United States
Consumer Product Safety Commission

# 2020 – 2022 Residential Fire Loss Estimates

## U.S. National Estimates of Fires, Deaths, Injuries, and Property Loss from Unintentional Fires

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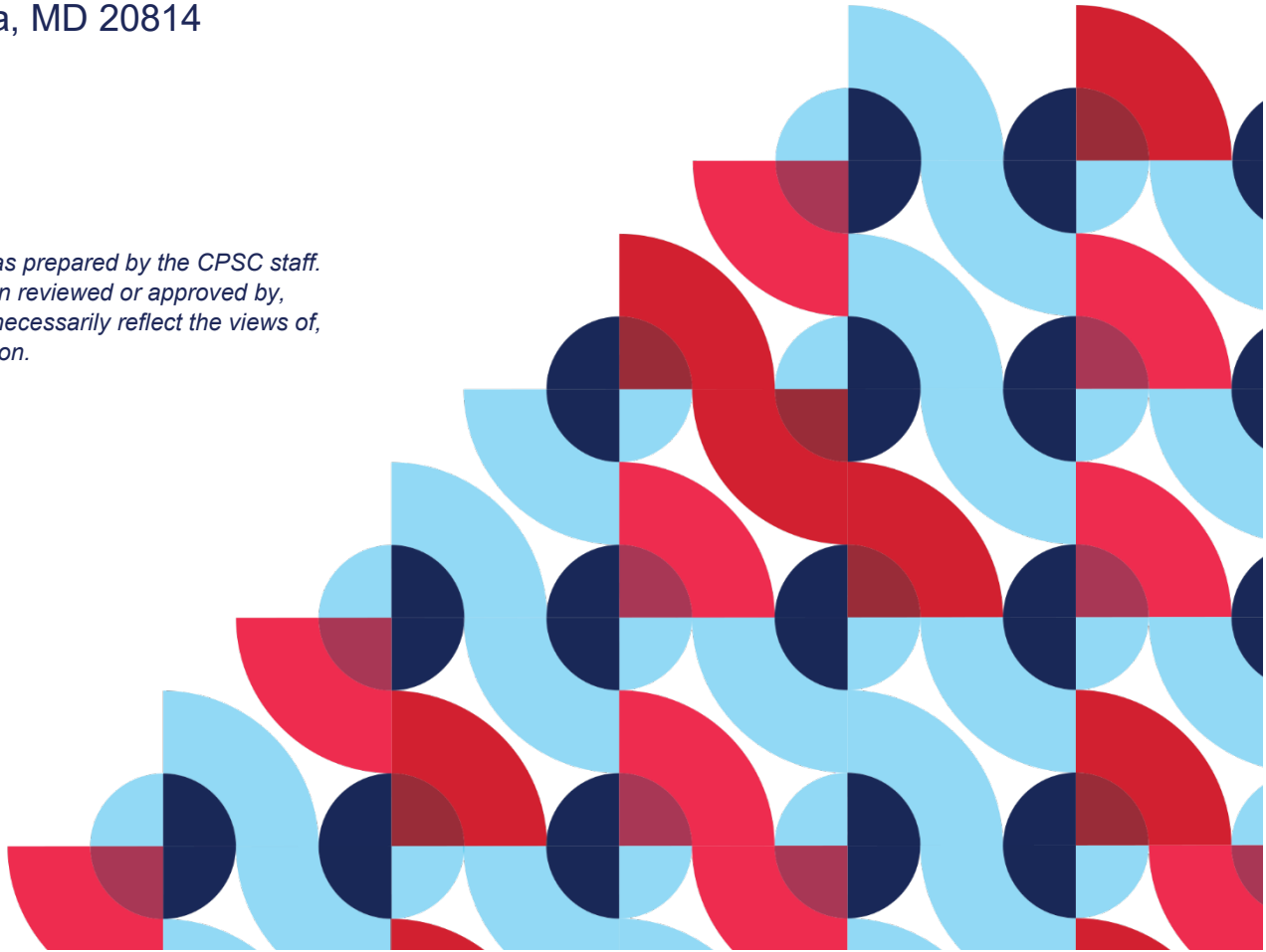
David Miller
Division of Hazard Analysis
U.S. Consumer Product Safety Commission
Bethesda, MD 20814

*This report was prepared by the CPSC staff. It has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.*



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# Executive Summary

This report presents estimates of consumer product-related losses that occurred in U.S. residential structure fires attended by the fire service. The estimates were derived from data provided by the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA) Survey of Fire Departments for U.S. Fire Experience for 2020 through 2022.

The fire and fire loss estimates presented in this report pertain to unintentional residential structure fires and civilian casualties. The estimates are:

- 364,100 fires, 2,360 deaths, 11,010 injuries, and $7.55 billion in property losses in 2020;
- 346,400 fires, 2,540 deaths, 10,610 injuries, and $8.21 billion in property losses in 2021;
- 367,900 fires, 2,430 deaths, 9,470 injuries, and $10.16 billion in property losses in 2022; for
- an estimated annual average of 359,500 fires, 2,440 deaths, 10,360 injuries, and $8.64 billion in property losses over the 3-year period from 2020 through 2022.

This report will provide total estimates of residential structure fires as well as corresponding deaths, injuries, and property loss. It will also provide estimates (including deaths, injuries, and property loss) for residential structure fires associated with specific consumer products. Consumer products involved in fires can be categorized as "sources of ignition" or "the materials first ignited." Sources of ignition can be small, such as candles, or large, like ranges. The larger sources of ignition, *e.g.*, operating equipment, are identified in NFIRS as "equipment." Smaller sources of ignition that are not equipment—such as candles, matches, and lighters—are identified in NFIRS as "heat sources." Consumer products can also be involved as items or materials contributing to flame spread. For this report, CPSC staff produced estimates based on the sources of ignition and the materials first ignited, but not for the items or materials contributing to flame spread.

Because the fire losses are derived separately for sources of ignition and materials first ignited, estimates presented in this report can overlap in some cases. For example, a fire involving a candle igniting a mattress will count as a candle fire (Heat Source) and a mattress fire (Item First Ignited). Additionally, these estimates do not account for all of the materials involved in a fire because items that are neither the Heat Source nor the Item First Ignited can still be involved in (and in some cases be a significant factor in) residential fire losses. Consider a cigarette igniting newspapers and then the flaming newspapers igniting upholstered furniture. In this case, the upholstered furniture was neither the heat source nor the first item ignited. However, the furniture represents a significant fuel load, and it increases the potential for life-threatening conditions to occupants.

The same products continue to contribute to the greatest estimated numbers of fire losses (as measured by Equipment Involved in Ignition, Heat Sources, and Items First Ignited), highlighted in the following paragraphs from Tables 1a–5d and 6.

Cooking equipment accounted for the largest percentage of fires. An estimated annual average of 156,300 cooking equipment-related fires from 2020 through 2022 accounted for 43.5 percent of the average annual estimate of total residential fires for the same period. The corresponding death estimates constitute an annual average of 210 deaths, which is 8.4 percent of the average annual estimate of total residential fire deaths. The annual average number of cooking fire injuries for 2020 through 2022 was estimated to be 2,700, which represents 26.0 percent of the total estimated annual average number of injuries for the same period. Much of these losses were associated with range and oven fires.

Heating and cooling equipment fires constituted the second largest share of total residential fires. The estimated annual average of 38,100 fires for 2020 to 2022 was 10.6 percent of the annual average estimate of total residential fires during the same period. The corresponding death estimate is an annual average of 220 deaths, which is 8.9 percent of the average annual estimated number of total residential fire deaths. The corresponding injuries for the 3 years averaged to an annual estimate of 910. This accounts for 8.8 percent of the annual average estimate of total injuries during 2020 to 2022.

An estimated annual average of 18,100 fires was attributable to electrical distribution equipment (*e.g.*, installed wiring, lighting, etc.). This is 5.0 percent of the estimated annual average number of residential fires for this period. The annual average death estimate is 160 (6.4 percent of average annual estimated residential fire deaths); and the injury estimates averaged 670 (6.5 percent of the estimated annual average of residential fire injuries).

For Item First Ignited, upholstered furniture was involved in the greatest number of fire deaths. From 2020 through 2022, an estimated annual average of 340 deaths was associated with these fires. This constitutes 13.9 percent of the estimated annual average of total deaths (from an estimated 1.0 percent of the fires) associated with residential structure fires for the same period. From 2020 through 2022, mattress or bedding ignitions accounted for an annual average of 300 deaths, which is 12.4 percent of the average annual estimated number of total residential fire deaths (from an estimated 1.8 percent of the fires).

Note that the estimate of upholstered furniture deaths declined sharply from 2020 to 2021 and then rose sharply in 2022—from 380 to 250 to 390. The death estimates for mattress or bedding fires decreased throughout the period from 360 in 2020 to 310 in 2021 to 240 in 2022. It is not clear yet if this decline in the mattress fire death estimates is an anomaly or if it is a sign of a real reduction in the hazard, but there was also a large decrease in the mattress fire injury estimates.

For Heat Source, smoking materials (cigarettes, pipes, cigars, and heat from undetermined smoking material) were the largest contributor to deaths, associated with an annual average of 600 deaths from 2020 to 2022. This is 24.5 percent of the estimated annual average of total residential fire deaths. Smoking materials as the heat source in fires, however, composed only 3.0 percent of the total estimated residential fires.

Among products that are identified as Heat Sources, cigarette lighters had the second highest estimated number of deaths. The estimated annual average number of deaths from cigarette lighter fires is 80, which is 3.2 percent of the average estimated total number of residential fire

deaths from 2020 to 2022, although lighters are only involved in an estimated 0.4 percent of the fires.

There were also an estimated 70 deaths from candle fires (2.8 percent of the estimated annual average of total residential fire deaths, versus an estimated 1.6 percent of the fires).

There was a 4.9-percent decrease in the estimates of total residential fires from 2020 to 2021, from an estimate of residential fires of 364,100 in 2020 to 346,400 in 2021. This was followed by an increase of the total residential fire estimate in 2022—back up to 367,900 (an increase of 6.2 percent).

Conversely, the total residential fire death estimate increased and then decreased over the period of 2020 to 2022, rising from 2,360 in 2020 to 2,540 in 2021 before falling to 2,430 total residential fire deaths in 2022. This is an overall increase of 2.9 percent from 2020 to 2022.

The total residential fire injury estimates decreased throughout the period, from 11,010 in 2020 to 10,610 in 2021 and down again to 9,470 in 2022. This was an overall decrease of 14.0 percent.

By age of fire death victim, older people are the most likely age group to die from fires. The fire death rate from 2020 to 2022, for people between the ages of 65 and 74, is 1.6 per hundred thousand population, which is more than twice the overall fire death rate (0.7 per hundred thousand). The fire death rate for people aged 75 and over (2.1 per hundred thousand) is about three times the overall rate.

