

U.S. Fire Administration
Fire is Everyone's Fight®

Fire in the United States 2014-2023

21st Edition

FEMA

Fire in the United States 2014-2023

21st Edition

October 2026

Mission Statement

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



U.S. Fire Administration

Fire is Everyone's Fight®



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Executive Summary

The U.S. Fire Administration's (USFA) National Fire Data Center (NFDC) periodically publishes "Fire in the United States," a statistical overview of the fires in the United States over a 10-year span, with the focus on the latest year in which data were available. This 21st edition of the report provides the fire service and others with information that motivates corrective action, sets priorities, targets specific fire programs, serves as a model for state and local analyses of fire data, and provides a baseline for evaluating programs.

The primary source of data is the USFA's National Fire Incident Reporting System (NFIRS). The National Fire Protection Association (NFPA) annual survey results, mortality data from the National Center for Health Statistics, wildland fire data from the National Interagency Fire Center, population data from the U.S. Census Bureau and inflation adjustments from the Bureau of Labor Statistics' Consumer Price Index (CPI) are also used. Because of the time it takes for states to submit data to the USFA from the thousands of fire departments that participate in the NFIRS, review of the data for quality issues, and analysis and display of the results, the publication lags behind the date of data collection. Fortunately, the fire problem does not vary rapidly, so the data are usually quite representative of the situation in the year of publication as well.

The national problem: a 10-year retrospective

Each year, fires in the United States cause thousands of deaths, injuries and property losses totaling billions of dollars. Beyond these direct impacts, fires generate significant indirect costs, including temporary housing needs, lost business revenue, medical expenses and psychological harm. To provide context, the combined annual losses from floods, hurricanes, tornadoes, earthquakes and other natural disasters are only a fraction of those caused by fires. Given the magnitude of these losses, understanding the circumstances and effects of the nation's fire problem is critical to reducing risks to life and property in our communities.

From 2014 to 2023, the United States averaged approximately 1,355,100 fires annually, or just over two fires per minute. These incidents resulted in an average of 3,545 civilian deaths, 14,900 civilian injuries and $18.2 billion in direct property losses each year. While fire injuries have decreased over the past decade, the number of fires, fire-related deaths and property losses have increased. For example, there were an estimated 1,298,000 fires in 2014, rising to 1,389,000 fires in 2023.

Recent trends indicate an increase in fire-related fatalities. The highest estimate from 2014 to 2023 occurred in 2021, with 3,800 deaths. By 2023, fire deaths were estimated at 3,670, representing a 3% decrease from 2021.

Table 1 summarizes 10-year trends in fires and fire-loss rates from 2014 to 2023. During this period, fires per million population reached their lowest point in 2019, despite a 4% increase in the overall 10-year trend. The fire death rate (deaths per million population) increased by 10% from 2014 to 2023. Dollar loss per capita increased by 11% over the decade, while injuries per million population continued to decline.

Table 1. Fire and fire-loss rate trends (2014-2023)

Loss measure	10-year trend (percent)
Fires per million population	3.7
Deaths per million population	10.2
Injuries per million population	-16.5
Dollar loss/capita*	11.2

* The 2014 to 2022 dollar-loss values were adjusted to 2023 dollars.
Sources: NFPA, CPI and U.S. Census Bureau.

Analyzing fire occurrence by property type supports the development of targeted fire prevention strategies, allowing resources to be focused where fires are most frequent and their impacts are most severe. Residential building fires account for most fire-related fatalities, averaging approximately 367,500 fires, 2,750 deaths and $9.9 billion in property loss annually. In contrast, outside fires result in about 125 deaths per year, with an average of 55,000 incidents annually.

Aside from fire-related fatalities, year-over-year comparisons indicate minimal changes in the proportions of fires, injuries and dollar losses reported to the NFIRS by property type. Examining trends over time provides insight into changes in fire occurrence and associated losses for specific property types. Between 2014 and 2023, residential building fires decreased by 6%, while associated deaths and property losses increased by nearly 5% and 25%, respectively. For comparison, wildland fires and acres burned declined by 12% and 16%, respectively, over the same period.

Table 2 provides a detailed overview of 10-year trends for fires, fire deaths, fire injuries and property losses by property type.

Table 2. Fire and fire loss trends by property type (2014-2023)

	Fires	Fire deaths	Fire injuries	Property loss
Buildings				
Residential buildings	-6.3%	4.7%	-8.2%	25.1%
One- and two- family residential buildings	-12.5%	0.8%	-5.6%	20.1%
Multifamily residential buildings	-8.0%	-2.4%	-17.6%	26.0%
Other residential buildings	60.7%	115.8%	40.3%	107.7%
Nonresidential buildings	19.4%	70.1%	-13.7%	9.8%
Vehicles and other mobile properties	9.4%	49.1%	-25.2%	50.5%
Outside and other properties	-13.6%	200.7%	-41.5%	46.5%

The national problem: 2023 in depth

Fire departments in the U.S. responded to nearly 1.4 million fire incidents in 2023. Consistent with previous years, these fires resulted in thousands of fatalities, thousands of injuries and billions of dollars in property damage.

Comparing fires and associated losses within a single year offers a snapshot of the fire problem, providing valuable insight into current trends and conditions within our communities. While all fire types are discussed in depth in this section, residential fires take precedence in fire prevention for their impact on lives and property.

In 2023, outside fires — such as those in fields, vacant lots and trash — remained the largest category, accounting for 48% of reported fire incidents. Residential and nonresidential structure fires together comprised 34% of all fires, with residential structure fires occurring nearly three times as often as nonresidential structure fires. Notably, vehicle fires represented a significant portion, with approximately one out of every eight fire department responses involving a vehicle.

The majority of fire-related deaths (68%) occurred on residential properties, primarily in one- and two-family homes. Vehicles were the second leading category, responsible for 23% of fire deaths. Nonresidential, commercial and public properties accounted for 5% of fire deaths, while outside and miscellaneous fires, including wildfires, contributed to 4%.

Regarding dollar loss, residential properties accounted for the largest share at 51%, with nonresidential properties contributing 26%. Together, these two property types represented 77% of all reported dollar loss. The reported dollar loss from outside fires may be understated, as damage to trees, grass and similar items is often assigned zero value unless it involves commercial cropland or timber.

A key strategy for reducing fire-related deaths, injuries and property loss is to prevent fires from occurring. By understanding the most common causes of fire ignition, targeted prevention measures can be implemented to effectively reduce fire incidents.

In 2023, cooking was the leading cause of residential building fires at 49%. Other unintentional or careless actions and heating caused another 9% and 8%, respectively. These percentages (and those that follow) are adjusted, which proportionally spreads the unknown causes over the other 15 cause categories.

The leading causes of residential fatal fires were other unintentional or careless actions at 22%, cause under investigation at 19%, intentional actions at 10% and electrical malfunction also at 10%. These four causes accounted for more than half of the residential fatal fires. The cause category “other unintentional or careless actions” includes the misuse of materials or products, abandoned or discarded materials or products, heat source too close to combustibles and other unintentional actions.

The leading cause of residential fires that resulted in injuries was cooking (26%). Cooking was, by far, the leading cause of fires resulting in dollar loss at 24%, followed by other unintentional or careless actions (14%) and electrical malfunction (13%).

For nonresidential building fires, cooking was the leading cause of fires (30%), followed by intentional actions and other unintentional or careless actions at 13% each. The leading causes of fires resulting in dollar loss in nonresidential buildings were other unintentional or careless actions (17%), as well as electrical malfunctions (12%) and cooking (11%).

In vehicles, unintentional actions were the leading cause of fires and fires resulting in dollar loss (43% and 42%, respectively). In 22% of these fires, the causes were undetermined after the investigations. Failure of equipment or heat source caused an additional 18% of vehicle fires.

In outside fires, unintentional actions were the leading cause of fires and fires resulting in dollar loss (40% and 43%, respectively). In 26% of these fires, and in 23% of these fires resulting in dollar loss, causes were undetermined after the investigations.

Like vehicle and outside fires, unintentional actions were the leading cause of other fires and fires resulting in dollar loss (44% and 50%, respectively). Cause was undetermined after investigation in an additional 19% of other fires. Failure of equipment or heat source was the third leading cause of other fires (16%) and the second leading cause of other fires resulting in dollar loss (21%).

Characteristics of fire casualties by age, race and sex

Fire casualties affect all demographic groups, regardless of race, socioeconomic status, geographic region, or whether individuals reside in urban or rural areas. However, certain groups experience disproportionately higher impacts. Males, African Americans and American Indians/Alaska Natives had fire death rates above the national average, while Asians/Pacific Islanders and individuals of two or more races had the lowest rates.

Males were 1.7 times more likely to die in fires than females. Among females, those age 65 and older accounted for 48% of female fire deaths. For males, fire deaths were most prevalent among adults ages 60 to 74, representing 34% of male fire fatalities.

Individuals with limited physical and cognitive abilities, particularly older adults (ages 65 and above), are at greater risk of fire-related death. In 2023, older adults comprised 45% of all fire deaths and 21% of estimated fire injuries.

The majority of fire-related injuries occurred in adults ages 25 to 64, who accounted for 61% of fire injuries in 2023. Within this group, males had a higher proportion of injuries than females, while among older adults, females experienced more injuries than their male counterparts.

As the U.S. population ages, particularly with the retirement of the baby boomer generation, the number of older adults is expected to increase significantly. This demographic shift is likely to result in a corresponding rise in fire deaths and injuries among older adults.

Historically, children ages 4 and younger were considered at high risk for fire-related fatalities. However, recent data show that in 2023, the relative risk for this age group was 50% lower than that of the general population.

Fire deaths by state

The fire problem varies across regions and states due to differences in weather, demographics and other contributing factors. In 2023, 10 states — primarily in the South — along with the District of Columbia, had fire death rates exceeding 20 deaths per million population. Sixteen states reported fire death rates between 13.2 and 20 deaths per million, while 22 states had rates at or below the national average of 13.1 deaths per million. Notably, 11 states, most of which are highly populated, accounted for 51% of all fire deaths in the United States. Without significant reductions in these states, lowering the national total of fire deaths will remain challenging.

Moving forward

The USFA urges state, local, tribal and territorial (SLTT) partners to take targeted actions to reduce the impact of fire in the United States, as fire incidents, deaths and property losses have risen over the past decade. Key recommendations include:

1. **Enhance life safety through residential sprinklers, especially in high-risk communities.**
2. **Prioritize fire safety for older adults and through education of preventing cooking fires.**
3. **Target high-risk communities with focused prevention and enforcement.**
4. **Strengthen prevention for outside and wildland fires.**
5. **Improve fire data reporting and use it to drive local decisions,** particularly through the National Emergency Response Information System (NERIS).

Implementing these strategies can significantly reduce fire-related deaths, injuries and property losses, leading to safer and more resilient communities.

Conclusion

This 21st edition of "Fire in the United States" provides a comprehensive analysis of national fire trends, highlighting rising fire deaths and property losses, particularly in residential buildings. The data underscores the importance of focusing fire prevention efforts on residential fires and tailoring safety messaging for older adults, who face significantly higher fire death rates. By offering actionable insights and supporting targeted prevention strategies, this report fulfills the USFA's mission to "support and strengthen fire and emergency medical services (EMS) and stakeholders in preparing for, preventing, mitigating and responding to all hazards," thereby enhancing safety nationwide.

Moving forward, the USFA calls on SLTT partners to prioritize the adoption of residential sprinklers, enhance protections for older adults, strengthen prevention of outside and wildland fires, and focus resources on the highest-risk communities. Improving fire data reporting, especially through expanded participation in the NERIS, will enable more effective, data-driven decisions and targeted prevention efforts. By acting on these recommendations, communities and agencies can make meaningful progress in reducing fire deaths, injuries and property losses. Collectively, these efforts will help build safer, more resilient communities and protect lives and property across the nation.

Introduction

In 1973, the President's Commission on Fire Prevention and Control released "America Burning," the first comprehensive report on the fire problem in the United States. This report raised national awareness about the seriousness of the issue and highlighted the need for prevention efforts. By 1987, a second commission was formed, and significant progress had been made in addressing the nation's fire problem. The follow-up report, "America Burning Revisited," outlined new strategies to further reduce deaths and property loss caused by fire.

This report provides a statistical overview of fire in the United States and is the 21st major edition of "Fire in the United States" published by the U.S. Fire Administration (USFA). It covers the overall fire problem during the 10-year period from 2014 to 2023, followed by a focus on 2023. The report highlights the size and trends of the fire problem, the causes of fires, where fires occur and who is affected by fire. It is intended for a broad audience, including the fire service, media, researchers, industry, government agencies and the general public. The report does not include detailed analyses of residential and nonresidential fires, firefighter casualties, or other specific aspects of the national fire problem. These topics are covered in separate, stand-alone publications.[1]

Fire in the United States

The National Fire Problem: A 10-Year Retrospective

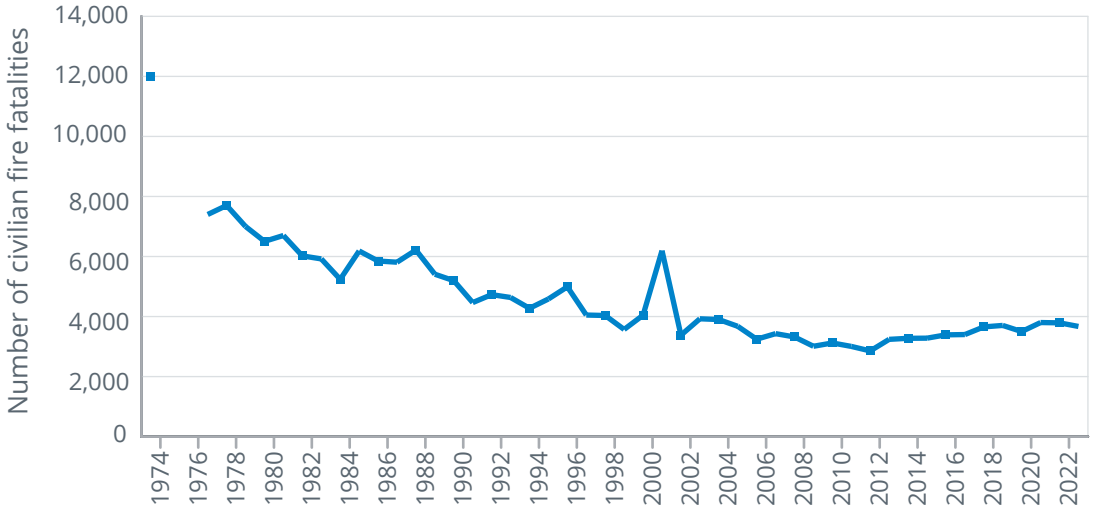
Each year, fires in the United States result in thousands of deaths, thousands of injuries and property losses totaling billions of dollars. In addition to these direct impacts, fires also cause substantial indirect costs, such as temporary housing needs, lost business revenue, medical expenses and psychological harm. To provide perspective, the annual losses from floods, hurricanes, tornadoes, earthquakes and other natural disasters combined are only a fraction of those caused by fires.[2] Given the scale of these losses, understanding the circumstances and impacts of the nation's fire problem is essential for reducing risks to lives and property in our communities. The following sections will present 10-year trends in fire incidents and losses, including estimated numbers and rates for deaths, injuries and dollar losses.

[1] These publications are available at https://www.usfa.fema.gov/statistics/.
[2] National Weather Service. (2023). *Summary of natural hazard statistics for 2023 in the United States.* Retrieved from https://www.weather.gov/media/hazstat/sum23.pdf.

Fires and losses (10-year trends, 2014–2023)

From 2014 to 2023, the United States averaged an estimated 1,355,100 fires each year. These fires resulted in an average of 3,545 civilian deaths, 14,900 civilian injuries and $18.2 billion in direct property loss annually.[3] Compared to 10 years ago, the number of fire injuries has decreased. However, the number of fires, fire deaths and property losses has increased. These trends are concerning because fires are becoming more frequent, dangerous and costly. Additional research is needed to understand potential root causes and mitigation recommendations.

Figure 1. Number of civilian fire fatalities (1974-2023)



When the USFA was established in 1974, annual fire deaths were estimated at 12,000. The agency set a goal to cut fire deaths in half within 25 years, which was achieved.[4] By 2012, civilian fire deaths reached their lowest level at 2,855.[5] However, fire deaths have increased in recent years, peaking at 3,800 in 2021 — 33% higher than in 2012.[6] In 2023, fire deaths decreased slightly to 3,670, which is 3% lower than in 2021.[7] Figure 1 shows the decrease and plateau of these deaths over the past five decades.

[3] Annual average estimates are based on National Fire Protection Association (NFPA) estimates of fires, deaths, injuries and dollar loss. Fires are rounded to the nearest 100, deaths to the nearest 5, injuries to the nearest 25 and dollar loss to the nearest billion dollars. The 2014 to 2022 dollar-loss estimates were adjusted to 2023 dollars.

[4] The NFPA changed their estimation methodology in the mid-1970s. As a result, by 1977, the estimate of fire deaths had already dropped to approximately 7,400 and rose the next year to 7,700. Nevertheless, it is fair to say that the 50% reduction in fire deaths was achieved. National Commission on Fire Prevention and Control (1973). *America burning: The report of the national commission on fire prevention and control.* Washington, D.C.

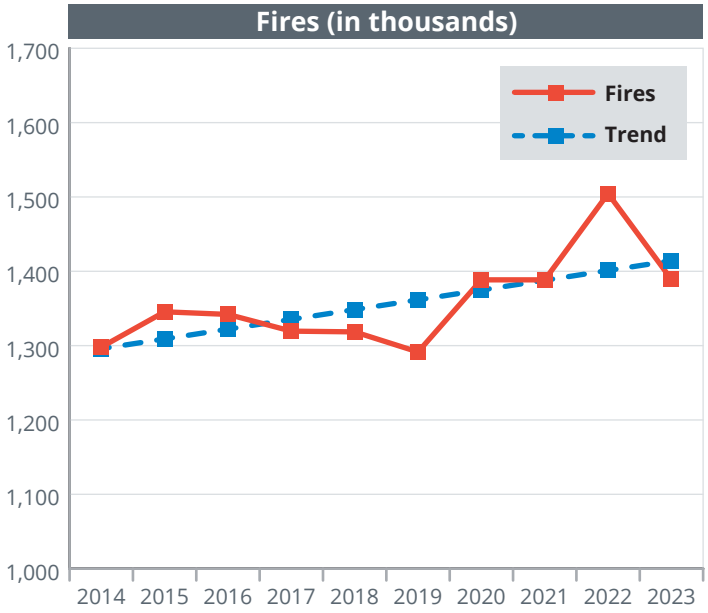
[5] USFA (2019). *Fire in the United States (2008-2017)* (20th ed.). Retrieved from https://www.usfa.fema.gov/downloads/pdf/publications/fius20th.pdf.

[6] USFA. (2009). *Fire in the United States (2003-2007)* (15th ed.).

[7] The NFPA estimated fire deaths to be 3,670 in 2023. For the same year, the National Center for Health Statistics (NCHS) mortality data reflected 4,371 fire deaths. For 2023, the NCHS mortality data suggest that fire deaths may be 19% higher than the NFPA estimate of fire deaths.

Figure 2 illustrates the 10-year trends for fires and losses from 2014 to 2023. Over this period, the number of fires increased by 9%. Fire-related deaths and property losses (adjusted for inflation) each increased by 16%. The rise in property loss is partly due to large-loss wildfires. Meanwhile, fire-related injuries declined by 12%.[8] These upward trends in fire incidents, deaths and losses show the ongoing need for efforts to reduce the nation's fire problem.

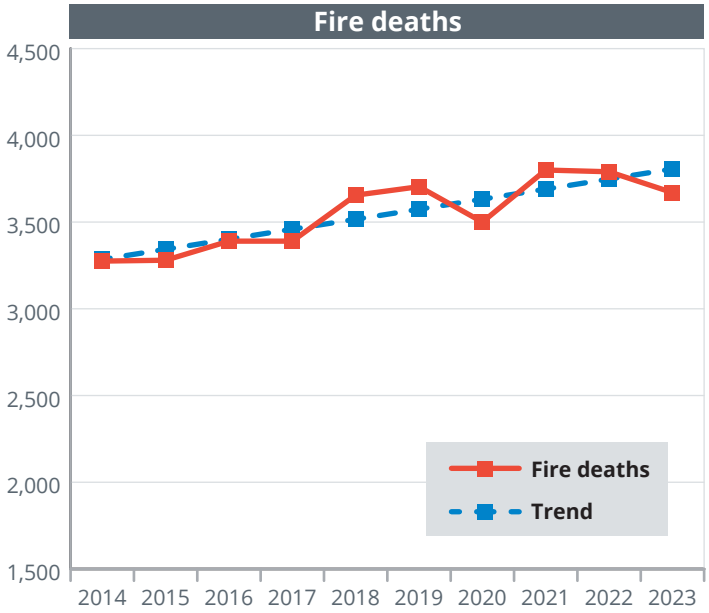
Figure 2. Fires and fire losses (2014–2023)



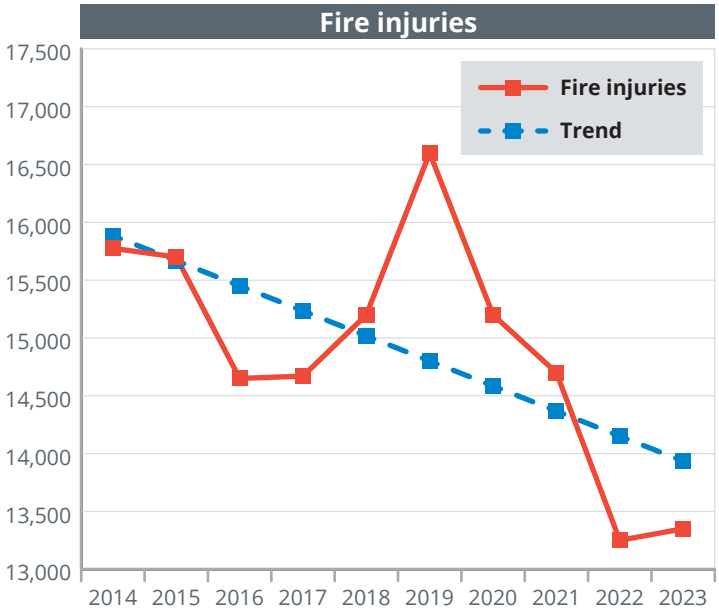
Fires (thousands)	
Year	**Value**
2014	1,298.0
2015	1,345.5
2016	1,342.0
2017	1,319.5
2018	1,318.5
2019	1,291.5
2020	1,388.5
2021	1,353.5
2022	1,504.5
2023	1,389.0
10-year trend (%)	**9.1%**

[8] For 2015, the direct dollar loss includes the Valley and Butte wildfires in California with an estimated property loss of $1,950,000,000. For 2016, the direct dollar loss includes the Gatlinburg, Tennessee, wildfires with an estimated property loss of $911,000,000. For 2017, the $23 billion in direct property loss estimate includes a $10 billion loss in the Northern California wildfires. NFPA. (2018). *Fire loss in the United States during 2017.* For 2018, the $25.6 billion in direct property loss estimate includes a $12.4 billion loss in California wildfires. NFPA. (2019). *Fire loss in the United States during 2018.*

Figure 2. Fires and fire losses (2014–2023) — continued

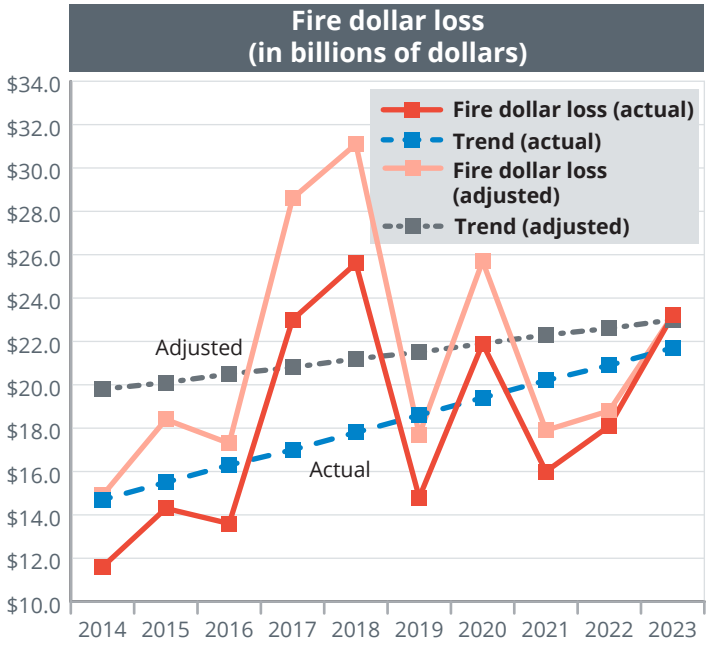


Deaths	
Year	**Value**
2014	3,275
2015	3,280
2016	3,390
2017	3,390
2018	3,655
2019	3,704
2020	3,500
2021	3,800
2022	3,790
2023	3,670
10-year trend (%)	**15.9%**



Injuries	
Year	**Value**
2014	15,775
2015	15,700
2016	14,650
2017	14,670
2018	15,200
2019	16,600
2020	15,200
2021	14,700
2022	13,250
2023	13,350
10-year trend (%)	**-12.3%**

Figure 2. Fires and fire losses (2014–2023) — continued



Dollar loss (billions of dollars)		
Year	Actual	Adjusted to 2023 dollars
2014	$11.6	$14.9
2015	$14.3	$18.4
2016	$13.6	$17.3
2017	$23.0	$28.6
2018	$25.6	$31.1
2019	$14.8	$17.7
2020	$21.9	$25.7
2021	$16.0	$17.9
2022	$18.1	$18.8
2023	$23.2	$23.2
10-year trend (%)	**47.7%**	**16.3%**

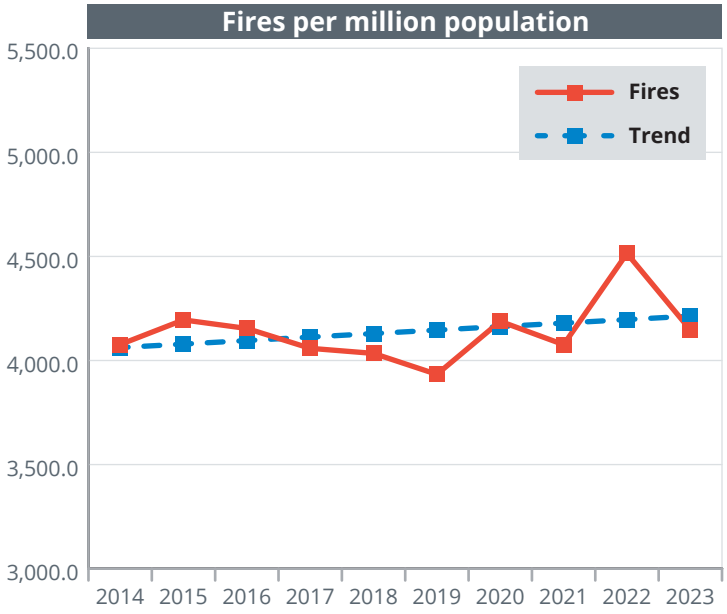
Sources: NFPA and Consumer Price Index (CPI).

Note: The large increase in the dollar-loss trend is partially attributed to the increases in the 2017 and 2018 dollar-loss estimates, which reflect California wildfires with an estimated property loss of $10 billion in 2017 and $12.4 billion in 2018. For 2020, the direct dollar loss includes $4,200,000,000 losses in California wildland urban interface (WUI) fires; also includes a $3 billion naval ship fire in California. For 2021, the direct dollar loss includes $678,000,000 losses in California WUI fires. For 2023, the direct dollar loss includes a $5.5 billion property loss estimate from the wildfires predominantly on the island of Maui in Hawaii, August 2023.

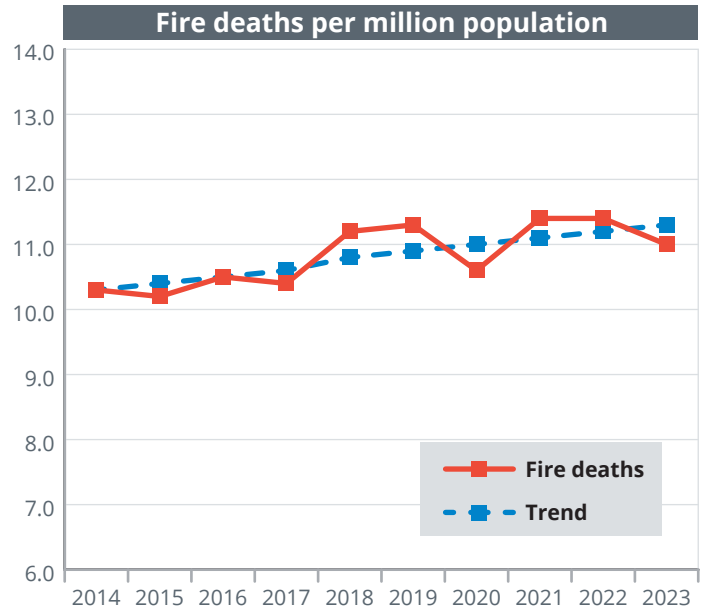
Fires and losses: rates (10-year trends, 2014–2023)

Examining rates per million population allows us to account for changes in the size of the U.S. population and make fair comparisons over time. Figure 3 displays the 10-year trends in fire and loss rates per million people from 2014 to 2023. Over this period, the number of fires per million population increased by 4%, inflation-adjusted property loss per person rose by 11%, and injuries per million people decreased by 17%. The rate of deaths per million people increased by 10%.

Figure 3. Fire-loss rates (2014–2023)

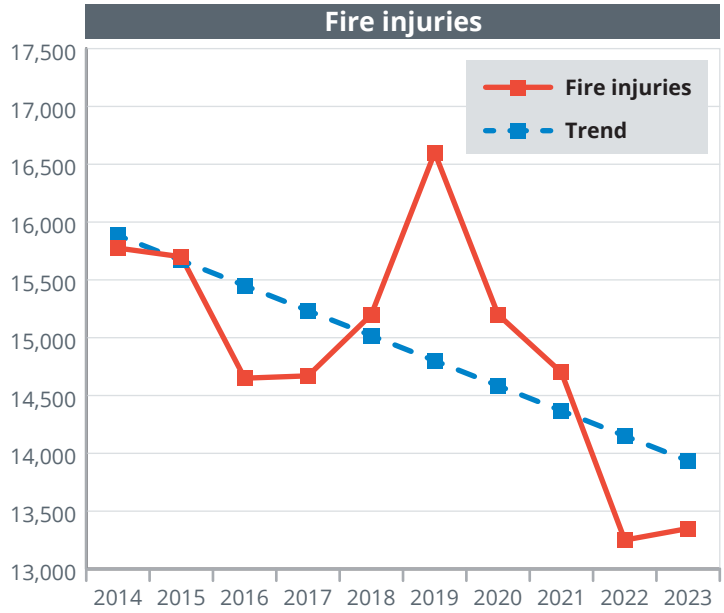


Fires per million population	
Year	Value
2014	4,076.8
2015	4,195.0
2016	4,153.9
2017	4,058.5
2018	4,034.1
2019	3,933.5
2020	4,188.2
2021	4,076.2
2022	4,514.3
2023	4,147.3
10-year trend (%)	**3.7%**

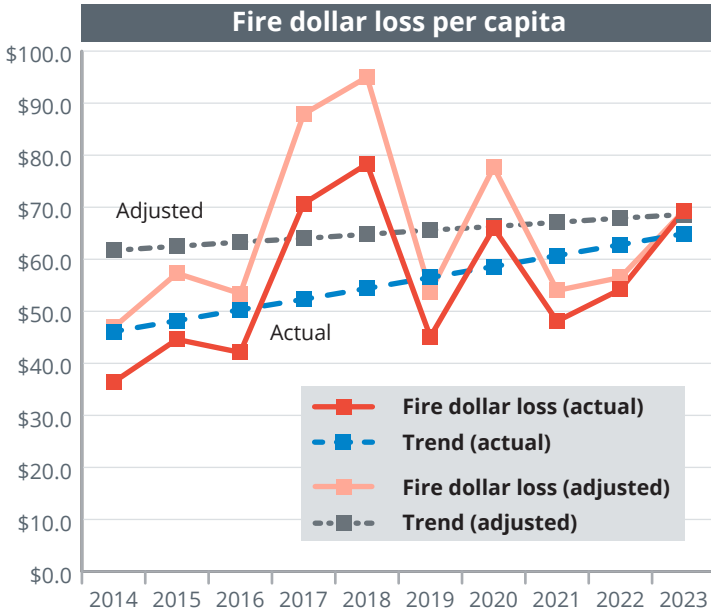


Deaths per million population	
Year	Value
2014	10.3
2015	10.2
2016	10.5
2017	10.4
2018	11.2
2019	11.3
2020	10.6
2021	11.4
2022	11.4
2023	11.0
10-year trend (%)	**10.2%**

Figure 3. Fire-loss rates (2014–2023) — continued



Injuries per million population	
Year	Value
2014	49.5
2015	48.9
2016	45.3
2017	45.1
2018	46.5
2019	50.6
2020	45.8
2021	44.3
2022	39.8
2023	39.9
10-year trend (%)	**-16.5%**



Dollar loss per capita		
Year	Actual	Adjusted to 2023 dollars
2014	$36.4	$46.9
2015	$44.6	$57.3
2016	$42.1	$53.4
2017	$70.7	$87.9
2018	$78.3	$95.0
2019	$45.1	$53.8
2020	$66.0	$77.7
2021	$48.1	$54.0
2022	$54.2	$56.5
2023	$69.3	$69.3
10-year trend (%)	**40.9%**	**11.2%**

Sources: NFPA, CPI and U.S. Census Bureau.
Note: The large increase in the dollar-loss trend is partially attributed to the increases in the 2017 and 2018 dollar-loss estimates, which reflect California wildfires with an estimated property loss of $10 billion in 2017 and $12.4 billion in 2018.

Fires and losses by property type (10-year trends, 2014–2023)

The following sections review fires by general property type — including residential and nonresidential buildings, mobile properties, outside and other categories — covering incidents from 2014 to 2023 that may have resulted in casualties and property loss.

Buildings

Fire is categorized into one of four types: structure, vehicle, outside and other. In the National Fire Incident Reporting System (NFIRS), a structure is a built object that includes buildings, platforms, tents, connective structures (e.g., bridges, fences, telephone poles) and other various structures.

The analysis of building fires is divided into two main categories: residential buildings (such as one- and two-family homes, multifamily dwellings and other residential structures) and nonresidential buildings (including industrial and commercial properties, institutions, educational facilities, mobile properties and storage facilities).

"Residential buildings" refer to what are commonly known as homes, including one- and two-family houses, multifamily buildings, manufactured housing, hotels and motels, residential hotels, dormitories, assisted living facilities and halfway houses (residences for individuals transitioning from institutional care, such as those with mental impairments, substance use disorders or prior incarceration). However, this definition does not include institutions like prisons, nursing homes, juvenile care facilities or hospitals, even though people may live in these settings for varying periods.

