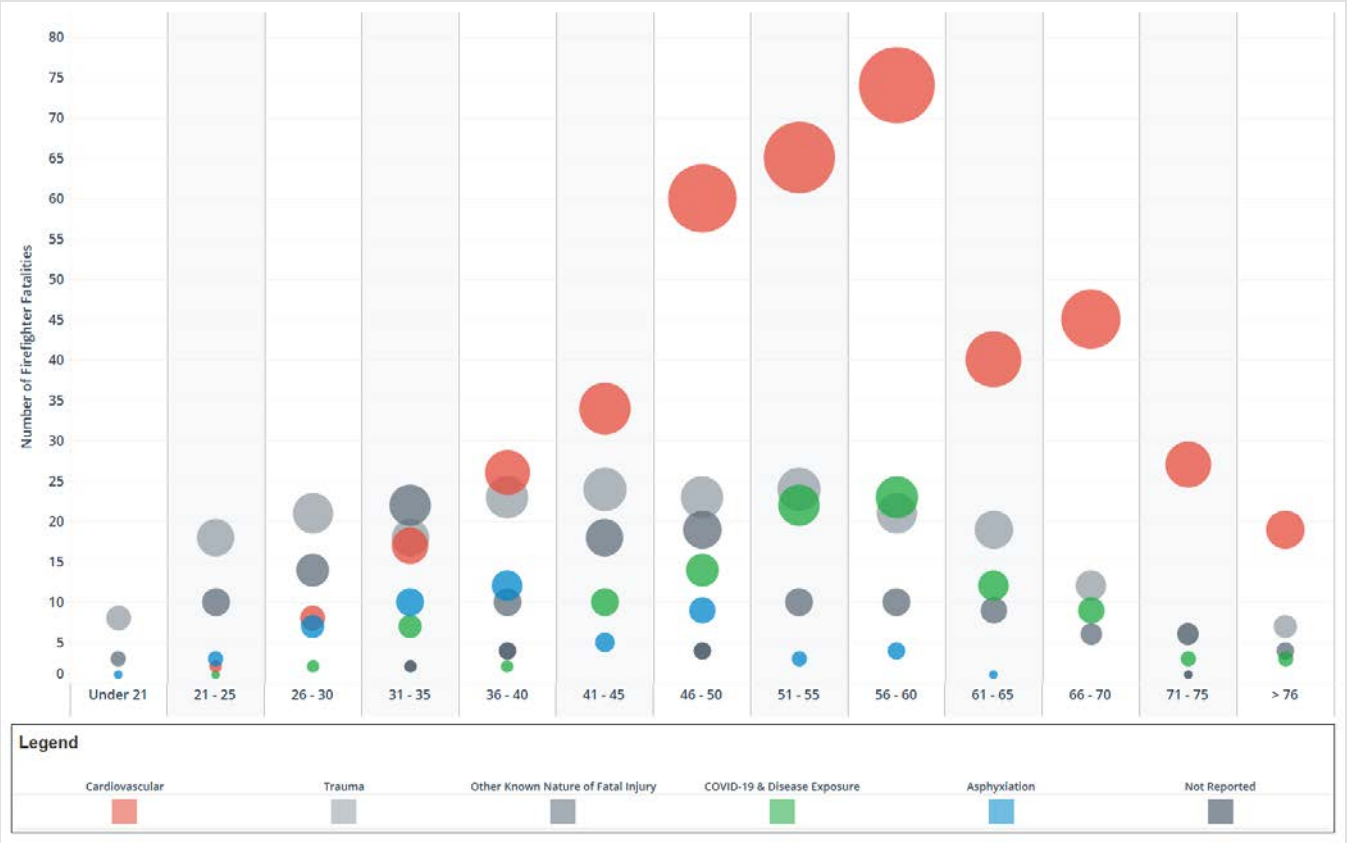
Figure 16 shows the distribution of firefighter deaths by age at the time of death. From 2014 to 2023, those ages 46 thru 60 accounted for 40% of firefighter fatalities. The least amount of firefighter fatalities at 2% occurred in those under 21 years of age. In 2023, firefighters ages 46 thru 50 accounted for the most deaths at 16%, followed by those ages 51 thru 55 (13%) and those ages 26 to 30 (10%).