# Introduction

The fire loss estimates presented in this report are based on the National Fire Protection Association's (NFPA) national fire loss estimates[1] and the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) data. The NFPA makes national estimates of fires, deaths, injuries, and property losses, based on a probability sample survey of U.S. fire departments. NFIRS compiles fire incident reports submitted voluntarily to the USFA by U.S. fire departments. Not all the states reporting include data from all fire departments in the state. Product-specific information, such as the equipment involved in the ignition of the fire or the item that was first ignited in the fire, are among the wealth of information collected and available.

The estimated number of fires and associated fire losses in this report pertain to fires in residential properties only. These include single-family and multifamily dwellings. Mobile and motor homes, when used as a structure, and not in transit, are also included. Hotels, long-term care facilities, dormitories, and barracks are included too. Injury and death estimates pertain to civilian[2] casualties only. The property losses include property and content losses, as estimated by fire departments. In this report, for convenience, property and content losses combined are referred to as "property losses."

NFIRS has codes to identify confined fires (those that do not spread beyond the originating item). To encourage the reporting of these fires, NFIRS requires only limited information for these fires. For this reason, it is usually not possible to determine the type of equipment involved in the incidents coded as "confined fires" because the specific equipment is rarely coded. For example, when a fire is identified in NFIRS as a "confined cooking fire" it is rarely possible to distinguish a fire started by a range versus other cooking equipment, such as a microwave oven or toaster. Consequently, confined cooking fire losses are only included as part of the "Total Cooking Equipment" fires, but they are not included in subcategories that define the equipment involved or the power source. Because ranges certainly are involved in some confined fires, this should be considered in evaluating the cooking fire hazard. The same is true for microwave ovens and other cooking equipment.

Consumer products for which there are estimates of fires and fire losses in this report are either ignition sources for fires or materials ignited by fires. The larger ignition sources—such as ranges, clothes dryers, and space heaters—are considered equipment and are covered by the NFIRS variable called "Equipment Involved in Ignition." Smaller ignition sources—such as candles, matches, or lighters—are heat sources and fall under the NFIRS variable called "Heat Source." Some of the consumer products that are materials ignited in fires are upholstered furniture, mattresses and bedding, clothing, curtains and drapes, cooking materials[3], and more. There are codes for these products under the NFIRS variable called "Item First Ignited."

[1] Hylton Haynes, "Fire Loss in the U.S. During 2020," National Fire Protection Association (NFPA), September 2021; Hylton Haynes, "Fire Loss in the U.S. During 2021," National Fire Protection Association (NFPA), September 2022; Ben Evarts, "Fire Loss in the U.S. During 2022," National Fire Protection Association (NFPA), September 2023.
[2] Injuries and deaths involving fire service, police, or emergency medical service personnel are not included in the estimates for this report.
[3] Cookware or food in cookware.

Fires can be associated with more than one product. For example, a fire can be a lighter fire and a curtain fire. Such a fire would contribute to the estimates for "Lighters" as well as the estimates for "Curtains, Drapes."

In some instances, consumer products ignited by the fire may contribute to the spread or severity of the fire but not be included in the category "Item First Ignited," such as when carpeting is the Item First Ignited in the fire but upholstered furniture ignites next and increases the severity of the fire. In that case, upholstered furniture plays a role in the fire, but the fire is not counted toward the estimates for upholstered furniture fires and losses. Some consumer products, such as mattresses and upholstered furniture, due to their larger fuel loads, tend to lead to bigger, more dangerous fires when they ignite.

NFIRS data were weighted up to the 2020, 2021, and 2022 NFPA estimates for total U.S. fires and fire losses to derive the product-specific estimates presented in this report. This was done separately for fires, deaths, injuries, and property loss. For the estimates related to victim demographics, staff looked at total residential structure fire deaths and injuries, categorized by victim age. Staff used the NFIRS variable "Age" for identification of victim age.

# Results

Fire-loss data are presented using five main tables, consistent with CPSC staff's previous reports. Each numbered table (1–5) has four associated sub-tables: Table "a" presents the fire estimates; "b" presents the death estimates; "c" presents the injury estimates; and "d" presents the property loss estimates. Only selected product-specific estimates are included in these tables, so the details may not add up to the totals that appear in the headings. All of the product categories in the tables, with the exception of smoking materials, contain products within CPSC's jurisdiction. Intentionally set fires and their associated losses, which include the deliberate misuse of heat sources or fires of an incendiary nature, are excluded from the estimates.

In Tables 1, 3, 4, and 5, Equipment Involved in Ignition codes were used to identify the types of products involved; in Table 2, either the Heat Source or the Item First Ignited was the primary means of identifying the product. Thus, some estimates provided in the different sections of the tables overlap. For example, in Table 2 estimates of fires involving cigarette ignition of upholstered furniture are included in the estimates for cigarettes (by Heat Source) as well as in the estimates for "Upholstered Furniture-Smoking Material Ignition" (by Item First Ignited).

This is the fifth year that CPSC staff analyzed the fire loss data for victim's age. Staff estimated total residential structure fire deaths and injuries for 2020 through 2022, broken down by victim age categories and paired with U.S. Census Bureau population estimates to compute estimated death and injury rates as shown in Table 6.

Additional details about the estimates and the data system are included in the Methodology section of this report.

**TABLE 1a**
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**
**SELECTED EQUIPMENT, 2020 – 2022**

| Equipment | 2020 | 2021 | 2022 | 2020 – 2022 Avg. |
|---|---|---|---|---|
| **Total Residential[4]** | **364,100** | **346,400** | **367,900** | **359,500** |
| **Total Heating and Cooling Equipment[4]** | **37,800** | **36,700** | **39,700** | **38,100** |
| Local Fixed Heater | 4,800 | 4,900 | 5,000 | 4,900 |
| Portable Heater | 1,400 | 1,700 | 1,800 | 1,600 |
| Central Heating | 700 | 700 | 900 | 800 |
| Fireplace, Chimney, Chimney Connector[4] | 15,800 | 14,900 | 15,500 | 15,400 |
| Water Heater | 1,200 | 1,200 | 1,300 | 1,200 |
| Air Conditioning | 1,300 | 1,500 | 1,600 | 1,500 |
| Other[4] | 12,400 | 11,900 | 13,700 | 12,700 |
| **Total Cooking Equipment[4]** | **167,200** | **148,000** | **153,800** | **156,300** |
| Range/Oven | 13,000 | 12,300 | 12,300 | 12,500 |
| *Gas* | *1,700* | *1,800* | *1,800* | *1,800* |
| *Electric* | *11,300* | *10,400* | *10,500* | *10,700* |
| *Other* | * | * | * | * |
| Microwave Oven | 700 | 700 | 700 | 700 |
| All Other Cooking | 4,200 | 4,500 | 4,600 | 4,400 |
| *Gas* | *1,200* | *1,200* | *1,300* | *1,200* |
| *Electric* | *2,500* | *2,800* | *2,900* | *2,700* |
| *Other* | *500* | *500* | *400* | *400* |
| **Total Electrical Distribution** | **16,600** | **18,000** | **19,700** | **18,100** |
| Installed Wiring | 7,400 | 8,100 | 8,900 | 8,100 |
| Cord, Plug | 1,500 | 1,700 | 1,900 | 1,700 |
| Receptacle, Switch | 2,300 | 2,600 | 2,700 | 2,500 |
| Lighting | 1,800 | 1,900 | 1,900 | 1,900 |
| Other | 3,600 | 3,700 | 4,300 | 3,800 |
| **Other Selected Equipment** | **8,300** | **8,600** | **8,700** | **8,600** |
| Audio/Visual Equipment | 200 | 300 | 300 | 300 |
| Clothes Dryer | 5,100 | 5,100 | 5,000 | 5,100 |
| Dishwasher | 400 | 400 | 400 | 400 |
| Washing Machine | 300 | 300 | 400 | 300 |
| Torch | 500 | 500 | 600 | 500 |
| Refrigerator/Freezer | 800 | 900 | 900 | 900 |
| Shop/Garden Tool | 1,000 | 1,100 | 1,200 | 1,100 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA. Note: Fire estimates are rounded to the nearest 100. Rounded estimates of fewer than 100 fires are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

[4] There are confined fire estimates included in *Total Residential, Total Heating and Cooling Equipment, Fireplace, Chimney, Chimney Connector, Other*, and *Total Cooking Equipment* categories. These confined fire estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment and power source. See Table 9a on p. 36 for details.

**TABLE 1b**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**
**SELECTED EQUIPMENT, 2020 - 2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential** | **2,360** | **2,540** | **2,430** | **2,440** |
| **Total Heating and Cooling Equipment** | **180** | **270** | **200** | **220** |
| Local Fixed Heater | 70 | 60 | 100 | 80 |
| Portable Heater | 60 | 100 | 60 | 70 |
| Central Heating | * | 20 | * | 10 |
| Fireplace, Chimney, Chimney Connector | 40 | 30 | 10 | 30 |
| Water Heater | * | 10 | 10 | 10 |
| Air Conditioning | * | * | * | * |
| Other | 10 | 50 | 10 | 20 |
| **Total Cooking Equipment** | **220** | **220** | **180** | **210** |
| Range/Oven | 140 | 140 | 90 | 130 |
| *Gas* | *20* | *50* | *10* | *30* |
| *Electric* | *130* | *90* | *80* | *100* |
| *Other* | * | * | * | * |
| Microwave Oven | * | 10 | * | * |
| All Other Cooking | 40 | 10 | 60 | 40 |
| *Gas* | * | * | *20* | *10* |
| *Electric* | *40* | *10* | *30* | *30* |
| *Other* | * | * | *20* | *10* |
| **Total Electrical Distribution** | **110** | **200** | **160** | **160** |
| Installed Wiring | 40 | 100 | 50 | 60 |
| Cord, Plug | 30 | 20 | 70 | 40 |
| Receptacle, Switch | 10 | 20 | 20 | 20 |
| Lighting | 10 | * | * | 10 |
| Other | 20 | 60 | 10 | 30 |
| **Other Selected Equipment** | **30** | **50** | **10** | **30** |
| Audio/Visual Equipment | * | * | * | * |
| Clothes Dryer | 10 | * | * | * |
| Dishwasher | * | * | * | * |
| Washing Machine | * | * | * | * |
| Torch | * | 10 | * | 10 |
| Refrigerator/Freezer | 20 | 30 | 10 | 20 |
| Shop/Garden Tool | * | * | * | * |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA. Note: Death estimates are rounded to the nearest 10. Rounded estimates of fewer than 10 deaths are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