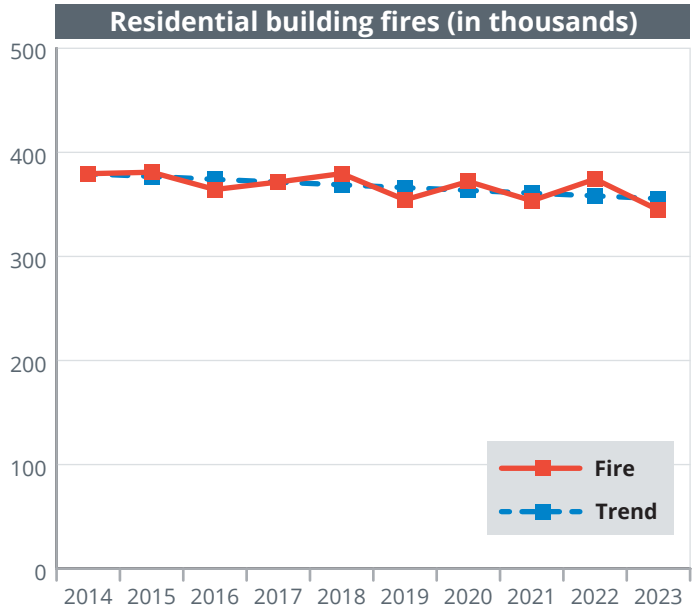
All residential buildings

Residential buildings include one- and two-family homes, multifamily dwellings and other types of residential structures.[9] From 2014 to 2023, there were approximately 367,500 residential building fires each year. These fires resulted in an annual average of 2,750 civilian deaths, 11,350 injuries and $9.9 billion in property loss (adjusted to 2023 dollars), highlighting the significant fire risk in U.S. residences.[10]

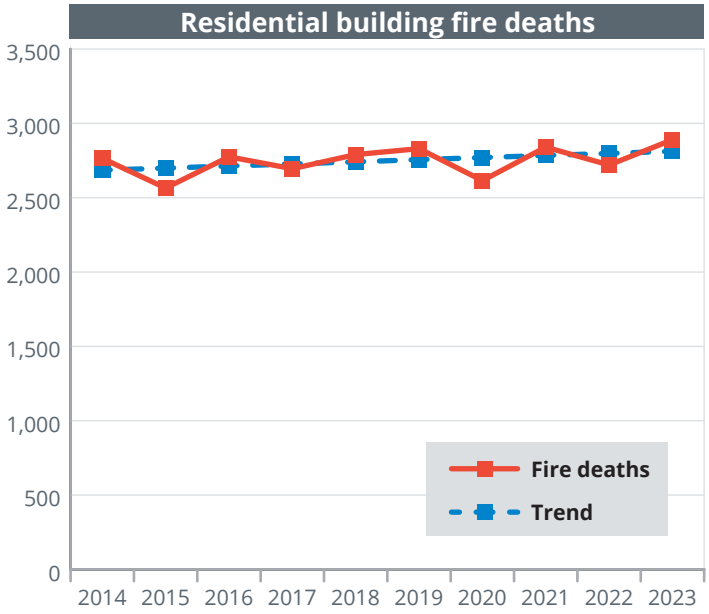
Figure 4 presents the 10-year trends for residential building fires and associated losses. Between 2014 and 2023, the number of residential building fires decreased by 6%, deaths increased by 5%, injuries decreased by 8%, and property loss increased by 25%. In short, while the overall number of residential fires is decreasing, those that do occur are more deadly and costly.

[9] The USFA's three topical reports that explore facets of the residential building fire problem, Residential Building Fires (2017-2019), One- and Two-Family Residential Building Fires (2017-2019), and Multifamily Residential Building Fires (2017-2019), are available at https://www.usfa.fema.gov/statistics/reports/where-fires-occur/.
[10] The USFA's Residential Building Fires Estimate Summary Series (2014 to 2023) is available at https://www.usfa.fema.gov/statistics/residential-fires/. To download an Excel file of 2003 to 2023 residential building fire and fire-loss estimates by property use and cause, visit https://www.usfa.fema.gov/statistics/data-sets/ (located under the section "More data sets").

Figure 4. Trends in residential building fires and fire losses (2014–2023)

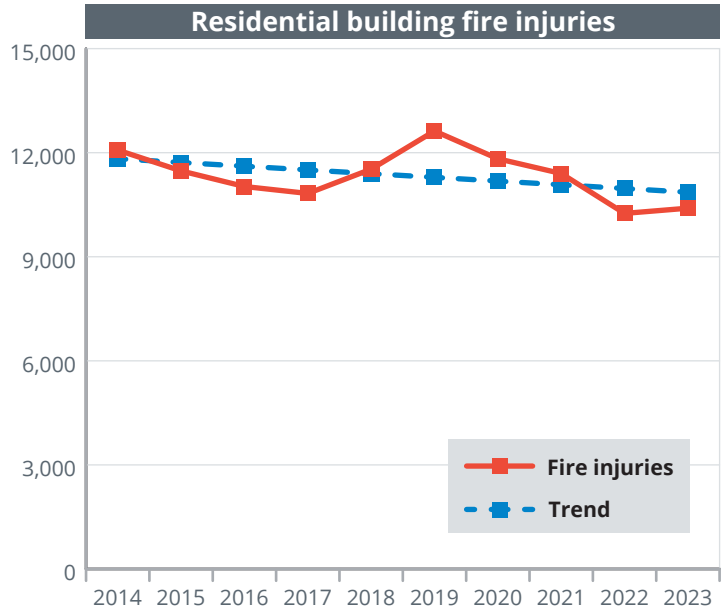


Fires (thousands)	
Year	Value
2014	379.5
2015	380.9
2016	364.3
2017	371.5
2018	379.6
2019	354.4
2020	372.0
2021	353.5
2022	374.3
2023	344.6
10-year trend (%)	**-6.3%**

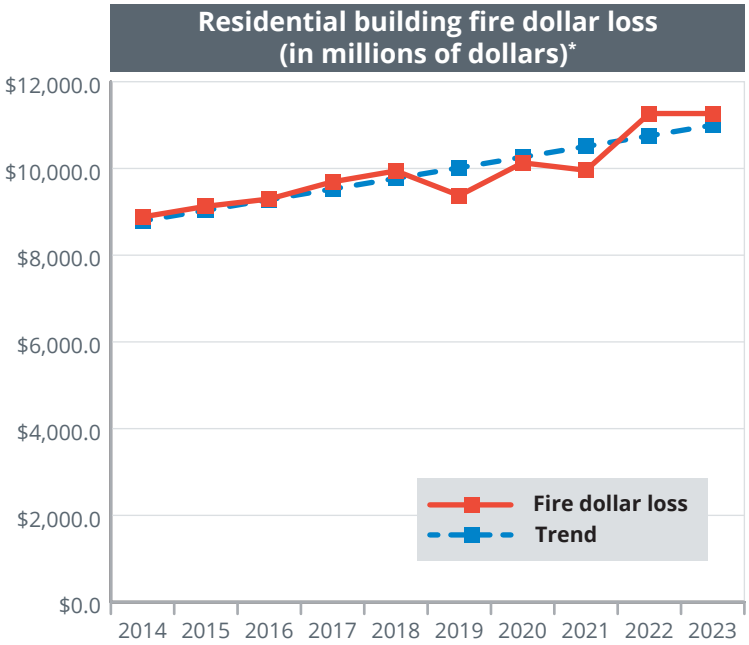


Deaths	
Year	Value
2014	2,765
2015	2,565
2016	2,775
2017	2,695
2018	2,790
2019	2,830
2020	2,615
2021	2,840
2022	2,720
2023	2,890
10-year trend (%)	**4.7%**

Figure 4. Trends in residential building fires and fire losses (2014–2023) — continued



Injuries	
Year	**Value**
2014	12,075
2015	11,475
2016	11,025
2017	10,825
2018	11,525
2019	12,625
2020	11,825
2021	11,400
2022	10,250
2023	10,400
10-year trend (%)	**-8.2%**



Dollar loss (millions of dollars) *Adjusted to 2023 dollars	
Year	**Value**
2014	$8,881.4
2015	$9,126.6
2016	$9,295.2
2017	$9,692.2
2018	$9,943.5
2019	$9,376.1
2020	$10,130.1
2021	$9,958.3
2022	$11,266.8
2023	$11,266.2
10-year trend (%)	**25.1%**

Sources: NFIRS, NFPA and CPI.

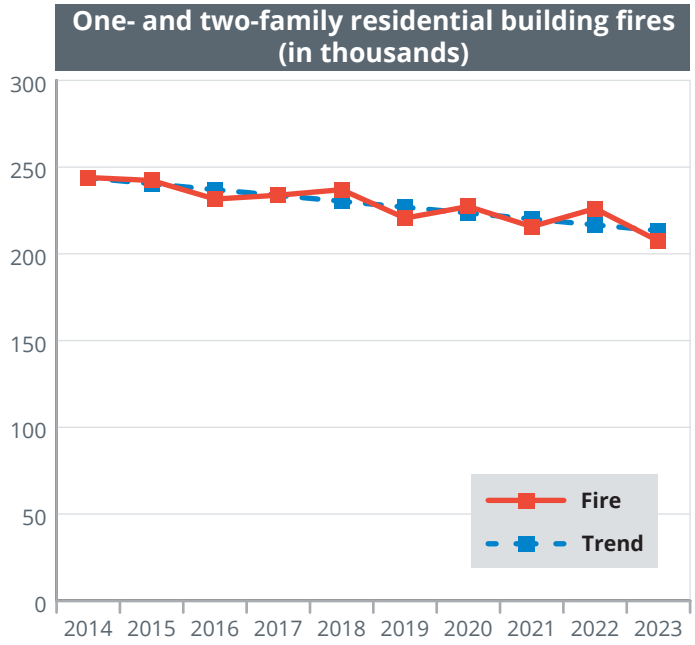
One- and two-family residential buildings

One- and two-family dwellings are home to 75% of the U.S. population,[11] making them the predominant category in the residential building fire profile. This group includes detached houses, manufactured homes, mobile homes not in transit and duplexes.

Between 2014 and 2023, fires in one- and two-family residential buildings accounted for 62% of all residential building fires, significantly shaping the overall residential fire statistics. During this period, the number of fires in these dwellings decreased by 13%, deaths increased slightly by nearly 1%, injuries declined by 6% and property loss rose by 20% (see Figure 4).

With one- and two-family residential buildings, we again see a decrease in the number of fires, a slight increase in deaths and a larger increase in dollar loss. However, in this case, it is only a slight increase in deaths.

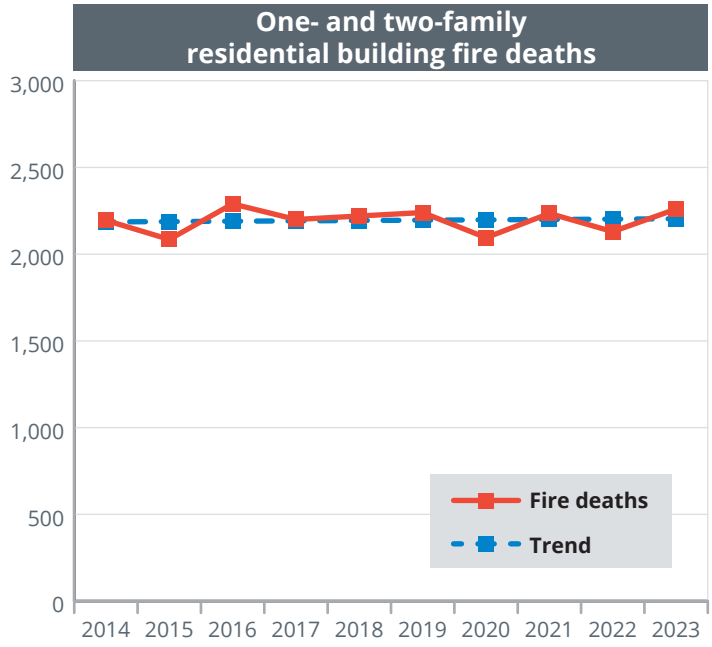
Figure 5. Trends in one- and two-family residential building fires and fire losses (2014–2023)



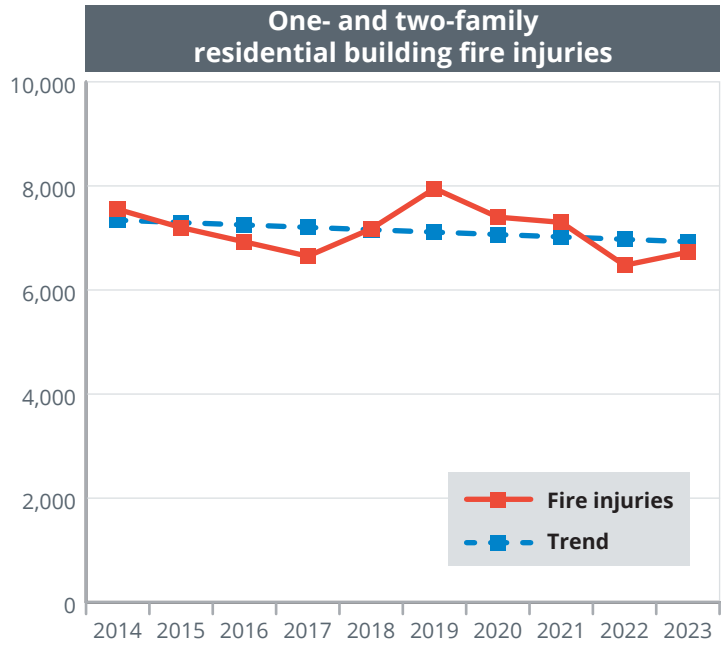
Fires (thousands)	
Year	Value
2014	244.0
2015	242.3
2016	231.6
2017	233.8
2018	237.0
2019	220.6
2020	227.3
2021	215.7
2022	226.1
2023	207.4
10-year trend (%)	**-12.5%**

[11] The U.S. Census Bureau showed that, in 2023, 75.5% of occupied housing units were one-unit attached and detached structures or mobile homes (100.6 million), U.S. Department of Housing and Urban Development and U.S. Census Bureau, 2023 American Housing Survey — Table Creator, select "2023 (Year) Housing Unit Characteristic (Table); Units by Structure Type (Variable 1); Occupancy/Vacancy Status (Variable 2)," https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html?s_areas=00000&s_year=2023&s_tablename=TABLE0&s_bygroup1=3&s_bygroup2=27&s_filtergroup1=1&s_filtergroup2=1 (accessed November 19, 2024). In 2023, household size was estimated at 2.49 people per household (https://data.census.gov/table/ACSCP1Y2023.CP02?q=social%20characteristics). Thus, 100.6 million housing units x 2.49 people per household = 250.5 million people. With the 2023 U.S. population given as 334.9 million, (https://www.census.gov/data/tables/time-series/demo/popest/2020s-national-total.html), approximately 74.8% of the population lived in what the NFIRS defines as one- and two-family housing.

Figure 5. Trends in one- and two-family residential building fires and fire losses (2014–2023) — continued

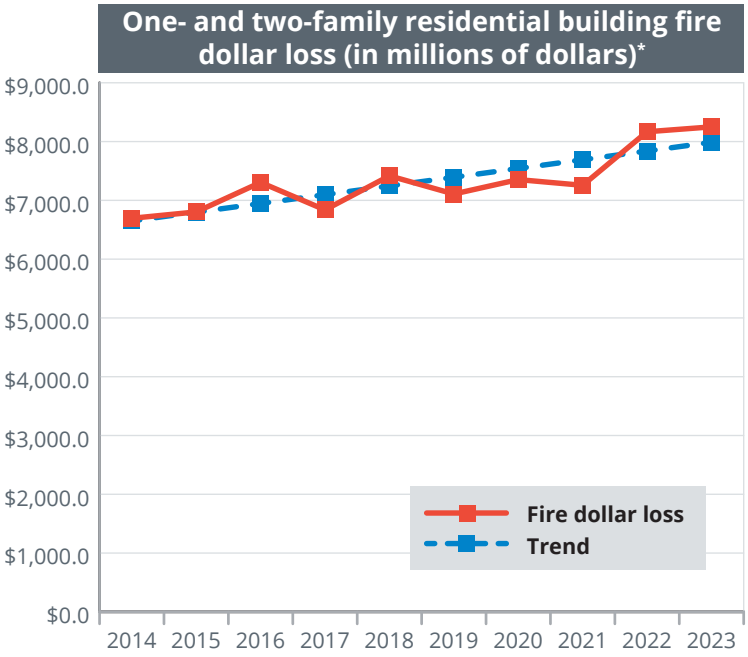


Deaths	
Year	Value
2014	2,195
2015	2,085
2016	2,290
2017	2,200
2018	2,220
2019	2,240
2020	2,095
2021	2,235
2022	2,130
2023	2,260
10-year trend (%)	**0.8%**



Injuries	
Year	Value
2014	7,550
2015	7,200
2016	6,925
2017	6,650
2018	7,175
2019	7,950
2020	7,400
2021	7,300
2022	6,475
2023	6,725
10-year trend (%)	**-5.6%**

Figure 5. Trends in one- and two-family residential building fires and fire losses (2014–2023) — continued



Dollar loss (millions of dollars) *Adjusted to 2023 dollars	
Year	**Value**
2014	$6,695
2015	$6,803
2016	$7,305
2017	$6,838
2018	$7,417
2019	$7,108
2020	$7,353
2021	$7,256
2022	$8,167
2023	$8,250
10-year trend (%)	**20.1%**

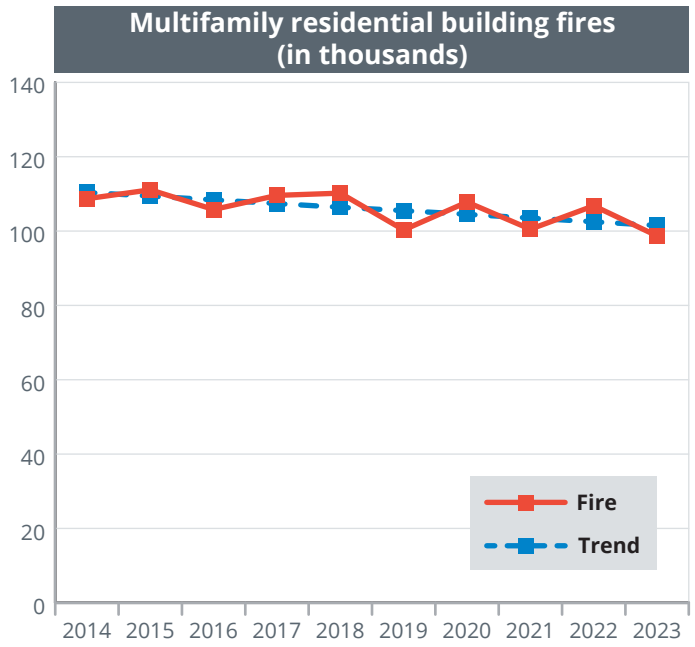
Sources: NFIRS, NFPA and CPI.

Multifamily residential buildings

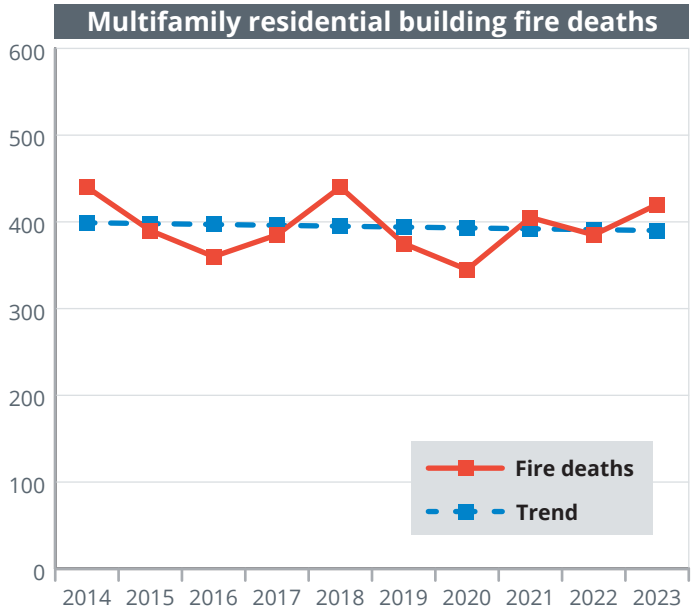
Multifamily residential buildings include apartments, townhouses, row houses, condominiums and other similar properties. Many of these dwellings are rental units, which are often subject to stricter fire prevention regulations and building codes. From 2014 to 2023, fires in multifamily residential buildings accounted for 29% of all residential building fires responded to by fire departments nationwide.

During this period, multifamily dwellings experienced an 8% decrease in fires, a 2% decrease in deaths, an 18% decrease in injuries and a 26% increase in property loss (see Figure 6). Notably, in 2017, four multifamily residential building fires reported to NFIRS resulted in dollar losses exceeding $20 million each, contributing to the rise in overall property loss.

Figure 6. Trends in multifamily residential building fires and fire losses (2014–2023)

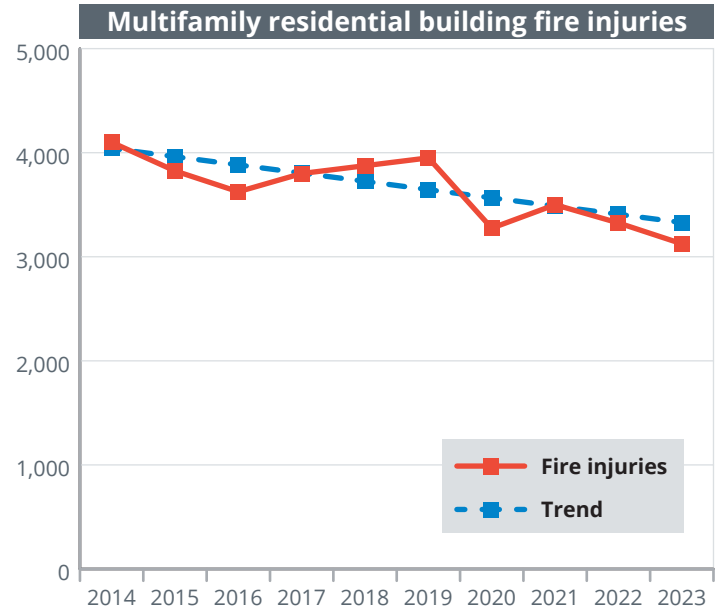


Fires (thousands)	
Year	Value
2014	108.7
2015	111.1
2016	105.8
2017	109.6
2018	110.2
2019	100.3
2020	107.8
2021	100.5
2022	106.8
2023	98.7
10-year trend (%)	**-8.0%**

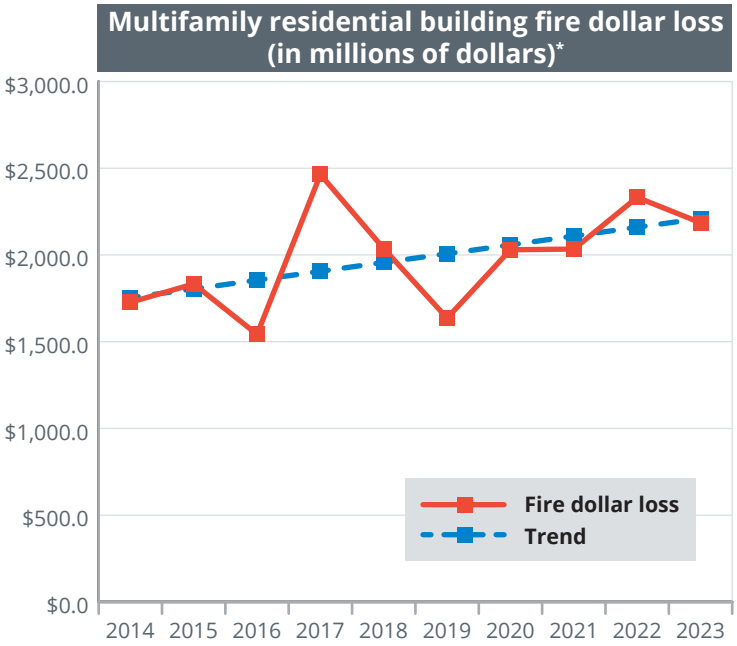


Deaths	
Year	Value
2014	440
2015	390
2016	360
2017	385
2018	440
2019	375
2020	345
2021	405
2022	385
2023	420
10-year trend (%)	**-2.4%**

Figure 6. Trends in multifamily residential building fires and fire losses (2014–2023) — continued



Injuries	
Year	**Value**
2014	4,100
2015	3,825
2016	3,625
2017	3,800
2018	3,875
2019	3,950
2020	3,275
2021	3,500
2022	3,325
2023	3,125
10-year trend (%)	**-17.6%**



Dollar loss (millions of dollars) *Adjusted to 2023 dollars	
Year	**Value**
2014	$1,727
2015	$1,833
2016	$1,542
2017	$2,464
2018	$2,037
2019	$1,636
2020	$2,030
2021	$2,034
2022	$2,332
2023	$2,186
10-year trend (%)	**26.0%**

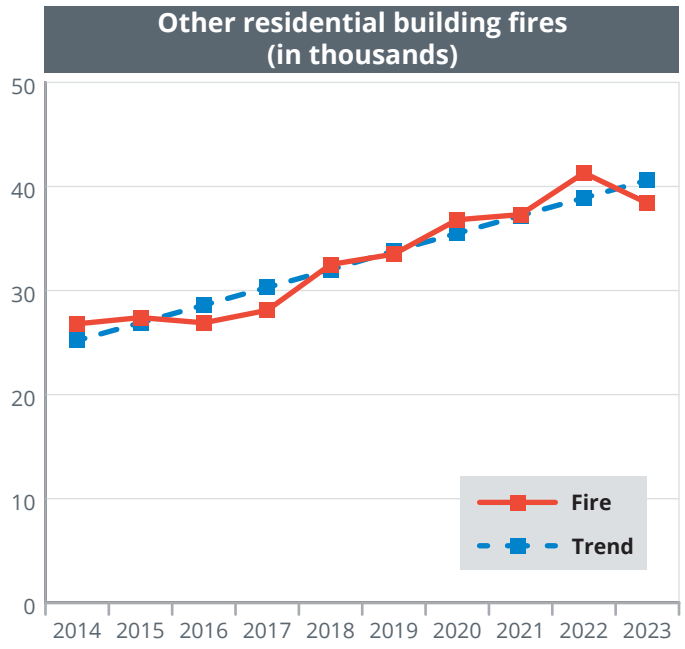
Sources: NFIRS, NFPA and CPI.
Note: In 2017, there were four multifamily residential building fire incidents reported to NFIRS with total dollar losses exceeding $20 million each that contributed to the increase in dollar loss.

Other residential buildings

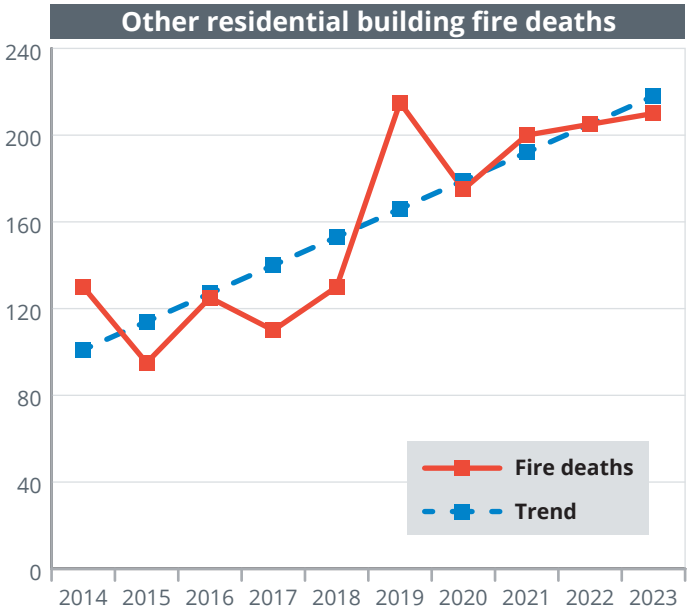
Other residential buildings include rooming houses, dormitories, residential hotels, halfway houses, hotels and motels, as well as miscellaneous and unclassified structures reported as residences. This category does not include nursing homes, prisons or other institutions, which are classified as nonresidential buildings.

From 2014 to 2023, fires in other residential buildings increased by 61%, deaths rose by 116%, injuries increased by 40%, and property loss grew by 108% (see Figure 7).

Figure 7. Trends in other residential building fires and fire losses (2014 – 2023)

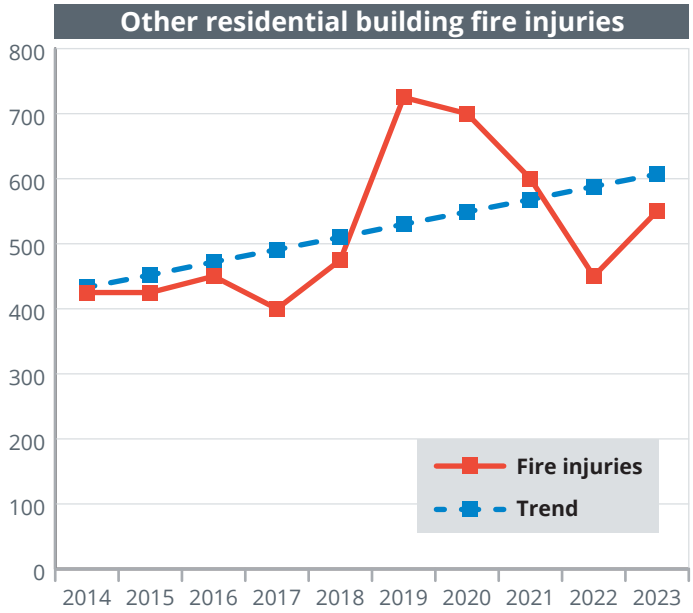


Fires (thousands)	
Year	Value
2014	26.8
2015	27.4
2016	26.9
2017	28.1
2018	32.5
2019	33.5
2020	36.8
2021	37.3
2022	41.3
2023	38.4
10-year trend (%)	**60.7%**

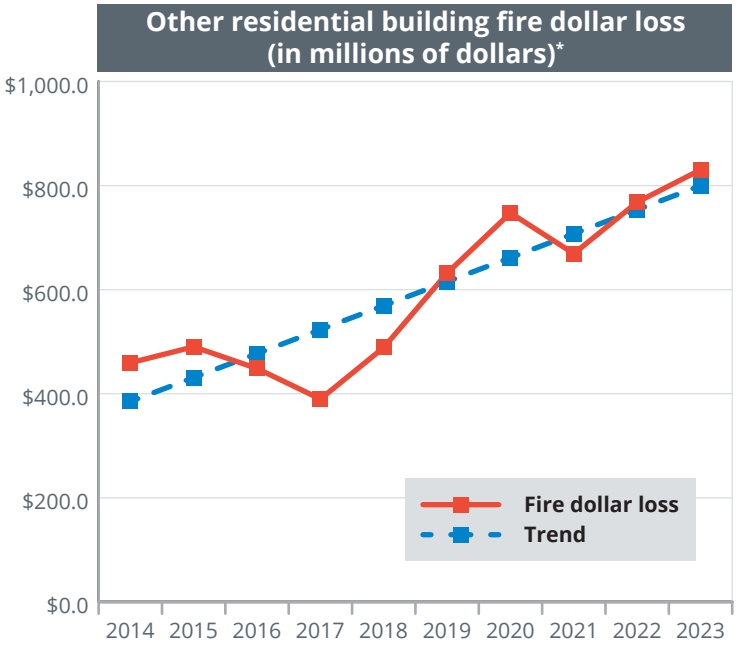


Deaths	
Year	Value
2014	130
2015	95
2016	125
2017	110
2018	130
2019	215
2020	175
2021	200
2022	205
2023	210
10-year trend (%)	**115.8%**

Figure 7. Trends in other residential building fires and fire losses (2014 – 2023) — continued



Injuries	
Year	**Value**
2014	425
2015	425
2016	450
2017	400
2018	475
2019	725
2020	700
2021	600
2022	450
2023	550
10-year trend (%)	**40.3%**



Dollar loss (millions of dollars) *Adjusted to 2023 dollars	
Year	**Value**
2014	$459.5
2015	$490.2
2016	$448.5
2017	$389.8
2018	$488.9
2019	$631.8
2020	$747.5
2021	$669.2
2022	$768.1
2023	$830.3
10-year trend (%)	**107.7%**

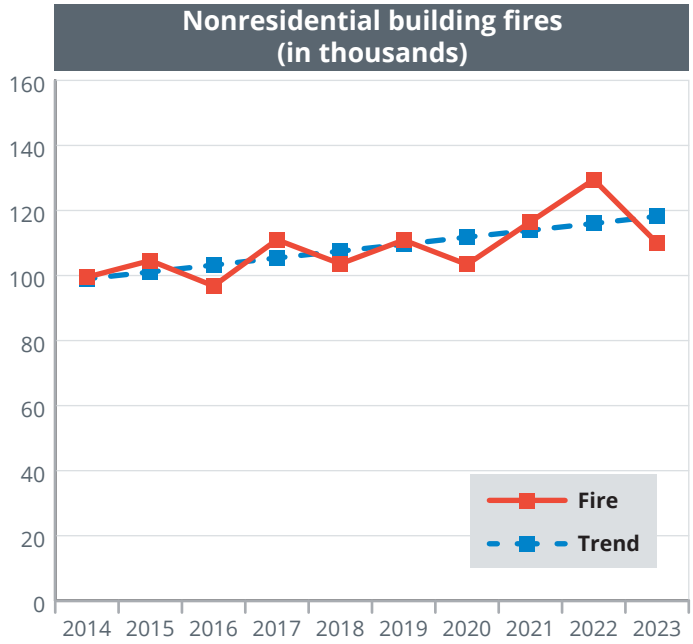
Sources: NFIRS, NFPA and CPI.

Nonresidential buildings

The nonresidential building category includes industrial and commercial properties, institutions such as hospitals, nursing homes and prisons, educational establishments ranging from preschools to universities, mobile properties and storage facilities. National estimates from 2014 to 2023 show that, on average, 93% of nonresidential structure fires, 92% of deaths, 94% of injuries and 91% of dollar losses occurred in nonresidential buildings. [12]

Annually, from 2014 to 2023, nonresidential building fires and losses accounted for only 8% of all fires, 3% of deaths and 8% of injuries. However, these properties contributed to a disproportionately high share of annual dollar loss — 17%.[13] Trends in nonresidential buildings over this period showed a 19% increase in fires, a 70% increase in deaths, a 14% decrease in injuries and a 10% increase in dollar loss (see Figure 8). Notably, a fire at a converted warehouse in Oakland, California, in 2016 resulted in 35 reported fire deaths, contributing to a peak in fire fatalities. Additionally, there were five reported multifatality fire incidents in 2021 and nine each in 2022 and 2023, which may have also contributed to the increase in estimated fire deaths.

