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Fire Risk in 2020

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.

Findings

- Risk by age:
  - Adults ages 50 or older had a greater relative risk of fire death than the general population.
  - Adults ages 85 or older had the highest relative risk of fire death.
  - 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 is the lowest relative risk for this age group since the mid-1970s. However, children ages 4 and younger had an elevated risk of both fire death and injury when compared to older children (ages 5 to 14).
  - 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 1.7 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.

Risk is a factor, element or course of action involving uncertainty. It is an exposure to some peril, and it 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 risk of death or injury from fire is not the same for everyone. In 2020, fires caused 3,790 deaths and 15,200 injuries in the U.S.[1] These casualties were not equally distributed across the U.S. population, and the resulting risk of death or injury from fire is not uniform — it is more severe for some groups than for others.[2] Much can be learned from understanding why different segments of society are at a heightened risk from the fire problem.

This topical fire report explores fire risk as it applies to fire casualties in the U.S. population and is an update to "Fire Risk in 2019," Volume 21, Issue 8. It focuses on how fire risk, specifically the risks of death or injury, varies with age and how other demographic factors weigh upon that risk.

Data sources and methodology

The findings pertaining to deaths in this report were taken from the 2020 National Center for Health Statistics (NCHS) Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. For each reported death certificate in the U.S., NCHS assigned International Classification of Disease (ICD) codes for all reported conditions leading to death. For this report, the following ICD codes were analyzed: F63.1, W39-W40, X00-X06, X08-X09, X75-X76, X96-X97, Y25-Y26 and Y35.1.[3] These codes include 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. Only deaths where age was specified were used in the analyses in the relative risk tables; age was specified in 99.92% of fire deaths in 2020.

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The most recent NCHS mortality data available at the time of this analysis were from 2020. For this reason, all analyses in this report reference 2020 data for consistency.

Fire injury estimates in this report are based on civilian fire injury data from the 2020 National Fire Incident Reporting System (NFIRS) Public Data Release file and the 2020 National Fire Protection Association's (NFPA's) Survey of Fire Departments for U.S. Fire Experience. In the NFIRS, civilian fire injuries involve people who are injured from fire and who are not on active duty with a firefighting organization. Civilians also include emergency personnel who are not members of the fire department, such as police officers or utility workers. Fire injuries generally occur from activities of fire control, escaping from the dangers of fire, or sleeping.[4]