**TABLE 1c**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**
**SELECTED EQUIPMENT, 2020 – 2022**

| Equipment | 2020 | 2021 | 2022 | 2020 – 2022 Avg. |
|---|---|---|---|---|
| **Total Residential[5]** | **11,010** | **10,610** | **9,470** | **10,360** |
| **Total Heating and Cooling Equipment[5]** | **850** | **980** | **890** | **910** |
| Local Fixed Heater | 350 | 350 | 280 | 320 |
| Portable Heater | 160 | 150 | 130 | 150 |
| Central Heating | 20 | 60 | 20 | 30 |
| Fireplace, Chimney, Chimney Connector[5] | 80 | 120 | 70 | 90 |
| Water Heater | 60 | 70 | 80 | 70 |
| Air Conditioning | 50 | 80 | 90 | 80 |
| Other[5] | 120 | 160 | 220 | 170 |
| **Total Cooking Equipment[5]** | **2,990** | **2,800** | **2,300** | **2,700** |
| Range/Oven | 1,290 | 1,300 | 1,060 | 1,220 |
| *Gas* | *200* | *130* | *140* | *160* |
| *Electric* | *1,090* | *1,160* | *920* | *1,060* |
| *Other* | * | *10* | * | * |
| Microwave Oven | 30 | 40 | 30 | 30 |
| All Other Cooking | 300 | 290 | 260 | 280 |
| *Gas* | *80* | *80* | *80* | *80* |
| *Electric* | *200* | *160* | *160* | *170* |
| *Other* | *20* | *50* | *20* | *30* |
| **Total Electrical Distribution** | **640** | **700** | **670** | **670** |
| Installed Wiring | 160 | 260 | 190 | 210 |
| Cord, Plug | 140 | 120 | 150 | 140 |
| Receptacle, Switch | 120 | 100 | 50 | 90 |
| Lighting | 60 | 40 | 50 | 50 |
| Other | 150 | 170 | 230 | 180 |
| **Other Selected Equipment** | **190** | **310** | **160** | **220** |
| Audio/Visual Equipment | 10 | 20 | * | 10 |
| Clothes Dryer | 60 | 120 | 80 | 90 |
| Dishwasher | 10 | * | 10 | 10 |
| Washing Machine | * | 20 | * | 10 |
| Torch | 20 | 20 | 10 | 20 |
| Refrigerator/Freezer | 40 | 40 | 40 | 40 |
| Shop/Garden Tool | 40 | 80 | 20 | 50 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA. Note: Fire injury estimates are rounded to the nearest 10. Rounded estimates of fewer than 10 injuries are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

[5] There are confined fire injury estimates included in *Total Residential, Total Heating and Cooling Equipment, Fireplace, Chimney, Chimney Connector, Other*, and *Total Cooking Equipment* categories. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment and power source. See Table 9b on p. 37 for details.

**TABLE 1d**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS**
**(In $Millions[6]) SELECTED EQUIPMENT, 2020 – 2022**

| Equipment | 2020 | 2021 | 2022 | 2020 – 2022 Avg. |
|---|---|---|---|---|
| **Total Residential[7]** | **$7,554.0** | **$8,214.7** | **$10,155.7** | **$8,641.5** |
| **Total Heating and Cooling Equipment[7]** | **$612.6** | **$630.5** | **$826.4** | **$689.8** |
| Local Fixed Heater | $122.4 | $146.2 | $176.3 | $148.3 |
| Portable Heater | $58.1 | $63.3 | $86.2 | $69.2 |
| Central Heating | $23.0 | $18.8 | $27.8 | $23.2 |
| Fireplace, Chimney, Chimney Connector[7] | $131.0 | $115.1 | $146.4 | $130.8 |
| Water Heater | $25.8 | $20.2 | $29.1 | $25.0 |
| Air Conditioning | $91.3 | $91.6 | $97.9 | $93.6 |
| Other[3] | $161.0 | $175.3 | $262.8 | $199.7 |
| **Total Cooking Equipment[7]** | **$585.7** | **$592.9** | **$658.4** | **$612.3** |
| Range/Oven | $305.8 | $290.6 | $293.4 | $296.6 |
| *Gas* | *$35.3* | *$31.6* | *$37.6* | *$34.8* |
| *Electric* | *$269.5* | *$256.0* | *$255.6* | *$260.4* |
| *Other* | *$1.0* | *$3.0* | *$0.2* | *$1.4* |
| Microwave Oven | $17.9 | $19.0 | $24.8 | $20.6 |
| All Other Cooking | $171.2 | $179.0 | $225.4 | $191.9 |
| *Gas* | *$80.3* | *$74.3* | *$60.4* | *$71.7* |
| *Electric* | *$71.5* | *$64.5* | *$82.8* | *$72.9* |
| *Other* | *$19.4* | *$40.2* | *$82.2* | *$47.2* |
| **Total Electrical Distribution** | **$594.3** | **$691.6** | **$804.8** | **$696.9** |
| Installed Wiring | $248.9 | $283.6 | $356.0 | $296.2 |
| Cord, Plug | $50.7 | $63.0 | $108.7 | $74.1 |
| Receptacle, Switch | $51.7 | $133.8 | $93.1 | $92.9 |
| Lighting | $55.9 | $54.1 | $79.5 | $63.2 |
| Other | $187.1 | $157.1 | $167.6 | $170.6 |
| **Other Selected Equipment** | **$287.2** | **$253.6** | **$307.2** | **$282.7** |
| Audio/Visual Equipment | $10.6 | $6.9 | $18.1 | $11.9 |
| Clothes Dryer | $80.8 | $73.0 | $86.7 | $80.2 |
| Dishwasher | $7.4 | $8.5 | $9.4 | $8.4 |
| Washing Machine | $1.8 | $5.2 | $7.5 | $4.8 |
| Torch | $18.9 | $17.7 | $58.7 | $31.8 |
| Refrigerator/Freezer | $32.8 | $45.5 | $52.9 | $43.7 |
| Shop/Garden Tool | $134.8 | $96.8 | $74.0 | $101.8 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA. Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

[6] Dollar values are not adjusted for inflation in this table or for any of the property loss estimates in the report.
[7] There are confined fire estimates included in *Total Residential, Total Heating and Cooling Equipment, Fireplace, Chimney, Chimney Connector, Other*, and *Total Cooking Equipment* categories. These confined fire property loss estimates could not be included in the detail lines as NFIRS does not provide information to determine the type of equipment and power source. See Table 9c on p. 37 for details.

**TABLE 2a**
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**
**SELECTED PRODUCTS, 2020 – 2022**

| Product | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential[8]** | **364,100** | **346,400** | **367,900** | **359,500** |
| **By Heat Source** | | | | |
| Cigarette, Other Tobacco Products | 10,700 | 10,600 | 11,600 | 11,000 |
| Candle | 5,300 | 6,200 | 6,200 | 5,900 |
| Lighter | 1,300 | 1,400 | 1,500 | 1,400 |
| Match | 300 | 200 | 300 | 300 |
| **By Item First Ignited** | | | | |
| **Upholstered Furniture** | **3,600** | **3,700** | **3,800** | **3,700** |
| Smoking Material Ignition | 900 | 900 | 900 | 900 |
| Open-Flame Ignition | 400 | 500 | 500 | 500 |
| Other[8] | 2,300 | 2,400 | 2,500 | 2,400 |
| **Mattress, Bedding** | **6,300** | **6,300** | **6,700** | **6,500** |
| Smoking Material Ignition | 1,200 | 1,300 | 1,300 | 1,300 |
| Open-Flame Ignition | 1,000 | 1,100 | 1,100 | 1,100 |
| Other[8] | 4,000 | 4,000 | 4,300 | 4,100 |
| **Other Materials** | | | | |
| Cooking Materials[8] | 165,600 | 145,100 | 149,600 | 153,400 |
| Electric Cable Insulation | 17,200 | 18,700 | 20,600 | 18,800 |
| Interior Wall Covering | 4,800 | 4,600 | 5,100 | 4,800 |
| Wearing Apparel-Worn | 300 | 300 | 300 | 300 |
| Wearing Apparel-Not Worn | 3,700 | 3,600 | 3,800 | 3,700 |
| Floor Covering | 2,900 | 3,100 | 3,200 | 3,100 |
| Curtains, Drapes | 1,000 | 1,200 | 1,100 | 1,100 |
| Magazines, Newspaper | 1,300 | 1,200 | 1,400 | 1,300 |
| Thermal Insulation | 4,300 | 4,400 | 4,700 | 4,500 |
| Cabinet, Desk | 3,900 | 3,800 | 3,800 | 3,800 |
| Trash, Rubbish[8] | 32,700 | 32,800 | 35,400 | 33,600 |
| Toy, Game | 400 | 400 | 400 | 400 |
| Box, Carton, Bag, Basket, Barrel | 3,600 | 3,600 | 4,100 | 3,800 |

Source: U. S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire estimates are rounded to the nearest 100. Subtotals do not necessarily add up to heading totals. Estimates exclude intentionally set fires.

[8] There are confined fire estimates included in *Total Residential, Cooking Materials* and *Trash, Rubbish* categories. Estimates for confined cooking fires are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 9a on p. 36 for details.

**TABLE 2b**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**
**SELECTED PRODUCTS, 2020 – 2022**

| Product | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential** | **2,360** | **2,540** | **2,430** | **2,440** |
| **By Heat Source** | | | | |
| Cigarette, Other Tobacco Products | 640 | 580 | 580 | 600 |
| Candle | 90 | 70 | 50 | 70 |
| Lighter | 70 | 90 | 70 | 80 |
| Match | * | * | * | * |
| **By Item First Ignited** | | | | |
| **Upholstered Furniture** | **380** | **250** | **390** | **340** |
| Smoking Material Ignition | 190 | 100 | 210 | 170 |
| Open-Flame Ignition | * | 10 | 10 | 10 |
| Other | 190 | 140 | 160 | 160 |
| **Mattress, Bedding** | **360** | **310** | **240** | **300** |
| Smoking Material Ignition | 190 | 220 | 120 | 180 |
| Open-Flame Ignition | 20 | 10 | 20 | 20 |
| Other | 160 | 80 | 100 | 110 |
| **Other Materials** | | | | |
| Cooking Materials | 150 | 190 | 150 | 170 |
| Electric Cable Insulation | 90 | 110 | 110 | 100 |
| Interior Wall Covering | 80 | 70 | 70 | 70 |
| Wearing Apparel-Worn | 80 | 50 | 70 | 70 |
| Wearing Apparel-Not Worn | 40 | 20 | 50 | 40 |
| Floor Covering | 60 | 40 | 70 | 50 |
| Curtains, Drapes | 10 | 10 | * | 10 |
| Magazines, Newspaper | 20 | 30 | * | 20 |
| Thermal Insulation | * | 40 | * | 10 |
| Cabinet, Desk | 70 | 30 | 80 | 60 |
| Trash, Rubbish | 80 | 50 | 50 | 60 |
| Toy, Game | * | * | * | * |
| Box, Carton, Bag, Basket, Barrel | 50 | 30 | 20 | 30 |

Source: U. S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Death estimates are rounded to the nearest 10. Subtotals do not necessarily add up to heading totals. Estimates exclude intentionally set fires.