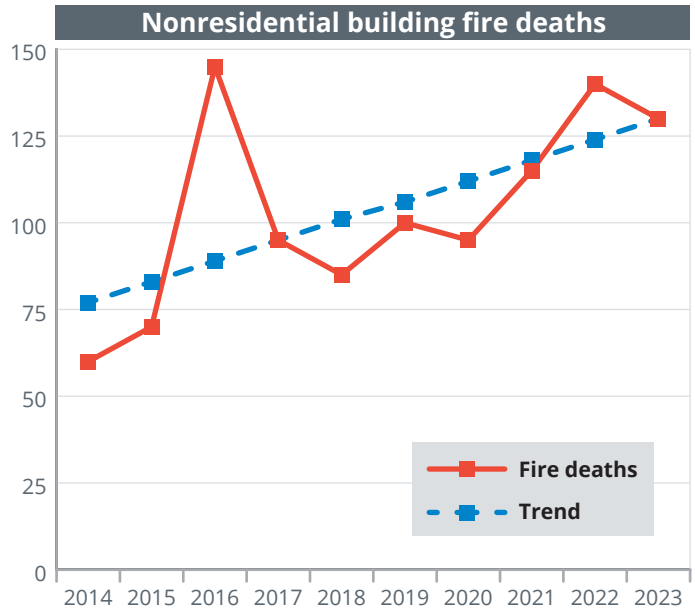
Figure 8. Trends in nonresidential building fires and fire losses (2014–2023)



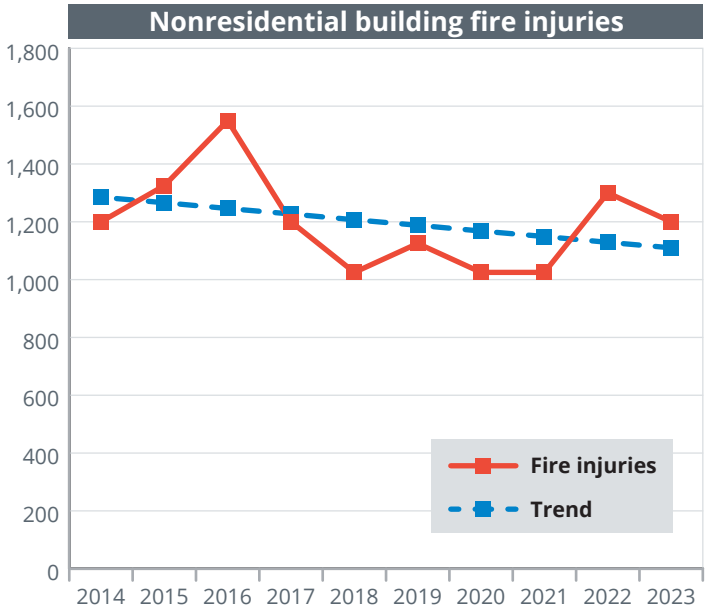
Fires (thousands)	
Year	Value
2014	99.5
2015	104.6
2016	96.8
2017	111.0
2018	103.6
2019	110.9
2020	103.4
2021	116.5
2022	129.5
2023	110.0
10-year trend (%)	**19.4%**

[12] In the NFIRS, a structure is a built object that can include platforms, tents, connective structures (e.g., bridges, fences, telephone poles) and other various structures in addition to buildings.
[13] The USFA's Nonresidential Building Fires Estimate Summary Series (2014 to 2023) is available at https://www.usfa.fema.gov/statistics/nonresidential-fires/. To download an Excel file of nonresidential building fire and fire loss estimates by property use and cause, visit https://www.usfa.fema.gov/statistics/data-sets/ (located under the section "More data sets").

Figure 8. Trends in nonresidential building fires and fire losses (2014–2023) — continued

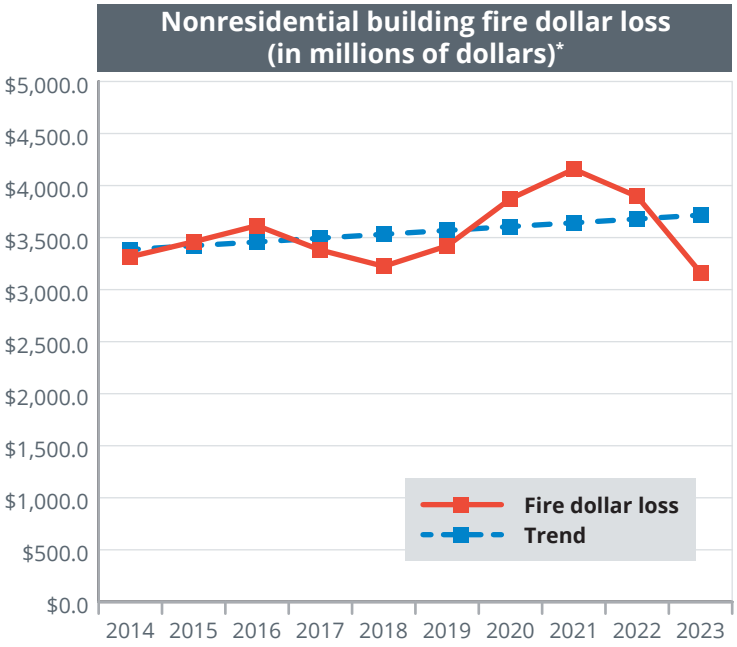


Deaths	
Year	**Value**
2014	60
2015	70
2016	145
2017	95
2018	85
2019	100
2020	95
2021	115
2022	140
2023	130
10-year trend (%)	**70.1%**



Injuries	
Year	**Value**
2014	1,200
2015	1,325
2016	1,550
2017	1,200
2018	1,025
2019	1,125
2020	1,025
2021	1,025
2022	1,300
2023	1,200
10-year trend (%)	**-13.7%**

Figure 8. Trends in nonresidential building fires and fire losses (2014–2023) — continued



Dollar loss (millions of dollars) *Adjusted to 2023 dollars	
Year	**Value**
2014	$3,316
2015	$3,460
2016	$3,615
2017	$3,380
2018	$3,224
2019	$3,420
2020	$3,873
2021	$4,157
2022	$3,895
2023	$3,164
10-year trend (%)	**9.8%**

Sources: NFIRS, NFPA and CPI.
Note: The 2016 peak in fire deaths is attributed to a fire at a former warehouse in Oakland, California, that had been converted to mixed-use properties with an assembly area.

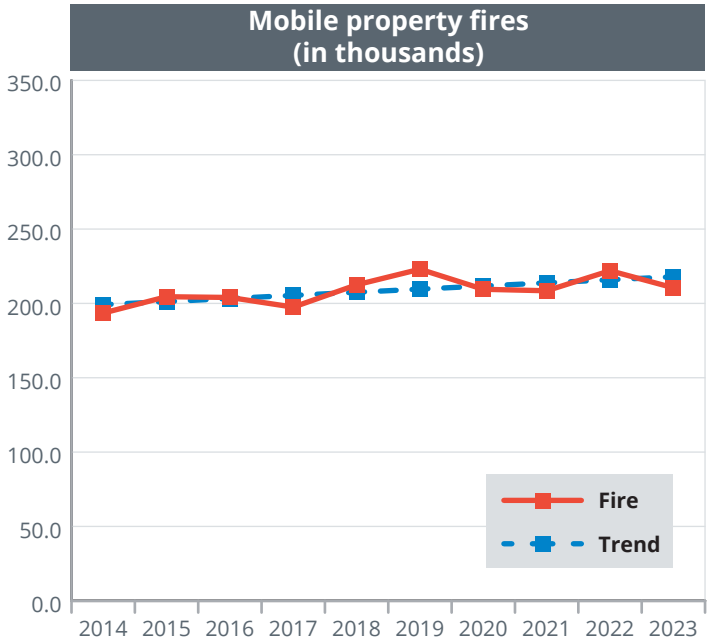
Vehicles and other mobile properties

Mobile properties include vehicles and other movable assets such as passenger vehicles, construction vehicles, motor homes, recreational vehicles, farm machinery, trains, boats, ships and aircraft. Vehicle fires represent a significant portion of the overall fire problem, often underestimated by the public. In 2023, vehicles accounted for 23% of all fire deaths, 9% of fire injuries, 16% of property losses and 13% of fires reported to NFIRS — approximately one in every eight fires.[14]

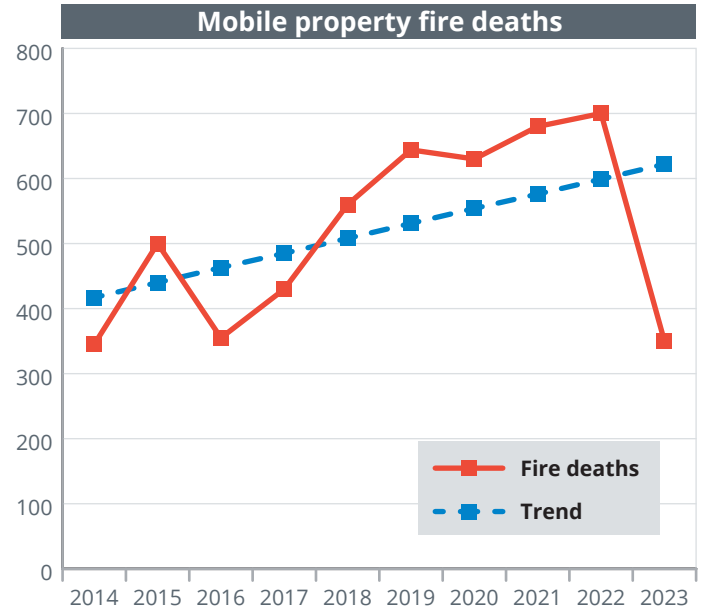
Figures 10 and 11 present the 10-year trends for mobile property fires and associated losses. Over this period, mobile property fires, deaths and dollar losses increased, while fire injuries decreased (see Figure 9). The highest number of mobile property fire deaths occurred in 2022, with an estimated 700 deaths. Figure 10 indicates that most mobile property fires and losses are associated with highway vehicles. Trends for highway vehicles showed an 8% increase in fires, a 45% increase in deaths, a 34% decrease in injuries and a 31% increase in dollar loss (adjusted for inflation). Although there was a substantial increase in the trend for fire deaths involving other mobile properties, this is primarily due to fluctuations in the relatively small number of deaths in this category.

[14] When there are fatalities associated with a mobile property accident, such as a collision between two cars, it is often difficult to determine whether the fatalities were the result of the mechanical forces or the fire that ensued. Because of the very large number of vehicle fatalities occurring in this country each year and the frequency of fires associated with these accidents, there can be a substantial error in estimating the total number of fire deaths if this issue is not carefully addressed. A fire fatality should be counted only if a person was trapped and killed by the fire, rather than killed on impact and subsequently exposed to the fire.

Figure 9. Trends in mobile property fires and fire losses (2014–2023)

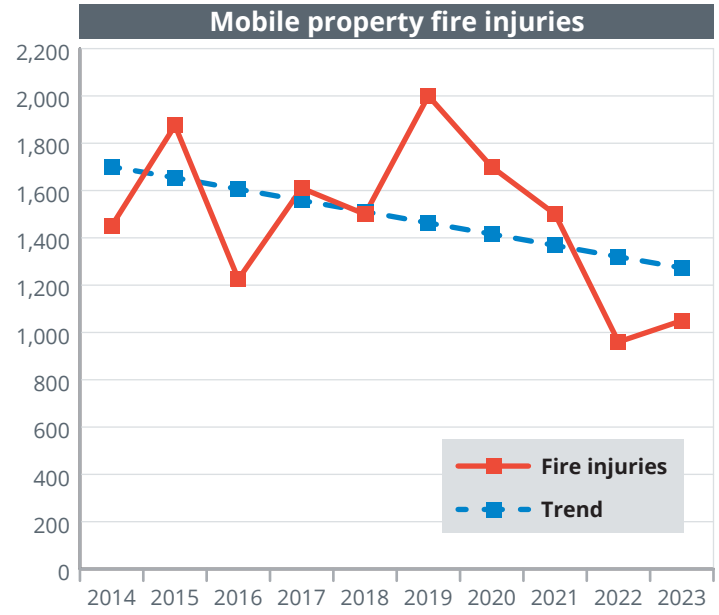


Fires (thousands)	
Year	Value
2014	193.5
2015	204.5
2016	204.0
2017	197.5
2018	212.5
2019	223.0
2020	209.5
2021	208.5
2022	222.0
2023	210.5
10-year trend (%)	**9.4%**

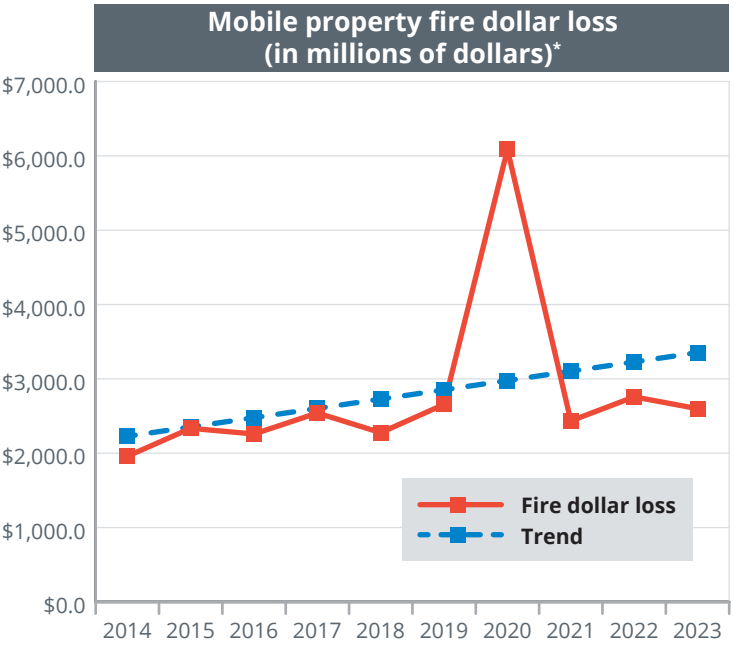


Deaths	
Year	Value
2014	345
2015	500
2016	355
2017	430
2018	560
2019	644
2020	630
2021	680
2022	700
2023	350
10-year trend (%)	**49.1%**

Figure 9. Trends in mobile property fires and fire losses (2014–2023) — continued



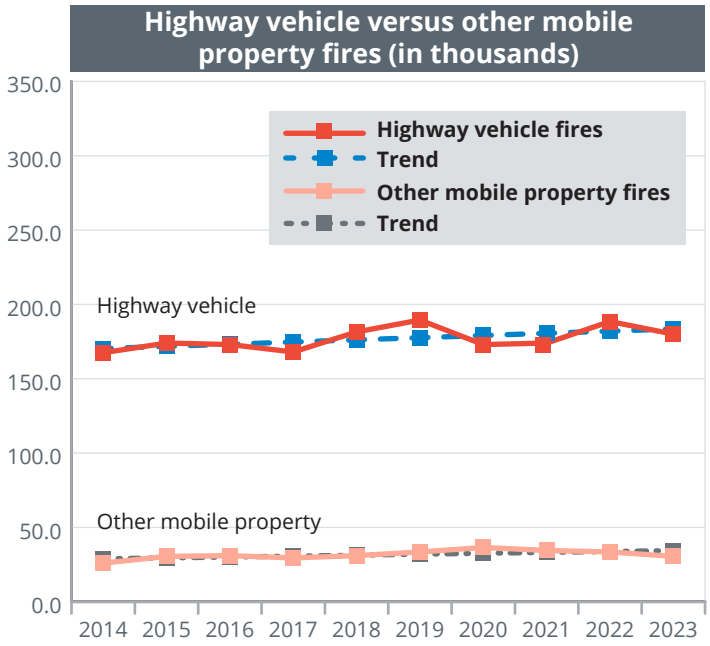
Injuries	
Year	**Value**
2014	1,450
2015	1,875
2016	1,225
2017	1,610
2018	1,500
2019	2,000
2020	1,700
2021	1,500
2022	960
2023	1,050
10-year trend (%)	**-13.7%**



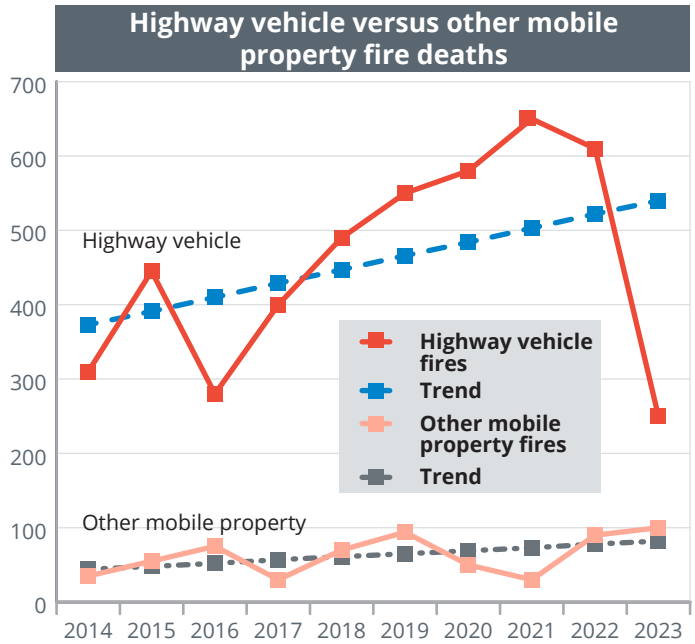
Dollar loss (millions of dollars) *Adjusted to 2023 dollars	
Year	**Value**
2014	$1,959.0
2015	$2,334.6
2016	$2,258.5
2017	$2,540.8
2018	$2,276.4
2019	$2,656.6
2020	$6,086.7
2021	$2,434.5
2022	$2,758.0
2023	$2,599.0
10-year trend (%)	**50.5%**

Sources: NFPA and CPI.
Note: The 2020 spike in dollar loss reflects a $3 billion naval ship fire in California.

Figure 10. Trends in highway vehicle versus other mobile property fires and fire losses (2014–2023)

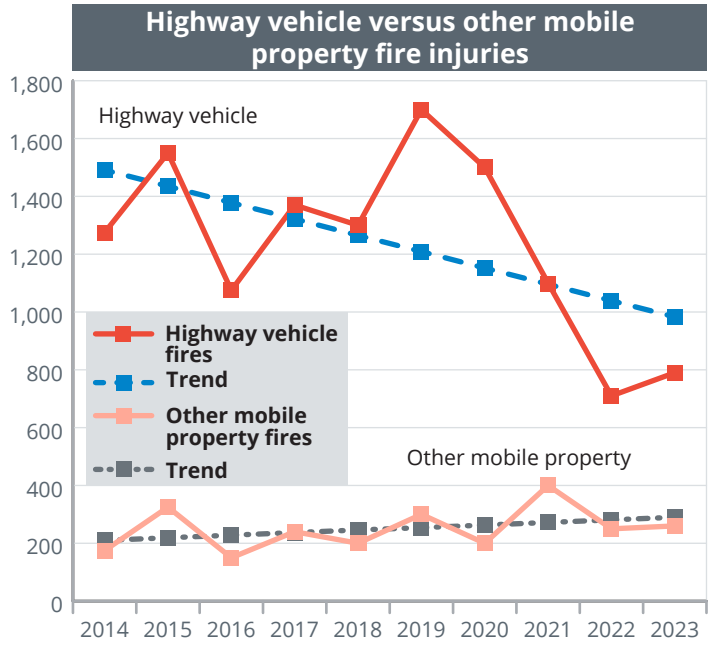


Fires (thousands)		
Year	Highway vehicle value	Other mobile value
2014	167.5	26.0
2015	174.0	30.5
2016	173.0	31.0
2017	168.0	29.5
2018	181.5	31.0
2019	189.5	33.5
2020	173.0	36.5
2021	174.0	34.5
2022	188.5	33.5
2023	180.0	30.5
10-year trend (%)	**7.8%**	**19.4%**

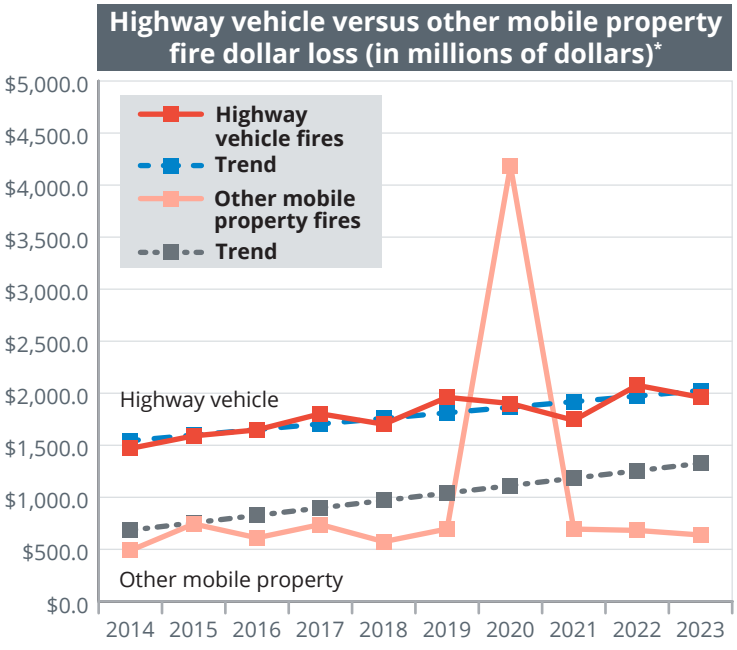


Deaths		
Year	Highway vehicle value	Other mobile value
2014	310	35
2015	445	55
2016	280	75
2017	400	30
2018	490	70
2019	550	94
2020	580	50
2021	650	30
2022	610	90
2023	250	100
10-year trend (%)	**44.8%**	**85.2%**

Figure 10. Trends in highway vehicle versus other mobile property fires and fire losses (2014–2023) — continued



Injuries		
Year	Highway vehicle value	Other mobile value
2014	1,275	175
2015	1,550	325
2016	1,075	150
2017	1,370	240
2018	1,300	200
2019	1,700	300
2020	1,500	200
2021	1,100	400
2022	710	250
2023	790	260
10-year trend (%)	**-34.1%**	**38.2%**



Dollar loss (millions of dollars) *Adjusted to 2023 dollars		
Year	Highway vehicle value	Other mobile value
2014	$1,469.9	$489.1
2015	$1,590.3	$744.3
2016	$1,647.9	$610.7
2017	$1,802.5	$738.4
2018	$1,702.4	$574.0
2019	$1,960.6	$696.0
2020	$1,901.4	$4,185.4
2021	$1,739.6	$694.9
2022	$2,076.1	$682.0
2023	$1,961.0	$638.0
10-year trend (%)	**31.2%**	**94.0%**

Sources: NFPA and CPI.
Note: The large increase in the trend for other mobile property type fire deaths is due primarily to the fluctuations in the small numbers of deaths. The 2020 spike in dollar loss for other mobile property fires reflects a $3 billion naval ship fire in California.

Outside and other properties

The "Outside and Other Properties" category includes all fires that did not occur in buildings, other structures or vehicles. According to NFIRS terminology, this includes fires outside of structures — either where the burning material had value or where the fire was limited to trees, brush, grass or refuse. Wildland fires are a subset of outside fires. The "Other" category encompasses fires that are not specifically classified or are related to outside gas or vapor combustion incidents.

Outside and other fires made up approximately half of all reported fires. However, these figures may not accurately reflect the true scope of the problem due to underreporting and the challenges in assigning monetary value to outside fires. Additionally, many wildland fires are not reported to agencies participating in NFIRS or the NFPA annual survey.[15] To address this gap, the USFA presents wildland fire data from the National Interagency Fire Center (NIFC) in the next section.

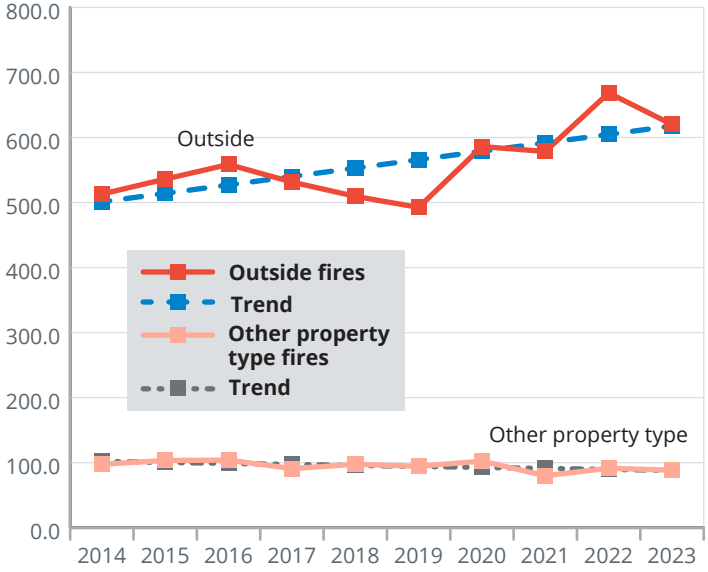
Figure 11 illustrates the 10-year trends for outside and other property fires and associated losses. On average, there were 559,400 outside fires each year, with the "Other" category contributing an additional 95,050 fires annually. Over the 10-year period, outside and other fires resulted in an average of 125 deaths and 725 injuries per year. Although fire deaths in this category increased by 201%, this trend is primarily due to fluctuations in the relatively small number of deaths. Injuries decreased by 42%. Dollar loss for outside properties alone declined by 65% from 2014 to 2023.

Estimating dollar loss for these fires is challenging.[16] The NFPA estimates property loss only for outside fires "with value," while NFIRS allows property loss data collection for any fire. Both approaches are reasonable, but neither may provide a definitive estimate. Furthermore, large-loss fires may not always be reported to NFIRS, contributing to differences in property loss estimates.

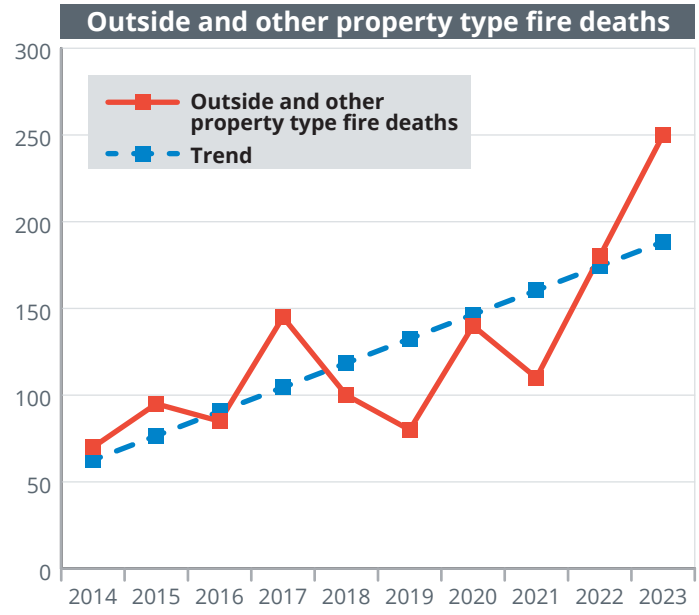
[15] For more information regarding NFIRS and reported wildfires, see USFA's Wildfire Report Series, https://www.usfa.fema.gov/wui/data/wildfire-report-series/.

[16] Setting a value for outside fire damage is always a problem. It is difficult to assign a dollar value to grass, tree and rubbish fires, yet the damage from these fires often requires labor beyond that of the fire department to clean up and restore the area. They also cause aesthetic problems that are intangible. Some outside fires spread to structural properties and may be reported as structural fires rather than outside fires with exposure to structures. Outside fires can have other indirect costs, such as the financial impact on agricultural communities where a fire destroys crops. Forest fires and other wildfires to which local departments are not called will not be reported to the NFIRS if the state or federal agency with principal authority for fighting the fire does not participate in the NFIRS. To better analyze outside fires, the NFIRS data needs to be complemented with data from these other agencies.

Figure 11. Trends in outside and other property type fires and fire losses (2014–2023)

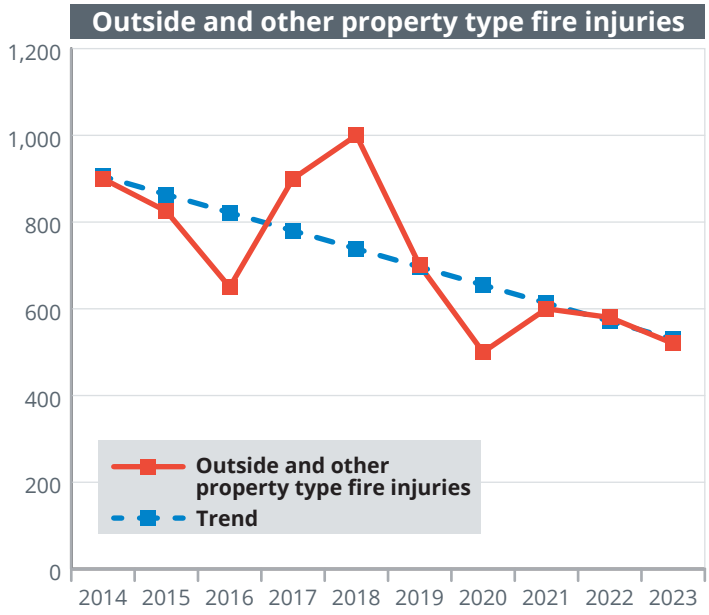


Fires (thousands)		
Year	Outside value	Other value
2014	513.0	97.5
2015	536.0	103.5
2016	558.5	104.0
2017	531.5	91.0
2018	509.5	97.5
2019	492.5	94.5
2020	586.0	102.5
2021	578.5	80.0
2022	668.5	91.5
2023	620.0	88.5
10-year trend (%)	**23.3%**	**-13.6%**

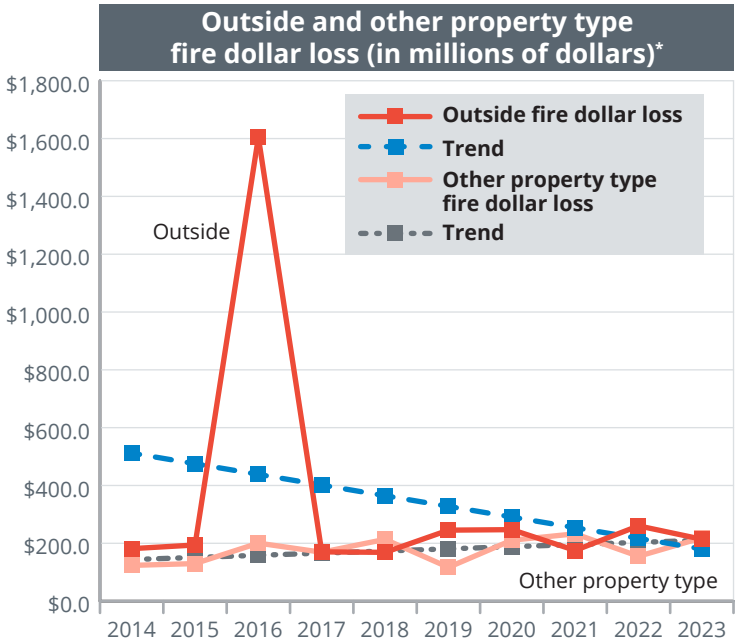


Deaths	
Year	Outside and other value
2014	70
2015	95
2016	85
2017	145
2018	100
2019	80
2020	140
2021	110
2022	180
2023	250
10-year trend (%)	**200.7%**

Figure 11. Trends in outside and other property type fires and fire losses (2014–2023) — continued



Injuries	
Year	Outside and other value
2014	900
2015	825
2016	650
2017	900
2018	1,000
2019	700
2020	500
2021	600
2022	580
2023	520
10-year trend (%)	**-41.5%**



Dollar loss (millions of dollars) *Adjusted to 2023 dollars		
Year	Outside value	Other value
2014	$181.5	$123.6
2015	$194.1	$129.8
2016	$1,604.7	$200.6
2017	$170.3	$169.1
2018	$168.7	$213.6
2019	$245.5	$116.8
2020	$247.2	$210.7
2021	$175.4	$232.8
2022	$260.3	$155.1
2023	$214.0	$219.0
10-year trend (%)	**-64.8%**	**46.5%**

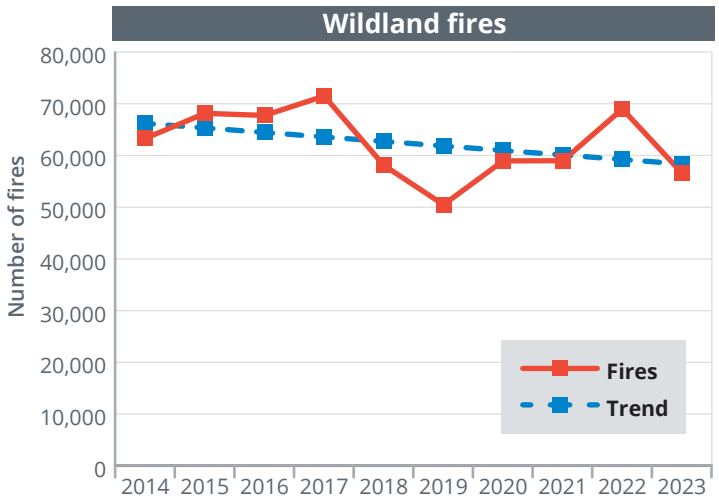
Sources: NFPA and CPI.
Note: The large increase in the trend for outside and other property type fire deaths is due primarily to the fluctuations in the small numbers of deaths. The 2016 spike in dollar loss includes the $911,000,000 property damage resulting from the Gatlinburg, Tennessee, wildfires.

Wildland fires and acres burned

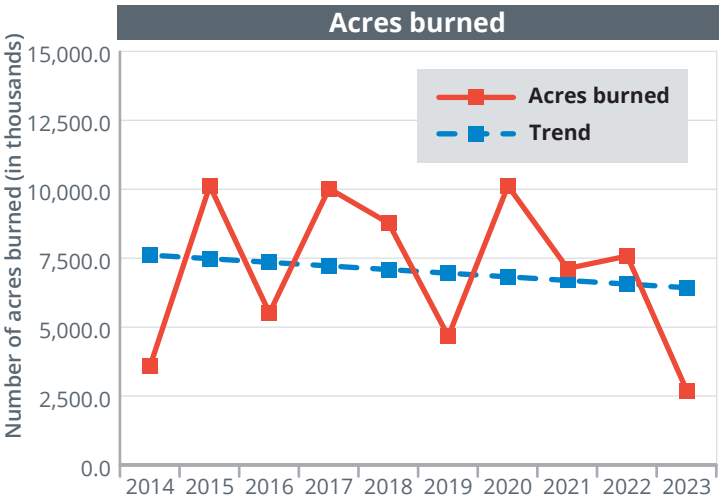
In 2023, the NIFC reported 56,580 wildland fires, which burned a total of 2,693,910 acres (see Figure 12).[17] Between 2014 and 2023, the number of wildland fires decreased by 12%, and the number of acres burned declined by 16%.

Wildfires destroyed 4,318 structures in 2023, including 3,060 residences, 1,228 minor structures and 51 commercial or mixed residential structures. Most of these losses occurred in Northern California and Hawaii, with 2,308 residences destroyed in Maui alone.[18]

Figure 12. Trends in wildland fires and acres burned (2014–2023)



Wildland fires	
Year	**Value**
2014	63,312
2015	68,151
2016	67,743
2017	71,499
2018	58,083
2019	50,477
2020	58,950
2021	58,985
2022	68,988
2023	56,580
10-year trend (%)	**-11.8%**



Acres burned	
Year	**Value**
2014	3,595,613
2015	10,125,149
2016	5,509,995
2017	10,026,086
2018	8,767,492
2019	4,664,364
2020	10,122,336
2021	7,125,643
2022	7,577,183
2023	2,693,910
10-year trend (%)	**-15.5%**

[17] NIFC, https://www.nifc.gov/fire-information/statistics/wildfires.
[18] NIFC, https://www.nifc.gov/fire-information/statistics/wildfires.