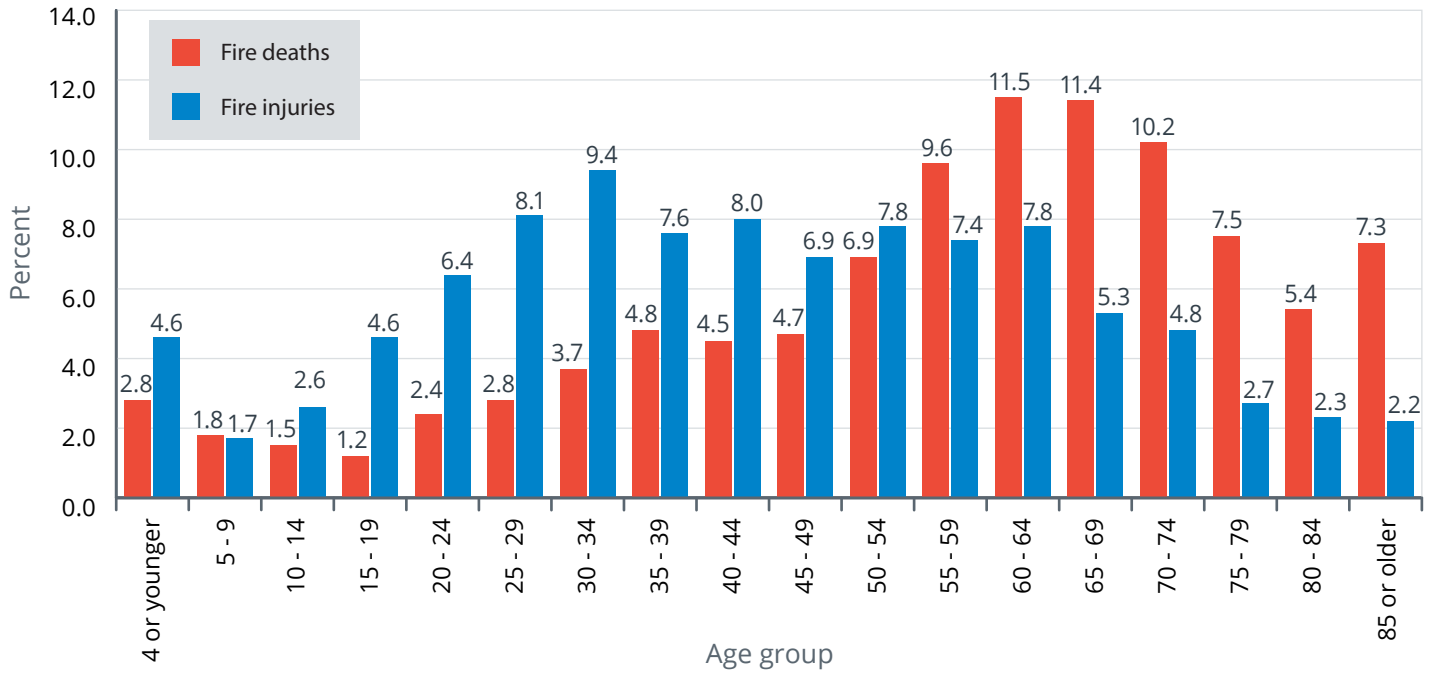
Fire casualties, per capita rates and relative risk

When determining fire risk, geographic, demographic and socioeconomic factors are considered.[5] People in the Midwest and South, males, and adults ages 50 or older were all at a higher risk of dying in a fire than the general population. Although their risk of fire death and injury was less than the general population, the very young (ages 4 and younger) were at a higher risk of fire death and injury when compared to older children. Additionally, African Americans and American Indians/Alaska Natives had a higher risk of death from fire than the population as a whole. These groups remained at a higher risk despite considerable long-term reductions in fires and fire casualties.

Fire casualties across population groups 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. For example, in the case of race in 2020, the number of fire deaths was greatest for white Americans and least for Asian/Pacific Islander Americans. In the case of age, percentages of fire deaths were greatest for those ages 55 to 74 accounting for 43% of fire deaths, while only 25% of fire injuries occurred among adults in this same age group (Figure 1).

Although these findings are informative, they do not account for differences in the basic population groups under comparison. In the case of age, as an age group matures, its number of individuals decreases as a result of deaths. In the case of race for populations living in the U.S., there are far fewer American Indians/Alaska Natives, for example, than white Americans. Consequently, it is possible for an age group or race to have greater (or fewer) injuries or deaths because the total number of individuals who can be injured is larger (or smaller) than that of other groups.

Figure 1. Percentage of fire deaths and injuries by age group in 2020



Sources: 2020 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program, and 2020 NFIRS fire injury data.

Notes: 1. Data have been adjusted to account for deaths and injuries with unknown age. Age was specified in 99.92% of fire deaths and in 99.79% of reported fire injuries.
2. The total percentage distribution of fire injuries does not add up to 100% due to rounding.

To account for population differences such as these, per capita rates are used. Per capita rates use a common population size that permits comparisons between different groups.[6] 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). For the general population in the U.S., the relative risk is set at 1.

From this report, in 2020, the relative risk of dying in a fire for the total population of females in comparison to the total population was 0.7. This is equivalent to the per capita fire death rate for females (8.5 deaths per million population) divided by the per capita fire death rate for the entire population (11.4 deaths per million population).[7] Therefore, the relative risk of a female dying from fire was 30% less than that of the total population (Table 2).