**TABLE 2c**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**
**SELECTED PRODUCTS, 2020 – 2022**

| Product | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential[9]** | **11,010** | **10,610** | **9,470** | **10,360** |
| **By Heat Source** | | | | |
| Cigarette, Other Tobacco Products | 960 | 930 | 910 | 930 |
| Candle | 500 | 680 | 520 | 570 |
| Lighter | 300 | 200 | 230 | 240 |
| Match | 30 | 10 | 20 | 20 |
| **By Item First Ignited** | | | | |
| **Upholstered Furniture** | **580** | **610** | **540** | **580** |
| Smoking Material Ignition | 190 | 210 | 240 | 220 |
| Open-Flame Ignition | 100 | 100 | 30 | 80 |
| Other | 290 | 300 | 260 | 280 |
| **Mattress, Bedding** | **960** | **830** | **750** | **850** |
| Smoking Material Ignition | 350 | 290 | 190 | 280 |
| Open-Flame Ignition | 180 | 160 | 170 | 170 |
| Other | 430 | 380 | 400 | 400 |
| **Other Materials** | | | | |
| Cooking Materials[9] | 3,200 | 2,890 | 2,340 | 2,810 |
| Electric Cable Insulation | 440 | 690 | 510 | 550 |
| Interior Wall Covering | 180 | 130 | 190 | 170 |
| Wearing Apparel-Worn | 130 | 60 | 100 | 100 |
| Wearing Apparel-Not Worn | 200 | 160 | 160 | 180 |
| Floor Covering | 150 | 220 | 70 | 140 |
| Curtains, Drapes | 80 | 110 | 120 | 100 |
| Magazines, Newspaper | 80 | 110 | 90 | 100 |
| Thermal Insulation | 40 | 70 | 40 | 50 |
| Cabinet, Desk | 270 | 280 | 240 | 260 |
| Trash, Rubbish[9] | 440 | 220 | 300 | 320 |
| Toy, Game | 40 | 10 | 30 | 30 |
| Box, Carton, Bag, Basket, Barrel | 190 | 150 | 200 | 180 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude injuries from intentionally set fires.

[9] There are confined fire injury estimates included in *Total Residential, Cooking Materials,* and *Trash, Rubbish* categories. Estimates for confined cooking fire injuries are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 9b on p. 37 for details.

**TABLE 2d**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS**
**(In $Millions) SELECTED PRODUCTS, 2020 – 2022**

| Product | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential[10]** | **$7,554.0** | **$8,214.7** | **$10,155.7** | **$8,641.5** |
| **By Heat Source** | | | | |
| Cigarette, Other Tobacco Products | $495.7 | $502.1 | $761.6 | $586.5 |
| Candle | $240.5 | $297.6 | $294.4 | $277.5 |
| Lighter | $51.1 | $60.8 | $73.2 | $61.7 |
| Match | $12.2 | $7.6 | $15.5 | $11.8 |
| **By Item First Ignited** | | | | |
| **Upholstered Furniture** | **$259.2** | **$265.2** | **$308.2** | **$277.5** |
| Smoking Material Ignition | $77.0 | $82.4 | $76.5 | $78.6 |
| Open-Flame Ignition | $27.1 | $30.3 | $29.8 | $29.1 |
| Other | $155.1 | $152.4 | $201.9 | $169.8 |
| **Mattress, Bedding** | **$248.4** | **$276.7** | **$325.9** | **$283.7** |
| Smoking Material Ignition | $40.3 | $70.3 | $50.9 | $53.8 |
| Open-Flame Ignition | $37.8 | $49.8 | $55.0 | $47.5 |
| Other | $170.3 | $156.7 | $220.1 | $182.4 |
| **Other Materials** | | | | |
| Cooking Materials[10] | $597.7 | $506.7 | $580.1 | $561.5 |
| Electric Cable Insulation | $518.2 | $605.2 | $847.1 | $656.8 |
| Interior Wall Covering | $202.7 | $250.5 | $270.3 | $241.2 |
| Wearing Apparel-Worn | $4.7 | $4.7 | $8.8 | $6.1 |
| Wearing Apparel-Not Worn | $132.5 | $104.1 | $96.2 | $110.9 |
| Floor Covering | $105.6 | $122.0 | $143.5 | $123.7 |
| Curtains, Drapes | $31.5 | $74.8 | $73.3 | $59.9 |
| Magazines, Newspaper | $48.7 | $47.9 | $51.9 | $49.5 |
| Thermal Insulation | $140.9 | $181.4 | $199.7 | $174.0 |
| Cabinet, Desk | $190.5 | $170.8 | $197.9 | $186.4 |
| Trash, Rubbish[9] | $239.3 | $236.4 | $359.9 | $278.5 |
| Toy, Game | $9.4 | $14.3 | $12.7 | $12.1 |
| Box, Carton, Bag, Basket, Barrel | $180.6 | $132.4 | $257.3 | $190.1 |

Source: U. S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Subtotals do not necessarily add to heading totals. Estimates exclude property loss from intentionally set fires.

[10] There are confined fire injury estimates included in *Total Residential, Cooking Materials,* and *Trash, Rubbish* categories. Estimates for confined cooking fire injuries are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 9b on p. 37 for details.

**TABLE 3a**
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**
**HEATING AND COOLING EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential**[11] | **364,100** | **346,400** | **367,900** | **359,500** |
| **Total Heating and Cooling Equipment**[11] | **37,800** | **36,700** | **39,700** | **38,100** |
| **Solid Fuel** | **1,900** | **1,600** | **2,200** | **1,900** |
| Fixed Heater | 400 | 400 | 500 | 500 |
| Portable Heater | * | * | * | * |
| Fireplace, Chimney, Chimney Connector | 1,400 | 1,100 | 1,600 | 1,300 |
| Central Heating | * | * | * | * |
| Water Heater | * | * | * | * |
| Other | 100 | 100 | 100 | 100 |
| **Gas-Fired** | **2,200** | **2,200** | **2,500** | **2,300** |
| Fixed Heater | 800 | 800 | 900 | 800 |
| Portable Heater | 100 | 200 | 200 | 200 |
| Fireplace, Chimney, Chimney Connector | 200 | 200 | 200 | 200 |
| Central Heating | 300 | 200 | 300 | 300 |
| Water Heater | 500 | 400 | 500 | 500 |
| Fixed, Central Air Conditioning | * | * | * | * |
| Other | 200 | 200 | 300 | 300 |
| **Electric** | **12,500** | **13,300** | **14,100** | **13,300** |
| Fixed Heater | 3,500 | 3,600 | 3,500 | 3,500 |
| Portable Heater | 1,100 | 1,200 | 1,300 | 1,200 |
| Central Heating | 400 | 400 | 500 | 400 |
| Water Heater | 700 | 800 | 800 | 800 |
| Fixed, Central Air Conditioning | 900 | 900 | 1,100 | 1,000 |
| Portable Air Conditioner | 400 | 500 | 500 | 500 |
| Other | 5,500 | 5,800 | 6,400 | 5,900 |
| **Liquid Fuel** | **300** | **300** | **300** | **300** |
| Fixed Heater | * | * | * | * |
| Portable Heater | 200 | 200 | 200 | 200 |
| Fireplace, Chimney, Chimney Connector | * | * | * | * |
| Central Heating | * | * | 100 | 100 |
| Water Heater | * | * | * | * |
| Other | * | * | 100 | * |
| **All Other Fuel** | **100** | **100** | **100** | **100** |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire estimates are rounded to the nearest 100. Rounded estimates less than 100 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

[11] There are confined fire estimates included in *Total Residential,* and *Total Heating and Cooling Equipment* categories. These confined fire estimates were not included in the detail lines because NFIRS does not provide information to determine the equipment or the power source. See Table 9a on p. 36 for details.

**TABLE 3b**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**
**HEATING AND COOLING EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential** | **2,360** | **2,540** | **2,430** | **2,440** |
| **Total Heating and Cooling Equipment** | **180** | **270** | **200** | **220** |
| **Solid Fuel** | **80** | **80** | **70** | **80** |
| Fixed Heater | 40 | 40 | 70 | 50 |
| Portable Heater | * | * | * | * |
| Fireplace, Chimney, Chimney Connector | 40 | 30 | * | 20 |
| Central Heating | * | * | * | * |
| Water Heater | * | * | * | * |
| Other | * | * | * | * |
| **Gas-Fired** | **30** | **40** | **70** | **50** |
| Fixed Heater | 20 | 10 | 20 | 10 |
| Portable Heater | * | 20 | 30 | 20 |
| Fireplace, Chimney, Chimney Connector | * | * | 10 | * |
| Central Heating | * | * | * | * |
| Water Heater | * | * | 10 | * |
| Fixed, Central Air Conditioning | * | * | * | * |
| Other | 10 | 10 | * | 10 |
| **Electric** | **60** | **150** | **60** | **90** |
| Fixed Heater | 10 | 10 | 10 | 10 |
| Portable Heater | 50 | 70 | 30 | 50 |
| Central Heating | * | 20 | * | 10 |
| Water Heater | * | 10 | * | * |
| Fixed, Central Air Conditioning | * | * | * | * |
| Portable Air Conditioner | * | * | * | * |
| Other | * | 40 | 10 | 20 |
| **Liquid Fuel** | **10** | **10** | **10** | **10** |
| Fixed Heater | * | * | 10 | * |
| Portable Heater | 10 | 10 | * | 10 |
| Fireplace, Chimney, Chimney Connector | * | * | * | * |
| Central Heating | * | * | * | * |
| Water Heater | * | * | * | * |
| Other | * | * | * | * |
| **All Other Fuel** | * | * | * | * |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Death estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude deaths from intentionally set fires.

**TABLE 3c**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**
**HEATING AND COOLING EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential[12]** | **11,010** | **10,610** | **9,470** | **10,360** |
| **Total Heating and Cooling Equipment[12]** | **850** | **980** | **890** | **910** |
| **Solid Fuel** | **70** | **110** | **110** | **100** |
| Fixed Heater | 20 | 30 | 40 | 30 |
| Portable Heater | * | * | * | * |
| Fireplace, Chimney, Chimney Connector | 50 | 80 | 60 | 60 |
| Central Heating | * | * | * | * |
| Water Heater | * | * | * | * |
| Other | * | * | * | * |
| **Gas-Fired** | **180** | **210** | **190** | **190** |
| Fixed Heater | 80 | 80 | 50 | 70 |
| Portable Heater | 20 | 40 | 20 | 30 |
| Fireplace, Chimney, Chimney Connector | * | 10 | * | 10 |
| Central Heating | 20 | 20 | 20 | 20 |
| Water Heater | 60 | 50 | 80 | 60 |
| Fixed, Central Air Conditioning | * | * | * | * |
| Other | * | 10 | 20 | 10 |
| **Electric** | **520** | **580** | **510** | **540** |
| Fixed Heater | 240 | 240 | 170 | 220 |
| Portable Heater | 140 | 100 | 90 | 110 |
| Central Heating | 10 | 30 | * | 10 |
| Water Heater | * | 20 | * | 10 |
| Fixed, Central Air Conditioning | 20 | 30 | 40 | 30 |
| Portable Air Conditioner | 30 | 50 | 50 | 40 |
| Other | 70 | 110 | 160 | 120 |
| **Liquid Fuel** | ***** | **30** | **50** | **30** |
| Fixed Heater | * | * | 20 | 10 |
| Portable Heater | * | 20 | 20 | 10 |
| Fireplace, Chimney, Chimney Connector | * | * | * | * |
| Central Heating | * | * | * | * |
| Water Heater | * | * | * | * |
| Other | * | 10 | 10 | 10 |
| **All Other Fuel** | ***** | ***** | ***** | ***** |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude injuries from intentionally set fires.

