



# **2003 - 2005 Residential Fire Loss Estimates\***

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

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August 2008

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\* 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 2003 through 2005 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:

- 374,700 fires, 2,740 deaths, 13,120 injuries, and \$5.31 billion in property loss in 2003
- 386,100 fires, 2,850 deaths, 13,330 injuries, and \$5.31 billion in property loss in 2004
- 375,100 fires, 2,630 deaths, 12,820 injuries, and \$6.22 billion in property loss in 2005
- An estimated annual average of 378,700 fires, 2,740 deaths, 13,090 injuries, and \$5.61 billion in property loss over the three year period 2003-2005.

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. Since the fire losses are derived separately for sources of ignition and materials first ignited, estimates presented in this report overlap in some cases.

For each year from 2003 through 2005, the relative ranking of the greatest contributors to fire loss has remained unchanged. For example, Tables 1a-1d show that:

- Cooking equipment accounted for the largest percentage of fires. An estimated annual average of 137,400 cooking equipment-related fires during 2003-2005 accounted for 36.3% of total residential fires for the same period. The corresponding death estimates averaged around 230 which is 8.4% of total deaths annually. The annual average number of injuries for 2003-2005 was estimated to be 3,510 which is 26.8% of the total estimated annual average number of injuries for the same time period. Most of the cooking equipment 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 57,300 fires for 2003-2005 was 15.1% of the annual average estimate of total residential fires during the same period. The death estimates averaged around 270 which is 10.0% of total deaths annually. The corresponding injuries for the three years averaged to an annual estimate of 1,040 injuries. This accounts for 8.0% of the annual average estimate of total injuries during 2003-2005.
- During 2003-2005, an estimated annual average of 13,700 fires was attributable to electrical distribution system components (e.g., installed wiring, lighting, etc.). This corresponds to 3.6% of the estimated annual average of total residential fires for the same time period. The death estimates averaged around 5.6% of total deaths while the injury estimates averaged around 3.8% of total injuries annually.
- By item first ignited, upholstered furniture ignition was involved in the greatest number of deaths. From 2003 through 2005, an estimated annual average of 560 deaths was associated with these fires. This constitutes 20.5% of the estimated annual average of total deaths associated with residential structure fires for the same period. On average, during 2003-2005, mattress or bedding ignitions accounted for 12.9% of the total deaths annually.

- By heat source, smoking materials were the largest contributor to deaths, associated with an annual average of 650 deaths from 2003-2005. This accounts for 23.9% of the estimated annual average of total residential fire deaths. The estimated annual average number of deaths from candle fires constituted around 6.3% of total deaths during 2003-2005. Death estimates from lighter fires averaged around 2.4% of total deaths annually, while, on average, matches were responsible for 1.2% of total deaths annually over the three years.

Beginning with 1999 and including the period covered in this report, the NFIRS system underwent some major changes. As such, the 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. This report presents annual estimates and estimates averaged across three consecutive years because of the year-to-year variability.

## 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 completed by U.S. fire departments that are sent to the USFA. These reports come from the states and the District of Columbia. However, 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.

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 the product categories in the tables, with the exception of smoking materials, contain products within the jurisdiction of the CPSC. Intentionally set fires, which include the deliberate misuses of heat sources or fires of an incendiary nature, are excluded from the estimates.

The fires and fire losses 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. For convenience, they are referred to as "property loss" only in this report. Fire departments provide a rough estimate for this figure. As such, these property loss estimates are based on crude estimates themselves and the significance of variations in these estimates is ambiguous.

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 estimates for cigarettes (by heat source) and 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.

The estimates for 2002 through 2004 were published in the July 2007 Residential Fire Loss Estimates report<sup>2</sup>. The estimates for 2003 and 2004 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.

The CPSC staff has been producing estimates of unintentional 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 the CPSC analysts produce the product specific estimates. A discussion of some of these changes follows.

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<sup>1</sup> M.J. Karter, "Fire Loss in the U.S. During 2003", National Fire Protection Association (NFPA), October 2004; M.J. Karter, "Fire Loss in the U.S. During 2004", NFPA, September 2005; M.J. Karter, "Fire Loss in the U.S. During 2005", NFPA, July 2006.

<sup>2</sup> R. Chowdhury, M. Greene, D. Miller, "2002-2004 residential Fire Loss Estimates", U.S. Consumer Product Safety Commission, July 2007.

Beginning with 1999 data, a major revision to the NFIRS data coding system, designated version 5.0, was implemented. In 1999, 5% of the residential fire data was coded by fire departments in the new NFIRS version 5.0; in 2000, 20% was coded in version 5.0. The proportion increased to 50% in 2001, 70% in 2002, 80% in 2003, 89% in 2004, and to 94% in 2005. However, from 1999 onwards, the NFIRS data received from the USFA is entirely in version 5.0 format. In order to produce a dataset entirely in version 5.0 format, where some of the source data was originally coded in version 4.1, data elements were converted. The conversion was done completely by computer programs. However, 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 is not the same as data originally coded in version 5.0.

As mentioned above, in 2005, over 94% of the data was originally coded in version 5.0. Given this large proportion of version 5.0 data, CPSC analysts produced the 2005 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 2005 NFPA estimates for total U.S. fire losses to arrive at the 2005 product-specific estimates presented in this report. Since the proportion of version 5.0 data in NFIRS is expected to increase further in future years, only version 5.0 data will be used from now onwards.

Beginning with version 5.0, NFIRS has 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 onwards, as the use of version 5.0 increased, an increasingly larger number of confined fires were reported. In 1999, about 2% of residential fires were reported as confined; by 2005, over 42% of fires reported to NFIRS were confined fires.

Some apparent decreases in estimates, for example in the detail lines in the tables showing fire losses for ranges and chimneys, are related to the increase in the reported confined fires. Because it is not required information, in most confined fire cases it is not possible 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 and by the power source. However, since ranges undoubtedly are involved in 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 actually range fires. A similar problem affects fires involving chimneys.

Identification of child play fires in NFIRS 5.0 requires the combination of several variables (such as factors contributing to ignition, human factors contributing to ignition, and age of the fire starter; see Methodology section for detailed discussion) which often remain unreported in the data system. As a result, estimates for child play are considered to be unreliable and are no longer reported. More detail on these and other issues is included in the Methodology section.

The changes cited above and the gradual implementation of these changes in the NFIRS data system has affected the estimates since 1999 considerably. The CPSC staff strongly discourages any comparison of post 1998 estimates with estimates from earlier years.

**TABLE 1a**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**  
**SELECTED EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>374,700</b>	<b>386,100</b>	<b>375,100</b>	<b>378,700</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>58,000</b>	<b>57,900</b>	<b>56,100</b>	<b>57,300</b>
Local Fixed Heater	4,200	4,200	5,000	4,500
Portable Heater	2,400	1,900	1,500	1,900
Central Heating	2,700	2,000	1,200	1,900
Fireplace, Chimney, Chimney Connector <sup>1</sup>	25,600	25,200	24,500	25,100
Water Heater	3,500	2,800	2,600	3,000
Air Conditioning	1,500	1,100	1,100	1,200
Other <sup>1</sup>	18,000	20,700	20,300	19,700
<b>Total Cooking Equipment<sup>1</sup></b>	<b>132,800</b>	<b>141,900</b>	<b>137,500</b>	<b>137,400</b>
Range / Oven	30,400	23,300	13,400	22,400
<i>Gas</i>	7,400	4,800	2,400	4,900
<i>Electric</i>	22,400	18,000	10,900	17,100
<i>Other</i>	600	500	*	400
All Other Cooking	7,900	7,500	4,800	6,700
<i>Gas</i>	1,200	1,200	900	1,100
<i>Electric</i>	6,000	5,700	3,800	5,200
<i>Other</i>	600	600	200	500
<b>Total Electrical Distribution</b>	<b>17,800</b>	<b>13,600</b>	<b>9,700</b>	<b>13,700</b>
Installed Wiring	6,400	4,700	3,500	4,900
Cord, Plug	3,000	2,100	1,100	2,000
Receptacle, Switch	1,900	1,500	1,000	1,400
Lighting	3,700	3,000	2,300	3,000
Other	2,800	2,400	1,800	2,300
<b>Other Selected Equipment</b>	<b>11,800</b>	<b>10,300</b>	<b>9,200</b>	<b>10,500</b>
Audio / Visual Equipment	800	700	600	700
Clothes Dryer	7,600	6,800	6,300	6,900
Washing Machine	500	400	300	400
Torch	1,700	1,200	700	1,200
Refrigerator / Freezer	600	600	700	600
Shop / Garden Tool	700	700	700	700

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 fires identifiable as intentionally set.

