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Fire-Related Firefighter Injuries Reported to the National Fire Incident Reporting System (2018-2020)

Topical reports are designed to explore facets of the U.S. fire problem as depicted through data collected in the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS). Each topical report briefly addresses the nature of the specific fire or fire-related topic, highlights important findings from the data, and may suggest other resources to consider for further information.

Findings

- From 2018 to 2020, an estimated average of 23,075 firefighter injuries occurred annually on the fireground. This annual estimate reflects an 11% decrease from 2015 to 2017 when the estimated average of firefighter injuries that occurred on the fireground was 25,975 each year.
- Annually, from 2018 to 2020, an additional estimated average of 4,400 firefighter injuries occurred while responding to or returning from an incident.
- Most fire-related firefighter injuries (87%) occurred in structure fires. In addition, on average, firefighters were 10 times more likely to be injured in structure fires than in nonstructure fires.
- Fires resulting in firefighter injuries occurred more often in July, at 12%, and peaked between the hours of 2 and 5 p.m.
- Overexertion/strain was the cause of 29% of reported fire-related firefighter injuries.
- Injuries resulted in lost work time for 43% of firefighters with reported fire-related injuries.
- Injuries to the lower and upper extremities (legs/feet and arms/hands) accounted for 41% of the reported fire-related firefighter injuries.
- About half (51%) of the reported fire-related firefighter injuries occurred while extinguishing the fire or neutralizing the incident, followed by suppression support (22%).
- Most firefighters (80%) were reported as being well rested before their fire-related injury occurred.
- Of the reported fire-related injuries, 63% of the firefighters were transported to hospitals to be treated for their injuries. Of the firefighters treated at a hospital, 70% were career firefighters.

Every occupation brings degrees of safety risk. At the fire scene, on the way to or from a fire, or while training, firefighters face the chance of suffering an injury and possibly death. Each year, firefighters are injured while fighting fires, rescuing people, responding to emergency medical and hazardous material incidents, training for their jobs, or participating in other on-duty activities.

Annually, from 2018 to 2020, there was an estimated average of 61,325 firefighter injuries resulting from all types of fire department duties.[1, 2] Of these injuries, an annual estimated average of 23,075 occurred on the fireground or were considered fire related (includes structure fires, vehicle fires, outside fires, etc.). This annual estimate reflects an 11% decrease from the previous 3-year period (2015-2017) when the estimated average of firefighter injuries that occurred on the fireground was 25,975 each year.[3] Annually, from 2018 to 2020, an additional estimated average of 4,400 firefighter injuries occurred while responding to or returning from an incident, which includes, but is not limited to, fires.[4, 5, 6] While most injuries are minor, a significant number are debilitating and career ending. These injuries impose a great toll on the fire service.

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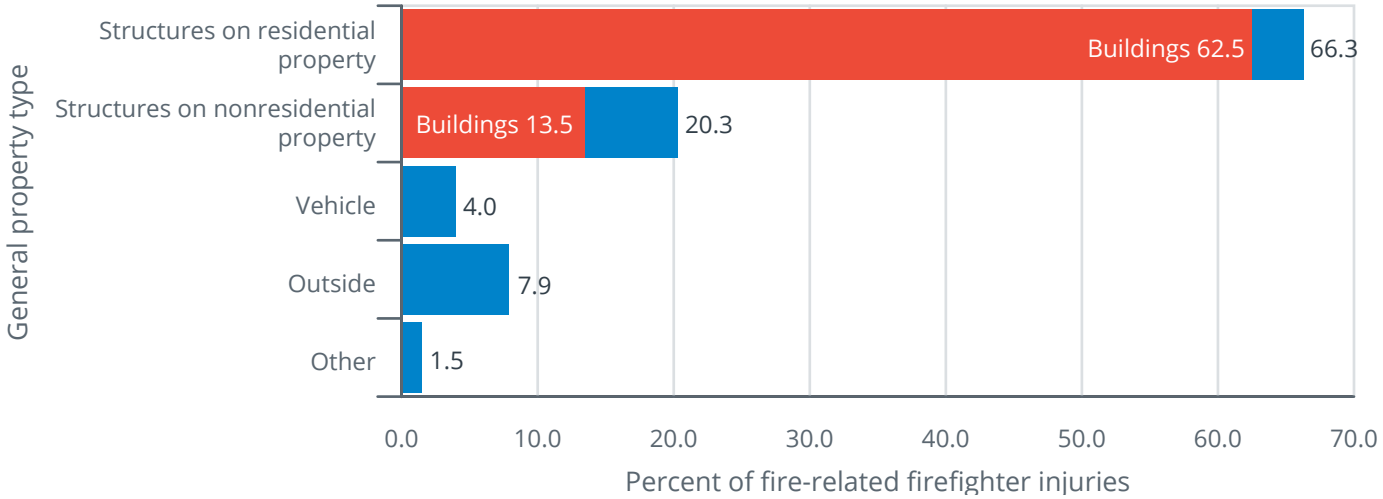
The fire service has done much to improve firefighter safety. From the need to adjust staffing levels and shift rotations due to on-the-job injuries to the focus of the fire service on injury prevention, firefighter injuries and injury prevention are a primary concern. Firefighter health and safety initiatives, incident command structure, and training are a few areas where time, energy and resources have been well spent. Nonetheless, firefighting by its very nature is a hazardous profession. Injuries can and do occur.

This topical report, issued by the USFA's National Fire Data Center (NFDC), addresses the details of firefighter injuries sustained at, responding to or returning from a fire incident. The report focuses on data as reported to the NFIRS from 2018 to 2020, the most recent data available at the time of the analysis.[7, 8] NFIRS data from the Public Data Release (PDR) files are used for the analyses throughout this report. This current report is an update to the "Fire-Related Firefighter Injuries Reported to the National Fire Incident Reporting System (2015-2017)" (Volume 20, Issue 2) topical report, which was released in July 2019.

Fire-related firefighter injuries by general property type

From 2018 to 2020, 87% of the fire-related firefighter injuries reported to the NFIRS were associated with structure fires (Figure 1). Over 3 times as many firefighter injuries occurred in residential structures as in nonresidential structures, tracking with overall residential/nonresidential fire incidence. Firefighter injuries in residential structures accounted for 66% of firefighter injuries, a majority of which occurred in residential building fires.[9] Building fires also accounted for two-thirds of the firefighter injuries that occurred in structure fires on nonresidential properties. Outside, vehicle and other fires combined accounted for 13% of firefighter injuries from 2018 to 2020.[10]

Figure 1. Fire-related firefighter injuries by general property type (2018-2020)



Source: NFIRS 5.0.

Fire-related firefighter injuries per fire

Firefighters were 10 times more likely to be injured in structure fires than in nonstructure fires (e.g., vehicle fires, outdoor fires) as shown in Table 1. Building fire injury rates are shown separately in Table 2.

Table 1. Fire-related firefighter injury rates per 1,000 fires by general property type (2018-2020)

General property type	Fire-related firefighter injuries per 1,000 fires
Structure	10.1
Residential	10.2
Nonresidential	10.0
Nonstructure	1.0
Vehicle	1.2
Outside and other	0.9
Total/Overall	4.5

Source: NFIRS 5.0.