[12] There are confined fire injury estimates included in *Total Residential,* and *Total Heating and Cooling Equipment* categories. These confined fire injury estimates were not included in the detail lines because NFIRS does not provide information to determine the equipment or the power source of the equipment. See Table 9b on p. 37 for details.

**TABLE 3d**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In $Millions)**
**HEATING AND COOLING EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential[13]** | **$7,554.0** | **$8,214.7** | **$10,155.7** | **$8,641.5** |
| **Total Heating and Cooling Equipment[13]** | **$612.6** | **$630.5** | **$826.4** | **$689.8** |
| **Solid Fuel** | **$137.1** | **$124.9** | **$138.4** | **$133.5** |
| Fixed Heater | $21.5 | $22.7 | $18.1 | $20.7 |
| Portable Heater | * | $0.1 | * | * |
| Fireplace, Chimney, Chimney Connector | $111.8 | $99.2 | $116.2 | $109.1 |
| Central Heating | $0.5 | $0.1 | $1.6 | $0.7 |
| Water Heater | * | * | * | * |
| Other | $3.4 | $2.8 | $2.5 | $2.9 |
| **Gas-Fired** | **$93.9** | **$76.0** | **$123.8** | **$97.9** |
| Fixed Heater | $17.5 | $26.9 | $52.6 | $32.3 |
| Portable Heater | $5.1 | $12.7 | $11.1 | $9.6 |
| Fireplace, Chimney, Chimney Connector | $12.3 | $8.9 | $21.6 | $14.3 |
| Central Heating | $12.6 | $9.4 | $13.5 | $11.8 |
| Water Heater | $20.3 | $12.4 | $14.5 | $15.7 |
| Fixed, Central Air Conditioning | $10.7 | * | $0.1 | $3.6 |
| Other | $4.5 | $5.8 | $10.4 | $6.9 |
| **Electric** | **$365.0** | **$408.9** | **$539.8** | **$437.9** |
| Fixed Heater | $82.2 | $94.4 | $103.8 | $93.5 |
| Portable Heater | $48.6 | $44.3 | $69.9 | $54.2 |
| Central Heating | $8.5 | $7.8 | $9.6 | $8.6 |
| Water Heater | $5.5 | $7.9 | $14.6 | $9.3 |
| Fixed, Central Air Conditioning | $30.5 | $38.4 | $40.0 | $36.3 |
| Portable Air Conditioner | $39.2 | $52.9 | $57.7 | $49.9 |
| Other | $150.6 | $163.2 | $244.3 | $186.0 |
| **Liquid Fuel** | **$5.9** | **$10.0** | **$12.4** | **$9.4** |
| Fixed Heater | $0.6 | $1.2 | $1.5 | $1.1 |
| Portable Heater | $3.6 | $6.2 | $5.0 | $4.9 |
| Fireplace, Chimney, Chimney Connector | * | * | $0.2 | $0.1 |
| Central Heating | $1.4 | $1.6 | $3.2 | $2.0 |
| Water Heater | * | * | * | * |
| Other | $0.3 | $1.0 | $2.6 | $1.3 |
| **All Other Fuel** | **$2.1** | **$3.2** | **$2.8** | **$2.7** |

Source: U. S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Subtotals do not necessarily add to heading totals. Estimates exclude property loss from intentionally set fires.

[13] There are confined fire property loss estimates included in *Total Residential,* and *Total Heating and Cooling Equipment* categories. These estimates were not included in the detail lines because NFIRS does not provide information to determine the equipment or its power source. See Table 9c on p. 37 for details.

**TABLE 4a**
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**
**SELECTED ELECTRICAL EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential**[14] | **364,100** | **346,400** | **367,900** | **359,500** |
| **Total Electrical** | **54,200** | **56,200** | **60,400** | **56,900** |
| **Electric Heating and Cooling** | **12,500** | **13,300** | **14,100** | **13,300** |
| Central Heating | 400 | 400 | 500 | 400 |
| Local Fixed Heater | 3,500 | 3,600 | 3,500 | 3,500 |
| Portable Heater | 1,100 | 1,200 | 1,300 | 1,200 |
| Water Heater | 700 | 800 | 800 | 800 |
| Fixed, Central Air Conditioning | 900 | 900 | 1,100 | 1,000 |
| Portable Air Conditioner | 400 | 500 | 500 | 500 |
| Other | 5,500 | 5,800 | 6,400 | 5,900 |
| **Electric Cooking Equipment** | **14,500** | **13,700** | **14,100** | **14,100** |
| Range/Oven | 11,300 | 10,400 | 10,500 | 10,700 |
| Range/Oven Hood | 200 | 200 | 200 | 200 |
| Deep Fat Fryer | 100 | 100 | 100 | 100 |
| Grill | 100 | * | 100 | 100 |
| Microwave Oven | 700 | 700 | 700 | 700 |
| Small Heat-Producing Appliance | 700 | 700 | 900 | 800 |
| Other | 1,400 | 1,600 | 1,600 | 1,500 |
| **Electrical Distribution** | **16,700** | **18,100** | **19,900** | **18,200** |
| Installed Wiring | 7,400 | 8,100 | 8,900 | 8,100 |
| Light Fixture | 1,300 | 1,400 | 1,300 | 1,300 |
| Receptacle, Switch | 2,300 | 2,600 | 2,700 | 2,500 |
| Cord, Plug | 1,500 | 1,700 | 1,900 | 1,700 |
| Lamp, Light Bulb | 500 | 600 | 600 | 500 |
| Panel Board | 700 | 600 | 700 | 700 |
| Meter | 400 | 500 | 500 | 500 |
| Transformer | 100 | 100 | 100 | 100 |
| Other | 2,500 | 2,600 | 3,100 | 2,700 |
| **Other Selected Electrical Appliances** | **5,900** | **6,300** | **6,300** | **6,200** |
| Clothes Dryer | 3,800 | 3,900 | 3,800 | 3,800 |
| Dishwasher | 400 | 400 | 400 | 400 |
| Audio/Visual Equipment | 200 | 300 | 300 | 300 |
| Washing Machine | 300 | 300 | 400 | 300 |
| Refrigerator/Freezer | 800 | 800 | 900 | 800 |
| Shop/Garden Tools | 300 | 400 | 400 | 400 |
| Torch | 100 | 100 | 100 | 100 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire estimates are rounded to the nearest 100. Rounded estimates less than 100 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

[14] There are confined fire estimates included in *Total Residential*. These were not included in the detail lines because NFIRS does not provide information to determine the equipment or power source. See Table 9a on p. 36 for details.

**TABLE 4b**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**
**SELECTED ELECTRICAL EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential** | **2,360** | **2,540** | **2,430** | **2,440** |
| **Total Electrical** | **480** | **610** | **460** | **510** |
| **Electric Heating and Cooling** | **60** | **150** | **60** | **90** |
| Central Heating | * | 20 | * | 10 |
| Local Fixed Heater | 10 | 10 | 10 | 10 |
| Portable Heater | 50 | 70 | 30 | 50 |
| Water Heater | * | 10 | * | * |
| Fixed, Central Air Conditioning | * | * | * | * |
| Portable Air Conditioner | * | * | * | * |
| Other | * | 40 | 10 | 20 |
| **Electric Cooking Equipment** | **170** | **110** | **110** | **130** |
| Range/Oven | 130 | 90 | 80 | 100 |
| Range/Oven Hood | * | * | * | * |
| Deep Fat Fryer | * | * | * | * |
| Grill | * | * | * | * |
| Microwave Oven | * | * | * | * |
| Small Heat-Producing Appliance | 10 | * | * | * |
| Other | 20 | 10 | 20 | 20 |
| **Electrical Distribution** | **100** | **190** | **150** | **150** |
| Installed Wiring | 40 | 100 | 50 | 60 |
| Light Fixture | 10 | * | * | * |
| Receptacle, Switch | 10 | 20 | 20 | 20 |
| Cord, Plug | 30 | 20 | 70 | 40 |
| Lamp, Light Bulb | * | * | * | * |
| Panel Board | * | 10 | * | * |
| Meter | * | * | * | * |
| Transformer | * | * | * | * |
| Other | 20 | 30 | 10 | 20 |
| **Other Selected Electrical Appliances** | **30** | **30** | **10** | **20** |
| Clothes Dryer | 10 | * | * | * |
| Dishwasher | * | * | * | * |
| Audio/Visual Equipment | * | * | * | * |
| Washing Machine | * | * | * | * |
| Refrigerator/Freezer | 20 | 30 | 10 | 20 |
| Shop/Garden Tools | * | * | * | * |
| Torch | * | * | * | * |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Death estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*).
Subtotals do not necessarily add to heading totals. Estimates exclude deaths from intentionally set fires.

## TABLE 4c
## ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
## SELECTED ELECTRICAL EQUIPMENT, 2020–2022

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential[15]** | **11,010** | **10,610** | **9,470** | **10,360** |
| **Total Electrical** | **2,960** | **3,140** | **2,810** | **2,970** |
| **Electric Heating and Cooling** | **520** | **580** | **510** | **540** |
| Central Heating | 10 | 30 | * | 10 |
| Local Fixed Heater | 240 | 240 | 170 | 220 |
| Portable Heater | 140 | 100 | 90 | 110 |
| Water Heater | * | 20 | * | 10 |
| Fixed, Central Air Conditioning | 20 | 30 | 40 | 30 |
| Portable Air Conditioner | 30 | 50 | 50 | 40 |
| Other | 70 | 110 | 160 | 120 |
| **Electric Cooking Equipment** | **1,320** | **1,350** | **1,110** | **1,260** |
| Range/Oven | 1,090 | 1,160 | 920 | 1,060 |
| Range/Oven Hood | 10 | 10 | 10 | 10 |
| Deep Fat Fryer | 10 | 10 | 10 | 10 |
| Grill | * | * | * | * |
| Microwave Oven | 30 | 40 | 30 | 30 |
| Small Heat-Producing Appliance | 50 | 70 | 40 | 50 |
| Other | 130 | 60 | 90 | 90 |
| **Electrical Distribution** | **610** | **660** | **640** | **640** |
| Installed Wiring | 160 | 260 | 190 | 210 |
| Light Fixture | 40 | 30 | 30 | 40 |
| Receptacle, Switch | 120 | 100 | 50 | 90 |
| Cord, Plug | 140 | 120 | 150 | 140 |
| Lamp, Light Bulb | 20 | 10 | 20 | 20 |
| Panel Board | 10 | 20 | 20 | 20 |
| Meter | 10 | * | 10 | 10 |
| Transformer | * | * | * | * |
| Other | 100 | 110 | 160 | 130 |
| **Other Selected Electrical Appliances** | **130** | **210** | **120** | **150** |
| Clothes Dryer | 60 | 90 | 60 | 70 |
| Dishwasher | 10 | * | 10 | 10 |
| Audio/Visual Equipment | 10 | 20 | * | 10 |
| Washing Machine | * | 20 | * | 10 |
| Refrigerator/Freezer | 40 | 40 | 40 | 40 |
| Shop/Garden Tools | 10 | 40 | 10 | 20 |
| Torch | * | * | * | * |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

[15] There are confined fire estimates included in *Total Residential*. These were not included in the detail lines because NFIRS does not provide information to determine the equipment or power source. See Table 9b on p. 37 for details.