<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. See Table 7a on pg 31 for details.

**TABLE 1b**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**  
**SELECTED EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>2,740</b>	<b>2,850</b>	<b>2,630</b>	<b>2,740</b>
<b>Total Heating and Cooling Equipment</b>	<b>250</b>	<b>290</b>	<b>280</b>	<b>270</b>
Local Fixed Heater	110	90	130	110
Portable Heater	40	130	30	70
Central Heating	10	10	30	10
Fireplace, Chimney, Chimney Connector	50	20	20	30
Water Heater	20	10	30	20
Air Conditioning	10	*	*	10
Other <sup>1</sup>	10	30	50	30
<b>Total Cooking Equipment<sup>1</sup></b>	<b>240</b>	<b>240</b>	<b>210</b>	<b>230</b>
Range / Oven	170	190	160	180
<i>Gas</i>	70	90	30	60
<i>Electric</i>	100	90	130	110
<i>Other</i>	*	10	*	*
All Other Cooking	60	40	30	40
<i>Gas</i>	10	10	*	10
<i>Electric</i>	40	30	30	30
<i>Other</i>	10	*	*	*
<b>Total Electrical Distribution</b>	<b>130</b>	<b>140</b>	<b>200</b>	<b>150</b>
Installed Wiring	50 <sup>2</sup>	40 <sup>2</sup>	50	50
Cord, Plug	40	70	90	60
Receptacle, Switch	10 <sup>2</sup>	10 <sup>2</sup>	10	10
Lighting	20	10	20	20
Other	*	10	30	10
<b>Other Selected Equipment</b>	<b>10</b>	<b>30</b>	<b>10</b>	<b>20</b>
Audio / Visual Equipment	10	10	*	10
Clothes Dryer	*	*	*	*
Washing Machine	*	*	*	*
Torch	*	*	*	*
Refrigerator / Freezer	*	*	10	*
Shop / Garden Tool	*	10	*	*

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<sup>1</sup> Includes an estimated 10 deaths in both 2003 and 2004, and an estimated 20 deaths in 2005 from confined cooking fires.

<sup>2</sup> Deaths from installed wiring and receptacle/switch were allocated in the same proportion as the fires. See discussion in Methodology section for details.

**TABLE 1c**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**  
**SELECTED EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>13,120</b>	<b>13,330</b>	<b>12,820</b>	<b>13,090</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>1,090</b>	<b>950</b>	<b>1,100</b>	<b>1,040</b>
Local Fixed Heater	220	220	330	260
Portable Heater	250	180	140	190
Central Heating	80	60	60	70
Fireplace, Chimney, Chimney Connector <sup>1</sup>	80	90	110	90
Water Heater	190	140	160	160
Air Conditioning	40	50	60	50
Other <sup>1</sup>	220	210	240	220
<b>Total Cooking Equipment<sup>1</sup></b>	<b>3,590</b>	<b>3,680</b>	<b>3,250</b>	<b>3,510</b>
Range / Oven	1,990	1,890	1,410	1,760
<i>Gas</i>	290	310	130	240
<i>Electric</i>	1,680	1,540	1,270	1,500
<i>Other</i>	20	40	20	30
All Other Cooking	450	450	340	410
<i>Gas</i>	80	90	90	90
<i>Electric</i>	320	320	220	290
<i>Other</i>	40	40	30	40
<b>Total Electrical Distribution</b>	<b>530</b>	<b>480</b>	<b>500</b>	<b>500</b>
Installed Wiring	160 <sup>2</sup>	130 <sup>2</sup>	110	130
Cord, Plug	150	80	150	130
Receptacle, Switch	50 <sup>2</sup>	40 <sup>2</sup>	50	50
Lighting	130	150	120	130
Other	40	80	70	60
<b>Other Selected Equipment</b>	<b>380</b>	<b>390</b>	<b>360</b>	<b>380</b>
Audio / Visual Equipment	40	40	60	50
Clothes Dryer	190	190	200	200
Washing Machine	10	10	*	10
Torch	70	50	20	50
Refrigerator / Freezer	20	30	40	30
Shop / Garden Tool	40	60	40	50

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<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 7b on pg 32 for details.

<sup>2</sup> Injuries from installed wiring and receptacle/switch were allocated in the same proportion as the fires. See discussion in Methodology section for details.



**TABLE 1d**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)**  
**SELECTED EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>\$5,311.5</b>	<b>\$5,308.3</b>	<b>\$6,215.6</b>	<b>\$5,611.8</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>\$543.3</b>	<b>\$490.8</b>	<b>\$558.3</b>	<b>\$530.8</b>
Local Fixed Heater	\$93.8	\$75.0	\$131.0	\$99.9
Portable Heater	\$75.6	\$60.7	\$75.9	\$70.7
Central Heating	\$54.9	\$50.2	\$29.9	\$45.0
Fireplace, Chimney, Chimney Connector <sup>1</sup>	\$142.9	\$120.2	\$115.2	\$126.1
Water Heater	\$59.8	\$53.9	\$65.4	\$59.7
Air Conditioning	\$22.7	\$37.5	\$28.8	\$29.7
Other <sup>1</sup>	\$93.7	\$93.3	\$112.0	\$99.7
<b>Total Cooking Equipment<sup>1</sup></b>	<b>\$449.2</b>	<b>\$400.5</b>	<b>\$412.7</b>	<b>\$420.8</b>
Range / Oven	\$287.0	\$245.0	\$222.0	\$251.3
<i>Gas</i>	\$43.9	\$31.3	\$26.2	\$33.8
<i>Electric</i>	\$239.3	\$211.1	\$195.5	\$215.3
<i>Other</i>	\$3.7	\$2.7	\$0.2	\$2.2
All Other Cooking	\$136.1	\$132.4	\$157.3	\$141.9
<i>Gas</i>	\$38.8	\$17.4	\$62.2	\$39.4
<i>Electric</i>	\$86.1	\$103.1	\$90.3	\$93.2
<i>Other</i>	\$11.3	\$11.9	\$4.8	\$9.3
<b>Total Electrical Distribution</b>	<b>\$503.8</b>	<b>\$354.4</b>	<b>\$361.3</b>	<b>\$406.5</b>
Installed Wiring	\$204.4	\$126.9	\$121.6	\$151.0
Cord, Plug	\$101.6	\$58.3	\$49.4	\$69.7
Receptacle, Switch	\$35.0	\$35.4	\$31.9	\$34.1
Lighting	\$72.5	\$70.6	\$81.8	\$75.0
Other	\$90.3	\$63.2	\$76.6	\$76.7
<b>Other Selected Equipment</b>	<b>\$244.9</b>	<b>\$160.0</b>	<b>\$177.4</b>	<b>\$194.1</b>
Audio / Visual Equipment	\$22.2	\$16.9	\$13.3	\$17.5
Clothes Dryer	\$107.3	\$60.8	\$89.2	\$85.8
Washing Machine	\$2.1	\$2.2	\$0.9	\$1.8
Torch	\$69.4	\$47.1	\$35.3	\$50.6
Refrigerator / Freezer	\$18.3	\$9.9	\$20.1	\$16.1
Shop / Garden Tool	\$25.8	\$23.0	\$19.0	\$22.6

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<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 7c on pg 32 for details.