Table 2. Fire-related firefighter injury rates per 1,000 building fires by type (2018-2020)

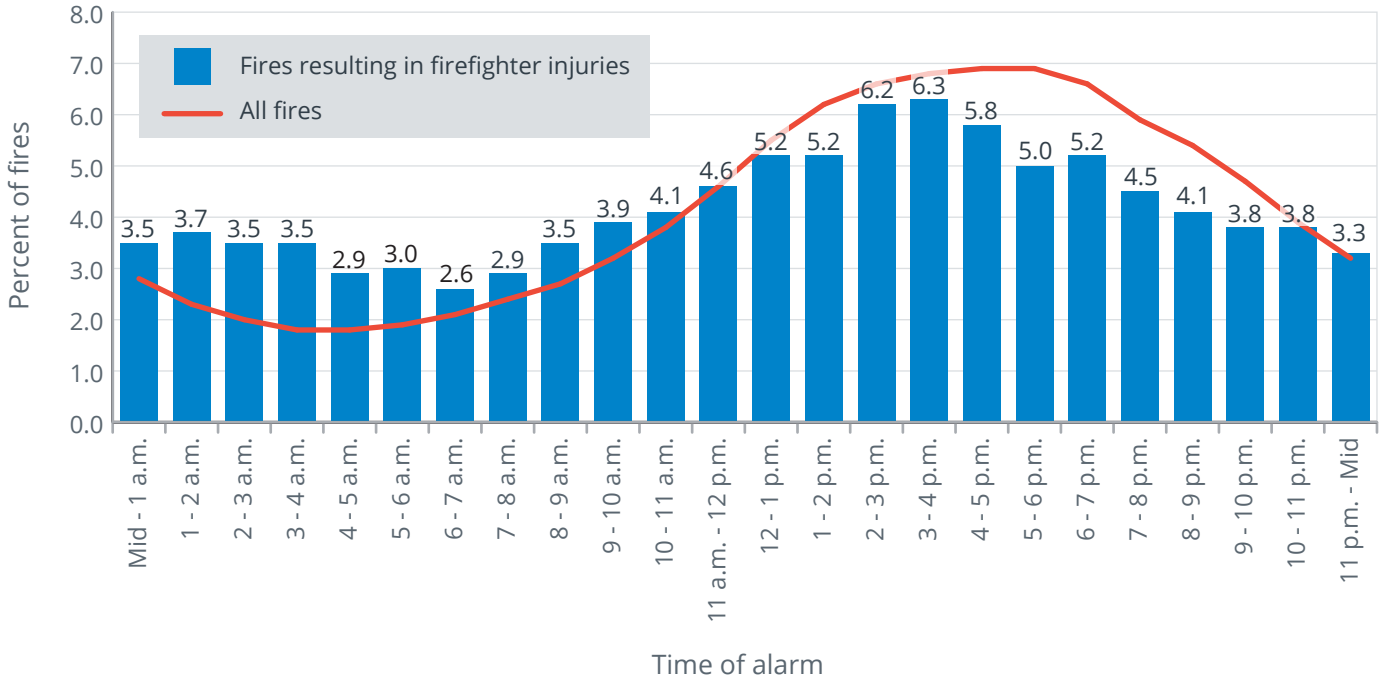
Type	Fire-related firefighter injuries per 1,000 building fires
Buildings	9.2
Residential	9.8
Nonresidential	7.1

Source: NFIRS 5.0.

When fire-related firefighter injuries occur

As shown in Figure 2, fires resulting in firefighter injuries occurred most frequently in the midday, peaking from 2 to 5 p.m. After 5 p.m., fires resulting in injuries decreased until midnight. A small peak is then seen in the early morning. After 3 a.m., the numbers of fires resulting in firefighter injuries decreased, reaching the lowest point between 6 and 7 a.m. After 7 a.m., the number of fires resulting in injuries gradually increased to the start of the peak period. The peak period (2 to 5 p.m.) accounted for 18% of fires resulting in firefighter injuries.[11] The time of alarm profile for fires resulting in firefighter injuries tracked somewhat similarly with that for fires overall; however, the peak for all fires was more pronounced during the afternoon and early evening.

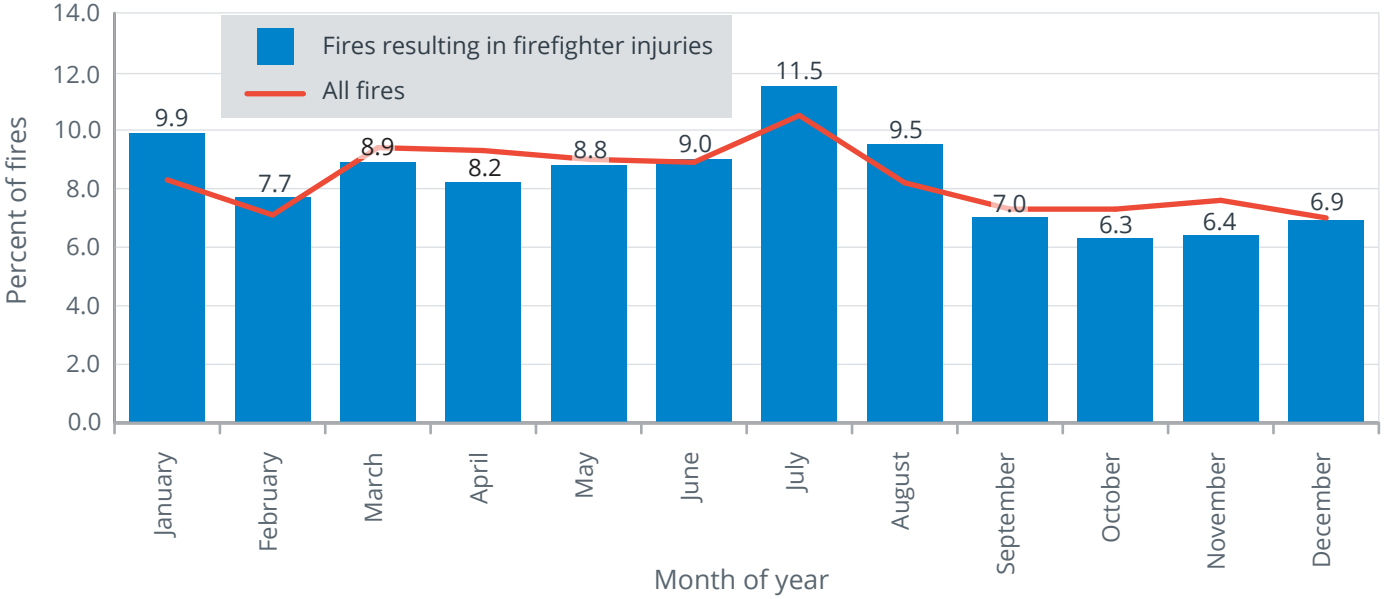
Figure 2. Fires resulting in firefighter injuries by time of alarm (2018-2020)



Source: NFIRS 5.0.
Note: Total does not add up to 100% due to rounding.

