



RESEARCH



United States Firefighter Injuries in 2019

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Key Findings

An estimated 60,825 firefighter injuries occurred in the line of duty in 2019, an increase of 4 percent from the 2018 injury total.

In addition to injuries, there were 7,675 documented exposures to infectious diseases and 24,525 exposures to hazardous conditions.

Firefighters were more likely to be injured during fireground operations than during any other duties. In 2019, 23,825 injuries, or 39 percent of all reported firefighter injuries, occurred at the fireground.

The leading cause of fireground injuries was overexertion or strain (29 percent).

Strains, sprains, or muscular pain injuries accounted for approximately two out of five (41 percent) injuries on the fireground.

Other major fireground injuries included wounds, cuts, bleeding, or bruising (13 percent); smoke or gas inhalation (10 percent); and thermal stress (frostbite or heat exhaustion) (9 percent).

Non-fireground injuries included 4,100 injuries while responding to or returning from an incident; 8,175 injuries incurred during training activities, 14,150 injuries at non-fire emergency incidents; and 10,575 injuries during other on-duty activities.

Strains, sprains, and muscular pain accounted for 56 percent of all non-fireground injuries.

In 2019, an estimated 15,350 collisions involved fire department emergency vehicles responding to or returning from incidents.

Background and Objectives

Firefighters work in varied and complex environments that expose them to a number of potential hazards. Each year, NFPA studies firefighter deaths and injuries to provide national statistics on their frequency, extent, and characteristics. Earlier this year, NFPA reported that there were 48 firefighter fatalities while on duty in 2019 (See *NFPA Journal*, July/August, www.nfpa.org/firefighterfatalities¹). A better understanding of how firefighters become injured or ill on the job can inform intervention efforts to help ensure firefighter safety and health.

This report examines firefighter injuries in the United States in 2019. The results are based on data collected during the *NFPA Survey of Fire Departments for US Fire Experience (2019)*. An earlier report, *Fire Loss in the United States in 2019*², measured the national fire experience in terms of the number of fires that fire departments responded to and the resulting civilian deaths, civilian injuries, and property losses that occurred.

This year's report includes the following among its results:

- An estimate of the total number of firefighter injuries in 2019.
- Estimates of the number of injuries by type of duty.
- An estimate of the number of exposures to infectious diseases.
- Trends in firefighter injuries and rates.
- Fireground injuries by cause.
- Fire department vehicle accidents and resulting firefighter injuries.
- Descriptions of select injury incidents that illustrate firefighter safety issues.

This report provides a high-level overview of firefighter injuries. See NFPA's 2020 report *Patterns of Firefighter Fireground Injuries*, which uses data collected in the US Fire Administration's National Fire Incident Reporting System (NFIRS), to find more information on these injuries.

¹ Fahy, Rita F., et al. *Firefighter Fatalities in the United States – 2018*. Quincy, MA: National Fire Protection Association Research, Data, and Analytics division, June 2019.

² Ahrens, Marty and Ben Evarts, "Fire Loss in the United States in 2019," *NFPA Journal* (September/October 2020).

Results

Based on data reported by fire departments responding to the 2019 national fire experience survey, we estimate that 60,825 firefighter injuries³ occurred in the line of duty in 2019. This is an increase of four percent over the 2018 total, but nevertheless represents the third-lowest number of injuries since NFPA began analyzing this data in 1981, exceeding only the injury totals in 2017 and 2018 (see Figure 1). Over the past 20 years or so, the number of reported firefighter injuries has been considerably lower than in the 1980s and 1990s, due in part to a redefinition of injuries that places exposures to hazardous conditions and infectious diseases in their own categories, some of which may have previously been included in injury totals.

NFPA estimates that there were 7,675 exposures to infectious diseases, such as hepatitis, meningitis, and HIV, in 2019. We also estimate there were 24,525 exposures to hazardous conditions such as asbestos, radioactive materials, chemicals, and fumes last year. An estimated 17,575 injuries, or 29 percent of all firefighter injuries, resulted in lost time.

Injuries by Type of Duty

As in past reports, the type of duty is divided into five categories: responding to or returning from an incident (includes fire and non-fire emergencies); non-fire emergency (includes rescue calls, hazardous calls, and natural disaster calls); training; other on-duty activities (e.g., inspection or maintenance duties); and fireground (includes structure fires, vehicle fires, brush fires, etc.). Estimates of firefighter injuries by type of duty are displayed in Figure 2.