**TABLE 2a**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**  
**SELECTED PRODUCTS, 2003 – 2005**

<b>Product</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>374,700</b>	<b>386,100</b>	<b>375,100</b>	<b>378,700</b>
<b>By Heat Source</b>				
<b>Cigarette, Other Tobacco Products</b>	<b>13,600</b>	<b>12,700</b>	<b>10,700</b>	<b>12,300</b>
<b>Match</b>	<b>1,900</b>	<b>1,600</b>	<b>1,200</b>	<b>1,600</b>
<b>Lighter</b>	<b>3,100</b>	<b>2,700</b>	<b>2,000</b>	<b>2,600</b>
<b>Candle</b>	<b>13,700</b>	<b>13,400</b>	<b>12,100</b>	<b>13,000</b>
<b>By Item First Ignited</b>				
<b>Upholstered Furniture</b>	<b>7,500</b>	<b>7,200</b>	<b>6,700</b>	<b>7,100</b>
Smoking Material Ignition	2,500	2,400	1,800	2,200
Open Flame Ignition	1,200	1,200	1,100	1,100
Other	3,800	3,700	3,800	3,800
<b>Mattress, Bedding</b>	<b>12,200</b>	<b>11,700</b>	<b>10,200</b>	<b>11,300</b>
Smoking Material Ignition	2,700	2,600	2,100	2,500
Open Flame Ignition	3,600	3,300	2,600	3,200
Other	5,900	5,800	5,600	5,700
<b>Other Materials</b>				
Cooking Materials <sup>1</sup>	130,300	142,400	142,300	138,300
Electric Cable Insulation	18,900	18,400	16,500	17,900
Interior Wall Covering	10,800	9,700	7,900	9,500
Wearing Apparel-Worn	400	300	300	300
Wearing Apparel-Not Worn	8,100	7,200	6,400	7,200
Floor Covering	5,200	4,900	4,700	4,900
Curtains, Drapes	2,700	2,400	2,200	2,400
Magazines, Newspaper	2,500	2,500	2,500	2,500
Thermal Insulation	5,800	6,200	6,200	6,100
Cabinet, Desk	6,300	6,000	5,200	5,800
Trash, Rubbish <sup>1</sup>	20,300	20,600	21,700	20,800
Toy, Game	300	300	200	300
Box, Carton, Bag, Basket, Barrel	2,900	3,100	2,700	2,900

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

Note: Fire estimates are rounded to the nearest 100. Subtotals do not necessarily add up to heading totals. Estimates exclude losses from fires identifiable as intentionally set.

<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 7a on pg 31 for details.

**TABLE 2b**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**  
**SELECTED PRODUCTS, 2003 – 2005**

Product	2003	2004	2005	2003-2005 Average
<b>Total Residential<sup>1</sup></b>	<b>2,740</b>	<b>2,850</b>	<b>2,630</b>	<b>2,740</b>
<b>By Heat Source</b>				
<b>Cigarette, Other Tobacco Products</b>	<b>650</b>	<b>660</b>	<b>650</b>	<b>650</b>
<b>Match</b>	<b>50</b>	<b>20</b>	<b>20</b>	<b>30</b>
<b>Lighter</b>	<b>80</b>	<b>30</b>	<b>90</b>	<b>70</b>
<b>Candle</b>	<b>200</b>	<b>150</b>	<b>170</b>	<b>170</b>
<b>By Item First Ignited</b>				
<b>Upholstered Furniture</b>	<b>560</b>	<b>610</b>	<b>520</b>	<b>560</b>
Smoking Material Ignition	310	320	290	310
Open Flame Ignition	20	40	60	40
Other	220	240	170	210
<b>Mattress, Bedding</b>	<b>380</b>	<b>300</b>	<b>370</b>	<b>350</b>
Smoking Material Ignition	170	160	160	170
Open Flame Ignition	100	30	50	60
Other	110	110	160	130
<b>Other Materials</b>				
Cooking Materials <sup>1</sup>	90	210	130	140
Electric Cable Insulation	60	140	90	100
Interior Wall Covering	200	180	120	170
Wearing Apparel-Worn	100	90	90	90
Wearing Apparel-Not Worn	50	20	70	40
Floor Covering	130	110	110	120
Curtains, Drapes	30	10	40	30
Magazines, Newspaper	50	30	50	40
Thermal Insulation	10	20	10	20
Cabinet, Desk	60	70	60	60
Trash, Rubbish	30	60	50	50
Toy, Game	*	*	*	*
Box, Carton, Bag, Basket, Barrel	*	30	*	10

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<sup>1</sup> Includes an estimated 10 deaths in both 2003 and 2004, and an estimated 20 deaths in 2005 from confined cooking fires. Estimates for confined cooking fire deaths are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited.

**TABLE 2c**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**  
**SELECTED PRODUCTS, 2003 – 2005**

<b>Product</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>13,120</b>	<b>13,330</b>	<b>12,820</b>	<b>13,090</b>
<b>By Heat Source</b>				
<b>Cigarette, Other Tobacco Products</b>	<b>1,220</b>	<b>1,210</b>	<b>1,100</b>	<b>1,180</b>
<b>Match</b>	<b>200</b>	<b>170</b>	<b>110</b>	<b>160</b>
<b>Lighter</b>	<b>590</b>	<b>560</b>	<b>360</b>	<b>500</b>
<b>Candle</b>	<b>1,280</b>	<b>1,240</b>	<b>1,070</b>	<b>1,200</b>
<b>By Item First Ignited</b>				
<b>Upholstered Furniture</b>	<b>890</b>	<b>800</b>	<b>880</b>	<b>850</b>
Smoking Material Ignition	360	300	330	330
Open Flame Ignition	180	170	180	180
Other	340	330	380	350
<b>Mattress, Bedding</b>	<b>1,470</b>	<b>1,450</b>	<b>1,240</b>	<b>1,390</b>
Smoking Material Ignition	380	420	340	380
Open Flame Ignition	620	590	350	520
Other	470	450	540	490
<b>Other Materials</b>				
Cooking Materials <sup>1</sup>	3,680	4,010	3,780	3,830
Electric Cable Insulation	400	380	410	400
Interior Wall Covering	410	410	280	370
Wearing Apparel-Worn	90	130	100	110
Wearing Apparel-Not Worn	450	300	410	390
Floor Covering	250	340	320	300
Curtains, Drapes	260	180	140	190
Magazines, Newspaper	160	190	160	170
Thermal Insulation	90	110	80	90
Cabinet, Desk	330	370	350	350
Trash, Rubbish <sup>1</sup>	290	220	280	260
Toy, Game	30	20	10	20
Box, Carton, Bag, Basket, Barrel	160	130	110	130

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

Note: Injury estimates are rounded to the nearest 10. Subtotals do not necessarily add to heading totals. Estimates exclude losses from fires identifiable as intentionally set.

<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 7b on pg 32 for details.

