



2009–2011 Residential Fire Loss Estimates*

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

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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 2009 through 2011, 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:

- 357,000 fires, 2,210 deaths, 12,140 injuries, and \$6.96 billion in property loss in 2009;
- 364,300 fires, 2,330 deaths, 12,910 injuries, and \$6.63 billion in property loss in 2010;
- 365,500 fires, 2,240 deaths, 13,400 injuries, and \$6.46 billion in property loss in 2011; and
- an estimated annual average of 362,300 fires, 2,260 deaths, 12,820 injuries, and \$6.68 billion in property loss over the three-year period 2009–2011.

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, such as 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 2009 through 2011, the relative ranking of the greatest contributors remained largely unchanged from that reported for 2008–2010. The annual average total cooking equipment fire death estimate (160) is now higher than the total electrical distribution fire death estimate (140). For 2008–2010, the annual average fire death estimate had been higher for electrical distribution. Tables 1a–1d show that:

- Cooking equipment accounted for the largest percentage of fires. An estimated annual average of 146,700 cooking equipment-related fires during 2009–2011 accounted for 40.5 percent of the average annual estimate of total residential fires for the same period. The corresponding death estimate is an annual average of 160 deaths, which is 7.1 percent of the average annual estimate of total residential fire deaths. The annual average number of cooking fire injuries for 2009–2011 was estimated to be 3,450, which represents 26.9 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 48,200 fires for 2009–2011 was 13.3 percent of the annual average estimate of total residential fires during the same period. The corresponding death estimate is an annual average of 190 deaths, which is 8.2 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 930. This accounts for 7.3 percent of the annual average estimate of total injuries during 2009–2011.

- During 2009–2011, an estimated annual average of 9,700 fires was attributable to electrical distribution system components (*e.g.*, installed wiring, lighting). This corresponds to 2.7 percent of the estimated annual average number of total residential fires for the same time period. The annual average death estimate is 140 (6.0 percent of average annual estimated number of total residential fire deaths); the injury estimates averaged 480, which is 3.8 percent of the estimated annual average of total residential fire injuries.
- With respect to item first ignited, upholstered furniture was involved in the greatest number of fire deaths. From 2009 through 2011, an estimated annual average of 410 deaths was associated with these fires. This constitutes 18.0 percent of the estimated annual average of total deaths associated with residential structure fires for the same period. On average, during 2009 to 2011, mattress or bedding ignitions accounted for an annual average of 340 deaths, which is 15.0 percent of the average annual estimated number of total residential fire deaths.
- With respect to heat source, smoking materials were the largest contributor to deaths, associated with an annual average of 450 deaths from 2009 to 2011. This accounts for 20.1 percent of the estimated annual average of total residential fire deaths. The estimated annual average number of deaths from candle fires is 70, which represents 3.2 percent of the average annual estimated total number of residential fire deaths during 2009 to 2011. There were an estimated 70 deaths from lighter fires (3.1 percent of the estimated annual average of the total number of residential fire deaths) while, on average, matches were responsible for 10 deaths, or 0.6 percent of total deaths annually.
- The estimates for fire injuries rose during the 2009–2011 time period from 12,140 in 2009 to 12,910 in 2010 to 13,400 in 2011.

Beginning with 1999, the NFIRS system underwent some major changes. Thus, fire loss estimates from before 1999 are not readily comparable with those from after 1999. The post-1999 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 estimates¹ 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 fire incident reports submitted voluntarily to the USFA by U.S. fire departments. Not all the states reporting include data from all fire departments in the state. 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 to fires in residential properties only. 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, property and content losses are referred to as "property losses" 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. Beginning with 1999 data, a major revision to the NFIRS data coding system, designated version 5.0, was implemented. In 1999, five percent of the residential fire data were 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, 99 percent in 2008; and 100 percent in 2009, 2010, and 2011. However, from 1999 forward, the NFIRS data received from the USFA are entirely in version 5.0 format. Data were converted from NFIRS 4.1 to NFIRS 5.0 by computer programs. Because 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.

As mentioned above, in 2009, 2010, and 2011, 100 percent of the residential fire data were originally coded in version 5.0. The data were weighted up to the 2009, 2010, and 2011 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. From 1999 onward, as the use of version 5.0 increased, an increasingly large number of confined fires were reported. In 1999, about two percent of residential structure fires were reported as confined; by 2011, 46 percent of residential structure fires reported to NFIRS were confined.

¹ M.J. Karter, "Fire Loss in the U.S. During 2009," National Fire Protection Association (NFPA), August 2010; M.J. Karter, "Fire Loss in the U.S. During 2010," National Fire Protection Association (NFPA), September 2011; M.J. Karter, "Fire Loss in the U.S. During 2011," National Fire Protection Association (NFPA), September 2012.