Figure 1. Total Firefighter Injuries by Year, 1981–2019

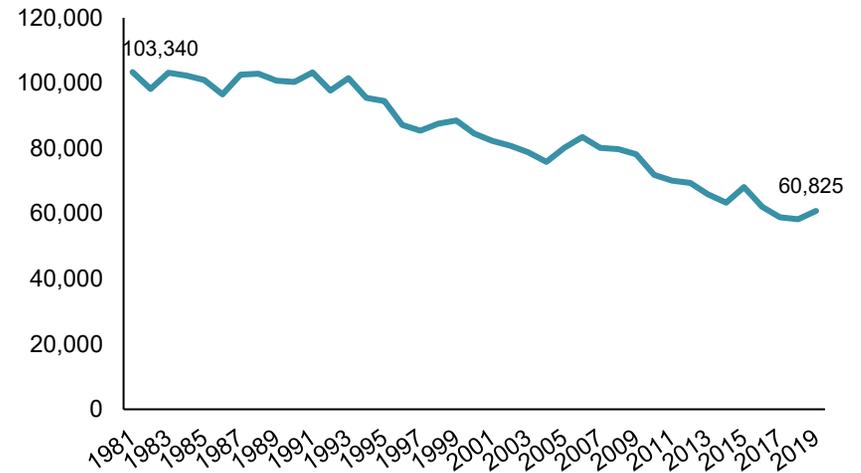
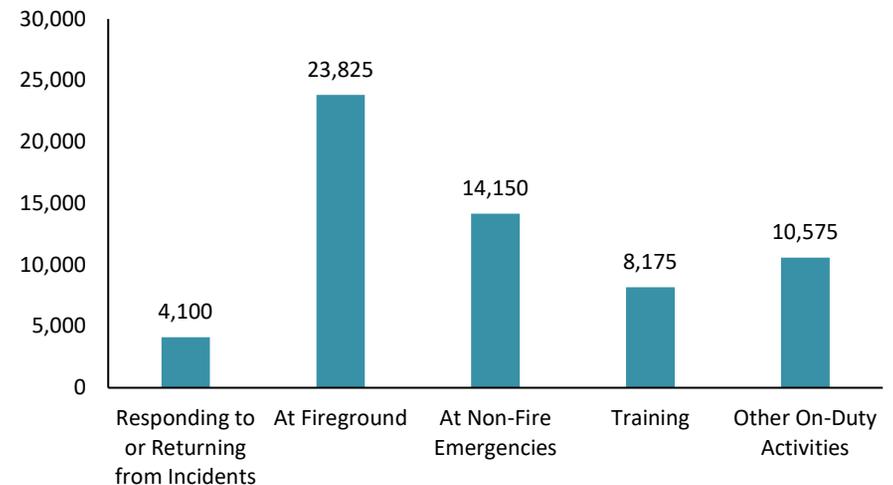


Figure 2. Firefighter Injuries by Type of Duty, 2019



³ Around any estimate based on a sample survey, there is a confidence interval that measures the statistical certainty (or uncertainty) of the estimate. Based on data reported by fire departments responding to the *NFPA Survey of Fire Departments for US Fire Experience* (2019), NFPA is very confident that the actual number of firefighter injuries falls within the range of 55,250 to 61,250.

Firefighters were more likely to be injured during fireground operations than during any other duties. In 2019, 23,825 injuries (39 percent of all firefighter injuries) occurred at the fireground, a four percent increase over 2018 (see Table 1). Still, injuries at the fireground in 2019 represented a 65 percent decline from the 67,500 injuries in 1981. The number of fires also declined steadily, for an overall decrease of 55 percent. The rate of 18.4 injuries per 1,000 fires in 2019 represented the third-lowest rate over the past 38 years, bettered only by rates of 17.4 injuries per 1,000 fires in 2018 and 18.1 injuries per 1,000 fires in 2016 (see Table 1).

The number of injuries at non-fire emergencies increased by 47 percent between 1981 and 2019, from 9,600 to 14,150 (see Figure 4). During the same period, the number of non-fire emergencies increased 367 percent, due in large part to an increase in the number of fire department responses to medical emergencies. The injury rate per 1,000 non-fire emergencies declined between 1981 and 2019, from 1.2 to 0.4, largely because the number of non-fire emergencies increased at a higher rate than the number of injuries at non-fire responses. In general, however, the total number of injuries at non-fire emergencies has shown substantial fluctuation, as shown in Table 1.

Another 8,175 firefighter injuries occurred during training activities, and 10,575 injuries occurred during other on-duty activities. In addition, 4,100 firefighter injuries occurred while responding to or returning from an incident in 2019.

