



# **2006–2008 Residential Fire Loss Estimates<sup>\*</sup>**

**U.S. National Estimates of Fires,  
Deaths, Injuries, and Property Losses from  
Unintentional Fires**

David Miller  
Risana Chowdhury  
Division of Hazard Analysis  
Directorate for Epidemiology  
U.S. Consumer Product Safety Commission  
Bethesda, MD 20814  
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<sup>\*</sup> This analysis was prepared by the CPSC staff. It has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

## Executive Summary

This report presents estimates of consumer product-related fire losses that occurred in U.S. residential structure fires attended by the fire service. The estimates were derived from data for 2006 through 2008, 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.

The fire and fire loss estimates presented in this report pertain to unintentional residential structure fires and civilian casualties. These estimates show that there were:

- 390,900 fires, 2,280 deaths, 12,070 injuries, and \$6.30 billion in property loss in 2006;
- 389,200 fires, 2,490 deaths, 12,910 injuries, and \$6.77 billion in property loss in 2007;
- 378,800 fires, 2,390 deaths, 12,610 injuries, and \$7.69 billion in property loss in 2008; and
- an estimated annual average of 386,300 fires, 2,390 deaths, 12,530 injuries, and \$6.92 billion in property loss over the three year period 2006–2008.

Consumer products involved in fires can be categorized as sources of ignition or as the materials first ignited. As sources of ignition, they can be small sources like candles or large sources like ranges, which are usually categorized as the equipment involved in ignition. Because the fire losses are derived separately for sources of ignition and materials first ignited, estimates presented in this report overlap in some cases.

For 2006 through 2008, the relative ranking of the greatest contributors remained largely unchanged from that reported for 2005–2007. An exception is that the annual average electrical distribution fire death estimate is just as high (150) as the cooking equipment fire death estimate for 2006–2008. In previous years the estimated annual average of cooking equipment deaths had been higher than that for electrical distribution equipment. Tables 1a–1d show that:

- Cooking equipment accounted for the largest percentage of fires. An estimated annual average of 149,500 cooking equipment-related fires during 2006–2008 accounted for 38.7 percent of the average annual estimate of total residential fires for the same period. The corresponding death estimate is an annual average of 150 deaths, which is 6.1 percent of the average annual estimate of total residential fire deaths. The annual average number of cooking fire injuries for 2006–2008 was estimated to be 3,400, which represents 27.1 percent of the total estimated annual average number of injuries for the same time 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 56,500 fires for 2006–2008 was 14.6 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 9.1 percent of the average annual estimated number of total residential fire deaths. The corresponding injuries for the three years averaged to an annual estimate of 1,070. This accounts for 8.5 percent of the annual average estimate of total injuries during 2006–2008.

- During 2006–2008, an estimated annual average of 12,300 fires was attributable to electrical distribution system components (*e.g.*, installed wiring, lighting). This corresponds to 3.2 percent of the estimated annual average number of total residential fires for the same time period. The annual average death estimate is 150 (6.2 percent of average annual estimated number of total residential fire deaths); while the injury estimates averaged 470, which is 3.8 percent of the estimated annual average of total residential fire injuries.
- By item first ignited, upholstered furniture ignition was involved in the greatest number of deaths. From 2006 through 2008, an estimated annual average of 510 deaths was associated with these fires. This constitutes 21.3 percent of the estimated annual average of total deaths associated with residential structure fires for the same period. On average, during 2006 to 2008, mattress or bedding ignitions accounted for an annual average of 350 deaths, which is 14.5 percent of the average annual estimated number of total residential fire deaths.
- By heat source, smoking materials were the largest contributor to deaths, associated with an annual average of 600 deaths from 2006 to 2008. This accounts for 25.2 percent of the estimated annual average of total residential fire deaths. The estimated annual average number of deaths from candle fires is 130, which represents 5.3 percent of the average annual estimated total number of residential fire deaths during 2006 to 2008. There were an estimated 50 deaths from lighter fires (2.2 percent of the estimated annual average of the total number of residential fire deaths); while, on average, matches were responsible for 40 deaths, or 1.5 percent of total deaths annually.

Beginning with 1999, the NFIRS system underwent some major changes. As such, staff at the U.S. Consumer Product Safety Commission (CPSC) recommends against comparing fire loss estimates from before 1999, with those after 1999. Rather, the estimates in this report are best viewed as reflecting estimates from a substantially different reporting system because of the inherent system design differences.

## Introduction

The fire loss estimates presented in this report are based on the National Fire Protection Association's (NFPA) national fire loss estimates<sup>1</sup> 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 loss based on a probability sample survey of U.S. fire departments. The NFIRS is a compilation of voluntarily submitted fire incident reports by U.S. fire departments that are sent to the USFA. Not all the states reporting data include data from all fire departments in the state. Among the multitude of information collected, product-specific information, such as the equipment involved in the ignition of the fire, or the item that was first ignited in the fire, is available in NFIRS data. The NFIRS product-specific frequency counts are weighted up to the NFPA estimates for total U.S. fire losses, to arrive at the estimates that are presented in this report.

The estimated number of fires and fire loss estimates pertain only to fires in residential properties. These include single family and multifamily dwellings. Mobile and motor homes, while used as a structure and not in transit, are also included. Injury and death estimates pertain to civilian casualties only. The property losses include property and content losses, as estimated by fire departments. For convenience, they are referred to as "property losses" in this report.

The estimates for 2005 through 2007 were published in the August 2010 Residential Fire Loss Estimates report.<sup>2</sup> The estimates for 2006 and 2007 that are presented here remain unchanged from that earlier report. Annual average estimates generated from the most recent three years of data are presented in this report.

CPSC staff has been producing estimates of residential fires and related deaths, injuries, and property losses since the early 1980s. However, over the years, NFIRS has undergone major changes. This, in turn, has necessitated changes in the way CPSC analysts produce the product-specific estimates. A discussion of some of these changes follows.

Beginning with 1999 data, a major revision to the NFIRS data coding system, designated version 5.0, was implemented. In 1999, 5 percent of the residential fire data was coded by fire departments in the new NFIRS version 5.0; in 2000, 20 percent was coded in version 5.0. The proportion increased to 50 percent in 2001; 70 percent in 2002; 80 percent in 2003; 89 percent in 2004; 94 percent in 2005; 95 percent in 2006; 97 percent in 2007; and 99 percent in 2008. However, from 1999 onwards, the NFIRS data received from the USFA is entirely in version 5.0 format. Data were converted from NFIRS 4.1 to NFIRS 5.0 by computer programs. Since version 5.0 has many more data fields than version 4.1, and some of the new data fields have many more choices than in 4.1, the converted data are not likely to be the same as data originally coded in version 5.0.

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<sup>1</sup> M.J. Karter, "Fire Loss in the U.S. During 2006," National Fire Protection Association (NFPA), September 2007; M.J. Karter, "Fire Loss in the U.S. During 2007," National Fire Protection Association (NFPA), August 2008; M.J. Karter, "Fire Loss in the U.S. During 2008," National Fire Protection Association (NFPA), August 2009.

<sup>2</sup> D. Miller, R. Chowdhury, M. Greene, "2005–2007 Residential Fire Loss Estimates," CPSC, August 2010.

As mentioned above, in 2006, 2007, and 2008, 95 percent, 97 percent, and 99 percent of the residential fire data, respectively, were originally coded in version 5.0. Given this large proportion of version 5.0 data, CPSC analysts excluded reports originally coded in version 4.1 and produced these estimates using the version 5.0 data only. The NFIRS product-specific frequency counts based only on this component of the data were weighted up to the 2006, 2007, and 2008 NFPA estimates for total U.S. fire losses, to arrive at the product-specific estimates presented in this report.

Beginning with version 5.0, NFIRS introduced newly created 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 on these fires. From 1999 forward, as the use of version 5.0 increased, an increasingly larger number of confined fires were reported. In 1999, about 2 percent of residential fires were reported as confined; by 2008, about 46 percent of fires reported to NFIRS were confined fires.

Because it is not required information, in most confined fire cases, it is not possible by looking at the codes to determine the type of equipment involved. For example, when a fire is identified as a “confined cooking fire” in NFIRS, it is not possible to separate ranges from other cooking equipment. As a result, confined cooking fire losses are only included as part of the “cooking equipment” totals and cannot be broken down further into ranges or other cooking equipment (*e.g.*, toasters, microwaves), or by the power source. However, because ranges certainly are involved in some confined fires, evaluation of the range-related hazard needs to take into account that some cooking fires that are included only in the totals are likely to have been range fires.

The changes cited above, and the gradual implementation of these changes in the NFIRS data system, have affected the estimates since 1999 considerably. CPSC staff strongly discourages comparison of pre-1999 estimates with estimates from later years.

