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Fire Risk in 2021

These topical reports are designed to explore facets of the U.S. fire problem. Each topical report briefly addresses the nature of the specific fire or fire-related topic, highlights important findings from the data, and may suggest other resources to consider for further information.

Executive summary

The Fire Risk in 2021 report, published by the U.S. Fire Administration (USFA), provides an analysis of fire-related risks in the United States for the year 2021. The report presents several key findings:

- Total deaths and injuries: 4,315 fire deaths and 14,700 fire injuries.
- Age-related risk:
  - Adults ages 85 or older had the highest relative risk of fire death.
  - Adults ages 55 or older had a greater relative risk of fire death than the general population.
  - Children ages 4 and younger had a relative risk of fire death that was 50% less than that of the general population. This did not change from 2019 and 2020 and is the lowest relative risk for this age group since the mid-1970s.
  - Adults ages 25 to 64, 70 to 74, and 80 or older had a greater relative risk of fire injury than the general population.
- Risk by region: People living in the Midwest and South had the greatest relative risk of dying in a fire when compared to populations living in other regions of the United States.
- Risk by sex: Males were 1.8 times more likely to die in fires than females.
- Risk by race: African Americans and American Indians/Alaska Natives were at a greater relative risk of dying in a fire than the general population.

This report emphasizes the critical need for targeted and culturally sensitive fire safety educational programs to reduce fire-related deaths and injuries among high-risk groups. By focusing on vulnerable populations, overall fire safety can improve, save lives and reduce injury.

Introduction

The risk of fire-related fatalities and injuries is not uniform across the population. In 2021, fires resulted in 4,315 deaths and 14,700 injuries in the U.S., with these casualties disproportionately occurring in specific demographic groups.[1] This disparity highlights the importance of understanding why certain segments of society face heightened fire risks.

This report serves as a critical resource for assessing and understanding fire risk across various communities. It presents data on fire casualties and trends and aims to raise public awareness about the risk of death or injury from fire as well as inform policymakers and fire service leaders as they develop effective strategies and regulations. Additionally, it identifies areas in need of increased resources or targeted interventions that may lead to enhanced overall fire safety and the reduction of fire-related injuries and fatalities.

Specifically, this report presents data on fire death and injury rates, relative risk and trends according to age, race, sex and location. Capturing age, race, sex and region in fire data reporting is essential for enhancing fire safety

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and prevention strategies. It enables effective risk assessment by identifying demographic groups or areas at higher risk for specific fire hazards, allowing for targeted prevention measures. These data also facilitate optimal resource allocation, ensuring that high-risk areas receive adequate support.

Furthermore, reporting demographic information improves community engagement by fostering trust and communication between the fire service and diverse populations. It informs culturally sensitive safety education and guides policy development for more effective fire safety regulations tailored to specific communities. Finally, these data enhance accountability and evaluation of fire response efforts, ensuring they are equitable and effective. Overall, demographic insights are crucial for creating safer communities.

Data sources and methodology

This topical fire report explores fire risk as it applies to fire casualties in the U.S. population and is an update to a series of fire risk reports with the latest being Fire Risk in 2020, Volume 22, Issue 4. It focuses on how fire risk, specifically the risks of death or injury, varies with age and how other demographic factors influence that risk.

The data sources and methodology in this report are designed to evaluate fire casualties per capita and assess relative risk. This report's findings on fire-related fatalities are based on the 2021 Mortality Data File from the National Center for Health Statistics (NCHS). The data were compiled from contributions by 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Each death certificate in the U.S. is assigned International Classification of Diseases (ICD) codes by NCHS, which categorize the conditions leading to death.

For this analysis, ICD codes were analyzed to encompass all deaths where exposure to fire, fire products or explosion were either the primary cause or a contributing factor.[2] For the relative risk analyses, only cases with specified ages were included; in 2021, age values were available for 99.98% of fire-related deaths. The analysis is based on the most recent NCHS mortality data from 2021, ensuring consistency throughout the report.

Fire injury estimates are derived from civilian fire injury data from the 2021 National Fire Incident Reporting System (NFIRS), along with the civilian fire injury estimate from the 2021 National Fire Protection Association's (NFPA's) Survey of Fire Departments for U.S. Fire Experience.[3] Fire-related injuries typically result during activities related to fire control, escape from fire hazards, or incidents occurring during sleep.[4] For the relative risk analyses, only cases with specified ages were included; in 2021, age values were available for 99.81% of fire-related injuries.

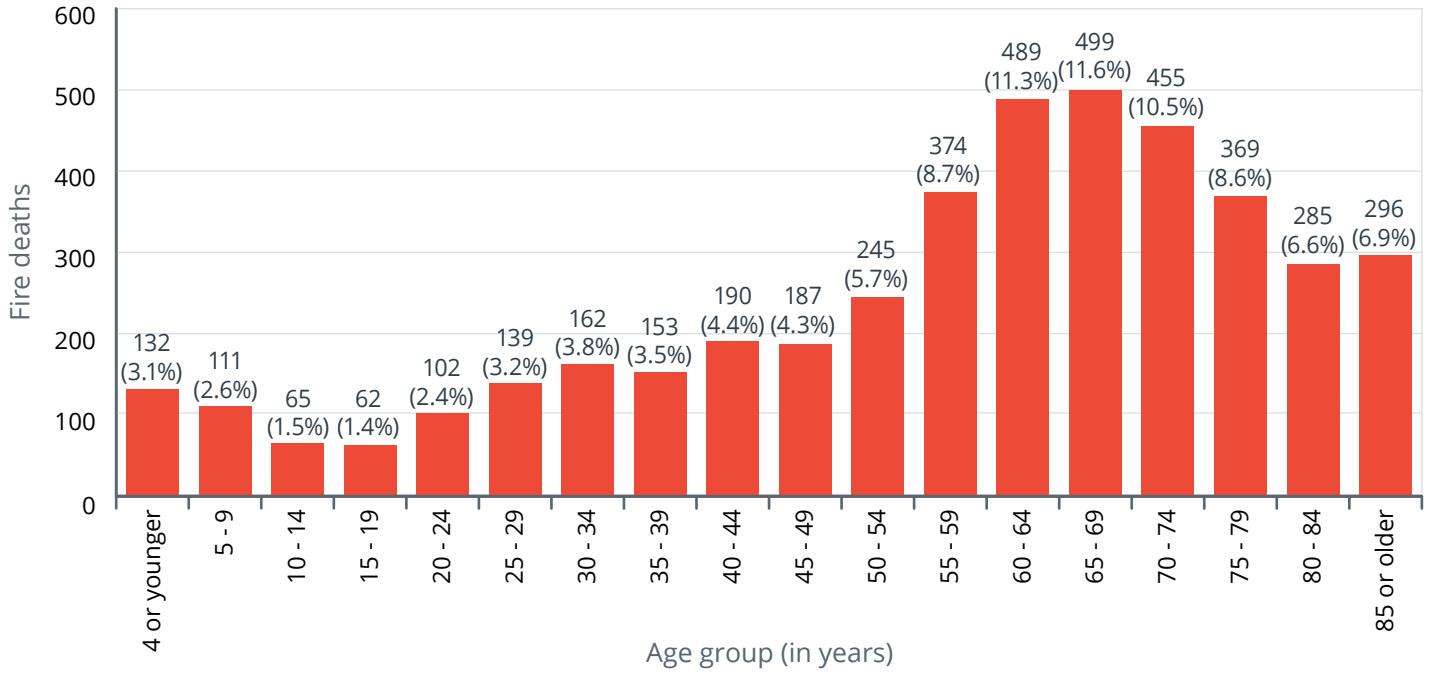
When exploring the risk associated with fire in the U.S., it is important to understand several key terms and definitions such as risk, fatality or death, injury, casualty, and per capita rate. Risk is a factor, element or course of action involving uncertainty. It is an exposure to some peril, and often implies a probability of occurrence, such as investment risk or insurance risk. In terms of the fire problem, risk is the potential for the death of or injury to a person, or damage to or loss of property, as a result of fire. The terms "fatality" or "death" refer to a person who died due to the exposure to fire, heat from fire, or the products of combustion (smoke). The death may have occurred during the actual fire-related incident or at a later date if they succumb to their injury. Fire injury refers to the wide range of nonfatal physical conditions that a person may experience if exposed to fire, heat from a fire, or the products of combustion (smoke). The term "casualties" refers collectively to fire deaths and injuries. The term "per capita" uses a common population size that permits comparisons between different groups.

