

NFPA® RESEARCH

United States Firefighter Injuries in 2024

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Key Findings

NFPA estimates that 53,575 municipal firefighters were injured in the line of duty in 2024, a decrease of 15 percent over the 63,175 injuries reported in 2023.

Firefighters were more likely to be injured at fireground operations than during any other duties. In 2024, an estimated 16,275 injuries, or 30 percent of all reported firefighter injuries, occurred on the fireground.

The non-fireground injuries included 11,325 injuries during other on-duty activities; 10,050 injuries during training activities; 9,825 injuries at non-fire emergency incidents; and 6,100 injuries sustained while responding to or returning from an incident.

Strains, sprains, or muscular pain injuries were the leading type of injury during all non-fireground activities, particularly training, which accounted for 63 percent of the injuries.

In 2024, an estimated 16,900 collisions involved fire department emergency vehicles responding to or returning from incidents, resulting in 650 injuries. Another 850 collisions occurred in firefighters' personal vehicles while responding to or returning from incidents, which resulted in 125 injuries.

Background and Objectives

Firefighters are exposed to a variety of potential hazards in the course of their work, both on and off the fireground. Each year, NFPA studies firefighter deaths and injuries to provide national statistics on their frequency, extent, and characteristics. A better understanding of how firefighters become injured or ill on the job can help inform intervention efforts to ensure firefighter safety and health.

This report examines the firefighter injuries sustained in 2024 in the United States. The results are based on data collected during NFPA's annual survey of fire departments for the US fire experience.

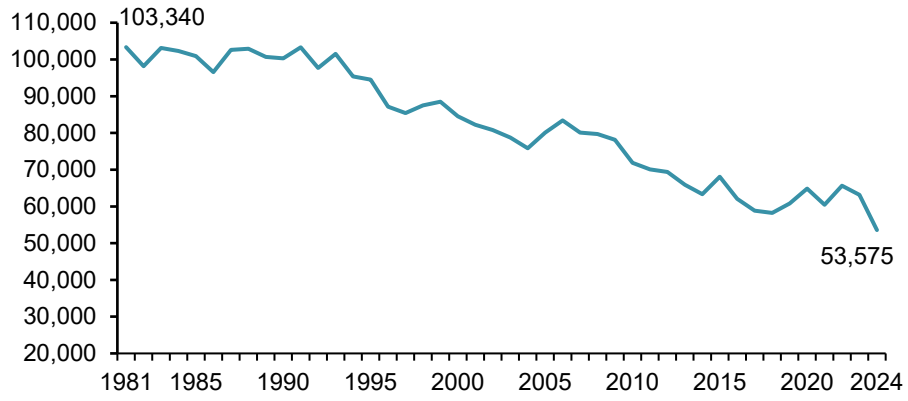
This year's report includes the following:

- An estimate of the total number of firefighter injuries in 2024
- Estimates of the number of injuries by type of duty
- Trends in firefighter injuries and rates
- Fireground injuries by cause
- Fire department vehicle accidents and resulting firefighter injuries

Municipal Firefighter Injuries in 2024 in the United States

Data from NFPA's 2024 national fire experience survey indicates that municipal firefighters experienced 53,575 injuries in 2024, a 15 percent decrease over the estimated 63,175 injuries in 2023 (Figure 1). Over the past 20 years, the number of these injuries has been much lower than in prior years. This decrease is likely influenced by 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.

Figure 1. Municipal Firefighter Injuries: 1981–2024

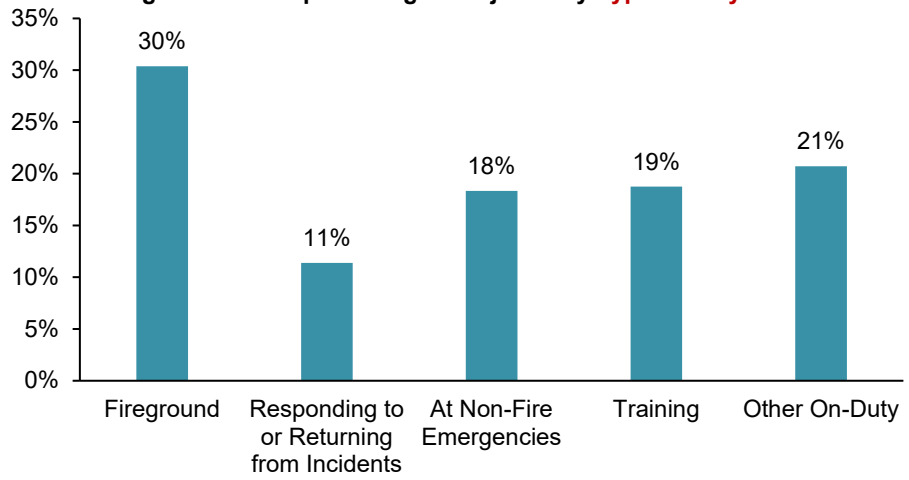


NFPA estimates that 9,100 injuries, or 17 percent of the injury total, resulted in lost time.