**TABLE 2d**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)**  
**SELECTED PRODUCTS, 2003 – 2005**

Product	2003	2004	2005	2003-2005 Average <sup>†</sup>
<b>Total Residential<sup>1</sup></b>	\$5,311.5	\$5,308.3	\$6,215.6	\$5,611.8
<b>By Heat Source</b>				
<b>Cigarette, Other Tobacco Products</b>	\$353.2	\$319.4	\$357.7	\$343.4
<b>Match</b>	\$46.3	\$36.9	\$40.1	\$41.1
<b>Lighter</b>	\$85.4	\$86.2	\$76.7	\$82.8
<b>Candle</b>	\$352.9	\$390.3	\$428.4	\$390.5
<b>By Item First Ignited</b>				
<b>Upholstered Furniture</b>	\$246.6	\$250.2	\$312.2	\$269.6
Smoking Material Ignition	\$67.8	\$78.1	\$81.9	\$75.9
Open Flame Ignition	\$42.8	\$51.6	\$66.3	\$53.5
Other	\$136.0	\$120.5	\$164.0	\$140.2
<b>Mattress, Bedding</b>	\$360.8	\$329.3	\$348.6	\$346.2
Smoking Material Ignition	\$74.2	\$76.6	\$56.9	\$69.2
Open Flame Ignition	\$135.8	\$100.4	\$109.1	\$115.1
Other	\$150.9	\$152.3	\$182.6	\$161.9
<b>Other Materials</b>				
Cooking Materials <sup>1</sup>	\$391.3	\$362.7	\$406.3	\$386.8
Electric Cable Insulation	\$321.9	\$373.8	\$373.3	\$356.3
Interior Wall Covering	\$313.9	\$297.2	\$257.0	\$289.4
Wearing Apparel-Worn	\$6.0	\$4.5	\$6.8	\$5.8
Wearing Apparel-Not Worn	\$133.5	\$107.8	\$149.5	\$130.3
Floor Covering	\$139.9	\$137.9	\$138.4	\$138.7
Curtains, Drapes	\$52.7	\$74.3	\$78.4	\$68.5
Magazines, Newspaper	\$59.3	\$56.6	\$77.9	\$64.6
Thermal Insulation	\$117.1	\$116.4	\$177.6	\$137.0
Cabinet, Desk	\$158.7	\$146.3	\$150.5	\$151.8
Trash, Rubbish <sup>1</sup>	\$98.4	\$94.8	\$132.3	\$108.5
Toy, Game	\$5.1	\$5.8	\$7.1	\$6.0
Box, Carton, Bag, Basket, Barrel	\$74.8	\$117.0	\$113.6	\$101.8

Source: U. S. Consumer Product Safety Commission/EPHA, from data obtained from the U. S. Fire Administration 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 losses from fires identifiable as intentionally set.

<sup>†</sup> Data in this column only has been amended since earlier published report of July 2008.

<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 7c on pg 32 for details.

**TABLE 3a**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**  
**HEATING AND COOLING EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>374,700</b>	<b>386,100</b>	<b>375,100</b>	<b>378,700</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>58,000</b>	<b>57,900</b>	<b>56,100</b>	<b>57,300</b>
<b>Solid Fuel</b>	<b>4,800</b>	<b>3,800</b>	<b>2,400</b>	<b>3,700</b>
Fixed Heater	800	800	700	800
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	3,800	2,900	1,600	2,800
Central Heating	100	*	*	*
Water Heater	*	*	*	*
Other	*	100	*	*
<b>Gas-Fired</b>	<b>5,400</b>	<b>4,300</b>	<b>4,500</b>	<b>4,700</b>
Fixed Heater	1,100	1,100	1,400	1,200
Portable Heater	300	200	200	200
Fireplace, Chimney, Chimney Connector	300	200	200	200
Central Heating	1,100	700	600	800
Water Heater	2,300	1,700	1,700	1,900
Fixed, Central Air Conditioning	*	*	*	*
Other	300	300	300	300
<b>Electric</b>	<b>10,900</b>	<b>9,400</b>	<b>9,500</b>	<b>9,900</b>
Fixed Heater	2,100	2,100	2,700	2,300
Portable Heater	1,600	1,200	1,000	1,300
Central Heating	1,200	800	400	800
Water Heater	1,100	1,000	900	1,000
Fixed, Central Air Conditioning	1,000	700	700	800
Portable Air Conditioner	500	300	400	400
Other	3,400	3,200	3,500	3,400
<b>Liquid Fuel</b>	<b>1,400</b>	<b>1,200</b>	<b>800</b>	<b>1,100</b>
Fixed Heater	200	100	200	200
Portable Heater	500	400	400	400
Fireplace, Chimney, Chimney Connector	100	100	*	100
Central Heating	400	400	200	300
Water Heater	100	*	*	*
Other	100	100	100	100
<b>All Other Fuel</b>	<b>200</b>	<b>300</b>	<b>100</b>	<b>200</b>

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 fires identifiable as intentionally set.

<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 7a on pg 31 for details.

**TABLE 3b**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**  
**HEATING AND COOLING EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>2,740</b>	<b>2,850</b>	<b>2,630</b>	<b>2,740</b>
<b>Total Heating and Cooling Equipment</b>	<b>250</b>	<b>290</b>	<b>280</b>	<b>270</b>
<b>Solid Fuel</b>	<b>80</b>	<b>80</b>	<b>120</b>	<b>90</b>
Fixed Heater	30	50	90	60
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	50	20	20	30
Central Heating	*	*	10	10
Water Heater	*	*	*	*
Other	*	*	*	*
<b>Gas-Fired</b>	<b>70</b>	<b>50</b>	<b>80</b>	<b>70</b>
Fixed Heater	50	10	20	30
Portable Heater	*	30	*	10
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	*	*	10	10
Water Heater	20	*	30	20
Fixed, Central Air Conditioning	*	*	*	*
Other	*	*	20	10
<b>Electric</b>	<b>80</b>	<b>120</b>	<b>60</b>	<b>90</b>
Fixed Heater	30	20	10	20
Portable Heater	30	70	30	40
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Portable Air Conditioner	10	*	*	*
Other	10	30	30	20
<b>Liquid Fuel</b>	<b>20</b>	<b>40</b>	<b>20</b>	<b>20</b>
Fixed Heater	*	*	10	*
Portable Heater	10	40	10	20
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	10	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
<b>All Other Fuel</b>	<b>*</b>	<b>*</b>	<b>*</b>	<b>*</b>

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<sup>1</sup> Includes an estimated 10 deaths in both 2003 and 2004, and an estimated 20 deaths in 2005 from confined cooking fires.

**TABLE 3c**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**  
**HEATING AND COOLING EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>13,120</b>	<b>13,330</b>	<b>12,820</b>	<b>13,090</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>1,090</b>	<b>950</b>	<b>1,100</b>	<b>1,040</b>
<b>Solid Fuel</b>	<b>80</b>	<b>80</b>	<b>100</b>	<b>90</b>
Fixed Heater	20	30	40	30
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	50	50	60	60
Central Heating	10	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
<b>Gas-Fired</b>	<b>290</b>	<b>260</b>	<b>280</b>	<b>280</b>
Fixed Heater	50	50	50	50
Portable Heater	10	20	20	10
Fireplace, Chimney, Chimney Connector	*	10	10	10
Central Heating	60	50	40	50
Water Heater	160	120	140	140
Fixed, Central Air Conditioning	*	*	*	*
Other	10	10	10	10
<b>Electric</b>	<b>460</b>	<b>420</b>	<b>530</b>	<b>470</b>
Fixed Heater	140	120	220	160
Portable Heater	120	140	80	110
Central Heating	10	10	20	10
Water Heater	10	10	20	10
Fixed, Central Air Conditioning	20	20	30	20
Portable Air Conditioner	20	30	20	20
Other	130	90	140	120
<b>Liquid Fuel</b>	<b>160</b>	<b>40</b>	<b>60</b>	<b>90</b>
Fixed Heater	*	*	*	*
Portable Heater	120	30	40	60
Fireplace, Chimney, Chimney Connector	*	*	10	*
Central Heating	*	*	*	*
Water Heater	10	*	*	10
Other	20	10	*	10
<b>All Other Fuel</b>	<b>*</b>	<b>10</b>	<b>10</b>	<b>10</b>

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<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 7b on pg 32 for details.



