US Fire Death Rates by State

Marty Ahrens
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Key Findings

Fire death rates vary considerably by state, with the 2015–2019 average death rates per million population ranging from a low of 4.7 to a high of 23.7. The overall US average was 10.0.

Nine of the 10 states with the highest overall fire death rates in 2015–2019 were in the South.

Higher state fire death rates are generally found in states with larger percentages of people who:

- Have incomes below the poverty line
- Have a disability
- Live in an area in which at least 20 percent of the population lives below the poverty line
- Are current smokers
- Are either Native American or Alaskan Native, or African American or Black
- Live in rural areas

None of these factors themselves cause fires or fire deaths.


Trends

In 2015–2019, the national annual average death toll was 43 percent lower than it was in 1981–1985. All but four states had fewer fire deaths in 2015–2019 than in 1981–1985. All states had lower population-based fire death rates in 2015–2019 than in 1981–1985. In 30 states, the 2015–2019 rates were higher than they were in 2010–2014.

Figure 1. US Census Regions
**Introduction**

Fire death rates vary considerably by state. Information about demographic factors associated with higher fire death rates and how individual states compare to others can be helpful in developing appropriate prevention programs. Risk factors should be considered when developing these programs and materials. Users can also compare the progress made in reducing deaths and death rates to the country as a whole.

This analysis uses death certificate data collected by the National Center for Health Statistics (NCHS) [accessible at the Centers for Disease Control and Prevention’s (CDC’s) Web-based Injury Statistics Query and Reporting System (WISQARS™) Fatal Injury Reports] to provide total and average fire or flame deaths and average fire or flame death rates per year for 1981–1985 through 2015–2019. Additional information related to race, ethnicity, age, and urbanization was obtained from the Underlying Cause of Death query page on the Mortality Data site on CDC Wonder. Unless otherwise specified, demographic data were obtained from the American Community Survey (ACS), US Census Bureau, and the Behavioral Risk Factor Surveillance System. See Appendix A for more details. Fire death, fire death rate trends, and demographic factors for specific states are available at nfpa.org/News-and-Research/Data-research-and-tools/US-Fire-Problem/Fire-deaths-by-state.

Information from several articles and reports is included to provide further context.

**State-level trends**

An average of 3,241 US death certificates per year in 2015–2019 indicated that a fire or flame was an external cause of injury. Nearly every state had fewer fire deaths and a lower fire death rate in 2015–2019 than in 1981–1985. Only four states, Nevada, Arizona, New Mexico, and Wyoming, saw an increase in fire deaths over that interval. However, during that time, Nevada’s population more than tripled, Arizona’s more than doubled, and New Mexico’s increased 1.5 times. Wyoming’s population also increased by more than its increase in fire deaths. Some fluctuation is normal, particularly in states with smaller populations, such as Wyoming.

The fire death rate per million population was lower in 2015–2019 than in 1981–1985 in all 50 states.

Death certificate data showed a 6 percent increase in the fire death toll nationally from 2010–2014 to 2015–2019. Thirty-six states showed an increase in fire deaths over these two recent periods while 30 states experienced an increase in the fire death rate per million population.

Nine of the 10 states with the highest overall fire death rates in 2015–2019 were in the South. Alaska was the exception.

**Race and ethnicity**

Figure 2 shows the average fire deaths per year in the US by race or ethnicity.¹ Four of the 10 states with the highest death rates were also among the 10 states with the highest percentage of African American or Black residents. Two of the states with the highest fire death rates were in the top 10 states with the highest percentage of Native American or Alaska Native residents.

Definitions and interpretations of race and ethnicity can vary. Some data may have been based on visual impressions, while other data could have come from interviews or records. Individuals may identify more with a particular race or ethnicity or interpret questions differently at different times. Consequently, estimates of racial and ethnic groups can vary. Data from some categories were considered unreliable due to smaller numbers; these are not shown. Hispanic or Latino is considered an ethnicity. In this analysis, Hispanic also includes Latino.
While the fire death rate is lowest for Asian or Pacific Islanders, Figure 3 shows that the Hispanic population has a much lower fire death rate than non-Hispanics. Non-Hispanic Native Americans or Alaska Natives have the highest fire death rate, followed by non-Hispanic African Americans or Blacks.