Figure 3 shows that fires resulting in firefighter injuries were highest in July (12%) and lowest in October (6%) and November (6%). Fires resulting in firefighter injuries by month tracked similarly with all fires by month.

Figure 3. Fires resulting in firefighter injuries by month (2018-2020)



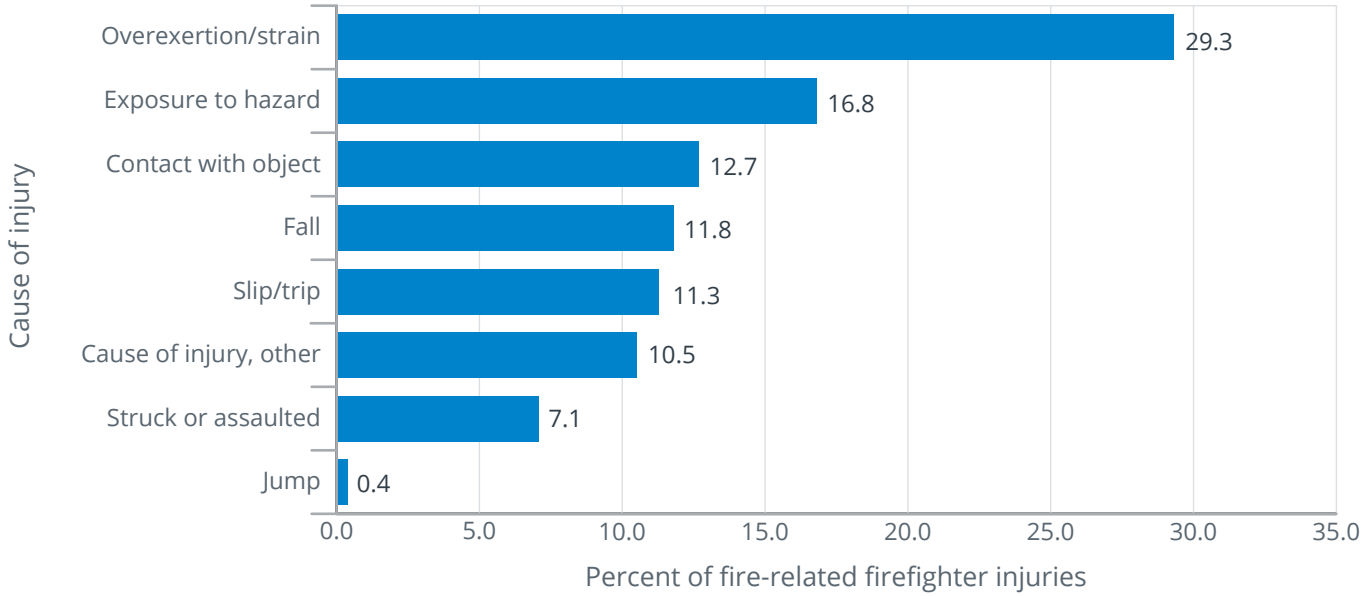
Source: NFIRS 5.0.
Note: Total does not add up to 100% due to rounding.

Cause and nature of fire-related firefighter injuries

Figure 4 shows that 29% of all fire-related firefighter injuries were caused by overexertion/strain. The next 3 leading reported causes combined accounted for 41% of fire-related firefighter injuries: exposure to hazard (17%), contact with object (13%), and fall (12%).[12]

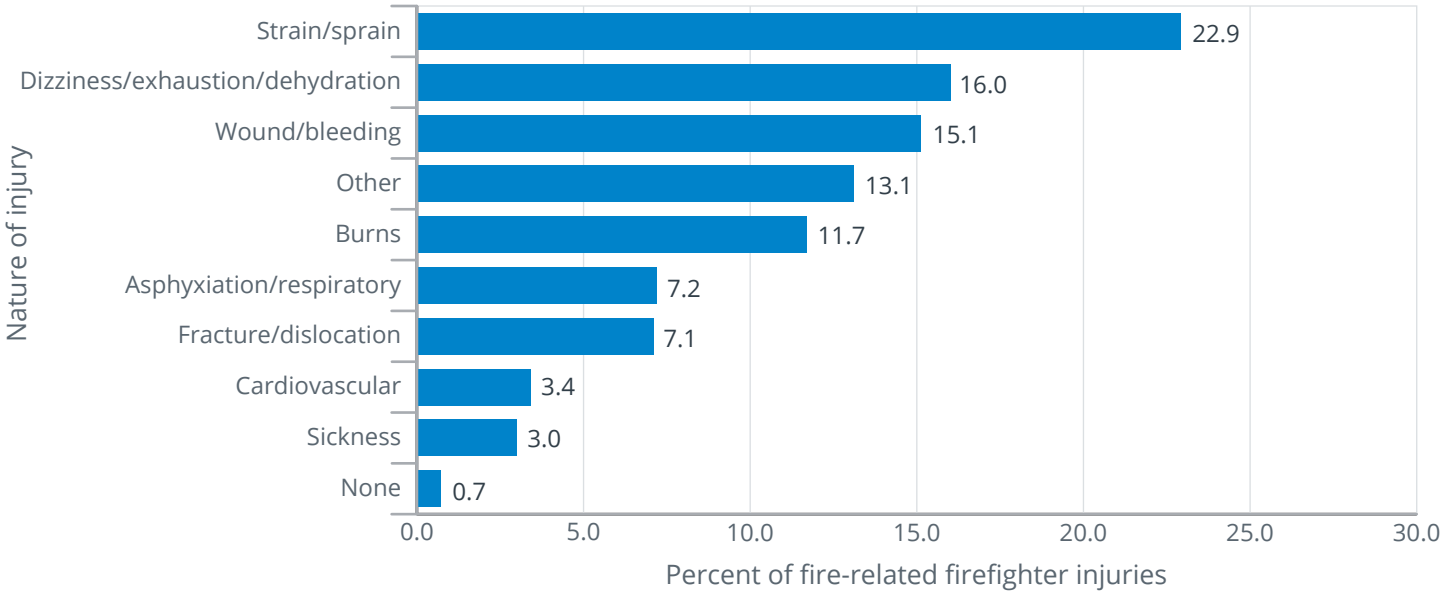
Not surprisingly, the leading nature of injury was strain/sprain at 23%, closely associated with overexertion/strain as the cause of the injury (Figure 5). Dizziness/exhaustion/dehydration and wound/bleeding accounted for an additional 16% and 15% of fire-related firefighter injuries, respectively.

Figure 4. Fire-related firefighter injuries by cause of injury (2018-2020)



Source: NFIRS 5.0.
Note: Total does not add up to 100% due to rounding. Includes only injuries where cause of injury was specified. The cause of injury was specified in 71% of reported injuries.

Figure 5. Fire-related firefighter injuries by nature of injury (2018-2020)



Source: NFIRS 5.0.
Note: Total does not add up to 100% due to rounding. Includes only injuries where the nature of injury was specified. The nature of injury was specified in 79% of reported injuries.