Age and risk of fire casualty

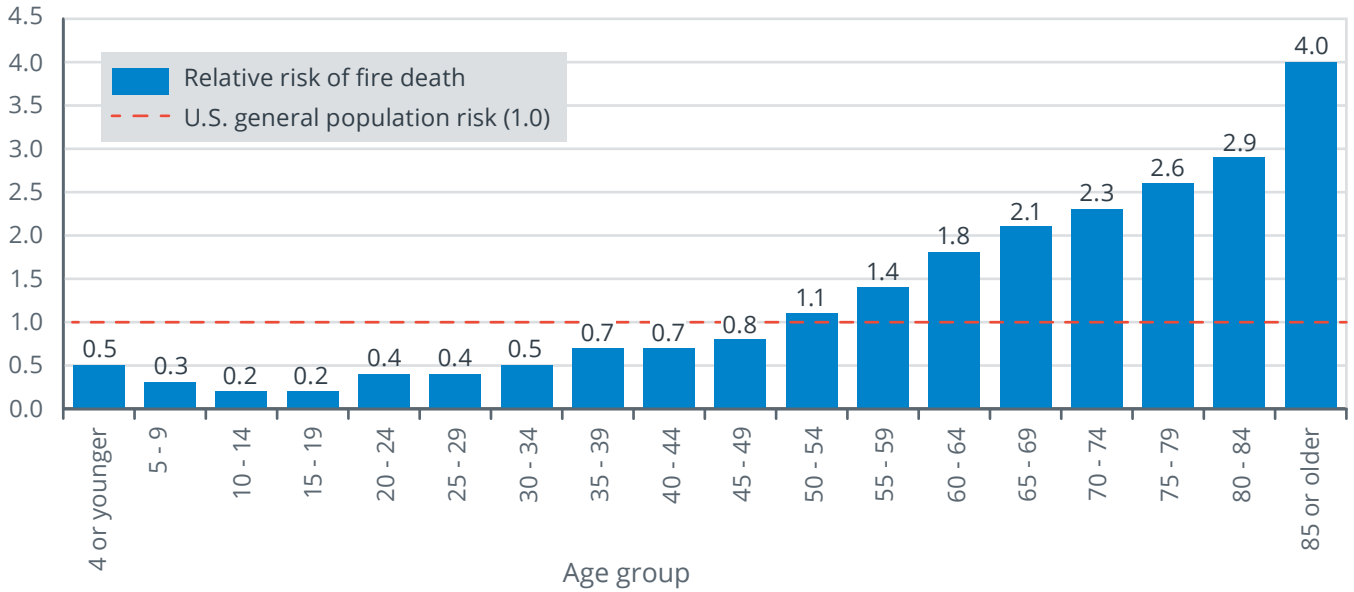
In 2020, the risk of fire death for children ages 4 or younger was 50% less than that of the general population (Figure 2), as it also was in 2019 — the lowest relative risk for this age group since the U.S. Fire Administration (USFA) began tracking the relative risk of dying in a fire in the mid-1970s. 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 70% 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 50, in 2020, 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 2020, 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 2.5 times higher than for the population as a whole and rose even more for the oldest segments (Figure 2). The oldest adults, those ages 85 and older, had a risk

of dying in a fire that was 4.0 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.

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 2. Relative risk of fire death by age group in 2020