**TABLE 3d**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)**  
**HEATING AND COOLING EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>\$5,311.5</b>	<b>\$5,308.3</b>	<b>\$6,215.6</b>	<b>\$5,611.8</b>
<b>Total Heating and Cooling Equipment<sup>1</sup></b>	<b>\$543.3</b>	<b>\$490.8</b>	<b>\$558.3</b>	<b>\$530.8</b>
<b>Solid Fuel</b>	<b>\$143.9</b>	<b>\$112.0</b>	<b>\$125.3</b>	<b>\$127.1</b>
Fixed Heater	\$21.6	\$18.8	\$35.2	\$25.2
Portable Heater	\$0.6	\$0.8	*	\$0.5
Fireplace, Chimney, Chimney Connector	\$120.4	\$85.8	\$87.1	\$97.8
Central Heating	\$0.8	\$5.7	\$3.0	\$3.2
Water Heater	\$0.2	\$0.3	*	\$0.2
Other	\$0.4	\$0.6	*	\$0.3
<b>Gas-Fired</b>	<b>\$119.1</b>	<b>\$109.0</b>	<b>\$148.9</b>	<b>\$125.7</b>
Fixed Heater	\$20.1	\$17.4	\$40.5	\$26.0
Portable Heater	\$8.4	\$7.2	\$23.0	\$12.9
Fireplace, Chimney, Chimney Connector	\$4.9	\$16.6	\$8.8	\$10.1
Central Heating	\$23.2	\$15.8	\$16.7	\$18.6
Water Heater	\$49.6	\$46.5	\$50.1	\$48.7
Fixed, Central Air Conditioning	\$0.2	*	\$0.4	\$0.2
Other	\$12.7	\$5.6	\$9.3	\$9.2
<b>Electric</b>	<b>\$216.5</b>	<b>\$197.8</b>	<b>\$236.6</b>	<b>\$216.9</b>
Fixed Heater	\$44.6	\$34.1	\$49.2	\$42.6
Portable Heater	\$50.6	\$36.3	\$40.7	\$42.6
Central Heating	\$17.2	\$8.5	\$8.1	\$11.2
Water Heater	\$9.3	\$6.3	\$15.2	\$10.3
Fixed, Central Air Conditioning	\$11.4	\$30.8	\$20.3	\$20.9
Portable Air Conditioner	\$11.0	\$6.6	\$8.0	\$8.6
Other	\$72.3	\$75.2	\$95.0	\$80.8
<b>Liquid Fuel</b>	<b>\$34.1</b>	<b>\$52.8</b>	<b>\$20.9</b>	<b>\$36.0</b>
Fixed Heater	\$4.2	\$4.7	\$5.4	\$4.8
Portable Heater	\$15.6	\$16.3	\$12.2	\$14.7
Fireplace, Chimney, Chimney Connector	\$3.3	\$3.1	*	\$2.2
Central Heating	\$6.5	\$20.3	\$2.1	\$9.6
Water Heater	\$0.7	\$0.8	\$0.1	\$0.5
Other	\$3.8	\$7.6	\$1.1	\$4.1
<b>All Other Fuel</b>	<b>\$12.1</b>	<b>\$4.2</b>	<b>\$2.8</b>	<b>\$6.4</b>

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<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 7c on pg 32 for details.

**TABLE 4a**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**  
**SELECTED ELECTRICAL EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>374,700</b>	<b>386,100</b>	<b>375,100</b>	<b>378,700</b>
<b>Total Electrical</b>	<b>69,600</b>	<b>57,700</b>	<b>43,700</b>	<b>57,000</b>
<b>Electric Heating and Cooling</b>	<b>10,900</b>	<b>9,400</b>	<b>9,500</b>	<b>9,900</b>
Central Heating	1,200	800	400	800
Local Fixed Heater	2,100	2,100	2,700	2,300
Portable Heater	1,600	1,200	1,000	1,300
Water Heater	1,100	1,000	900	1,000
Fixed, Central Air Conditioning	1,000	700	700	800
Portable Air Conditioner	500	300	400	400
Other	3,400	3,200	3,500	3,400
<b>Electric Cooking Equipment</b>	<b>28,400</b>	<b>23,600</b>	<b>14,700</b>	<b>22,300</b>
Range / Oven	22,400	18,000	10,900	17,100
Range / Oven Hood	400	300	200	300
Deep Fat Fryer	100	100	*	100
Grill	*	*	*	*
Small Heat-Producing Appliance	1,300	1,000	800	1,100
Other	4,200	4,200	2,700	3,700
<b>Electrical Distribution</b>	<b>17,800</b>	<b>13,600</b>	<b>9,700</b>	<b>13,700</b>
Installed Wiring	6,400	4,700	3,500	4,900
Light Fixture	2,200	1,800	1,400	1,800
Receptacle, Switch	1,900	1,500	1,000	1,400
Cord, Plug	3,000	2,100	1,100	2,000
Lamp, Light Bulb	1,500	1,200	900	1,200
Panel Board	900	800	500	700
Meter	400	300	200	300
Transformer	100	100	100	100
Other	1,400	1,200	900	1,100
<b>Other Selected Electrical Appliances</b>	<b>8,400</b>	<b>7,300</b>	<b>6,500</b>	<b>7,400</b>
Clothes Dryer	6,000	5,300	4,600	5,300
Audio / Visual Equipment	800	700	600	700
Washing Machine	500	400	300	400
Refrigerator / Freezer	600	600	600	600
Shop / Garden Tools	300	300	200	300
Torch	200	100	100	100

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 fires identifiable as intentionally set.

<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 7a on pg 31 for details.

**TABLE 4b**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**  
**SELECTED ELECTRICAL EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>2,740</b>	<b>2,850</b>	<b>2,630</b>	<b>2,740</b>
<b>Total Electrical</b>	<b>390</b>	<b>490</b>	<b>450</b>	<b>440</b>
<b>Electric Heating and Cooling</b>	<b>80</b>	<b>120</b>	<b>60</b>	<b>90</b>
Central Heating	*	*	*	*
Local Fixed Heater	30	20	10	20
Portable Heater	30	70	30	40
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Portable Air Conditioner	10	*	*	*
Other	10	30	30	20
<b>Electric Cooking Equipment</b>	<b>140</b>	<b>120</b>	<b>160</b>	<b>140</b>
Range / Oven	100	90	130	110
Range / Oven Hood	*	*	*	*
Deep Fat Fryer	*	*	*	*
Grill	*	*	*	*
Small Heat-Producing Appliance	10	*	*	10
Other	30	20	30	20
<b>Electrical Distribution</b>	<b>130</b>	<b>140</b>	<b>200</b>	<b>150</b>
Installed Wiring	50 <sup>2</sup>	40 <sup>2</sup>	50	50
Light Fixture	10	*	10	*
Receptacle, Switch	10 <sup>2</sup>	10 <sup>2</sup>	10	10
Cord, Plug	40	70	90	60
Lamp, Light Bulb	20	*	20	10
Panel Board	*	*	*	*
Meter	*	*	10	*
Transformer	*	*	*	*
Other	*	10	20	10
<b>Other Selected Electrical Appliances</b>	<b>10</b>	<b>20</b>	<b>10</b>	<b>10</b>
Clothes Dryer	*	*	*	*
Audio / Visual Equipment	10	10	*	10
Washing Machine	*	*	*	*
Refrigerator / Freezer	*	*	10	*
Shop / Garden Tool	*	*	*	*
Torch	*	*	*	*

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<sup>1</sup> Includes an estimated 10 deaths in both 2003 and 2004, and an estimated 20 deaths in 2005 from confined cooking fires.

<sup>2</sup> Deaths from *Installed Wiring* and *Receptacle, Switch* were allocated in the same proportion as the fires. See discussion in Methodology section.

**TABLE 4c**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**  
**SELECTED ELECTRICAL EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>13,120</b>	<b>13,330</b>	<b>12,820</b>	<b>13,090</b>
<b>Total Electrical</b>	<b>3,440</b>	<b>3,240</b>	<b>2,960</b>	<b>3,210</b>
<b>Electric Heating and Cooling</b>	<b>460</b>	<b>420</b>	<b>530</b>	<b>470</b>
Central Heating	10	10	20	10
Local Fixed Heater	140	120	220	160
Portable Heater	120	140	80	110
Water Heater	10	10	20	10
Fixed, Central Air Conditioning	20	20	30	20
Portable Air Conditioner	20	30	20	20
Other	130	90	140	120
<b>Electric Cooking Equipment</b>	<b>2,000</b>	<b>1,860</b>	<b>1,490</b>	<b>1,780</b>
Range / Oven	1,680	1,540	1,270	1,500
Range / Oven Hood	30	10	*	10
Deep Fat Fryer	*	10	*	*
Grill	*	*	*	*
Small Heat-Producing Appliance	60	40	50	50
Other	230	260	170	220
<b>Electrical Distribution</b>	<b>530</b>	<b>480</b>	<b>500</b>	<b>500</b>
Installed Wiring	160 <sup>2</sup>	130 <sup>2</sup>	110	130
Light Fixture	70	80	60	70
Receptacle, Switch	50 <sup>2</sup>	40 <sup>2</sup>	50	50
Cord, Plug	150	80	150	130
Lamp, Light Bulb	60	60	60	60
Panel Board	10	20	20	20
Meter	*	10	10	10
Transformer	*	10	10	10
Other	30	30	40	30
<b>Other Selected Electrical Appliances</b>	<b>250</b>	<b>280</b>	<b>260</b>	<b>260</b>
Clothes Dryer	160	140	140	150
Audio / Visual Equipment	40	40	60	50
Washing Machine	10	10	*	10
Refrigerator / Freezer	20	30	40	30
Shop / Garden Tool	10	30	10	20
Torch	*	10	*	10

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<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 7b on pg 32 for details.