Severity of fire-related firefighter injuries

More than half of fire-related firefighter injuries (57%) resulted in no lost work time, as shown in Table 3. These injuries were treated on the scene with first aid or after the incident by a physician, either at a medical facility or in a doctor's office. Of the fire-related firefighter injuries, 43% resulted in lost work time. Most of the lost-work-time injuries (93% of lost-work-time injuries or 40% of all fire-related firefighter injuries) were moderate in severity. Severe or life-threatening injuries accounted for 3% of firefighter injuries.

Table 3. Severity of fire-related firefighter injuries (2018-2020)

Severity	Percent of fire-related firefighter injuries
First aid only, no lost time	24.1
Treated by physician, no lost time	32.6
Moderate severity, lost-time injury	40.4
Severe, lost-time injury	2.4
Life-threatening, lost-time injury	0.5
Total	100.0

Source: NFIRS 5.0.
Note: The severity of the injury was specified in 100% of reported injuries.

Fire-related firefighter injuries by age and gender

Table 4 shows the percent of firefighter injuries based on gender. Most fire-related firefighter injuries, 95%, were sustained by males. This statistic is comparable with the composition of the fire service during this period — on average, males constituted 96% of employed firefighters from 2018 to 2020.[13]

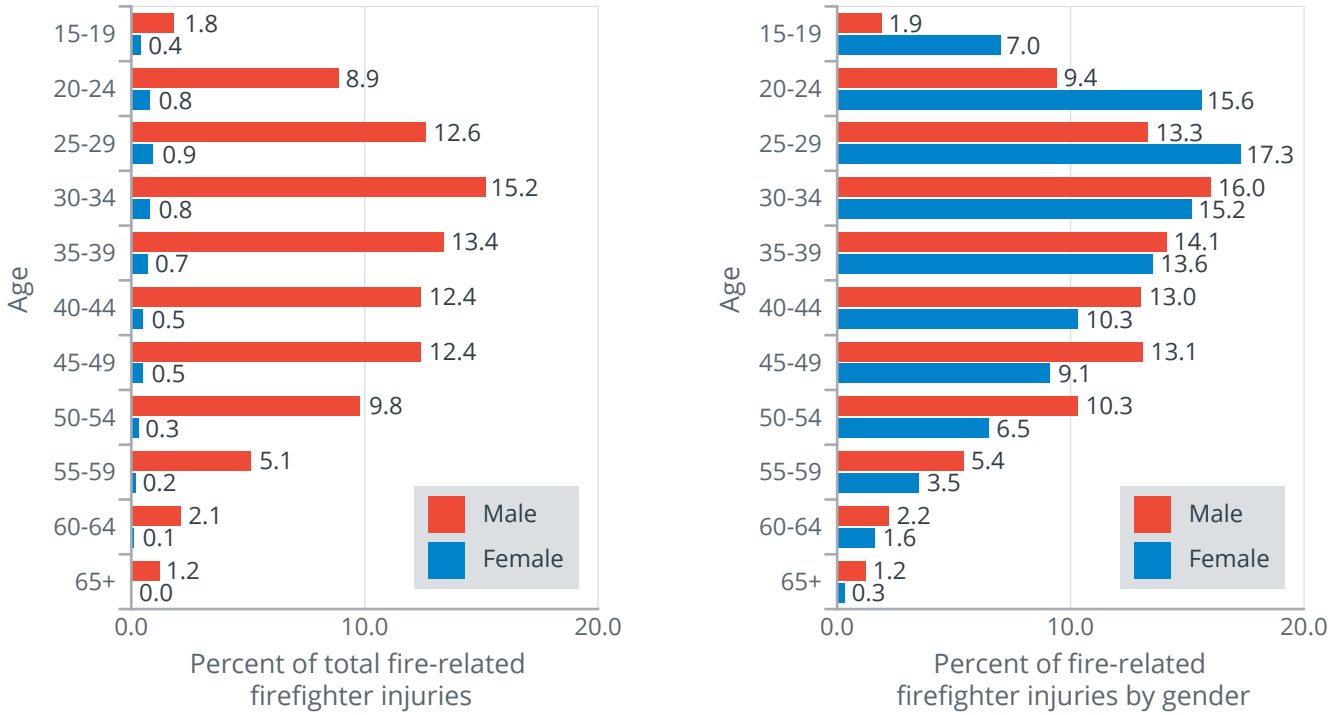
Table 4. Fire-related firefighter injuries by gender (2018-2020)

Gender	Percent of fire-related firefighter injuries
Male	94.9
Female	5.1
Total	100.0

Source: NFIRS 5.0.
Note: Gender was specified in 100% of reported injuries.

Figure 6 shows 2 different profiles of fire-related firefighter injuries by age and gender. The left graphic shows male and female injuries as a percent of the total injuries (all bars add to 100%). The right graphic shows the age distribution of injuries by gender (each distribution adds to 100%). Both graphs show that male firefighter injuries peaked between ages 30 and 34, and female firefighter injuries peaked between ages 25 and 29. Overall, about two-thirds (69%) of all fire-related injuries occurred to firefighters aged 25 to 49.

Figure 6. Fire-related firefighter injuries by age and gender (2018-2020)



Source: NFIRS 5.0.

Note: Includes only injuries where the age of the firefighter was between 15 and 100, and gender was specified. Age was specified in 98% of the reported male injuries and 98% of the reported female injuries. Totals may not add up to 100% due to rounding.

The leading reported causes of injury among younger firefighters (ages 15 to 24) were related to overexertion/strains and exposure to hazards, while among older firefighters (age 65 and older), overexertion/strains, other cause of injury, and falls were the most common injuries. These results, among other factors, relate to physical fitness variations with age and the effect of age on type of assignments.

Fire-related firefighter injuries by affiliation and age

Injuries to career firefighters were the largest share (71%) of the reported fire-related injuries (Table 5.) Nationally, only 33% of the fire service was made up of career firefighters.[14]

Table 5. Fire-related firefighter injuries by affiliation (2018-2020)