Fire casualties, per capita rates and relative risk

In evaluating fire risk, it is crucial to consider geographic, demographic and socioeconomic factors. Individuals in the Midwest and South, as well as males and adults ages 55 or older, are at a higher risk of dying in a fire than the general population. Although very young children (ages 4 and under) have a lower overall risk of fire death and injury than the general population, they remain at higher risk relative to older children. Furthermore, data reveal that African Americans and American Indians/Alaska Natives experience a higher risk of fire-related deaths than the general population.

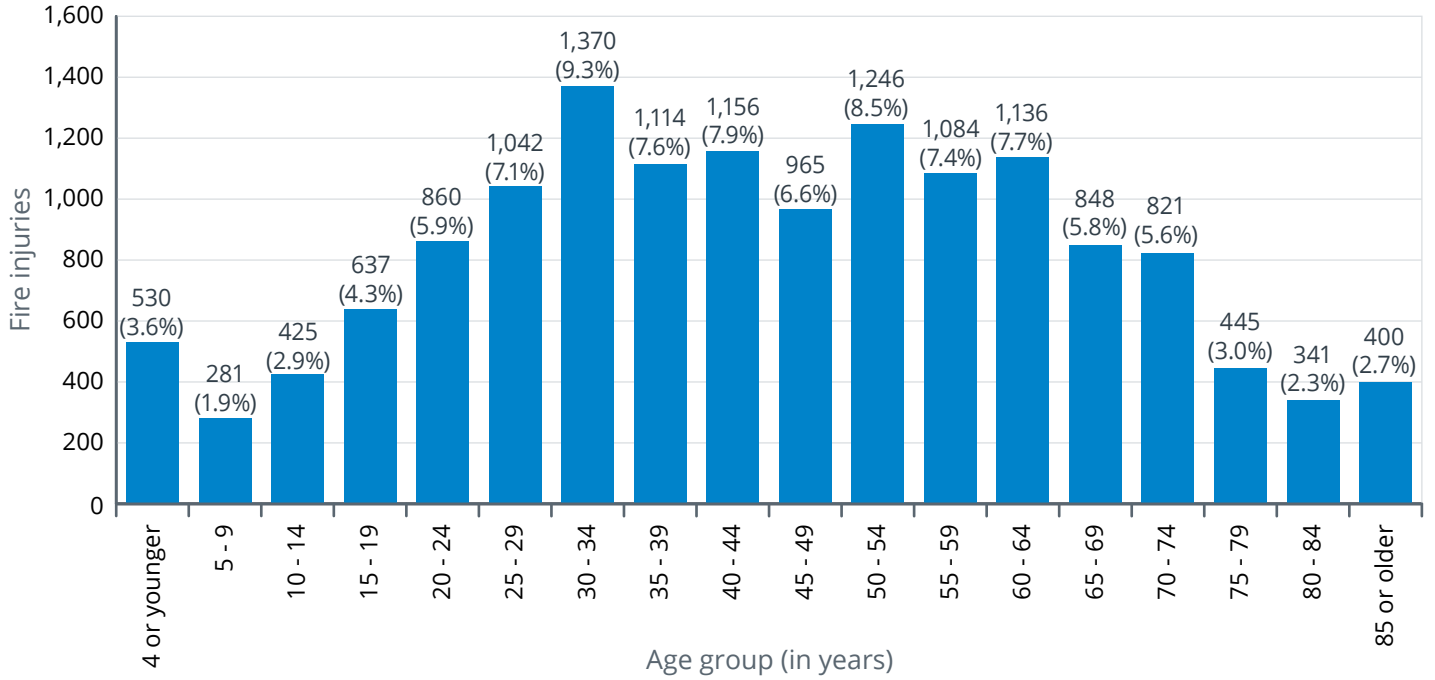
To assess fire casualties across various demographic groups, the data can be assessed in several ways. The simplest method is to look at the distribution of the numbers of deaths or injuries across the factor of interest. Another method is to examine percentages of deaths or injuries to make comparisons between groups such as age groups. In the case of age, of 4,315 total fire deaths in 2021, fire deaths were greatest for those ages 55 to 79 accounting for 2,186 (51%) deaths (Figure 1a).[5] Of 14,700 total fire injuries in 2021,[6] only 4,334 fire injuries (30%) occurred among adults in this same age group (Figure 1b).

Figure 1a. Fire deaths by age group in 2021



Sources: 2021 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program.
Notes: 1. Data have been adjusted to account for deaths with unknown age. Age was specified in 99.98% of fire deaths.
2. The total percentage distribution of fire deaths does not add up to 100% due to rounding.

Figure 1b. Fire injury estimates by age group in 2021



Sources: 2021 NFIRS fire injury data and 2021 NFPA estimate of fire injuries.