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Figure 3. Fireground Injuries by Year, 1981–2019

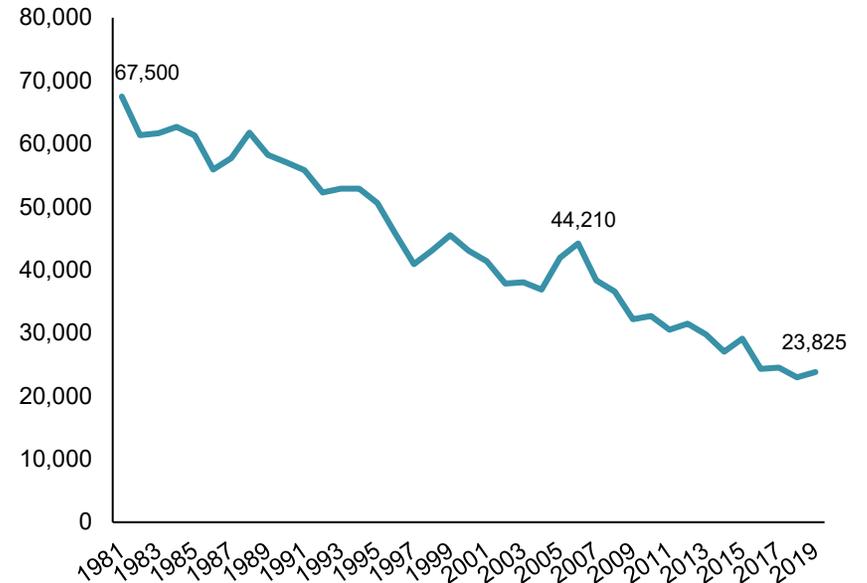
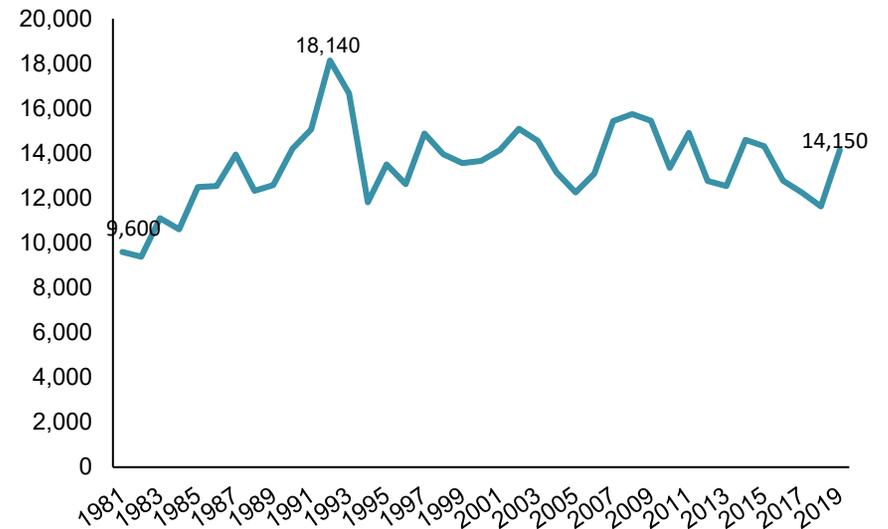


Figure 4. Injuries at Non-Fire Emergencies, 1981-2019

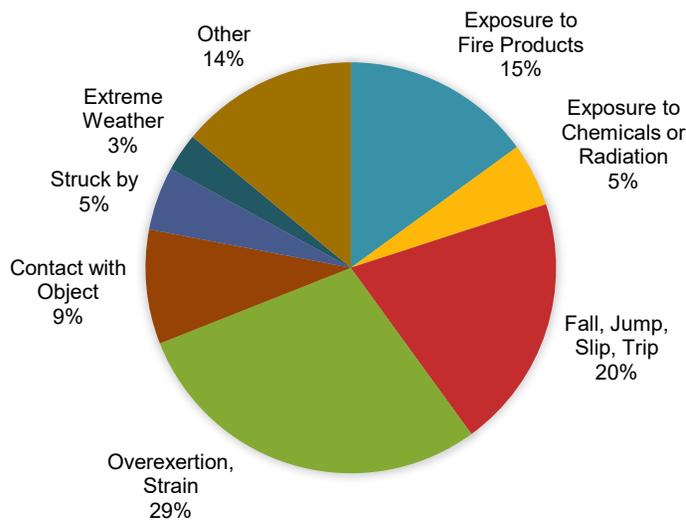


Nature and Causes of Fireground Injuries

The major types of injuries that occurred during fireground operations were strains, sprains, or muscular pain, which accounted for 41 percent of the injuries; wounds, cuts, bleeding, and bruising, which accounted for 13 percent; smoke or gas inhalation, which accounted for 10 percent; and thermal stress (frostbite or heat exhaustion) with 9 percent. Strains, sprains, and muscular pain were the leading type of injury during all firefighter activities and accounted for more than half of all the non-fireground injuries, while wounds, cuts, bleeding, and bruising were the second leading cause during non-fireground activities (see Table 2).