## Results

In keeping with reports from previous years, there are five main tables in this report. Each numbered table (1–5) has four tables associated with it; Table “a” presents the fire estimates; “b” presents the death estimates; “c” presents the injury estimates; and “d” presents the property loss estimates. As in previous years, only selected product-specific estimates are included in these tables. Therefore, the detail may not add 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 the jurisdiction of the CPSC. Intentionally set fires and their associated losses, which include the deliberate misuses of heat sources, or fires of an incendiary nature, are excluded from the estimates.

In Tables 1, 3, 4, and 5, equipment codes were used to identify the products; while in Table 2, either the heat source or the item first ignited was the primary means of identifying the product. As such, 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). 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, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>390,900</b>	<b>389,200</b>	<b>378,800</b>	<b>386,300</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>55,500</b>	<b>57,700</b>	<b>56,300</b>	<b>56,500</b>
Local Fixed Heater	4,400	4,500	4,900	4,600
Portable Heater	1,400	1,900	1,900	1,700
Central Heating	1,000	1,100	1,200	1,100
Fireplace, Chimney, Chimney Connector <sup>1</sup>	26,400	27,000	27,200	26,900
Water Heater	2,500	2,700	2,300	2,500
Air Conditioning	1,200	1,300	1,000	1,200
Other <sup>1</sup>	18,700	19,100	17,800	18,500
<b>Total Cooking Equipment<sup>1</sup></b>	<b>150,600</b>	<b>148,700</b>	<b>149,100</b>	<b>149,500</b>
Range/Oven	14,300	15,000	14,600	14,600
<i>Gas</i>	2,700	2,600	2,300	2,500
<i>Electric</i>	11,500	12,400	12,300	12,100
<i>Other</i>	*	*	*	*
All Other Cooking	5,500	5,800	5,500	5,600
<i>Gas</i>	800	900	900	900
<i>Electric</i>	4,200	4,500	4,300	4,300
<i>Other</i>	500	400	300	400
<b>Total Electrical Distribution</b>	<b>12,000</b>	<b>12,700</b>	<b>12,100</b>	<b>12,300</b>
Installed Wiring	4,600	5,200	5,100	5,000
Cord, Plug	1,400	1,400	1,300	1,400
Receptacle, Switch	1,400	1,500	1,400	1,400
Lighting	2,600	2,500	2,200	2,500
Other	2,000	2,000	2,100	2,000
<b>Other Selected Equipment</b>	<b>9,700</b>	<b>10,600</b>	<b>9,800</b>	<b>10,100</b>
Audio/Visual Equipment	700	500	600	600
Clothes Dryer	6,800	7,500	6,800	7,000
Washing Machine	300	400	300	300
Torch	600	600	500	600
Refrigerator/Freezer	700	900	900	800
Shop/Garden Tool	700	900	800	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. 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.

<sup>1</sup> 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 6a on p. 31 for details.

**TABLE 1b**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**  
**SELECTED EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>2,280</b>	<b>2,490</b>	<b>2,390</b>	<b>2,390</b>
<b>Total Heating and Cooling Equipment</b>	<b>200</b>	<b>230</b>	<b>220</b>	<b>220</b>
Local Fixed Heater	80	100	60	80
Portable Heater	50	70	100	70
Central Heating	20	*	*	10
Fireplace, Chimney, Chimney Connector	*	20	10	10
Water Heater	20	10	10	10
Air Conditioning	*	*	*	*
Other <sup>1</sup>	30	20	30	30
<b>Total Cooking Equipment<sup>1</sup></b>	<b>130</b>	<b>160</b>	<b>140</b>	<b>150</b>
Range/Oven	130	110	130	120
<i>Gas</i>	50	40	40	40
<i>Electric</i>	80	70	90	80
<i>Other</i>	*	*	*	*
All Other Cooking	10	50	10	20
<i>Gas</i>	*	*	*	*
<i>Electric</i>	*	20	10	10
<i>Other</i>	*	30	*	10
<b>Total Electrical Distribution</b>	<b>140</b>	<b>100</b>	<b>210</b>	<b>150</b>
Installed Wiring	50	50	120	70
Cord, Plug	50	30	30	40
Receptacle, Switch	*	*	10	*
Lighting	20	10	10	20
Other	10	*	40	20
<b>Other Selected Equipment</b>	<b>*</b>	<b>*</b>	<b>40</b>	<b>10</b>
Audio/Visual Equipment	*	*	*	*
Clothes Dryer	*	*	40	*
Washing Machine	*	*	*	*
Torch	*	*	*	*
Refrigerator / Freezer	*	*	*	*
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.

<sup>1</sup> There were no NFIRS confined cooking fire deaths in 2006 or 2008, and a rounded estimate of fewer than 10 confined cooking fire deaths in 2007.

**TABLE 1c**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**  
**SELECTED EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>12,070</b>	<b>12,910</b>	<b>12,610</b>	<b>12,530</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>890</b>	<b>1,260</b>	<b>1,050</b>	<b>1,070</b>
Local Fixed Heater	230	320	360	300
Portable Heater	130	200	210	180
Central Heating	50	40	50	50
Fireplace, Chimney, Chimney Connector <sup>1</sup>	90	150	80	110
Water Heater	130	170	130	150
Air Conditioning	60	50	20	40
Other <sup>1</sup>	200	330	200	240
<b>Total Cooking Equipment<sup>1</sup></b>	<b>3,120</b>	<b>3,520</b>	<b>3,560</b>	<b>3,400</b>
Range/Oven	1,260	1,480	1,410	1,390
<i>Gas</i>	220	220	150	190
<i>Electric</i>	1,040	1,260	1,270	1,190
<i>Other</i>	10	*	*	*
All Other Cooking	350	350	400	370
<i>Gas</i>	60	30	70	50
<i>Electric</i>	270	290	310	290
<i>Other</i>	30	20	20	20
<b>Total Electrical Distribution</b>	<b>430</b>	<b>570</b>	<b>420</b>	<b>470</b>
Installed Wiring	120	150	100	120
Cord, Plug	100	130	100	110
Receptacle, Switch	60	70	20	50
Lighting	90	180	130	130
Other	60	40	70	60
<b>Other Selected Equipment</b>	<b>310</b>	<b>530</b>	<b>330</b>	<b>390</b>
Audio/Visual Equipment	40	60	40	40
Clothes Dryer	170	300	230	230
Washing Machine	20	10	*	10
Torch	40	40	10	30
Refrigerator/Freezer	20	50	10	30
Shop/Garden Tool	20	60	40	40

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.

<sup>1</sup> 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. See Table 6b on p. 32 for details.

**TABLE 1d**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS**  
**(In Millions)**  
**SELECTED EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>\$6,303.3</b>	<b>\$6,771.5</b>	<b>\$7,692.0</b>	<b>\$6,922.3</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>\$586.5</b>	<b>\$548.9</b>	<b>\$649.0</b>	<b>\$594.8</b>
Local Fixed Heater	\$147.6	\$125.9	\$148.3	\$140.6
Portable Heater	\$67.6	\$87.6	\$87.4	\$80.8
Central Heating	\$26.5	\$24.9	\$37.9	\$29.8
Fireplace, Chimney, Chimney Connector <sup>1</sup>	\$126.6	\$110.3	\$147.6	\$128.2
Water Heater	\$77.8	\$51.3	\$62.3	\$63.8
Air Conditioning	\$27.0	\$30.9	\$24.4	\$27.4
Other <sup>1</sup>	\$113.3	\$118.0	\$141.3	\$124.2
<b>Total Cooking Equipment<sup>1</sup></b>	<b>\$372.4</b>	<b>\$434.8</b>	<b>\$483.9</b>	<b>\$430.4</b>
Range/Oven	\$225.1	\$276.6	\$300.8	\$267.5
<i>Gas</i>	\$39.9	\$57.3	\$45.2	\$47.5
<i>Electric</i>	\$183.8	\$219.0	\$255.2	\$219.3
<i>Other</i>	\$1.4	\$0.2	\$0.5	\$0.7
All Other Cooking	\$123.6	\$136.9	\$157.5	\$139.3
<i>Gas</i>	\$22.4	\$24.5	\$41.1	\$29.3
<i>Electric</i>	\$89.1	\$103.9	\$104.0	\$99.0
<i>Other</i>	\$12.0	\$8.5	\$12.4	\$11.0
<b>Total Electrical Distribution</b>	<b>\$388.6</b>	<b>\$425.5</b>	<b>\$476.5</b>	<b>\$430.2</b>
Installed Wiring	\$145.3	\$175.7	\$210.5	\$177.1
Cord, Plug	\$44.0	\$44.7	\$50.2	\$46.3
Receptacle, Switch	\$52.6	\$36.4	\$41.2	\$43.4
Lighting	\$82.3	\$95.6	\$85.0	\$87.6
Other	\$64.5	\$73.1	\$89.5	\$75.7
<b>Other Selected Equipment</b>	<b>\$181.5</b>	<b>\$281.7</b>	<b>\$201.8</b>	<b>\$221.7</b>
Audio/Visual Equipment	\$19.6	\$14.5	\$19.5	\$17.9
Clothes Dryer	\$82.8	\$101.0	\$91.5	\$91.8
Washing Machine	\$3.1	\$2.0	\$2.9	\$2.7
Torch	\$23.4	\$113.9	\$30.8	\$56.0
Refrigerator/Freezer	\$21.1	\$21.0	\$24.6	\$22.3
Shop/Garden Tool	\$31.9	\$29.3	\$32.4	\$31.2

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.