Notes: 1. Data have been adjusted to account for injuries with unknown age. Age was specified in 99.81% of fire injuries.
2. The total percentage distribution of fire injuries does not add up to 100% due to rounding.

To account for population differences,[7] per capita rates are used. Per capita rates use a common population size that permits comparisons between different groups. Per capita rates are determined by the number of deaths or injuries occurring to a specific population group, divided by the total population for that group. This ratio is then multiplied by a common population size. For the purposes of this report, per capita rates for fire deaths and injuries are measured per 1 million people.[8]

Perhaps the most useful 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 particular group (e.g., females) to the overall per capita rate (i.e., the general population).[9] For the general population in the U.S., the relative risk is set at 1.

These insights highlight the importance of considering population dynamics when interpreting fire risk data. Further exploration of these factors will be provided in subsequent sections of this report.

Age and risk of fire casualty

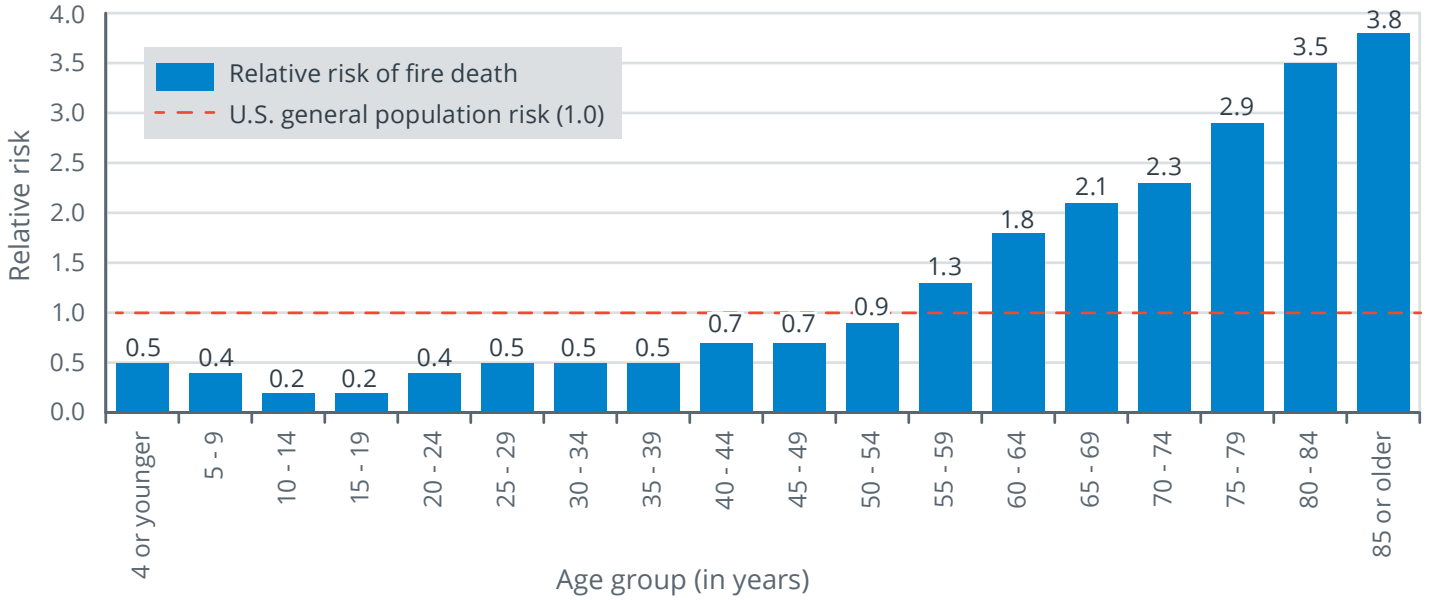
In 2021, the risk of fire death for children ages 4 or younger was 50% less than that of the general population (Figure 2a), as it also was in 2019 and 2020 — the lowest relative risk for this age group since the USFA began tracking the relative risk of dying in a fire in the mid-1970s. But the risk of death for this age group was greater than for older children, because as children mature and their cognitive and social abilities develop, the risk of fire death drops sharply. For children ages 5 to 9, the fire death risk was 60% less than that of the general population. For those ages 10 to 14, the risk of fire death was 80% less than that of the general population — the same as it was for 15- to 19-year-olds. After age 19, the risk of fire death began to steadily increase. By age 55, in 2021, the risk of fire death was higher than the risk for the population as a whole and continued to increase as the population aged.

When physical and cognitive abilities are limited, as is often the case for the elderly, the risk of death from fire rises. In 2021, older adults (ages 65 or older) experienced large numbers of fire deaths that occurred in small population groups. As a result, the risk of dying in a fire for these older adults was 2.6 times higher than for the population as a whole and rose even more for the oldest segments (Figure 2a). The oldest adults, those ages 85 and older, had a

risk of dying in a fire that was 3.8 times higher than that for the general population. This was even higher than it was in 2019 when their relative risk was 3.6 times higher but lower than it was in 2020 when their relative risk was 4.0 times higher.

Although the overall numbers change, these profiles have remained relatively constant from year to year, according to the NCHS and U.S. Census Bureau data. The fire risk to children and older adults will be discussed in more detail in later sections of this report.