In confined fire cases, it is frequently not possible to determine the type of equipment involved because this is not required information. For example, when a fire is identified as a “confined cooking fire” in NFIRS, it is not possible to distinguish a fire started by a range versus other cooking equipment, like a microwave oven or toaster. As a result, confined cooking fire losses are only included as part of the “Total Cooking Equipment” fires, but they are not included in subcategories that define the equipment involved or the power source. Because ranges certainly are involved in some confined fires, their contribution should be taken into account in the evaluation of the cooking fire hazard. The same is true for microwave ovens and other cooking equipment.

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

Results

Consistent with previous years' reports, CPSC staff has presented data here using five main tables. Each numbered table (1–5) has four sub-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 up to the totals that appear in the headings. All of the product categories in the tables, with the exception of smoking materials, contain products within the jurisdiction of the CPSC. Intentionally set fires and their associated losses, which include the deliberate misuse of heat sources, or fires of an incendiary nature, are excluded from the estimates.

In Tables 1, 3, 4, and 5, equipment codes were used to identify the products involved, 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, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential²	357,000	364,300	365,500	362,300
Total Heating and Cooling Equipment²	50,600	48,600	45,400	48,200
Local Fixed Heater	3,900	4,000	3,900	3,900
Portable Heater	1,500	1,600	1,400	1,500
Central Heating	900	1,000	900	900
Fireplace, Chimney, Chimney Connector ²	26,000	24,400	22,500	24,300
Water Heater	1,700	1,800	1,900	1,800
Air Conditioning	900	1,100	1,100	1,000
Other ²	16,200	15,600	14,500	15,400
Total Cooking Equipment²	146,000	147,000	146,900	146,700
Range/Oven	12,600	13,600	13,500	13,200
<i>Gas</i>	1,800	1,900	1,900	1,900
<i>Electric</i>	10,700	11,600	11,600	11,300
<i>Other</i>	*	*	*	*
Microwave Oven	600	500	600	600
All Other Cooking	3,100	3,000	3,300	3,200
<i>Gas</i>	900	800	1,000	900
<i>Electric</i>	2,000	2,000	2,100	2,100
<i>Other</i>	200	200	200	200
Total Electrical Distribution	9,900	9,400	9,800	9,700
Installed Wiring	4,200	3,700	3,900	3,900
Cord, Plug	1,100	900	1,100	1,100
Receptacle, Switch	1,000	1,100	1,200	1,100
Lighting	1,900	1,900	1,900	1,900
Other	1,700	1,700	1,700	1,700
Other Selected Equipment	8,000	9,100	9,400	8,800
Audio/Visual Equipment	400	300	400	400
Clothes Dryer	5,200	6,200	6,600	6,000
Dishwasher	400	500	400	400
Washing Machine	200	300	200	200
Torch	400	400	400	400
Refrigerator/Freezer	700	700	700	700
Shop/Garden Tool	600	700	700	700

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.

² 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 8a on p. 31 for details.

TABLE 1b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential³	2,210	2,330	2,240	2,260
Total Heating and Cooling Equipment	210	200	160	190
Local Fixed Heater	50	40	60	50
Portable Heater	90	100	40	80
Central Heating	10	10	10	10
Fireplace, Chimney, Chimney Connector ³	30	10	30	20
Water Heater	*	30	*	10
Air Conditioning	*	10	*	*
Other ³	20	*	10	10
Total Cooking Equipment³	110	180	190	160
Range/Oven	90	170	150	140
<i>Gas</i>	10	50	40	40
<i>Electric</i>	80	120	110	100
<i>Other</i>	*	*	*	*
Microwave Oven	*	*	*	*
All Other Cooking	20	10	40	20
<i>Gas</i>	*	10	10	*
<i>Electric</i>	10	*	30	20
<i>Other</i>	*	*	*	*
Total Electrical Distribution	150	140	120	140
Installed Wiring	50	30	50	40
Cord, Plug	50	60	40	50
Receptacle, Switch	*	10	*	10
Lighting	20	30	20	20
Other	20	10	10	10
Other Selected Equipment	10	20	10	10
Audio/Visual Equipment	*	*	*	*
Clothes Dryer	*	10	*	*
Dishwasher	*	*	*	*
Washing Machine	*	10	*	*
Torch	*	*	*	*
Refrigerator / Freezer	*	*	10	*
Shop/Garden Tool	*	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.