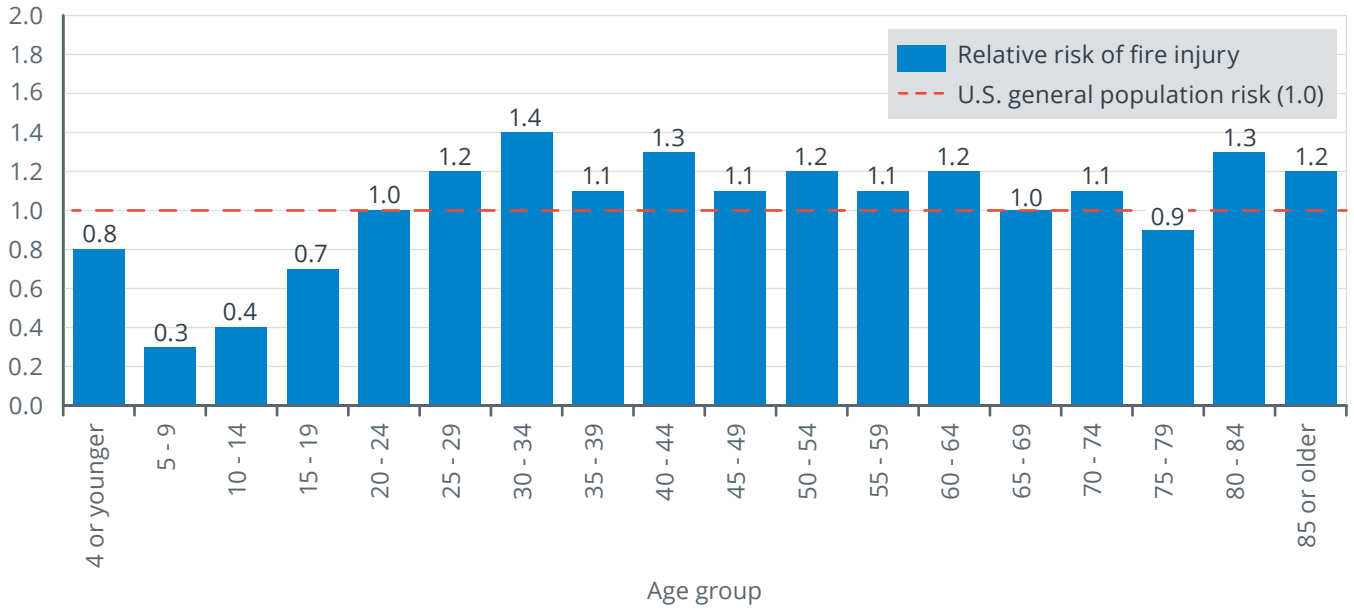


Sources: 2020 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program and U.S. Census Bureau population estimates.

Note: Data have been adjusted to account for deaths with unknown age. Age was specified in 99.92% of fire deaths.

In general, the age profile of risk for fire injuries was different than that for deaths (Figure 3), with a narrower range of risk quotients (0.3 to 1.4 for fire injuries versus 0.2 to 4.0 for fire deaths).[8, 9] 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 2). However, in 2020, adults ages 65 to 69 and 75 to 79 had a relative risk of fire injury at or below the risk of the general population (Figure 3). 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 20. 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 3. Relative risk of fire injury by age group in 2020



Sources: 2020 NFIRS fire injury data, 2020 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 99.79% of reported fire injuries.

Other factors that influence risk

In addition to age, geographic location, sex and race also influence fire risk. In fact, research shows that fire death rates are higher in states with larger percentages of people who are African American, poor and smokers; have less formal education; and live in rural areas. Many of these states tend to be in the southeastern U.S.[10]

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).[11] In the South, this may be partially attributed to the intermittent need for occasional heating. Rather than including central heating systems, as used in northern areas, many households in the South use portable heating devices that may be more likely to lead to a fire. 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 2020

Region	Population	Fire deaths	Death rate (per million population)	Relative risk
Northeast	57,525,633	534	9.3	0.8
Midwest	68,935,174	930	13.5	1.2
South	126,409,007	1,632	12.9	1.1
West	78,631,266	694	8.8	0.8
U.S. overall	331,501,080	3,790	11.4	1.0

Sources: 1. 2020 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, 2020, population estimates from the table Annual Estimates of the Resident Population for the United States, Regions, States, the District of Columbia, and Puerto Rico: April 1, 2020, to July 1, 2021 (NST-EST2021-POP). Release date: December 2021.
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 2020 as well as in 2015 and 2019, males were 1.7 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. For 2020, data showed that males, overall, were about 1.5 times more likely to suffer fire injuries than their female counterparts — the same as in 2017 to 2019.[12]

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 2020, but only 14% of the U.S. population.[13, 14] In 2020, African Americans had a 40% greater risk of dying in a fire than the general population. This is the same as it was in 2019, but lower than in 2018 when the risk was 50% higher than the general population. It is also much lower than in 2007, however, when the risk was 80% higher than the general population.[15] For American Indians/Alaska Natives in 2020, the relative risk was also 40% higher than the risk of the general population — the same as in 2019. This was an increase from 2017, when their risk was 30% higher, but a decrease from 2014, when their risk was 50% higher. By contrast, Asian/Pacific Islander Americans were 70% less likely to die in a fire than the overall population in 2020.