Figure 2a. Relative risk of fire death by age group in 2021

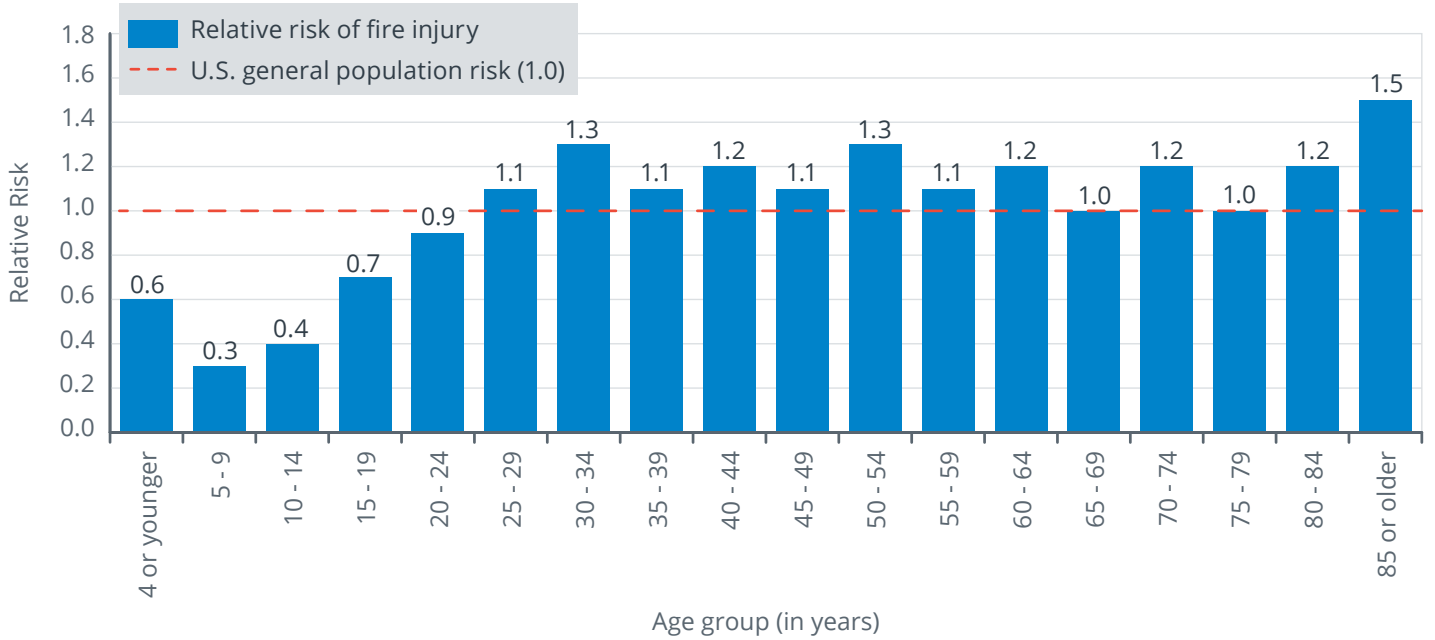


Sources: 2021 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program and U.S. Census Bureau population estimates.

Note: Data have been adjusted to account for deaths with unknown age. Age was specified in 99.98% of fire deaths.

In general, the age profile of risk for fire injuries was different than that for deaths (Figure 2b), with a narrower range of risk quotients (0.3 to 1.5 for fire injuries versus 0.2 to 3.8 for fire deaths).[10, 11] This difference is thought to be the result of both cognitive and mobility issues that affect older adults. Most older adults were generally less likely to escape the effects of fire and more likely to suffer fatal injuries, causing their risk of fire death to be much higher than the general population (Figure 2a). However, in 2021, adults ages 65 to 69 and 75 to 79 had the same relative risk of fire injury as the general population (Figure 2b). The relative risk of fire injury was greater for 25- to 64-year-olds than for the general population. The risk of injury was below average for children and adults younger than 25. While less than the total population, however, children ages 4 and younger had a greater relative risk of injury from fire than older children (ages 5 to 14).

Figure 2b. Relative risk of fire injury by age group in 2021



Sources: 2021 NFIRS fire injury data, 2021 NFPA fire injury estimates and U.S. Census Bureau population estimates.
Note: Data have been adjusted to account for injuries with unknown age. Age was specified in 99.81% of reported fire injuries.

Other factors that influence risk

In addition to age, geographic location, sex and race also influence fire risk. In fact, males, African Americans, American Indians/Alaska Natives, and those living in the South and Midwest have higher fire death rates.

Location

The risk of dying in a fire was greatest for people living in the Midwest and South when compared to populations living in other regions (Table 1).[12] Conversely, the Northeast and West had a much lower risk of fire death. In fact, their risk from fire death was 20% less than the population as a whole.

Table 1. Relative risk of fire death by geographic region in 2021

Region	Population	Fire deaths	Death rate (per million population)	Relative risk
Northeast	57,243,423	623	10.9	0.8
Midwest	68,850,246	998	14.5	1.1
South	127,353,282	1,873	14.7	1.1
West	78,602,026	822	10.5	0.8
U.S. overall	332,048,977	4,316	13.0	1.0

Sources: 1. 2021 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program.
2. U.S. Census Bureau, Population Division. July 1, 2021, population estimates from the table Annual Estimates of the Resident Population for the United States, Regions, States, District of Columbia and Puerto Rico: April 1, 2020, to July 1, 2023 (NST-EST2023-POP). Release date: December 2023.
Note: Relative risk may not compute due to rounding.

Sex

For nearly all age groups and race categories, males were as likely or more likely to die in a fire-related incident than females (Table 2, Table 4 and Table 6). Overall, in 2021, males were 1.8 times more likely to die in fires than females (Table 2). This is an increase from 2016 to 2018, when males were 1.6 times more likely to die in fires than females, and from 2015, 2019 and 2020 when males were 1.7 times more likely to die in fires than females. For 2021, data showed that males, overall, were 1.6 times more likely to suffer fire injuries than their female counterparts — this is higher than in 2017 to 2020 when males were 1.5 times more likely to suffer injuries than females.[13]

Race

African Americans and American Indians/Alaska Natives had higher fire death rates per capita than the national average. African Americans constituted a large and disproportionate share of total fire deaths, accounting for 20% of fire deaths in 2021, but only 14% of the U.S. population.[14, 15] In 2021, African Americans had a 50% greater risk of dying in a fire than the general population. This is higher than it was in 2019 and 2020 when it was 40% higher, but the same as it was in 2018. It is also substantially lower than in 2007 when the risk was 80% higher than the general population.[16] For American Indians/Alaska Natives in 2021, the relative risk was 20% higher than the risk of the general population. This is lower than in 2017 when their risk was 30% higher, 2019 and 2020 when it was 40% higher, and 2014 when it was 50% higher. By contrast, Asian/Pacific Islander Americans were 70% less likely to die in a fire than the overall population in 2021.

Table 2. Relative risk of fire death by race and sex in 2021, overall population

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Total	332,048,977	4,316	13.0	1.0
Male	164,418,227	2,755	16.8	1.3
Female	167,630,750	1,561	9.3	0.7
White	251,476,938	3,246	12.9	1.0
African American	45,099,811	878	19.5	1.5
American Indian/Alaska Native	4,347,306	70	16.1	1.2
Asian/Pacific Islander	21,319,710	84	3.9	0.3
2 or more races	9,805,212	38	3.9	0.3
White male	125,380,974	2,095	16.7	1.3
African American male	21,688,028	539	24.9	1.9
American Indian/Alaska Native male	2,196,437	42	19.1	1.5
Asian/Pacific Islander male	10,281,163	50	4.9	0.4
2 or more races male	4,871,625	29	6.0	0.5
White female	126,095,964	1,151	9.1	0.7
African American female	23,411,783	339	14.5	1.1
American Indian/Alaska Native female	2,150,869	28	13.0	1.0
Asian/Pacific Islander female	11,038,547	34	3.1	0.2
2 or more races female	4,933,587	9	-	-

Notes: 1. Relative risk may not compute due to rounding.
2. Because they are considered highly variable, fire death rates and relative risk were not computed when there were fewer than 20 deaths per category.