The National Fire Problem: 2023 In Depth

In 2023, fire departments across the United States responded to nearly 1.4 million fire incidents.[19] This is equal to one fire every 23 seconds or 2.6 fires every minute. Consistent with previous years, these fires resulted in thousands of fatalities, thousands of injuries and billions of dollars in property damage. Due to the magnitude of these losses in just a single year, it is critical to understand the circumstances and impacts of the nation's fire problem to help reduce the impact of fires to America's communities. This section will review the fire situation in 2023 by examining the types of properties affected, the causes of fires and the demographics of fire casualties — including age, sex, race and state of residence.

Fires and losses: property types

Figure 13 illustrates the distribution of fire incidents in 2023 by general property type. Apart from fire deaths, year-to-year comparisons show minimal changes in the proportions of fires, injuries and dollar losses reported to NFIRS by property type. The largest category of reported fires was outside fires — such as those in fields, vacant lots or trash — which accounted for 48% of all incidents. Residential and nonresidential structure fires together made up 34% of fires, with residential structure fires occurring nearly three times as often as nonresidential structure fires. Notably, vehicle fires represented a significant portion, comprising 13% of all reported fires. This means that roughly one out of every eight fires responded to by fire departments involved a vehicle.

In 2023, 68% of reported fire deaths occurred on residential properties, with the majority happening in one- and two-family homes. This is a decrease from 2014, when residential properties accounted for 75% of reported fire deaths. Vehicles were the second-largest category, responsible for 23% of fire deaths in 2023, an increase from 17% in 2014. Over the past decade, the gap between residential and vehicle fire deaths has narrowed, moving from 75% and 17% in 2014[20] to 68% and 23% in 2023. Nonresidential commercial and public properties accounted for 5% of fire deaths in 2023. Fires occurring outside or in other miscellaneous locations, including wildfires, contributed to 4% of fire deaths.

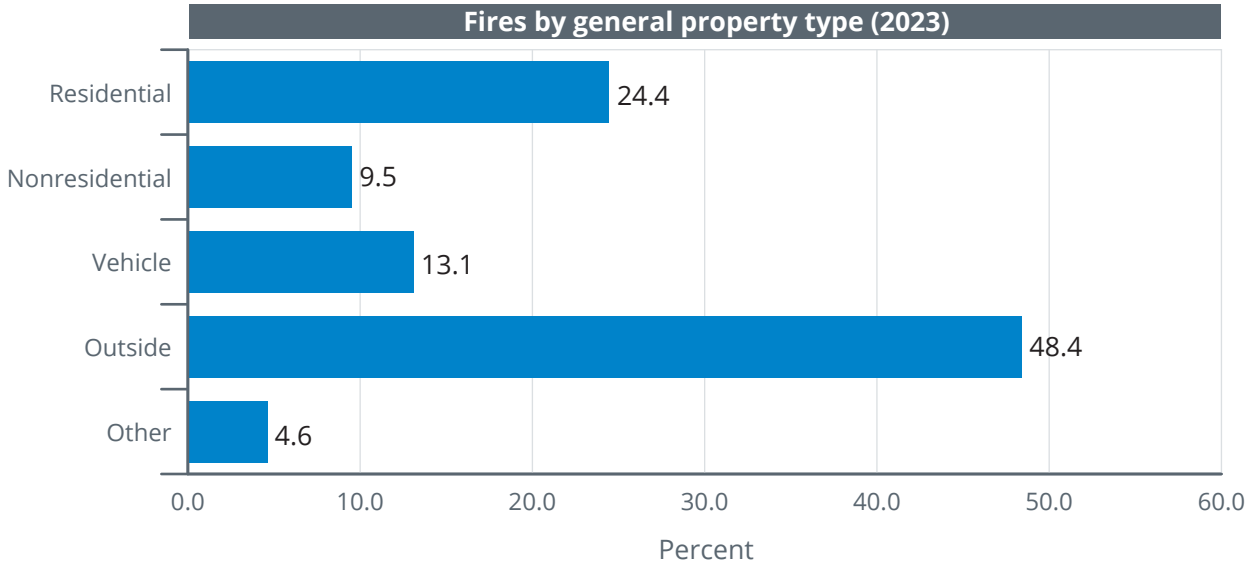
Large, multiple-death fires in public places, such as hotels, nightclubs and office buildings, often receive significant attention. However, fires resulting in 10 or more fatalities are rare and make up only a small fraction of total fire deaths. Public properties are typically required by local codes to have built-in fire suppression systems. The greatest fire risk, however, is found in residential homes, which may often be overlooked. Consequently, prevention efforts remain focused on improving home fire safety. The distribution of fire injuries closely mirrored that of fire deaths, with 75% of all reported injuries occurring on residential properties. The remaining injuries were spread across other property types: 9% on nonresidential properties, 9% involving vehicles and 8% resulting from outside and other fires combined.[21]

[19] NFPA. (2024). *Fire loss in the United States During 2023*.
[20] Analysis based on data from the 2014 NFIRS Public Data Release file.
[21] The total percentage of fire injuries by general property type does not add up to 100% due to rounding.

The distribution of dollar loss differs somewhat from fire deaths and injuries. Residential properties accounted for the largest share, representing 51% of reported dollar loss. Nonresidential properties contributed significantly as well, comprising 26% of the total. Together, these two property types made up 77% of all reported dollar loss. It is important to note that the proportion of dollar loss from outside fires may be understated, as the destruction of trees, grass and similar items is often assigned zero value in fire incident reports unless it involves commercial cropland or timber.

Figure 14 presents the rates of reported fire deaths and injuries per 1,000 fires, as well as dollar loss per fire in 2023, categorized by general property type.[22] These measures indicate the severity of fires; however, they can be somewhat ambiguous, as increases may result from either more casualties or damage per fire or from fewer minor fires being reported. Residential fires had the highest rates of deaths and injuries per 1,000 fires, underscoring the importance of prioritizing home fire safety in prevention programs. Nonresidential structure fires experienced the highest dollar loss per fire.

Figure 13. Fires and fire losses by general property type (2023)



[22] General property types include residential structures, nonresidential structures, vehicles, outside properties and other or unknown properties.

Figure 13. Fires and fire losses by general property type (2023) — continued

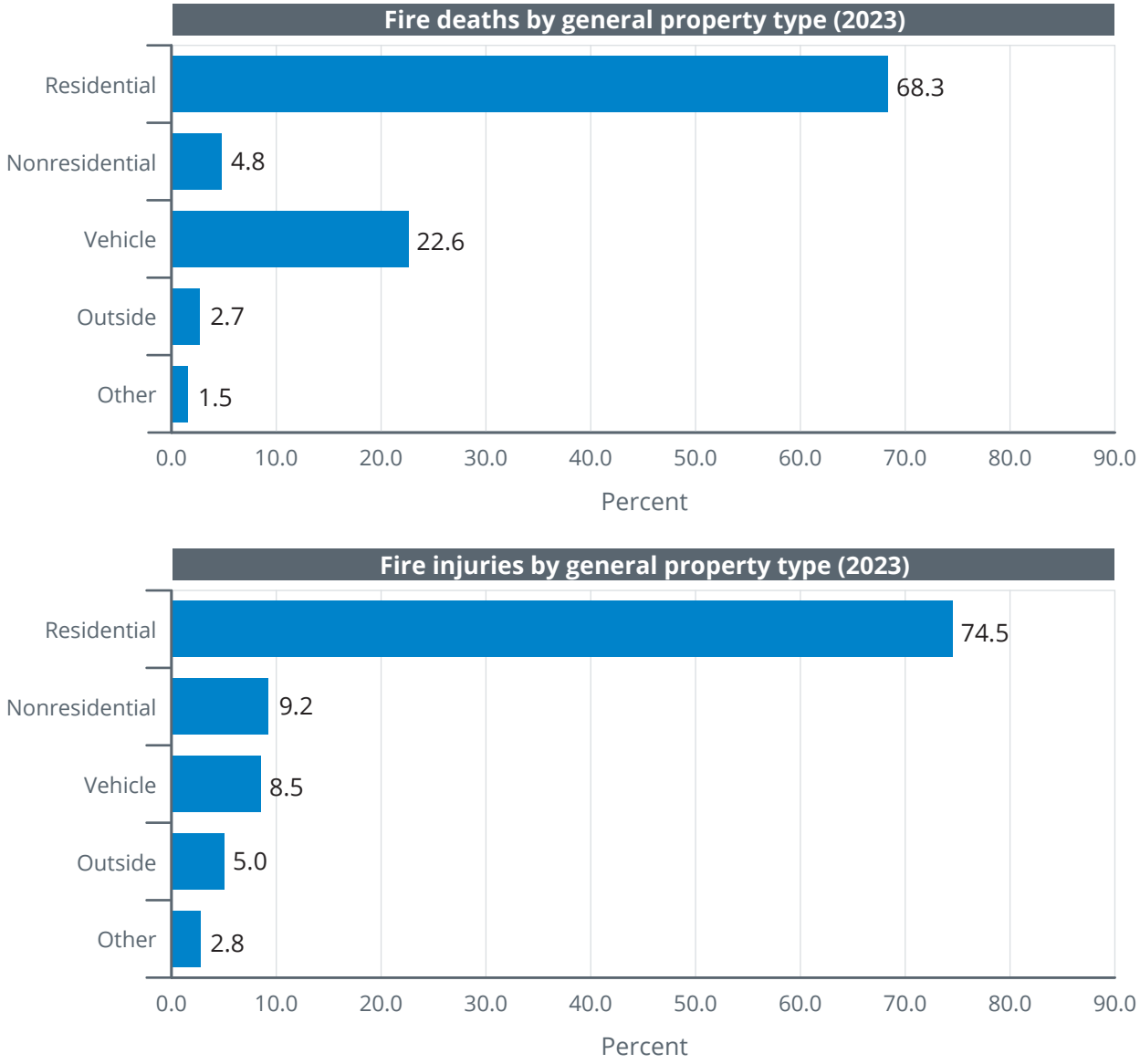
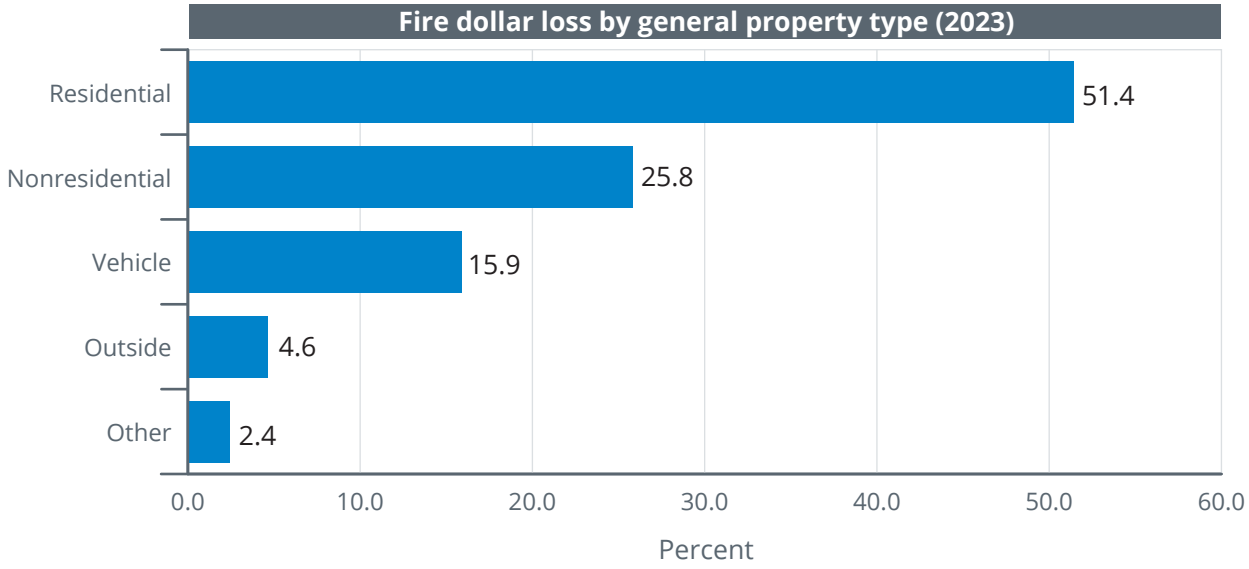


Figure 13. Fires and fire losses by general property type (2023) — continued



Source: NFIRS.
Note: Totals may not add up to 100% due to rounding.

Figure 14. Fire casualties and dollar loss per fire by general property type (2023)

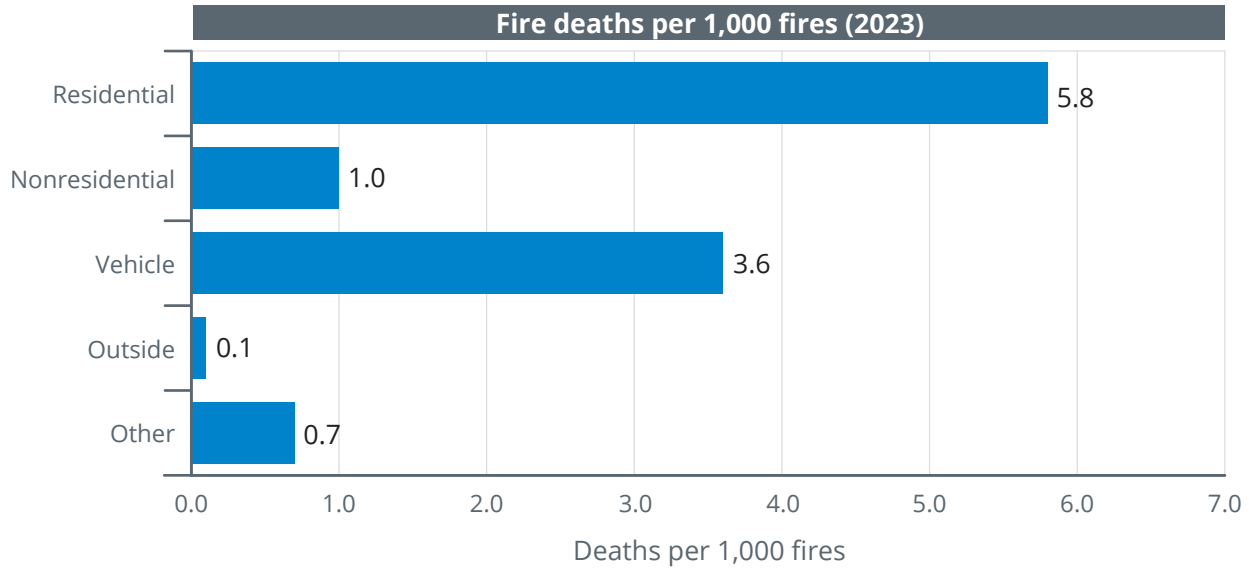
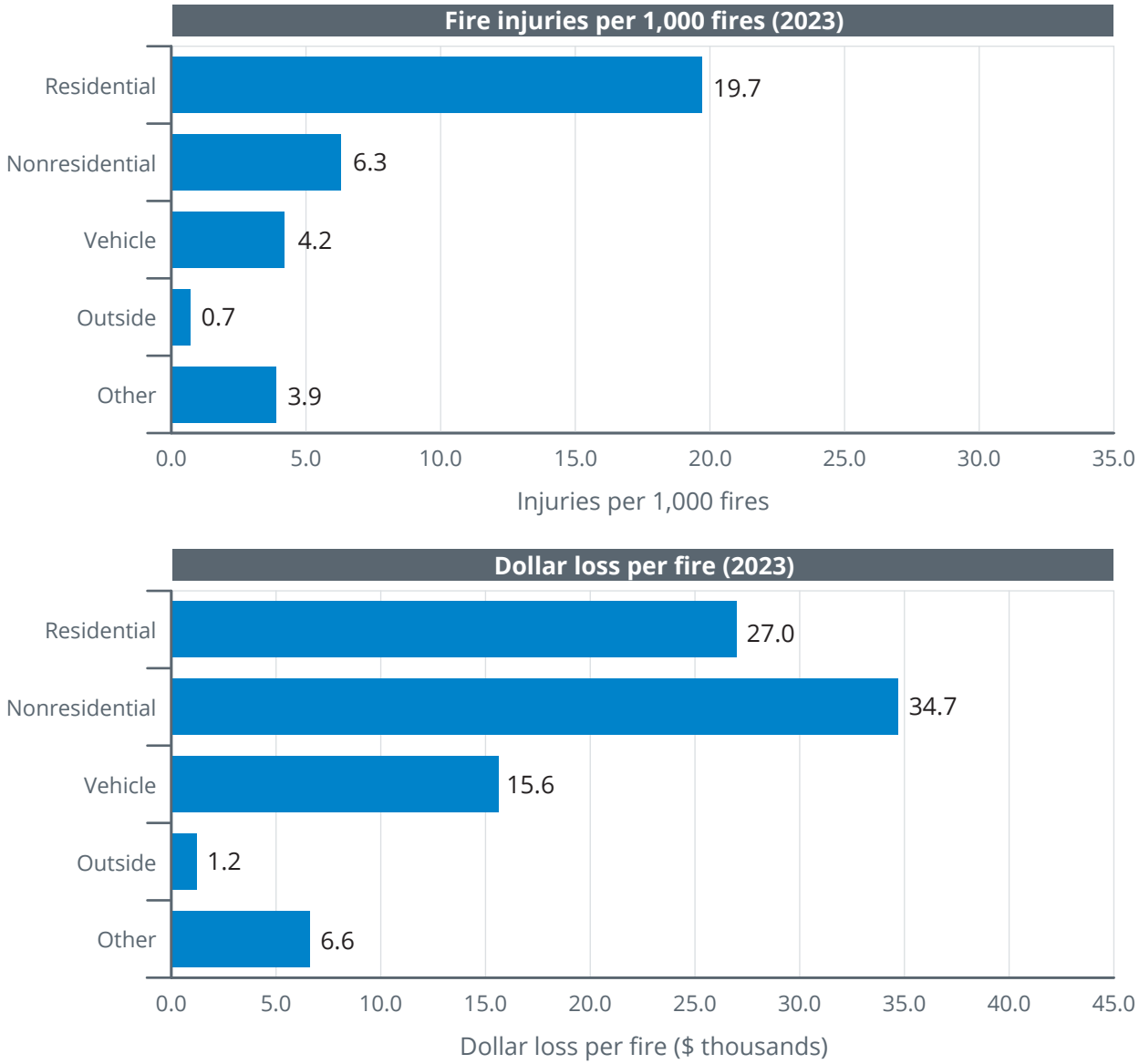


Figure 14. Fire casualties and dollar loss per fire by general property type (2023) — continued



Source: NFIRS.

Fires and losses: causes by property types

The following sections present fire cause profiles for each general property type, highlighting the major causes of fires and those that resulted in losses in 2023, including fatal fires, fires causing injuries and fires resulting in property loss.[23]

[23] In principle, it is the cause of the fire that results in deaths and injuries that should be analyzed, not the numbers of deaths and injuries associated with fire causes.

Residential buildings

Figure 15 presents the cause profiles for residential building fires and related losses in 2023. Cooking was the leading cause, responsible for 49% of residential building fires. Other unintentional or careless actions accounted for 9% and heating caused 8%.[24] These percentages, along with those for other causes, are adjusted to proportionally distribute unknown causes across all 15 categories.

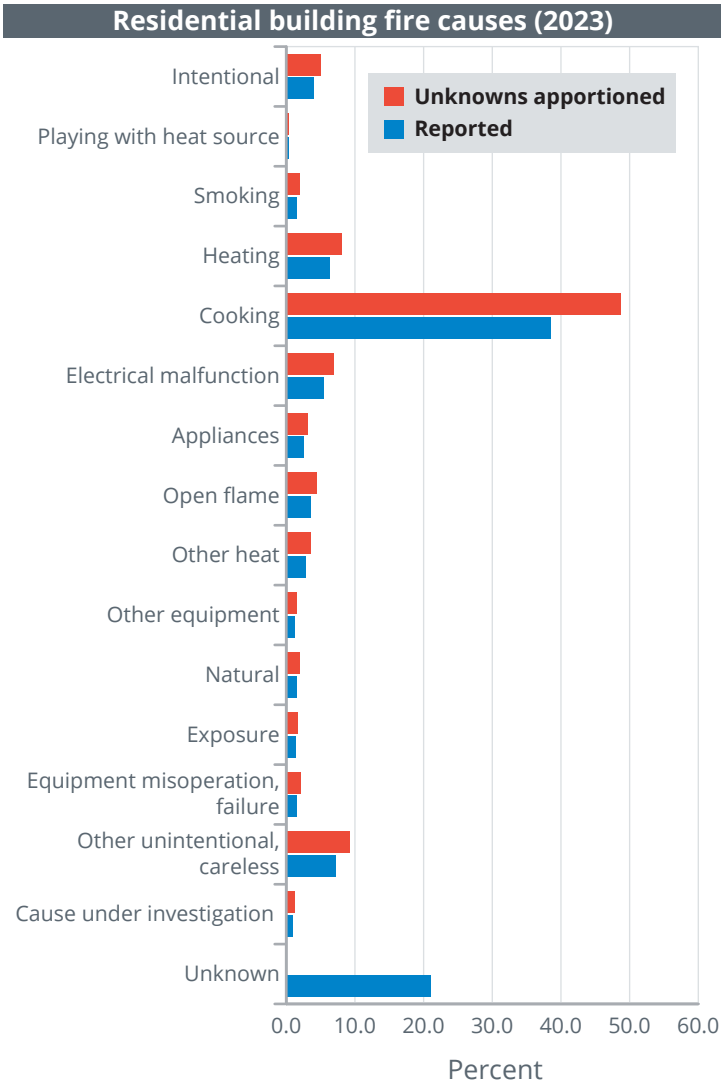
For residential fatal fires, the leading causes were other unintentional or careless actions (22%), causes under investigation (19%), intentional actions (10%) and electrical malfunctions (10%). Collectively, these four causes accounted for over half of all residential fatal fires.

Cooking was the primary cause of residential fires resulting in injuries (26%), and also the leading cause of fires resulting in property loss (24%). Other unintentional or careless actions (14%) and electrical malfunctions (13%) were also significant contributors to property loss in residential fires. [25]

[24] The cause category "Other unintentional or careless actions" includes the misuse of materials or products, abandoned or discarded materials or products, heat source too close to combustibles and other unintentional actions.

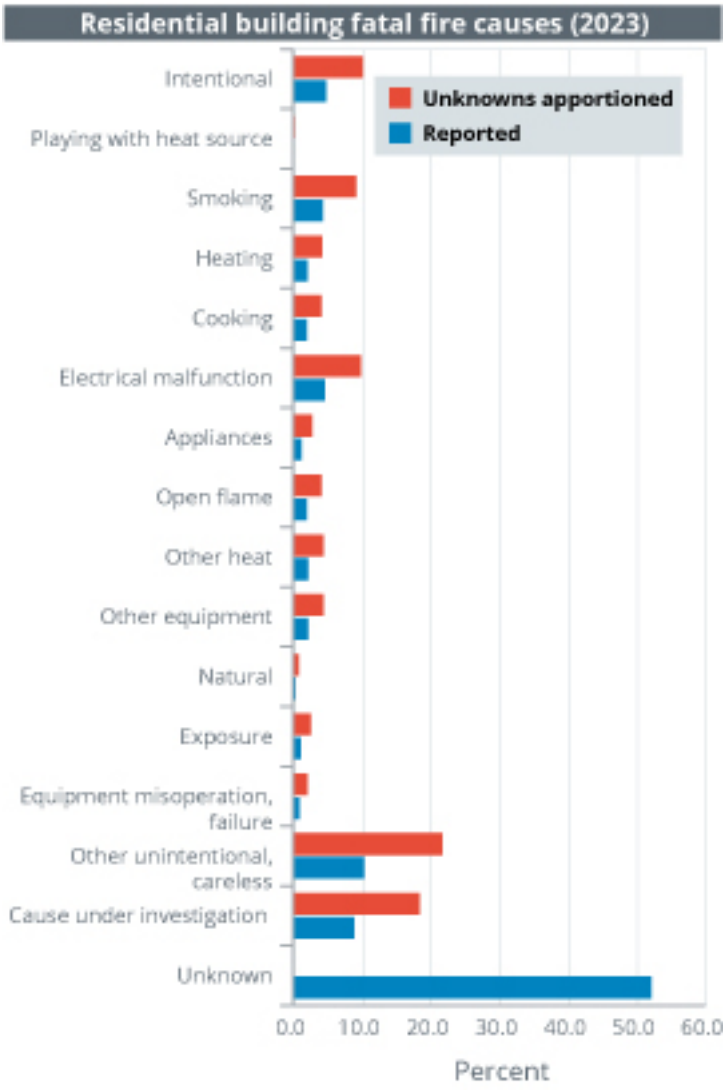
[25] Causes of residential building fires are presented in more detail as part of the USFA's Residential Building Fire Estimate Summary series (2014 to 2023) available at https://www.usfa.fema.gov/statistics/residential-fires/. To download an Excel file of residential building fire and fire-loss estimates by property use and cause, visit https://www.usfa.fema.gov/statistics/data-sets/ (located under the section "More data sets").

Figure 15. Causes of residential building fires and fires resulting in losses (2023)



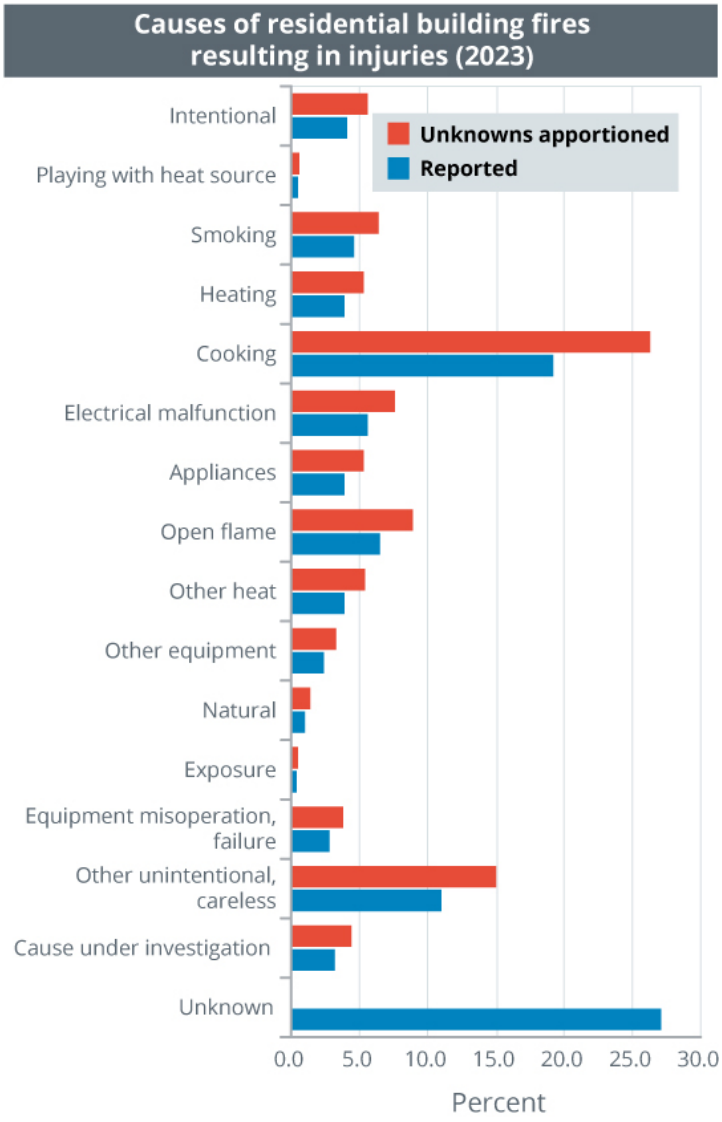
Cause	Reported	Unknowns apportioned
Intentional	4.0	5.0
Playing with heat source	0.3	0.3
Smoking	1.6	2.0
Heating	6.4	8.1
Cooking	38.5	48.7
Electrical malfunction	5.4	6.9
Appliances	2.5	3.2
Open flame	3.5	4.4
Other heat	2.8	3.6
Other equipment	1.2	1.6
Natural	1.5	1.9
Exposure	1.4	1.7
Equipment misoperation, failure	1.6	2.1
Other unintentional, careless	7.2	9.2
Cause under investigation	1.0	1.3
Unknown	21.0	0.0
Total	**100.0**	**100.0**

Figure 15. Causes of residential building fires and fires resulting in losses (2023) — continued



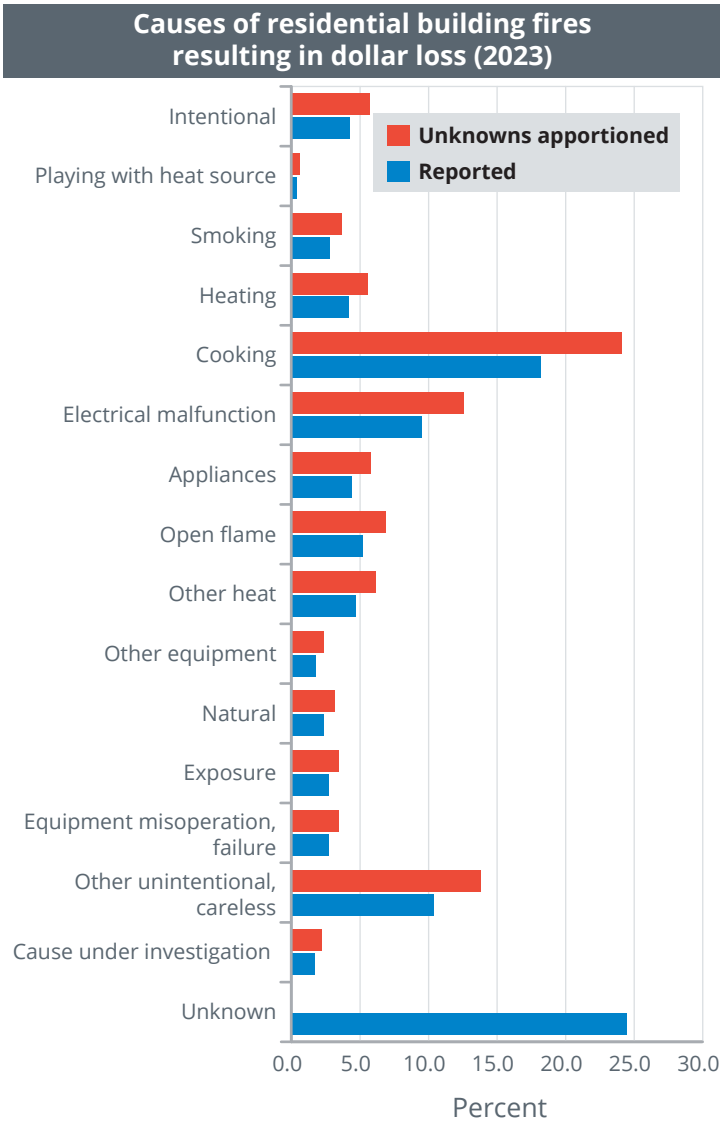
Cause	Reported	Unknowns apportioned
Intentional	4.9	10.2
Playing with heat source	0.2	0.3
Smoking	4.4	9.2
Heating	2.1	4.3
Cooking	2.0	4.2
Electrical malfunction	4.7	9.9
Appliances	1.3	2.8
Open flame	2.0	4.2
Other heat	2.2	4.5
Other equipment	2.2	4.5
Natural	0.4	0.9
Exposure	1.2	2.6
Equipment misoperation, failure	1.0	2.1
Other unintentional, careless	10.4	21.8
Cause under investigation	8.9	18.5
Unknown	52.2	0.0
Total	**100.0**	**100.0**

Figure 15. Causes of residential building fires and fires resulting in losses (2023) — continued



Cause	Reported	Unknowns apportioned
Intentional	4.1	5.6
Playing with heat source	0.5	0.6
Smoking	4.6	6.4
Heating	3.9	5.3
Cooking	19.2	26.3
Electrical malfunction	5.6	7.6
Appliances	3.9	5.3
Open flame	6.5	8.9
Other heat	3.9	5.4
Other equipment	2.4	3.3
Natural	1.0	1.4
Exposure	0.4	0.5
Equipment misoperation, failure	2.8	3.8
Other unintentional, careless	11.0	15.0
Cause under investigation	3.2	4.4
Unknown	27.1	0.0
Total	**100.0**	**100.0**

Figure 15. Causes of residential building fires and fires resulting in losses (2023) — continued



Cause	Reported	Unknowns apportioned
Intentional	4.3	5.7
Playing with heat source	0.4	0.6
Smoking	2.8	3.7
Heating	4.2	5.6
Cooking	18.2	24.1
Electrical malfunction	9.5	12.6
Appliances	4.4	5.8
Open flame	5.2	6.9
Other heat	4.7	6.2
Other equipment	1.8	2.4
Natural	2.4	3.2
Exposure	2.7	3.5
Equipment misoperation, failure	2.7	3.5
Other unintentional, careless	10.4	13.8
Cause under investigation	1.7	2.2
Unknown	24.5	0.0
Total	**100.0**	**100.0**

Source: NFIRS.

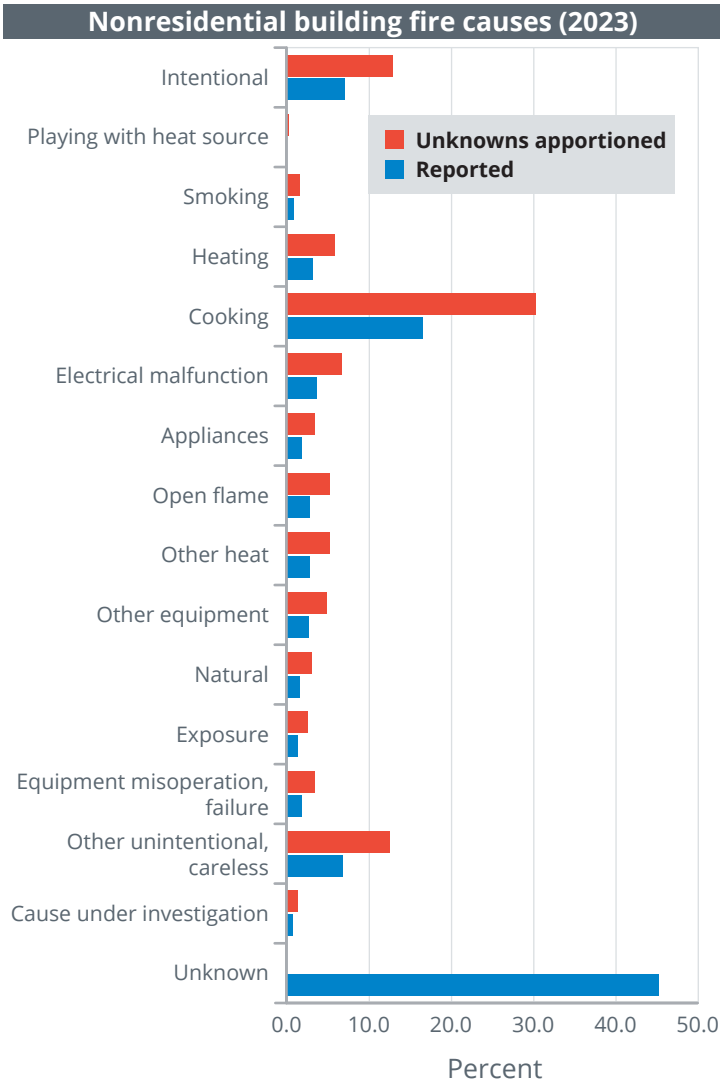
Notes:
1. Adjusted percentages (percentages with unknowns apportioned) proportionally spread the fire incidents with unknown causes over the other 15 cause categories. Totals may not add up to 100% due to rounding.
2. A large percentage of residential building fatal fire incidents reported to the NFIRS (52%) did not have sufficient information to determine the cause of the fire.