Table 2. Relative risk of fire death by race and sex in 2020, overall population

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Total	331,501,080	3,790	11.4	1.0
Male	164,214,877	2,360	14.4	1.3
Female	167,286,203	1,430	8.5	0.7
White	251,741,953	2,918	11.6	1.0
African American	44,861,705	742	16.5	1.4
American Indian/Alaska Native	4,322,700	67	15.5	1.4
Asian/Pacific Islander	20,999,647	63	3.0	0.3
White male	125,548,118	1,819	14.5	1.3
African American male	21,608,593	460	21.3	1.9
American Indian/Alaska Native male	2,183,824	37	16.9	1.5
Asian/Pacific Islander male	10,120,576	44	4.3	0.4
White female	126,193,835	1,099	8.7	0.8
African American female	23,253,112	282	12.1	1.1
American Indian/Alaska Native female	2,138,876	30	14.0	1.2
Asian/Pacific Islander female	10,879,071	19	-	-

Notes:
1. The overall male and female estimates include individuals with "2+ races" per the census. The "2+ races" category accounts for 2.9% of the population. The NCHS does not include this race category. Therefore, the population estimates for the individual race categories do not sum to the total population estimate. 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 2020

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 2020, 230 children younger than age 15 died from fires (Table 3).[16] These children accounted for 6% of all fire deaths. The youngest children were hit especially hard — 46% of child fire deaths affected children ages 4 or younger. As in prior years, the numbers of fire deaths declined with increasing age.

In 2020, fire injuries affected an estimated 1,350 children.[17] Again, the youngest suffered a large share of injuries: 52% 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 2020, this pattern in fire injuries to children by age group is comparable to the profile of child fire injuries from 2013 to 2019. With these 3 age groups combined, children accounted for 9% of all civilian fire injuries.

Table 3. Child fire deaths and injuries by age group in 2020

	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	232	100.0	107	46.1	69	29.7	56	24.1
Injuries	1,346	100.0	694	51.6	260	19.3	392	29.1

Sources: 2020 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program; 2020 NFIRS fire injury data; and 2020 NFPA fire injury estimates.
Note: Total percent of child fire deaths does not add up to 100% due to rounding.

Age, sex and socioeconomic factors of children and the households where they live also impact fire risk, as they do for the total population.[18] 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 2020, 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 70% 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 31% of fire deaths among children in 2020 but for only 15% of the child population. Moreover, African American children ages 4 or younger had a relative risk of dying that was 10% higher than the general population but 2.3 times higher than for all children in that age group.[19]

Table 4. Relative risk of child fire deaths by age, race and sex in 2020 (ages 0 to 14)

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
All children (ages 0 to 14)				
Total	61,301,070	232	3.8	0.3
Male	31,367,763	119	3.8	0.3
Female	29,933,307	113	3.8	0.3
White	43,432,690	155	3.6	0.3
African American	9,423,162	73	7.7	0.7
American Indian/Alaska Native	1,047,170	2	-	-
Asian/Pacific Islander	3,742,605	2	-	-

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 0 to 4				
Total	19,281,212	107	5.5	0.5
Male	9,857,153	54	5.5	0.5
Female	9,424,059	53	5.6	0.5
White	13,444,414	66	4.9	0.4
African American	3,013,556	39	12.9	1.1
American Indian/Alaska Native	351,706	1	-	-
Asian/Pacific Islander	1,235,018	1	-	-