Fire risk to children in 2021

While the relative risk of fire death or injury for children under age 15 was lower than the general population, the very young will always remain inherently vulnerable for a variety of reasons. Children age 4 or younger are usually unable to escape from fire independently. They lack the mental abilities to understand the need and means of quickly escaping a burning structure, even in their own homes.

Age

In 2021, 310 children younger than age 15 died from fires (Table 3).[17] These children accounted for 7% of all fire deaths. The youngest children were hit especially hard — 43% of child fire deaths affected children ages 4 or younger. As in prior years, the numbers of fire deaths declined with increasing age.

In 2021, fire injuries affected an estimated 1,225 children.[18] Again, the youngest suffered a large share of injuries: 43% of child fire injuries occurred to children ages 4 or younger. The number of fire injuries, however, declined sharply between the young preschoolers (ages 4 or younger) and the younger school-aged children (ages 5 to 9), but rose for older children (ages 10 to 14). For 2021, this pattern in fire injuries to children by age group is comparable to the profile of child fire injuries from 2013 to 2020. With these 3 age groups combined, children accounted for 8% of all civilian fire injuries.

Table 3. Child fire deaths and injuries by age group in 2021

	Overall (ages 0 to 14)		Ages 0 to 4		Ages 5 to 9		Ages 10 to 14	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Deaths	308	100.0	132	42.9	111	36.0	65	21.1
Injuries	1,236	100.0	530	42.9	281	22.7	425	34.4

Sources: 2021 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program; 2021 NFIRS fire injury data; and 2021 NFPA fire injury estimates.

Age, sex and socioeconomic factors of children and the households where they live also impact fire risk, as they do for the total population.[19] Because the numbers of fire deaths decreased as the age of the child increased, the likelihood of dying in a fire also decreased (Table 4). In 2021, as previously discussed, children ages 4 or younger had 50% less risk of dying in a fire than the general population. These children, however, had a higher risk of dying in a fire than older children. In fact, the relative risk of dying in a fire for children ages 5 to 9 was 60% less than that of the general population. By the time a child reached the 10 to 14 age group, the relative risk of dying in a fire dropped to 80% less than that of the general population.

Sex and race

Overall, boys tended to have the same or equivalent fire risk as girls. Additionally, African Americans constituted a large and disproportionate share of fire deaths, accounting for 35% of fire deaths among children in 2021 but for only 16% of the child population. Moreover, African American children ages 4 or younger had a relative risk of dying that was 30% higher than the general population but 2.3 times higher than for all children in that age group.[20]

Table 4. Relative risk of child fire deaths by age, race and sex in 2021 (ages 0 to 14)

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
All children (ages 0 to 14)				
Total	60,622,548	308	5.1	0.4
Male	31,019,273	167	5.4	0.4
Female	29,603,275	141	4.8	0.4
White	42,745,375	179	4.2	0.3
African American	9,406,326	107	11.4	0.9
American Indian/Alaska Native	1,039,549	6	-	-
Asian/Pacific Islander	3,750,560	8	-	-
2 or more races	3,680,738	8	-	-

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 0 to 4				
Total	18,850,308	132	7.0	0.5
Male	9,637,967	70	7.3	0.6
Female	9,212,341	62	6.7	0.5
White	13,058,389	76	5.8	0.4
African American	3,009,142	49	16.3	1.3
American Indian/Alaska Native	346,456	3	-	-
Asian/Pacific Islander	1,206,987	0	-	-
2 or more races	1,229,334	4	-	-

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 5 to 9				
Total	20,307,666	111	5.5	0.4
Male	10,384,386	64	6.2	0.5
Female	9,923,280	47	4.7	0.4
White	14,294,688	55	3.8	0.3
African American	3,118,968	47	15.1	1.2
American Indian/Alaska Native	348,139	3	-	-
Asian/Pacific Islander	1,301,548	5	-	-
2 or more races	1,244,323	1	-	-

Table 4. Relative risk of child fire deaths by age, race and sex in 2021 (ages 0 to 14) (continued)

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 10 to 14				
Total	21,464,574	65	3.0	0.2
Male	10,996,920	33	3.0	0.2
Female	10,467,654	32	3.1	0.2
White	15,392,298	48	3.1	0.2
African American	3,278,216	11	-	-
American Indian/Alaska Native	344,954	0	-	-
Asian/Pacific Islander	1,242,025	3	-	-
2 or more races	1,207,081	3	-	-

Source: See notes at the end of the report.
Notes: 1. Relative risk may not compute due to rounding.
2. Because they are considered highly variable, fire death rates and relative risk were not computed when there were fewer than 20 deaths per category.

Fire risk to older adults in 2021

Older adults tend to have physical disabilities or ailments that hinder their mobility. With advancing age, many people experience a decline in physical and mental capabilities, making it more difficult to see, smell and hear clearly. Lessened senses and decreased mobility increase the risk of death or injury from fire.

To compound this problem, older adults are more inclined to accidentally start a fire than younger adults. Oftentimes, older adults are close to the source of a fire, such as cooking equipment or a cigarette, and their clothing or bedding ignites. Because the aging process affects the senses, older adults typically have diminished sensation to pain and often do not seek timely treatment. All these factors combine to increase the risk of death from fire for older adults.

Age

In 2021, 1,905 older adults ages 65 or older died from fires (Table 5).[21] These adults accounted for 44% of all fire deaths. However, older adults constituted only 17% of the U.S. population in 2021,[22] and their ranks are growing. It is estimated that the older population will rise between now and 2030, the years when the baby-boom generation will be in retirement. By 2040, the U.S. Census Bureau estimates that adults ages 65 or older will constitute 22% of the U.S. population, which will increase to 24% by 2060.[23] Better health care and new developments in medicine continue to increase American life expectancy. By their 65th birthday, on average, Americans can expect to live another 20 years.[24]

Adults ages 65 to 74 accounted for half (50%) of older adult fire deaths, and those ages 75 to 84 accounted for an additional 34%. Adults ages 85 or older accounted for 16% of older adult fire deaths.

While fire injuries affected an estimated 2,850 older adults, this group accounted for 19% of all estimated fire injuries in 2021.[25] The relative risk of older adults ages 65 or older being injured in a fire was 20% higher than that of the general population. The youngest segment of the older adults suffered the largest share of injuries: 58% of older adult injuries occurred to those ages 65 to 74. As in previous years, the number of older adult fire deaths and fire injuries in 2021 declined with increasing age.