Figure 16. Firefighter fatalities by age at death (2014-2023)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Under 21		3	1	1	3		1	1	2	4	16
21-25	4	2	6	1	1	3	4	6	6	6	39
26-30	3	5	4	5	5	3	5	8	5	9	52
31-35	3	6	7	7	12	3	5	15	11	5	74
36-40	6	9	7	6	7	8	7	8	9	7	74
41-45	11	11	14	8	10	7	15	14	4	4	98
46-50	12	12	13	11	12	11	14	14	15	15	129
51-55	12	10	14	18	8	8	9	22	14	12	127
56-60	18	15	9	15	8	1	15	21	14	6	122
61-65	16	4	4	7	7	6	10	15	7	7	83
66-70	9	7	7	3	5	6	11	9	6	7	70
71-75	1	4	3	8	4	6	3	3	2	6	40
Over 76	2	2	3	3	3	3	3	5	3	5	32
	97	90	92	93	85	65	102	141	98	93	**956**

Figure 17 shows the distribution of firefighter deaths by age at the time of death and the leading nature of fatal injuries from 2014 to 2023. The leading nature of injuries for most firefighters under the age of 36 years was trauma or other nature of fatal injury. As firefighters aged, there was a change. Once firefighters reached 36 years of age, cardiovascular events clearly became the leading nature of fatal injury for all subsequent age groups.

Figure 17. Firefighter fatalities by age and leading nature of fatal injury (2014-2023)