Injuries by Type of Duty

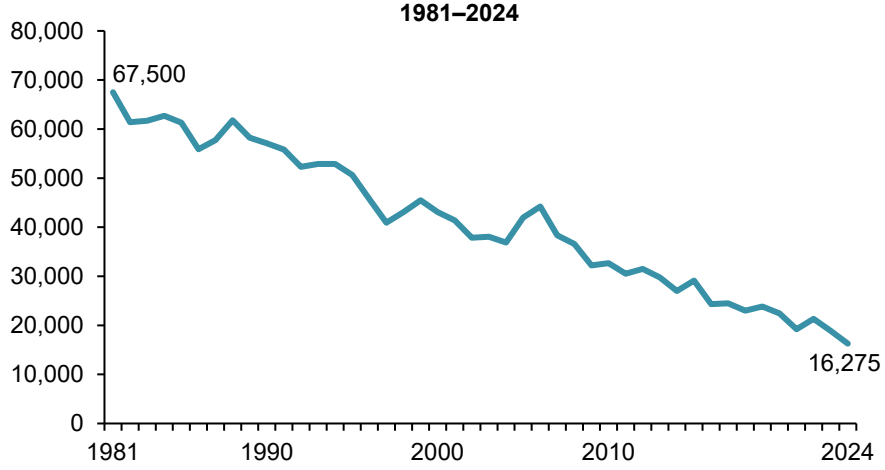
Injuries occurred while firefighters were performing a variety of duties, including responding to or returning from incidents (including fire and non-fire emergencies); working at non-fire emergencies (including rescue calls, hazardous calls, and natural disaster calls); undergoing training; performing other on-duty activities (e.g., inspection or maintenance duties); and working at the fireground (including structure fires, vehicle fires, brush fires, etc.). Firefighter injuries by the type of duty being performed at the time of injury are displayed in Figure 2.

Figure 2. Municipal Firefighter Injuries by Type of Duty: 2024



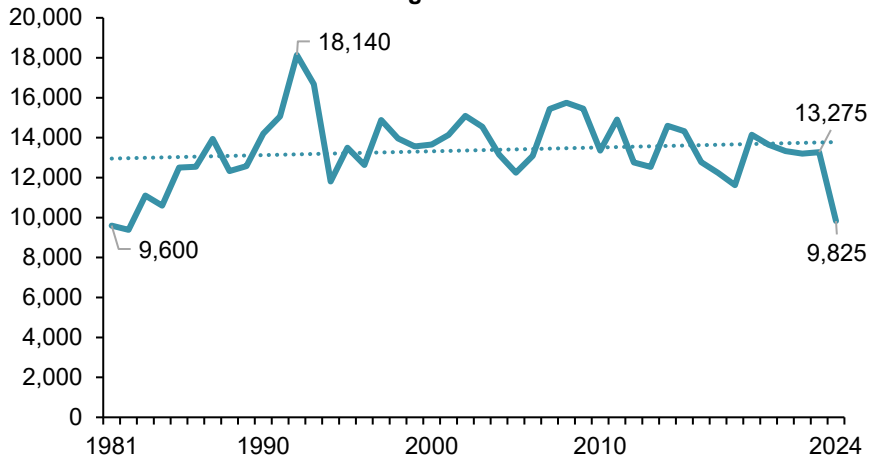
The fireground was the location at which the largest share of firefighter injuries occurred in 2024, accounting for 16,275 injuries (30 percent of the injury total).

Figure 3. Municipal Firefighter Fireground Injuries by Year: 1981–2024



Seven in ten firefighter injuries occurred during non-fireground activities. These included 11,325 injuries during unclassified on-duty activities; 10,050 during training activities; 9,825 during non-fire emergencies; and 6,100 while responding to or returning from incidents. The number of injuries at non-fire emergencies has followed an upward trend since 1981, but with considerable year-to-year fluctuation (see Figure 4). Firefighters experienced 9,825 injuries at non-fire emergencies in 2024, a 26 percent increase over the 13,275 non-fire emergency injuries in 2023. However, the injury rate declined from 1.2 injuries per 1,000 non-fire emergencies in 1981 to 0.2 in 2024, largely because the number of non-fire emergencies increased at a higher rate than the number of injuries at non-fire responses.