Table 5. Older adult fire deaths and injuries by age group in 2021

	Overall (ages 65 or older)		Ages 65 to 74		Ages 75 to 84		Ages 85 or older	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Deaths	1,904	100.0	954	50.1	654	34.3	296	15.5
Injuries	2,854	100.0	1,668	58.4	786	27.5	400	14.0

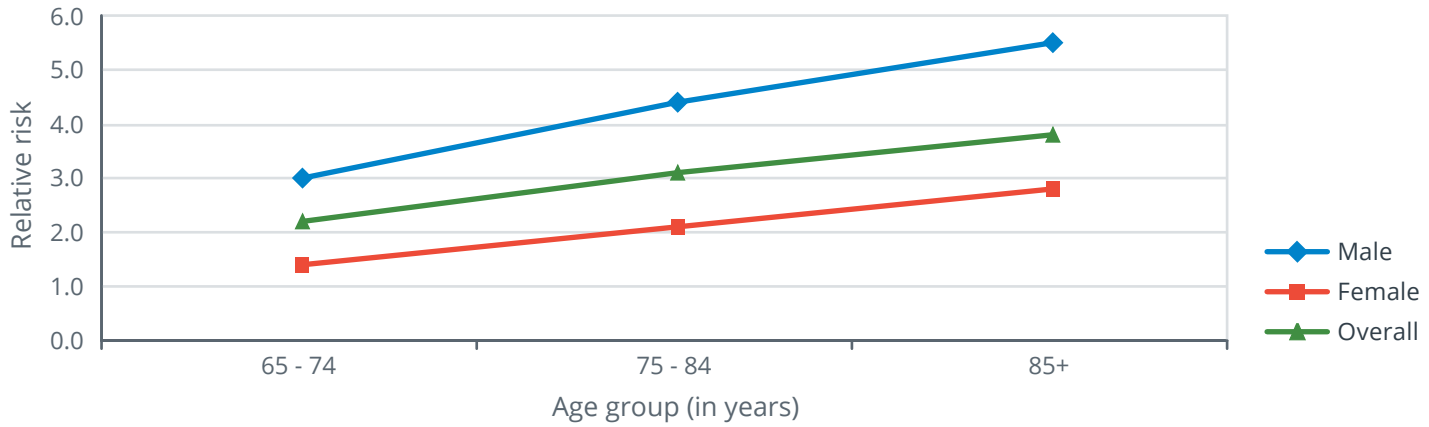
Sources: 2021 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program; 2021 NFIRS fire injury data; and 2021 NFPA fire injury estimates.
Note: Total percentage of older adult fire deaths and injuries do not add up to 100% due to rounding.

In 2021, the relative risk of dying in a fire for older adults was 2.6 times higher than for the population as a whole (Table 6) — higher than it was in 2019 and 2020 when it was 2.5 times higher. This statistic alone is troublesome, but when subcategories of older adults were more closely evaluated, the situation worsened. The relative risk of dying in a fire rose substantially for the oldest segment (Figure 3 and Table 6). Individuals ages 85 or older were 3.8 times more likely to die in a fire than the general population. This is the same as it was from 2017 and 2018, when they were also 3.8 times more likely to die in a fire than the general population, but higher than it was in 2019 at 3.6 times higher. It is lower, however, than in 2020 when those ages 85 and older were 4.0 times more likely to die in a fire than the general population. Adults ages 65 to 74 were 2.2 times more likely to suffer fire-related deaths than the general population — the same as it was from 2018 to 2020. This is an increase from 2017, however, when they were 2.1 times more likely to die in a fire.

Sex

As previously discussed, the risk of fire death was not uniform across sexes, and for the whole population, in 2021, males were 80% more likely than females to be victims of fires. This disparity held for older adults ages 65 and older where males were 102% more likely to die in a fire than females.

Figure 3. Age, sex and relative risk of fire fatality for older adults in 2021



Source: Derived from Table 6.

Race

In 2021, the problem was more severe for African Americans ages 65 and older when, as an overall group, they had 4.7 times the relative risk of dying from fire than the general population (Table 2). But it was the African American elderly, particularly those ages 85 or older, who were most at risk; this group had a fire death risk over 9 times greater than that of the general population and over 2 times the risk of all elderly people in this age group (Table 6). This is an increase from 2019 when this group had a fire death risk over 7 times greater than the general population. In 2014, 2015 and 2020, however, this group had a fire death risk 10 times greater than the general population.

Table 6. Relative risk of older adult fire deaths by age, race and sex in 2021 (ages 65 or older)

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
All older adults (ages 65 or older)				
Total	55,884,746	1,904	34.1	2.6
Male	25,190,890	1,187	47.1	3.6
Female	30,693,856	717	23.4	1.8
White	46,590,798	1,513	32.5	2.5
African American	5,465,639	337	61.7	4.7
American Indian/Alaska Native	443,903	17	-	-
Asian/Pacific Islander	2,820,325	30	10.6	0.8
2 or more races	564,081	7	-	-

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 65 to 74				
Total	33,632,878	954	28.4	2.2
Male	15,846,199	620	39.1	3.0
Female	17,786,679	334	18.8	1.4
White	27,735,214	756	27.3	2.1
African American	3,528,359	170	48.2	3.7
American Indian/Alaska Native	289,212	12	-	-
Asian/Pacific Islander	1,721,329	13	-	-
2 or more races	358,764	3	-	-

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 75 to 84				
Total	16,210,654	654	40.3	3.1
Male	7,158,414	410	57.3	4.4
Female	9,052,240	244	27.0	2.1
White	13,702,118	529	38.6	3.0
African American	1,444,493	107	74.1	5.7
American Indian/Alaska Native	117,510	3	-	-
Asian/Pacific Islander	794,240	11	-	-
2 or more races	152,293	4	-	-

Table 6. Relative risk of older adult fire deaths by age, race and sex in 2021 (ages 65 or older) (continued)

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 85 or older				
Total	6,041,214	296	49.0	3.8
Male	2,186,277	157	71.8	5.5
Female	3,854,937	139	36.1	2.8
White	5,153,466	228	44.2	3.4
African American	492,787	60	121.8	9.4
American Indian/Alaska Native	37,181	2	-	-
Asian/Pacific Islander	304,756	6	-	-
2 or more races	53,024	0	-	-

Source: See notes at the end of the report.

Notes: 1. Relative risk may not compute due to rounding.
2. Because they are considered highly variable, fire death rates and relative risk were not computed when there were fewer than 20 deaths per category.