In their 2010 article, Bishai and Lee noted that in 1999–2004, African Americans and Native Americans aged 55 and older had much higher fire death rates than White people of comparable age.²

Figure 4 shows that the lower Hispanic fire death rate persists throughout the life span. African American or Black children under 10 have a fire death rate that is roughly twice that of children that age overall. This ratio was also true for African American or Black adults at least 75 years of age.
In their 2016 article, Karb, Subramanian, and Fleeger compared county fire death rates in 1999 and 2012 by age, gender, race or ethnicity, urban/rural designation, and county poverty percentages for all unintentional injuries and for six specific causes, including fire or smoke exposure. As in this analysis, fire and smoke death rates were uniformly lower in 2012 than in 1999 across the different measures. The fire death rate increased with age, was higher for individuals who were Black or African American, and was lowest for Hispanics. (Native Americans and Asian Americans were grouped together as “other.”)

Poverty
Race and ethnicity correlate to other factors that impact risk. According to ACS estimates, 13.4 percent of the US population lived in households with incomes below the poverty line in 2015–2019. This was true for:

- 24.9 percent of the Native American or Alaskan population
- 23.0 percent of the African American or Black population
- 19.6 percent of the Hispanic population
- 10.9 percent of the Asian population
- 9.6 percent of the White, non-Hispanic population

In this analysis, nine of the 10 states with the highest fire death rates were among the 10 states with the largest percentage of the population below the poverty line. These nine states were all in the South.

People who are poor generally have older things, often find it difficult to afford repairs or routine maintenance, may work multiple jobs to make ends meet, and are likely to face more stress. They may have less energy and resources to focus on safety. In their analysis of 1988–1992 fire death rates from counties with populations of 250,000 or more, Hannon and Shai found that “… areas with a high proportion of African Americans and a low median family income tend to have exceptionally high fire death rates, and racial composition appears unrelated to variation in the fire death rate among areas with very high levels of income.”

Bishaw, Benson, Shrider, and Glassman reported on ACS findings that, during 2015 to 2019, 21.2 percent of the population lived in census tracts with poverty rates of at least 20 percent. Percentages of people living in these poverty areas ranged from 5.2 to 42.4 percent, and, in some cases, were more than double the percentage of those with incomes below the poverty line. Such areas may have poorer housing and services, higher crime, and fewer resources for code enforcement or prevention.

Figure 4. Fire death rates by age and race or ethnicity: 2015–2019

Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death on CDC WONDER Online Database.
Seven of the 10 states with the highest fire death rates were also among the 10 states with the highest percentages of people living in poverty areas.

Karb, Subramanian, and Fleeger found that fire death rates increased steadily with increasing percentages of the county population having incomes below the poverty line. In 2012, the 12.4 fire deaths per million population in counties in which at least 20 percent of the population had incomes below the poverty line was nearly five times the 2.6 deaths per million population in counties with less than 5 percent of the population below the poverty line. Individuals living in a county with a high poverty rate may or may not be poor.7

The same study also found that the most rural counties had the highest fire death rates.

**Disability**

Eight of the 10 states with the highest fire death rates were among the 10 states with the highest percentage of people with disabilities.

In its 2014 report on physical disabilities and home fire deaths, NFPA noted that a physical disability contributed to an estimated average of 400 (15 percent) of the home fire deaths per year in 2007–2011.8 Forty-two percent of the fire victims with a physical disability were killed by fires started by smoking materials. People with disabilities often need more time to escape, assuming they are able to self-rescue.

According to CDC’s infographic “Adults with Disabilities: Ethnicity and Race,” three of every 10 Native American or Alaskan Native adults have a disability.9 This is true for one of every four in the African American or Black population, one in five Whites, one in six native Hawaiian or Pacific Islanders, one in six Hispanics, and one in 10 Asian people in the United States. Forty-one percent of the Native Americans or Alaska Natives who had disabilities smoked.

**Adult smokers**

Seven of the 10 states with the highest fire death rates were also among the 10 states with the highest percentage of adult smokers.

According to the 2021 NFPA report *Home Structure Fires*, only 5 percent of reported home fires in 2015–2019 were started by smoking materials, yet those fires accounted for 23 percent of the total home fire deaths, making smoking the leading cause of fire death over the combined 5-year period.10

The CDC’s National Health Interview Survey found that 16.7 percent of US adults used a “combustible tobacco product” (smoked) every day or some days in 2019.11 Non-Hispanic Native Americans and Alaska Natives had the highest smoking rate of the different racial groups, while Asians had the lowest. Hispanic individuals were less likely to be smokers than were non-Hispanic people.