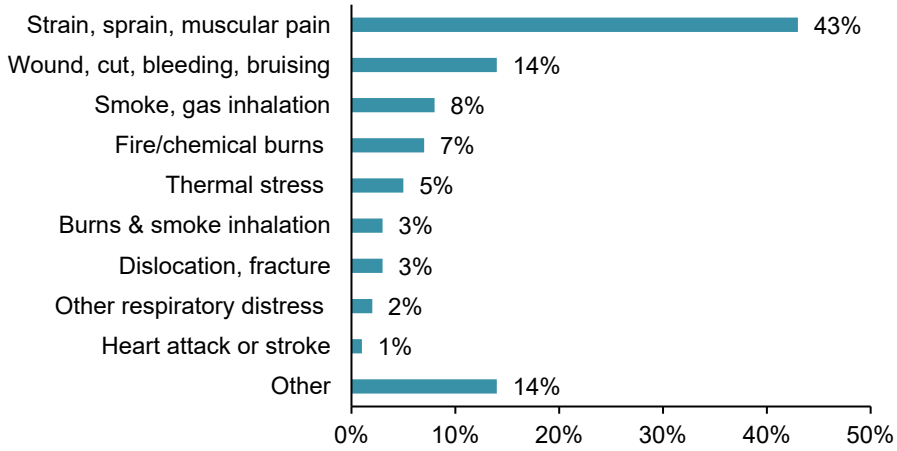
Figure 4. Municipal Firefighter Injuries at Non-Fire Emergencies: 1981–2024



Nature of Fireground Injuries

As the primary location of firefighter injuries, injuries on the fireground are a particular concern. The major types of injuries that occurred during fireground operations were strains, sprains, or muscular pain, which accounted for 43 percent of the injuries, and wounds, cuts, bleeding, and bruising, which accounted for 14 percent. Other injuries included smoke or gas inhalation (8 percent), fire or chemical burns (7 percent), and thermal stress (frostbite or heat exhaustion) (5 percent). Burns and smoke inhalation injuries and dislocations or fractures (each with 3 percent), other respiratory distress (2 percent), heart attacks or strokes (1 percent), and unclassified injuries (14 percent) accounted for the remaining injuries (see Figure 5).

Figure 5. Fireground Injuries by Nature of Injury: 2024

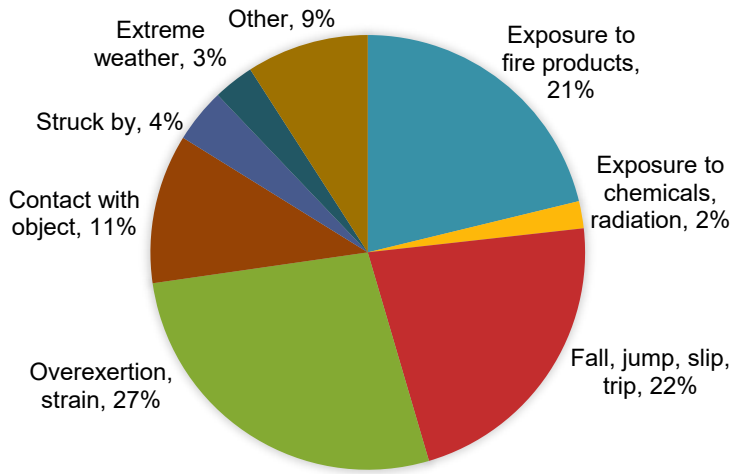


Fireground Injuries by Cause of Injury

The major causes of fireground injuries (the initial circumstances that led to the injury) are shown in Figure 6.

Overexertion or strain was the leading cause of fireground injuries, accounting for 27 percent of the injuries, while another 22 percent were caused by falls, jumps, slips, or trips, and 21 percent by exposure to fire products. Other leading causes of injury included contact with objects (11 percent) and being struck by an object (4 percent). Extreme weather (3 percent) and exposure to chemicals or radiation (2 percent) accounted for smaller shares of the injuries on the fireground.