**TABLE 4d**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS**
**(In $Millions) SELECTED ELECTRICAL EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential[16]** | **$7,554.0** | **$8,214.7** | **$10,109.9** | **$8,626.2** |
| **Total Electrical** | **$1,726.8** | **$1,798.8** | **$2,211.5** | **$1,912.4** |
| **Electric Heating and Cooling** | **$365.0** | **$408.9** | **$539.8** | **$437.9** |
| Central Heating | $8.5 | $7.8 | $9.6 | $8.6 |
| Local Fixed Heater | $82.2 | $94.4 | $103.8 | $93.5 |
| Portable Heater | $48.6 | $44.3 | $69.9 | $54.2 |
| Water Heater | $5.5 | $7.9 | $14.6 | $9.3 |
| Fixed, Central Air Conditioning | $30.5 | $38.4 | $40.0 | $36.3 |
| Portable Air Conditioner | $39.2 | $52.9 | $57.7 | $49.9 |
| Other | $150.6 | $163.2 | $244.3 | $186.0 |
| **Electric Cooking Equipment** | **$375.1** | **$338.1** | **$369.9** | **$361.0** |
| Range/Oven | $269.5 | $256.0 | $255.6 | $260.4 |
| Range/Oven Hood | $3.3 | $4.1 | $8.0 | $5.1 |
| Deep Fat Fryer | $12.2 | $4.7 | $3.6 | $6.8 |
| Grill | $1.6 | $8.0 | $6.3 | $5.3 |
| Microwave Oven | $17.9 | $19.0 | $24.8 | $20.6 |
| Small Heat-Producing Appliance | $21.2 | $13.6 | $30.0 | $21.6 |
| Other | $49.5 | $32.7 | $41.6 | $41.3 |
| **Electrical Distribution** | **$585.9** | **$677.4** | **$789.1** | **$684.2** |
| Installed Wiring | $248.9 | $283.6 | $356.0 | $296.2 |
| Light Fixture | $38.1 | $39.1 | $43.6 | $40.3 |
| Receptacle, Switch | $51.7 | $133.8 | $93.1 | $92.9 |
| Cord, Plug | $50.7 | $63.0 | $108.7 | $74.1 |
| Lamp, Light Bulb | $17.8 | $15.0 | $35.9 | $22.9 |
| Panel Board | $22.8 | $19.8 | $17.7 | $20.1 |
| Meter | $11.8 | $7.4 | $13.4 | $10.9 |
| Transformer | $1.2 | $3.4 | $1.0 | $1.9 |
| Other | $143.0 | $112.2 | $119.8 | $125.0 |
| **Other Selected Electrical Appliances** | **$201.7** | **$165.5** | **$133.7** | **$167.0** |
| Clothes Dryer | $64.7 | $52.7 | $22.9 | $46.8 |
| Dishwasher | $7.4 | $8.5 | $9.4 | $8.4 |
| Audio/Visual Equipment | $10.6 | $6.9 | $18.1 | $11.9 |
| Washing Machine | $1.8 | $5.2 | $7.5 | $4.8 |
| Refrigerator/Freezer | $31.8 | $42.7 | $52.5 | $42.4 |
| Shop/Garden Tools | $81.3 | $47.6 | $19.4 | $49.4 |
| Torch | $4.1 | $1.8 | $4.0 | $3.3 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

[16] There are confined fire estimates included in *Total Residential*. These were not included in the detail lines because NFIRS does not provide information to determine the equipment or power source. See Table 9c on p. 37 for details.

**TABLE 5a**
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**
**SELECTED GAS-FIRED EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential**[17] | **364,100** | **346,400** | **367,900** | **359,500** |
| **Total Gas-Fired Equipment** | **8,000** | **8,200** | **8,400** | **8,200** |
| **Gas Heating Equipment** | **2,200** | **2,200** | **2,500** | **2,300** |
| Fixed Heater | 800 | 800 | 900 | 800 |
| Portable Heater | 100 | 200 | 200 | 200 |
| Central Heating | 300 | 200 | 300 | 300 |
| Fireplace, Chimney, Connector | 200 | 200 | 200 | 200 |
| Water Heater | 500 | 400 | 500 | 500 |
| Fixed, Central Air Conditioning | * | * | * | * |
| Other | 200 | 200 | 300 | 300 |
| **Gas Cooking Equipment** | **2,800** | **3,000** | **3,000** | **2,900** |
| Range/Oven | 1,700 | 1,800 | 1,800 | 1,800 |
| Open Gas Grill | 700 | 700 | 700 | 700 |
| Other | 400 | 500 | 400 | 400 |
| **Other Selected Gas Equipment** | **1,700** | **1,700** | **1,600** | **1,600** |
| Clothes Dryer | 1,000 | 900 | 900 | 900 |
| Torch | 400 | 300 | 300 | 400 |
| Shop/Garden Tool | 300 | 400 | 300 | 400 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA. Note: Fire estimates are rounded to the nearest 100. Rounded estimates less than 100 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude losses from intentionally set fires.

[17] There are confined fire estimates included in the *Total Residential* category. These were not included in the detail lines because NFIRS does not provide information to determine the equipment or power source. See Table 10a on p. 36 for details.

**TABLE 5b**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**
**SELECTED GAS-FIRED EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential** | **2,360** | **2,540** | **2,430** | **2,440** |
| **Total Gas-Fired Equipment** | **60** | **130** | **140** | **110** |
| **Gas Heating Equipment** | **30** | **40** | **70** | **50** |
| Fixed Heater | 20 | 10 | 20 | 10 |
| Portable Heater | * | 20 | 30 | 20 |
| Central Heating | * | * | * | * |
| Fireplace, Chimney, Connector | * | * | 10 | * |
| Water Heater | * | * | 10 | * |
| Fixed, Central Air Conditioning | * | * | * | * |
| Other | 10 | 10 | * | 10 |
| **Gas Cooking Equipment** | **20** | **50** | **30** | **30** |
| Range/Oven | 20 | 50 | 10 | 30 |
| Open Gas Grill | * | * | 10 | 10 |
| Other | * | * | * | * |
| **Other Selected Gas Equipment** | ***** | **10** | ***** | ***** |
| Clothes Dryer | * | * | * | * |
| Torch | * | 10 | * | * |
| Shop/Garden Tool | * | * | * | * |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Death estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*).
Subtotals do not necessarily add to heading totals. Estimates exclude deaths from intentionally set fires.

**TABLE 5c**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**
**SELECTED GAS-FIRED EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential[18]** | **11,010** | **10,610** | **9,470** | **10,360** |
| **Total Gas-Fired Equipment** | **610** | **580** | **500** | **570** |
| **Gas Heating Equipment** | **180** | **210** | **190** | **190** |
| Fixed Heater | 80 | 80 | 50 | 70 |
| Portable Heater | 20 | 40 | 20 | 30 |
| Central Heating | 20 | 20 | 20 | 20 |
| Fireplace, Chimney, Connector | * | 10 | * | 10 |
| Water Heater | 60 | 50 | 80 | 60 |
| Fixed, Central Air Conditioning | * | * | * | * |
| Other | * | 10 | 20 | 10 |
| **Gas Cooking Equipment** | **270** | **210** | **210** | **230** |
| Range/Oven | 200 | 130 | 140 | 160 |
| Open Gas Grill | 50 | 30 | 50 | 40 |
| Other | 30 | 40 | 20 | 30 |
| **Other Selected Gas Equipment** | **40** | **60** | **20** | **40** |
| Clothes Dryer | * | 20 | 10 | 10 |
| Torch | 20 | 20 | * | 10 |
| Shop/Garden Tool | 10 | 10 | * | 10 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude injuries from intentionally set fires.

[18] There are confined fire injury estimates included in the *Total Residential* category. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source. See Table 9b on p. 37 for details.

**TABLE 5d**
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS**
**(In $Millions) SELECTED GAS-FIRED EQUIPMENT, 2020–2022**

| Equipment | 2020 | 2021 | 2022 | 2020–2022 Avg. |
|---|---|---|---|---|
| **Total Residential[19]** | **$7,554.0** | **$8,214.7** | **$10,155.7** | **$8,641.5** |
| **Total Gas-Fired Equipment** | **$315.6** | **$379.6** | **$391.8** | **$362.3** |
| **Gas Heating Equipment** | **$93.9** | **$76.0** | **$123.8** | **$97.9** |
| Fixed Heater | $17.5 | $26.9 | $52.6 | $32.3 |
| Portable Heater | $5.1 | $12.7 | $11.1 | $9.6 |
| Central Heating | $12.6 | $9.4 | $13.5 | $11.8 |
| Fireplace, Chimney, Connector | $12.3 | $8.9 | $21.6 | $14.3 |
| Water Heater | $20.3 | $12.4 | $14.5 | $15.7 |
| Fixed, Central Air Conditioning | $10.7 | * | $0.1 | $3.6 |
| Other | $4.5 | $5.8 | $10.4 | $6.9 |
| **Gas Cooking Equipment** | **$107.4** | **$100.2** | **$93.4** | **$100.3** |
| Range/Oven | $35.3 | $31.6 | $37.6 | $34.8 |
| Open Gas Grill | $49.0 | $55.6 | $44.9 | $49.8 |
| Other | $23.1 | $12.9 | $11.0 | $15.7 |
| **Other Selected Gas Equipment** | **$54.8** | **$40.4** | **$94.9** | **$63.4** |
| Clothes Dryer | $11.4 | $11.1 | $14.7 | $12.4 |
| Torch | $12.3 | $13.5 | $50.5 | $25.4 |
| Shop/Garden Tool | $30.5 | $14.8 | $29.5 | $24.9 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Rounded estimates less than $0.1m are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude property loss from intentionally set fires.

[19] There are confined fire property loss estimates included in the *Total Residential* category. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the equipment or the power source. See Table 9c on p. 37 for details.

### Estimates of Fire Death and Injury Victims by Age

Table 6 provides estimates of the rate of deaths and injuries by age categories. Note that people in the age categories of "40 – 64," "65 – 74," and "75+" have fire death rates higher than the overall rate of 0.7 per hundred thousand people. The death rate for people aged between 65 and 74 is more than twice as high as the overall death rate, and the rate for people aged 75 and over is about three times as high as the overall rate. The discrepancies by age are not as great in the fire injury rate, but the people in the age categories of "40 – 64," "65 – 74," and "75+" all have injury rates as high or higher than the overall rate of 2.8 per hundred thousand. In general, older adults suffer higher rates of fire deaths and injuries than younger people, with the relative difference in rates much larger for deaths.

Although older adults continue to have higher fire death and injury rates than the population at large, 2022 saw a large decrease from previous years for the fire death and injury rates for older adults. The fire death rate of Americans age 65+ fell to an estimated 1.7 per hundred thousand (from 1.9 in 2021) in 2022, and their fire injury rate fell to 3.0 in 2022 (from 3.8 in 2021).