³ There were no NFIRS confined cooking fire deaths in 2009 or 2010 and a rounded estimate of fewer than 10 in 2011. There were no confined fire deaths in the Heating and Cooling Other Equipment category in 2009, 2010, or 2011.

TABLE 1c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential⁴	12,140	12,910	13,400	12,820
Total Heating and Cooling Equipment⁴	880	940	980	930
Local Fixed Heater	320	260	390	320
Portable Heater	180	190	160	180
Central Heating	30	50	20	30
Fireplace, Chimney, Chimney Connector ⁴	70	120	90	90
Water Heater	80	90	90	90
Air Conditioning	60	40	70	50
Other ⁴	170	210	200	200
Total Cooking Equipment⁴	3,210	3,560	3,580	3,450
Range/Oven	1,280	1,510	1,650	1,480
<i>Gas</i>	180	210	170	190
<i>Electric</i>	1,100	1,290	1,480	1,290
<i>Other</i>	*	*	*	*
Microwave Oven	50	30	50	50
All Other Cooking	230	210	240	230
<i>Gas</i>	70	70	60	70
<i>Electric</i>	130	120	160	140
<i>Other</i>	20	20	20	20
Total Electrical Distribution	510	500	440	480
Installed Wiring	180	140	130	150
Cord, Plug	100	110	70	90
Receptacle, Switch	30	20	70	40
Lighting	120	130	100	120
Other	90	90	70	80
Other Selected Equipment	290	280	430	330
Audio/Visual Equipment	40	20	30	30
Clothes Dryer	150	190	260	200
Dishwasher	10	*	10	10
Washing Machine	*	10	*	*
Torch	10	30	40	30
Refrigerator/Freezer	40	10	60	30
Shop/Garden Tool	40	20	40	30

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.

⁴ 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 8b on p. 31 for details.

TABLE 1d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential⁵	\$6,958.7	\$6,627.6	\$6,457.1	\$6,681.1
Total Heating and Cooling Equipment⁵	\$505.5	\$579.7	\$466.5	\$517.3
Local Fixed Heater	\$149.2	\$109.3	\$106.8	\$121.8
Portable Heater	\$62.7	\$85.6	\$44.7	\$64.3
Central Heating	\$29.1	\$28.3	\$35.0	\$30.8
Fireplace, Chimney, Chimney Connector ⁵	\$106.3	\$153.6	\$87.9	\$115.9
Water Heater	\$43.2	\$37.8	\$53.1	\$44.7
Air Conditioning	\$14.9	\$30.2	\$27.7	\$24.3
Other ⁵	\$109.1	\$158.6	\$126.9	\$131.5
Total Cooking Equipment⁵	\$372.8	\$404.6	\$409.9	\$395.7
Range/Oven	\$228.1	\$254.2	\$253.4	\$245.2
<i>Gas</i>	\$29.8	\$39.6	\$32.6	\$34.0
<i>Electric</i>	\$197.8	\$213.9	\$220.8	\$210.8
<i>Other</i>	\$0.6	\$0.6	*	\$0.4
Microwave Oven	\$16.7	\$9.6	\$8.8	\$11.7
All Other Cooking	\$90.3	\$113.8	\$120.9	\$108.3
<i>Gas</i>	\$22.6	\$49.7	\$44.2	\$38.8
<i>Electric</i>	\$48.5	\$55.0	\$54.1	\$52.5
<i>Other</i>	\$19.2	\$9.2	\$22.6	\$17.0
Total Electrical Distribution	\$382.6	\$311.1	\$340.2	\$344.6
Installed Wiring	\$169.8	\$137.8	\$143.6	\$150.4
Cord, Plug	\$51.1	\$35.8	\$39.8	\$42.2
Receptacle, Switch	\$39.8	\$26.4	\$33.1	\$33.1
Lighting	\$73.7	\$51.6	\$50.0	\$58.4
Other	\$48.1	\$59.5	\$73.8	\$60.5
Other Selected Equipment	\$188.3	\$177.5	\$169.0	\$178.3
Audio/Visual Equipment	\$17.0	\$6.6	\$8.4	\$10.7
Clothes Dryer	\$68.1	\$76.4	\$81.4	\$75.3
Dishwasher	\$8.9	\$11.4	\$11.0	\$10.5
Washing Machine	\$3.8	\$2.7	\$2.1	\$2.9
Torch	\$50.4	\$13.2	\$12.4	\$25.3
Refrigerator/Freezer	\$20.4	\$34.0	\$17.8	\$24.0
Shop/Garden Tool	\$19.8	\$34.5	\$36.9	\$30.4

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.

⁵ 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 8c on p. 32 for details.