As the major location for firefighter injuries, injuries on the fireground are a concern. The major causes of fireground injuries are shown in Figure 5. Cause, as defined here, refers to the initial circumstance leading to the injury. Overexertion or strain was the leading cause of fireground injuries, which accounted for three in ten injuries (29 percent). Other major causes were falls, jumps, or slips, accounting for one in five injuries and exposure to fire products (15 percent).

Figure 5. Fireground Injuries by Cause, 2019



Fire Department Vehicle Collisions

In a previous report, *Firefighter Fatalities in the United States — 2019*, NFPA reported that four firefighters died in vehicle-related incidents in 2019. Three of those incidents involved road vehicles and one occurred in a helicopter crash. None of the road vehicle victims were wearing seatbelts. Over the past 10 years, there has been an average of 10 road crash fatalities a year. This is the second year with fewer than five such deaths during that time span.

In 2019, an estimated 15,350 collisions involved fire department vehicles responding to or returning from incidents. These collisions resulted in 575 injuries, or one percent of all firefighter injuries. Another 800 collisions involved personal vehicles when firefighters were responding to or returning from incidents. These collisions resulted in an estimated 10 injuries (see Table 3).

Vehicle Safety

Investigations of vehicle-related firefighter fatalities by the National Institute for Occupational Safety and Health (NIOSH) have identified several key contributing factors to injury incidents during transport, including failure to use seatbelts, excess speed for conditions, and vehicle maintenance. Firefighters may also be exposed to vehicle hazards when not in transit, particularly when on or near roadways, where hazards may be influenced by lighting, road conditions, time of day, and the speed and volume of traffic.

Safety protocols and training programs based on best practices can help to reduce the number of firefighter injuries caused by a variety of vehicle-related hazards. At a basic level, this entails mandatory seatbelt use for all firefighters in all areas of the vehicle or apparatus — including personal vehicles used during response. Protocols and training are also in order in such areas as operating vehicles at safe speeds, navigating intersections, and backing up apparatus. To prevent injuries to firefighters working near roadways, NIOSH has developed recommendations for safe procedures in such areas as parking and staging vehicles and personal safety of firefighters working near traffic.

Average Fires and Fireground Injuries per Department by Population Protected

The number of fires a fire department responds to is related to the size of the population it protects. The number of fireground injuries in departments is also relative to the number of fires attended by the department. This point is demonstrated by the average number of fireground injuries per year per fire department, which range from a high of 75.3 for departments that protect communities of 500,000 or more to a low of 0.2 for departments that protect communities that protect fewer than 5,000 people (see Table A).

One way to understand the risk of firefighter injury is to examine the number of fireground injuries per every 100 fires. This considers relative fire experience and allows for a more direct comparison between departments protecting communities of different sizes. In 2019, the overall range of rates varied from 2.4 injuries per 100 fires for departments that protected communities with populations of 500,000 or more to 1.3 injuries per 100 fires for departments that protected communities with populations between 5,000 and 9,999.

Table A. Average Number of Fires, Fireground Injuries and Injury Rates by Population of Community Protected, 2019

Population of Community	Average Number of Fireground Injuries	Fireground Injuries per 100 Fires	Fireground Injuries per 100 Firefighters
500,000 or more*	75.3	2.4	5.5
250,000 to 499,999	21.8	1.8	4.1
100,000 to 249,999	9.6	1.9	4.2
50,000 to 99,999	3.5	1.7	3.3
25,000 to 49,999	2.0	1.8	3.2
10,000 to 24,999	1.0	1.5	2.3
5,000 to 9,999	0.4	1.3	1.4
2,500 to 4,999	0.4	1.6	1.4
Under 2,500	0.2	1.5	0.9

*Excludes New York City

Larger fire departments generally had the highest rates of fireground injuries per firefighter; departments protecting communities of 500,000 or more experienced 5.5 injuries per 100 firefighters. As the size of the community decreases, the rate of fireground injuries generally declines, to a low of 0.9 per 100 fires for departments protecting fewer than 2,500 residents. That represents a difference in risk of injury per firefighter of 6 to 1 between communities of 500,000 or more people and communities of fewer than 2,500 residents.

Firefighters in larger cities may experience higher risk of injury due to the presence of infrastructure and large buildings that might involve exposure to more complicated hazards than those in areas with less developed infrastructure and smaller buildings. In addition, fire departments in smaller communities are more likely to be staffed by volunteer firefighters, who are unlikely to respond to every fire and who face lower levels of injury exposure. Different policies for documenting minor injuries and different levels of fire engagement could also explain some of the difference.