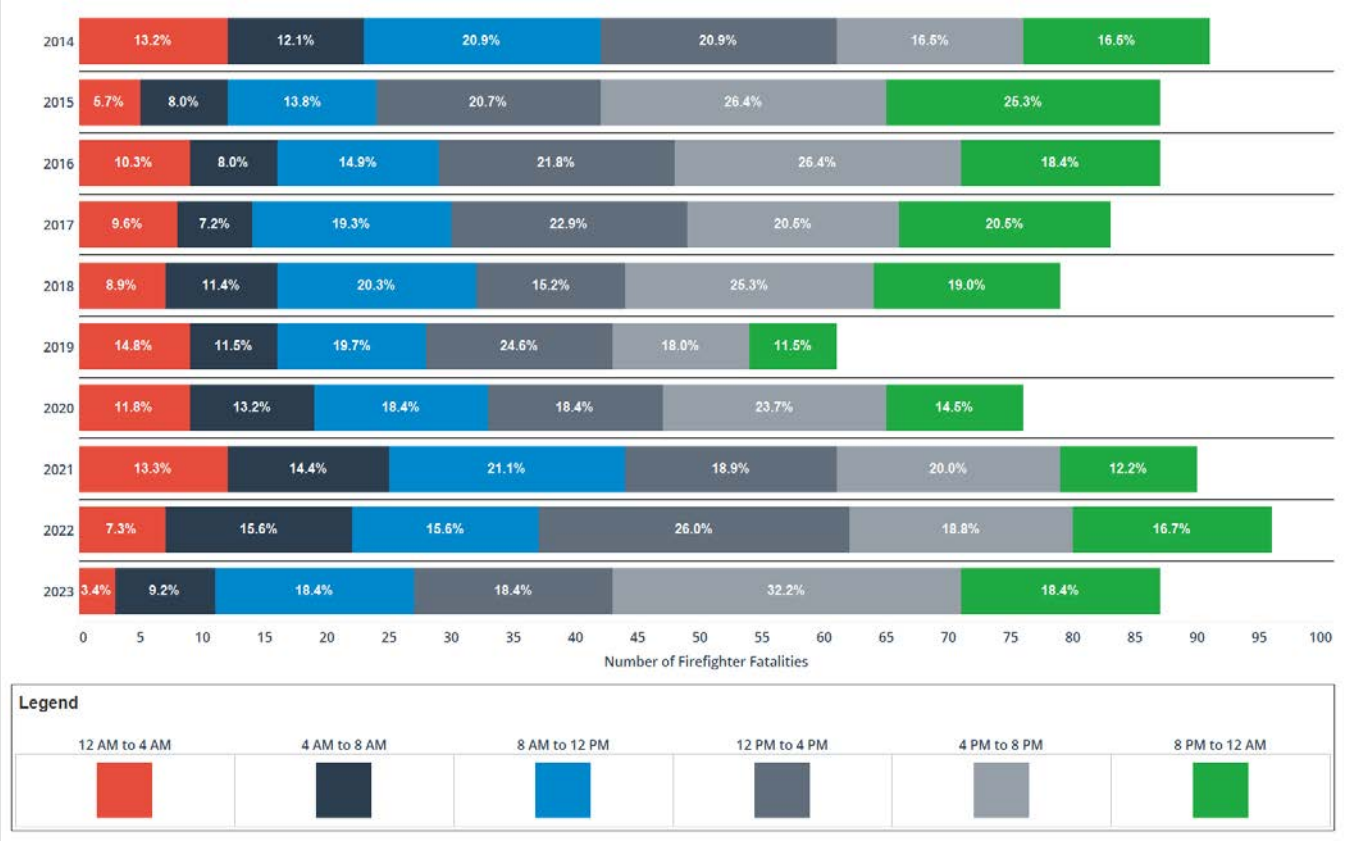


Firefighter Fatalities by Time of Fatal Injury

Analysis of time of fatal injury could potentially give insight to factors that contributed to firefighter deaths. For example, more fatalities in the late evening and early morning hours may support that sleep disruption could be a factor. In addition, more firefighter fatalities in the daytime hours may support that heat stress could be a factor.

Figure 18 illustrates the distribution of firefighter deaths according to the time of day when the fatal injury occurred. From 2014 to 2023, most firefighter fatalities occurred between 4 and 8 p.m. A correlation could be made between the frequency of residential building fires and the firefighter deaths, as most residential building fires occur between 5 and 8 p.m. when many people are expected to be cooking dinner.[7]

Figure 18. Firefighter fatalities by year and hour of day (2014-2023)



[7] USFA, "Residential Building Fires (2017-2019)," Volume 21, Issue 2, May 2021, https://www.usfa.fema.gov/downloads/pdf/statistics/v21i2.pdf

On-Duty Firefighter Fatalities Where Incidents and Deaths Occurred in Previous Years

The USFA was informed in 2023 of 4 additional firefighters whose deaths and on-duty fatal injuries occurred in 2022. The following are descriptions of these 4 incidents:

- A firefighter responded to a vehicle collision. While at the incident, the firefighter provided traffic control and scene safety. The incident concluded at approximately midnight. About 4 hours later, the firefighter became ill and was discovered unresponsive on the floor by his spouse. The firefighter died as the result of a ruptured aortic aneurysm.

- A firefighter and members of his fire department responded to a detached shed fire. The incident was reported at 9:26 p.m., and firefighters reported back in station at 11:36 p.m. The following day, the firefighter and his fire department responded to a report of a full code and found a patient who was not ill. The incident was dispatched at 12:38 p.m. and concluded at 12:50 p.m. Later that afternoon, responders were called to the firefighter's residence for an unresponsive party where they found him not breathing. Resuscitation efforts were not successful. The firefighter was pronounced dead at his residence as a result of a cardiovascular event.