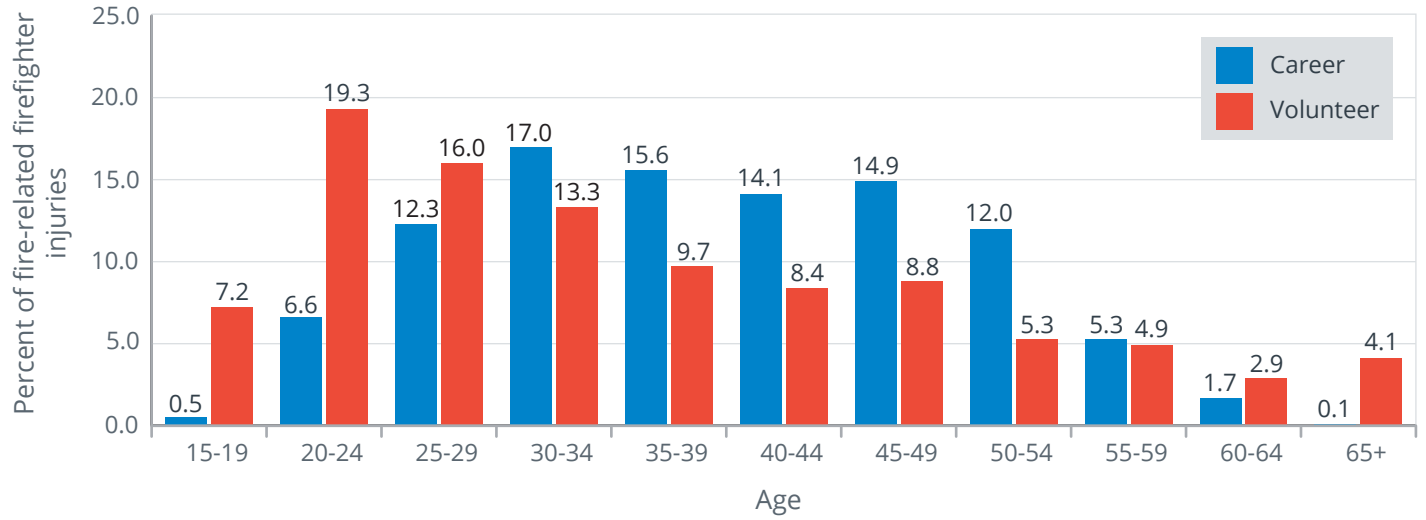
Affiliation	Percent of fire-related firefighter injuries
Career	71.0
Volunteer	29.0
Total	100.0

Source: NFIRS 5.0.

Note: Percent of fire-related firefighter injuries includes only injuries where affiliation was specified. Affiliation was specified in 74% of reported fire-related firefighter injuries.

As shown in Figure 7, injuries to career firefighters occurred most often in midcareer (ages 30 to 49) with the peak between ages 30 and 34 at 17%. Injuries to volunteers, however, were sustained predominately by the younger members of the organization. Firefighters under the age of 25 accounted for 27% of injuries in the volunteer service.

Figure 7. Career and volunteer fire-related firefighter injuries by age (2018-2020)



Source: NFIRS 5.0.

Note: Totals do not add up to 100% due to rounding. Includes only injuries where the age of the firefighter was between 15 and 100, and affiliation was specified. Age was specified in 98% of the reported injuries to career firefighters and 97% of the reported injuries to volunteer firefighters. Overall, both age and affiliation were specified in 73% of all reported firefighter injuries.

Career firefighters also experienced proportionally more fire-related injuries that resulted in lost time than their volunteer counterparts, as shown in Table 6. Volunteer firefighters, on the other hand, received far more injuries that resulted in no lost time.

Table 6. Overall comparison of fire-related firefighter injury severity by affiliation (2018-2020)

Affiliation	Severity		Total percent
	No lost time (percent)	Lost time (percent)	
Overall	56.6	43.4	100.00
Career	48.5	51.5	100.00
Volunteer	77.2	22.8	100.00

Source: NFIRS 5.0.

Note: Includes only injuries where affiliation and severity were specified. Severity was specified in 100% of reported injuries, and affiliation was specified in 74% of reported injuries.

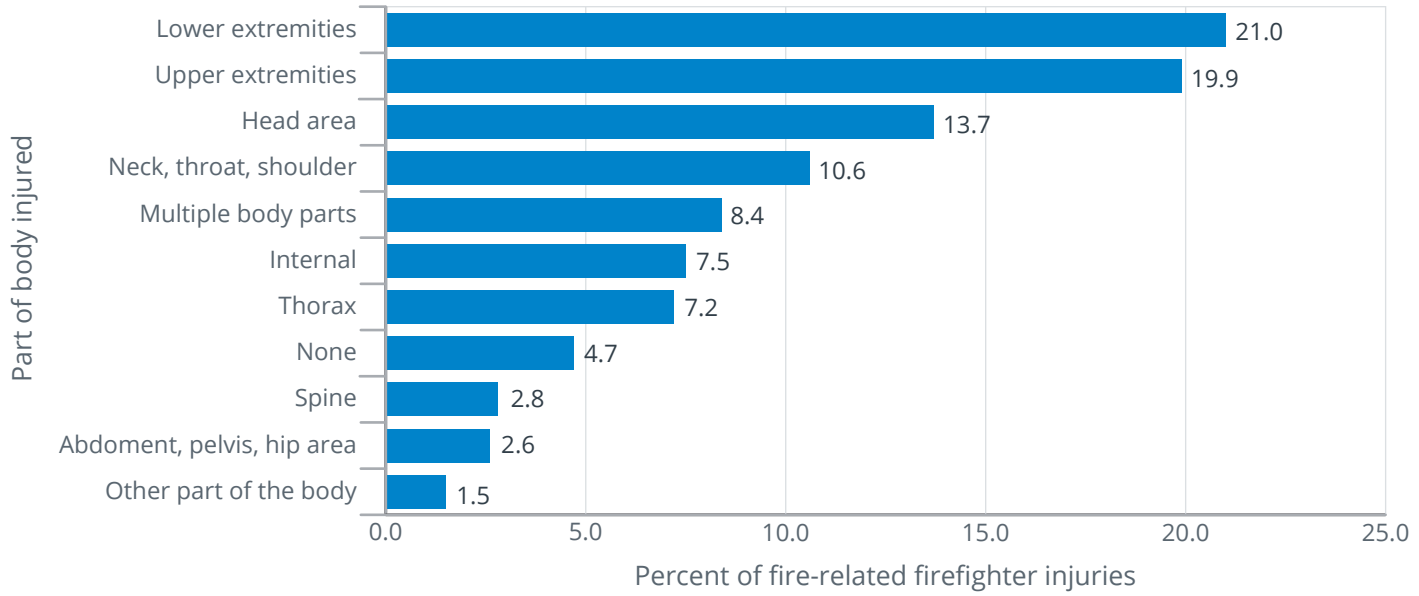
Part of body injured in fire-related firefighter injuries

Injuries to the lower and upper extremities (legs/feet and arms/hands) accounted for 41% of fire-related firefighter injuries (Figure 8). The head and shoulder areas accounted for an additional 24% of injuries.

Most of the injuries that occurred to the lower extremities (where the nature of the injury was specified) were strains/sprains at 54%. Injuries to the lower extremities also involved fractures (15%) and wounds/bleeding (11%).

Of the fire-related firefighter injuries that occurred to the upper extremities, 42% involved wounds/bleeding, 23% were burns and 14% were strains/sprains. Burns (32%) and wounds/bleeding (30%) accounted for 62% of fire-related firefighter injuries to the head area.

Figure 8. Fire-related firefighter injuries by part of body injured (2018-2020)



Source: NFIRS 5.0.
Note: Total does not add up to 100% due to rounding. Includes only injuries where part of body injured was specified. The part of body injured was specified in 74% of reported injuries.

General location of fire-related firefighter injuries and type of activity when injured

Of all fire-related firefighter injuries, 95% occurred at the scene — 54% of the injuries occurred outside the structure and 41% occurred inside the structure. All other locations produced far fewer injuries (Table 7).