Discussion

Since 1981, when firefighter injury data was first collected for this report, the overall trend has been a decrease in the number of firefighter injuries. While this decline is encouraging, research indicates that firefighter injury and illness — in excess of 60,000 cases in 2019 — continue to represent a substantial problem. And it doesn't only affect firefighters and their families, but also the cities and towns that bear the financial burden of the expenses related to injury and illness.

As the statistics in this report and previous reports attest, firefighting presents risks of personal injury to firefighters. Due to the kind of work performed and the hazards of the incident scene environment, it is unlikely that all firefighter injuries can be eliminated. However, the adoption of proactive safety programs by fire departments can help to reduce injury and illness among firefighters and other emergency response personnel.

For example, the prevalence of strain and sprain injuries identified in this report have been well documented in other research and the focus of numerous prevention initiatives. Although many of the activities that influence strain injuries are a regular part of firefighting — such as carrying hoses and heavy equipment, performing forcible entry, climbing ladders, and contending with uneven and slippery surfaces — injury prevention specialists have identified potential opportunities to reduce injury risk. For instance, training in techniques to reduce the mechanical load on parts of the musculoskeletal system involved in ergonomically challenging tasks, such as bending and lifting, has been shown to reduce injuries to the backs and upper extremities of firefighters.⁴ Better aerobic fitness has also been found to be associated with lower firefighter risk for sprain and strain injuries, underscoring a need for structured fitness programs in firefighter injury prevention efforts.⁵

Research indicates that firefighters may fail to follow model injury prevention practices because they are unaware of new protocols, have limited training, or don't have access to new equipment, which could be mitigated by adopting proactive risk management programs. The underutilization of patient transfer equipment to reduce strain and sprain injuries is also cited as an indication of the need for greater attention to injury control through comprehensive risk management.⁶ Safety protocols and training programs based on best practices can help to reduce firefighter injuries from a variety of hazards they experience. A recent study of the NIOSH firefighter fatality database found that personal protective equipment, seatbelt use, and fitness were contributing factors in nearly half of the fatalities between 2009 and 2014.⁷ The researchers also found that a lack of training or experience and inappropriate medical clearance were factors in fire departments that did not have standard operating protocols

for respirator fitness testing, use of personal protective equipment, fitness testing, rapid intervention, medical clearance, safety or distress alarms, vehicle maintenance, or incident command. An absence of key safety protocols was seen to put firefighters at risk, which the authors suggested might be increasing over time.

In addition to their efforts to prevent traumatic injuries, it is also critically important for firefighter health and safety programs to develop policies and procedures to address the long-term health risks of firefighting activities, including prevention efforts around [cardiovascular health and protection from exposure to toxic materials](#).

Annual medical evaluations are an important component of programs for reducing the risk of cardiac events, with clearance for duty by physicians who are familiar with the physical demands of firefighting. Fitness and wellness programs also play a role in enhancing the ability of firefighters to contend with the cardiovascular strain of fire-related duties. At the fireground, good practice requires on-scene rehabilitation to ensure adequate hydration and rest, as well as medical monitoring to evaluate indications of cardiovascular strain.

Besides reducing the risk of injury, firefighter health and safety programs need to be attentive to reducing exposure to contaminants or pathogens that might lead to illness or disease, whether through inhalation, ingestion, or absorption through the skin. Firefighters are exposed to a variety of contaminants at the fire scene — and potentially at the fire station itself in the case of diesel exhaust — that may be carcinogenic.

However, while carcinogens represent a particularly serious health threat, firefighters are also at risk for chronic respiratory disease, coronary heart disease, and other illnesses caused by work-related exposures. Use of

⁴ Peate, WF, et al., “Core strength: a new model for injury prediction and prevention,” *Journal of Occupational Medicine and Toxicology* 11 (2007): p. 2–3.

⁵ Poplin, GS, et al., “The association of aerobic fitness with injuries in the fire service,” *American Journal of Epidemiology* 179 (2014): p. 149–155.

⁶ Pollack, KM, et al., “Implementing risk management to reduce injuries in the U.S. fire service,” *Journal of Safety Research* 60 (2017): p. 21–27.

⁷ Kahn, SA, et al., “Factors implicated in safety-related firefighter fatalities,” *Journal of Burn Care & Research* 38 (2016).

SCBA, with properly fitting masks, is essential when exposure to contaminants is an issue, including during overhaul, when contaminants are less obvious but still present. Suppression activities also require the use of gloves and hoods to protect against dermal absorption of hazardous substances.

Although the hazards of firefighting are very real, the use of best practice health and safety protocols, active training programs, and other measures can help protect firefighters in all areas of work.