<sup>1</sup> There are confined fire property loss 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 because NFIRS does not provide information to determine the type of equipment. See Table 6c on p. 32 for details.

**TABLE 2a**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**  
**SELECTED PRODUCTS, 2006–2008**

<b>Product</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>390,900</b>	<b>389,200</b>	<b>378,800</b>	<b>386,300</b>
<b>By Heat Source</b>				
<b>Cigarette, Other Tobacco Products</b>	<b>12,200</b>	<b>11,600</b>	<b>11,100</b>	<b>11,600</b>
<b>Match</b>	<b>1,000</b>	<b>1,000</b>	<b>700</b>	<b>900</b>
<b>Lighter</b>	<b>2,100</b>	<b>2,100</b>	<b>1,800</b>	<b>2,000</b>
<b>Candle</b>	<b>10,800</b>	<b>9,700</b>	<b>8,800</b>	<b>9,700</b>
<b>By Item First Ignited</b>				
<b>Upholstered Furniture</b>	<b>6,900</b>	<b>6,600</b>	<b>6,000</b>	<b>6,500</b>
Smoking Material Ignition	1,900	1,700	1,600	1,800
Open-Flame Ignition	1,100	1,000	800	1,000
Other	3,900	3,800	3,600	3,800
<b>Mattress, Bedding</b>	<b>10,000</b>	<b>9,500</b>	<b>8,900</b>	<b>9,500</b>
Smoking Material Ignition	2,200	1,900	1,900	2,000
Open-Flame Ignition	2,400	2,200	1,900	2,100
Other	5,400	5,400	5,100	5,300
<b>Other Materials</b>				
Cooking Materials <sup>1</sup>	154,000	150,900	150,800	151,900
Electric Cable Insulation	17,900	17,800	17,200	17,600
Interior Wall Covering	7,800	8,100	7,800	7,900
Wearing Apparel-Worn	300	300	300	300
Wearing Apparel-Not Worn	6,800	6,600	5,900	6,400
Floor Covering	4,600	5,000	4,700	4,800
Curtains, Drapes	2,100	2,000	1,800	2,000
Magazines, Newspaper	2,300	2,000	2,000	2,100
Thermal Insulation	6,100	6,600	6,500	6,400
Cabinet, Desk	5,300	5,400	4,900	5,200
Trash, Rubbish <sup>1</sup>	23,100	21,200	19,600	21,300
Toy, Game	200	200	200	200
Box, Carton, Bag, Basket, Barrel	2,800	2,900	2,700	2,800

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.

<sup>1</sup> 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 6a on p. 31 for details.

**TABLE 2b**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**  
**SELECTED PRODUCTS, 2006–2008**

<b>Product</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>2,280</b>	<b>2,490</b>	<b>2,390</b>	<b>2,390</b>
<b>By Heat Source</b>				
<b>Cigarette, Other Tobacco Products</b>	<b>600</b>	<b>660</b>	<b>550</b>	<b>600</b>
<b>Match</b>	<b>40</b>	<b>40</b>	<b>30</b>	<b>40</b>
<b>Lighter</b>	<b>70</b>	<b>60</b>	<b>30</b>	<b>50</b>
<b>Candle</b>	<b>120</b>	<b>160</b>	<b>100</b>	<b>130</b>
<b>By Item First Ignited</b>				
<b>Upholstered Furniture</b>	<b>480</b>	<b>540</b>	<b>510</b>	<b>510</b>
Smoking Material Ignition	290	320	210	270
Open-Flame Ignition	20	50	50	40
Other	170	170	250	200
<b>Mattress, Bedding</b>	<b>370</b>	<b>360</b>	<b>310</b>	<b>350</b>
Smoking Material Ignition	160	190	160	170
Open-Flame Ignition	60	30	20	40
Other	150	140	130	140
<b>Other Materials</b>				
Cooking Materials <sup>1</sup>	110	140	90	110
Electric Cable Insulation	80	100	70	80
Interior Wall Covering	80	60	90	80
Wearing Apparel-Worn	90	100	90	90
Wearing Apparel-Not Worn	40	10	30	30
Floor Covering	120	80	160	120
Curtains, Drapes	10	30	20	20
Magazines, Newspaper	50	50	30	40
Thermal Insulation	*	*	20	10
Cabinet, Desk	40	40	70	50
Trash, Rubbish	50	70	50	60
Toy, Game	*	*	*	*
Box, Carton, Bag, Basket, Barrel	20	10	*	10

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.

<sup>1</sup> There were no NFIRS confined cooking fire deaths in 2006 or 2008, and a rounded estimate of fewer than 10 confined cooking fire deaths in 2007.

**TABLE 2c**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**  
**SELECTED PRODUCTS, 2006–2008**

<b>Product</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>12,070</b>	<b>12,910</b>	<b>12,610</b>	<b>12,530</b>
<b>By Heat Source</b>				
<b>Cigarette, Other Tobacco Products</b>	<b>1,240</b>	<b>1,080</b>	<b>1,120</b>	<b>1,150</b>
<b>Match</b>	<b>150</b>	<b>160</b>	<b>100</b>	<b>130</b>
<b>Lighter</b>	<b>340</b>	<b>380</b>	<b>380</b>	<b>370</b>
<b>Candle</b>	<b>1,040</b>	<b>900</b>	<b>790</b>	<b>910</b>
<b>By Item First Ignited</b>				
<b>Upholstered Furniture</b>	<b>860</b>	<b>780</b>	<b>940</b>	<b>860</b>
Smoking Material Ignition	320	300	320	310
Open-Flame Ignition	190	170	220	190
Other	340	310	400	350
<b>Mattress, Bedding</b>	<b>1,250</b>	<b>1,200</b>	<b>1,140</b>	<b>1,200</b>
Smoking Material Ignition	400	300	280	330
Open-Flame Ignition	380	330	310	340
Other	480	570	550	530
<b>Other Materials</b>				
Cooking Materials <sup>1</sup>	3,640	3,930	4,000	3,860
Electric Cable Insulation	490	470	480	480
Interior Wall Covering	280	260	340	300
Wearing Apparel-Worn	100	120	120	110
Wearing Apparel-Not Worn	360	350	360	350
Floor Covering	230	300	260	260
Curtains, Drapes	170	200	140	170
Magazines, Newspaper	180	110	190	160
Thermal Insulation	100	120	70	100
Cabinet, Desk	270	350	330	320
Trash, Rubbish <sup>1</sup>	250	270	310	280
Toy, Game	30	10	20	20
Box, Carton, Bag, Basket, Barrel	130	110	150	130

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. Subtotals do not necessarily add to heading totals. Estimates exclude injuries from intentionally set fires.

<sup>1</sup>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 6b on p. 32 for details.

**TABLE 2d**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)**  
**SELECTED PRODUCTS, 2006–2008**

Product	2006	2007	2008	2006–2008 Average
<b>Total Residential<sup>1</sup></b>	<b>\$6,303.3</b>	<b>\$6,771.5</b>	<b>\$7,692.0</b>	<b>\$6,922.3</b>
<b>By Heat Source</b>				
<b>Cigarette, Other Tobacco Products</b>	<b>\$408.5</b>	<b>\$433.2</b>	<b>\$435.3</b>	<b>\$425.7</b>
<b>Match</b>	<b>\$34.6</b>	<b>\$31.3</b>	<b>\$30.4</b>	<b>\$32.1</b>
<b>Lighter</b>	<b>\$61.3</b>	<b>\$64.9</b>	<b>\$82.3</b>	<b>\$69.5</b>
<b>Candle</b>	<b>\$360.3</b>	<b>\$367.2</b>	<b>\$352.6</b>	<b>\$360.0</b>
<b>By Item First Ignited</b>				
<b>Upholstered Furniture</b>	<b>\$342.0</b>	<b>\$334.3</b>	<b>\$352.0</b>	<b>\$342.8</b>
Smoking Material Ignition	\$111.3	\$103.8	\$87.2	\$100.8
Open-Flame Ignition	\$64.5	\$47.7	\$61.3	\$57.8
Other	\$166.1	\$182.8	\$203.5	\$184.2
<b>Mattress, Bedding</b>	<b>\$343.4</b>	<b>\$339.9</b>	<b>\$324.5</b>	<b>\$335.9</b>
Smoking Material Ignition	\$61.5	\$53.9	\$48.4	\$54.6
Open-Flame Ignition	\$86.5	\$79.8	\$96.2	\$87.5
Other	\$195.3	\$206.3	\$179.9	\$193.8
<b>Other Materials</b>				
Cooking Materials <sup>1</sup>	\$409.2	\$418.8	\$511.6	\$446.5
Electric Cable Insulation	\$385.1	\$407.1	\$522.3	\$438.2
Interior Wall Covering	\$264.1	\$316.5	\$333.8	\$304.8
Wearing Apparel-Worn	\$7.3	\$6.9	\$5.7	\$6.6
Wearing Apparel-Not Worn	\$144.3	\$132.0	\$169.5	\$148.6
Floor Covering	\$151.5	\$164.3	\$167.9	\$161.3
Curtains, Drapes	\$52.7	\$63.0	\$45.9	\$53.9
Magazines, Newspaper	\$73.7	\$62.5	\$75.4	\$70.5
Thermal Insulation	\$134.8	\$240.0	\$178.8	\$184.5
Cabinet, Desk	\$188.6	\$181.0	\$190.4	\$186.7
Trash, Rubbish <sup>1</sup>	\$148.9	\$112.5	\$136.4	\$132.6
Toy, Game	\$1.3	\$6.0	\$8.2	\$5.1
Box, Carton, Bag, Basket, Barrel	\$105.8	\$110.2	\$157.9	\$124.6

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.