TABLE 2a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED PRODUCTS, 2009–2011

Product	2009	2010	2011	2009–2011 Average
Total Residential⁶	357,000	364,300	365,500	362,300
By Heat Source				
Cigarette, Other Tobacco Products	9,600	10,400	10,700	10,200
Match	600	600	600	600
Lighter	1,500	1,600	1,700	1,600
Candle	6,900	6,700	6,600	6,700
By Item First Ignited				
Upholstered Furniture	4,900	4,900	5,100	5,000
Smoking Material Ignition	1,300	1,300	1,200	1,300
Open-Flame Ignition	600	600	700	600
Other	3,100	3,100	3,300	3,100
Mattress, Bedding	7,800	7,800	7,800	7,800
Smoking Material Ignition	1,600	1,400	1,500	1,500
Open-Flame Ignition	1,600	1,500	1,500	1,500
Other	4,700	4,900	4,900	4,800
Other Materials				
Cooking Materials ⁶	151,300	152,800	152,400	152,200
Electric Cable Insulation	15,300	16,500	17,200	16,300
Interior Wall Covering	7,100	7,300	6,900	7,100
Wearing Apparel-Worn	300	300	300	300
Wearing Apparel-Not Worn	5,200	5,600	5,600	5,500
Floor Covering	4,100	3,900	3,800	4,000
Curtains, Drapes	1,400	1,500	1,400	1,500
Magazines, Newspaper	1,600	1,700	1,900	1,700
Thermal Insulation	5,400	5,900	6,100	5,800
Cabinet, Desk	4,600	4,900	4,500	4,700
Trash, Rubbish ⁶	19,500	20,000	20,900	20,100
Toy, Game	200	100	200	100
Box, Carton, Bag, Basket, Barrel	2,400	2,600	2,600	2,500

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.

⁶ 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 8a on p. 31 for details.

TABLE 2b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED PRODUCTS, 2009–2011

Product	2009	2010	2011	2009–2011 Average
Total Residential⁷	2,210	2,330	2,240	2,260
By Heat Source				
Cigarette, Other Tobacco Products	490	460	410	450
Match	20	20	*	10
Lighter	30	90	90	70
Candle	50	80	90	70
By Item First Ignited				
Upholstered Furniture	420	410	390	410
Smoking Material Ignition	200	220	160	190
Open-Flame Ignition	30	80	40	50
Other	190	120	190	170
Mattress, Bedding	360	300	360	340
Smoking Material Ignition	150	80	150	130
Open-Flame Ignition	40	30	50	40
Other	170	190	170	170
Other Materials				
Cooking Materials ⁷	120	150	170	150
Electric Cable Insulation	150	80	110	120
Interior Wall Covering	80	160	80	110
Wearing Apparel-Worn	80	90	100	90
Wearing Apparel-Not Worn	20	50	30	30
Floor Covering	110	100	40	80
Curtains, Drapes	*	10	10	10
Magazines, Newspaper	20	30	50	30
Thermal Insulation	10	10	*	10
Cabinet, Desk	50	50	50	50
Trash, Rubbish	60	40	30	40
Toy, Game	*	*	*	*
Box, Carton, Bag, Basket, Barrel	10	20	20	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.

⁷ There were no NFIRS confined cooking fire deaths in 2009 or 2010 and a rounded estimate of fewer than 10 in 2011.

TABLE 2c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED PRODUCTS, 2009–2011

Product	2009	2010	2011	2009–2011 Average
Total Residential⁸	12,140	12,910	13,400	12,820
By Heat Source				
Cigarette, Other Tobacco Products	1,050	1,070	1,180	1,100
Match	100	70	70	80
Lighter	300	380	410	360
Candle	670	620	740	680
By Item First Ignited				
Upholstered Furniture	780	710	710	730
Smoking Material Ignition	270	240	220	240
Open-Flame Ignition	140	120	140	130
Other	380	350	350	360
Mattress, Bedding	1,220	1,190	1,250	1,220
Smoking Material Ignition	340	330	350	340
Open-Flame Ignition	350	270	320	310
Other	530	590	580	570
Other Materials				
Cooking Materials ⁸	3,930	4,250	4,290	4,150
Electric Cable Insulation	440	460	430	450
Interior Wall Covering	260	330	320	300
Wearing Apparel-Worn	80	110	110	100
Wearing Apparel-Not Worn	260	310	360	310
Floor Covering	200	230	300	240
Curtains, Drapes	150	190	160	170
Magazines, Newspaper	110	120	190	140
Thermal Insulation	80	90	90	90
Cabinet, Desk	280	310	330	310
Trash, Rubbish ⁸	270	320	300	300
Toy, Game	*	*	30	10
Box, Carton, Bag, Basket, Barrel	120	120	90	110

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.