Contaminated Gear and Equipment

In recent years, cancer concerns have prompted considerable interest in minimizing firefighter exposure to toxic contaminants. Among the areas of emerging interest is the health hazards caused by [contaminated gear and equipment](#). Some of the best practices for avoiding exposure to dirty gear are likely to be beyond the reach of many fire departments, including such practices as purchasing two sets of gear for every firefighter or spatially separating “clean” and “dirty” zones of fire stations in ways that require substantial station redesign. However, there are a number of best practices that are not expensive and can be implemented right away, such as removing gear before returning to the station and storing it in leakproof bags or using alternate footwear inside the station. Information on [best practices for reducing exposure risk to carcinogens](#) is available through the Washington State Council of Fire Fighters.

Methods

NFPA annually surveys a sample of fire departments in the United States to make national projections of the fire problem. The sample is stratified by the size of the community protected by the fire department and includes all the United States fire departments that protect communities with a population larger than 5,000 residents. These 8,672 fire departments protect a population of 280 million, or 85 percent of the United States population as of July 2019. The rest of the sample includes 15,478 randomly selected departments that protect populations under 5,000, for a total sample size of 24,150, or 83 percent of all departments in the US known to NFPA.

A ratio estimation was used for the survey, with stratification by community size⁸. For each injury statistic, a sample injury rate was computed for each stratum. This rate consisted of the total for that particular statistic from all the departments reporting it divided by the total population protected by the departments reporting the statistic. Note that this means the departments used in calculating each statistic could be different, reflecting differences in unreported statistics. The national projections were made by weighing the sample results according to the proportion of total US population accounted for by communities of each size. Around any estimate based on a sample survey is a confidence interval that measures statistical certainty. We are confident that the actual number of total firefighter injuries falls within five percent of the estimate.

Data were collected by sending designated fire departments a form requesting descriptions of the circumstances that led to particular injuries. A total of 2,432 departments responded to the 2019 fire experience survey. The results reported here are based on injuries incurred by public fire departments. No state or federal firefighting entities were included in the research and no adjustments were made for injuries that occurred during fires attended solely by private fire brigades.

⁸ William G. Cochran, *Sampling Techniques* (New York, NY: John Wiley, 1977), p. 150–161.

NFPA Codes and Standards References

NFPA codes and standards identify a number of protocols and initiatives that can be taken at the local level to promote the safety and health of personnel.

- Commitment on the part of top fire service management to reduce injuries: *NFPA 1500™, Standard on Fire Department Occupational Safety, Health, and Wellness Program, Section 4.3.*
- Establishment of a safety committee headed by a safety officer to recommend a safety policy and the means of implementing it: *NFPA 1500, Section 4.5.*
- Development and implementation of an investigation procedure that includes all accidents, near misses, injuries, fatalities, occupational illnesses, and exposures involving members: *NFPA 1500, 4.4.4. and 4.4.5.*
- Provision of appropriate protective equipment and a mandate to use it: *NFPA 1500, Section 7.1 through 7.8.*
- Development and enforcement of a program on the use and maintenance of SCBA: *NFPA 1500, Section 7.9 through 7.14.*
- Development and enforcement of policies on safe practices for drivers and passengers of fire apparatus: *NFPA 1500, Section 6.2 and 6.3.*
- Development of procedures to ensure response of sufficient personnel for both firefighting and overhaul duties: *NFPA 1500, 4.1.2; NFPA 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments; and NFPA 1720, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments).*
- Implementation of regular medical examinations and a physical fitness program: *NFPA 1500, Section 10.1 through 10.3; NFPA 1582, Standard on Comprehensive Occupational Medical Program for Fire Departments; and NFPA 1583, Standard on Health-Related Fitness Programs for Fire Department Members).*

- Adoption and implementation of an incident management system: *NFPA 1500, Section 8.1 and NFPA 1561, Standard on Emergency Services Incident Management System and Command Safety.*
- Training and education for emergency operations personnel: *NFPA 1500, Chapter 5.*
- Implementation of programs for the installation of private fire protection systems so fires are discovered at an earlier stage, exposing firefighters to a less hostile environment: *NFPA 1, Fire Code and NFPA 101®, Life Safety Code®.*
- Increased efforts in the area of fire safety education programs so citizens are aware of measures to prevent fires and correct reactions to a fire situation: *NFPA 1201, Standard for Providing Fire and Emergency Services to the Public, Chapter 6.*

Other NFPA standards that can help to reduce firefighter injuries and illnesses include the following:

- *NFPA 1584, Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises*, Chapter 4, Preparedness, and Chapter 6, Incident Scene and Training Rehabilitation.
- *NFPA 1002, Standard for Fire Apparatus Driver/Operator Professional Qualifications*, Section 4.8, The Risk Management Process.
- *NFPA 1620, Standard for Pre-Incident Planning*, Chapter 4, Pre-Incident Planning Process; Chapter 5, Physical & Site Considerations; Chapter 7, Water Supplies & Fire Protection Systems; Chapter 8, Special Hazards.