Smoking rates were highest in the Midwest, followed by the South. Smoking rates fell as educational and income levels increased. Smoking rates were twice as high among those who reported serious psychological distress. Older adults were less likely to smoke than other age groups. People with disabilities were more likely to smoke. Individuals with generalized anxiety disorder were also more likely to smoke, with the percentage of smokers increasing with anxiety severity.

**Rural or urban**

This analysis found that five of the 10 states with the highest fire death rates were also among the states with the largest percentage of their residents living in rural areas according to the 2010 Census.

Figure 5 shows that the percentage of total fire deaths increases as the percentage of the population decreases12 according to the 2013 NCHS urban-rural scheme for counties.13
The median county population per square mile for the six categories in the 2013 study is shown below:

- 2,037 persons per square mile in large central metros
- 233 per square mile in large fringe metros
- 148 per square mile in medium metros
- 55 per square mile in micropolitan (non-metro) counties
- 18 per square mile in non-core counties

The percentage of the population in large central and fringe metros was roughly 1.5 times their percentage of fire deaths, while the percentage of total fire deaths in the two least populated areas was roughly twice the percentage of their populations.

An elevated risk of fire death in rural areas is not unique to the US. A 2017 study of residential fire deaths in Sweden found that the death rate was highest in “sparsely populated municipalities.”

Discussion

These risk factors are correlated with each other and so tend to explain some of the variations in state fire death rates. A state that ranks high in one or more of these risk factors could be expected to have a higher fire death rate, and a state that ranks low in the risk factors could be expected to have a lower state fire death rate.

For example, West Virginia, Mississippi, and Arkansas are all among the top 10 states for at least five of the major risk factors and had the three highest average state fire death rates.

Fire death rates can also be heavily influenced by a fire that kills several people, particularly in states with lower populations.

The supporting tables that accompany this report list all the states and their average fire death totals and fire death rates, as well as their standing in relation to the factors discussed in this report. The tool at nfpa.org/News-and-Research/Data-research-and-tools/US-Fire-Problem/Fire-deaths-by-state provides more trend data and allows users to compare trends in fire death tolls and rates in five-year averages from 1981 through 2019 and demographic for up to five states at a time.

Fire deaths are not an inevitable consequence of any factor. Effective programs—such as universal public fire and life safety education, wider use of home fire protection systems, and strong consensus codes with strong enforcement—can reduce fire death rates regardless of demographics. Given that nine of the 10 states with the highest fire death rates were also in the bottom 10 states based on 35 health measures, including: community and environment factors such as air pollution, children in poverty, rates of infectious diseases, occupational fatalities, and violent crime; behaviors; policy; clinical care; and outcomes,15 these states have multiple needs and resource challenges. Fire safety is only one of the issues requiring attention.
While national-level data provides important insights about trends related to fire death rates, risk mitigation can be enhanced with a local approach. The 2020 edition of NFPA 1300, *Standard on Community Risk Assessment and Community Risk Reduction Plan Development*, was released in July 2019. The document describes a data-driven process for helping community leaders identify, prioritize, and mitigate local risks.

In July 2021, NFPA released a companion tool for NFPA 1300, CRAIG 1300™, the NFPA Community Risk Assessment Insight Generator powered by mySidewalk. The tool generates customized dashboards with maps, graphs, and charts identifying at-risk people, places, and conditions to inform local community risk assessments and to support community risk reduction activities aligned with NFPA 1300.

**Appendix A: Data Sources, Methods, and Definitions**

**Death certificate data**

This analysis is based on the national database of death certificates collected by the NCHS. The CDC’s Web-based Injury Statistics Query and Reporting System (WISQARS™) Fatal Injury Reports provided counts of residents in each of the 50 states with fire or flame coded as an external cause of fatal injury. All intents (intentional, unintentional, and unknown intent) were counted. Death certificates are coded by local medical authorities using codes defined by the International Classification of Diseases (ICD) prepared by the World Health Organization. Death certificate data are then compiled by the states and finally by NCHS. WISQARS also provided population data from the US Census and death rates per 100,000 population. From 1981 through 1998, the ninth edition of the ICD codes was used. ICD-10 codes have been used for death certificates from 1999 on.