<sup>2</sup> Injuries from *Installed Wiring* and *Receptacle, Switch* were allocated in the same proportion as the fires. See discussion in Methodology section.

**TABLE 4d**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)**  
**SELECTED ELECTRICAL EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>\$5,311.5</b>	<b>\$5,308.3</b>	<b>\$6,215.6</b>	<b>\$5,611.8</b>
<b>Total Electrical</b>	<b>\$1,306.5</b>	<b>\$1,062.6</b>	<b>\$1,130.9</b>	<b>\$1,166.7</b>
<b>Electric Heating and Cooling</b>	<b>\$216.5</b>	<b>\$197.8</b>	<b>\$236.6</b>	<b>\$216.9</b>
Central Heating	\$17.2	\$8.5	\$8.1	\$11.2
Local Fixed Heater	\$44.6	\$34.1	\$49.2	\$42.6
Portable Heater	\$50.6	\$36.3	\$40.7	\$42.6
Water Heater	\$9.3	\$6.3	\$15.2	\$10.3
Fixed, Central Air Conditioning	\$11.4	\$30.8	\$20.3	\$20.9
Portable Air Conditioner	\$11.0	\$6.6	\$8.0	\$8.6
Other	\$72.3	\$75.2	\$95.0	\$80.8
<b>Electric Cooking Equipment</b>	<b>\$325.4</b>	<b>\$314.2</b>	<b>\$285.9</b>	<b>\$308.5</b>
Range / Oven	\$239.3	\$211.1	\$195.5	\$215.3
Range / Oven Hood	\$1.8	\$7.5	\$2.8	\$4.0
Deep Fat Fryer	\$2.4	\$1.1	\$2.3	\$2.0
Grill	\$0.9	\$3.8	*	\$1.6
Small Heat-Producing Appliance	\$22.3	\$26.8	\$20.2	\$23.1
Other	\$58.6	\$63.9	\$65.1	\$62.5
<b>Electrical Distribution</b>	<b>\$503.8</b>	<b>\$354.4</b>	<b>\$361.3</b>	<b>\$406.5</b>
Installed Wiring	\$204.4	\$126.9	\$121.6	\$151.0
Light Fixture	\$40.3	\$43.6	\$48.9	\$44.2
Receptacle, Switch	\$35.0	\$35.4	\$31.9	\$34.1
Cord, Plug	\$101.6	\$58.3	\$49.4	\$69.7
Lamp, Light Bulb	\$32.2	\$27.0	\$33.0	\$30.7
Panel Board	\$25.3	\$17.1	\$15.7	\$19.4
Meter	\$10.4	\$7.6	\$11.0	\$9.7
Transformer	\$2.3	\$0.6	\$3.1	\$2.0
Other	\$52.4	\$37.8	\$46.8	\$45.7
<b>Other Selected Electrical Appliances</b>	<b>\$147.4</b>	<b>\$93.7</b>	<b>\$110.0</b>	<b>\$117.0</b>
Clothes Dryer	\$96.5	\$51.3	\$67.3	\$71.7
Audio / Visual Equipment	\$22.2	\$16.9	\$13.3	\$17.5
Washing Machine	\$2.1	\$2.2	\$0.9	\$1.8
Refrigerator / Freezer	\$18.1	\$9.9	\$19.6	\$15.9
Shop / Garden Tool	\$6.7	\$7.2	\$3.1	\$5.7
Torch	\$1.8	\$6.3	\$5.7	\$4.6

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<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 7c on pg 32 for details.

**TABLE 5a**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRES**  
**SELECTED GAS-FIRED EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>374,700</b>	<b>386,100</b>	<b>375,100</b>	<b>378,700</b>
<b>Total Gas-Fired Equipment</b>	<b>17,300</b>	<b>13,400</b>	<b>10,900</b>	<b>13,900</b>
<b>Gas Heating Equipment</b>	<b>5,400</b>	<b>4,300</b>	<b>4,500</b>	<b>4,700</b>
Fixed Heater	1,100	1,100	1,400	1,200
Portable Heater	300	200	200	200
Central Heating	1,100	700	600	800
Fireplace, Chimney, Connector	300	200	200	200
Water Heater	2,300	1,700	1,700	1,900
Fixed, Central Air Conditioning	*	*	*	*
Other	300	300	300	300
<b>Gas Cooking Equipment</b>	<b>8,600</b>	<b>6,000</b>	<b>3,300</b>	<b>6,000</b>
Range / Oven	7,400	4,800	2,400	4,900
Open Gas Grill	400	400	300	300
Other	900	800	600	800
<b>Other Selected Gas Equipment</b>	<b>3,100</b>	<b>2,700</b>	<b>2,700</b>	<b>2,800</b>
Clothes Dryer	1,500	1,500	1,700	1,600
Torch	1,300	1,000	600	900
Shop / Garden Tool	300	300	400	300

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 fires identifiable as intentionally set.

<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 7a on pg 31 for details.

**TABLE 5b**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS**  
**SELECTED GAS-FIRED EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>2,740</b>	<b>2,850</b>	<b>2,630</b>	<b>2,740</b>
<b>Total Gas-Fired Equipment</b>	<b>160</b>	<b>160</b>	<b>110</b>	<b>140</b>
<b>Gas Heating Equipment</b>	<b>70</b>	<b>50</b>	<b>80</b>	<b>70</b>
Fixed Heater	50	10	20	30
Portable Heater	*	30	*	10
Central Heating	*	*	10	10
Fireplace, Chimney, Connector	*	*	*	*
Water Heater	20	*	30	20
Fixed, Central Air Conditioning	*	*	*	*
Other	*	*	20	10
<b>Gas Cooking Equipment</b>	<b>90</b>	<b>100</b>	<b>30</b>	<b>70</b>
Range / Oven	70	90	30	60
Open Gas Grill	10	*	*	*
Other	*	10	*	10
<b>Other Selected Gas Equipment</b>	<b>*</b>	<b>10</b>	<b>*</b>	<b>*</b>
Clothes Dryer	*	*	*	*
Torch	*	*	*	*
Shop / Garden Tool	*	10	*	*

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<sup>1</sup>Includes an estimated 10 deaths in both 2003 and 2004, and an estimated 20 deaths in 2005 from confined cooking fires.

**TABLE 5c**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES**  
**SELECTED GAS-FIRED EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>13,120</b>	<b>13,330</b>	<b>12,820</b>	<b>13,090</b>
<b>Total Gas-Fired Equipment</b>	<b>830</b>	<b>810</b>	<b>610</b>	<b>750</b>
<b>Gas Heating Equipment</b>	<b>290</b>	<b>260</b>	<b>280</b>	<b>280</b>
Fixed Heater	50	50	50	50
Portable Heater	10	20	20	10
Central Heating	60	50	40	50
Fireplace, Chimney, Connector	*	10	10	10
Water Heater	160	120	140	140
Fixed, Central Air Conditioning	*	*	*	*
Other	10	10	10	10
<b>Gas Cooking Equipment</b>	<b>380</b>	<b>400</b>	<b>210</b>	<b>330</b>
Range / Oven	290	310	130	240
Open Gas Grill	20	40	20	30
Other	60	50	70	60
<b>Other Selected Gas Equipment</b>	<b>110</b>	<b>100</b>	<b>100</b>	<b>110</b>
Clothes Dryer	30	50	60	50
Torch	70	40	20	40
Shop / Garden Tool	10	10	30	20

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<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 7b on pg 32 for details.