**Table 6. Death and Injury Estimates by Age Category: 2020–2022**

| Age Category | Fire Deaths per Hundred Thousand People[20] | Fire Injuries per Hundred Thousand People[20] |
|---|---|---|
| **Overall** | 0.7 | 2.8 |
| **Under 5 years** | 0.6 | 2.1 |
| **5 – 14 years** | 0.3 | 1.1 |
| **15 – 39 years** | 0.3 | 2.7 |
| **40 – 64 years** | 0.8 | 3.3 |
| **65 – 74 years** | 1.6 | 3.4 |
| **75+ years** | 2.1 | 3.5 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.

[20] Population estimates obtained from U.S. Census Bureau resident population estimates by age for 2020 – 2022. Estimates can be found at https://www.census.gov/data/datasets/time-series/demo/popest/2010s-national-detail.html and https://www.census.gov/data/datasets/time-series/demo/popest/2020s-national-detail.html

# Methodology

This section describes the data from which fire loss estimates were derived, the procedures for preparing the data, and how the fire loss estimates were made by imputing missing and unknown data.

**Data**

*Sources of Data for Fire Loss Estimates*

The estimates in this report are based on the National Fire Protection Association's (NFPA) Survey of Fire Departments and the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) data.

The NFPA survey is a stratified random sample of fire departments in the United States.[21] The sample is stratified by the size of the community protected. The NFPA makes national estimates of aggregated fires, deaths, injuries, and property loss, by weighting sample results according to the proportion of the total U.S. population accounted for by communities of each size. The table below shows the NFPA estimates of residential structure fires and the associated losses for 2020 through 2022.

**Table 7. NFPA Estimates of Residential Structure Fires and Associated Losses 2020–2022**

| | 2020 | 2021 | 2022 |
|---|---|---|---|
| **Structure Fires** | 379,500 | 361,500 | 382,500 |
| **Civilian Deaths** | 2,630 | 2,880 | 2,760 |
| **Civilian Injuries** | 11,900 | 11,500 | 10,320 |
| **Property Loss** | $8.70 billion | $8.95 billion | $10.96 billion |

Source: See footnote 21.

The table above contains the only data from the NFPA survey that CPSC staff use to make fire loss estimates.

NFIRS compiles incident reports submitted voluntarily to the U.S. Fire Administration (USFA) by U.S. fire departments. Thus, NFIRS is not a probability sample and is insufficient to support precision estimation. The reports come from all 50 states and the District of Columbia in each of 2020, 2021, and 2022. Not all the states reporting included data from every fire department in the state. The number of fire departments participating in NFIRS decreased from 22,726 in 2020 to 22,303 in 2021. It then increased to 22,580 in 2022. Table 8 shows the number of residential structure fires and the corresponding losses reported to USFA from 2020 through 2022. The number of residential structure fires reported to NFIRS decreased by a large amount from 2020 to 2021 and then increased by an even larger amount to 2022. The low numbers of fires reported to NFIRS in 2021 and then the big increase in 2022 could be a result of the Covid-19

[21] Hylton Haynes, "Fire Loss in the U.S. During 2020," National Fire Protection Association (NFPA), September 2021; Hylton Haynes, "Fire Loss in the U.S. During 2021," National Fire Protection Association (NFPA), September 2022; Ben Evarts, "Fire Loss in the U.S. During 2022," National Fire Protection Association (NFPA), September 2023.

pandemic. There was also a big increase in the number of fire deaths and the amount of property loss reported to NFIRS in 2022.

**Table 8. Residential Structure Fires and Associated Losses Reported to NFIRS 2020–2022**

| | 2020 | 2021 | 2022 |
|---|---|---|---|
| **Structure Fires** | 226,686 | 209,407 | 235,547 |
| **Civilian Deaths** | 1,351 | 1,344 | 1,438 |
| **Civilian Injuries** | 4,914 | 4,389 | 4,664 |
| **Property Loss** | $4.20 billion | $4.5 billion | $6.0 billion |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA.

According to NFPA, there was an estimated annual average of 374,500 residential structure fires in the United States during 2020 to 2022, and an annual average of 2,760 deaths, 11,240 injuries, and $9.5 billion in property losses. NFIRS captured about 60 percent of these fires, 50 percent of the deaths, 41 percent of the injuries, and 51 percent of the property losses (Table 8).

*NFIRS Variables*

The NFIRS version 5.0 coding system includes many variables, but CPSC staff used only the following for this report:

| Variable | Description |
|---|---|
| *Civilian Deaths* | Number of people who died in connection with the fire incident other than fire service personnel. |
| *Civilian Injuries* | Number of people who were injured (but did not die) in connection with the fire incident, other than fire service personnel. |
| *Property Loss* | Estimate of loss, in whole dollars, if structure sustained damage from flame, smoke, or suppression efforts. Content losses are not adjusted for inflation. |
| *Contents Loss* | Estimate of loss, in whole dollars for contents (which had value) that sustained damage from flame, smoke, suppression efforts, or otherwise. Content losses are not adjusted for inflation. |
| *Property Use* | Refers to the specific use of the property where the incident occurred. For residential structure fires, the properties that were deemed appropriate were single/multifamily dwellings, any type of boarding houses, dormitories, |

| | |
|---|---|
| | sorority/fraternity houses, hotels/motels, and mobile property not in transit. |
| *Incident Type* | Identifies the various types of incidents to which fire departments respond. It may include fires, rescue and emergency medical services, or false alarms. For this report, the incident codes of interest included structure fires (which include confined fires) and fires in mobile and portable structures used as fixed residences. |
| *Equipment Involved* | Device that provided the heat that started the fire (*e.g.*, heater, clothes dryer, etc.). |
| *Power Source* | The type of power for the equipment involved in the fire's ignition. These are grouped into electrical; gas-, liquid-, or solid-fueled; and other. |
| *Equipment Portability* | Identifies the equipment involved as stationary or portable. |
| *Heat Source* | Source of heat that ignited the fire (*e.g.*, candle, lighter, cigarette, heat from operating equipment, hot object, etc.). |
| *Item First Ignited* | The functional description or use of the item that was first ignited by the heat source (e.g., upholstered furniture, mattress, bedding, electric cable insulation, curtains or drapes, etc.). |
| *Cause of Ignition* | The general causal factor that resulted in a heat source igniting a combustible material. The cause code values are:<br>1: intentional<br>2: unintentional<br>3: failure of equipment or heat source<br>4: act of nature<br>5: cause under investigation<br>0: cause, other<br>U: cause undetermined after investigation<br><br>CPSC staff regrouped the codes as:<br>1: intentional<br>0, 2, 3, 4, or fire involving child play: unintentional<br>5, U, missing information: unknown |
| *Age* | The age of the civilian fire casualty. |

The NFIRS coding manual[22] defines some variables as "required fields." A "required field" means that, if known, a value must be supplied for that variable. Other variables may or may not be supplied at the discretion of the reporting department. In the list above, the categories Equipment Involved, Power Source, and Equipment Portability are not required fields. Variables that are not required are more likely to be missing from a given fire incident report in NFIRS than those that are required.

**Data Preparation—Addressing Different Types of Missing Data**

There are four general types of missing data in NFIRS: (1) data where the value of the missing variable can be inferred logically; (2) missing data from exposure fires; (3) missing data from confined fires; and (4) other missing data. Standard practice, in analysis of fire data over the last 20 years or so, has been to fill in the missing values whenever possible, as explained below.

*Missing data that can be logically inferred*

Only a few of the available fire incident characteristics were used to generate estimates in this report. Of these, only the variables Incident Type, Property Use, Cause of Ignition, Item First Ignited, Heat Source, and the Loss[23] variables are required to be filled out by the fire departments. Even fewer are required for confined fires, which will be discussed below. Tables 1, 3, 4, and 5 in this report rely heavily on the variables Equipment Involved and Equipment Power Source. To reduce the extent of missing data, CPSC staff has implemented some conventions, as necessary, after consulting with USFA technical staff. For example, if the heat source is known to be matches, lighters, or candles, and no equipment is reported, CPSC staff concludes that equipment was not involved, rather than equipment being unknown. Similarly, if the factor contributing to the ignition of a fire is reported to be an act of nature—such as an earthquake or a storm—and no equipment is reported, CPSC staff concludes that no equipment was involved.

In another scenario, if the reported equipment code is electrical but the Equipment Power Source is missing then the power source should have been reported as electrical. Similarly, when known that no electrical equipment is involved, the power source should be reported as "none" instead of "unknown."

These edits are made before any other steps in data preparation.

*Exposure fires*

Some fires involved more than one residential structure. The initial structure is identified as "exposure zero" in the data file. Structure fires that spread from the initial fire are identified as "exposure fires" and are numbered from "zero," up to as many structures as necessary.

[22] NFIRS Complete Reference Guide, January 2015.
[23] These are property loss and content loss which CPSC staff add together for what they call *property loss*.

Typically, in exposure fires, most of the information on the variables listed above is not filled out for exposures beyond the initial home. Any residential structure exposure fire that originated from a different residential fire or a non-residential structure fire is in-scope for this report.

If the initial fire was a residential structure fire, CPSC staff transferred the fire cause values—such as Cause of Ignition, Equipment Involved, or Heat Source—from the initial fire to the exposure fire. For example, if a portable heater caused the initial fire, all exposures would be considered portable heater fires. All associated deaths, injuries, and property losses in these exposures also would be attributed to portable heaters.

If the initial fire is not a residential structure fire but the exposure fire is a residential structure fire, then the cause information is not passed down from the initial fire. For example, if a wildfire is started by a cigarette and then the fire spreads to homes, the wildfire would not count as a residential structure fire but the exposure home fires would. The cigarette as the heat source would not be passed on to the home fires in this case. The cause information for the exposure home fires would be left as is.

*Confined fires*

NFIRS's defines a fire that is confined to a noncombustible container causing no flame damage beyond the container to be a confined fire. By far, the largest proportion of missing data was encountered among the confined fires.

In NFIRS version 5.0, the following Incident Type codes are used to identify the different types of confined fires.

| *Incident Type Code* | *Definition* |
|---|---|
| 113 | Fire involving the contents of a cooking vessel without fire extension beyond the vessel. |
| 114 | Fire originating in and confined to a chimney or flue. |
| 115 | Fire caused by overload or malfunction of an incinerator, with no flame damage outside the incinerator. |
| 116 | Fire caused by delayed ignition or malfunction of a fuel or oil burner/boiler, with no flame damage outside the box. |
| 117 | Fire originating in and confined to contents of a trash compactor. Home trash compactors are excluded. |

| | |
|---|---|
| 118 | Fire involving a trash or rubbish fire in a structure with no flame damage to structure or its contents. |

With the proportion of reported confined fires increasing, the proportion of missing data also increases. However, imputation of unknowns based on the information from confined fires is not a viable option. CPSC staff's imputation of unknown data assumes that the unknown data will be like the known. Confined fires are inherently different than non-confined fires so data are not imputed across those categories. From the definition of the Incident Type of confined fires, it is unclear whether they are similar to the rest of the fires by Equipment Involved in Ignition, the Equipment Power Source, Heat Source, or Item First Ignited. As such, CPSC staff separates all confined fires from the data before the product-specific estimates are derived.