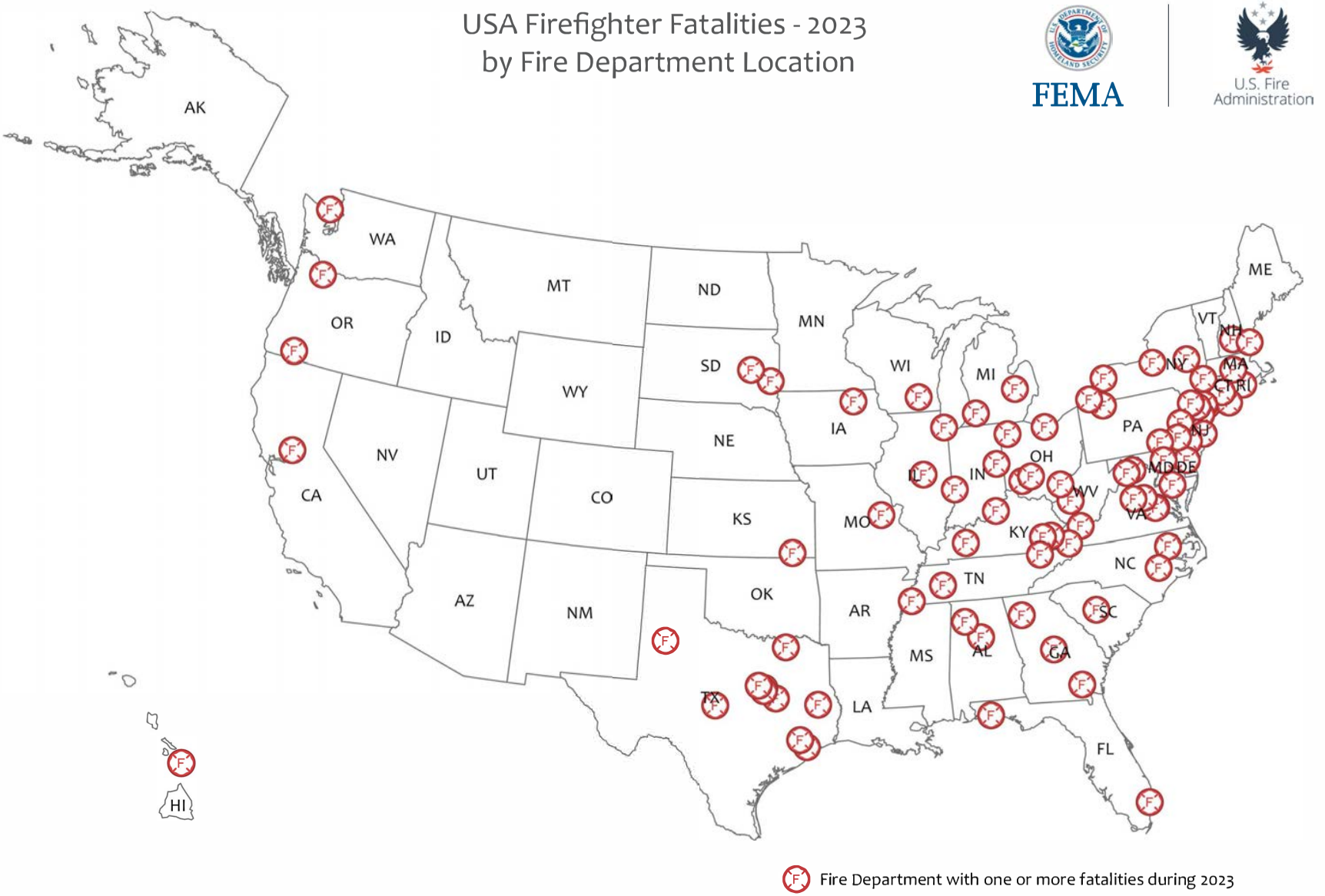
- A firefighter worked a 24-hour shift that began at 8:00 a.m. on one day and ended at 8:00 a.m. the next day. During the shift, the firefighter responded to 5 emergency incidents. The last was an EMS incident that occurred at 6:46 a.m. As was his routine, the firefighter went for a 10-mile fitness run after going off-duty. During the run, the firefighter suffered a medical emergency. He was discovered at the fire station door, treated by on-duty firefighters and transported to a local hospital by ambulance. He was treated at the hospital but later died on Aug. 4, 2022, because of a cardiovascular event.

- A fire chief responded to a medical assistance call at a local residence. Upon completion of the call at approximately 11:06 a.m., the fire chief proceeded to the fire station. The fire chief then left the station shortly thereafter and suffered a medical emergency while driving home. The fire chief died because of a cardiovascular event.

Fire Department Location by State

Firefighters based in 32 states died in 2023. The highest number of firefighter deaths in 2023 (based on the location of the fire service organization) occurred in Texas, with 10 losses. New York, Ohio and Virginia each had 7 deaths, followed by New Jersey, which experienced 6 losses, and Illinois, Kentucky and Pennsylvania, which experienced 5 losses each.

Figure 19. Firefighter fatalities in 20203 by fire department location.



Note: there were no firefighter fatalities reported in U.S. Territories or Possessions during 2023

Source:
U.S. Fire Administration - National Fire Data Center
National Fallen Firefighters Foundation

Conclusion

In 2023, 93 firefighters lost their lives while on duty. Moreover, the long-term trend (10-year) shows a 16.8% increase of on-duty firefighter fatalities since 2014. As in many previous years, the leading cause of fatal injury in 2023 was, by far, stress/overexertion at 53%, and cardiovascular event was the leading nature of fatal injury at 49%. In addition, 77% of firefighters were killed while operating at an incident where the most common type of duty leading to a firefighter fatality was operating at a fireground (41%) during which most were advancing hoselines.