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 5 to 9				
Total	20,336,862	69	3.4	0.3
Male	10,407,280	34	3.3	0.3
Female	9,929,582	35	3.5	0.3
White	14,360,806	47	3.3	0.3
African American	3,117,000	21	6.7	0.6
American Indian/Alaska Native	347,889	1	-	-
Asian/Pacific Islander	1,277,294	0	-	-

Table 4. Relative risk of child fire deaths by age, race and sex in 2020 (ages 0 to 14) (continued)

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 10 to 14				
Total	21,682,996	56	2.6	0.2
Male	11,103,330	31	2.8	0.2
Female	10,579,666	25	2.4	0.2
White	15,627,470	42	2.7	0.2
African American	3,292,606	13	-	-
American Indian/Alaska Native	347,575	0	-	-
Asian/Pacific Islander	1,230,293	1	-	-

Source: See notes at the end of the report.

Notes: 1. The overall male and female estimates include individuals with "2+ races" per the census. The "2+ races" category accounts for 2.9% of the population. The NCHS does not include this race category. Therefore, the population estimates for the individual race categories do not sum to the total population estimate. 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 2020

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 2020, 1,580 older adults ages 65 or older died from fires (Table 5).[20] These adults accounted for 42% of all fire deaths. However, older adults constituted only 16% of the U.S. population in 2020,[21] and their ranks are growing. It is estimated that the older population will rise sharply between now and 2030, the years when the baby-boom generation will be in retirement. By 2030, the U.S. Census Bureau estimates that adults ages 65 or older will constitute 21% of the U.S. population, which will increase to 23% by 2060.[22] 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.[23]

Adults ages 65 to 74 accounted for about half (52%) of older adult fire deaths, and those ages 75 to 84 accounted for an additional 31%. Adults ages 85 or older accounted for 17% of older adult fire deaths.

While fire injuries affected an estimated 2,625 older adults, this group accounted for 17% of all estimated fire injuries in 2020.[24] The relative risk of older adults ages 65 or older being injured in a fire was 10% 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 2020 declined with increasing age.

Table 5. Older adult fire deaths and injuries by age group in 2020

	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	1,582	100.0	815	51.5	491	31.0	276	17.4
Injuries	2,626	100.0	1,533	58.4	761	29.0	332	12.6

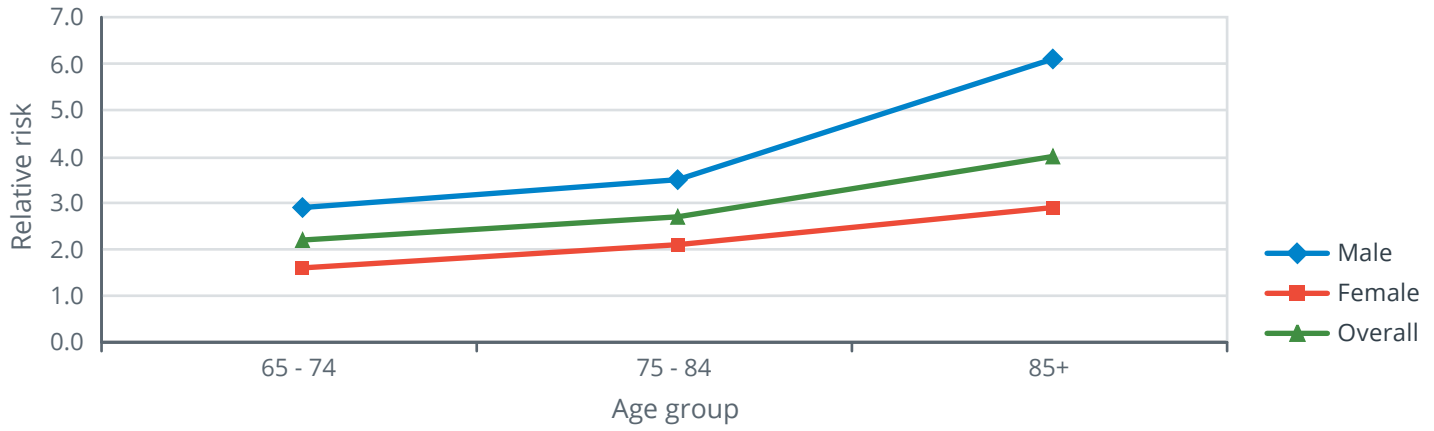
Sources: 2020 NCHS Mortality Data File, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program; 2020 NFIRS fire injury data; and 2020 NFPA fire injury estimates.