<sup>1</sup> There are confined fire property loss estimates included in *Total Residential*, *Cooking Materials*, and *Trash, Rubbish* categories. Estimates for confined cooking fire property losses are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 6c on p. 32 for details.

**TABLE 3a**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**  
**HEATING AND COOLING EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>390,900</b>	<b>389,200</b>	<b>378,800</b>	<b>386,300</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>55,500</b>	<b>57,700</b>	<b>56,300</b>	<b>56,500</b>
<b>Solid Fuel</b>	<b>2,500</b>	<b>2,800</b>	<b>3,000</b>	<b>2,800</b>
Fixed Heater	600	700	800	700
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	1,800	2,100	2,100	2,000
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
<b>Gas-Fired</b>	<b>3,900</b>	<b>3,900</b>	<b>3,600</b>	<b>3,800</b>
Fixed Heater	1,100	1,100	1,100	1,100
Portable Heater	200	200	100	200
Fireplace, Chimney, Chimney Connector	200	200	200	200
Central Heating	500	500	500	500
Water Heater	1,700	1,600	1,300	1,500
Fixed, Central Air Conditioning	*	*	*	*
Other	200	300	300	300
<b>Electric</b>	<b>9,600</b>	<b>11,100</b>	<b>10,500</b>	<b>10,400</b>
Fixed Heater	2,500	2,600	2,900	2,700
Portable Heater	1,000	1,400	1,500	1,300
Central Heating	400	400	500	400
Water Heater	800	1,100	900	900
Fixed, Central Air Conditioning	800	800	700	800
Portable Air Conditioner	400	500	300	400
Other	3,700	4,200	3,700	3,900
<b>Liquid Fuel</b>	<b>600</b>	<b>600</b>	<b>600</b>	<b>600</b>
Fixed Heater	100	100	100	100
Portable Heater	300	300	300	300
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	100	100	200	100
Water Heater	*	*	*	*
Other	100	100	*	100
<b>All Other Fuel</b>	<b>200</b>	<b>200</b>	<b>100</b>	<b>200</b>

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.

<sup>1</sup> There are confined fire estimates included in *Total Residential*, and *Total Heating and Cooling 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 or the power source of the equipment. See Table 6a on p. 31 for details.

**TABLE 3b**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**  
**HEATING AND COOLING EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>2,280</b>	<b>2,490</b>	<b>2,390</b>	<b>2,390</b>
<b>Total Heating and Cooling Equipment</b>	<b>200</b>	<b>230</b>	<b>220</b>	<b>220</b>
<b>Solid Fuel</b>	<b>30</b>	<b>60</b>	<b>50</b>	<b>40</b>
Fixed Heater	20	30	40	30
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	*	20	10	10
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
<b>Gas-Fired</b>	<b>70</b>	<b>80</b>	<b>30</b>	<b>60</b>
Fixed Heater	30	40	20	30
Portable Heater	*	20	*	10
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	10	*	*	*
Water Heater	20	10	10	10
Fixed, Central Air Conditioning	*	*	*	*
Other	*	*	*	*
<b>Electric</b>	<b>80</b>	<b>90</b>	<b>110</b>	<b>90</b>
Fixed Heater	30	30	10	20
Portable Heater	30	40	80	50
Central Heating	10	*	*	*
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Portable Air Conditioner	*	*	*	*
Other	20	10	30	20
<b>Liquid Fuel</b>	<b>20</b>	<b>10</b>	<b>30</b>	<b>20</b>
Fixed Heater	*	*	*	*
Portable Heater	20	10	20	20
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
<b>All Other Fuel</b>	<b>*</b>	<b>*</b>	<b>10</b>	<b>*</b>

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.

<sup>1</sup> There were no NFIRS confined cooking fire deaths in 2006 or 2008, and a rounded estimate of fewer than 10 confined cooking fire deaths in 2007.

**TABLE 3c**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**  
**HEATING AND COOLING EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>12,070</b>	<b>12,910</b>	<b>12,610</b>	<b>12,530</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>890</b>	<b>1,260</b>	<b>1,050</b>	<b>1,070</b>
<b>Solid Fuel</b>	<b>80</b>	<b>110</b>	<b>60</b>	<b>80</b>
Fixed Heater	20	30	20	20
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	50	70	40	50
Central Heating	*	*	*	*
Water Heater	10	*	*	*
Other	*	*	*	*
<b>Gas-Fired</b>	<b>250</b>	<b>270</b>	<b>280</b>	<b>270</b>
Fixed Heater	90	50	100	80
Portable Heater	10	30	30	20
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	30	20	40	30
Water Heater	110	140	120	120
Fixed, Central Air Conditioning	*	*	*	*
Other	10	20	*	10
<b>Electric</b>	<b>390</b>	<b>690</b>	<b>590</b>	<b>550</b>
Fixed Heater	120	220	230	190
Portable Heater	70	160	170	130
Central Heating	10	10	10	10
Water Heater	20	30	10	20
Fixed, Central Air Conditioning	30	50	10	30
Portable Air Conditioner	20	10	10	10
Other	120	210	150	160
<b>Liquid Fuel</b>	<b>60</b>	<b>40</b>	<b>30</b>	<b>40</b>
Fixed Heater	*	*	10	10
Portable Heater	50	10	20	30
Fireplace, Chimney, Chimney Connector	*	10	*	*
Central Heating	10	10	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
<b>All Other Fuel</b>	<b>*</b>	<b>10</b>	<b>*</b>	<b>*</b>

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.

<sup>1</sup> There are confined fire injury estimates included in *Total Residential*, and *Total Heating and Cooling 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 or the power source of the equipment. See Table 6b on p. 32 for details.

**TABLE 3d**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)**  
**HEATING AND COOLING EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>\$6,303.3</b>	<b>\$6,771.5</b>	<b>\$7,692.0</b>	<b>\$6,922.3</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>\$586.5</b>	<b>\$548.9</b>	<b>\$649.0</b>	<b>\$594.8</b>
<b>Solid Fuel</b>	<b>\$110.7</b>	<b>\$121.7</b>	<b>\$165.0</b>	<b>\$132.5</b>
Fixed Heater	\$21.6	\$31.1	\$34.8	\$29.2
Portable Heater	\$1.2	\$1.3	\$0.3	\$0.9
Fireplace, Chimney, Chimney Connector	\$85.1	\$88.3	\$125.5	\$99.6
Central Heating	\$2.3	*	\$2.4	\$1.6
Water Heater	*	*	*	*
Other	\$0.5	\$1.0	\$2.1	\$1.2
<b>Gas-Fired</b>	<b>\$173.0</b>	<b>\$114.5</b>	<b>\$126.4</b>	<b>\$138.0</b>
Fixed Heater	\$34.0	\$31.0	\$30.0	\$31.6
Portable Heater	\$12.7	\$5.3	\$7.3	\$8.4
Fireplace, Chimney, Chimney Connector	\$34.0	\$13.0	\$14.3	\$20.4
Central Heating	\$13.7	\$13.0	\$18.5	\$15.1
Water Heater	\$70.3	\$40.0	\$49.5	\$53.3
Fixed, Central Air Conditioning	*	*	*	*
Other	\$8.4	\$12.2	\$6.8	\$9.1
<b>Electric</b>	<b>\$268.1</b>	<b>\$278.0</b>	<b>\$321.6</b>	<b>\$289.2</b>
Fixed Heater	\$86.9	\$58.7	\$75.5	\$73.7
Portable Heater	\$43.2	\$68.8	\$70.6	\$60.9
Central Heating	\$4.9	\$9.8	\$12.2	\$8.9
Water Heater	\$7.4	\$11.1	\$12.7	\$10.4
Fixed, Central Air Conditioning	\$19.8	\$20.2	\$16.4	\$18.8
Portable Air Conditioner	\$7.2	\$10.7	\$7.9	\$8.6
Other	\$98.6	\$98.8	\$126.2	\$107.9
<b>Liquid Fuel</b>	<b>\$25.1</b>	<b>\$21.5</b>	<b>\$20.3</b>	<b>\$22.3</b>
Fixed Heater	\$4.4	\$5.0	\$5.2	\$4.9
Portable Heater	\$10.4	\$12.1	\$8.3	\$10.3
Fireplace, Chimney, Chimney Connector	\$1.6	\$1.0	\$0.5	\$1.0
Central Heating	\$5.6	\$2.2	\$4.8	\$4.2
Water Heater	*	*	\$0.1	*
Other	\$3.0	\$1.3	\$1.4	\$1.9
<b>All Other Fuel</b>	<b>\$2.7</b>	<b>\$5.8</b>	<b>\$6.5</b>	<b>\$5.0</b>

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.