Table 7. General location of fire-related firefighter injuries (2018-2020)

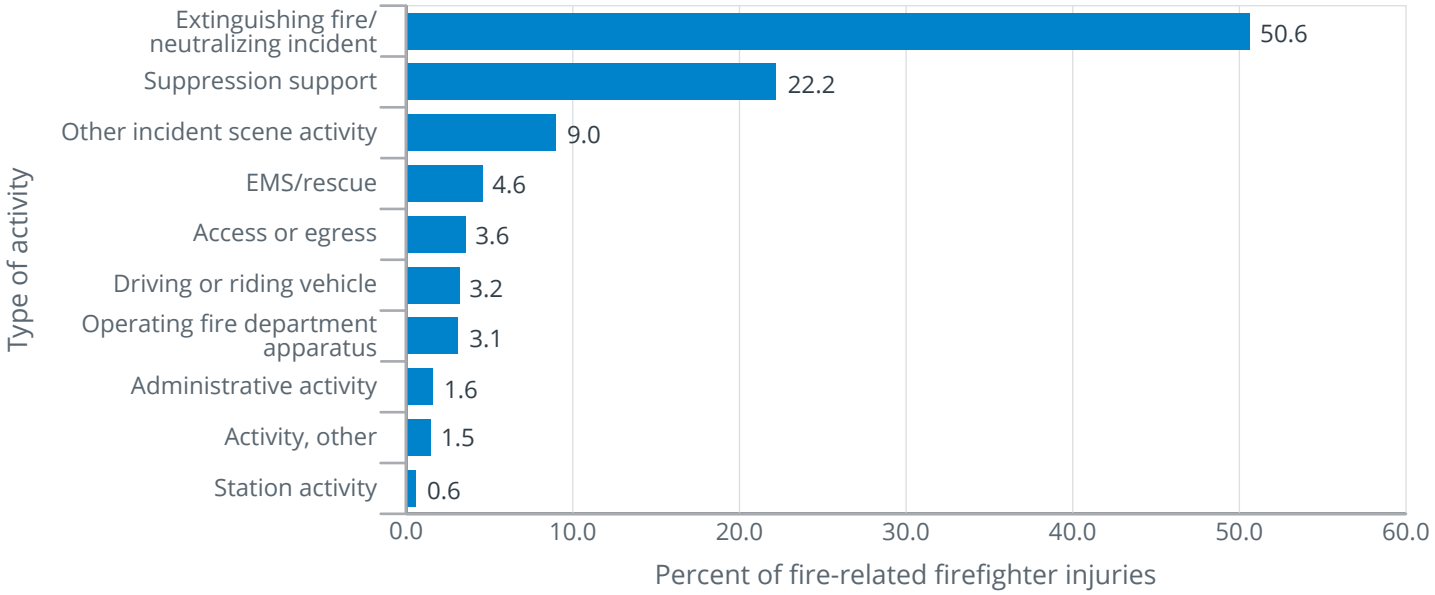
Where injury occurred	Percent
At scene, outside structure	54.0
At scene, inside structure	41.2
At fire department location	2.3
En route/returning	1.4
Location, other	1.1
Total	100.0

Source: NFIRS 5.0.
Note: Includes only injuries where the general location of injury was specified. The general location of the injury was specified in 75% of reported injuries.

As shown in Figure 9, the largest percent of fire-related firefighter injuries occurred while extinguishing the fire/neutralizing the incident (51%). This is followed by suppression support and other incident scene activity, which made up 22% and 9% of the injuries, respectively.

Of those fire-related firefighter injuries that occurred while extinguishing the fire/neutralizing the incident, 59% were strains/sprains (21%), dizziness/exhaustion/dehydration (21%) and burns (17%). Of those fire-related firefighter injuries that occurred during suppression support activities, 44% were strains/sprains (23%) and wounds/bleeding (21%).

Figure 9. Fire-related firefighter injuries by type of activity (2018-2020)



Source: NFIRS 5.0.
Note: Includes only injuries where type of activity was specified. The type of activity was specified in 79% of reported injuries.

Specific location of fire-related firefighter injuries

For 76% of the fire-related firefighter injuries, the specific location at the time of injury was outside at grade (41%) and in a structure (35%). An additional 3% of the injuries occurred on the roof. Of interest, 2% of fire-related firefighter injuries occurred in motor vehicles, and less than 1% of the injuries occurred in rail, water and aircraft vehicles combined (Table 8).

Table 8. Specific location of fire-related firefighter injuries (2018-2020)

Specific location of injury	Percent
Outside at grade	41.0
In structure (excludes attic, roof or wall)	35.3
Specific location, other	15.0
On roof	3.0
In attic or other confined structural space	2.6
On ground ladder	1.6
In motor vehicle	1.5
In all other vehicles (includes rail, water and aircraft)	0.1
Total	100.0

Source: NFIRS 5.0.
Note: Total does not add up to 100% due to rounding. Includes only injuries where the specific location of injury occurred was specified. The specific location where the injury occurred was noted in 60% of reported injuries.

Factor contributing to injury in fire-related firefighter injuries

When a factor was specified as contributing to the firefighter's injury, fire development — fire progress, smoky conditions and the like — and slippery or uneven surfaces accounted for 55% of fire-related firefighter injuries, with fire development as the leading factor contributing to injury (Table 9). The third and fourth general factors contributing to injury included other factors and collapse or falling objects, which made up 20% and 15%, respectively.

Table 9. General factor contributing to fire-related firefighter injuries (2018-2020)

General factor contributing to injury	Percent
Fire development	29.2
Slippery or uneven surfaces	25.6
Other factor	19.8
Collapse or falling object	15.1
Holes	3.9
Vehicle or apparatus issue	2.9
Lost, caught, trapped or confined	2.7
Civil unrest/hostile acts	0.8
Total	100.0

Source: NFIRS 5.0.
Note: Includes only injuries where a factor contributing to injury was specified. The factor contributing to injury was specified in 44% of reported injuries.

Protective equipment failure in fire-related firefighter injuries

Very few of the fire-related firefighter injuries reported to the NFIRS indicated problems with firefighter protective gear; only 6% indicated protective gear failures as a factor in the injury.[15] Modern equipment and equipment standards, combined with current equipment replacement cycles, may preclude protective equipment failures. Firefighter protective coats, gloves, helmets, hoods, protective trousers and positive-pressure self-contained breathing apparatus accounted for 70% of equipment problems.

Responses and physical condition prior to injury in fire-related firefighter injuries

Most firefighters (80%) were reported as being well-rested before their injury occurred; this applies to both minor and severe injuries, as shown in Table 10. In an additional 13% of the reported fire-related injuries, the firefighter was fatigued prior to incurring the injury.

Table 10. Firefighter physical condition prior to fire-related injury (2018-2020)

Physical condition prior to injury	Severity		Overall (percent)
	No lost time (percent)	Lost time (percent)	
Rested	79.2	81.0	80.0
Fatigued	15.0	11.3	13.3
Injured or ill	3.0	4.4	3.6
Physical condition, other	2.9	3.3	3.0
Total	100.0	100.0	100.0

Source: NFIRS 5.0.
Note: Totals for the no lost time and overall distributions do not add up to 100% due to rounding. Includes only injuries where the physical condition and severity of injury were specified. Severity was specified in 100% of reported injuries, and physical condition was specified in 63% of reported injuries.