Queries were done in August and September 2021. Five-year averages are shown for most periods except for 1996–1998, the last three years of ICD-9 data. The first year of the ICD-10 codes, 1999, was omitted to provide five-year intervals from 2000 through 2019. Although in some cases the yearly averages were less than 10, in all cases, the five-year totals were greater than 10 in keeping with the CDC’s confidentiality policy.

In WISQARS and this analysis, the term *state* refers to the state in which the victim lived. Local fire departments and state fire authorities are likely to track victims who died as a result of fires in their state even if they were not state residents. Through the annual fire experience survey, NFPA develops estimates of civilian fire deaths based on data from local fire departments.

**CDC documentation** shows that in ICD-9, fire or flame deaths were identified by external cause of injury codes E890–E899 (unintentional), E958.1 (suicide by fire or flame), E968.0 (homicide by fire or flame), and E988.1 (fire or flame of undetermined intent), while in ICD-10, these deaths were identified by external cause of injury codes X00–X09 (unintentional), X76 (suicide), X97 (homicide), and Y26 (undetermined intent). WISQARS notes a separate code was added for terrorism. Consequently, the deaths caused by the events of September 11, 2001, were not recorded as fire deaths.

Vehicle fire deaths, particularly those resulting from post-crash fires, may be captured under transport codes in the death certificate dataset, but they are included in the fire deaths captured in NFPA estimates.

**Other demographic data**

- State population estimates from the US Census were obtained with WISQARS queries of the death certificate data.
- The percentage of a state’s population with incomes below the poverty line was taken from the American Community Survey (ACS) Table ID: S1701, “Poverty Status in the Past 12 Months: 2019 Five-Year Estimate Subject Tables.”
- The percentage of adults who are current smokers was obtained from the CDC’s Behavioral Risk Factor Surveillance System 2015–2019.
The percentage of people living in the community with a disability was obtained from the ACS Table ID: S1810, “Disability Characteristics: 2019 Five-Year Estimate Subject Tables.”

The percentage of each state’s population living in rural communities in 2010 was obtained from the US Census Bureau’s 2010 Decennial Census Table ID: PCT2 “Urban and Rural Total Population.”

The percentage of the population belonging to various racial or ethnic characteristics was obtained from the ACS Table ID: DP05, “Demographic and Housing Characteristics: 2019 Five-Year Estimates Data Profiles.”

Comparing state data, the NFPA fire experience survey, and death certificate data

State fire agencies and NFPA national estimates of civilian fire deaths capture slightly different data than do death certificates. As mentioned earlier, state death tolls in this analysis are based on the victim’s residence, not where the fire occurred. In addition, fire departments may not be informed of a death that occurs after hospitalization. Deaths from a post-collision fire may be grouped with transportation rather than fire in the ICD codes. NFPA estimates are projections based on the NFPA fire experience survey of a subset of fire departments, not a complete census. Firefighter fatalities were not included in these NFPA estimates.

Figure 6 shows the difference between national fire death counts from the death certificate data and the NFPA estimate of civilian fire deaths, while Figure 7 compares the death rates per million population. Differences between the two systems have generally decreased over time. The last three years of ICD-9 data are shown in lighter shades to indicate they are not five-year averages. The year 1999 was omitted to maintain five-year intervals for the ICD-10 data.

The COVID-19 pandemic placed a tremendous strain on first responders. Fire department responses to the NFPA fire experience survey have declined over time and fell even more during the pandemic. Because of the pandemic, NFPA omitted its routine second mailing in 2020 for 2019 data. This mailing would have normally gone out in March. In 2020, 2,432 fire departments responded for an overall sample response rate of 10 percent. In 2021, fire departments returned 2,204 surveys with data for 2020 for a 9 percent response rate.

Response rates are lowest for the smallest departments. This causes more weight to be given to deaths reported by these departments.
Does not include the fatalities from the events of September 11, 2011.

Source: NCHS death certificate data accessed through CDC’s WISQARs and estimates from the NFPA FES as reported in the Fire Loss in the United States series of annual reports.
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7 Karb, Subramanian, and Fleegler (2016).


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12 Centers for Disease Control and Prevention, National Center for Health Statistics, “About Underlying Cause of Death, 1999-2019,” CDC WONDER Online Database.


NFPA Research. *Methodology used in calculating 2020 national estimates from NFPA’s fire experience survey.* (Quincy, MA: National Fire Protection Association, 2021n, Index #3117)