<sup>1</sup> There are confined fire property loss estimates included in *Total Residential*, and *Total Heating and Cooling Equipment* categories. These confined fire property loss 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 of the equipment. See Table 6c on p. 32 for details.

**TABLE 4a**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**  
**SELECTED ELECTRICAL EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>390,900</b>	<b>389,200</b>	<b>378,800</b>	<b>386,300</b>
<b>Total Electrical</b>	<b>48,000</b>	<b>52,200</b>	<b>50,100</b>	<b>50,100</b>
<b>Electric Heating and Cooling</b>	<b>9,600</b>	<b>11,100</b>	<b>10,500</b>	<b>10,400</b>
Central Heating	400	400	500	400
Local Fixed Heater	2,500	2,600	2,900	2,700
Portable Heater	1,000	1,400	1,500	1,300
Water Heater	800	1,100	900	900
Fixed, Central Air Conditioning	800	800	700	800
Portable Air Conditioner	400	500	300	400
Other	3,700	4,200	3,700	3,900
<b>Electric Cooking Equipment</b>	<b>15,700</b>	<b>17,000</b>	<b>16,600</b>	<b>16,400</b>
Range-/Oven	11,500	12,400	12,300	12,100
Range/Oven Hood	200	200	200	200
Deep Fat Fryer	100	100	100	100
Grill	*	*	*	*
Small Heat-Producing Appliance	1,000	900	900	900
Other	3,000	3,300	3,100	3,100
<b>Electrical Distribution</b>	<b>12,000</b>	<b>12,700</b>	<b>12,100</b>	<b>12,300</b>
Installed Wiring	4,600	5,200	5,100	5,000
Light Fixture	1,600	1,500	1,400	1,500
Receptacle, Switch	1,400	1,500	1,400	1,400
Cord, Plug	1,400	1,400	1,300	1,400
Lamp, Light Bulb	1,000	1,000	800	900
Panel Board	600	700	700	700
Meter	300	300	300	300
Transformer	100	100	100	100
Other	1,000	900	1,000	1,000
<b>Other Selected Electrical Appliances</b>	<b>7,000</b>	<b>7,600</b>	<b>7,200</b>	<b>7,300</b>
Clothes Dryer	5,100	5,500	5,100	5,200
Audio/Visual Equipment	600	500	600	600
Washing Machine	300	400	300	300
Refrigerator/Freezer	600	800	800	800
Shop/Garden Tools	200	300	300	200
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.

<sup>1</sup> There are confined fire estimates included in *Total Residential* category. These confined fire 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 of the equipment. See Table 6a on p. 31 for details.

**TABLE 4b**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**  
**SELECTED ELECTRICAL EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>2,280</b>	<b>2,490</b>	<b>2,390</b>	<b>2,390</b>
<b>Total Electrical</b>	<b>370</b>	<b>320</b>	<b>510</b>	<b>400</b>
<b>Electric Heating and Cooling</b>	<b>80</b>	<b>90</b>	<b>110</b>	<b>90</b>
Central Heating	10	*	*	*
Local Fixed Heater	30	30	10	20
Portable Heater	30	40	80	50
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Portable Air Conditioner	*	*	*	*
Other	20	10	30	20
<b>Electric Cooking Equipment</b>	<b>80</b>	<b>90</b>	<b>110</b>	<b>90</b>
Range/Oven	80	70	90	80
Range/Oven Hood	*	*	*	*
Deep Fat Fryer	*	*	*	*
Grill	*	*	*	*
Small Heat-Producing Appliance	*	*	*	*
Other	*	20	10	10
<b>Electrical Distribution</b>	<b>140</b>	<b>100</b>	<b>210</b>	<b>150</b>
Installed Wiring	50	50	120	70
Light Fixture	10	*	*	10
Receptacle, Switch	*	*	10	*
Cord, Plug	50	30	30	40
Lamp, Light Bulb	10	10	*	10
Panel Board	10	*	10	10
Meter	*	*	*	*
Transformer	*	*	*	*
Other	10	*	30	10
<b>Other Selected Electrical Appliances</b>	<b>*</b>	<b>*</b>	<b>30</b>	<b>10</b>
Clothes Dryer	*	*	30	10
Audio/Visual Equipment	*	*	*	*
Washing Machine	*	*	*	*
Refrigerator/Freezer	*	*	*	*
Shop/Garden Tool	*	*	*	*
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.

<sup>1</sup> There were no NFIRS confined cooking fire deaths in 2006 or 2008, and a rounded estimate of fewer than 10 confined cooking fire deaths in 2007.

**TABLE 4c**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**  
**SELECTED ELECTRICAL EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>12,070</b>	<b>12,910</b>	<b>12,610</b>	<b>12,530</b>
<b>Total Electrical</b>	<b>2,550</b>	<b>3,390</b>	<b>3,030</b>	<b>2,990</b>
<b>Electric Heating and Cooling</b>	<b>390</b>	<b>690</b>	<b>590</b>	<b>550</b>
Central Heating	10	10	10	10
Local Fixed Heater	120	220	230	190
Portable Heater	70	160	170	130
Water Heater	20	30	10	20
Fixed, Central Air Conditioning	30	50	10	30
Portable Air Conditioner	20	10	10	10
Other	120	210	150	160
<b>Electric Cooking Equipment</b>	<b>1,310</b>	<b>1,550</b>	<b>1,580</b>	<b>1,480</b>
Range/Oven	1,040	1,260	1,270	1,190
Range/Oven Hood	*	10	*	10
Deep Fat Fryer	10	*	10	10
Grill	*	*	*	*
Small Heat-Producing Appliance	80	80	80	80
Other	180	190	220	200
<b>Electrical Distribution</b>	<b>430</b>	<b>570</b>	<b>420</b>	<b>470</b>
Installed Wiring	120	150	100	120
Light Fixture	40	100	70	70
Receptacle, Switch	60	70	20	50
Cord, Plug	100	130	100	110
Lamp, Light Bulb	50	80	60	60
Panel Board	10	20	20	20
Meter	*	*	*	*
Transformer	*	*	*	*
Other	50	10	50	30
<b>Other Selected Electrical Appliances</b>	<b>200</b>	<b>390</b>	<b>250</b>	<b>280</b>
Clothes Dryer	120	210	170	170
Audio/Visual Equipment	30	60	40	40
Washing Machine	20	10	*	10
Refrigerator/Freezer	20	50	10	30
Shop/Garden Tool	10	30	20	20
Torch	10	20	*	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.

<sup>1</sup> There are confined fire injury estimates included in *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 of the equipment. See Table 6b on p. 32 for details.