Efforts need to be made to recognize that firefighter injuries can be reduced. By addressing the priorities listed above, fire service organizations can make significant strides toward reducing the number and impact of such injuries.

Definition of Terms

Fire: Any instance of uncontrolled burning. Excludes combustion explosions and fires out on arrival (whether authorized or not); overpressure ruptures without combustion; mutual aid responses; smoke scares; and hazardous materials responses, e.g., flammable gas, liquid, or chemical spills without fire.

Incident: The movement of a piece or pieces of fire service apparatus or equipment in response to an alarm.

Injury: Physical damage suffered by a person that requires (or should require) treatment by a practitioner of medicine (physician, nurse, paramedic, or EMT) within one year of the incident (regardless of whether treatment was actually received), or that results in at least one day of restricted activity immediately following the incident.

Acknowledgments

NFPA is grateful to the many fire departments that responded to the 2019 national fire experience survey for their continuing efforts to provide the data necessary to make national projections. The authors would also like to thank the members of the NFPA staff who worked on this year's survey, including Stephen Belski, Frank Deely, and Jay Petrillo for editing the survey forms and making follow-up calls to fire departments.

To learn more about the research, visit nfpa.org/research.

Email: research@nfpa.org

NFPA No. FFI10

Table 1. Total Firefighter Injuries, Firefighter Injuries at the Fireground, and Firefighter Injuries at Non-Fire Emergencies, 1981–2019

Year	Total Firefighter Injuries	Firefighter Injuries at the Fireground		Firefighter Injuries at Non-Fire Emergencies	
		Injuries	Injuries per 1,000 Fires	Injuries	Injuries per 1,000 Incidents
1981	103,340	67,500	23.3	9,600	1.2
1982	98,150	61,400	24.2	9,385	1.2
1983	103,150	61,700	26.5	11,105	1.3
1984	102,300	62,700	26.8	10,600	1.2
1985	100,900	61,300	25.9	12,500	1.4
1986	96,540	55,900	24.7	12,545	1.3
1987	102,600	57,755	24.8	13,940	1.4
1988	102,900	61,790	25.4	12,325	1.1
1989	100,700	58,250	27.5	12,580	1.1
1990	100,300	57,100	28.3	14,200	1.3
1991	103,300	55,839	27.3	15,065	1.2
1992	97,700	52,290	26.6	18,140	1.4
1993	101,500	52,885	27.1	16,675	1.3
1994	95,400	52,875	25.7	11,810	0.8
1995	94,500	50,640	25.8	13,500	0.9
1996	87,150	45,725	23.1	12,630	0.8
1997	85,400	40,920	22.8	14,880	0.9
1998	87,500	43,080	24.5	13,960	0.8
1999	88,500	45,500	25	13,565	0.8
2000	84,550	43,065	25.2	13,660	0.7
2001	82,250	41,395	23.9	14,140	0.7
2002	80,800	37,860	22.4	15,095	0.8

**Table 1. Total Firefighter Injuries, Firefighter Injuries at the Fireground, and Firefighter Injuries at Non-Fire Emergencies, 1981–2019
(Continued)**

Year	Total Firefighter Injuries	Firefighter Injuries at the Fireground		Firefighter Injuries at Non-Fire Emergencies	
		Injuries	Injuries per 1,000 Fires	Injuries	Injuries per 1,000 Incidents
2003	78,750	38,045	24	14,550	0.7
2004	75,840	36,880	22.1	13,150	0.6
2005	80,100	41,950	26.2	12,250	0.6
2006	83,400	44,210	26.9	13,090	0.6
2007	80,100	38,340	24.6	15,435	0.7
2008	79,700	36,595	25.2	15,745	0.7
2009	78,150	32,205	24.1	15,455	0.6
2010	71,875	32,675	24.5	13,355	0.5
2011	70,090	30,505	22	14,905	0.5
2012	69,400	31,490	22.9	12,760	0.4
2013	65,880	29,760	24	12,535	0.4
2014	63,350	27,015	20.8	14,595	0.5
2015	68,085	29,130	21.6	14,320	0.4
2016	62,085	24,325	18.1	12,780	0.4
2017	58,835	24,495	18.6	12,240	0.4
2018	58,250	22,975	17.4	11,625	0.3
2019	60,825	23,825	18.4	14,150	0.4

Source: *NFPA Survey of Fire Departments for US Fire Experience (1981–2019)*.