The number of fire department responses attended prior to the injury, however, does appear to result in more severe injuries. Table 11 shows that firefighters with 2 or more responses in the immediate 24-hour period prior to the time of injury had higher percentages of injuries that resulted in lost time than firefighters who reported no prior responses. It is important to note, however, that 63% of all fire-related firefighter injuries occurred when a firefighter had no prior responses.

Table 11. Fire-related firefighter injuries by severity and number of responses prior to injury (2018-2020)

Number of responses prior to injury	Severity		Total (percent)	Overall (percent)
	No lost time (percent)	Lost time (percent)		
No prior responses	57.9	42.1	100.0	62.6
1 prior response	59.4	40.6	100.0	12.9
2 prior responses	53.5	46.5	100.0	7.3
3 prior responses	48.3	51.7	100.0	5.2
4 or more prior responses	54.0	46.0	100.0	11.9
Overall total				100.0

Source: NFIRS 5.0.
Note: The overall total does not add up to 100% due to rounding. Includes only injuries where number of responses prior to injury and severity of injury were specified. The number of responses prior to injury was specified in 66% of reported injuries.

Type of medical care for fire-related firefighter injuries

Regardless of the apparent severity of an injury, it is a common safety precaution to transport an injured firefighter to a hospital. Of the reported fire-related injuries, 63% of the firefighters were transported to hospitals to be treated for their injuries (Table 12). Of the firefighters treated at a hospital, 70% were career firefighters.

In addition, 26% of the injured firefighters were treated but not transported to a medical facility or other location. Only 6% of firefighters with fire-related injuries sought medical care at a doctor's office.

Table 12. Fire-related firefighter injuries by where treated and affiliation (2018-2020)

Where treated	Affiliation		Total (percent)	Overall (percent)
	Career (percent)	Volunteer (percent)		
Hospital	69.7	30.3	100.0	63.2
Not transported	68.3	31.7	100.0	26.0
Doctor's office	84.1	15.9	100.0	6.1
Station or quarters	85.9	14.1	100.0	3.0
Taken to, other	85.2	14.8	100.0	1.2
Residence	78.8	21.2	100.0	0.5
Overall total				100.0

Source: NFIRS 5.0.
Note: Includes only injuries where treatment information and affiliation were specified. Treatment information was specified in 74% of reported injuries. Affiliation was also specified in 74% of reported fire-related firefighter injuries. Overall, both treatment information and affiliation were specified in 60% of all reported fire-related firefighter injuries.

Examples

The following are recent examples of fire-related firefighter injuries reported by the media:

- August 2022: Several firefighters suffered smoke-related injuries while battling a house fire in Lexington Township, Ohio. The fire started around 2 p.m. in the solar-powered home. It took firefighters 5 hours to extinguish the blaze as several battery banks inside the house made it more difficult to control. The injured firefighters were transported to local hospitals where they were treated and released. Several firefighters also were treated on scene for heat exhaustion and dehydration. The homeowner safely escaped the burning home. The cause of the fire is unknown.[16]
- August 2022: A 2-alarm fire in a Grafton, Massachusetts, home resulted in an injury to 1 firefighter. A neighbor reported the fire at 11:20 a.m. after noticing smoke coming from the house, and he used a garden hose to contain the fire until firefighters arrived on scene. Once crews arrived, the fire was extinguished within 15 minutes. Shortly before noon, 1 firefighter suffered a sprained ankle and was transported to a local hospital. The fire was reported to have started in the kitchen of the home; however, the cause of the blaze remains under investigation. No one was home at the time of the incident, and no other injuries were reported.[17]
- August 2022: A New York City firefighter was seriously injured and hospitalized after battling a house fire on Staten Island, New York. The fire started around 8:30 p.m. on the second floor of the 3-story building. Upon arrival, fire crews found heavy fire coming from the windows of the home, and it took them nearly an hour to control the flames. While fighting the blaze, the firefighter lost control of a hose nozzle that knocked off his face piece causing him to inhale super-heated gases from the fire. The firefighter was transported to a local hospital along with a resident of the home who suffered a minor injury. The injured firefighter was reported to be in serious but stable condition after sustaining severe burns to his face, neck and airways. Fire investigators determined the fire was caused accidentally by a power strip. The home had working smoke alarms, and no serious injuries were suffered by any of its occupants.[18]

Firefighter health and safety

A key mission of the USFA is to reduce firefighter injuries and on-duty fatalities through leadership, advocacy, coordination and support. The USFA facilitates this through the research and special studies conducted by its National Fire Programs Division. These initiatives cover topics to support firefighter health and safety, including:

- Firefighter health, wellness and fitness: https://www.usfa.fema.gov/a-z/health-safety-wellness/.
- Emergency vehicle and roadway operations safety: https://www.usfa.fema.gov/a-z/vehicle-roadway-safety.html.
- Health and safety resources for the volunteer fire service: https://www.usfa.fema.gov/a-z/volunteer-fire-service.html.

Additionally, USFA's National Fire Academy (NFA) offers numerous training courses in firefighter health and safety topics. Further information on NFA training opportunities is available at the USFA website: http://www.usfa.fema.gov/nfa/.

NFIRS data specifications for fire-related firefighter injuries

Data for this report were extracted from the NFIRS annual PDR files for 2018, 2019 and 2020.[19] Only Version 5.0 data were extracted.

- All fires were included, as defined by the following incident type categories:

Incident Type	Description
100, 163	Other fires
111-123	Structure fires
130-138	Vehicle fires
140-162, 164-173	Outside

Note: Incident Type 110 was not included in the analysis.

- Aid Given Types 3 (mutual aid given) and 4 (automatic aid given) were included to allow for proper counting of firefighter injuries.
- Building fires were defined by the following criteria:
  - Structure Type:
    - For Incident Types 113 to 118:
      - 1 — Enclosed building, or
      - 2 — Fixed portable or mobile structure, or
      - Structure type not specified (null entry).
    - For Incident Types 111 and 120 to 123:
      - 1 — Enclosed building, or
      - 2 — Fixed portable or mobile structure.
- Residential and nonresidential were defined by:
  - Residential — Property Use 400 to 499.
  - Nonresidential — Property Use except 400 to 499.
- Firefighter injuries were defined by the following criteria:
  - The number of injured firefighters (i.e., FF_INJ > 0).
  - Severity:
    - 2 — First aid only.
    - 3 — Treated by physician (no lost time).
    - 4 — Moderate (lost time).
    - 5 — Severe (lost time).
    - 6 — Life threatening (lost time).
- For complete code lists of the NFIRS data elements including Incident Type, Aid Given or Received, Structure Type, and Property Use, refer to the NFIRS 5.0 Complete Reference Guide (CRG): https://www.usfa.fema.gov/downloads/pdf/nfirs/NFIRS_Complete_Reference_Guide_2015.pdf (January 2015). For detailed code lists regarding the firefighter injury characteristics examined in this report, refer to the data elements in the Fire Service Casualty Module of the NFIRS 5.0 CRG.