**TABLE 4d**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)**  
**SELECTED ELECTRICAL EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>\$6,303.3</b>	<b>\$6,771.5</b>	<b>\$7,692.0</b>	<b>\$6,922.3</b>
<b>Total Electrical</b>	<b>\$1,174.6</b>	<b>\$1,312.3</b>	<b>\$1,463.1</b>	<b>\$1,316.7</b>
<b>Electric Heating and Cooling</b>	<b>\$268.1</b>	<b>\$278.0</b>	<b>\$321.6</b>	<b>\$289.2</b>
Central Heating	\$4.9	\$9.8	\$12.2	\$8.9
Local Fixed Heater	\$86.9	\$58.7	\$75.5	\$73.7
Portable Heater	\$43.2	\$68.8	\$70.6	\$60.9
Water Heater	\$7.4	\$11.1	\$12.7	\$10.4
Fixed, Central Air Conditioning	\$19.8	\$20.2	\$16.4	\$18.8
Portable Air Conditioner	\$7.2	\$10.7	\$7.9	\$8.6
Other	\$98.6	\$98.8	\$126.2	\$107.9
<b>Electric Cooking Equipment</b>	<b>\$272.9</b>	<b>\$323.0</b>	<b>\$359.2</b>	<b>\$318.3</b>
Range/Oven	\$183.8	\$219.0	\$255.2	\$219.3
Range/Oven Hood	\$2.7	\$2.2	\$3.0	\$2.7
Deep Fat Fryer	\$2.2	\$2.6	\$3.5	\$2.8
Grill	\$0.1	\$0.3	*	\$0.1
Small Heat-Producing Appliance	\$26.3	\$20.8	\$20.2	\$22.5
Other	\$57.7	\$78.0	\$77.2	\$71.0
<b>Electrical Distribution</b>	<b>\$388.6</b>	<b>\$425.5</b>	<b>\$476.5</b>	<b>\$430.2</b>
Installed Wiring	\$145.3	\$175.7	\$210.5	\$177.1
Light Fixture	\$51.6	\$59.0	\$61.6	\$57.4
Receptacle, Switch	\$52.6	\$36.4	\$41.2	\$43.4
Cord, Plug	\$44.0	\$44.7	\$50.2	\$46.3
Lamp, Light Bulb	\$30.7	\$36.6	\$23.4	\$30.2
Panel Board	\$10.4	\$15.5	\$30.3	\$18.7
Meter	\$3.9	\$9.4	\$5.7	\$6.3
Transformer	\$6.7	\$9.6	\$4.4	\$6.9
Other	\$43.5	\$38.6	\$49.1	\$43.7
<b>Other Selected Electrical Appliances</b>	<b>\$116.7</b>	<b>\$133.0</b>	<b>\$132.3</b>	<b>\$127.3</b>
Clothes Dryer	\$63.2	\$83.4	\$72.2	\$72.9
Audio/Visual Equipment	\$19.5	\$14.5	\$19.5	\$17.9
Washing Machine	\$3.1	\$2.0	\$2.9	\$2.7
Refrigerator/Freezer	\$20.8	\$20.8	\$24.5	\$22.0
Shop/Garden Tool	\$2.4	\$9.5	\$6.9	\$6.3
Torch	\$7.7	\$2.8	\$6.2	\$5.5

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

Note: Estimates are rounded to the \$0.1m. 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.

<sup>1</sup> There are confined fire property loss estimates included in *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 type of equipment or the power source of the equipment. See Table 6c on p. 32 for details.

**TABLE 5a**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**  
**SELECTED GAS-FIRED EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>390,900</b>	<b>389,200</b>	<b>378,800</b>	<b>386,300</b>
<b>Total Gas-Fired Equipment</b>	<b>10,300</b>	<b>10,700</b>	<b>9,700</b>	<b>10,200</b>
<b>Gas Heating Equipment</b>	<b>3,900</b>	<b>3,900</b>	<b>3,600</b>	<b>3,800</b>
Fixed Heater	1,100	1,100	1,100	1,100
Portable Heater	200	200	100	200
Central Heating	500	500	500	500
Fireplace, Chimney, Connector	200	200	200	200
Water Heater	1,700	1,600	1,300	1,500
Fixed, Central Air Conditioning	*	*	*	*
Other	200	300	300	300
<b>Gas Cooking Equipment</b>	<b>3,500</b>	<b>3,500</b>	<b>3,200</b>	<b>3,400</b>
Range/Oven	2,700	2,600	2,300	2,500
Open Gas Grill	400	400	500	400
Other	500	500	500	500
<b>Other Selected Gas Equipment</b>	<b>2,500</b>	<b>2,800</b>	<b>2,500</b>	<b>2,600</b>
Clothes Dryer	1,700	1,900	1,700	1,800
Torch	500	400	400	400
Shop/Garden Tool	400	500	400	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.

<sup>1</sup> There are confined fire estimates included in *Total Residential* category. These confined fire 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 of the equipment. See Table 6a on p. 31 for details.

**TABLE 5b**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**  
**SELECTED GAS-FIRED EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>2,280</b>	<b>2,490</b>	<b>2,390</b>	<b>2,390</b>
<b>Total Gas-Fired Equipment</b>	<b>120</b>	<b>120</b>	<b>70</b>	<b>110</b>
<b>Gas Heating Equipment</b>	<b>70</b>	<b>80</b>	<b>30</b>	<b>60</b>
Fixed Heater	30	40	20	30
Portable Heater	*	20	*	10
Central Heating	10	*	*	*
Fireplace, Chimney, Connector	*	*	*	*
Water Heater	20	10	10	10
Fixed, Central Air Conditioning	*	*	*	*
Other	*	*	*	*
<b>Gas Cooking Equipment</b>	<b>50</b>	<b>40</b>	<b>40</b>	<b>40</b>
Range/Oven	50	40	40	40
Open Gas Grill	*	*	*	*
Other	*	*	*	*
<b>Other Selected Gas Equipment</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>*</b>
Clothes Dryer	*	*	*	*
Torch	*	*	*	*
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.

<sup>1</sup>Includes an estimated 20 deaths in 2005 from confined cooking fires. There were no NFIRS confined cooking fire deaths in 2006 and a rounded estimate of fewer than 10 confined cooking fire deaths in 2007.

**TABLE 5c**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**  
**SELECTED GAS-FIRED EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>12,070</b>	<b>12,910</b>	<b>12,610</b>	<b>12,530</b>
<b>Total Gas-Fired Equipment</b>	<b>620</b>	<b>760</b>	<b>620</b>	<b>670</b>
<b>Gas Heating Equipment</b>	<b>250</b>	<b>270</b>	<b>280</b>	<b>270</b>
Fixed Heater	90	50	100	80
Portable Heater	10	30	30	20
Central Heating	30	20	40	30
Fireplace, Chimney, Connector	*	*	*	*
Water Heater	110	140	120	120
Fixed, Central Air Conditioning	*	*	*	*
Other	10	20	*	*
<b>Gas Cooking Equipment</b>	<b>270</b>	<b>250</b>	<b>210</b>	<b>250</b>
Range/Oven	220	220	150	190
Open Gas Grill	10	10	20	20
Other	40	20	40	30
<b>Other Selected Gas Equipment</b>	<b>80</b>	<b>140</b>	<b>80</b>	<b>100</b>
Clothes Dryer	50	90	60	70
Torch	20	20	10	20
Shop/Garden Tool	10	30	10	20

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.

<sup>1</sup> There are confined fire injury estimates included in *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 of the equipment. See Table 6b on p. 32 for details.

**TABLE 5d**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)**  
**SELECTED GAS-FIRED EQUIPMENT, 2006–2008**

<b>Equipment</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2006–2008 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>\$6,303.3</b>	<b>\$6,771.5</b>	<b>\$7,692.0</b>	<b>\$6,922.3</b>
<b>Total Gas-Fired Equipment</b>	<b>\$308.0</b>	<b>\$357.1</b>	<b>\$289.1</b>	<b>\$318.1</b>
<b>Gas Heating Equipment</b>	<b>\$173.0</b>	<b>\$114.5</b>	<b>\$126.4</b>	<b>\$138.0</b>
Fixed Heater	\$34.0	\$31.0	\$30.0	\$31.6
Portable Heater	\$12.7	\$5.3	\$7.3	\$8.4
Central Heating	\$13.7	\$13.0	\$18.5	\$15.1
Fireplace, Chimney, Connector	\$34.0	\$13.0	\$14.3	\$20.4
Water Heater	\$70.3	\$40.0	\$49.5	\$53.3
Fixed, Central Air Conditioning	*	*	*	*
Other	\$8.4	\$12.2	\$6.8	\$9.1
<b>Gas Cooking Equipment</b>	<b>\$62.4</b>	<b>\$81.8</b>	<b>\$86.3</b>	<b>\$76.8</b>
Range/Oven	\$39.9	\$57.3	\$45.2	\$47.5
Open Gas Grill	\$9.5	\$15.0	\$24.2	\$16.2
Other	\$12.9	\$9.5	\$16.9	\$13.1
<b>Other Selected Gas Equipment</b>	<b>\$60.5</b>	<b>\$140.4</b>	<b>\$61.6</b>	<b>\$87.5</b>
Clothes Dryer	\$19.6	\$17.6	\$19.3	\$18.8
Torch	\$14.8	\$110.6	\$24.5	\$50.0
Shop/Garden Tool	\$26.1	\$12.1	\$17.8	\$18.7

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. 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.

<sup>1</sup> There are confined fire property loss estimates included in *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 type of equipment or the power source of the equipment. See Table 6c on p. 32 for details.

## Methodology

The Methodology section is divided into five major sections. Section 1 describes the data from which fire loss estimates were made; Section 2 describes the procedures for preparing the data, especially focusing on missing data; Section 3 describes the quality control checking and correction of the data; Section 4 describes how the fire loss estimates were made; and Section 5 describes other issues that relate to the data and the estimates.

### 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 USFA's (USFA) National Fire Incident Reporting System (NFIRS) data.

The NFPA survey is a stratified random sample of fire departments in the United States.<sup>1</sup> 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 2006 through 2008.

**NFPA Estimates of Residential Structure Fires and Associated Losses 2006–2008**

	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Structure Fires</b>	412,500	414,000	403,000
<b>Civilian Deaths</b>	2,580	2,865	2,780
<b>Civilian Injuries</b>	12,925	14,000	13,560
<b>Property Loss</b>	\$6.99 billion	\$7.55 billion	\$8.55 billion

Source: See footnote 1 below.