Table 2. Firefighter Injuries by Nature of Injury and Type of Duty, 2019

Nature of Injury	Responding to or Returning from Incidents		Fireground		Non-Fire Emergency		Training		Other Duties		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Burns (fire or chemical)	75	(2%)	1,125	(5%)	200	(1%)	225	(3%)	150	(1%)	1,775	(3%)
Smoke or gas inhalation	200	(5%)	2,450	(10%)	250	(2%)	75	(1%)	100	(1%)	3,075	(5%)
Other respiratory distress	25	(1%)	625	(3%)	150	(1%)	200	(2%)	75	(1%)	1,075	(2%)
Burns and smoke inhalation	125	(3%)	1,100	(5%)	50	(0%)	25	(0%)	50	(0%)	1,350	(2%)
Wounds, cuts, bleeding, or bruising	525	(13%)	3,175	(13%)	2,350	(17%)	1,300	(16%)	1,650	(16%)	9,000	(15%)
Dislocation, fracture	100	(2%)	625	(3%)	275	(2%)	300	(4%)	400	(4%)	1,700	(3%)
Heart attack or stroke	25	(1%)	200	(1%)	100	(1%)	75	(1%)	175	(2%)	575	(1%)
Strain, sprain, or muscular pain	2,400	(59%)	9,725	(41%)	7,675	(54%)	5,075	(62%)	5,625	(53%)	30,500	(50%)
Thermal stress (frostbite, heat exhaustion)	125	(3%)	2,225	(9%)	125	(1%)	325	(4%)	200	(2%)	3,000	(5%)
Other	500	(12%)	2,575	(11%)	2,975	(21%)	575	(7%)	2,150	(20%)	8,775	(14%)
Total	4,100	(100%)	23,825	(100%)	14,150	(100%)	8,175	(100%)	10,575	(100%)	60,825	(100%)

Note: In cases where individual firefighters sustained multiple injuries, only the nature of the most serious injury was tabulated and reported.

Source: NFPA Survey of Fire Departments for US Fire Experience, 2019.

Table 3. Fire Department Vehicle Collisions and Resulting Firefighter Injuries While Responding to or Returning from Incidents, 1990–2019

Year	Involving Fire Department Emergency Vehicles		Involving Firefighters' Personal Vehicles	
	Collisions	Firefighter Injuries	Collisions	Firefighter Injuries
1990	11,325	1,300	950	175
1991	12,125	1,075	1,375	125
1992	11,500	1,050	1,575	150
1993	12,250	900	1,675	200
1994	13,755	1,035	1,610	285
1995	14,670	950	1,690	190
1996	14,200	910	1,400	240
1997	14,950	1,350	1,300	180
1998	14,650	1,050	1,350	315
1999	15,450	875	1,080	90
2000	15,300	990	1,160	170
2001	14,900	960	1,325	140
2002	15,550	1,040	1,030	210
2003	15,900	850	980	85
2004	15,420	980	1,150	220
2005	15,885	1,120	1,080	125
2006	16,020	1,250	1,070	210
2007	14,650	915	665	120
2008	14,950	670	1,000	70
2009	15,100	820	870	100
2010	14,200	775	1,000	75
2011	14,850	970	790	190

Table 3. Fire Department Vehicle Collisions and Resulting Firefighter Injuries While Responding to or Returning from Incidents, 1990–2019 (Continued)

Year	Involving Fire Department Emergency Vehicles		Involving Firefighters’ Personal Vehicles	
	Collisions	Firefighter Injuries	Collisions	Firefighter Injuries
2012	14,300	725	750	70
2013	12,350	730	830	185
2014	14,910	550	620	90
2015	16,600	1,150	700	50
2016	15,430	700	850	175
2017	15,425	1,005	795	75
2018	14,425	575	700	50
2019	15,350	575	800	10

Source: NFPA Survey of Fire Departments for US Fire Experience (1980–2019).

Table 4. Average Number of Fires, Fireground Injuries, and Injury Rates by Population of Community Protected, 2019

Population of Community Protected	Average No. of Fireground Injuries	Fireground Injuries Per 100 Fires	Fireground Injuries Per 100 Firefighters
500,000 or more*	75.3	2.4	5.5
250,000 to 499,999	21.8	1.8	4.1
100,000 to 249,999	9.6	1.9	4.2
50,000 to 99,999	3.5	1.7	3.3
25,000 to 49,999	2.0	1.8	3.2
10,000 to 24,999	1.0	1.5	2.3
5,000 to 9,999	0.4	1.3	1.4
2,500 to 4,999	0.4	1.6	1.4
Under 2,500	0.2	1.5	0.9

Source: NFPA Survey of Fire Departments for US Fire Experience (1980–2019).