Figure 6. Fireground Injuries by Cause: 2024



Non-Fireground Injuries

Strains, sprains, and muscular pain injuries were the leading types of injury sustained during all non-fireground activities and accounted for an especially high share of injuries during training (63 percent of the total) and non-fire emergencies (58 percent). Strains, sprains, and muscular pain injuries also accounted for nearly half of the injuries sustained while performing other on-duty activities (48 percent) and while responding to or returning from an incident (47 percent).

Wounds, cuts, bleeding, and bruising injuries were the second leading type of injury sustained during non-fireground activities, accounting for 13 to 15 percent of the injuries across all non-fireground activities. Thermal stress accounted for 6 percent of the injuries sustained while responding to/returning from incidents, as well as 3 percent of the training injuries. Dislocations and fractures accounted for 5 percent of the injuries sustained while firefighters responded to or returned from incidents, 4 percent of injuries sustained during training activities, and 3 percent of injuries sustained during non-fire emergency responses. Smoke or gas inhalation accounted for 6 percent of the injuries sustained while responding to or returning from incidents.

Table A shows the leading types of injuries in each of these categories. Complete information on the nature of injuries by activity is available in Table 2.

Table A. Non-Fireground Injuries by Nature of Injury: 2024

Nature of Injury	Responding, Returning	Non-fire Emergency	Training	Other on Duty
Strain, sprain, muscular pain	47%	58%	63%	48%
Wound, cut, bleeding, bruising	15%	13%	14%	14%
Dislocation, fracture	5%	3%	4%	2%
Thermal stress	6%	2%	3%	1%
Smoke, gas inhalation	6%	1%	1%	1%
Burns	2%	1%	1%	2%
Other respiratory distress	3%	1%	1%	1%
Burns and smoke inhalation	2%	1%	1%	0%

Fire Department Vehicle Collisions

In 2024, an estimated 16,900 collisions involved fire department emergency vehicles responding to or returning from incidents, resulting in an estimated 650 firefighter injuries. Another 850 collisions occurred while firefighters were in personal vehicles while responding to or returning from incidents, which resulted in 125 injuries (see Table 3).

Average Fires and Fireground Injuries per Department by Population Protected

The number of fire calls a fire department responds to is related to the community's population, while the number of fireground injuries is influenced by the number of fires attended by a given department. This point is demonstrated by the average number of fireground injuries per year per fire department, which ranges from a high of 60.8 for

departments that protect communities of 500,000 or more, to a low of 0.1 for departments that protect communities with fewer than 2,500 people (see Table B).

Table B. Average Number of Fireground Injuries, Injury Rate per 100 Fires, and Injury Rate per 100 Firefighters by Population of Community Protected: 2024

Population of Community	Average Number of Fireground Injuries	Fireground Injuries/ 100 Fires	Fireground Injuries/ 100 Firefighters
500,000 or more*	47.4	1.1	3.4
250,000 to 499,999	15.4	1.1	3.2
100,000 to 249,999	4.8	1.0	2.2
50,000 to 99,999	2.0	1.0	1.9
25,000 to 49,999	1.2	1.2	1.9
10,000 to 24,999	0.7	1.2	1.8
5,000 to 9,999	0.3	0.7	1.0
2,500 to 4,999	0.1	0.6	0.5
Under 2,500	0.1	1.0	0.6

*Excludes New York City

Larger fire departments generally had the highest rates of fireground injuries per 100 firefighters, with the highest rates occurring in communities protecting 250,000 or more residents. As community size decreased, the rate of fireground injuries also generally declined; in 2024, the rate hit lows of 0.5 injuries per 100 firefighters in departments protecting 2,500 to 4,999 residents and 0.6 in departments protecting fewer than 2,500 residents.

Firefighters in larger cities may experience a higher risk of injury due to the presence of infrastructure and large buildings that could expose them to more complicated hazards than those in areas with less developed infrastructure and smaller buildings. Different policies for documenting minor injuries and different levels of fire engagement could also explain some of these differences.

Discussion

Since 1981, when firefighter injury data was first collected for this report, the annual number of firefighter injuries has shown a fairly consistent downward trend. While this decline is encouraging, research indicates that firefighter injuries—more than 63,000 in 2023—and illnesses continue to represent a substantial problem. The number of firefighter injuries and illnesses affects not only firefighters and their families, but also the cities and towns that bear the financial burden of the expenses related to the injuries and illnesses.

Due to the kind of work performed by firefighters 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 the number of injuries and illnesses among firefighters and other emergency response personnel.