**TABLE 5d**  
**ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)**  
**SELECTED GAS-FIRED EQUIPMENT, 2003 – 2005**

<b>Equipment</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2003-2005 Average</b>
<b>Total Residential<sup>1</sup></b>	<b>\$5,311.5</b>	<b>\$5,308.3</b>	<b>\$6,215.6</b>	<b>\$5,611.8</b>
<b>Total Gas-Fired Equipment</b>	<b>\$301.3</b>	<b>\$224.5</b>	<b>\$311.2</b>	<b>\$279.0</b>
<b>Gas Heating Equipment</b>	<b>\$119.1</b>	<b>\$109.0</b>	<b>\$148.9</b>	<b>\$125.7</b>
Fixed Heater	\$20.1	\$17.4	\$40.5	\$26.0
Portable Heater	\$8.4	\$7.2	\$23.0	\$12.9
Central Heating	\$23.2	\$15.8	\$16.7	\$18.6
Fireplace, Chimney, Connector	\$4.9	\$16.6	\$8.8	\$10.1
Water Heater	\$49.6	\$46.5	\$50.1	\$48.7
Fixed, Central Air Conditioning	\$0.2	*	\$0.4	\$0.2
Other	\$12.7	\$5.6	\$9.3	\$9.2
<b>Gas Cooking Equipment</b>	<b>\$82.7</b>	<b>\$48.6</b>	<b>\$88.4</b>	<b>\$73.3</b>
Range / Oven	\$43.9	\$31.3	\$26.2	\$33.8
Open Gas Grill	\$22.3	\$8.1	\$43.4	\$24.6
Other	\$16.5	\$9.3	\$18.8	\$14.9
<b>Other Selected Gas Equipment</b>	<b>\$91.2</b>	<b>\$54.3</b>	<b>\$64.1</b>	<b>\$69.9</b>
Clothes Dryer	\$10.8	\$9.5	\$21.9	\$14.1
Torch	\$63.8	\$34.9	\$29.3	\$42.6
Shop / Garden Tool	\$16.7	\$9.9	\$12.8	\$13.1

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 losses from fires identifiable as intentionally set.

<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 7c on pg 32 for details.

## Methodology

The Methodology section is divided into four 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 how the fire loss estimates were made, and Section 4 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 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 U.S.<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 2003 through 2005.

#### NFPA Estimates of Residential Structure Fires and Associated Losses 2003 - 2005

	2003	2004	2005
<b>Structure Fires</b>	402,000	410,500	396,000
<b>Civilian Deaths</b>	3,165	3,225	3,055
<b>Civilian Injuries</b>	14,075	14,175	13,825
<b>Property Loss</b>	\$6.07 billion	\$5.95 billion	\$6.88 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 states (50 in 2003 and 2004, 49 in 2005) and the District of Columbia. Not all the states reporting data included data from all fire departments in the state. In 2005, there were over 19,000 fire departments that participated in NFIRS. The table below shows the number of residential structure fires and the corresponding losses reported to USFA during the years 2003 through 2005.

#### Residential Structure Fires and Associated Losses Reported to USFA 2003 - 2005

	2003	2004	2005	
			All	Version 5.0 Data Only
<b>Structure Fires</b>	213,161	229,447	252,739	238,204
<b>Civilian Deaths</b>	1,370	1,416	1,328	1,225
<b>Civilian Injuries</b>	7,108	6,997	7,125	6,574
<b>Property Loss</b>	\$2.35 billion	\$2.60 billion	\$3.19 billion	\$2.95 billion

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

<sup>1</sup> M.J.Karter, "Fire Loss in the U.S. During 2003", NFPA, October 2004; M.J.Karter, "Fire Loss in the U.S. During 2004", NFPA, September 2005; M.J.Karter, "Fire Loss in the U.S. During 2005", NFPA, July 2006.

According to the NFPA, there was an estimated annual average of 402,833 residential structure fires in the U.S. during 2003-2005. NFIRS captured about 58% of these fires. During the same time period, NFPA also estimated an annual average of 3,148 deaths, 14,025 injuries and \$6.3 billion in property loss. On average, NFIRS captured 44% of the deaths, 50% of the injuries and 43% of the property loss.

### *NFIRS Variables*

The NFIRS version 5.0 coding system includes many variables but CPSC staff has used only a few of them for this report. The list of variables 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 / multi family 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, etc. 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>	Equipment that provided the heat which started the fire, e.g., heater, clothes dryer, etc.
<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, e.g., candle, lighter, cigarette, heat from operating equipment, hot object, etc.
<i>Item First Ignited</i>	The functional description or use of that item which was first ignited by the heat source, e.g., upholstered furniture, mattress, bedding, electric cable insulation, curtains or drapes, etc.
<i>Cause of Ignition</i>	<p>This indicates the general causal factor that resulted in a heat source igniting a combustible material. The cause code values are:</p> <p>1: intentional  2: unintentional  3: failure of equipment or heat source  4: act of nature  5: cause under investigation  0: cause, other  U: cause undetermined after investigation.</p> <p>CPSC staff regrouped the codes as:</p> <p>1: intentional  0, 2, 3, 4 or fire involving child play*: unintentional  5, U, missing information: unknown.</p>
<i>Factors Contributing to Ignition</i>	The event that allowed the heat source and the material first ignited to combine to start the fire. Factors adding specificity to the cause of ignition, such as playing with heat source, heat source too close to combustibles, equipment malfunction, etc.
<i>Human Factors Contributing to Ignition</i>	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, etc.
<i>Age</i>	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 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>

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\* See discussion on child play later in this section.  
<sup>1</sup> NFIRS Complete Reference Guide, January 2004.

## **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) other missing data, and (4) missing data from confined fires. 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 the Equipment Power Source. In an effort to lessen the extent of missing data, the 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 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, power source should be reported as “none” instead of “unknown”.

These changes 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 numbered from “one” to however many are necessary. Typically in exposure fires most of the information on the variables listed above is not filled out.

The CPSC staff transferred the fire cause values such as Cause of Ignition, Equipment Involved, Heat Source, etc. from the initial fire to the exposure fires. Thus, if the initial fire was caused by a portable heater, all exposures would be considered portable heater fires. All associated deaths, injuries, and property loss 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 within scope for this report.

### *Other missing data*

Tables 6a-6c below 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 reporting

instructions, they have been excluded from the tabulations below. Confined fires are discussed later in this section.

**Table 6a**  
**Missing Data on Residential Structure Fires: 2003 - 2005**

	<b>2003</b>	<b>2004</b>	<b>2005</b>
<b>Cause of Ignition</b>	25%	27%	29%
<b>Heat Source</b>	29%	30%	32%
<b>Item First Ignited</b>	28%	30%	32%
<b>Equipment Involved</b>	39%	45%	52%
<b>Equipment Power</b>	41%	46%	51%

Source: U.S. Consumer Product Safety Commission / EPHA, from NFIRS data obtained from the U.S. Fire Administration. Table excludes confined fires. Table includes only version 5 component (94%) of total residential structure fires data for 2005.

**Table 6b**  
**Missing Data on Residential Structure Fire Deaths: 2003 - 2005**

	<b>2003</b>	<b>2004</b>	<b>2005</b>
<b>Cause of Ignition</b>	50%	52%	51%
<b>Heat Source</b>	54%	55%	53%
<b>Item First Ignited</b>	50%	51%	48%
<b>Equipment Involved</b>	48%	48%	51%
<b>Equipment Power</b>	50%	48%	51%

Source: U.S. Consumer Product Safety Commission / EPHA, from NFIRS data obtained from the U.S. Fire Administration. Table excludes deaths from confined fires. Table includes only version 5 component (92%) of total residential structure fire death data for 2005.