In 2020, the relative risk of dying in a fire for older adults was 2.5 times higher than for the population as a whole (Table 6) — the same as it was in 2019. 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 4 and Table 6). Individuals ages 85 or older were 4.0 times more likely to die in a fire than the general population. This is an increase from 2017 to 2019, when they were, respectively, 3.8, 3.8, and 3.6 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 in 2018 and 2019. 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 2020, males were 68% more likely than females to be victims of fires. This disparity held for older adults as well (77%), increasing to 112% in the 85 or older age group.

Figure 4. Age, sex and relative risk of fire fatality for older adults in 2020



Source: Derived from Table 6.

Race

In 2020, the problem was more severe for African Americans ages 65 and older when, as an overall group, they had 4.6 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 10 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, however, when this group had a fire death risk over 7 times greater than the general population. From 2014 to 2015, 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 2020 (ages 65 or older)

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
All older adults (ages 65 or older)				
Total	54,438,296	1,582	29.1	2.5
Male	24,535,756	937	38.2	3.3
Female	29,902,540	645	21.6	1.9
White	45,529,378	1,268	27.9	2.4
African American	5,277,363	280	53.1	4.6
American Indian/Alaska Native	421,523	12	-	-
Asian/Pacific Islander	2,679,080	22	8.2	0.7

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 65 to 74				
Total	32,596,995	815	25.0	2.2
Male	15,374,884	504	32.8	2.9
Female	17,222,111	311	18.1	1.6
White	26,973,980	662	24.5	2.1
African American	3,373,567	138	40.9	3.6
American Indian/Alaska Native	274,856	4	-	-
Asian/Pacific Islander	1,636,904	11	-	-

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 75 to 84				
Total	15,821,149	491	31.0	2.7
Male	6,993,079	283	40.5	3.5
Female	8,828,070	208	23.6	2.1
White	13,402,579	399	29.8	2.6
African American	1,411,378	83	58.8	5.1
American Indian/Alaska Native	111,768	4	-	-
Asian/Pacific Islander	751,847	5	-	-

Table 6. Relative risk of older adult fire deaths by age, race and sex in 2020 (ages 65 or older) (continued)

Sex/race	Population	Fire deaths	Death rate (per million population)	Relative risk
Ages 85 or older				
Total	6,020,152	276	45.8	4.0
Male	2,167,793	150	69.2	6.1
Female	3,852,359	126	32.7	2.9
White	5,152,819	207	40.2	3.5
African American	492,418	59	119.8	10.5
American Indian/Alaska Native	34,899	4	-	-
Asian/Pacific Islander	290,329	6	-	-

Source: See notes at the end of the report.

Notes:
1. The overall male and female estimates include individuals with "2+ races" per the census. The "2+ races" category accounts for 2.9% of the population. The NCHS does not include this race category. Therefore, the population estimates for the individual race categories do not sum to the total population estimate. 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.

Conclusion

Older adults are some of the nation's most vulnerable residents, and in 2020, their risk of death in a fire remained high. 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 16% of the total population to 23% by 2060,[25] with an assumed corresponding increase in fire deaths and injuries among older adults. According to U.S. Census Bureau population projections, by 2060, the number of individuals ages 65 or older is expected to be 95 million — nearly double the amount in 2020. At the same time, the population ages 85 or older is expected to triple, increasing from 6 million in 2020 to 19 million in 2060.[26] 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 2020, their relative risk of fire death was 70% 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.

Prevention

Because children and older adults accounted for nearly half (48%) of all fire deaths and 26% of fire injuries in 2020, 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.

New technologies

Partly due to early detection and fire extinguishing systems, fire fatalities and injuries have declined over the last 40 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/.