Although voluntary, the NFIRS is the world's largest national database of fire incident information. By contributing to the NFIRS, the fire service is helping to make data-informed decisions ranging from local budget development to the identification of national preparedness initiatives. It is important that fire departments participate in the NFIRS and critical that the data they report are complete and accurate. This provides for sound decision-making that has an impact on reducing community risk and emergency response at the local level.

Analysis disclaimer

Complete or full years of data are required for statistical analyses presented in the topical reports. Although NFIRS data for a calendar year are often reported to the USFA throughout the year, fire departments and/or states have until the official cutoff date as set forth by the NFDC to submit their data to the USFA. Typically, this cutoff date is July 1 after the end of the previous calendar year. This provides states with ample time to perform data quality checks and correct incidents with questionable reported data before they are set to released status in the national production database and Enterprise Data Warehouse. Once the data are released to the USFA, additional data quality reviews are completed before the data are prepared for public release.

The analyses contained in this report reflect the current methods used by the USFA. The USFA is committed to providing the best and most current information on the U.S. fire problem and continually examines data received from participating fire departments and the analytical methods used to fulfill this goal. Because of this commitment and the variation in the quality of the reported data as well as any changes in the fire problem from year to year, data collection strategies and methodological changes are possible and do occur. As a result, analyses and estimates of the fire problem may vary over time. Previous analyses and estimates for specific issues (or similar issues) may have used different methodologies or different data definitions and therefore may not be directly comparable to the current analyses and estimates.

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Notes:

[1]The estimate of overall firefighter injuries includes both fire-related and nonfire-related injuries. This entails firefighters injured while performing fire suppression activities (at the fireground), responding to or returning from an incident (includes fire and nonfire emergencies), working at on-scene nonfire emergencies (includes rescues, hazardous calls and natural disaster calls), training, and participating in other on-duty activities (e.g., inspection or maintenance duties).

[2]In addition to the estimate of firefighter injuries, annually, from 2018 to 2020, there was an estimated average of 11,575 documented exposures to infectious diseases and an estimated average of 29,575 recorded exposures to hazardous substances.

[3]USFA, Topical Fire Report Series, "Fire-Related Firefighter Injuries Reported to the National Fire Incident Reporting System (2015-2017)," Volume 20, Issue 2 (July 2019).

[4]Injury estimates are from the National Fire Protection Association's (NFPA's) "U.S. Firefighter Injuries in 2020," by Richard Campbell and Ben Evarts, December 2021, and previous reports in the series. Annual averages of the NFPA estimates of overall firefighter injuries, firefighter fireground injuries, and firefighter injuries that occurred while responding to or returning from an incident were taken for the 3-year period from 2018 to 2020.

[5]In this topical report, all firefighter injury estimates are rounded to the nearest 25.

[6]To determine the best estimate of firefighter injuries that are fire related, an unknown portion of the NFPA estimate of injuries categorized as responding to or returning from an incident (which includes, but is not limited to, fires) should be added to the estimate of firefighter fireground injuries. In addition, it is important to note that 58% of all NFIRS-reported fire-related firefighter injuries submitted a report only of being exposed to toxic substances or harmful physical agents through any route of entry into the body. These reports of exposures to hazardous substances were excluded from the analyses presented in this report.

[7]Fire department participation in the NFIRS is voluntary; however, some states do require their departments to participate in the state system. Additionally, if a fire department is a recipient of a Fire Act Grant, participation is required. From 2018 to 2020, 65% of the NFPA's annual average estimated 1,332,800 fires to which fire departments responded were captured in the NFIRS. Therefore, the NFIRS is not representative of all fire incidents in the U.S. and is not a "complete" census of fire incidents. Although the NFIRS does not represent 100% of the incidents reported to fire departments each year, the enormous dataset exhibits stability from one year to the next without radical changes. Results based on the full dataset are generally similar to those based on part of the data.

[8]Firefighter injuries reported to the NFIRS may be the result of operations at the fire scene or responding to or returning from a fire incident.

[9]In NFIRS Version 5.0, a structure is a constructed item of which a building is one type. In previous versions of the NFIRS, the term "residential structure" commonly referred to buildings where people live. To coincide with this concept, the definition of a residential structure fire for the NFIRS 5.0 includes only those fires where the NFIRS 5.0 Structure Type is 1 or 2 (enclosed building and fixed portable or mobile structure) with a residential property use. Such structures are referred to as "residential buildings" to distinguish these buildings from other structures on residential properties that may include fences, sheds and other uninhabitable structures. In addition, confined fire incidents that have a residential property use but do not have a structure type specified are presumed to occur in buildings. Nonconfined fire incidents that have a residential property use without a structure type specified are considered to be invalid incidents (structure type is a required field) and are not included.

[10]For the analyses in Figure 1 and Table 1, vehicle fire incidents include those with mobile property not involved in ignition but burned, as well as mobile property involved in ignition that burned. Vehicle fires exclude mobile property involved in ignition but did not itself burn; these incidents are included in the Other General Property type category.
[11]For the purposes of this report, the time of the fire alarm is used as an approximation for the general time at which the fire started. However, in the NFIRS, it is the time at which the fire was reported to the fire department.
[12]Total does not add up to 41% due to rounding.
[13]U.S. Department of Labor, Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey, 2018 to 2020 Annual Averages - Household Data - Tables from Employment and Earnings. Table 11. Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity. Numbers of firefighters are based on a sample of U.S. households (https://www.bls.gov/cps/aa2020/cpsaat11.pdf). This statistic may reflect only a portion of the volunteer firefighters (i.e., those firefighters who are paid per call).
[14]Rita Fahy, Ben Evarts and Gary P. Stein, NFPA, U.S. Fire Department Profile 2019 Supporting Tables, December 2021. Here, the 33% is based on 2018 and 2019 estimates of firefighters; the 2020 estimates were not available at the time of this analysis.
[15]Protective equipment failure was specified in 98% of reported injuries.
[16]Nist, Cassandra, "Firefighters suffer smoke-related injuries battling fire at solar-powered house," www.cantonrep.com, August 24, 2022, https://www.cantonrep.com/story/news/fire/2022/08/24/firefighters-suffer-smoke-related-injuries-at-lexington-twp-fire/65417344007/ (accessed August 24, 2022).
[17]Caushi, Toni, "Firefighter injured in 2-alarm Grafton fire; Neighbor came to aid," www.telegram.com, August 18, 2022, https://www.telegram.com/story/news/2022/08/17/one-firefighter-injured-shortly-before-noon-wednesday-after-two-alarm-fire-scorched-kitchen-home-nea/10349450002/ (accessed August 24, 2022).
[18]Fan, Christina and Martinez, Astrid, Firefighter suffers serious neck and face burns in Staten Island fire, FDNY says," www.cbsnews.com, August 13, 2022, https://www.cbsnews.com/newyork/live-updates/fdny-firefighter-serious-burns-staten-island-fire/ (accessed August 24, 2022).
[19]The NFIRS PDR files are available for download at: https://www.fema.gov/about/openfema/data-sets/fema-usfa-nfirs-annual-data.