Clearly, the USFA and our nation's fire service still have a lot of work to do. To prevent future on-duty firefighter deaths, the USFA offers the following recommendations:

- Recommendation #1: Enhance situational awareness training, especially on escalating and dynamic events in an all-hazard environment.
- Recommendation #2: Improve and increase cardiac-related screenings of firefighters.
- Recommendation #3: Increase awareness and training related to minimizing physical exertion and the criticality of nutrition and physical fitness for better cardiac health as well as getting adequate rest and recovery.
- Recommendation #4: Ensure emergency vehicle operators are knowledgeable of and adhere to established fire department policies, procedures and guidelines related to the safe operation of vehicles.

This report serves as a critical resource for the USFA, fire service, policymakers and other safety organizations. Together, these groups can have a powerful impact on the health and safety of the nation's firefighters and eliminate future on-duty firefighter deaths.

Appendix

Firefighter fatality inclusion criteria — national fire service organizations

The NFPA, the NFFF, the USFA and other organizations individually collect information on firefighter fatalities in the United States. Each organization uses a slightly different set of inclusion criteria based at least in part on the purposes of the information collection for each organization and data consistency.

As a result of these differing inclusion criteria, statistics about firefighter fatalities may be provided by each organization that do not coincide with one another. This section will explain the inclusion criteria for each organization and provide information about these differences.

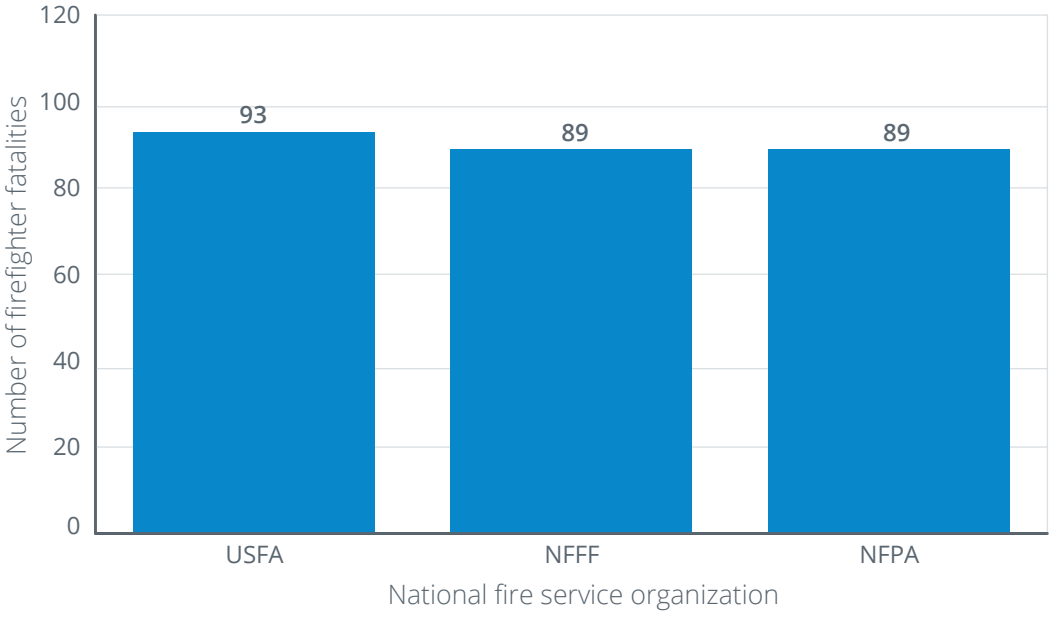
Inclusion criteria for the USFA's annual report

The USFA includes firefighters in this report who died while on duty, became ill while on duty and later died, and firefighters who died within 24 hours of an emergency response or training regardless of whether the firefighter complained of illness while on duty. The USFA counts firefighter deaths that occurred in the 50 states, the District of Columbia, and United States protectorates such as Puerto Rico and Guam. Detailed inclusion criteria appear starting on page 12 of this report.

For the USFA report from 2020 and the years that follow, firefighter deaths are counted in the year the death occurs rather than the year the fatal incident occurred as had been done in previous years.

For 2023, the USFA reported 93 on-duty firefighter fatalities. This number includes 1 firefighter that died in 2023 because of COVID-19 and its complications.

Firefighter fatalities in 2023



Inclusion criteria for the National Fire Protection Association's annual firefighter fatality study

Methodology

Since 1977, the NFPA has collected information each year about on-duty U.S. firefighter fatalities and maintained the information in a database. Information about these deaths, including their causes and circumstances, can be useful in monitoring trends and identifying opportunities for prevention efforts. This research draws from several types of firefighting populations, including the following:

- Career and volunteer firefighters serving in local fire departments.
- Seasonal, full-time and contract employees of state and federal agencies who have fire suppression responsibilities.
- Prison inmates serving on firefighting crews.
- Military personnel performing assigned fire suppression activities.
- Civilian firefighters working at military installations.
- Members of facility or industrial fire brigades.