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

Notes:

Sources for Table 2, Table 4 and Table 6 are the 2020 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, 2020, 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, 2021 (NST-EST2021-POP). Release date: December 2021 (https://www.census.gov/newsroom/press-kits/2021/2021-national-state-population-estimates.html).
- July 1, 2020, 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, 2021 (NC-EST2021-ASR6H). Release date: June 2022.

[1]2020 NCHS mortality data (deaths) and the 2020 NFPA survey estimates (injuries). The count of fire deaths cited in the text is rounded to the nearest 5.

[2]The term "casualties" refers to both fire deaths and injuries.

[3]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.

[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]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.

[6]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. For example, the per capita fire death rate for the total female population in 2020 was computed from the total number of female fire deaths (1,430) divided by the total female population (167,286,203) and multiplied by 1,000,000 people. This rate is equivalent to 8.5 fire deaths per 1 million population.

[7]The per capita fire death rate for the total population in 2020 was computed from the total number of fire deaths (3,790) divided by the total U.S. resident population (331,501,080) and multiplied by 1,000,000 people. This rate is equivalent to 11.4 fire deaths per 1 million population.
[8]Estimates of injuries by age are derived from 2020 NFIRS civilian fire casualty age data in conjunction with the 2020 NFPA estimate of civilian fire injuries (15,200). Fire injury risk is computed using the 2020 NFIRS data and the NFPA estimate of civilian fire injuries.
[9]Fire department participation in the NFIRS is voluntary; however, some states do require their departments to participate in the state system. Additionally, if a fire department is a recipient of a Fire Act Grant, participation is required. From 2018 to 2020, 65% of the NFPA's annual average estimated 1,332,800 fires to which fire departments responded were captured in the NFIRS. Therefore, the NFIRS is not representative of all fire incidents in the U.S. and is not a "complete" census of fire incidents 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.
[10]NFPA, Fire Analysis and Research Division, "Demographic and Other Characteristics Related to Fire Deaths or Injuries," March 2010.
[11]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).
[12]Unrounded values of relative risk were used for the computations in this paragraph.
[13]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.
[14]Statistics are based on 2020 NCHS mortality data and U.S. Census Bureau population estimates for July 1, 2020.
[15]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.
[16]Numbers of fire deaths are extracted from 2020 NCHS mortality data using the ICD codes noted previously. The count of fire deaths cited in the text is rounded to the nearest 5.
[17]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 (15,200). The fire injury estimate cited in the text is rounded to the nearest 25.
[18]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.
[19]Unrounded values of relative risk were used for this computation.
[20]2020 NCHS mortality data. The count of fire deaths cited in the text is rounded to the nearest 5.
[21]U.S. Census Bureau, Population Division. July 1, 2020, population estimates from the file Annual Estimates of the Resident Population by Single Year of Age and Sex for the United States: April 1, 2020 to July 1, 2021 (NC-EST2021-AGESEX-RES). Release date: April 2022.
[22]U.S. Census Bureau, Population Division, Table 2. Projected age groups and sex composition of the population: Main Projection Series for the United States: 2017 to 2060 (NP2017-T2). Release date: September 2018, https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html (accessed July 22, 2022).
[23]NCHS, "Health, United States, 2019," Table 4. Life expectancy at birth, at age 65 and at age 75, by sex, race and Hispanic origin: United States, selected years 1900–2018, https://www.cdc.gov/nchs/data/hus/hus19-508.pdf (accessed July 22, 2022).
[24]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 (15,200). The fire injury estimate cited in the text is rounded to the nearest 25.
[25]U.S. Census Bureau, Population Division, Table 2. Projected age groups and sex composition of the population: Main Projection Series for the United States: 2017 to 2060 (NP2017-T2). Release date: September 2018, https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html (accessed July 22, 2022).
[26]U.S. Census Bureau, Population Division, Table 2. Projected age groups and sex composition of the population: Main Projection Series for the United States: 2017 to 2060 (NP2017-T2). Release date: September 2018, https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html (accessed July 22, 2022).