Nonresidential buildings

Figure 16 presents the cause profiles for nonresidential building fires and those resulting in property loss. The distribution of causes for fatal fires and fires resulting in injuries is not shown due to the limited number of such incidents reported to NFIRS and the high percentage of cases with insufficient information to determine the cause.

Among nonresidential building fires, three causes accounted for over half of all incidents: cooking was the leading cause (30%), followed by intentional actions and other unintentional or careless actions, each responsible for 13%. The main causes of fires resulting in property loss were other unintentional or careless actions (17%), electrical malfunctions (12%) and cooking (11%).[26]

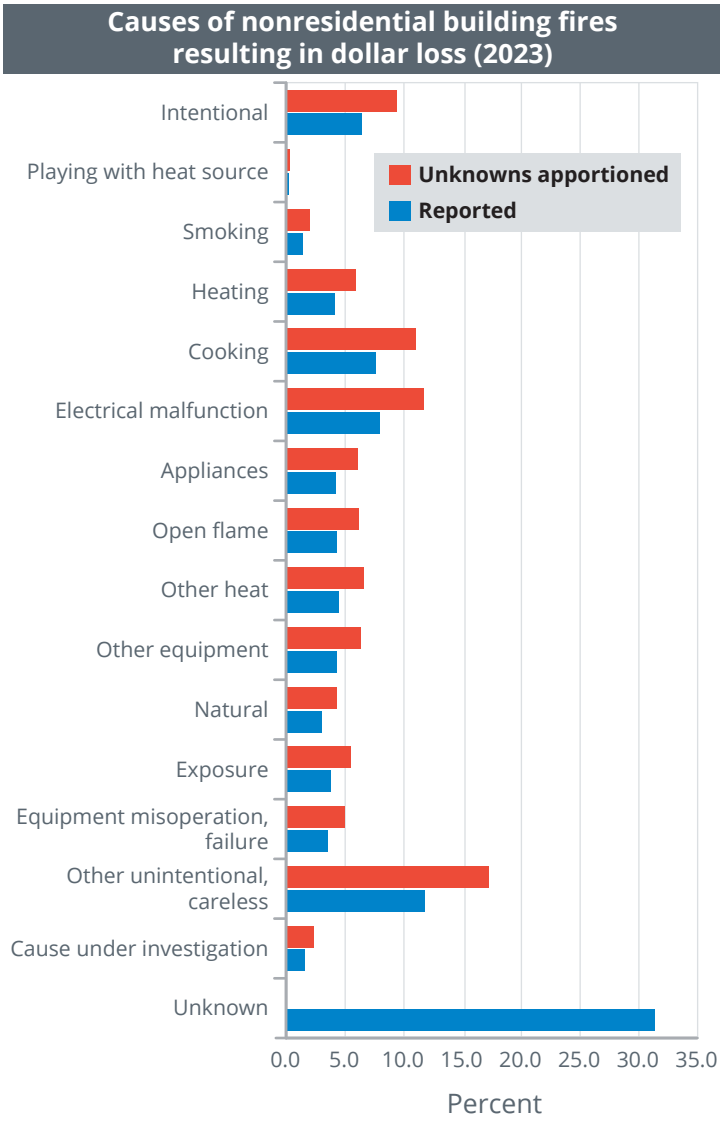
Figure 16. Causes of nonresidential building fires and fires resulting in dollar loss (2023)



Cause	Reported	Unknowns apportioned
Intentional	7.1	13.0
Playing with heat source	0.1	0.3
Smoking	0.9	1.6
Heating	3.2	5.9
Cooking	16.6	30.3
Electrical malfunction	3.7	6.7
Appliances	1.9	3.5
Open flame	2.9	5.3
Other heat	2.9	5.3
Other equipment	2.7	4.9
Natural	1.7	3.1
Exposure	1.4	2.6
Equipment misoperation, failure	1.9	3.5
Other unintentional, careless	6.9	12.6
Cause under investigation	0.8	1.4
Unknown	45.3	0.0
Total	**100.0**	**100.0**

[26] Causes of nonresidential building fires are presented in more detail as part of the USFA's Nonresidential Building Fire Estimate Summary series (2014 to 2023), available at https://www.usfa.fema.gov/statistics/nonresidential-fires/. To download an Excel file of nonresidential building fire and fire-loss estimates by property use and cause, visit https://www.usfa.fema.gov/statistics/data-sets/ (located under the section "More data sets").

Figure 16. Causes of nonresidential building fires and fires resulting in dollar loss (2023) — continued



Cause	Reported	Unknowns apportioned
Intentional	6.4	9.4
Playing with heat source	0.2	0.3
Smoking	1.4	2.0
Heating	4.1	5.9
Cooking	7.6	11.0
Electrical malfunction	8.0	11.7
Appliances	4.2	6.1
Open flame	4.3	6.2
Other heat	4.5	6.6
Other equipment	4.3	6.3
Natural	3.0	4.3
Exposure	3.8	5.5
Equipment misoperation, failure	3.5	5.0
Other unintentional, careless	11.8	17.2
Cause under investigation	1.6	2.3
Unknown	31.4	0.0
Total	**100.0**	**100.0**

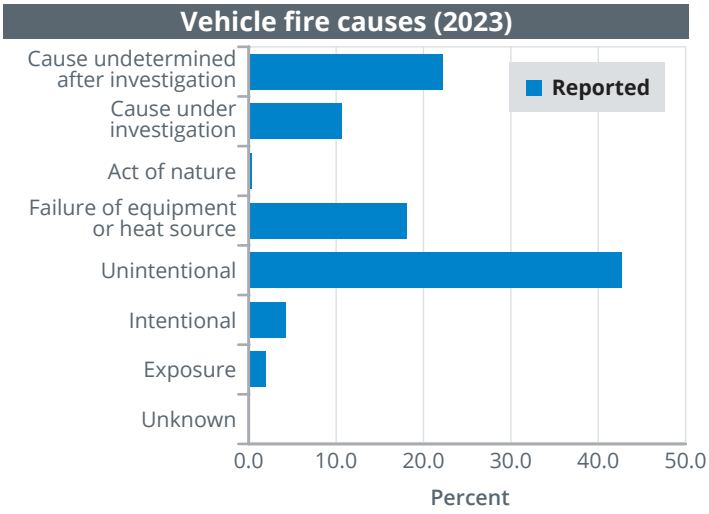
Source: NFIRS.
Note: Adjusted percentages (percentages with unknowns apportioned) proportionally spread the fire incidents with unknown causes over the other 15 cause categories. Totals may not add up to 100% due to rounding.

Vehicles

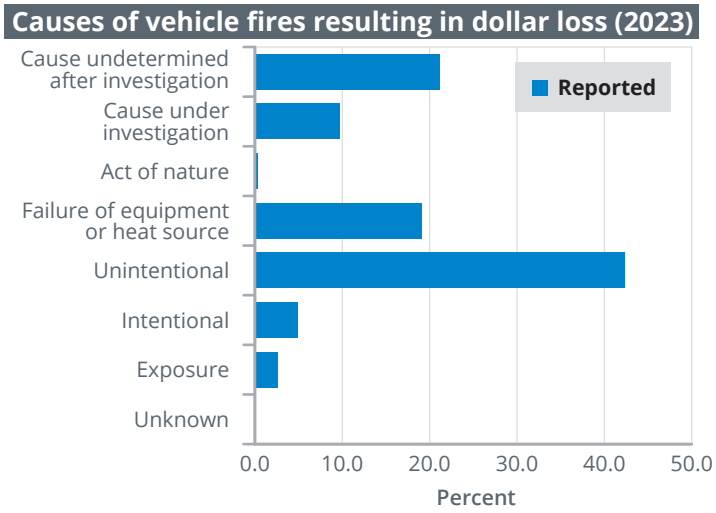
Figure 17 presents the cause profiles for vehicle fires and those resulting in property loss. The distribution of causes for fatal vehicle fires and fires resulting in injuries is not shown due to the limited number of such incidents reported to NFIRS. Additionally, because there were no unknown causes for vehicle fires, the percentages are not adjusted across the seven cause categories.

Unintentional actions were the leading cause of vehicle fires and those resulting in property loss, accounting for 43% and 42%, respectively. The cause was undetermined after investigation in 22% of vehicle fires and in 21% of fires resulting in property loss. Equipment or heat source failure was responsible for 18% of vehicle fires.

Figure 17. Causes of vehicle fires and fires resulting in dollar loss (2023)



Cause	Reported
Cause undetermined after investigation	22.2
Cause under investigation	10.6
Act of nature	0.4
Failure of equipment or heat source	18.1
Unintentional	42.7
Intentional	4.2
Exposure	1.9
Unknown	0.0
Total	**100.0**



Cause	Reported
Cause undetermined after investigation	21.1
Cause under investigation	9.7
Act of nature	0.3
Failure of equipment or heat source	19.1
Unintentional	42.3
Intentional	4.9
Exposure	2.6
Unknown	0.0
Total	**100.0**

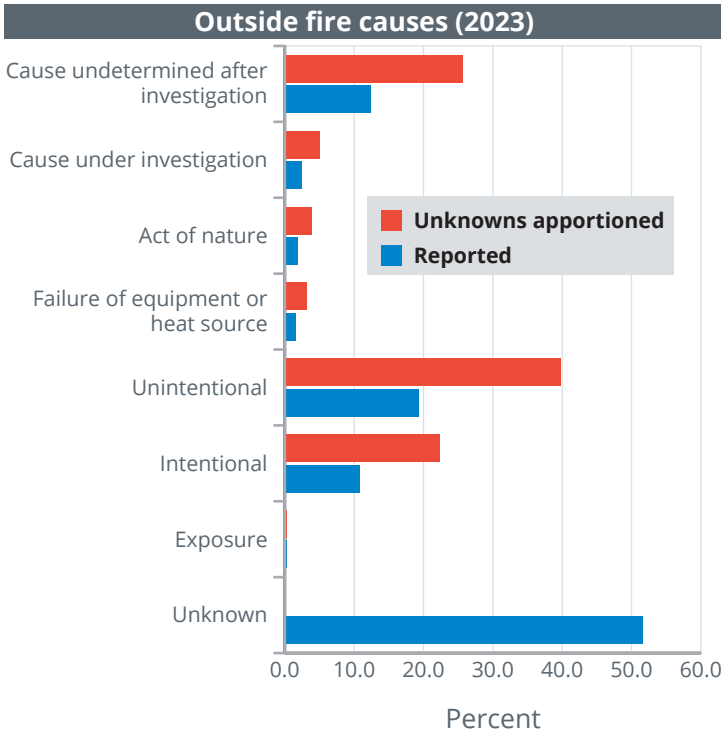
Source: NFIRS.
Note: Totals may not add up to 100% due to rounding.

Outside

Figure 18 presents the cause profiles for outside fires and those resulting in property loss. The distribution of causes for fatal outside fires and fires resulting in injuries is not shown, due to the limited number of such incidents reported to NFIRS and the high percentage of cases with insufficient information to determine the cause.

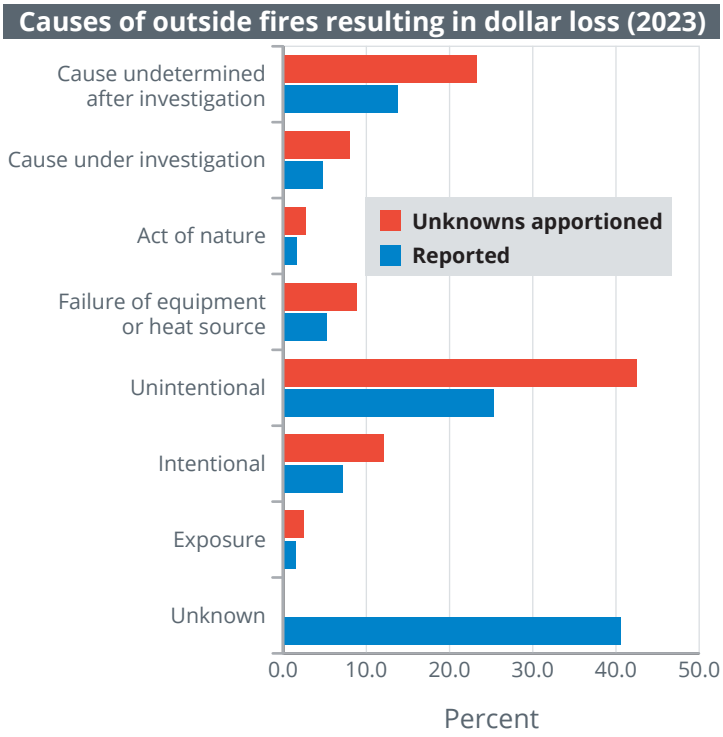
Unintentional actions were the leading cause of outside fires and those resulting in property loss, accounting for 40% and 43%, respectively. The cause was undetermined after investigation in 26% of outside fires and 23% of outside fires resulting in property loss.

Figure 18. Causes of outside fires and fires resulting in dollar loss (2023)



Cause	Reported	Unknowns apportioned
Cause undetermined after investigation	12.4	25.6
Cause under investigation	2.4	5.0
Act of nature	1.9	3.9
Failure of equipment or heat source	1.5	3.1
Unintentional	19.3	39.8
Intentional	10.8	22.4
Exposure	0.2	0.3
Unknown	51.6	0.0
Total	**100.0**	**100.0**

Figure 18. Causes of outside fires and fires resulting in dollar loss (2023) — continued



Cause	Reported	Unknowns apportioned
Cause undetermined after investigation	13.8	23.3
Cause under investigation	4.8	8.0
Act of nature	1.6	2.7
Failure of equipment or heat source	5.2	8.8
Unintentional	25.3	42.5
Intentional	7.2	12.1
Exposure	1.5	2.5
Unknown	40.6	0.0
Total	**100.0**	**100.0**

Source: NFIRS.

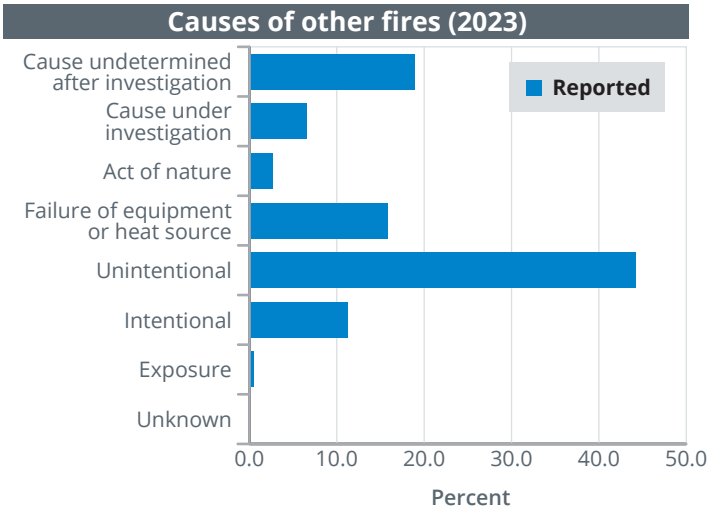
Notes:
1. Adjusted percentages (percentages with unknowns apportioned) proportionally spread the fire incidents with unknown causes over the other seven cause categories. Totals may not add up to 100% due to rounding.
2. A large percentage of outside fire incidents reported to the NFIRS (52%) did not have sufficient information to determine the cause of the fire.

Other

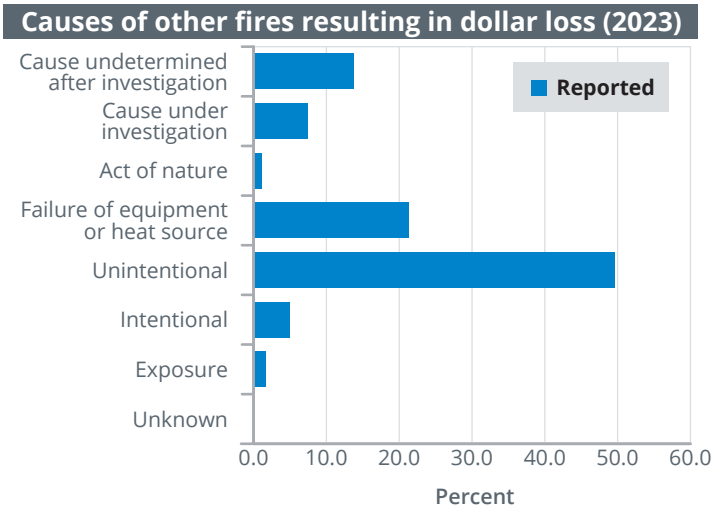
Figure 19 presents the cause profiles for other fires and those resulting in property loss. The distribution of causes for fatal fires and fires resulting in injuries in this category is not shown due to the limited number of such incidents reported to NFIRS. Additionally, since there were no unknown causes for other fires, percentages are not adjusted across the seven cause categories.

Similar to vehicle and outside fires, unintentional actions were the leading cause of other fires and those resulting in property loss, accounting for 44% and 50%, respectively. The cause was undetermined after investigation in 19% of other fires. Equipment or heat source failure was the third leading cause of other fires (16%) and the second leading cause of fires resulting in property loss (21%).

Figure 19. Causes of other fires and fires resulting in dollar loss (2023)



Cause	Reported
Cause undetermined after investigation	18.9
Cause under investigation	6.6
Act of nature	2.7
Failure of equipment or heat source	15.8
Unintentional	44.2
Intentional	11.3
Exposure	0.5
Unknown	0.0
Total	**100.0**



Cause	Reported
Cause undetermined after investigation	13.8
Cause under investigation	7.4
Act of nature	1.2
Failure of equipment or heat source	21.3
Unintentional	49.6
Intentional	5.0
Exposure	1.7
Unknown	0.0
Total	**100.0**

Source: NFIRS.
Note: Totals may not add up to 100% due to rounding.

Fires and losses: casualties

Fire-related deaths and injuries are a nationwide concern, affecting people from all walks of life. No demographic group is immune as fires can impact anyone, regardless of age, race, income or geographic location. While the risk is universal, certain populations experience disproportionate impacts, highlighting the importance of understanding how fire casualties are distributed across different groups.

Fire casualties across population groups can be assessed in several ways. The simplest approach is to examine the distribution of deaths or injuries by the factor of interest. For example, in 2023, the highest number of fire deaths occurred among white Americans, while the lowest number was among American Indians/Alaska Natives. In terms of age, the percentage of fire deaths was highest among individuals aged 60 to 74, whereas fire injuries were most common among adults aged 30 to 34.

While these findings provide useful information, they do not account for differences in the size of the population groups being compared. For instance, older age groups naturally have fewer individuals due to mortality, and there are far fewer American Indians/Alaska Natives than white Americans in the U.S. As a result, a group may have more or fewer deaths or injuries simply because its population size is larger or smaller.

To address these differences, per capita rates are used. Per capita rates standardize the data to a common population size, allowing for meaningful comparisons between groups. The most effective way to assess fire casualties across groups is to determine the relative risk of death or injury. Relative risk compares the per capita rate for a specific group (such as females) to the overall per capita rate for the general population, which is set at one.

Fatalities

In 2023, according to the National Center for Health Statistics (NCHS), 4,371 deaths were caused by fire.[27, 28] The risk of death from fire is not the same for everyone. When determining fire risk, geographic and demographic factors all come into play.[29]

[27] NCHS, 2023 Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program.

[28] For each reported death certificate in the U.S., the NCHS assigns International Classification of Disease (ICD) codes for all reported conditions leading to death. Based on the NCHS mortality data, there were 4,371 fire-related deaths in 2023. These included all deaths in which exposure to fire, fire products or explosion was the underlying cause of death or was a contributing factor in the chain of events leading to death. This latter condition is an expanded approach to capturing fire and fire-related deaths. With this current approach, deaths where such exposures were a contributing factor (i.e., the death may not have occurred without the exposure) can be captured. The ICD 10 codes included in the mortality statistics are F63.1, W39 to W40, X00 to X06, X08 to X09, X75 to X76, X96 to X97, Y25 to Y26, and Y35.1.

[29] For more information on U.S. fire deaths, fire death rates and the risk of dying in a fire, visit https://www.usfa.fema.gov/statistics/deaths-injuries/. Additionally, the USFA's topical report Fire Risk in 2022 focuses on how fire risk, specifically the risk of death and injury, varies with age and how other demographic factors weigh on that risk. This report is available at https://www.usfa.fema.gov/downloads/pdf/statistics/v22i6.pdf.

Age

Figure 20 displays the percentage of fire deaths by age group. Unlike relative risk, these percentages do not account for the size of each age group, resulting in different distributions. In 2023, children under 15 years old accounted for 6% of all fire deaths, while older adults (aged 65 and older) represented 45%. Adults aged 55 to 64 contributed an additional 20% of fire deaths.

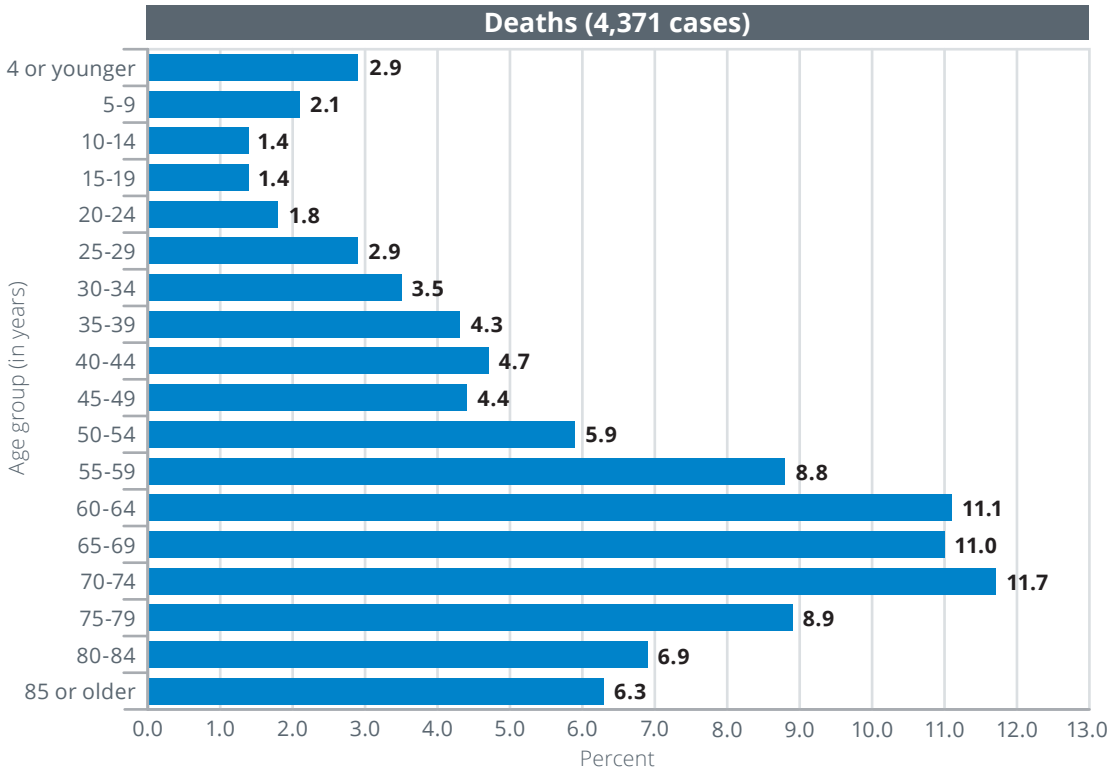
Individuals aged 55 and older had a higher fire death rate than the national average (13.1 deaths per million population). For those aged 80 and older, the fire death rate was more than three times the national average (see Figure 21).

Adults aged 55 and older also had a greater relative risk of dying in fires compared to the general population (see Figure 22). The highest risk was observed among those aged 80 and older, who were more than three times as likely to die in a fire as the general population.

Older adults are among the most vulnerable to fire-related fatalities, and their risk remained high in 2023. The U.S. population is aging rapidly, with the proportion of adults aged 65 and older expected to increase from 18% in 2023 to 24% by 2060. This shift is likely to result in a corresponding increase in fire deaths and injuries among older adults. According to U.S. Census Bureau projections, the number of individuals aged 65 and older will rise from 59 million in 2023 to 89 million by 2060. The population aged 85 and older is expected to nearly triple, increasing from six million in 2023 to 18 million in 2060. As people age, declines in physical and mental abilities can impair mobility and reduce sensory perception, increasing their risk of death or injury from fire.

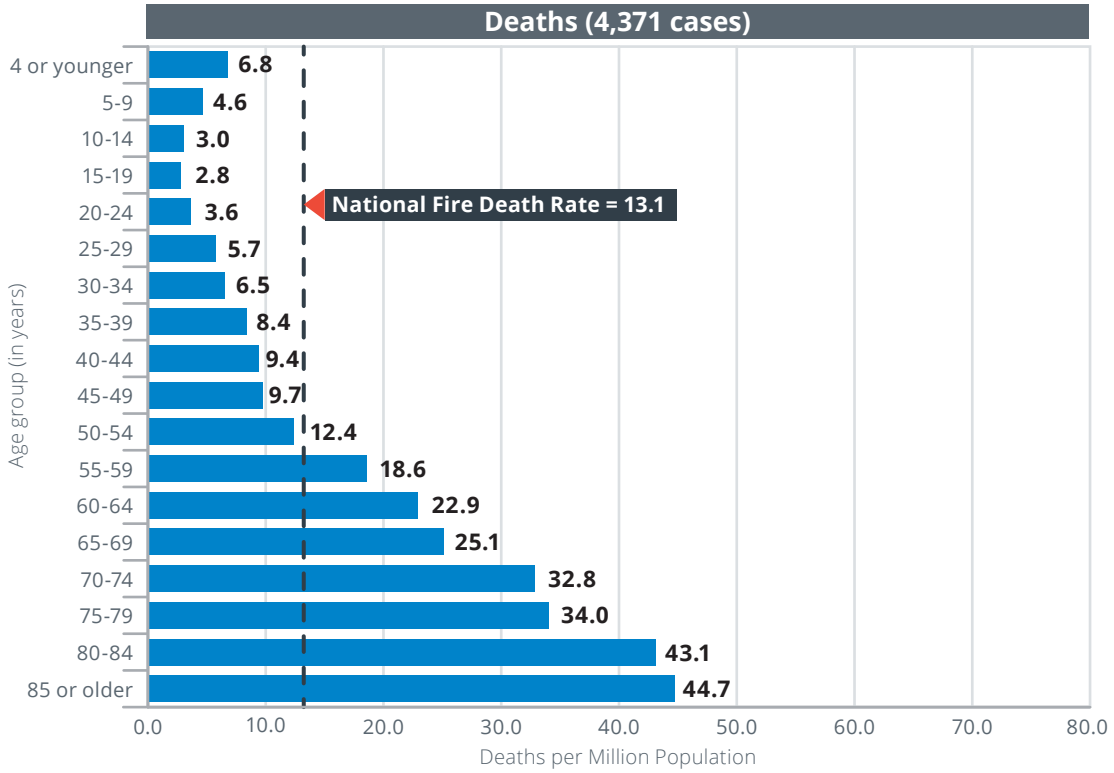
Historically, children aged 4 and younger, were considered at high risk for fire-related fatalities. However, data from 2014 to 2023 show that their fire death rates are now lower than those of the general population. In 2023, the relative risk of fire death for children aged 4 and younger was 50% less than that of the general population, although it remained higher compared to older children aged 5 to 14.

Figure 20. Percent of fire deaths by age group (2023)



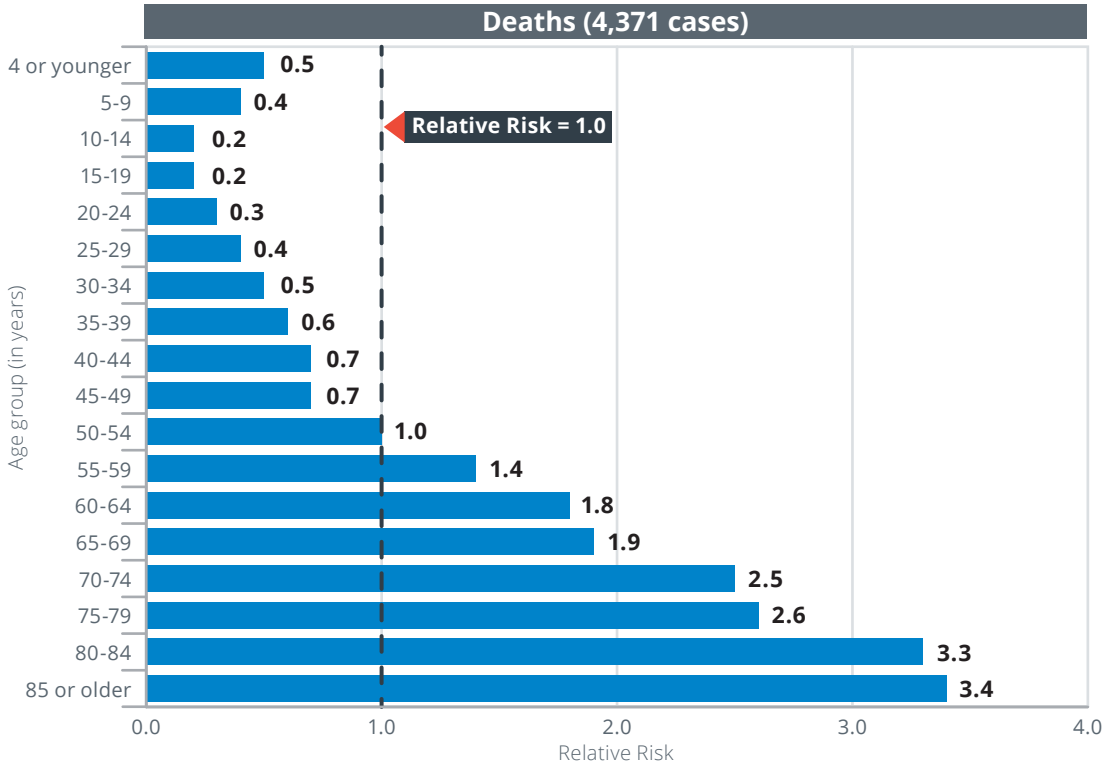
Source: NCHS.
Note: Data have been adjusted to account for unknown or unspecified ages.

Figure 21. Fire death rates by age group (2023)



Sources: NCHS and U.S. Census Bureau.
Note: Data have been adjusted to account for unknown or unspecified ages.

Figure 22. Relative risk of fire deaths by age group (2023)



Sources: NCHS and U.S. Census Bureau.

Notes: 1. Relative risk compares the per capita rate for a particular group (e.g., age group) to the overall per capita rate (i.e., the general population). For the general population, the relative risk is set at 1, as indicated by the dashed line in the figure above.

2. Data has been adjusted to account for unknown or unspecified ages.

Sex

As shown in Table 1, men accounted for 62% of fire deaths in 2023, while women accounted for 38%. This higher proportion of male fire deaths has remained consistent over the years.

Table 1. Percent of fire deaths by sex (2023)

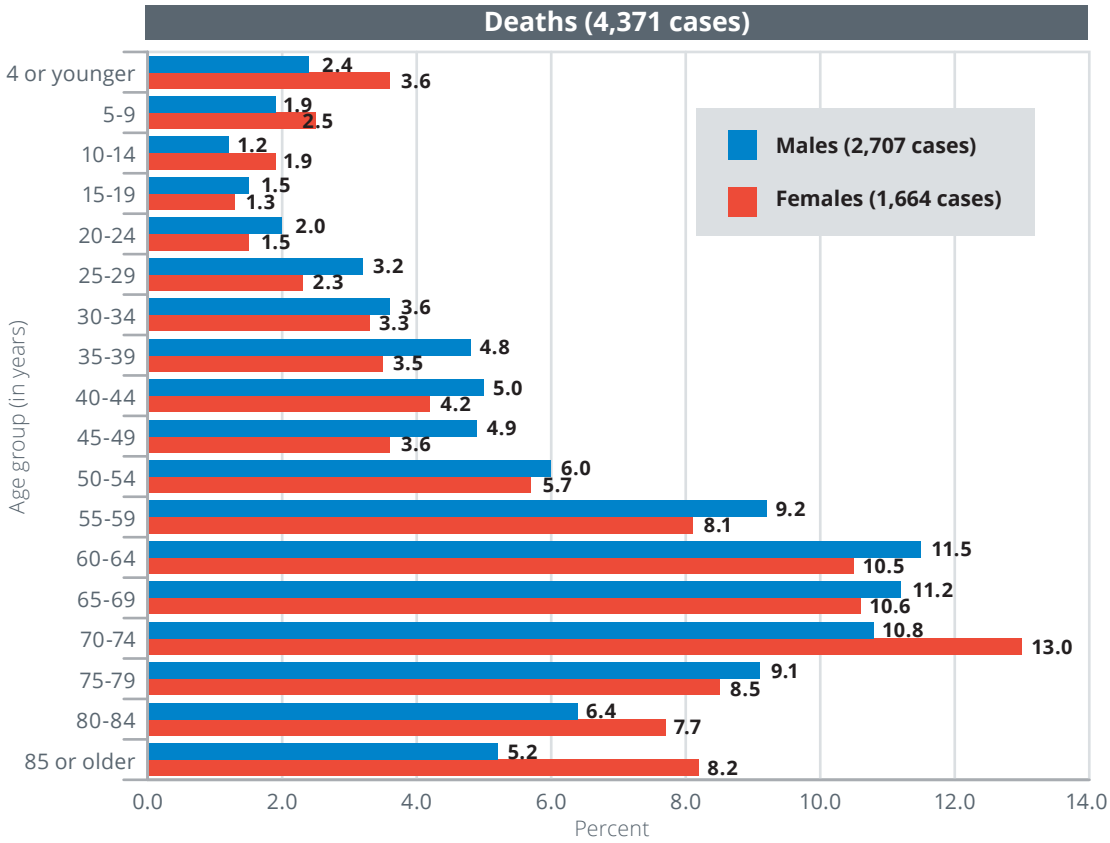
Casualty type	Males (percent)	Females (percent)
Deaths	61.9	38.1

Source: NCHS.