At times, there may be a considerable delay between an injury or the onset of an illness and the resulting death. Fatalities are assigned to the year of the initial injury occurrence in cases where death occurred in a subsequent year. Accordingly, the number of deaths in a particular year may change as additions are made to annual totals following the receipt of new information.

Firefighter fatalities included in this study

The focus of the NFPA's study is on firefighter fatalities caused by traumatic injuries or select illnesses or conditions for which immediate work activities are presumed to have contributed to death. These include fatal heart attacks, strokes and pulmonary embolisms that occurred while victims were on duty or within 24 hours of duty. Illnesses or medical conditions other than heart attacks or strokes are not included in the study.

The "on-duty" designation refers to a variety of injury scenarios that are eligible for inclusion in this research. These include injuries sustained while:

- At the scene of an alarm (fire or emergency medical or other responses).
- During transport to or from an alarm.
- While participating in other department duties (such as training, maintenance, public education, investigations, etc.).
- While on call or standby for assignment.

As previously indicated, the NFPA's research has historically only included heart attacks or strokes that occurred while victims were on duty or when they made explicit physical complaints prior to going off duty. Beginning with their study in 2022, the NFPA expanded the inclusion criteria to include cardiac deaths and strokes or other fatal medical conditions that occurred within 24 hours of duty. While these deaths technically occurred while the victim was off duty, their inclusion presumes they were precipitated by on-duty activities, regardless of a specific physical complaint.

Type of duty

The NFPA includes types of duty that firefighters were engaged in when they were fatally injured or suffered fatal medical events: suppression activities on the fireground, operating at non-fire emergencies, responding to or returning from fires and emergency calls, training activities, emergency medical response calls, normal station duties, maintenance activities, and other on-duty activities.

Categories not included in the study

The NFPA study does not include members of fire department auxiliaries, nonuniformed employees of fire departments, or EMTs who are not also firefighters, chaplains or civilian dispatchers. In addition, the NFPA recognizes that working as a firefighter can also lead to chronic illnesses, such as cancer or heart disease, that arise from occupational factors and prove fatal. However, it is not possible to include deaths resulting from chronic and multifactorial exposures due to the limitations in establishing work relationships between exposure and disease. An additional challenge for establishing a comprehensive count of firefighter deaths is the well-publicized problem of firefighter suicide. Although the NFPA's study includes firefighter suicides that occur on duty, working as a firefighter is also recognized as contributing to suicides that occur when firefighters are off duty or have retired.[8]

2023 National Fire Protection Association experience

In 2023, a total of 89 on-duty firefighter deaths occurred in the United States, according to the NFPA inclusion criteria.

[8] "Fatal Firefighter Injuries in the United States," NFPA, June 2025, https://www.nfpa.org/education-and-research/research/nfpa-research/fire-statistical-reports/fatal-firefighter-injuries

National Fallen Firefighters Foundation firefighter fatality criteria

The National Fallen Firefighters Memorial was built in 1981 in Emmitsburg, Maryland. The names listed there begin with those firefighters who died in the line of duty that year. The U.S. Congress created the NFFF to lead a nationwide effort to remember America's fallen firefighters. Since 1992, the tax-exempt, nonprofit foundation has developed and expanded programs to honor our fallen fire heroes and assist their families and co-workers by providing them with resources to rebuild their lives. Since 1997, the foundation has managed the National Memorial Service held each October to honor the firefighters who died in the line of duty the previous year. In 2024 and 2025, the National Memorial Service was held in May.

***The National Fallen Firefighters Memorial line-of-duty deaths shall be determined by the following standards:**

1. For the purpose of this memorial the term "firefighter" means an individual whose official duties include fire suppression, fire investigation or fire police activities and who is actively employed on a full-time, part-time, volunteer or contract basis by a local county, state or federal agency, with or without compensation, to provide primary fire protection for an organized jurisdiction having authority.

   This definition also includes seasonal and full-time employees of USFS, BLM, FWS, NPS, DOE and state wildland agencies; contract fire suppression personnel and pilots working under the official auspices of one of the above; prison inmates serving on fire crews; civilian firefighters working at military installations; and privately employed firefighters including trained members of industrial or institutional fire brigades.