Prevention

Because children and older adults accounted for 51% of all fire deaths and 28% of fire injuries in 2021, and for the reasons stated previously, the USFA has been working toward the goal of reducing fire deaths and injuries in these populations. Several resources are available to help address the fire problem for children and adults. For children, the USFA provides outreach materials for parents and caregivers, including information on home strategies ranging from the control of matches and lighters to home escape planning (https://www.usfa.fema.gov/prevention/home-fires/at-risk-audiences/children/index.html). For adults, the USFA provides outreach materials that address lifestyle strategies of safe smoking, safe cooking and safe heating to reduce the incidence of fires that traditionally affect older adults (https://www.usfa.fema.gov/prevention/home-fires/at-risk-audiences/older-adults/index.html). For more information, see the USFA website (https://www.usfa.fema.gov) or contact your local fire department.

Further, several important public safety education programs and campaigns have been advanced after years of fire safety research. For example, through the Close Before You Doze program, the Fire Safety Research Institute (FSRI) is encouraging people trapped in a room during a fire as well as those who can safely leave a home to close as many doors and windows as possible.[26] With the doors and windows closed, fire will not have oxygen to burn, which will help to stop its spread. In turn, this will give other people in the house more time to get out and help protect property. In addition, through the Take C.H.A.R.G.E. of Battery Safety campaign, FSRI highlights messages aimed at driving safe behaviors among the public related to the use of lithium-ion batteries.[27] More specifically, FSRI is educating the public on key actions it can take to prevent these battery fires from occurring and, if they do, how it can respond.

New technologies

Partly due to early detection and fire extinguishing systems, fire fatalities and injuries have declined over the last 45 years. In addition, residential sprinkler systems have gained support from the fire service and many communities.

If a fire occurs, properly installed and maintained smoke alarms provide an early warning signal to everyone in a home. It is well documented that smoke alarms help save lives and property.

The USFA continues to partner with other government agencies, nongovernment organizations and fire service organizations to improve and develop new smoke alarm technologies. More information on smoke alarm technologies, performance, training bulletins, and public education and outreach materials is available at https://www.usfa.fema.gov/prevention/home-fires/prepare-for-fire/smoke-alarms/. Additionally, the USFA's position statement on smoke alarms is available at https://www.usfa.fema.gov/about/position-statements/.

Residential sprinkler systems reduce the risk of deaths and injuries, homeowners insurance premiums, and insured and uninsured property losses. Despite these advantages, many homes do not have automatic extinguishing systems, although they are often found in other frequently occupied locations such as hotels, multifamily residences and businesses where they are required by code. In addition, there are major movements in the U.S. fire service to require sprinklers in all new single-family homes.

The USFA and fire service officials across the nation are working to promote and advance residential fire sprinklers. More information on costs and benefits, performance, training bulletins, and public education and outreach materials regarding residential sprinklers is available at https://www.usfa.fema.gov/prevention/home-fires/prepare-for-fire/home-fire-sprinklers/. Additionally, the USFA's position statement on residential sprinklers is available at https://www.usfa.fema.gov/about/position-statements/.

Conclusion

Older adults are some of the nation's most vulnerable residents, and in 2021, their risk of death in a fire remained high. The African American elderly, particularly those ages 85 or older, were most at risk; this group had a fire death risk over 9 times greater than that of the general population and over 2 times the risk of older adults. In addition, with an aging population, the U.S. demographic profile is rapidly changing. The older adult population (ages 65 or older) is expected to increase from its current 17% of the total population to 24% by 2060,[28] with an assumed corresponding increase in fire deaths and injuries among older adults. According to U.S. Census Bureau population projections, the number of individuals ages 65 or older is expected to grow to 89 million by 2060 from 56 million in 2021. At the same time, the population ages 85 or older is expected to triple, increasing from 6 million in 2021 to 18 million in 2060.[29] With advancing age, these older adults will likely experience a decline in physical and mental capabilities, hindering their mobility and making it more difficult to see, smell and hear clearly. Lessened senses and decreased mobility increase the risk of death or injury from fire.

Substantial improvements have been made in reducing fire deaths and injuries among children younger than age 15, and in 2021, their relative risk of fire death was 60% lower than that of the general population. However, the youngest children (ages 4 and younger) faced an elevated risk of death or injury in a fire when compared to older children. In addition, young children are physiologically susceptible to severe injury or death from fire. Children this age generally lack the means and mental abilities to understand the need to quickly escape from a burning structure. Further, while older children face a lower risk of death or injury in a fire and are more mobile than those in the youngest age group, they still may not have sufficient abilities to protect themselves. As a result, the young and old continue to merit special attention to reduce their risk of injury or death from fire.

Given these findings, it is imperative that we continue to prioritize fire safety initiatives that specifically address the vulnerabilities of both the very young and older adults. Targeted strategies are essential to effectively reduce their risk of injury and death from fire.

To request additional information, visit https://www.usfa.fema.gov/contact.html.

Notes:

Sources for Table 2, Table 4 and Table 6 are the 2021 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program, and U.S. population estimates from the U.S. Census Bureau, Population Division:

- July 1, 2021, population estimates from the table Annual Estimates of the Resident Population for the United States, Regions, States, District of Columbia and Puerto Rico: April 1, 2020, to July 1, 2023 (NST-EST2023-POP). Release date: December 2023 (https://www.census.gov/data/tables/time-series/demo/popest/2020s-national-total.html).
- July 1, 2021, population estimates from the table Annual Estimates of the Resident Population by Sex, Age, Race and Hispanic Origin for the United States: April 1, 2020, to July 1, 2023 (NC-EST2023-ASR6H). Release date: June 2024 (https://www.census.gov/data/tables/time-series/demo/popest/2020s-national-detail.html).

[1]2021 NCHS mortality data (deaths) and the 2021 NFPA survey estimates (injuries). The count of fire deaths cited in the text is rounded to the nearest 5. The term "casualties" refers to both fire deaths and injuries.

[2]The ICD 10 codes used from the NCHS mortality data are as follows: F63.1 — Pathological fire-setting (pyromania); W39 — Discharge of firework; W40 — Explosion of other materials; X00 — Exposure to uncontrolled fire in building or structure; X01 — Exposure to uncontrolled fire, not in building or structure; X02 — Exposure to controlled fire in building or structure; X03 — Exposure to controlled fire, not in building or structure;

X04 — Exposure to ignition of highly flammable material; X05 — Exposure to ignition or melting of nightwear; X06 — Exposure to ignition or melting of other clothing and apparel; X08 — Exposure to other specified smoke, fire and flames; X09 — Exposure to unspecified smoke, fire and flames; X75 — Intentional self-harm (suicide) by explosive material; X76 — Intentional self-harm (suicide) by smoke, fire and flames; X96 — Assault (homicide) by explosive material; X97 — Assault (homicide) by smoke, fire and flames; Y25 — Contact with explosive material, undetermined intent; Y26 — Exposure to smoke, fire and flames, undetermined intent; and Y35.1 — Legal intervention involving explosives.