The table above contains the only data used from the NFPA survey for making fire loss estimates.

The NFIRS is a compilation of voluntarily submitted incident reports completed by U.S. fire departments. As such, the NFIRS is not a probability sample and is insufficient to support precision estimation. The reports come from all 50 states (in each of 2006, 2007, and 2008), the District of Columbia (in 2007), and U.S. territories. Not all the states reporting data included data from all fire departments in the state. In 2008, more than 21,000 fire departments participated in NFIRS. The next table shows the number of residential structure fires and the corresponding losses reported to USFA during the years 2006 through 2008.

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<sup>1</sup> M.J. Karter, "Fire Loss in the U.S. During 2006," National Fire Protection Association (NFPA), September 2007; M.J. Karter, "Fire Loss in the U.S. During 2007," National Fire Protection Association (NFPA), August 2008; M.J. Karter, "Fire Loss in the U.S. During 2008," National Fire Protection Association (NFPA), August 2009. NFPA estimates include intentionally set fires and associated losses.

### Residential Structure Fires and Associated Losses Reported to USFA 2006–2008

	2006		2007		2008	
	All	5.0 Only	All	5.0 Only	All	5.0 Only
<b>Structure Fires</b>	260,507	247,201	268,017	260,478	272,665	269,079
<b>Civilian Deaths</b>	1,444	1,335	1,472	1,419	1,453	1,437
<b>Civilian Injuries</b>	7,387	6,867	7,447	7,098	7,563	7,388
<b>Property Loss</b>	\$3.55 billion	\$3.24 billion	\$4.73 billion	\$4.53 billion	\$4.58 billion	\$4.51 billion

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

According to the NFPA, there was an estimated annual average of 409,833 residential structure fires in the U.S. during 2006 to 2008. NFIRS captured about 63 percent of these fires. During the same time period, NFPA also estimated an annual average of 2,742 deaths, 13,495 injuries, and \$7.7 billion in property losses. On average, NFIRS captured 51 percent of the deaths, 53 percent of the injuries, and 53 percent of the property loss.

#### *NFIRS Variables*

The NFIRS version 5.0 coding system includes many variables, but CPSC staff used only a few for this report. The list of variables used by CPSC staff is shown below.

<u>Variable</u>	<u>Description</u>
<i>Civilian Deaths</i>	Number of people who died in connection with the fire incident other than fire service personnel.
<i>Civilian Injuries</i>	Number of people who were injured (but did not die) in connection with the fire incident other than fire service personnel.
<i>Property Loss</i>	Estimate of loss, in whole dollars, if structure sustained damage from flame, smoke, or suppression efforts. Property loss is not adjusted for inflation.
<i>Contents Loss</i>	Estimate of loss in whole dollars for contents (which had value) that sustained damage from flame, smoke, suppression efforts, or otherwise. Contents loss is not adjusted for inflation.
<i>Property Use</i>	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.

<i>Incident Type</i>	Identifies the various types of incidents to which fire departments respond. It may include fires, rescue and emergency medical services, 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.
<i>Equipment Involved</i>	Device that provided the heat which started the fire ( <i>e.g.</i> , heater, clothes dryer).
<i>Power Source</i>	The type of power for the equipment involved in the fire's ignition. These are grouped into electrical, gas-fueled, liquid-fueled, solid-fueled, and other.
<i>Equipment Portability</i>	Identifies the equipment involved as stationary or portable.
<i>Heat Source</i>	Source of heat that ignited the fire ( <i>e.g.</i> , candle, lighter, cigarette, heat from operating equipment, hot object).
<i>Item First Ignited</i>	The functional description or use of that item which was first ignited by the heat source ( <i>e.g.</i> , upholstered furniture, mattress, bedding, electric cable insulation, curtains or drapes).
<i>Cause of Ignition</i>	<p>The general causal factor that resulted in a heat source igniting a combustible material. The cause code values are:</p> <ul style="list-style-type: none"> <li>1: intentional</li> <li>2: unintentional</li> <li>3: failure of equipment or heat source</li> <li>4: act of nature</li> <li>5: cause under investigation</li> <li>0: cause, other</li> <li>U: cause undetermined after investigation.</li> </ul> <p>CPSC staff regrouped the codes as:</p> <ul style="list-style-type: none"> <li>1: intentional</li> <li>0, 2, 3, 4 or fire involving child play* : unintentional</li> <li>5, U, missing information: unknown.</li> </ul>
<i>Factors Contributing to Ignition</i>	The event that allowed the heat source and the item first ignited to combine to start the fire. These add specificity to the cause of ignition, such as playing with heat source, heat source too close to combustibles, equipment malfunction.

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\* See discussion on child play later in this section.

### *Human Factors Contributing to Ignition*

Factors relating to the person or persons involved with the start of the fire. Examples are asleep, possibly impaired by alcohol or drugs, age, unattended or unsupervised person.

### *Age*

Age of the person, if age was considered a factor in contributing to the ignition of the fire.

The NFIRS coding manual defines some variables as “required fields,” that is, if known, values must be supplied for those variables. 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, Equipment Portability, Factors Contributing to Ignition, Human Factors Contributing to Ignition, and Age 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.<sup>1</sup>

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

There are four general types of missing data in NFIRS. These are as follows: (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 has been to fill in the missing values whenever possible.

### *Missing data that can be logically inferred*

As mentioned above, 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 Variables are required to be filled out by the fire departments. Even less is 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 lessen the extent of missing data, CPSC staff has implemented some conventions, as necessary, following consultation with USFA technical staff.

Some examples illustrate this. If the heat source is known to be matches, lighters, or candles, and no equipment is reported, then it is likely that no equipment was 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, then it is likely that no equipment was involved.

Another scenario would be when the reported equipment code is one that can only be electrical but the equipment power source is missing. In this case, it is evident that the power source should have been reported as electrical. On the other hand, when it is known that there is no equipment involved, the power source should be reported as “none” instead of “unknown.”

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

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<sup>1</sup> NFIRS Complete Reference Guide, January 2004.

### *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” numbered from “zero” up to as many as are necessary. Typically, in exposure fires, most of the information on the variables listed above is not filled out for exposures beyond the initial home.

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. Thus, 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. Any residential structure exposure fire that originated from a non-residential structure fire is also considered in-scope for this report. 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 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*

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

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

<i>Incident Type Code</i>	<i>Definition</i>
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 fire 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.

These Incident Type codes are unavailable in version 4.1 of NFIRS. It was believed that many of these cases were not being reported; so in version 5.0, these codes were created to simplify the coding of these fires. When reporting confined fires, the Cause of Ignition, Equipment Involved, Item First Ignited, or Power Source is not required to be reported.

Since 1999, more and more of the NFIRS data have been reported in version 5.0. With the opportunity to identify confined fires using the specific codes, more and more “confined” fires are also being reported to NFIRS. However, very little other useful information about them is available. 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. From the definition of the Incident Type of confined fires, it is unclear that they are at all similar to the rest of the fires in terms of the equipment involved, the equipment power source, the heat source, or the 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 on the weights used. Tables 6a through 6c 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 6a: Estimated Residential Confined Fires: 2006–2008**

<b>Included in Table Categories:</b>	<b>Appear in Tables:</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Total Residential</b>	1a, 2a, 3a, 4a, 5a	190,400	185,200	184,500
<b>Total Heating and Cooling Equipment</b>	1a, 3a	38,800	39,100	38,500
<i>Fireplace, Chimney, Connector</i>	<i>1a, 3a</i>	<i>24,300</i>	<i>24,600</i>	<i>24,800</i>
<i>Other (Burner/Boiler)</i>	<i>1a, 3a</i>	<i>14,600</i>	<i>14,500</i>	<i>13,700</i>
<b>Cooking</b>	1a, 2a	130,900	127,800	129,000
<b>Trash, Rubbish</b>	2a	18,200	16,300	15,100
<b>Incinerator</b>	-	800	700	600
<b>Trash Compactor</b>	-	1,700	1,300	1,300

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.

In 2006 and 2008, there were no NFIRS confined fire deaths; and in 2007, there were fewer than 10 deaths estimated from all residential confined fires. No confined fire table is presented showing these death estimates.