Figures 23 and 24 illustrate the percentage of fire deaths by age and sex, as well as fire death rates by age and sex. The age distribution of fire deaths differs between males and females. Among females, 48% of fire deaths occurred in the 65 and older age group. For males, the highest proportion of fire deaths was among ages 60 to 74, representing 34% of male fire deaths.

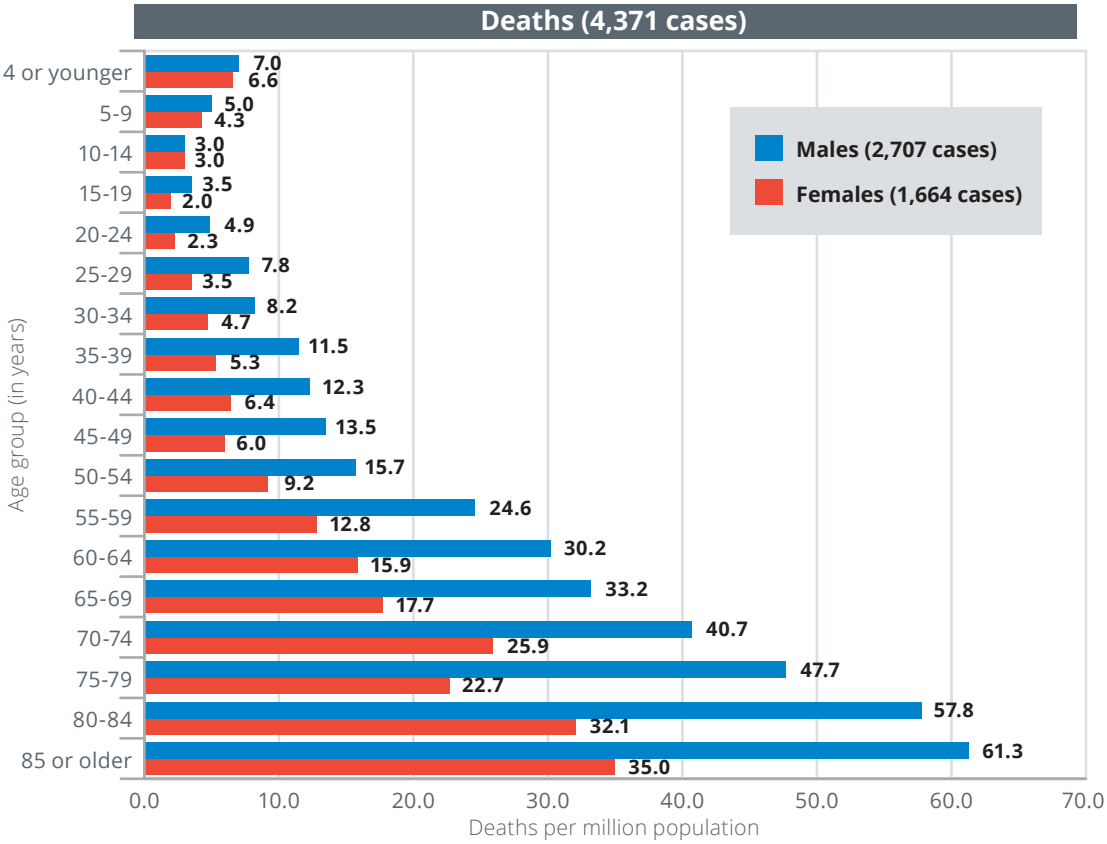
In 2023, the fire death rate for males was 16.3 deaths per million population, compared to 9.8 deaths per million for females. This means males were 1.7 times more likely to die in fires than females. Across all age groups, males had a higher fire death rate per million population than females, except for the 10 to 14 age group, where the rates were equal (see Figure 24).

Figure 23. Percent of fire deaths by age group and sex (2023)



Source: NCHS.
Note: Data has been adjusted to account for unknown or unspecified ages. Totals may not add up to 100% due to rounding.

Figure 24. Fire death rates by age group and sex (2023)



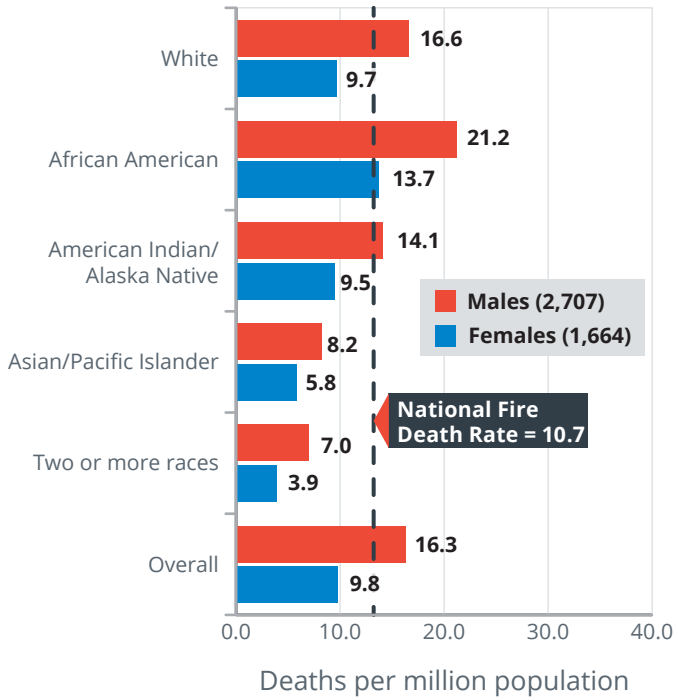
Sources: NCHS and U.S. Census Bureau.
Note: Data has been adjusted to account for unknown or unspecified ages.

Race

Figure 25 displays fire death rates by race and sex for 2023. Males, African Americans and American Indians/Alaska Natives had fire death rates above the national average.[30] In contrast, Asians/Pacific Islanders and individuals identifying as two or more races had the lowest fire death rates.

[30] For a further assessment and understanding of fire death rates and relative risk across various demographics, including race, refer to USFA's Fire Risk in 2022, Topical Fire Report Series, Volume 22, Issue 6, November 2024, https://www.usfa.fema.gov/downloads/pdf/statistics/v22i6.pdf.

Figure 25. Fire death rates by race and sex (2023)



Number of fire deaths			
Race	Male	Female	Total
White	2,084	1,230	3,314
African American	467	326	793
American Indian/Alaska Native	32	21	53
Asian/Pacific Islander	88	67	155
Two or more races	36	20	56
Total	**2,707**	**1,664**	**4,371**

Sources: NCHS and U.S. Census Bureau.
Note: This figure uses NCHS data in the computation of the national fire death rate for data consistency within this chart. Based on the 2023 NFPA fire death estimate, this rate is 11.0.

State

The fire problem varies across regions and states in the United States, often due to differences in weather, demographics and other contributing factors. Table 2 provides data for each state in 2023, including the number of civilian fire deaths, fire death rates per million population and relative risk.[31]

In 2023, 10 states — Alabama, Alaska, Arkansas, Hawaii, Kansas, Kentucky, Mississippi, Oklahoma, Tennessee and West Virginia — along with the District of Columbia, had fire death rates exceeding 20 deaths per million population, with most of these states located in the South. Sixteen states reported fire death rates between 13.2 and 20 deaths per million population. Additionally, 22 states had fire death rates at or below the national average of 13.1 deaths per million population.[32] Eleven states, primarily those with larger populations, accounted for 51% of all fire deaths nationwide. Unless fire problems in these states are significantly reduced, it will be challenging to lower the national total.

[31] This analysis includes only states where fire death rates were computed. Fire death rates were not computed for North Dakota and Wyoming due to very small numbers of fire deaths (fewer than 10 deaths). The fire death rates presented here reflect the crude death rates and are not age adjusted. The crude death rate is the total number of fire deaths per state divided by the total population per state and multiplied by one million.
[32] The per capita fire death rate for the total population in 2023 was computed from the total number of fire deaths (4,371), divided by the total resident population (334,914,895), then multiplied by 1,000,000 people. This rate is equivalent to 13.1 fire deaths per one million population.

Figure 26 ranks states by the relative risk of civilian fire death in 2023. The highest relative risk was observed in Alaska, the District of Columbia and Hawaii. Residents of Hawaii, the District of Columbia and Alaska were 6.0, 2.8 and 2.4 times more likely to die in a fire than the general population, respectively.[33] In contrast, individuals living in California, Colorado, Massachusetts and New Hampshire were 50% less likely to die in a fire compared to the national average. Where relative risk was calculated, 25 states and the District of Columbia had a relative risk higher than the general population. Delaware and Washington had a relative risk comparable to the national average, while 21 states had a lower relative risk than the general population.

Table 2. Fire deaths, rates and relative risk by state (2023)

State of occurrence	Fire deaths	Fire death rate per million population (crude rate)	Relative risk
Alabama	121	23.7	1.8
Alaska	23	31.4	2.4
Arizona	88	11.8	0.9
Arkansas	79	25.8	2.0
California	264	6.8	0.5
Colorado	41	7.0	0.5
Connecticut	28	7.7	0.6
Delaware**	13	12.6	1.0
District of Columbia	25	36.8	2.8
Florida	201	8.9	0.7
Georgia	172	15.6	1.2
Hawaii	112	78.0	6.0
Idaho**	17	8.7	0.7
Illinois	147	11.7	0.9
Indiana	105	15.3	1.2
Iowa	38	11.8	0.9
Kansas	64	21.8	1.7
Kentucky	99	21.9	1.7
Louisiana	89	19.5	1.5
Maine	22	15.8	1.2
Maryland	71	11.5	0.9
Massachusetts	49	7.0	0.5
Michigan	157	15.6	1.2

[33] For Hawaii, the high fire death rate is attributed to 100 confirmed deaths resulting from the wildfires on the island of Maui in August 2023 (National Interagency Coordination Center Wildland Fire Summary and Statistics Annual Report 2023).

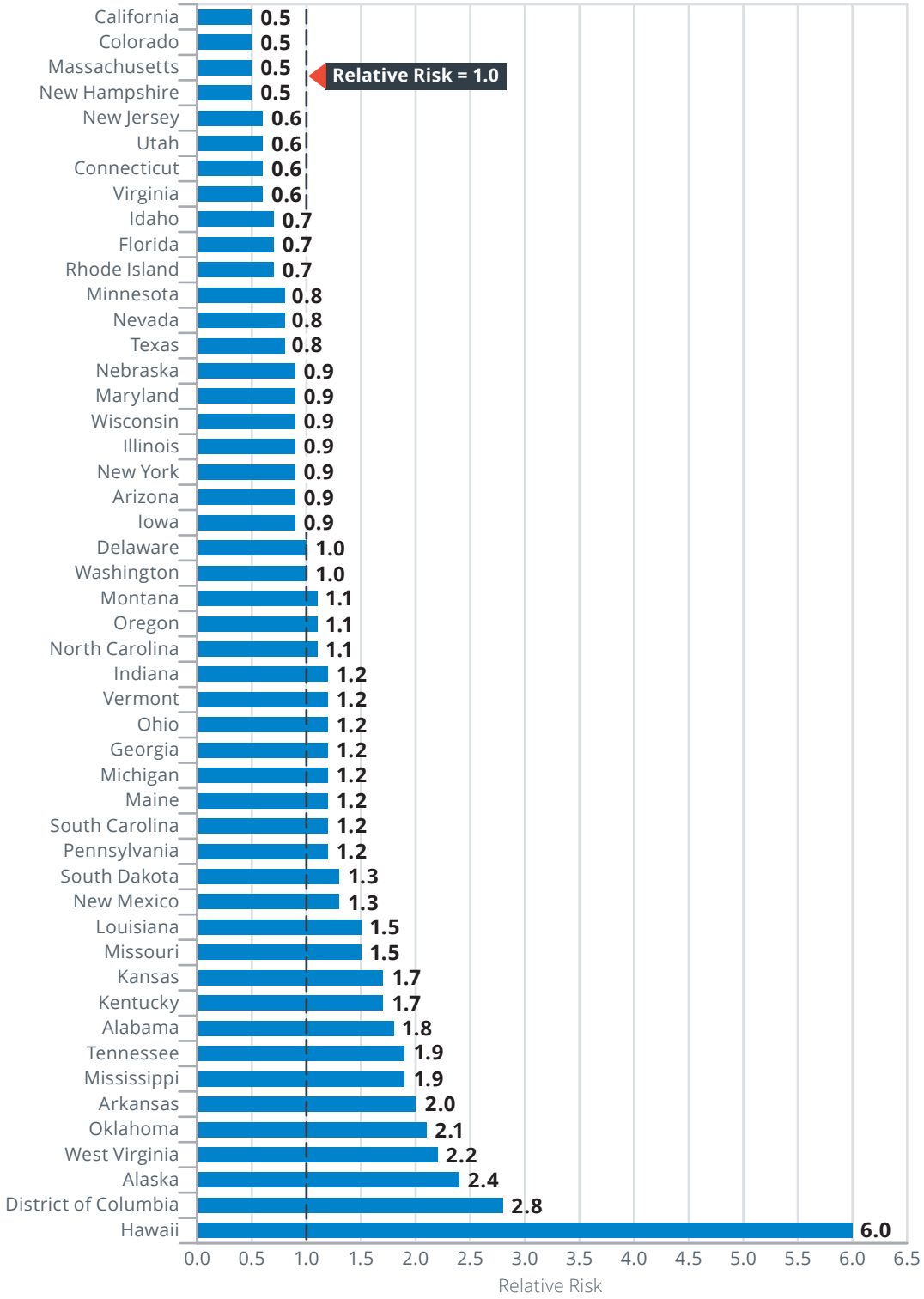
Table 2. Fire deaths, rates and relative risk by state (2023) — continued

State of occurrence	Fire deaths	Fire death rate per million population (crude rate)	Relative risk
Minnesota	59	10.3	0.8
Mississippi	74	25.2	1.9
Missouri	121	19.5	1.5
Montana**	16	14.1	1.1
Nebraska	22	11.1	0.9
Nevada	34	10.6	0.8
New Hampshire**	10	7.1	0.5
New Jersey	68	7.3	0.6
New Mexico	37	17.5	1.3
New York	231	11.8	0.9
North Carolina	156	14.4	1.1
North Dakota*	*	*	*
Ohio	183	15.5	1.2
Oklahoma	113	27.9	2.1
Oregon	60	14.2	1.1
Pennsylvania	208	16.0	1.2
Rhode Island**	10	9.1	0.7
South Carolina	86	16.0	1.2
South Dakota**	16	17.4	1.3
Tennessee	176	24.7	1.9
Texas	327	10.7	0.8
Utah	26	7.6	0.6
Vermont**	10	15.4	1.2
Virginia	68	7.8	0.6
Washington	103	13.2	1.0
West Virginia	50	28.2	2.2
Wisconsin	68	11.5	0.9
Wyoming*	*	*	*
United States	4,371	13.1	1.0

* Indicates states where fire death rates and relative risk were not computed due to very small numbers of fire deaths (fewer than 10 deaths).

** Indicates fire death rates should be used with caution due to small numbers of deaths. Per the NCHS, National Vital Statistics Reports, Volume 60, Number 4, "Deaths: Preliminary data for 2010," a rate or percentage is based on at least 20 deaths. Rates based on fewer than 20 deaths are considered highly variable.

Figure 26. Rank order of states by relative risk of civilian fire death (2023)



Source: 2023 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program and U.S. Census Bureau population estimates.

Note: Relative risk is not shown for North Dakota and Wyoming due to small numbers of fire deaths (fewer than 10).

Injuries

According to the NFPA, there were an estimated 13,350 civilian fire injuries in 2023. This section examines fire injuries, highlighting how the risk of injury differs from the risk of death in fires. While older adults are more likely to suffer fatal outcomes due to cognitive and mobility limitations, fire injuries are most common among adults ages 25 to 64. Understanding these differences is essential for targeting prevention efforts and reducing fire-related harm across all age groups.

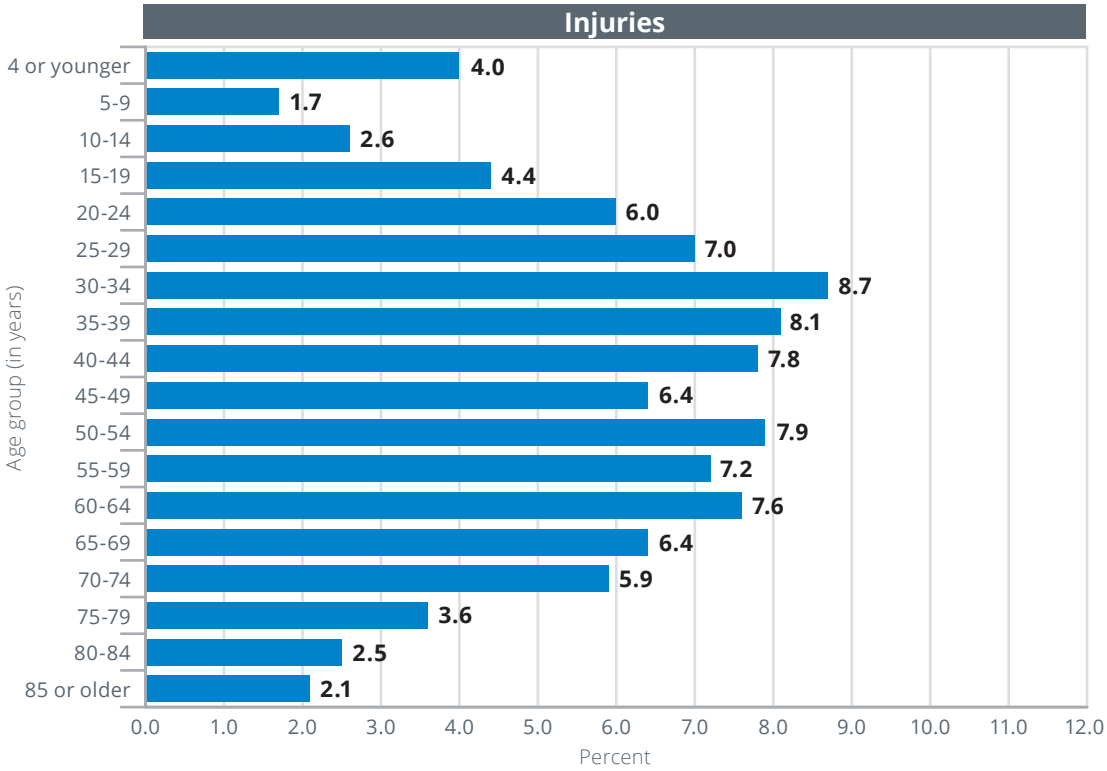
Age

Figures 27 and 28 present the percentage and rate of fire injuries by age group in 2023. Children under age 15 accounted for 8% of fire injuries, while older adults (aged 65 and older) represented 21%. The majority of fire-related injuries occurred among adults aged 25 to 64, who comprised 61% of all injuries (Figure 27). Adults aged 25 and older had higher fire injury rates than the overall population average of 39.9 injuries per million. Notably, adults aged 50 to 54 and 70 to 74 experienced the highest injury rates with 51 injuries per million population. Injury rates were below average for children and teenagers under age 19, as well as for young adults aged 20 to 24 (Figure 28).

In 2023, adults aged 25 and older faced a greater risk of fire injury than the general population (Figure 28), with the highest risk observed among those aged 50 to 54 and 70 to 74. The risk of injury was lowest for younger age groups. Since 2017, the risk of fire injury for adults aged 65 and older has increased, and as the older adult population continues to grow, fire injuries and deaths among this group are expected to rise.[34] Therefore, fire injury prevention efforts should focus on adults aged 25 and older, with particular emphasis on those aged 65 and older, who have shown the greatest increase in risk.

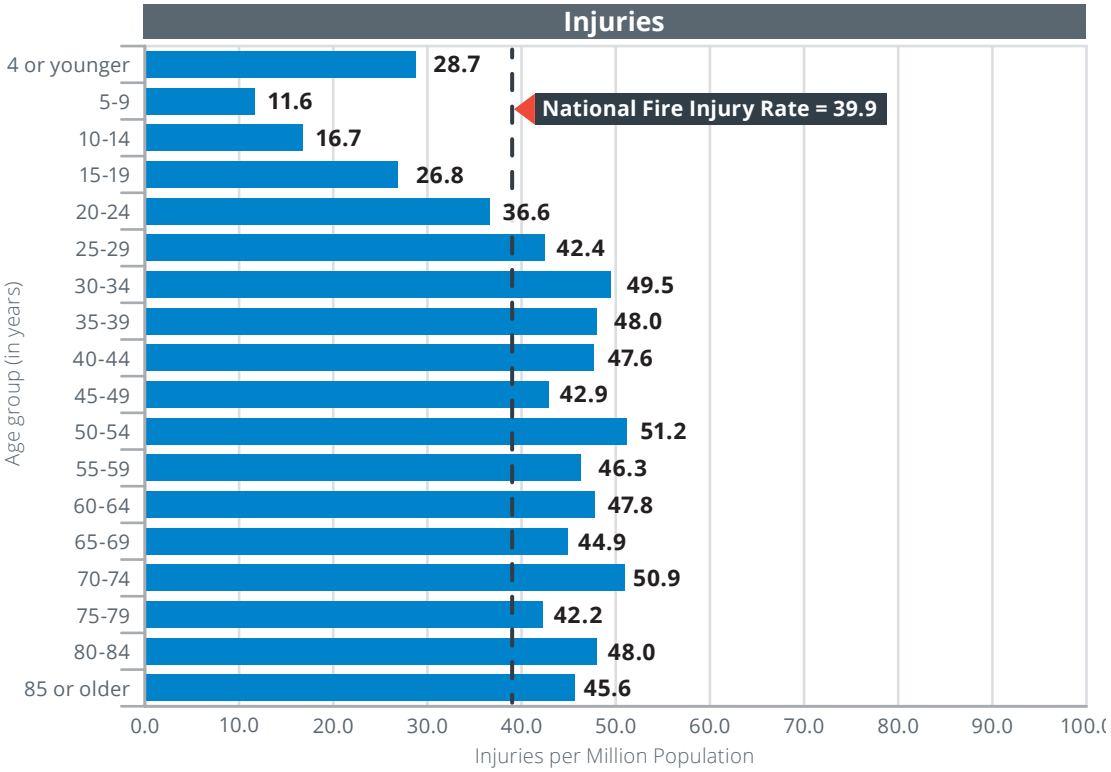
[34] For Hawaii, the high fire death rate is attributed to 100 confirmed deaths resulting from the wildfires on the island of Maui in August 2023 (National Interagency Coordination Center Wildland Fire Summary and Statistics Annual Report 2023).

Figure 27. Percent of fire injuries by age group (2023)



Source: NFIRS.
Note: Data has been adjusted to account for unknown or unspecified ages.

Figure 28. Fire injury rates by age group (2023)



Sources: NFIRS, NFPA and U.S. Census Bureau.
Note: Data has been adjusted to account for unknown or unspecified ages.

Sex

The male-to-female ratio for fire injuries in 2023 was similar to that for fire deaths, though the difference was slightly smaller. Men accounted for 60% of fire injuries, while women accounted for 40%, as shown in Table 4.

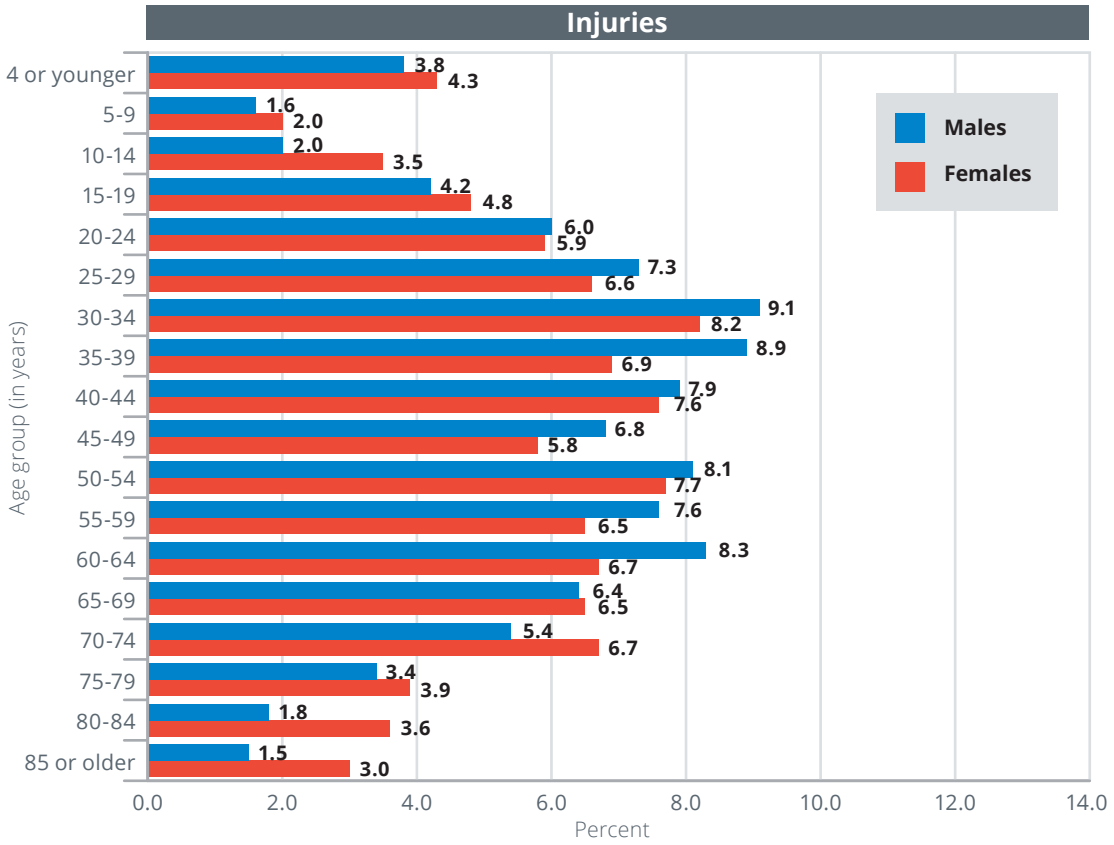
Table 4. Percent of fire injuries by sex (2023)

Casualty type	Males (percent)	Females (percent)
Injuries	60.0	40.0

Source: NFIRS.

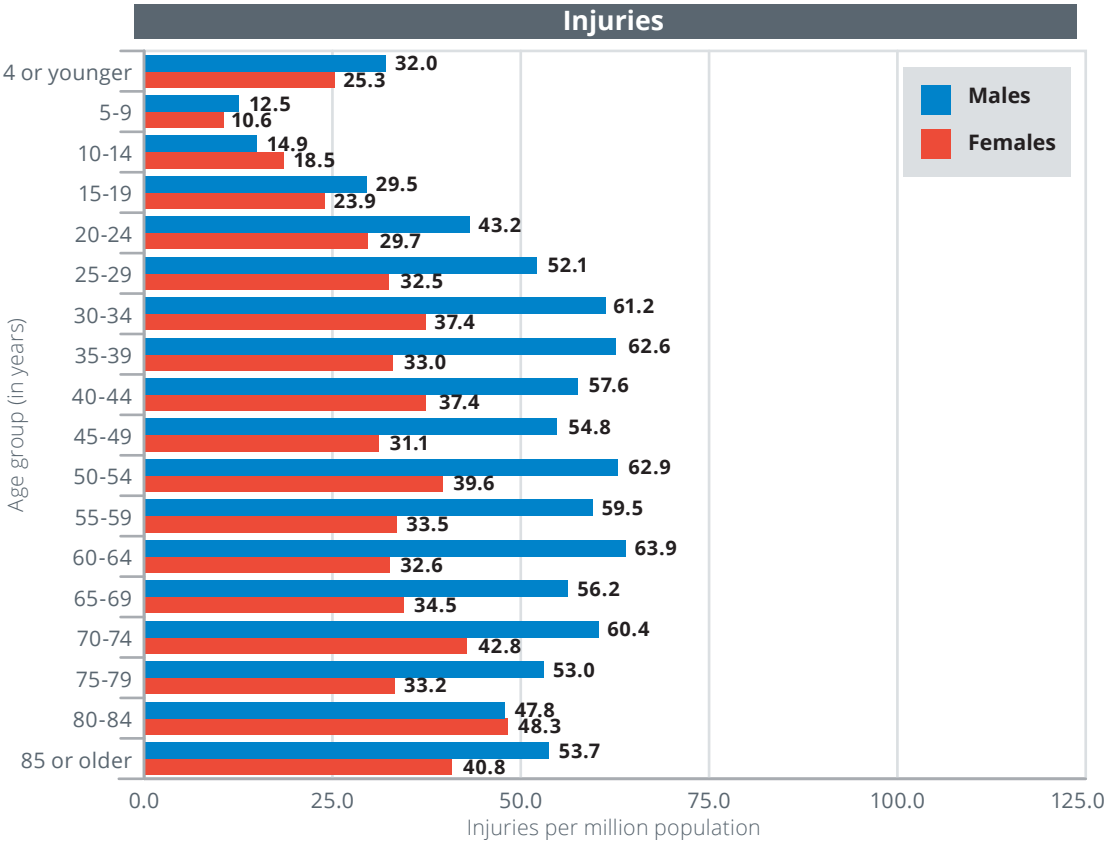
Figures 29 and 30 show the distribution and rates of fire injuries by age and sex. The age distribution of fire injuries differed between males and females: males aged 25 to 64 experienced a higher proportion of injuries than females in the same age group, while older adult females had more injuries than older adult males (Figure 28). Across nearly all age groups — except for children aged 10 to 14 and adults aged 80 to 84 — males had a significantly higher fire injury rate per million population than females (Figure 29).

Figure 29. Percent of fire injuries by age group and sex (2023)



Source: NFIRS.
Note: Data has been adjusted to account for unknown or unspecified ages. Totals may not add up to 100% due to rounding.

Figure 30. Fire injury rates by age group and sex (2023)



Sources: NFIRS, NFPA and U.S. Census Bureau.
Note: Data has been adjusted to account for unknown or unspecified ages.

Moving forward

Based on the analysis in this report, the USFA presents the following calls to action for state, local, tribal and territorial (SLTT) partners to help reduce the impact of fire in the United States. Over the past decade, fire incidents, deaths and property losses have increased even as injuries have declined. The data points to priority areas for action, including wider use of residential sprinklers, better protection of older adults at home, stronger prevention of outside and wildland fires and directing resources to the highest-risk states and communities. By improving prevention efforts and strengthening fire data reporting, particularly through the National Emergency Response Information System (NERIS), stakeholders can better understand local risks and implement solutions that save lives and reduce losses.

1. Enhance life safety through residential sprinklers

SLTT governments should consider expanding adoption and enforcement of up-to-date model codes and ordinances that require automatic fire sprinklers in new one- and two-family homes and other residential occupancies, particularly in high-risk communities. From 2014 to 2023, residential building fires decreased while deaths and dollar losses increased, yet multifamily dwellings, where sprinklers are more commonly required by

code, experienced decreases in fires, deaths and injuries despite higher property values. This pattern indicates that wider use of residential sprinklers can help break the link between fires, fatalities and high dollar losses and should be a key strategy in long-term community risk reduction.

2. **Prioritize older adults and cooking fires in home fire safety efforts**

   Fire departments and emergency management partners should focus their prevention programs on adults aged 55 and older and on cooking fires in one- and two-family homes. This includes promoting installation and maintenance of smoke alarms, safer cooking practices, routine checks of heating and electrical systems and tailored home fire escape planning for older adults, who accounted for a large share of fire deaths in 2023.

3. **Target high-risk communities with focused prevention and enforcement**

   All SLTT partners should increase fire prevention, education and enforcement efforts, especially those with communities with a higher risk of fire deaths. States with higher numbers of fire deaths and fire death rates above the national average should use their own data to identify and prioritize high-risk communities for targeted outreach, stronger adoption and enforcement of fire codes and wider use of proven measures, such as smoke alarms and residential sprinklers. Focusing efforts where risk is highest can help drive down deaths before the next reporting cycle.

4. **Strengthen prevention for outside and wildland fires**

   SLTT partners, especially those with significant WUI, should expand outside and wildland fire prevention by promoting defensible space around homes, clearing dry vegetation, supporting development and implementation of community wildfire protection plans and enforcing or publicizing burn restrictions and safe burning practices so small fires do not become deadly or high-loss events.

5. **Improve fire data reporting and use it to drive local decisions**

   Authorities having jurisdiction with the responsibility for incident reporting should improve the completeness and accuracy of incident reporting, particularly as participation in the NERIS grows. By capturing better cause and outcome data, SLTT partners can analyze local trends, design and adjust prevention programs and more effectively direct resources to the people and places at greatest risk.

By acting on these recommendations, communities, agencies and individuals can make measurable progress in reducing fire deaths, injuries and property losses nationwide. Together, focused prevention, improved data and targeted outreach will help build safer, more resilient communities for all Americans.

Conclusion

This 21st edition of Fire in the United States provides a comprehensive analysis of national fire trends, highlighting rising fire deaths and property losses, particularly in residential buildings. By offering actionable insights and supporting targeted prevention strategies, this report fulfills the USFA's mission to "support and strengthen fire and emergency medical services and stakeholders in preparing for, preventing, mitigating, and responding to all hazards," thereby enhancing safety nationwide.

The findings emphasize the need for SLTT partners to expand the use of residential fire sprinklers, strengthen code enforcement and prioritize prevention programs for vulnerable populations, especially older adults. The report also identifies the critical role of addressing cooking fires, improving home safety practices and conducting regular maintenance of heating and electrical systems. Furthermore, it calls for targeted outreach and enforcement in states and communities with disproportionately high fire death rates and urges enhanced prevention efforts for outside and wildland fires through defensible space and community wildfire protection plans. Improving fire data reporting, particularly through the NERIS, is essential for understanding local risks and directing resources effectively. By implementing these recommendations, stakeholders can drive measurable reductions in fire deaths, injuries and property losses, ultimately fostering safer, more resilient communities across the United States.

Data Sources and Methodology

Data sources

The U.S. Fire Administration's (USFA's) data analyses are based primarily on the National Fire Incident Reporting System's (NFIRS's) data but use other sources as well.[35] Summary estimates for fires, deaths, injuries and dollar loss are from the National Fire Protection Association's (NFPA's) annual survey of fire departments.[36] Other data sources used by the USFA include the 2023 National Center for Health Statistics (NCHS) mortality data[37] as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program, resident population estimates from the U.S. Census Bureau, inflation adjustments from the Bureau of Labor Statistics' Consumer Price Index (CPI) and state statistics from state fire marshals' offices or their equivalents. Because the NCHS mortality data are based on a census or enumeration of deaths based on death certificates rather than an estimate, they are used as the primary source for the computation of fire death rates and relative risk. The most current year available for the NCHS mortality data is 2023. Please note that, for consistency, national trend data are based on the NFPA survey estimates, not the NCHS mortality data.

The USFA gratefully acknowledges the use of the data and information provided by these groups. Data sources are cited for each graph and table.