[3]NFIRS civilian fire injury data excludes individuals not on active duty with a firefighting organization. It includes emergency personnel not affiliated with fire departments, such as police officers and utility workers.

[4]USFA, "Civilian Fire Injuries in Residential Buildings (2017-2019)," Topical Fire Report Series, Volume 21, Issue 4, July 2021, https://www.usfa.fema.gov/downloads/pdf/statistics/v21i4.pdf.

[5]The total count of fire deaths cited in the text is rounded to the nearest 5.

[6]The fire injury estimate cited in the text is rounded to the nearest 25.

[7]However, these findings must be interpreted with caution, as they do not fully account for differences in underlying population demographics. As individuals age, the overall size of that age group may decline due to mortality. Additionally, the relative sizes of different racial groups can significantly influence these statistics; for instance, the American Indian/Alaska Native population is much smaller than that of white Americans. Therefore, variations in the numbers of fire deaths or injuries across demographic groups can be attributed to differing population sizes impacting risk analyses.

[8]For example, the per capita fire death rate for the total female population in 2021 was computed from the total number of female fire deaths (1,561) divided by the total female population (167,630,750) and multiplied by 1,000,000 people. This rate is equivalent to 9.3 fire deaths per 1 million population.

[9]The per capita fire death rate for the total population in 2021 was computed from the total number of fire deaths (4,316) divided by the total U.S. resident population (332,048,977) and multiplied by 1,000,000 people. This rate is equivalent to 13.0 fire deaths per 1 million population.

[10]Estimates of injuries by age are derived from 2021 NFIRS civilian fire casualty age data in conjunction with the 2021 NFPA estimate of civilian fire injuries (14,700). Fire injury risk is computed using the 2021 NFIRS data and the NFPA estimate of civilian fire injuries.

[11]Fire department participation in the NFIRS is voluntary; however, some states do require their departments to participate in the state system. Additionally, if a fire department is a recipient of a Fire Act Grant, participation is required. From 2019 to 2021, 63% of the NFPA's annual average estimated 1,344,500 fires to which fire departments responded were captured in the NFIRS. Therefore, the NFIRS is not representative of all fire incidents in the U.S. and is not a "complete" census of fire incidents and their related losses, including fire injuries. Although the NFIRS does not represent 100% of the incidents and their related losses reported to fire departments each year, the enormous dataset exhibits stability from one year to the next without radical changes. Results based on the full dataset are generally similar to those based on part of the data.

[12]The regions of the U.S. are defined by the U.S. Census Bureau as the **Northeast** (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont); **South** (Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia); **Midwest** (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin); and **West** (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming).

[13]Unrounded values of relative risk were used for the computations in this paragraph.

[14]As required by the Office of Management and Budget, starting in 1997, the U.S. Census Bureau generates population estimates for the following race categories: white, Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, or some other race (2+ races). "Hispanic or Latino" is considered an ethnicity and refers to a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin **regardless** of race. As a result, "Hispanic or Latino" is not broken out as a separate race category in this report.

[15]Statistics are based on 2021 NCHS mortality data and U.S. Census Bureau population estimates for July 1, 2021.

[16]USFA, "Fire Risk in 2007," Topical Fire Report Series, Volume 11, Issue 8, February 2011, https://apps.usfa.fema.gov/downloads/pdf/statistics/v11i8.pdf.

[17]Numbers of fire deaths are extracted from 2021 NCHS mortality data using the ICD 10 codes noted previously. The count of fire deaths cited in the text is rounded to the nearest 5.

[18]Estimates of fire injuries are calculated by determining the percent of injuries reported to the NFIRS and applying this percentage to the NFPA estimate of civilian fire injuries (14,700). The fire injury estimate cited in the text is rounded to the nearest 25.

[19]Socioeconomic factors are discussed in more detail in the USFA report Fire Risk in 2016, Topical Fire Report Series, Volume 19, Issue 6, September 2018, https://apps.usfa.fema.gov/downloads/pdf/statistics/v19i6.pdf.

[20]Unrounded values of relative risk were used for this computation.

[21]2021 NCHS mortality data. The count of fire deaths cited in the text is rounded to the nearest 5.

[22]U.S. Census Bureau, Population Division. July 1, 2021, population estimates from the table Annual Estimates of the Resident Population by Sex, Age, Race and Hispanic Origin for the United States: April 1, 2020, to July 1, 2023 (NC-EST2023-ASR6H). Release date: June 2024.

[23]U.S. Census Bureau, Population Division, Table 2. Projected Population by Age Group and Sex for the United States, Main Series: 2022-2100 (NP2022-T2). Release date: November 2023, https://www.census.gov/data/tables/2023/demo/popproj/2023-summary-tables.html (accessed Oct. 16, 2024).

[24]NCHS, "Health, United States, 2020-2021," Table LExpMort. Life expectancy at birth, age 65, and age 75, by sex, race, and Hispanic origin: United States, selected years 1900–2019, https://www.cdc.gov/nchs/data/hus/2020-2021/LExpMort.pdf (accessed Oct. 16, 2024).

[25]Estimates of fire injuries are calculated by determining the percent of injuries reported to the NFIRS and applying this percentage to the NFPA estimate of civilian fire injuries (14,700). The fire injury estimate cited in the text is rounded to the nearest 25.

[26]FSRI, "Close Before You Doze," https://fsri.org/programs/close-before-you-doze (accessed Nov. 21, 2024).
[27]FSRI, "Take C.H.A.R.G.E. of Battery Safety," https://fsri.org/programs/take-charge-battery-safety (accessed Nov. 21, 2024).
[28]U.S. Census Bureau, Population Division, Table 2. Projected Population by Age Group and Sex for the United States, Main Series: 2022-2100 (NP2022-T2). Release date: November 2023, https://www.census.gov/data/tables/2023/demo/popproj/2023-summary-tables.html (accessed Oct. 16, 2024).
[29]U.S. Census Bureau, Population Division, Table 2. Projected Population by Age Group and Sex for the United States, Main Series: 2022-2100 (NP2022-T2). Release date: November 2023, https://www.census.gov/data/tables/2023/demo/popproj/2023-summary-tables.html (accessed Oct. 16, 2024).