⁸There 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 8b on p. 31 for details.

TABLE 2d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED PRODUCTS, 2009–2011

Product	2009	2010	2011	2009–2011 Average
Total Residential⁹	\$6,958.7	\$6,627.6	\$6,457.1	\$6,681.1
By Heat Source				
Cigarette, Other Tobacco Products	\$460.0	\$384.2	\$392.6	\$412.3
Match	\$27.0	\$23.9	\$12.5	\$21.1
Lighter	\$67.8	\$56.9	\$52.0	\$58.9
Candle	\$431.0	\$257.3	\$236.0	\$308.1
By Item First Ignited				
Upholstered Furniture	\$325.2	\$249.0	\$265.2	\$279.8
Smoking Material Ignition	\$82.1	\$61.0	\$72.3	\$71.8
Open-Flame Ignition	\$55.8	\$34.9	\$32.2	\$41.0
Other	\$187.4	\$153.1	\$160.7	\$167.1
Mattress, Bedding	\$317.1	\$297.8	\$296.8	\$303.9
Smoking Material Ignition	\$52.7	\$43.8	\$53.4	\$50.0
Open-Flame Ignition	\$90.4	\$70.2	\$70.6	\$77.0
Other	\$174.0	\$183.9	\$172.8	\$176.9
Other Materials				
Cooking Materials ⁹	\$556.3	\$508.9	\$521.8	\$529.0
Electric Cable Insulation	\$488.9	\$449.2	\$478.1	\$472.1
Interior Wall Covering	\$345.7	\$329.9	\$290.5	\$322.0
Wearing Apparel-Worn	\$9.7	\$4.6	\$7.5	\$7.3
Wearing Apparel-Not Worn	\$154.1	\$127.5	\$118.0	\$133.2
Floor Covering	\$166.0	\$129.7	\$117.5	\$137.8
Curtains, Drapes	\$44.8	\$52.7	\$91.0	\$62.8
Magazines, Newspaper	\$63.1	\$64.9	\$60.2	\$62.7
Thermal Insulation	\$157.8	\$153.0	\$172.2	\$161.0
Cabinet, Desk	\$161.3	\$167.0	\$167.3	\$165.2
Trash, Rubbish ⁹	\$180.7	\$206.7	\$150.7	\$179.4
Toy, Game	\$2.1	\$2.7	\$2.7	\$2.5
Box, Carton, Bag, Basket, Barrel	\$105.2	\$82.1	\$82.8	\$90.0

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.

⁹ 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 8c on p. 32 for details.

TABLE 3a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
HEATING AND COOLING EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential¹⁰	357,000	364,300	365,500	362,300
Total Heating and Cooling Equipment¹⁰	50,600	48,600	45,400	48,200
Solid Fuel	2,400	2,400	2,100	2,300
Fixed Heater	700	600	500	600
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	1,700	1,800	1,600	1,700
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	2,800	3,000	2,700	2,800
Fixed Heater	800	900	800	900
Portable Heater	100	200	100	100
Fireplace, Chimney, Chimney Connector	100	200	100	200
Central Heating	400	500	400	400
Water Heater	1,000	1,000	1,000	1,000
Fixed, Central Air Conditioning	*	*	*	*
Other	300	300	200	300
Electric	7,800	8,900	8,900	8,600
Fixed Heater	2,200	2,400	2,500	2,400
Portable Heater	1,100	1,100	1,100	1,100
Central Heating	400	400	400	400
Water Heater	700	800	900	800
Fixed, Central Air Conditioning	600	700	700	700
Portable Air Conditioner	300	300	400	300
Other	3,100	3,800	3,700	3,500
Liquid Fuel	500	400	300	400
Fixed Heater	100	100	100	100
Portable Heater	300	200	200	200
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	100	100	100	100
Water Heater	*	*	*	*
Other	*	*	*	*
All Other Fuel	200	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.

¹⁰ 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 8a on p. 31 for details.

TABLE 3b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
HEATING AND COOLING EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential¹¹	2,210	2,330	2,240	2,260
Total Heating and Cooling Equipment	210	200	160	190
Solid Fuel	60	30	40	50
Fixed Heater	30	20	20	30
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	30	10	20	20
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	30	50	30	40
Fixed Heater	20	*	20	10
Portable Heater	10	10	*	10
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	*	10	*	*
Water Heater	*	30	*	10
Fixed, Central Air Conditioning	*	*	*	*
Other	*	*	10	*
Electric	80	80	70	80
Fixed Heater	*	10	30	10
Portable Heater	60	60	30	50
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Portable Air Conditioner	*	10	*	*
Other	20	*	10	10
Liquid Fuel	30	30	10	20
Fixed Heater	*	*	*	*
Portable Heater	20	30	*	20
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	10	*	10	10
Water Heater	*	*	*	*
Other	*	*	*	*
All Other Fuel	*	*	*	*

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

Note: Death estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude deaths from intentionally set fires.