National Fire Incident Reporting System

The NFIRS was established in 1975 as one of the first programs of the National Fire Prevention and Control Administration, which later became the USFA. The basic concept of the NFIRS has not changed since the system's inception. All states and all fire departments within them have been invited to participate on a voluntary basis. Participating fire departments collect a common core of information on an incident and any casualties that ensue by using a common set of definitions. NFIRS data are collected electronically through third-party software, the reporting department's own system or by direct data entry with fire departments using the NFIRS application. Local agencies forward the completed NFIRS modules to the state agency responsible for NFIRS data. The state agency combines the information with data from other fire departments into a statewide database and then transmits the data to the National Fire Data Center (NFDC) at the USFA. Data on individual incidents and casualties are preserved incident by incident at local, state and national levels. Once limited to fire incidents only, the NFIRS encompasses all incidents to which fire departments respond: fire, emergency medical services (EMS), hazardous materials or hazmat, and the like.

[35] NFIRS data from the PDR files are used for the analyses throughout this report.
[36] The NFPA summary estimates are used for the overall U.S. fire losses; for fire losses from vehicle, outside and other fires; and as the basis for estimates of residential and nonresidential building fires. The alternative approach for these summary estimates is to use the relative percentage of fires (or other loss measures) from the NFIRS and scale up (multiply by) to the NFPA estimate of total fires. The results would be somewhat different from those based on the NFPA subtotals. These differences are discussed in the section Differences Between the National Fire Incident Reporting System Data and the National Fire Protection Association Survey Data. Better estimates of fire loss measures will not be available from the NFIRS until a more robust method of estimation is developed.
[37] The NCHS data provide additional details not available from the NFPA survey: state of fire death occurrence, age, sex and race.

From an initial six states in 1976, the NFIRS has grown in both participation and use. Over the life of the system, all 50 states, the District of Columbia and more than 40 major metropolitan areas have reported to the NFIRS. About 22,695 fire departments (77% of all fire departments nationwide[38]) reported to the NFIRS in 2023 and are captured in the 2023 NFIRS Public Data Release (PDR).[39] In 2023, these fire departments reported over 33,100,000 runs or responses to all incidents, including 1,285,550 fire runs in 2023.[40] The NFIRS is the world's largest collection of incidents to which fire departments respond.[41]

Figure 31 shows the growth in the number of fire departments reporting fire responses in the NFIRS over the last 44 years from 1980 to 2023.[42] Between 1985 and 1999, the level of reporting remained relatively constant: A few states came in or left the system each year, and at least 39 states reported to the NFIRS. Most years also included participation from the District of Columbia. The number of reporting fire departments within the states remained relatively constant as well, with a slight dip in participation during the system migration from Version 4.1 to 5.0 in 1999. In 2000, the number of states increased to 43, and fire department participation began to bounce back from the Version 5.0 transition. State and fire department participation began steadily increasing. In 2003, the NFIRS reached a milestone with participation by all 50 states. The following year, the NFIRS achieved another significant goal: The NFIRS not only achieved the national goal of 100% state participation, including the District of Columbia, but also for the first time, the Native American tribal authorities submitted data.

The NFIRS continued to grow and mature. By 2007, a new level of participation had been achieved: All 50 states, the District of Columbia, Native American tribal authorities, Northern Mariana Islands and Puerto Rico all participated in the NFIRS for a total of 54 state, district, tribal authority and commonwealth entities.

From 2009 to 2014, the level of participation remained relatively constant. From 2015 to 2019, the NFIRS experienced the most participation, with about 22,000 departments reporting annually — the highest number of departments reporting fires over the life of the system. Over the 10 years, from 2014 to 2023, data were submitted from all 50 states, the District of Columbia and the Native American tribal authorities.[43] Although fire departments in the Northern Mariana Islands no longer report incident data to the NFIRS, the USFA continues to

[38] For 2020, the NFPA estimated that there were 29,452 fire departments in the U.S. Source: NFPA, U.S. Fire Department Profile 2020, https://www.nfpa.org/News-and-Research/Data-research-and-tools/Emergency-Responders/US-fire-department-profile, September 2022.
[39] The 22,695 fire departments reflect only those departments submitting responses that were included in the 2023 NFIRS PDR file. Only NFIRS valid and released incidents were included in the PDR.
[40] The terminology "runs or responses" does not reflect single incidents but can include mutual-aid responses to the same incident.
[41] USFA, "About NFIRS," https://www.usfa.fema.gov/nfirs/about/.
[42] Figure 1 reflects fire departments that reported fire responses (includes mutual aid and automatic aid given); all other incident types were excluded from this figure.
[43] For 2021, only 96 incidents from the District of Columbia's Fire and EMS Department were included on the NFIRS PDR file due to an issue in the department's third-party software program. The issue was resolved as the D.C. later submitted their calendar year 2021 data to the NFIRS production database and data warehouse (DW).

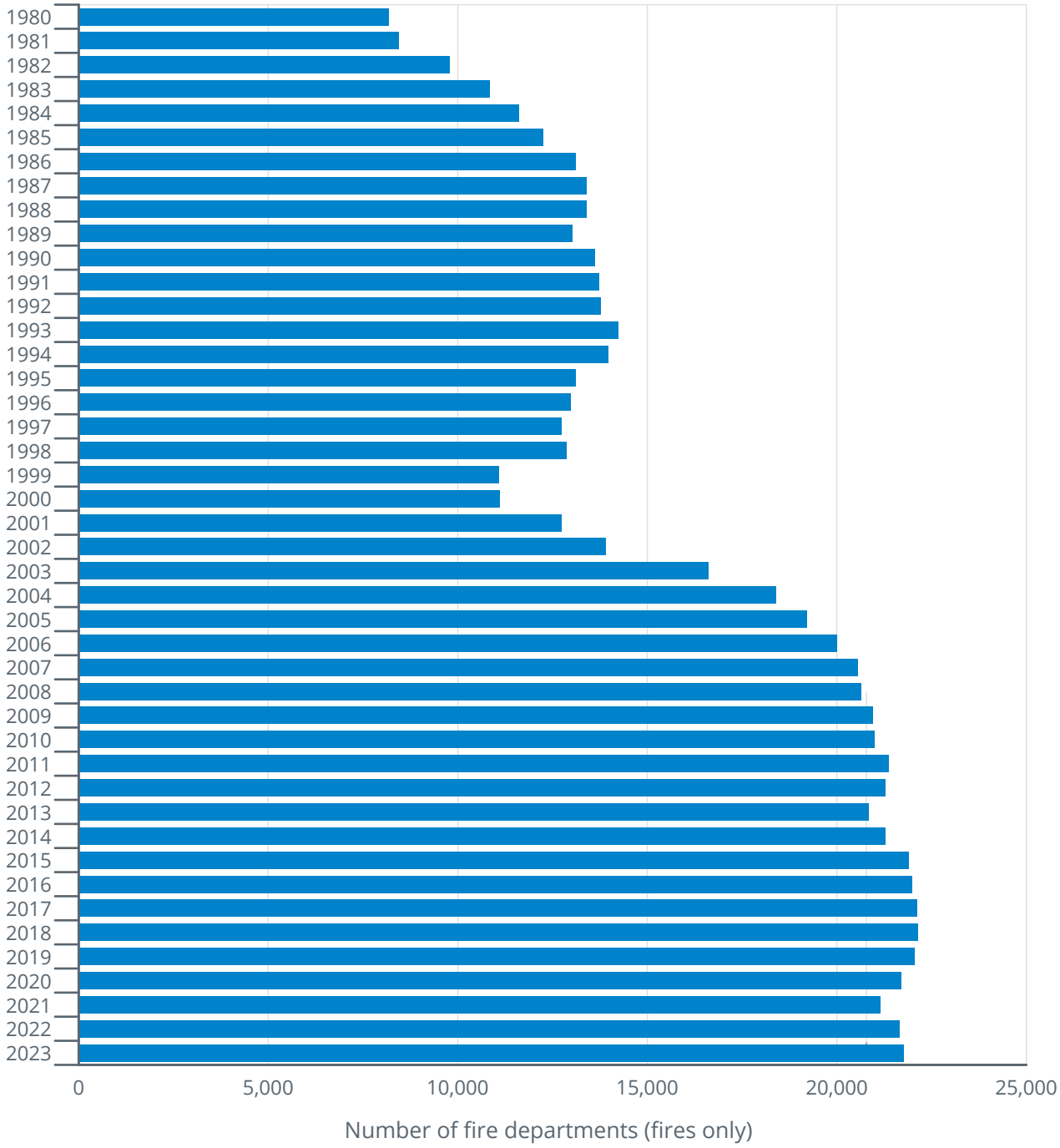
work with the U.S. territories to encourage participation. For the 10 years examined, American Samoa reported incidents in 2018, 2019 and 2023; Puerto Rico reported incidents in 2022 and 2023.[44] In 2023, the most recent year of data available, 21,767 fire departments reported fires to the NFIRS. Across participating entities, 74% of the estimated fire departments in the U.S. reported fires to the NFIRS in 2023.[45] With nearly 75% of all fire departments nationwide reporting fires to the NFIRS, the reporting departments represent a very large dataset that enables the USFA to make reasonable estimates of various facets of the fire problem. Although some states do require their departments to participate in the state system, participation in the NFIRS is voluntary. However, if a fire department is a recipient of an Assistance to Firefighters Grant (AFG), participation is required.[46]

[44] Although American Samoa and Puerto Rico reported some incidents to the NFIRS for the years noted, the numbers of reported incidents were limited and did not reflect full reporting from these territories. For these reasons, the USFA excluded these data from all analyses.

[45] For 2020, the NFPA estimated that there were 29,452 fire departments in the U.S. Source: NFPA. (2022). U.S. fire department profile 2020. https://www.nfpa.org/education-and-research/research/nfpa-research/fire-statistical-reports/us-fire-department-profile.

[46] From the fiscal year (FY) 2023 AFG Notice of Funding Opportunity (NOFO) — while NFIRS reporting is strongly encouraged, NFIRS reporting is not a requirement to apply for or be awarded a grant within the AFG Program. However, fire departments that receive funding under this program must agree to provide information to the NFIRS for the period covered by the assistance. If a recipient does not currently participate in the NFIRS and does not have the capacity to report at the time of the award, that recipient must agree to provide information to the system for a 12-month period commencing as soon as possible after it develops the capacity to report. Capacity to report to the NFIRS must be established prior to the termination of the 24-month performance period. To be compliant and close out the grant, the grantee may be asked by the Federal Emergency Management Agency (FEMA) to provide proof of compliance in reporting to the NFIRS. Any grantee that stops reporting to the NFIRS during the grant's period of performance is subject to having the award(s) modified or withdrawn. See the FY 2023 AFG NOFO at https://www.fema.gov/sites/default/files/documents/fema_gpd-fy-2023-afg-notice-of-funding-opportunity.pdf.

Figure 31. Number of fire departments reporting fire responses in the National Fire Incident Reporting System (1980-2023)



Source: NFIRS.

Notes: 1. 1999 to 2008 includes reporting from NFIRS 4.1 and NFIRS 5.0; 2009 and later only includes reporting from NFIRS 5.0.
2. Includes fire departments that reported mutual and automatic aid given at fire incidents.

Corresponding to increased participation, the numbers of fires, deaths and injuries, as well as estimates of dollar loss reported to the NFIRS, have also grown. An estimated 73% of all U.S. fires to which fire departments responded in 2023 were captured in the NFIRS.[47]

There are, of course, many problems with assembling a real-world database, and the NFIRS is no exception. Although the NFIRS does not represent 100% of incidents reported to fire departments each year, the enormous dataset and strong efforts by the fire service result in a huge amount of useful information. Because of advances in computer technology and data collection techniques over the past 45 years and improvements suggested by participants, the NFIRS has been revised periodically. The latest revision, NFIRS 5.0, became operational in January 1999.

NFIRS 5.0 captures information on all incidents, not just fires, to which a fire department responds. NFIRS 5.0 provides 11 modules that recognize the increasingly diverse activities of fire departments today. Together, these modules contain 567 data elements or fields.

The Basic Module is the main module, which is completed for every incident. The other modules are filled out, when appropriate, to provide additional information on an incident. All 11 modules are listed below:

Module	Description
Basic Module	General information for each incident
Fire Module	Fire incident information
Structure Fire Module	Information on structure fires
Civilian Fire Casualty Module	Fire-related injuries or deaths to civilians
Fire Service Casualty Module	Injuries or deaths to firefighters
EMS Module	Medical incidents
Hazardous Materials Module	Hazardous materials incidents
Wildland Fire Module	Wildland or vegetation fires
Apparatus/Resources Module	Apparatus-specific information
Personnel Module	Personnel associated with apparatus
Arson Module	Intentionally set fire information

Data from the modules are grouped together each calendar year to create the PDR files in carat-delimited text (.txt) format, which are then released annually into the public domain. These files can be read using SQL, Microsoft Access or statistical software packages such as R, SAS or SPSS. Microsoft Excel is not recommended as it does not have the capability to support very large datasets and will result in the truncation of data that exceed one million rows. For NFIRS data submitted prior to 2012, the PDR files were released in dBASE (.dbf) format.

[47] For 2023, the NFPA published that there were an estimated 1,389,000 fires. The 73% excludes mutual-aid fire incidents to avoid counting the same fire more than once.

The PDR files consist of a subset of the data fields contained within the NFIRS national production database. The Apparatus/Resources and Personnel Modules, as well as the Remarks field and fields pertaining to special studies, are excluded from the PDR because they are intended for local fire department use and the PDR dataset's main utility is intended for national analyses. In addition, fields that contain sensitive or personally identifiable information, such as names (e.g., Person/Entity Involved, Property Owner), are excluded from the PDR for privacy reasons. It is also important to note that although the U.S. Department of Defense (DOD) fire departments report to the NFIRS, the DOD does not release their incident data to the USFA at the national level and it is not included on the PDR files.

The data structure of the PDR files has been considerably simplified from the production database's schema for ease of use. The NFIRS PDR files from 1980 to 1998 include only fires. From 1999 to 2003, the PDR files include all incidents. The PDR files from 2004 to 2013, however, include only fire and hazmat incidents and their related data tables. Beginning with the 2014 NFIRS data, two separate PDR files are available — the fire and hazmat incident PDR file and the full, all-incident PDR file. Downloadable NFIRS PDR files from 1980 to 2023 are available on OpenFEMA at https://www.fema.gov/about/openfema/data-sets/fema-usfa-nfirs-annual-data.

In its basic form, the NFIRS PDR files have a relational data structure where data from each incident module are represented by a row in a data table. The primary tables (basic incident and incident address) contain most of the Basic Module data. Every NFIRS incident has a record in the BasicIncident.txt file and, depending on the type of incident or the circumstances of the event, may have records in additional tables. All other data tables (e.g., fire incident, civilian fire casualty, etc.) have records that are linked to the basic incident table through unique incident identification key fields (e.g., STATE, fire department identification (FDID), INC_DATE, INC_NO and EXP_NO). Beginning in 2019, the PDR files include a preset identification key (INCIDENT_KEY) that is a single field that uniquely identifies each record. As a result, the data can be imported directly into an existing relational database with established referential integrity.

Some module data are split across several tables (e.g., basic incident, incident address and basic aid tables), or one table (fire incident) combines data from two modules (i.e., Fire Module and Structure Fire Module). Some tables, such as fire incident, will only have one record for each relevant incident in the basic incident table, while tables such as civilian fire casualty may have several records linked to a single incident in the case where multiple injuries and/or deaths occur in the same incident.

State participation is voluntary, and each state specifies NFIRS reporting requirements for its fire departments. States have the flexibility to adapt their state reporting systems to their specific needs. As a result, the design of a state's data collection system varies from state to state. NFIRS 5.0 was designed so that data from state systems can be converted to a single format that is used at the national level to aggregate and store NFIRS data.

All data in the system, regardless of the entry mechanism, are in NFIRS 5.0 format; non-NFIRS 5.0 data are converted to the 5.0 format. The proportion of native 5.0 data steadily increased since the introduction of NFIRS 5.0 in 1999 (Table 6). This proportion rose to 99% in the 2008 data. By Jan. 1, 2009, NFIRS 4.1 data were no longer accepted by the system. Prior to 2009, NFIRS 4.1 data in its converted form was accepted by the system; however, the USFA only used native 5.0 data in its NFIRS-based analyses.

Table 6. National Fire Incident Reporting System fire incident data reporting by version (percent)

Year	Percent of NFIRS 4.1 (converted to 5.0 format)	Percent of Native NFIRS 5.0
1999	92	8
2000	77	23
2001	48	52
2002	31	69
2003	19	81
2004	11	89
2005	5	95
2006	5	95
2007	2	98
2008	1	99
2009	0	100

Source: NFIRS.

Methodology

An attempt has been made to keep the data presentation and analysis as straightforward as possible. It is also the desire of the USFA to make the data analyses widely accessible to many different users, so it avoids unnecessarily complex methodology. The term "fire casualties" refers to deaths and injuries; the term "fire losses" collectively includes fire casualties and dollar loss.

Analytic issues and considerations

There are several long-standing issues regarding how to analyze NFIRS data when they are neither as complete nor as accurate as desired. The sections that follow discuss how the analyses address these and other issues.

Moreover, the USFA developed the National Fire Incident Reporting System Version 5.0 Fire Data Analysis Guidelines and Issues document to address some of these issues and discuss analytic considerations and methods of analyzing NFIRS fire incident data.[48] Topics include the NFIRS 5.0 data structure, general quality assurance issues and definitions and parameters of common fire analyses (e.g., residential building fires or casualties), including the methodology for determining structure fire causes. The methods, techniques and considerations discussed are those used by USFA analysts, and they do not necessarily reflect methods, techniques and considerations used by fire data analysts from other agencies and organizations. USFA analysts make every attempt to follow standard operating procedures for analyzing and presenting fire data to ensure that the data reflect accurate, reproducible and transparent analyses.[49] NFIRS data partners may (and do) employ their own methods for analyzing the data and may make differing assumptions when encountering data issues.

Representativeness of the sample

The percentage of fire departments participating in the NFIRS varies from state to state, with some states not participating at all in some years. To the best that the USFA can determine, however, the distribution of participants is reasonably representative of the entire nation, even though the sample is not random. The dataset is so large — on average from 2014 to 2023, about 66% of all fires — and reasonably distributed geographically and by size of community that it is used as input to develop national estimates.

It is important to note that the USFA, along with other federal agencies, does not use NFIRS data to derive state-level fire estimates. The NFIRS data are used to show the fire problem at the national level. Because prior findings in the USFA's NFIRS representativeness studies showed high reporting rates, fire departments across the country appear to be well represented in the NFIRS.[50]

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[48] The National Fire Incident Reporting System Version 5.0 Fire Data Analysis Guidelines and Issues, July 2011, is available at https://www.usfa.fema.gov/downloads/pdf/nfirs/nfirs_data_analysis_guidelines_issues.pdf.

[49] American Statistical Association, Prepared by the Committee on Professional Ethics of the American Statistical Association, February 2022, "Ethical Guidelines for Statistical Practice" (https://www.amstat.org/docs/default-source/amstat-documents/ethicalguidelines.pdf).

[50] Prior NFIRS representativeness studies are described in USFA's Fire in the United States, 2008-2017, 20th Edition, November 2019, Representativeness of the Sample (p. 76) https://www.usfa.fema.gov/downloads/pdf/publications/fius20th.pdf.

In addition, most of the NFIRS data exhibit stability from one year to the next, without radical changes. Results based on the full dataset are generally like those based on part of the data, another indication of data reliability. Although improvements could be made — the individual incident reports could and should be filled out more completely and more accurately than they are today (as can be said about most real-world data collections as large as the NFIRS), and all participating departments should have the same reporting requirements — the overall portrayal is a reasonably accurate description of the fire situation in the U.S.

National estimates

National estimates are estimates of the number of fire losses (i.e., fires, deaths, injuries and dollar loss) associated with a subset of the fire data.[51] High-level summarized national estimates of the numbers for fires, deaths, injuries and dollar loss are based on the NFPA's annual Survey of Fire Departments for U.S. Fire Experience.[52] With the exception of the NFPA estimates for total fires; structure fires (i.e., residential and nonresidential); and vehicle, outside and other fires; all other estimates are scaled-up national estimates or percentages, not just the raw totals from the NFIRS. Because the NFIRS 5.0 data are not based on a statistically selected sample and do not represent a "complete" census of fire incidents, the raw counts of NFIRS data must be scaled up to national estimates.[53] These estimates are based on a method of apportioning the NFPA estimates for total fires, structure fires, vehicle fires, outside fires and other fires.[54] Generally speaking, the national estimates are derived by computing a percentage of fires, deaths, injuries or dollar loss in a particular NFIRS category and multiplying it by the corresponding total estimate from the NFPA annual survey.[55] For example, the national estimate for the number of injuries by age group used in the calculation for the fire injury rate per million population was computed by taking the percentage of NFIRS fire injuries (with known age) and multiplying it by the estimated total number of fire injuries from the NFPA survey. This methodology is the accepted practice of national fire data analysts.

Ideally, one would like to have all the data come from one consistent data source. Because the "residential population protected" is not reported to the NFIRS by many fire departments, and the reliability of that data element is suspect in many other cases, especially where a county or other jurisdiction is served by several fire departments that each report their

[51] An *estimate* approximates a count or total.
[52] For information on the NFPA's survey methodology, see the NFPA's report "Fire Loss in the U.S. During 2023," November 2024: https://www.nfpa.org/education-and-research/research/nfpa-research/fire-statistical-reports/fire-loss-in-the-united-states.
[53] For an explanation of the difference between raw fire incident data and estimated fire incident data, see the USFA NFIRSGram "The Difference Between Reported and Estimated Fire Data," https://www.usfa.fema.gov/nfirs/coding-help/reported-versus-estimates/.
[54] National estimates are based on "The National Estimates Approach to U.S. Fire Statistics," Hall, J., & Harwood, B. (1989, May), *Fire Technology, 25*(2), 99–113.
[55] The NFPA summary estimates are used for the overall U.S. fire losses; for fire losses from structure, vehicle, outside and other fires; and as the basis for the USFA's estimates of residential and nonresidential building fires. The alternative approach for these summary numbers is to use the relative percentage of fires (or other loss measures) from the NFIRS and scale up (multiply by) to the NFPA estimate of total fires.

population protected independently, this data element was not used. Instead, extrapolations of the NFIRS sample to national estimates were made using the NFPA survey for the gross totals of fires, deaths, injuries and dollar loss.

One problem with this approach is that the proportions of fires and fire losses differ between the large NFIRS sample and the NFPA survey sample. Nonetheless, to be consistent with approaches being used by other fire data analysts, the NFPA estimates of fires, deaths, injuries and dollar loss are used as a starting point. The details of the fire problem below this level are based on proportions from the NFIRS. Because the proportions of fires and fire losses differ between the NFIRS and the NFPA estimates, from time to time, this approach leads to minor inconsistencies. These inconsistencies will remain until all estimates can be derived from NFIRS data alone.

Data quality

Data quality is an area of great importance. The following three criteria are used when monitoring data in the NFIRS during the year: The data are complete, the data are accurate, and the data are current. These criteria are monitored by creating reports from the database in the NFIRS DW that show the number of reporting fire departments, the number of incidents by state, the number of invalid incidents and the number of unreleased incidents. The USFA provides the reports to the state NFIRS program managers and works with them to resolve any data issues. Technical assistance (e.g., telephone support) is provided to states to help address any data quality and data reporting needs.

Audits of the data are performed during the year to identify any inconsistencies. The audits focus on three criteria: gaps in reporting, critical errors in the data and outliers in the data. In particular, the USFA works closely with states to monitor the quality of data coming from third-party vendor software. The USFA assists states in monitoring vendor data quality issues or contacts vendors directly to discuss an issue at a state's request. Other data quality issues are questionable, high-dollar-loss incidents and questionable, high numbers of casualties (i.e., civilian fire and fire service). At least monthly, the USFA staff queries the database for questionable values (i.e., outliers) and contacts state- and local-level NFIRS program managers to review, verify and/or update values. The data quality steps are important to ensure that the data meet the USFA's three criteria before the data are released in the NFIRS PDR format.

The USFA published the Review and Assessment of Data Quality in the National Fire Incident Reporting System (May 2017) report. This document covered a review of the system, the many robust data-quality checks and mechanisms, which are an integral part of the NFIRS, and an assessment of the data quality both at the state level and at the data element level. The data-element assessment focused on the most common data elements used in the NFIRS data analyses. NFIRS data were reviewed from the three most recent years available at the time of the report's development (2009 to 2011). The Review and Assessment of Data Quality in the National Fire Incident Reporting System document is available at https://www.usfa.fema.gov/nfirs/data-quality/.

Unknown data entries, incomplete loss reporting and unreported data are also important considerations when assessing NFIRS data quality. These topics are discussed in more detail in the sections that follow.

Unknown entries

Unknown entries are of the highest concern for data quality. On a fraction of the incident reports or casualty reports submitted to the NFIRS, the desired information for many data elements is either reported as "unknown" or is not reported at all. The total number of unknown entries or missing (i.e., blank or null) values is often larger than some of the important subcategories. For example, 47% of fatal fires in residential buildings reported from 2021 to 2023 did not have sufficient data recorded in the NFIRS to determine fire cause. The lack of data, especially for these residential fatal fires, masks the true picture of the fire problem.

Many prevention and public education programs use the NFIRS data to target groups at risk for fires or to address critical problems. Fire officials use the data in decision-making that affects the allocation of firefighting resources. Consumer groups and litigators use the data to assess product fire incidents. When the numbers of unknown entries are large, the credibility of the data suffers. In some cases, even after the best attempts by fire investigators, the information is truly unknown. In other cases, the information reported as "unknown" in the initial NFIRS report is not updated after the fire investigation is completed. Reporting fire departments need to be more aware of the effect of incomplete data reporting and the need to update the initial NFIRS report if additional information is available after the investigation. Efforts have been undertaken at the national level to encourage fire departments to close the loop on fires after investigations are completed to fully document the fire incident.

In analyses, the unknowns should not be ignored. The approach taken by the USFA in presenting the data is to provide not only the "raw" percentages of each category but also the "adjusted" percentages computed using only those incidents for which data were provided. This calculation, in effect, distributes the fires for which the data are unknown in the same proportion as the fires for which the data are known, which may or may not be approximately right. Both the reported data and the adjusted data (if unknowns are present) are plotted on bar charts in USFA reports.

The following example illustrates distributing the fires for which the cause values are determined to be "unknown" using the cause of residential building fires distribution: Cooking was determined as the fire cause for 38.6% of reported residential building fires from 2021 to 2023; another 19.9% of these reported fires had unknown causes. Therefore, the percent of residential building fires with reported cause was 100 minus 19.9, which equals 80.1%. With the unknown causes apportioned like the known causes, the adjusted percent of cooking fires in residential buildings can then be computed as 38.6 divided by 80.1, which equals 48.2%.

Incomplete loss reporting

Although it is troublesome that insufficient data for the various NFIRS data elements can mask the true picture of the fire problem and impact the credibility of the data, the apparent nonreporting of injuries and property loss associated with many fire incidents is equally challenging. For example, there are many reported fires where the flame spread indicates damage, but property loss is not reported. It is notoriously difficult to estimate dollar loss, but an approximation is more useful than leaving the data element blank. Analysts need to be aware that this apparent lack of property-loss data affects the understanding of those fires that cause substantial loss.

Unreported fires

The NFIRS only includes fires to which the fire service responded. In some states, fires attended by state fire agencies (such as forestry) are included; in other states, they are not.

Nonreporting to the National Fire Incident Reporting System

The NFIRS includes fires from all states but does not include incidents from all fire departments within participating states. The percentage of reporting fire departments varies greatly from state to state. If the fires from the reporting departments are reasonably representative, however, this omission does not cause a problem in making useful national estimates for any but the smallest subcategories of data and some geographic analyses.

Some fire departments submit information on most, but not all, of their fires. Sometimes, the confusion is systematic, such as when no-loss cooking fires or chimney fires are not reported. Sometimes it is inadvertent, such as when incident reports are lost or accidentally not submitted. The information that is received is assumed to represent the total for the department and is extrapolated as such.

Nonreporting to the fire service

A very large number of fires are not reported to the fire service at all. Most are believed to be small fires in the home or industry that go out by themselves or are extinguished by the occupant. Special surveys of homes and businesses are needed to estimate the unreported fires.[56] No attempt is made here to estimate them. Although many fire incidents are unreported because they are small, confined and immediately extinguished, they are still fires. Even the largest fire starts small. Therefore, all fires, regardless of size, merit prevention attention and analytic investigation.

[56] Studies undertaken in the mid-1970s, mid-1980s and again in the mid-2000s on unreported residential fires indicated that a substantial number of fires are not reported to local fire departments. The 2004 to 2005 U.S. Consumer Product Safety Commission study on unreported residential fires noted that of the estimated number of fires in residences, only 3% were reported to fire departments and 97% were not. Greene, M. A., & Andres C. (2009). *2004-2005 national sample survey of unreported residential fires.* U.S. Consumer Product Safety Commission.

Structures versus buildings

NFIRS 5.0 allows for the differentiation between buildings and nonbuildings. In the NFIRS, a structure is a built object that can include platforms, tents, connective structures (e.g., bridges, fences, telephone poles) and other various structures in addition to buildings. From 2014 to 2023, analyses of NFIRS structure fires show that, in general, the majority (97%) of structure fires occurred in buildings.

Structure fires are defined by the NFIRS incident type — Incident Type 110 series (structure fires) and Incident Type 120 series (fires in mobile property used as a fixed structure).[57] These incident types are:

- 111 Building fire.
- 112 Fires in structure other than in a building.[58]
- 113 Cooking fire, confined to container.
- 114 Chimney or flue fire, confined to chimney or flue.
- 115 Incinerator overload or malfunction, fire confined.
- 116 Fuel burner/boiler malfunction, fire confined.
- 117 Commercial compactor fire, confined to rubbish.
- 118 Trash or rubbish fire, contained.
- 120 Fire in mobile property used as a fixed structure, other.
- 121 Fire in mobile home used as fixed residence.
- 122 Fire in motor home, camper, recreational vehicle.
- 123 Fire in portable building, fixed location.

As building fires are a subset of structure fires, they are defined as structure fires where the structure type is an enclosed building, or a fixed portable or mobile structure. By definition, this excludes nonbuilding structures. Previous USFA analyses demonstrated that confined structure fire incidents with full incident reporting primarily occurred in buildings. To accommodate the confined fire incident types with abbreviated incident reporting, the incident is also assumed to be a building if the structure type is not specified. In terms of the NFIRS data, building fires are therefore defined using the following criteria:

- NFIRS Version 5.0 data.
- Aid Types:
  - 1 Mutual aid received.
  - 2 Automatic aid received.
  - 5 Other aid given.

  Note: Mutual aid given and automatic aid given (Aid Types 3 and 4) were excluded to avoid counting a single incident more than once.

[57] Note that Incident Type 110 is not included. Incident Type 110 is a conversion code for NFIRS 4.1. Incident Type 110 is not a valid code for data collected in NFIRS 5.0. Incidents in the NFIRS 5.0 database with Incident Type 110 are incidents collected under the NFIRS 4.1 system that are converted to NFIRS 5.0 compatible data.
[58] Preliminary findings noted that the fires coded as Incident Type 112 appear to be in buildings. A more detailed look at these incident types is required to determine whether they were coded correctly.

- Incident Types 111 to 123 (excluding Incident Type 112):
  - 111 Building fire.
  - 113 Cooking fire, confined to container.
  - 114 Chimney or flue fire, confined to chimney or flue.
  - 115 Incinerator overload or malfunction, fire confined.
  - 116 Fuel burner/boiler malfunction, fire confined.
  - 117 Commercial compactor fire, confined to rubbish.
  - 118 Trash or rubbish fire, contained.
  - 120 Fire in mobile property used as a fixed structure, other.
  - 121 Fire in mobile home used as fixed residence.
  - 122 Fire in motor home, camper, recreational vehicle.
  - 123 Fire in portable building, fixed location.

  Notes: 1. Incident Types 113 to 118 do not specify if the structure is a building.
  2. Incident Type 112 was included in data analyses prior to 2008, as previous analyses showed that Incident Types 111 and 112 were used interchangeably. As of 2008, Incident Type 112 was excluded.

- 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.

The distinction between buildings and nonbuildings is particularly important when determining the effectiveness of engineered fire safety features, such as smoke alarms and residential sprinklers. These important components of early fire detection and automatic suppression apply to buildings and not necessarily to other types of structures. To facilitate analysis of these components and to acknowledge that prevention efforts are generally focused on buildings, the USFA separates the subset of buildings from the rest of the structures. For these reasons, the USFA focuses on producing building fire and loss estimates.

The USFA's Fire Estimate Summary series is available at https://www.usfa.fema.gov/statistics/residential-fires/ and https://www.usfa.fema.gov/statistics/nonresidential-fires/. In addition, 2003 to 2023 national estimates of residential and nonresidential building fires and losses by property use and cause, are published at https://www.usfa.fema.gov/statistics/data-sets/. Information regarding the USFA's methodology for computing national estimates of residential and nonresidential building fires and losses is published in the USFA's National Estimates Methodology for Building Fires and Losses (August 2012), which is available at https://www.usfa.fema.gov/statistics/reports/.

Computing trends

One common question is how much a particular aspect of the fire problem has changed over time. The usual response is in terms of a percent change from one year to another. In dealing with real-world data that fluctuate from year to year, a percent change from one specific year to another can be misleading. This is especially true when the beginning and ending data points are extremes, either high or low. For example, Table 7 shows that the percent change from 7,550 fire injuries in one- and two-family residential buildings in 2014 to 6,725 fire injuries in 2023 would be a decrease of 10.9%; however, if 2019 is chosen as the beginning data point (7,950 fire injuries), this change would show a substantial decrease of 15.4%. As trends in the U.S. fire problem are of interest, the USFA presents the computed best-fit linear trend line (which smooths fluctuations in the year-to-year data) and presents the change over time based on this trend line. In this example, the overall 10-year trend is a decrease in one- and two-family residential building fire injuries of 5.6%. It is important to note that trends that incorporate NFIRS data from both Version 4.1 and Version 5.0 may have subtle changes as a result of the Version 5.0 system design and not a true trend change.

Table 7. Comparison of percent change indicators

Year	One- and two-family residential building fire injuries	Best-fit linear trend	Change between 2014 and 2023	Change between 2019 and 2023
2014	7,550	7,342	7,550	
2015	7,200	7,296		
2016	6,925	7,250		
2017	6,650	7,204		
2018	7,175	7,158		
2019	7,950	7,112		7,950
2020	7,400	7,066		
2021	7,300	7,020		
2022	6,475	6,974		
2023	6,725	6,928	6,725	6,725
Percent change		-5.6	-10.9	-15.4

Source: USFA national estimates of one- and two-family residential building fire injuries.

Rounding

Percentages on each chart are rounded to one decimal point. Textual discussions cite these percentages as whole numbers. Therefore, 13.4% is rounded to 13%, and 13.5% is rounded to 14%. National estimates are rounded as follows: Fires are rounded to the nearest 100 fires, deaths to the nearest five deaths, injuries to the nearest 25 injuries and loss to the nearest million dollars.

Comparing statistics

Differences between the current NFIRS and older versions have, or may have, an effect on the analyses of fire topics. These differences, the result of both coding changes and data element design changes, required revisions to long-standing groupings and analyses. The revisions have caused some challenges when comparing current data to past data.