Annual medical evaluations, with clearance for duty required by physicians who are familiar with the physical demands of firefighting, are an important component of programs aimed at reducing the risk of cardiac events. Fitness and wellness programs can also play a role in enhancing the ability of firefighters to contend with the cardiovascular strain of fire-related duties. On the fireground, good practice requires on-scene rehabilitation to be available 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 for firefighters, they are also at risk for chronic respiratory disease, coronary heart disease, and other illnesses from their work-related exposures. Use of SCBA, with properly fitting masks, is essential for work 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 to protect firefighters in all areas of work activity.

Methods

NFPA surveys a sample of fire departments in the United States annually 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 United States fire departments that protect communities with a population of more than 5,000 residents. These 8,808 fire departments protect a population of 298 million, or 88 percent of the United States population as of July 2024. The rest of the sample includes 13,585 randomly selected departments that protect populations under 5,000, for a total sample size of 22,393, or 77 percent of all the departments in the US known to NFPA.

A ratio estimation was used for the survey, with stratification by community size[1]. For each injury statistic, a sample injury rate was computed for each stratum. This rate consisted of the total for that statistic from all the departments reporting it, divided by the total population protected by the departments reporting the statistic. Accordingly, the fire departments used in calculating each statistic could be different and thus reflect differences in unreported statistics. The national projections were made by weighing the sample results according to the proportion of the 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 5 percent of the estimate.

Data were collected by sending designated fire departments a form requesting descriptions of the circumstances that led to particular injuries. The overall response rate to the 2024 survey was 8.7 percent based on 1,968 fire department responses. Response rates were higher from departments protecting larger communities. Departments protecting communities with populations of 50,000 or more had an overall response rate of 31 percent; departments protecting communities of 10,000 to 49,999 residents had a response rate of 17 percent; and departments protecting fewer than 10,000 residents had a response rate of 5.8 percent. The 1,968 departments that responded to the survey protect roughly 88.5 million residents, or 26 percent of the US population.

The results reported here are based on injuries incurred by firefighters working for municipal fire departments. No state or federal firefighting entities are included, and no adjustments were made for injuries that occurred during fires attended solely by private fire brigades.

NFPA Codes and Standards

NFPA's codes and standards include a number of protocols and initiatives that can be utilized at the local level to promote the safety and health of personnel, including the following:

NFPA 1550, *Standard for Emergency Responder Health and Safety,* is a new document that consolidates a number of prior standards:

- NFPA 1500, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*
- NFPA 1521, *Standard for Fire Department Safety Officer Professional Qualifications*
- NFPA 1561, *Standard on Emergency Services Incident Management System and Command Safety*
- Increasing efforts in the area of fire safety education so citizens are aware of measures to prevent fires and correct reactions to fire situations:

[1] William G. Cochran. *Sampling Techniques*. John Wiley, New York, NY: 1977, pp. 150–161.

NFPA 1201, *Standard for Providing Fire and Emergency Services to the Public, Chapter 7*

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

- NFPA 1580, *Standard for Emergency Responder Occupational Health and Wellness*
- NFPA 1660, *Standard for Emergency, Continuity, and Crisis Management: Preparedness, Response, and Recovery*

Firefighter injuries can be reduced using a variety of intervention methods. By addressing the priorities listed above, fire service organizations can make significant strides toward reducing the number and impact of such injuries.

2024 Select Firefighter Injury Incidents

Two Firefighters Injured After Being Struck by Disabled Vehicle

At approximately 9:00 AM, a disabled vehicle being assisted off a roadway by a sheriff's deputy struck two firefighters who were outside a local fire station.

According to reports, the deputy was using the push bumper of his patrol vehicle to assist the disabled vehicle and had instructed the driver to turn into the next parking lot. After the deputy released the vehicle, the driver missed the parking lot entrance and instead made an abrupt turn onto the fire station's front ramp. The vehicle then struck two firefighters before colliding with the station's exterior wall.

Both firefighters were treated at the scene for injuries and transported to a nearby hospital, where they are listed in stable condition. The driver of the vehicle also sustained minor injuries and was transported for non-life-threatening injuries.

An investigation into the incident is ongoing, but no charges are expected to be filed.

Firefighter Injured After Fall into Auto Repair Pit

At approximately 4:00 PM, a local fire department was dispatched to a commercial building for a reported alarm activation. Upon arrival, the first responding unit encountered heavy smoke conditions. The building's sprinkler system had activated, successfully confining the fire to a forklift.

While crews worked to fully extinguish the fire and conduct overhaul operations, two firefighters fell into an uncovered auto repair pit inside the building. One firefighter sustained injuries to the lower extremities and was transported to the hospital for evaluation. He was treated and released but required follow-up care.