The confined fire and fire loss counts were weighted up to the NFPA estimates, using the same weights as the rest of the data, and presented at the aggregate levels (and sometimes at more specific levels as allowed by the Incident Type definitions). See the section on Estimation Procedure below for a discussion of the weights used. Tables 9a through 9c present all estimates related to confined fires. These estimates are also included in Tables 1a through 5d, as appropriate. Note that they do not appear in Tables 4a through 5d at any of the specific levels because there is no information available on Equipment Power Source.

**Table 9a. Estimated Residential Confined Fires: 2020–2022**

| Included in Table Categories: | Appear in Tables: | 2020 | 2021 | 2022 |
|---|---|---|---|---|
| **Total Residential** | 1a, 2a, 3a, 4a, 5a | 197,400 | 176,300 | 185,600 |
| **Total Heating and Cooling Equipment** | 1a, 3a | 20,800 | 19,300 | 20,600 |
| *Fireplace, Chimney, Connector* | *1a, 3a* | *14,200* | *13,600* | *13,700* |
| *Other (Burner/Boiler)* | *1a, 3a* | *6,600* | *5,700* | *6,900* |
| **Cooking** | 1a, 2a | 147,600 | 128,800 | 134,300 |
| **Trash, Rubbish** | 2a | 27,600 | 27,100 | 29,500 |
| **Incinerator** | - | 500 | 400 | 500 |
| **Trash Compactor** | - | 800 | 700 | 700 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Fire estimates are rounded to nearest 100. Rounded estimates less than 100 are denoted by an asterisk (*).
Subtotals do not necessarily add to heading totals. No information was available on the intentionality of these fires.

There were no confined fire deaths in 2020, 2021, or 2022.

**Table 9b. Estimated Residential Confined Fire Injuries: 2020–2022**

| Included in Table Categories: | Appear in Tables: | 2020 | 2021 | 2022 |
|---|---|---|---|---|
| **Total Residential** | 1c, 2c, 3c, 4c, 5c | 1,390 | 1,180 | 960 |
| **Total Heating and Cooling Equipment** | 1c, 3c | 60 | 50 | 40 |
| *Fireplace, Chimney, Connector* | *1c, 3c* | *20* | *20* | *20* |
| *Other (Burner/Boiler)* | *1c, 3c* | *40* | *30* | *30* |
| **Cooking** | 1c, 2c | 1,250 | 1,060 | 860 |
| **Trash, Rubbish** | 2c | 70 | 70 | 60 |

| | | | | |
|---|---|---|---|---|
| **Incinerator** | - | * | * | * |
| **Trash Compactor** | - | * | 10 | * |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Injury estimates rounded to nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. No information was available on the intentionality of these fires.

**Table 9c. Estimated Residential Confined Fire Property Loss (In $Millions): 2020–2022**

| Included in Table Categories: | Appear in Tables: | 2020 | 2021 | 2022 |
|---|---|---|---|---|
| **Total Residential** | 1d, 2d, 3d, 4d, 5d | $50.6 | $39.1 | $45.8 |
| **Total Heating and Cooling Equipment** | 1d, 3d | $8.7 | $7.6 | $9.3 |
| *Fireplace, Chimney, Connector* | *1d, 3d* | *$6.7* | *$5.5* | *$6.3* |
| *Other (Burner/Boiler)* | *1d, 3d* | *$2.0* | *$2.1* | *$3.0* |
| **Cooking** | 1d, 2d | $37.0 | $27.7 | $31.2 |
| **Trash, Rubbish** | 2d | $4.5 | $3.5 | $4.8 |
| **Incinerator** | - | $0.3 | $0.2 | $0.4 |
| **Trash Compactor** | - | $0.1 | $0.1 | $0.1 |

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the USFA and NFPA.
Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Rounded estimates less than $0.1m are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. No information was available on the intentionality of these fires.

*Other missing data*

Tables 10a–10c show the proportion of data missing for important fire cause variables after inferring data when appropriate. Because a large majority of the data fields for confined fires were not reported, those data fields were excluded from the tabulations.

The proportion of data for key fire cause variables that is missing has been generally increasing for decades. The high proportion of missing data, particularly for fire deaths, is problematic because the estimates are based on the non-missing data, with the missing data allocated based on the characteristics of the non-missing data. Against this trend, in 2021 there were some large decreases in the proportion of missing data—most notably a decrease to 60 percent (from 67 percent) in the Cause of Ignition deaths and a decrease to 66 percent (from 70 percent) in the Heat Source deaths. This was a positive development, but the proportions of missing data for most fire cause variables began to rise again from 2021 to 2022.

**Table 10a. Missing Data on Residential Structure Fires: 2020–2022**

| | 2020 | 2021 | 2022 |
|---|---|---|---|
| **Cause of Ignition** | 35% | 34% | 36% |
| **Heat Source** | 40% | 41% | 42% |
| **Item First Ignited** | 42% | 42% | 45% |
| **Equipment Involved** | 43% | 40% | 41% |
| **Equipment Power** | 43% | 40% | 41% |

Source: U.S. Consumer Product Safety Commission/EPHA, from NFIRS data obtained from the USFA. Table excludes confined fires.

**Table 10b. Missing Data on Residential Structure Fire Deaths: 2020–2022**

| | 2020 | 2021 | 2022 |
|---|---|---|---|
| **Cause of Ignition** | 67% | 60% | 62% |
| **Heat Source** | 70% | 66% | 69% |
| **Item First Ignited** | 70% | 68% | 71% |
| **Equipment Involved** | 57% | 54% | 58% |
| **Equipment Power** | 57% | 54% | 58% |

Source: U.S. Consumer Product Safety Commission/EPHA, from NFIRS data obtained from the USFA.

**Table 10c. Missing Data on Residential Structure Fire Injuries: 2020–2022**

| | 2020 | 2021 | 2022 |
|---|---|---|---|
| **Cause of Ignition** | 42% | 41% | 43% |
| **Heat Source** | 43% | 43% | 44% |
| **Item First Ignited** | 42% | 43% | 46% |
| **Equipment Involved** | 38% | 37% | 36% |
| **Equipment Power** | 38% | 37% | 36% |

Source: U.S. Consumer Product Safety Commission/EPHA, from NFIRS data obtained from the USFA. Table excludes injuries from confined fires.

### Quality Control Checks of NFIRS Data

In 2006 a California home fire was reported to NFIRS with a $100 million property loss. Because this loss was unusually high, CPSC staff decided to assign the fire to CPSC field staff to investigate and confirm (or correct) the amount of this large property loss. The actual fire department estimate of property loss for the fire was $100,000. The property loss was corrected, and the weight used for property loss estimates was changed accordingly.

Because of the finding on the 2006 California incident property loss estimate, CPSC staff initiated more quality control checking of the NFIRS data, beginning with the 2007 data by looking into fires with reported property losses of $5 million or higher. If CPSC staff deemed these property loss estimates to be suspicious, the cases were assigned to field investigators to conduct In-depth Investigations (IDIs) in an attempt to confirm or correct these high property loss estimates. Any new or differing information gained from these IDIs leads to editing of the data.

In addition to the high property loss incidents, CPSC staff also began assigning IDIs for many multiple (three or more) death fires. Much of the fire cause information in NFIRS is missing or unknown for many of the multiple death fires. Staff have found these IDIs useful for filling in or updating the fire cause information. In many cases, the IDI informs staff that the Cause of Ignition, although coded as unknown in NFIRS, is actually unintentional. In some cases, CPSC

staff learn that the deaths were the result of homicides that occurred before the fire was set. In such instances, CPSC staff edit the data with the new information.

Beginning with the 2015 data, a new class of NFIRS incident was assigned to CPSC field staff for IDIs, stemming from concern that some fires where the Heat Source was coded as "43 – Hot ember or ash" or "60 – Heat from other open flame or smoking materials" are incorrectly coded fires where a cigarette was the correct Heat Source. Beginning with the 2015 data, CPSC staff assigned to field investigators all incidents with at least one fire death where the coded Heat Source was either "43 – Hot ember or ash" or "60 – Heat from other open flame or smoking materials." In these cases, the investigator was instructed to contact the attending fire department and inquire about what specifically provided the source of heat for the fire.

These Quality Control check IDIs were conducted for each of the three years (2020, 2021, and 2022) covered in this report. For the years 2020, 2021, and 2022, there were a total of 56 high property loss fires assigned for Quality Control check IDIs. These IDI's led to editing the data for 35 of these fires. CPSC staff assigned a total of 40 IDIs for multiple death (three or more) fires. These IDIs led to data edits for 22 of these fires. Staff assigned IDIs for a total of 121 fatal fires due to the Heat Source being coded as either "43 – Hot ember or ash" or "60 – Heat from other open flame or smoking materials." These IDIs led to edits for 85 of these fires. CPSC staff are confident that this data editing improves the quality of the estimates by reducing the amount of unknown data and by correcting coding that was learned to be incorrect. The completed IDIs often tell us specific fire cause information for deadly fires that was not available from the original NFIRS coding.

### Using Raking to Allocate Missing Data and Make Estimates

For missing data, an assumption was made that the unknown values for a characteristic had the same distribution as the known values for that characteristic. To allocate these unknowns for the various characteristics, "raking" was performed using a SAS® macro.[24] The raking procedure maintains the marginal distributions for the known data while allocating the unknown data for all characteristics involved.[25] For each year, the raking procedure was applied separately for fires, deaths, injuries, and property loss.

For the CPSC staff estimates going back to 1980 all the way up to 2014, one raking procedure was applied separately for each year for each of the tables 1–5 (a–d). For 2015 and subsequent years, CPSC staff now rakes for each product. For example, for the Table 2b estimate for 2020 candle fire deaths, the raking only includes two variables: Cause of Ignition (Intentional or Unintentional) and Heat Source ("candle" or "not candle"). From this raking an estimate for 2020 candle fire deaths is produced. Such rakings are done for each row in each table.

Because some of the NFIRS information for victim age was missing/unknown (although victim age is rarely missing or unknown), the raking procedure was used to allocate the unknowns in

[24] M. Battaglia, D. Hoaglin and D. Izrael, "To Rake or Not To Rake Is Not the Question Anymore with the Enhanced Raking Macro," SAS® Users Group International (SUGI) 29th Annual Conference, May 9–12, 2004, Paper #207-29.
[25] M.A. Greene, L.E. Smith, M.S. Levenson, S. Hiser, and J.H. Mah, "Raking Fire Data," Presented at the Federal Conference on Statistical Methodology, Arlington, VA, 2001.

order to produce age estimates. The raking procedure was performed separately for age, separately for deaths and injuries, and separately for each of years 2020, 2021, and 2022. For example, it was used to allocate unknown victim ages to produce an estimate for 2020 deaths by age. Subsequently, it was repeated to estimate 2020 injuries by age, and so on.