¹¹ There were no NFIRS confined cooking fire deaths in 2009 or 2010 and a rounded estimate of fewer than 10 in 2011.

TABLE 3c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
HEATING AND COOLING EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential¹²	12,140	12,910	13,400	12,820
Total Heating and Cooling Equipment¹²	880	940	980	930
Solid Fuel	90	110	80	90
Fixed Heater	30	30	30	30
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	60	70	50	60
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	180	230	220	210
Fixed Heater	60	60	90	70
Portable Heater	20	10	20	20
Fireplace, Chimney, Chimney Connector	*	10	*	10
Central Heating	20	40	10	20
Water Heater	70	80	80	80
Fixed, Central Air Conditioning	*	*	*	*
Other	10	20	20	20
Electric	480	490	560	510
Fixed Heater	200	160	260	210
Portable Heater	140	140	110	130
Central Heating	*	10	10	*
Water Heater	10	20	10	10
Fixed, Central Air Conditioning	30	10	40	30
Portable Air Conditioner	30	30	30	30
Other	100	150	150	130
Liquid Fuel	50	40	50	50
Fixed Heater	*	*	*	*
Portable Heater	30	30	30	30
Fireplace, Chimney, Chimney Connector	*	*	10	*
Central Heating	10	*	10	10
Water Heater	*	*	*	*
Other	20	*	*	10
All Other Fuel	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.

¹² 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 8b on p. 31 for details.

TABLE 3d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
HEATING AND COOLING EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential¹³	\$6,958.7	\$6,627.6	\$6,457.1	\$6,681.1
Total Heating and Cooling Equipment¹³	\$505.5	\$579.7	\$466.5	\$517.3
Solid Fuel	\$132.6	\$128.3	\$99.0	\$119.9
Fixed Heater	\$36.6	\$22.8	\$24.4	\$27.9
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	\$93.9	\$101.7	\$71.5	\$89.0
Central Heating	\$1.5	\$3.4	\$1.2	\$2.0
Water Heater	*	*	\$0.2	\$0.1
Other	\$0.7	\$0.3	\$1.7	\$0.9
Gas-Fired	\$86.7	\$103.9	\$103.6	\$98.1
Fixed Heater	\$27.8	\$21.5	\$21.8	\$23.7
Portable Heater	\$3.3	\$12.7	\$2.4	\$6.1
Fireplace, Chimney, Chimney Connector	\$4.9	\$15.4	\$9.1	\$9.8
Central Heating	\$13.9	\$16.7	\$19.8	\$16.8
Water Heater	\$29.6	\$27.7	\$42.8	\$33.4
Fixed, Central Air Conditioning	*	\$0.2	\$0.5	\$0.2
Other	\$7.1	\$9.8	\$7.2	\$8.0
Electric	\$253.9	\$259.2	\$242.8	\$252.0
Fixed Heater	\$79.3	\$63.6	\$57.0	\$66.6
Portable Heater	\$48.9	\$64.3	\$37.6	\$50.2
Central Heating	\$10.1	\$6.6	\$11.8	\$9.5
Water Heater	\$13.4	\$9.0	\$10.1	\$10.8
Fixed, Central Air Conditioning	\$9.0	\$23.6	\$15.5	\$16.0
Portable Air Conditioner	\$5.9	\$6.5	\$11.7	\$8.0
Other	\$96.4	\$109.3	\$114.6	\$106.8
Liquid Fuel	\$19.9	\$15.6	\$9.4	\$15.0
Fixed Heater	\$4.6	\$1.2	\$1.2	\$2.4
Portable Heater	\$10.5	\$8.2	\$4.7	\$7.8
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	\$3.6	\$1.6	\$2.2	\$2.5
Water Heater	\$0.2	\$1.0	*	\$0.4
Other	\$0.9	\$3.5	\$1.2	\$1.9
All Other Fuel	\$2.0	\$4.5	\$3.7	\$3.4

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.

¹³ 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 8c on p. 32 for details.