State fire investigators responded to the scene. The incident remains under investigation.

Tire Explosion Injures Two Firefighters

At approximately 10:00 p.m., a local fire department responded to a reported fire outside a commercial building. Upon arrival, crews encountered three semi-trucks with trailers fully engulfed in flames.

During firefighting operations, a front tire on one of the trucks exploded, injuring two firefighters. Both were treated at the scene before being transported to the hospital in stable condition. They were later treated and released.

The cause of the fire remains under investigation.

Table 1. Total Firefighter Injuries, Firefighter Injuries at the Fireground, and Firefighter Injuries at Non-Fire Emergencies: 1981–2024

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: 1981–2024 (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	24.0	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	22.0	14,905	0.5
2012	69,400	31,490	22.9	12,760	0.4
2013	65,880	29,760	24.0	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
2020	64,875	22,450	16.2	13,650	0.4
2021	60,450	19,200	14.4	13,325	0.4
2022	65,650	21,325	14.4	13,200	0.4
2023	63,175	18,875	14.4	13,275	0.4
2024	53,575	16,275	11.7	9,825	0.2

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 the US fire experience (1981–2024).

Table 2. Firefighter Injuries by Nature of Injury and Type of Duty: 2024

Nature of Injury	Responding to or Returning from Incident		Fireground		Non-Fire Emergency		Training		Other Duties		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Burns (fire or chemical)	125	(2%)	1,075	(7%)	75	(1%)	150	(1%)	175	(2%)	1,600	(3%)
Smoke or gas inhalation	375	(6%)	1,300	(8%)	50	(1%)	75	(1%)	125	(1%)	1,925	(4%)
Other respiratory distress	200	(3%)	300	(2%)	75	(1%)	125	(1%)	150	(1%)	850	(2%)
Burns and smoke inhalation	150	(2%)	475	(3%)	50	(1%)	75	(1%)	25	(0%)	775	(1%)
Wound, cut, bleeding, bruising	925	(15%)	2,350	(14%)	1,325	(13%)	1,425	(14%)	1,550	(14%)	7,575	(14%)
Dislocation, fracture	300	(5%)	475	(3%)	250	(3%)	450	(4%)	225	(2%)	1,700	(3%)
Heart attack or stroke	175	(3%)	175	(1%)	50	(1%)	100	(1%)	225	(2%)	725	(1%)
Strain, sprain, muscular pain	2,850	(47%)	7,075	(43%)	5,675	(58%)	6,350	(63%)	5,450	(48%)	27,400	(51%)
Thermal stress (frostbite, heat exhaustion)	350	(6%)	775	(5%)	150	(2%)	325	(3%)	100	(1%)	1,700	(3%)
Other	650	(11%)	2,275	(14%)	2,125	(22%)	975	(10%)	3,300	(29%)	9,325	(17%)
Total	6,100	(100%)	16,275	(100%)	9,825	(100%)	10,050	(100%)	11,325	(100%)	53,575	(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 during 2024.

Table 3. Fire Department Vehicle Collisions and Resulting Firefighter Injuries While Responding to or Returning from Incidents: 1990–2024

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
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
2020	15,675	550	725	200
2021	18,775	600	550	200
2022	20,300	800	950	250
2023	19,225	1,450	550	75
2024	16,900	650	850	125

Source: NFPA survey of fire departments for US fire experience (1980–2024).

Table 4. Average Number of Fireground Injuries, Injury Rate per 100 Fires, and Injury Rate per 100 Firefighters by Population of Community Protected: 2024

Population of Community Protected	Average Number of Fireground Injuries	Fireground Injuries Per 100 Fires	Fireground Injuries Per 100 Firefighters
500,000 or more*	47.4	1.1	3.4
250,000 to 499,999	15.4	1.1	3.2
100,000 to 249,999	4.8	1.0	2.2
50,000 to 99,999	2.0	1.0	1.9
25,000 to 49,999	1.2	1.2	1.9
10,000 to 24,999	0.7	1.2	1.8
5,000 to 9,999	0.3	0.7	1.0
2,500 to 4,999	0.1	0.6	0.5
Under 2,500	0.1	1.0	0.6

*Excludes New York City

Source: NFPA survey of fire departments for US fire experience during 2024.

Acknowledgments

NFPA thanks all the fire departments that responded to the 2024 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 Michael Chabot and Frank Deely, for editing the survey forms and making follow-up calls to fire departments.

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NFPA No. FFI10