**Table 6c**  
**Missing Data on Residential Structure Fire Injuries: 2003 - 2005**

	<b>2003</b>	<b>2004</b>	<b>2005</b>
<b>Cause of Ignition</b>	24%	26%	26%
<b>Heat Source</b>	25%	26%	26%
<b>Item First Ignited</b>	22%	24%	24%
<b>Equipment Involved</b>	34%	40%	45%
<b>Equipment Power</b>	38%	41%	45%

Source: U.S. Consumer Product Safety Commission / EPHA, from NFIRS data obtained from the U.S. Fire Administration. Table excludes injuries from confined fires. Table includes only version 5 component (92%) of total residential structure fire injury data for 2005.

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.

<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.

There is one situation that requires special handling in preparing the estimates in Table 1 and Table 4. This is for the categories Installed Wiring and Receptacle, Switch. Incident reports in NFIRS 4.1, using Equipment Involved code 45 (Switch, Receptacle, Outlet), cannot be separated in order to be assigned to NFIRS 5.0 Equipment Involved codes 217 (Outlet, Receptacle) or 218 (Wall Switch). Instead, all such incidents are changed in the public data release of NFIRS by the conversion program to Equipment Involved code 210 (Electrical Wiring, Other), which also includes converted NFIRS 4.1 Equipment Involved code 41 (Fixed Wiring). As a result, Equipment Involved code 210 contains all the 4.1 fire losses for Installed Wiring and Receptacle, Switch. Equipment Involved codes 217 and 218 do not have incidents that were converted from NFIRS 4.1. Consequently, for years with a sizeable proportion of incident reports in NFIRS 4.1, there are too many incidents in code 210 and not enough in codes 217 and 218.

Incidents coded originally in NFIRS 5.0 do not have this problem because they can be coded as Outlet, Receptacle, Wall Switch, or a number of other electrical categories. In order to be able to estimate fire losses for Installed Wiring and for Receptacle, Switch, CPSC staff analysts assumed that NFIRS 4.1 fire losses from incidents converted to Electrical Wiring, Other, should be allocated to Installed Wiring and to Receptacle, Switch in the same proportion as they were in those incidents originally coded in NFIRS 5.0. This procedure worked well for fires and property loss, even in the first few years of NFIRS 5.0, when few fire departments reported in NFIRS 5.0. But the procedure did not work for deaths and injuries because there were no deaths and few injuries reported in NFIRS 5.0 for one category or another. Consequently, staff decided to allocate NFIRS 4.1 reported deaths and injuries from Electrical Wiring, Other in proportion to the NFIRS 5.0 proportions of Installed Wiring and Receptacle, Switch fires.

This special allocation procedure was used for deaths and injuries in the years 1999-2004. Since only NFIRS 5.0 was used in the analysis for 2005, the special allocation procedure was eliminated.

### *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 non-combustible 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.

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 has 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 increased. 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, the CPSC staff separated out all confined fires from the data before the product-specific estimates were 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 7a through 7c below 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 since there is no information available on equipment power source.

**Table 7a : Estimated Residential Confined Fires: 2003 - 2005**

<b>Included in Table Categories:</b>	<b>Appear in Tables:</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
<b>Total Residential</b>	1a, 2a, 3a, 4a, 5a	145,300	167,300	177,300
<b>Total Heating and Cooling Equipment</b>	1a, 3a	35,400	38,900	38,900
<i>Fireplace, Chimney, Connector</i>	<i>1a, 3a</i>	<i>21,300</i>	<i>21,900</i>	<i>22,600</i>
<i>Other (Burner / Boiler)</i>	<i>1a, 3a</i>	<i>14,100</i>	<i>17,000</i>	<i>16,300</i>
<b>Cooking</b>	1a, 2a	94,500	111,100	119,200
<b>Trash, Rubbish</b>	2a	13,100	14,900	17,000
<b>Incinerator</b>		600	600	600
<b>Trash Compactor</b>		1,700	1,800	1,500

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 10 deaths estimated in both 2003 and 2004 and 20 deaths estimated in 2005 from confined residential cooking fires. No table is presented showing these death estimates.



**Table 7b : Estimated Residential Confined Fire Injuries: 2003 - 2005**

Included in Table Categories:	Appear in Tables:	2003	2004	2005
<b>Total Residential</b>	1c, 2c, 3c, 4c, 5c	1,300	1,510	1,710
<b>Total Heating and Cooling Equipment</b>	1c, 3c	100	130	120
<i>Fireplace, Chimney, Connector</i>	<i>1c, 3c</i>	<i>30</i>	<i>30</i>	<i>30</i>
<i>Other (Burner / Boiler)</i>	<i>1c, 3c</i>	<i>70</i>	<i>100</i>	<i>90</i>
<b>Cooking</b>	1c, 2c	1,150	1,350	1,500
<b>Trash, Rubbish</b>	2c	50	40	80
<b>Incinerator</b>		*	*	*
<b>Trash Compactor</b>		*	*	*

Source: U.S. Consumer Product Safety Commission/EPHA, from data obtained from the U.S. Fire Administration 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 7c : Estimated Residential Confined Fire Property Loss (In Millions): 2003 - 2005**

Included in Table Categories:	Appear in Tables:	2003	2004	2005
<b>Total Residential</b>	1d, 2d, 3d, 4d, 5d	\$46.6	\$39.6	\$61.4
<b>Total Heating and Cooling Equipment</b>	1d, 3d	\$17.5	\$14.9	\$23.8
<i>Fireplace, Chimney, Connector</i>	<i>1d, 3d</i>	<i>\$13.1</i>	<i>\$11.4</i>	<i>\$17.3</i>
<i>Other (Burner / Boiler)</i>	<i>1d, 3d</i>	<i>\$4.4</i>	<i>\$3.5</i>	<i>\$6.6</i>
<b>Cooking</b>	1d, 2d	\$26.1	\$23.0	\$33.4
<b>Trash, Rubbish</b>	2d	\$2.9	\$1.2	\$3.7
<b>Incinerator</b>		\$0.1	\$0.4	\$0.3
<b>Trash Compactor</b>		*	\$0.1	\$0.2

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

## 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 loss 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 were then used to produce the estimates in the tables. As already mentioned, the confined fires were separated out and the estimates for them were computed separately.

The estimates presented in this report pertain to unintentional fires and fire losses only. To this end, the 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 un-rounded 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 loss.

## **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 is reported in version 5.0, fire departments are not required to fill in these three variable fields. Consequently, much of the data is missing and estimates of child play fires (which were presented in pre 1999 years) have become unreliable for post 1998 years. However, as already mentioned in the previous section, to keep consistency with version 4.1, whenever a fire can be identified as involving child play in version 5.0, the intentionality is designated to be "unintentional".

### *Trend in Estimates*

Since 1999, many product-specific fire estimates and the corresponding injury estimates seem to have decreased substantially. This is a consequence of the decline in the weights that are applied to the product-specific frequency counts to derive the estimates. Over the years, while the NFPA estimates have remained steady, the overall number of fire incidents reported to NFIRS has been increasing dramatically due to the increased reporting of confined fires in version 5.0. As such, the scaling weights, which are proportions of NFPA estimated totals to corresponding NFIRS totals, have declined. This decline is especially noticeable for fires and fire injury estimates. In searching for an explanation for this decline, CPSC staff, along with other NFIRS analysts at other organizations, is exploring the possibility that fire departments may not be reporting confined fires to the NFPA survey. The 2007 survey will ask fire departments to make separate entries for confined and non-confined fires. CPSC staff will be able to separate scaling weights for confined and non-confined fires starting with data from that year.

## **Conclusion**

The major changes introduced by the new NFIRS system in the area of coding specificity, limitations encountered in converting data reported under the old system to the new system, the creation of an entirely new class of fire incidents not defined under the old system, and a substantial increase in missing data for important analysis variables, have posed many challenges. The CPSC staff constantly consults with other NFIRS analysts at NFPA, USFA, and Tri-Data, a division of System Planning Corporation, to discuss different and improved options for analysis of NFIRS.