Data collection and reporting in NFIRS 5.0

The following are among the areas that are unique to NFIRS 5.0: abbreviated or streamlined reporting for qualified incidents, the collection of smoke alarm and automatic extinguishing system data (formerly called sprinklers), the differentiation between buildings and structures, and the cause methodology.[59] These areas have resulted in changes in overall trends, some subtle and some substantial.

Confined fires

"Confined structure fires" are typically small fire incidents that are limited in extent to specific types of equipment or objects, staying within pots, fireplaces or certain other noncombustible containers.[60] Confined structure fires rarely result in serious injury or large content loss and are expected to have no significant accompanying property loss due to flame damage.[61]

The NFIRS allows abbreviated reporting for confined structure fires, and many reporting details of these fires are not required, nor are they reported. (Not all fires limited to the object of origin are counted as confined fires.) For example, a fire contained to a chair or clothes dryer is not defined as a "confined fire" in NFIRS because of the greater potential for spread. Unlike fires in pots or chimneys, there is no container to stop the fire, even though the fire did not spread beyond the object of origin.

The limited reporting of confined, low-loss structure fires allows the fire service to capture incidents that either may have gone unreported prior to the introduction of NFIRS 5.0 or were reported, but as a nonfire incident, as little to no loss was involved.[62] Data from this reporting option for structure fires was investigated in a 2006 USFA report, Confined Structure

[59] The NFIRS 5.0 documentation at https://www.usfa.fema.gov/nfirs/documentation/ provides detailed information.

[60] In the NFIRS, a confined structure fire is defined by Incident Type codes 113 to 118. The confined structure fire incident type code descriptions are as follows: 113-Cooking fire, confined to container; 114-Chimney or flue fire, confined to chimney or flue; 115-Incinerator overload or malfunction, fire confined; 116-Fuel burner/boiler malfunction, fire confined; 117-Commercial compactor fire, confined to rubbish; and 118-Trash or rubbish fire, contained.

[61] The NFIRS distinguishes between "content" and "property" loss. Content loss includes losses to the contents of a structure due to damage by fire, smoke, water and overhaul. Property loss includes losses to the structure itself or to the property itself. For confined fires, the expectation is that the fire did not spread beyond the container (or rubbish for Incident Type code 118), and, therefore, there was no property damage (damage to the structure itself) from the flames. However, there could be property damage as a result of smoke, water and overhaul.

[62] Prior to NFIRS 5.0, some states routinely reported such nonloss fires as smoke scares. The result, from a reporting viewpoint, is that the incident was reported but not coded as a fire incident.

Fires. The addition of these fires results in increased proportions of cooking and heating fires in analyses of structure fire cause. In other analyses, the inclusion of confined fires may result in larger percentages of unknown values, as detailed reporting of fire specifics is not required. In many of the USFA's analyses, the confined fires are analyzed separately from the nonconfined fires to account for the fact that detailed reporting is not required for the confined fires. In 2023, confined structure fires accounted for 17% of all reported fires and 50% of all reported structure fires. Of the confined structure fires, 67% were no- or low-loss cooking fires (59%) and heating fires (8%).

Structure fire cause methodology

Determining cause is an important area of fire data analysis. For structure fires, the NFIRS employs a hierarchical schema that uses many different data elements to assign a cause to each incident. This schema examines the reported causal information for an incident and attempts to assign a cause value through a series of queries.

Since the introduction of NFIRS 5.0, the implementation of the cause hierarchy has resulted in a steady increase in the percentages of unknown fire causes. This increase may be due, in part, to the fact that the original cause hierarchy (described in Fire in the United States 1995-2004, 14th edition) does not apply as well to NFIRS 5.0. Causal information collected as part of NFIRS 5.0 was not incorporated in the old hierarchy. As a result, many incidents were assigned to the unknown cause category. As the hierarchy was originally designed for structures, incidents that did not fit well into the structure cause categories were also assigned to the unknown category.

Structure fires

To capture the wealth of data available in NFIRS 5.0, the USFA developed a modified version of the previous cause hierarchy for structure fires as shown in Table 8. The revised schema provides three levels of cause descriptions: a set of more detailed causes (priority cause description), a set of mid-level causes (cause description) and a set of high-level causes (general cause description). The priority cause description and the cause description existed previously as part of the original cause hierarchy but have been expanded to capture the 5.0 data.

Table 8. Three-level structure fire cause hierarchy

Priority cause description (in hierarchical order)	Cause description	General cause description
Exposure	Exposure	Exposure
Intentional	Intentional	Firesetting
Cause under investigation	Cause under investigation	Unknown
Children playing	Playing with heat source	Firesetting
Other playing		
Natural	Natural	Natural

Table 8. Three-level structure fire cause hierarchy — continued

Priority cause description (in hierarchical order)	Cause description	General cause description
Fireworks	Other heat	Flame, heat
Explosives		
Smoking	Smoking	
Heating	Heating	Equipment
Cooking	Cooking	
Air conditioning	Appliances	
Electrical distribution	Electrical malfunction	Electrical
Appliances	Appliances	Equipment
Special equipment	Other equipment	
Processing equipment		
Torches	Open flame	Flame, heat
Service equipment	Other equipment	Equipment
Vehicle, engine		
Unclassified fuel-powered equipment		
Unclassified equipment with other or unknown fuel source	Unknown	Unknown
Unclassified electrical malfunction	Electrical malfunction	Electrical
Matches, candles	Open flame	Flame, heat
Open fire		
Other open flame, spark	Other heat	
Friction, hot material		
Ember, rekindle	Open flame	
Other hot object	Other heat	
Natural condition, other	Natural	Natural
Heat source or product misuse	Other unintentional, careless	Unknown
Equipment operation deficiency	Equipment misoperation, failure	Equipment
Equipment failure, malfunction		
Trash, rubbish	Unknown	Unknown
Other unintentional	Other unintentional, careless	

Table 8. Three-level structure fire cause hierarchy — continued

Priority cause description (in hierarchical order)	Cause description	General cause description
Exposure (fire spread, other)	Exposure	Exposure
Unknown	Unknown	Unknown

Source: USFA.
Note: Fires are assigned to a cause category in the hierarchical order shown. For example, if the fire is judged to be intentionally set and a match was used to ignite it, it is classified as intentional and not open flame because intentional is higher on the list.

The causes of fires are often a complex chain of events. For USFA's analytic purposes, all NFIRS structure fires fall into one of the 16 mid-level categories of fire causes. These cause categories include determinations of intent (intentional, investigation, playing, unintentional), accidental fires (cooking, heating, smoking, etc.), natural fires, exposure fires and malfunction fires. The alternative is to present scores of detailed cause categories or scenarios, each of which would have a relatively small percentage of fires. For example, heating includes subcategories, such as misuse of portable space heaters, wood stove chimney fires and fires involving gas central heating systems. Experience has shown that the larger categories are useful for an initial presentation of the fire problem. A more detailed analysis can follow.

Fires are assigned to one of the 16 mid-level cause groupings using a hierarchy of definitions, as shown in Table 9.[63] A fire is included in the highest category into which it fits on the list. If it does not fit the top category, then the second one is considered, and if not that one, the third and so on. (See the note section in Table 8 for an example.)

Vehicle, outside and other fires

While these cause categories have usefulness for the other property types — vehicle, outside and other fires — there are limitations. For these property types, the causes of fires are based on the distributions of the NFIRS cause of ignition data element. This data element captures a very broad sense of the cause of the fire.

Deaths, injuries and dollar loss

In previous analyses, the cause sections have included the distributions of deaths, injuries and dollar loss by fire cause. In principle, it is the cause of the fire that results in deaths, injuries and dollar loss that should be analyzed — not numbers of deaths, injuries or dollar loss associated with fire causes. Therefore, analyses of fire cause address fires that result in deaths (fatal fires), fires that result in injuries and fires that result in dollar loss.

[63] The structure fire cause hierarchy and definitions can be found in the document "National Fire Incident Reporting System Version 5.0 Fire Data Analysis Guidelines and Issues," July 2011, available at http://www.usfa.fema.gov/downloads/pdf/nfirs/nfirs_data_analysis_guidelines_issues.pdf. The hierarchy involves many subcategories that are later grouped into the 16 mid-level cause categories, then the seven high-level cause groupings.

Other considerations

An additional problem to keep in mind, when considering the rank order of causes, is that sufficient data to categorize the causes was not reported to the NFIRS for all fatal fires in the database. The rank order of causes might be different from what is shown here if the cause profile for the fires where causes were not reported to the NFIRS was substantially different from the profile for the fires where causes were reported. However, there is no information available to indicate that there is a major difference between the known causes and the unknown causes, so the USFA's best present estimate of fire causes is based on the distribution of the fires with known causes.

Table 9. Mid-level cause groupings

Cause category	Definition
Exposure	Caused by heat spreading from another hostile fire.
Intentional[64]	Cause of ignition is intentional, or fire is deliberately set.
Cause under investigation	Cause is under investigation, and a valid NFIRS Arson Module is present. (This category was formerly called "Investigation with arson module.")
Playing with heat source	Includes all fires caused by individuals playing with any materials contained in the categories below, as well as fires where the factors contributing to ignition include playing with a heat source. Children playing with fire is included in this category.
Natural	Caused by the sun's heat; spontaneous ignition; chemicals, lightning; static discharge; high winds; storms; high water, including floods; earthquakes; volcanic action; and animals.
Other heat	Includes fireworks, explosives, flame/torch used for lighting, heat or spark from friction, molten material, hot material, and heat from hot or smoldering objects.
Smoking	Cigarettes, cigars, pipes and heat from undetermined smoking materials.
Heating	Includes confined chimney or flue fire, fire confined to fuel burner/boiler malfunction, central heating, fixed and portable local heating units, fireplaces and chimneys, furnaces, boilers and water heaters as source of heat.
Cooking	Includes confined cooking fires, stoves, ovens, fixed and portable warming units, deep fat fryers and open grills as source of heat.

[64] Fires caused by intentional actions include, but are not limited to, fires that are deemed to be arson. Intentional fires are those fires that are deliberately set, and they include fires that result from the deliberate misuse of a heat source and fires of an incendiary nature (arson) that require fire service intervention. For information and statistics on arson fires only, refer to the Uniform Crime Reporting Program arson statistics from the U.S. Department of Justice, FBI, Criminal Justice Information Services Division, https://www.fbi.gov/how-we-can-help-you/more-fbi-services-and-information/ucr.

Table 9. Mid-level cause groupings — continued

Cause category	Definition
Appliances	Includes televisions, radios, video equipment, phonographs, dryers, washing machines, dishwashers, garbage disposals, vacuum cleaners, hand tools, electric blankets, irons, hair dryers, electric razors, can openers, dehumidifiers, heat pumps, water cooling devices, air conditioners, freezers and refrigeration equipment as source of heat.
Electrical malfunction	Includes electrical distribution, wiring, transformers, meter boxes, power switching gear, outlets, cords, plugs, surge protectors, electric fences, lighting fixtures and electrical arcing as source of heat.
Other equipment	Includes special equipment (radar, X-ray, computer, telephone, transmitters, vending machine, office machine, pumps, printing press, gardening tools, agricultural equipment), processing equipment (furnace, kiln, other industrial machines), service, maintenance equipment (incinerator, elevator), separate motor or generator, vehicle in a structure and/or unspecified equipment.
Open flame, spark (heat from)	Includes torches, candles, matches, lighters, open fire, ember, ash, rekindled fire and backfire from internal combustion engine as source of heat.
Other unintentional, careless	Includes misuse of material or product, abandoned or discarded materials or products, heat source too close to combustibles, or other unintentional (mechanical failure/ malfunction, backfire).
Equipment misoperation, failure	Includes equipment operation deficiency and equipment malfunction.
Unknown	Cause of fire undetermined or not reported.

Source: USFA.

NFIRS fire causal data can be analyzed in many ways, such as by the heat source, equipment involved in ignition, factors contributing to ignition or many other groupings. The hierarchy of causes has proven to be useful in understanding the fire problem and targeting prevention, but other approaches are useful too. Because the NFIRS database stores records fire by fire, and not just as summary statistics, a wide variety of analyses is possible.

The cause categories displayed in the graphs of the USFA's NFIRS data-related reports are listed in the same order to make comparisons easier from one figure to another. The y-scale varies from figure to figure, depending on the largest percentage that is shown; the y-scale on a figure with multiple charts, however, is always the same.

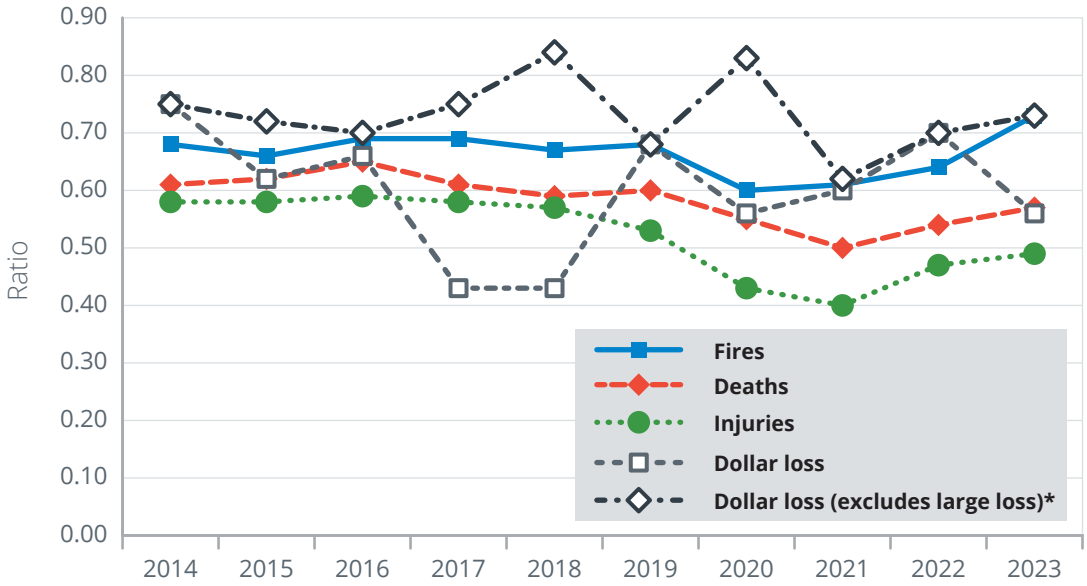
Differences between reported National Fire Incident Reporting System data and the National Fire Protection Association estimates

As there are differences between any two analysts using NFIRS data because of the many assumptions and decisions about how to analyze incomplete and imperfect data, there can be inconsistencies between different data sources. There are discrepancies between the NFIRS data and the NFPA annual estimates. In general, NFIRS deaths and injuries per 1,000 fires are lower than those of the NFPA. In addition, NFIRS dollar loss per fire was higher than that of the NFPA (excluding NFPA large dollar losses).

From 2014 to 2023, the NFIRS collected fire incident data from an average of 20,770 fire departments each year.[65] The NFPA annual survey of fire departments[66] collects data from nearly 2,500 fire departments. The NFIRS is not a statistically selected sample; however, it is a very large set of fire incidents representing, on average, two-thirds of NFPA estimated fires. The NFPA survey is based on a statistical sample. These two datasets often yield dramatically different fire rates. The NFPA survey collects tallied totals, whereas the NFIRS collects individual incident reports. It is not surprising, therefore, that there are differences between the NFPA annual estimates and the NFIRS reported values. In the years examined (2014 to 2023), the deaths reported to the NFIRS represented a smaller fraction of the NFPA national estimate of deaths than the NFIRS number of fires represented of the NFPA estimate of fires (Figure 32). The same was true for NFIRS reported injuries; however, the ratios for injuries were even less than those for deaths. Estimates of dollar loss are notoriously inexact; it is not surprising that the NFIRS dollar loss changed from year to year with respect to NFPA totals. By excluding the NFPA large dollar losses, the ratios of reported NFIRS dollar loss to NFPA estimates of dollar loss are much higher than the ratios of dollar loss that include these large loss events. As a result, this implies that the NFIRS is not capturing dollar losses associated with wildfires and fires occurring in the wildland urban interface (WUI). This may be due, in part, to unreported fires and the fact that most federal and state agencies typically do not report to the NFIRS.

[65] This count excludes fire departments that reported mutual-aid incidents only.
[66] "Fire Loss in the United States," *NFPA Journal*.

Figure 32. Ratio of reported National Fire Incident Reporting System data to National Fire Protection Association estimates



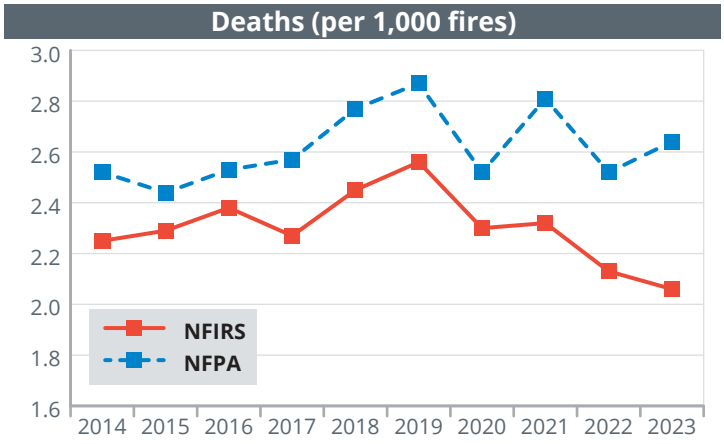
	Fires	Deaths	Injuries	Dollar loss adjusted to 2023 dollars	Dollar loss adjusted to 2023 dollars (excludes large loss)*
2014	0.68	0.61	0.58	0.75	0.75
2015	0.66	0.62	0.58	0.62	0.72
2016	0.69	0.65	0.59	0.66	0.70
2017	0.69	0.61	0.58	0.43	0.75
2018	0.67	0.59	0.57	0.43	0.84
2019	0.68	0.60	0.53	0.68	0.68
2020	0.60	0.55	0.43	0.56	0.83
2021	0.61	0.50	0.40	0.60	0.62
2022	0.64	0.54	0.47	0.70	0.70
2023	0.73	0.57	0.49	0.56	0.73

Sources: NFIRS and NFPA.

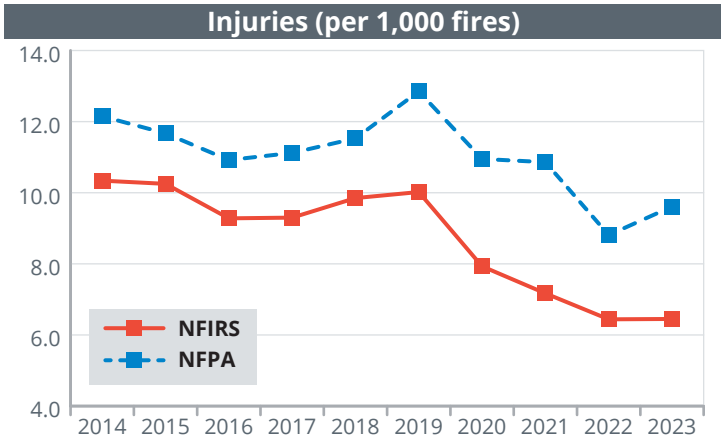
* For the NFPA dollar loss estimates, the 2015 dollar loss excludes the Valley and Butte Wildfires in California with an estimated property loss of $1,950,000,000; the 2016 dollar loss excludes the Gatlinburg, Tennessee,wildfires with an estimated property loss of $911,000,000; the 2017 dollar loss excludes a $10,000,000,000 loss in wildfires in Northern California; the 2018 dollar loss excludes $12,400,000,000 losses in wildfires in California; the 2020 dollar loss excludes $4,200,000,000 losses in California WUI fires as well as a $3 billion naval ship fire in California; the 2021 dollar loss excludes $678,000,000 losses in California WUI fires; and the 2023 dollar loss excludes a $5.5 billion property loss estimate from the wildfires predominantly on the island of Maui in Hawaii, August 2023.

Looking at the problem from a different perspective, Figure 33 includes three charts that show the number of deaths per 1,000 fires, number of injuries per 1,000 fires, and dollar loss per fire from the NFIRS and the NFPA from 2014 to 2023. In general, deaths and injuries per 1,000 fires were lower for the NFIRS than for the NFPA. The NFIRS dollar loss per fire was higher than that of the NFPA (excluding NFPA large dollar losses).[67]

Figure 33. Reported National Fire Incident Reporting System data versus National Fire Protection Association estimates: losses per fire



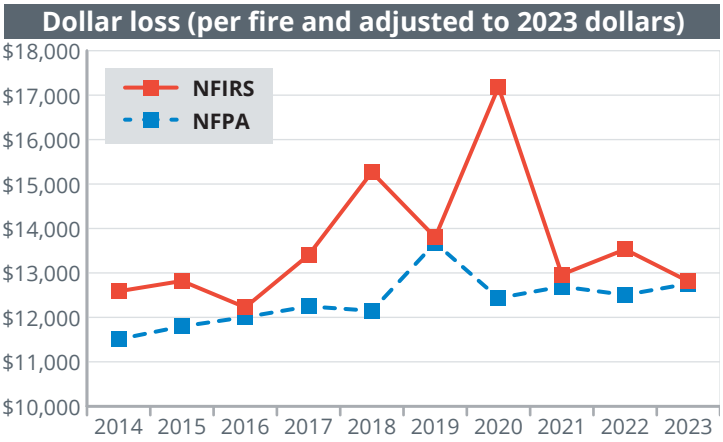
Deaths (per 1,000 fires)		
Year	NFIRS	NFPA
2014	2.25	2.52
2015	2.29	2.44
2016	2.38	2.53
2017	2.27	2.57
2018	2.45	2.77
2019	2.56	2.87
2020	2.30	2.52
2021	2.32	2.81
2022	2.13	2.52
2023	2.06	2.64



Injuries (per 1,000 fires)		
Year	NFIRS	NFPA
2014	10.34	12.15
2015	10.25	11.67
2016	9.28	10.92
2017	9.30	11.12
2018	9.85	11.53
2019	10.02	12.85
2020	7.93	10.95
2021	7.17	10.86
2022	6.44	8.81
2023	6.45	9.61

[67] The greater NFIRS dollar loss per fire may be due, in part, to the result of an NFIRS edit that was implemented in January 2012 that generates the following warning message: "Estimated dollar losses are required for all fires. If there was no loss or no pre-incident value, check or mark the appropriate 'None' boxes. If loss cannot be estimated, do not enter a loss value and no further action is required." NFIRS Version 5.0 Design Documentation (January 2015), https://www.usfa.fema.gov/nfirs/documentation/, Relational Edit #184.

Figure 33. Reported National Fire Incident Reporting System data versus National Fire Protection Association estimates: losses per fire — continued

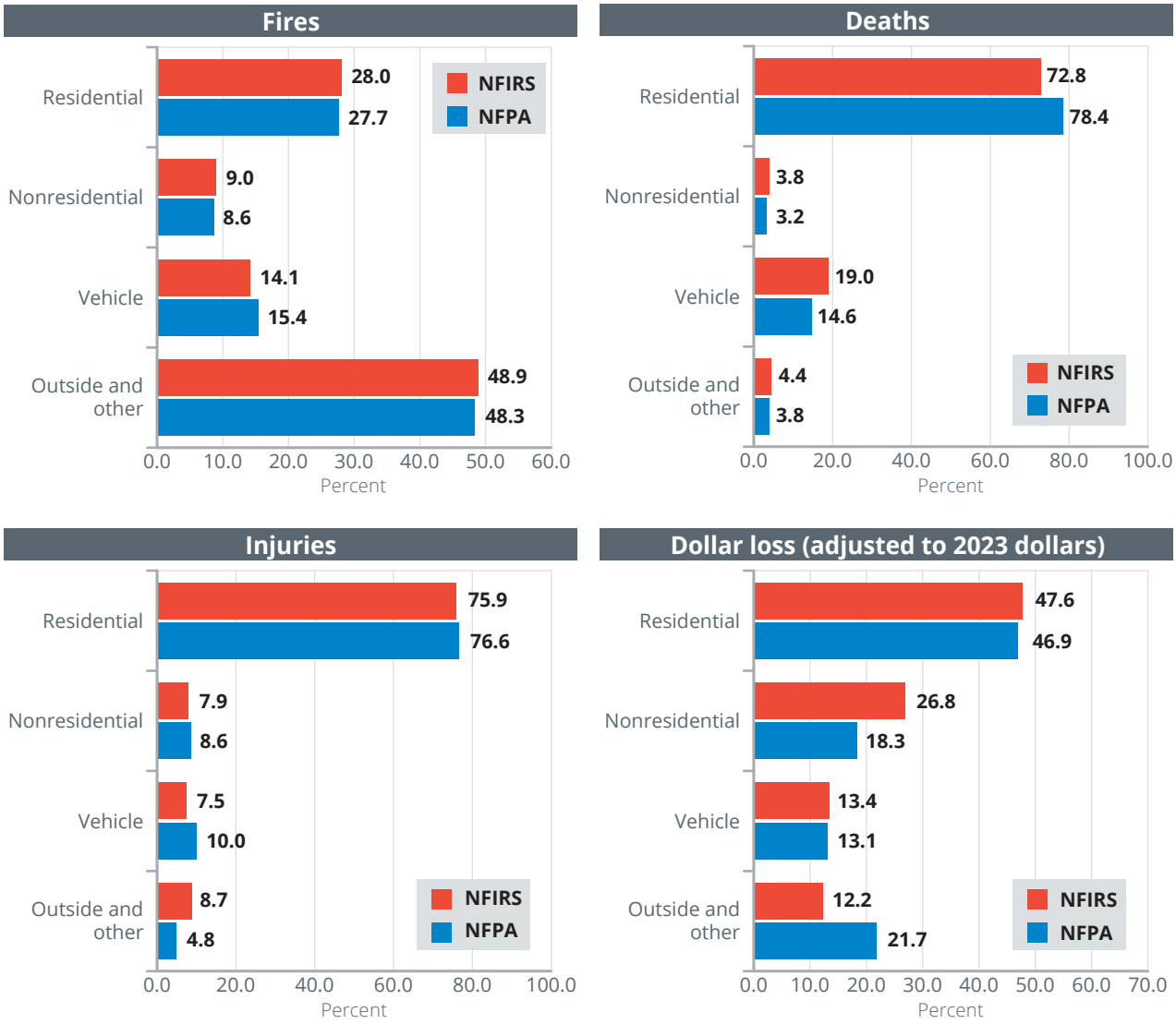


Dollar loss (per fire)*		
Year	NFIRS	NFPA
2014	12,587	11,508
2015	12,819	11,798
2016	12,226	12,005
2017	13,401	12,247
2018	15,267	12,148
2019	13,801	13,676
2020	17,183	12,435
2021	12,964	12,694
2022	13,529	12,506
2023	12,810	12,757

* Adjusted to 2023 dollars.
Sources: NFIRS, NFPA and CPI.
Notes: For the NFPA dollar loss estimates, the 2015 dollar loss excludes the Valley and Butte Wildfires in California with an estimated property loss of $1,950,000,000; the 2016 dollar loss excludes the Gatlinburg, Tennessee, wildfires with an estimated property loss of $911,000,000; the 2017 dollar loss excludes a $10,000,000,000 loss in wildfires in Northern California; the 2018 dollar loss excludes $12,400,000,000 losses in wildfires in California; the 2020 dollar loss excludes $4,200,000,000 losses in California WUI fires as well as a $3 billion naval ship fire in California; the 2021 dollar loss excludes $678,000,000 losses in California WUI fires; and the 2023 dollar loss excludes a $5.5 billion property loss estimate from the wildfires predominantly on the island of Maui in Hawaii, August 2023. These losses do not have associated property uses.

Other minor differences appear when reviewing losses by general property type as shown in Figure 34. Specifically, the distributions of fires across property types between the NFIRS and the NFPA were quite similar, which is reassuring. Over the 10-year period, the proportions of structure fires (both residential and nonresidential) were slightly higher in the NFIRS reported data, while the proportion of vehicle fires represented by the NFPA estimate was higher than what was reported to the NFIRS. Regardless of the specifics, the distributions were reasonably comparable.

Figure 34. Comparison of reported National Fire Incident Reporting System data with National Fire Protection Association estimates by general property type (10-year average, 2014-2023)



Sources: NFIRS and NFPA.

The deaths that resulted from these fires were consistently more heavily represented in residential structures in the NFPA estimates. For the other general property types, the NFPA percentages of deaths were less than those resulting from the NFIRS data.

The proportions of fire injuries were slightly higher in the NFPA estimates than those reflected in the NFIRS for all general property types except for the outside and other category. The NFPA percentages of dollar loss were less than those reported to the NFIRS for all general property types except for the outside and other category, where NFPA large dollar loss estimates were included for wildfires.

One of the more important consequences of these distributions is in the creation of estimates of the various parts of the U.S. fire problem. For example, it is noted that the 2023 NFPA residential structure fire death and injury estimates reflect 80% of all fire deaths (2,920 of 3,670) and 79% of all fire injuries (10,490 of 13,350). If the 2023 NFIRS percentages for residential structure fire deaths (68.26%) and injuries (74.51%) were applied to the overall 2023 NFPA estimates of fire deaths and injuries, the estimates would yield nearly 2,505 deaths and 9,950 injuries resulting from residential structure fires.[68] The scaled-up NFIRS estimate of residential structure fire deaths is 14% lower than the NFPA estimate of residential structure fire deaths and the scaled-up estimate of residential structure fire injuries is 5% lower than the NFPA estimate of residential structure fire injuries.

The reasons for these differences in distributions between the NFPA and the NFIRS are not known. It may be that some departments reporting summary data to the NFPA inadvertently undercount their casualties and losses when reporting on the NFPA survey forms. Another possibility is that there are data entry errors in the NFIRS, with incorrect values of deaths and dollar loss per incident record being entered into the database despite edit checks at state and federal levels. (It appears that at least some of the dollar loss difference is due to this.)

A third possibility for the differences is that, with the abbreviated reporting of small, low- or no-loss confined fires in the NFIRS, the NFPA sample of these fires is not adequately represented. It is known that, prior to abbreviated NFIRS reporting, some departments did not fill out NFIRS forms for minor fires, such as food on stoves or chimney fires. It is not clear whether these fires are included in the department's report to the NFPA, particularly if the department does not also report to the NFIRS. It may be that confined fires are underreported to the NFPA. Also unknown is the actual extent of this problem.

A fourth possibility is that some jurisdictions use the NFIRS as a tracking system for fire casualty information without providing the related incident data or vice versa. This situation does indeed occur from time to time in the NFIRS. Again, it is unclear how these incidents and their corresponding losses are reported to the NFPA. Lastly, it could be that techniques used to generate the NFPA estimates unintentionally favor residential buildings or that the NFIRS may result in fewer residential losses because it is a voluntary system and not based on a statistical sample.

Analysis disclaimer

Complete or full years of data are required for statistical analyses. 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 was July 1 after the end of the previous calendar year. This provided states with ample time to perform data quality checks and correct incidents with questionable reported data before they were set to released status in the national production database and Enterprise DW. Once the data were released to the USFA, additional data quality

[68] Estimates of fire deaths are rounded to the nearest five; estimates of fire injuries are rounded to the nearest 25.

reviews were completed before the data were prepared for public release. For 2024 incident data, however, the reporting deadline was accelerated to April 1, 2025. For 2025 incident data, the reporting deadline is set for December 31, 2025. The cutoff date was changed to accommodate fire departments' transitions in incident reporting to the NERIS platform.

The analyses contained in this report reflect the current methodologies 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.

Appendix A — Acronyms

AFG	Assistance to Firefighters Grant
CPI	Consumer Price Index
DOD	U.S. Department of Defense
DW	data warehouse
EMS	emergency medical services
FDID	fire department identification
FEMA	Federal Emergency Management Agency
FY	fiscal year
NCHS	National Center for Health Statistics
NFDC	National Fire Data Center
NFIRS	National Fire Incident Reporting System
NFPA	National Fire Protection Association
NOFO	Notice of Funding Opportunity
PDR	public data release
USFA	U.S. Fire Administration
WUI	wildland urban interface

Appendix B — Fire in the United States Editions

Previous editions of this report include:

- First edition, published in 1978, included 1975 and 1976 fire data.
- Second edition, published in 1982, included 1977 and 1978 fire data.
- Third through fifth editions produced as working papers but not published.
- Sixth edition, published in 1987, included 1983 fire data.
- Seventh edition, published in 1990, included 1983 to 1987 fire data.
- Eighth edition, published in 1993, included 1983 to 1990 fire data.
- Ninth edition, published in 1997, included 1985 to 1994 fire data; focused on the residential/nonresidential fire problem, as well as firefighter casualties.
- Tenth edition, published in 1998, included 1986 to 1995 fire data, and it provided a state-by-state profile of fires and an examination of firefighter casualties.
- Eleventh edition, published in 1999, included 1987 to 1996 fire data, and it focused on the residential/nonresidential fire problem, as well as firefighter casualties.
- Twelfth edition, published in 2001, included 1989 to 1998 fire data and was the last edition to use the NFIRS 4.1 data system. It included analyses of all of the previous topics under one cover: residential and nonresidential fire problems, state-by-state profiles and firefighter casualties.
- Thirteenth edition, published in 2004, included 1992 to 2001 fire data and was the first edition to include the new NFIRS 5.0 data in the analyses. It included the residential and nonresidential fire problem, as well as firefighter casualties.
- Fourteenth edition, published in 2007, included 1995 to 2004 fire data, with a primary focus on 2004. For the first time, only native NFIRS 5.0 data were used for NFIRS-based analyses. It addressed the overall national fire problem and provided detailed analyses of the residential and nonresidential fire problem. Firefighter casualties and other subsets of the national fire problem were not included.
- Fifteenth edition, published in 2009, covered the five-year period of 2003 to 2007, with a primary focus on 2007. As in the 14th edition, only native NFIRS 5.0 data were used for NFIRS-based analyses.[69] This report addressed only the overall national fire problem. Detailed analyses of the residential and nonresidential fire problem, firefighter casualties, and other subsets of the national fire problem were addressed as separate, stand-alone publications.

[69] Previous editions of Fire in the United States presented 10-year trends. As many of the trends are based on national estimates that use the proportion of native NFIRS 5.0 data to allocate estimated fires and fire losses, trends in this edition are limited to 2003 and the years after, when the proportion of native NFIRS 5.0 data exceeded 80% of the submitted data.

- Sixteenth edition, published in 2013, was entirely web-based and covered the five-year period of 2007 to 2011, with a primary focus on 2011. The document was renamed Data Sources and Methodology Documentation, with all of the data presented in an Excel file.
- Seventeenth edition, published in 2016, covered the 10-year period of 2004 to 2013, with a primary focus on 2013. This report addressed the overall national fire problem and was published as a PDF document.
- Eighteenth edition, published in January 2017, covered the 10-year period of 2005 to 2014, with a primary focus on 2014. This report addressed the overall national fire problem and was published as a PDF document.
- Nineteenth edition, published in December 2017, covered the 10-year period of 2006 to 2015, with a primary focus on 2015. This report addressed the overall national fire problem and was published as a PDF document.
- Twentieth edition, published in November 2019, covered the 10-year period of 2008 to 2017, with a primary focus on 2017. This report addressed the overall national fire problem and was published as a PDF document.



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