**Table 6b: Estimated Residential Confined Fire Injuries: 2006–2008**

Included in Table Categories:	Appear in Tables:	2006	2007	2008
<b>Total Residential</b>	1c, 2c, 3c, 4c, 5c	1,670	1,900	1,900
<b>Total Heating and Cooling Equipment</b>	1c, 3c	110	140	90
<i>Fireplace, Chimney, Connector</i>	1c, 3c	40	60	40
<i>Other (Burner/Boiler)</i>	1c, 3c	70	90	50
<b>Cooking</b>	1c, 2c	1,510	1,700	1,750
<b>Trash, Rubbish</b>	2c	50	60	60
<b>Incinerator</b>	-	*	*	10
<b>Trash Compactor</b>	-	*	*	*

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 6c: Estimated Residential Confined Fire Property Loss (In Millions): 2006–2008**

Included in Table Categories:	Appear in Tables:	2006	2007	2008
<b>Total Residential</b>	1d, 2d, 3d, 4d, 5d	\$33.5	\$30.8	\$39.1
<b>Total Heating and Cooling Equipment</b>	1d, 3d	\$6.9	\$7.4	\$9.1
<i>Fireplace, Chimney, Connector</i>	1d, 3d	\$5.2	\$5.1	\$6.5
<i>Other (Burner/Boiler)</i>	1d, 3d	\$1.7	\$2.3	\$2.6
<b>Cooking</b>	1d, 2d	\$23.7	\$21.4	\$25.6
<b>Trash, Rubbish</b>	2d	\$2.2	\$1.7	\$4.1
<b>Incinerator</b>	-	\$0.7	\$0.3	\$0.4
<b>Trash Compactor</b>	-	\$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 7a–7c show the extent of data still missing after logically inferring missing data when appropriate and information transfer was completed for exposure fires. Since most of the data fields for confined fires (those that do not spread beyond the originating item) were not reported per NFIRS's version 5.0 reporting instructions, they have been excluded from the tabulations below. Confined fires are discussed later in this section.

**Table 7a**  
**Missing Data on Residential Structure Fires: 2006–2008**

	2006	2007	2008
<b>Cause of Ignition</b>	29%	30%	32%
<b>Heat Source</b>	32%	34%	35%
<b>Item First Ignited</b>	32%	33%	34%
<b>Equipment Involved</b>	50%	52%	51%
<b>Equipment Power</b>	50%	52%	51%

Source: U.S. Consumer Product Safety Commission / EPHA, from NFIRS data obtained from the USFA. Table excludes confined fires. Table includes only version 5.0 component of total residential structure fires data (95 percent of the 2006 fires are coded in 5.0, 97 percent in 2007, and 99 percent in 2008).

**Table 7b**  
**Missing Data on Residential Structure Fire Deaths: 2006–2008**

	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Cause of Ignition</b>	49%	51%	56%
<b>Heat Source</b>	50%	51%	61%
<b>Item First Ignited</b>	52%	53%	59%
<b>Equipment Involved</b>	47%	55%	56%
<b>Equipment Power</b>	47%	55%	56%

Source: U.S. Consumer Product Safety Commission / EPHA, from NFIRS data obtained from the USFA. Table excludes deaths from confined fires. Table includes only version 5.0 component of total residential structure fire death data (92% of the fire deaths in 2006 were coded in 5.0, 96% in 2007, and 99% in 2008).

**Table 7c**  
**Missing Data on Residential Structure Fire Injuries: 2006–2008**

	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Cause of Ignition</b>	28%	27%	32%
<b>Heat Source</b>	26%	27%	32%
<b>Item First Ignited</b>	27%	28%	30%
<b>Equipment Involved</b>	43%	44%	44%
<b>Equipment Power</b>	44%	44%	43%

Source: U.S. Consumer Product Safety Commission / EPHA, from NFIRS data obtained from the USFA. Table excludes injuries from confined fires. Table includes only version 5.0 component of total residential structure fire injury data (93 percent of the fire injuries in 2006 were coded in 5.0, 95 percent in 2007, and 98 percent in 2008).

For these 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 used. A SAS<sup>®</sup> macro<sup>1</sup> performed the raking. The raking procedure maintains the marginal distributions for the known data, while allocating the unknown data for all characteristics involved.<sup>2</sup> For each year, the raking procedure was applied separately for fires, deaths, injuries, and property loss.

### **Quality Control Checks of NFIRS Data**

In 2006, a California home fire was reported to NFIRS with a \$100 million property loss. Since this was unusually high, CPSC staff decided to assign the fire to CPSC field staff to investigate and confirm this large property loss value. 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.

In light of this, CPSC staff did more quality control checking of the NFIRS data, beginning with the 2007 data. In 2008, residential structure fires with reported property losses of \$5 million or higher were assigned to CPSC field staff to confirm the high property loss estimate with the fire department. There were 21 such high property loss fires assigned for investigation. In nine of them, the property loss estimate was confirmed. In the remaining 12, a different property loss estimate was obtained, and the data were corrected.

<sup>1</sup> M. Battaglia, D. Hoaglin and D. Izrael, “To Rake or Not To Rake Is Not the Question Anymore with the Enhanced Raking Macro,” SAS<sup>®</sup> Users Group International (SUGI) 29<sup>th</sup> Annual Conference, May 9–12, 2004, Paper #207-29.

<sup>2</sup> 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.

In addition to the quality control checking of high property loss fire reports, some checking was done of multiple-death fire incidents for the 2008 data. In cases with 3 or more civilian deaths reported, a search of the Internet was conducted to look for news articles and fire marshal reports to confirm (or add to) the fire cause information given in the NFIRS report. There were 18 cases where it appeared that there might be information to conflict with or add to the information from the NFIRS report. These cases were assigned to field staff to contact the fire department and reconcile the information. As a result of these investigations, 15 of these cases had fire cause information edited. A common scenario was a report that had the “Cause of Ignition” variable “missing” or “unknown” and then changed to “unintentional” as a result of a CPSC field staff investigation. In two different instances, one case involving four deaths and another case involving three deaths resulted in investigations establishing that the deaths were not fire deaths. In both cases, the fires were set after the deaths occurred.

## **Estimation Procedure**

After applying the conventions and the raking procedure previously discussed, the estimation process was carried out. For each year, CPSC staff computed weights for residential fires, civilian deaths, civilian injuries, and property and content losses, respectively, by dividing the NFPA estimated totals for these losses by the corresponding NFIRS totals. These weights were multiplied by the NFIRS product-specific frequency counts, which then were used to produce the estimates in the tables. As already mentioned, the confined fires were separated, and the estimates were computed separately.

The estimates presented in this report pertain to unintentional fires and fire losses only. To this end, CPSC analysts excluded all incidents where the “Cause of Ignition” could be identified as intentional. While fires involving children playing with the source of heat have become more difficult to identify in the new NFIRS system (see discussion in the next section), whenever such a fire could be identified, the CPSC analysts designated it as “unintentional” even if the “Cause of Ignition” was coded as “intentional.”

Estimated annual averages recorded in this report are arithmetic averages of the unrounded estimates from each of the three years. The reported annual averages are rounded to the nearest 100 for fires, nearest 10 for deaths and injuries, and nearest \$0.1 million for property losses.

## **Other Issues**

### *Child Play*

When a fire is caused by the act of a child (under 10 years of age) playing with a source of heat, the cause of fire is considered “Child Play.”

In version 4.1 of NFIRS data, the variable “Ignition Factor” had specific codes to indicate the cause of the fire. The codes allowed for the identification of “Child Play” fire losses, which were associated with matches and lighters. In version 5.0, there is no one variable reserved to identify “Child Play” cases. A combination of variables, such as “Factors Contributing to Ignition,” “Human Factors Contributing to Ignition,” and “Age” (of fire starter when age was considered a factor contributing to ignition of fire) provides the means to identify these scenarios. However, for data that are reported in version 5.0, fire departments are not required to fill in these three variable fields. Consequently, much of the data are missing, and because these extra variables used to identify child play are not included in the raking procedure, estimates of “Child Play” fires (which were presented in pre-1999 years) have become unreliable for post-1998 years. However, for cases where these variables are not missing and are coded in a way that indicates child play, the “Cause of Ignition” variable is classified “unintentional.” This ensures that the fire and any associated losses will be counted and not excluded as an intentional fire.

### *Trend in Estimates*

From 1999 to 2004, the proportion of the NFIRS residential structure fire records that were originally coded in 5.0 increased rapidly (from 5 percent in 1999, to 89 percent in 2004). Because fires only can be coded as confined fires in 5.0, this rapid increase also meant a rapid increase in the proportion of the data that were confined fires (from 2 percent in 1999, to 41 percent in 2004). If the proportion of confined fires reported to NFPA did not increase likewise during this period, then this would have a downward effect on the fire estimates for nonconfined fire products. Without knowing whether fires reported to NFPA were confined or nonconfined, looking at specific product fire estimates from 1999 to 2004, suggested that this downward effect was occurring. Because we do not know the change in the proportion of confined fires in the NFPA survey, we cannot be sure that this is indeed what was causing this decrease in fire estimates for specific products.

By 2005, 94 percent of the NFIRS residential structure fire records were originally coded in 5.0. As a result, the proportion of NFIRS structure fires that are confined fires did not increase much from 2005 to 2008 (42 percent to 46 percent). This small increase should have little effect on the fire estimates for specific products. There does not appear to be a clear, overall downward trend in the fire estimates. Now that the proportion of NFIRS residential structure fires that were originally coded in 5.0 has stabilized, the product-specific fire estimates have as well. This is more evidence in support of the hypothesis that the quickly increasing proportion of 5.0 cases from 1999 to 2004 may have had a downward effect on product-specific fire estimates.