   In 2010, the foundation expanded the definition of firefighter to include active-duty, enlisted and officer U.S. Air Force, Army, Coast Guard, Navy and Marine Corps military personnel assigned to fire stations who die performing emergency services in accordance with their position description. The 2 exclusions from this policy are: (1) personnel who die fighting fire on board Navy ships where all sailors are considered firefighters, and (2) personnel who die from direct enemy action or attack.

2. "Line of duty" means any activity or action that a firefighter is obligated or authorized by statute, rule, regulation, condition of employment or service, official mutual-aid agreement, or other law, or for which they are compensated to perform under the auspices of the fire service protection agency they serve, and that such agency legally recognizes that activity or action to have been obligated or authorized at the time performed.

Additionally, the following criteria will be applied when evaluating circumstances of each death for inclusion on the national memorial:

- Deaths meeting the DOJ's PSOB program guidelines for a favorable determination. (See PSOB site for current information.)
- Deaths directly resulting from cancer, disease or infection that are defined as meeting the criteria of the decedent's home state occupational exposure presumption laws. **(Note: applies only to such deaths occurring on or after Jan. 1, 2018.)**

In all cases, documentation must be provided showing a direct link from a single emergency incident or training activity to the firefighter's injury and subsequent death. Examples of documentation that can be submitted are: department incident or run reports, newspaper articles, notarized witness statements, hospital records, physician reports and disability records. For deaths resulting from a cardiovascular event or stroke, documentation must be provided showing the firefighter's participation in emergency response or training activities within the designated time frame (24 hours) before the onset of the cardiovascular event. If the injury or cardiovascular event results in long-term disability or hospitalization, documentation will also be required indicating that the individual did not return to full-duty status as a firefighter prior to their death.

In certain cases, the foundation will abstain from rendering a decision regarding eligibility for inclusion on the national memorial until the PSOB program makes its determination.

Such cases are:

- Deaths where the decedent is under the age of 18.
- Deaths that occur while the firefighter was engaged in a nonemergency fire department duty (i.e., station or apparatus maintenance, special-event standby assignments, parades, community service details, fundraising events, etc.).
- Deaths that occur during the firefighter's commute to/from their assignment.
- Deaths where there is a report of alcohol or controlled substance involvement.

If a claim for death benefits has been filed with the PSOB office, the foundation will hold the case in a "Pending" status until the PSOB renders its decision. If the DOJ determines the firefighter's death was line-of-duty based on their guidelines, the foundation will rule the death eligible for inclusion on the national memorial. If the DOJ determines the firefighter's death does not meet their criteria for payment of death benefits, the foundation will rule the death ineligible for inclusion on the national memorial. If no claim for PSOB benefits is filed within 1 year of the firefighter's death, the foundation will close out the file as "Not Eligible" for inclusion on the national memorial.

Specific cases will be excluded from consideration for inclusion on the national memorial, such as:

- Deaths attributed to alcohol or controlled substance abuse.
- Deaths resulting from the firefighter acting in a grossly negligent manner at the time of their death.

Acceptance for inclusion on the National Fallen Firefighters Memorial in no way impacts decisions made by the federal government regarding the awarding of PSOB benefits.[9]

The NFFF honored 226 firefighters who died in the line of duty at the planned May 2024 Memorial Weekend. Of those, 89 firefighters that were honored are associated with incidents and deaths that occurred in 2023, and 137 deaths as the result of incidents that occurred prior to 2023. Of the 89 deaths that occurred in 2023, 15 were the result of cancer. Of the 137 deaths that occurred prior to 2023, 62 were the result of COVID-19 and its complications, and 34 were the result of cancer.

[9] https://www.firehero.org/resources/handling-a-lodd/criteria/

Acronyms

ATV	all-terrain vehicle
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CVA	cerebrovascular accident
DOE	U.S. Department of Energy
DOJ	U.S. Department of Justice
DPS	Department of Public Safety
EMS	emergency medical services
EMT	emergency medical technician
FWS	U.S. Fish and Wildlife Service
NFFF	National Fallen Firefighters Foundation
NFPA	National Fire Protection Association
NPS	National Park Service
OSHA	Occupational Safety and Health Administration
PSOB	Public Safety Officer Benefits
TOT	turbine outlet temperature
USFA	U.S. Fire Administration
USFS	U.S. Forest Service

U.S. Fire Administration

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