TABLE 4a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED ELECTRICAL EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential¹⁴	357,000	364,300	365,500	362,300
Total Electrical	41,300	43,700	44,500	43,200
Electric Heating and Cooling	7,800	8,900	8,900	8,600
Central Heating	400	400	400	400
Local Fixed Heater	2,200	2,400	2,500	2,400
Portable Heater	1,100	1,100	1,100	1,100
Water Heater	700	800	900	800
Fixed, Central Air Conditioning	600	700	700	700
Portable Air Conditioner	300	300	400	300
Other	3,100	3,800	3,700	3,500
Electric Cooking Equipment	12,800	13,700	13,700	13,400
Range/Oven	10,700	11,600	11,600	11,300
Range/Oven Hood	200	100	200	200
Deep Fat Fryer	100	100	100	100
Grill	*	*	*	*
Microwave Oven	600	500	600	600
Small Heat-Producing Appliance	500	500	500	500
Other	1,700	1,800	1,900	1,800
Electrical Distribution	9,900	9,400	9,800	9,700
Installed Wiring	4,200	3,700	3,900	3,900
Light Fixture	1,300	1,200	1,200	1,200
Receptacle, Switch	1,000	1,100	1,200	1,100
Cord, Plug	1,100	900	1,100	1,100
Lamp, Light Bulb	700	700	700	700
Panel Board	500	600	500	500
Meter	200	300	300	300
Transformer	100	100	100	100
Other	900	800	900	900
Other Selected Electrical Appliances	6,000	6,900	7,200	6,700
Clothes Dryer	4,000	4,800	5,100	4,600
Dishwasher	400	500	400	400
Audio/Visual Equipment	400	300	400	400
Washing Machine	200	300	200	200
Refrigerator/Freezer	700	700	700	700
Shop/Garden Tools	200	200	300	300
Torch	100	100	100	100

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

Note: Fire estimates are rounded to the nearest 100. Rounded estimates less than 100 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude intentionally set fires.

¹⁴ There are confined fire estimates included in *Total Residential* 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 8a on p. 31 for details.

TABLE 4b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED ELECTRICAL EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential¹⁵	2,210	2,330	2,240	2,260
Total Electrical	380	450	400	410
Electric Heating and Cooling	80	80	70	80
Central Heating	*	*	*	*
Local Fixed Heater	*	10	20	10
Portable Heater	60	60	40	50
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Portable Air Conditioner	*	10	*	*
Other	20	*	10	10
Electric Cooking Equipment	90	120	140	120
Range/Oven	80	120	110	100
Range/Oven Hood	*	*	*	*
Deep Fat Fryer	*	*	*	*
Grill	*	*	*	*
Microwave Oven	*	*	*	*
Small Heat-Producing Appliance	10	*	10	10
Other	10	*	30	10
Electrical Distribution	150	140	120	140
Installed Wiring	50	30	50	40
Light Fixture	10	*	10	10
Receptacle, Switch	*	10	*	10
Cord, Plug	50	60	40	50
Lamp, Light Bulb	10	30	10	20
Panel Board	10	*	*	*
Meter	*	*	*	*
Transformer	*	*	*	*
Other	10	10	10	10
Other Selected Electrical Appliances	10	20	10	10
Clothes Dryer	*	*	*	*
Dishwasher	*	*	*	*
Audio/Visual Equipment	*	*	*	*
Washing Machine	*	10	*	*
Refrigerator/Freezer	*	*	10	*
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.

¹⁵ There were no NFIRS confined fire deaths in 2009 or 2010 and a rounded estimate of fewer than 10 confined cooking fire deaths in 2011.

TABLE 4c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED ELECTRICAL EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential¹⁶	12,140	12,910	13,400	12,820
Total Electrical	2,830	2,940	3,250	3,010
Electric Heating and Cooling	480	490	560	510
Central Heating	*	10	10	*
Local Fixed Heater	200	160	260	210
Portable Heater	140	140	110	130
Water Heater	10	20	10	10
Fixed, Central Air Conditioning	30	10	40	30
Portable Air Conditioner	30	30	30	30
Other	100	150	140	130
Electric Cooking Equipment	1,230	1,410	1,640	1,430
Range/Oven	1,100	1,290	1,480	1,290
Range/Oven Hood	*	*	10	*
Deep Fat Fryer	*	10	10	10
Grill	*	*	*	*
Microwave Oven	50	30	50	50
Small Heat-Producing Appliance	30	60	50	50
Other	130	110	140	130
Electrical Distribution	510	500	440	480
Installed Wiring	180	140	130	150
Light Fixture	50	80	30	50
Receptacle, Switch	30	20	70	40
Cord, Plug	100	110	70	90
Lamp, Light Bulb	70	50	60	60
Panel Board	10	20	20	20
Meter	*	30	20	20
Transformer	*	*	*	*
Other	70	50	30	50
Other Selected Electrical Appliances	220	190	300	240
Clothes Dryer	120	140	180	150
Dishwasher	10	*	10	10
Audio/Visual Equipment	40	20	30	30
Washing Machine	*	10	*	*
Refrigerator/Freezer	40	10	60	30
Shop/Garden Tool	20	*	20	10
Torch	*	10	10	10

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

Note: Injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude injuries from intentionally set fires.

¹⁶ 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 8b on p. 31 for details.

TABLE 4d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED ELECTRICAL EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential¹⁷	\$6,958.7	\$6,627.6	\$6,457.1	\$6,681.1
Total Electrical	\$1,149.4	\$1,134.5	\$1,137.8	\$1,140.5
Electric Heating and Cooling	\$253.9	\$259.2	\$245.2	\$252.8
Central Heating	\$10.1	\$6.6	\$11.9	\$9.5
Local Fixed Heater	\$79.3	\$63.6	\$57.6	\$66.8
Portable Heater	\$48.9	\$64.3	\$38.0	\$50.4
Water Heater	\$13.4	\$9.0	\$10.2	\$10.8
Fixed, Central Air Conditioning	\$9.0	\$23.6	\$15.6	\$16.1
Portable Air Conditioner	\$5.9	\$6.5	\$11.8	\$8.1
Other	\$96.4	\$109.3	\$115.7	\$107.1
Electric Cooking Equipment	\$246.3	\$268.9	\$274.9	\$263.3
Range/Oven	\$197.8	\$213.9	\$220.8	\$210.8
Range/Oven Hood	\$5.0	\$0.9	\$1.2	\$2.3
Deep Fat Fryer	\$2.2	\$4.7	\$6.7	\$4.5
Grill	\$0.5	\$0.9	\$2.9	\$1.4
Microwave Oven	\$16.7	\$9.6	\$8.8	\$11.7
Small Heat-Producing Appliance	\$14.1	\$14.6	\$26.7	\$18.5
Other	\$40.7	\$48.5	\$43.3	\$44.2
Electrical Distribution	\$382.6	\$311.1	\$340.2	\$344.6
Installed Wiring	\$169.8	\$137.8	\$143.6	\$150.4
Light Fixture	\$54.3	\$31.5	\$29.3	\$38.4
Receptacle, Switch	\$39.8	\$26.4	\$33.1	\$33.1
Cord, Plug	\$51.1	\$35.8	\$39.8	\$42.2
Lamp, Light Bulb	\$19.4	\$20.1	\$20.7	\$20.1
Panel Board	\$12.6	\$18.3	\$7.6	\$12.9
Meter	\$5.3	\$3.0	\$8.0	\$5.5
Transformer	\$5.2	\$1.3	\$1.7	\$2.7
Other	\$25.0	\$36.9	\$56.5	\$39.5
Other Selected Electrical Appliances	\$125.5	\$128.8	\$113.9	\$122.7
Clothes Dryer	\$57.8	\$60.5	\$68.0	\$62.1
Dishwasher	\$8.9	\$11.4	\$11.0	\$10.4
Audio/Visual Equipment	\$17.0	\$6.6	\$8.4	\$10.7
Washing Machine	\$3.8	\$2.1	\$2.1	\$2.7
Refrigerator/Freezer	\$20.3	\$32.7	\$16.8	\$23.3
Shop/Garden Tool	\$8.5	\$13.0	\$6.2	\$9.2
Torch	\$9.3	\$2.5	\$1.3	\$4.4

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.

¹⁷ 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 8c on p. 32 for details.

TABLE 5a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED GAS-FIRED EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential¹⁸	357,000	364,300	365,500	362,300
Total Gas-Fired Equipment	7,700	8,100	8,000	7,900
Gas Heating Equipment	2,800	3,000	2,700	2,800
Fixed Heater	800	900	800	900
Portable Heater	100	200	100	100
Central Heating	400	500	400	400
Fireplace, Chimney, Connector	100	200	100	200
Water Heater	1,000	1,000	1,000	1,000
Fixed, Central Air Conditioning	*	*	*	*
Other	300	300	200	300
Gas Cooking Equipment	2,700	2,700	2,900	2,800
Range/Oven	1,800	1,900	1,900	1,900
Open Gas Grill	400	400	500	400
Other	500	400	400	400
Other Selected Gas Equipment	1,900	2,000	2,100	2,000
Clothes Dryer	1,200	1,400	1,500	1,400
Torch	300	300	300	300
Shop/Garden Tool	300	300	300	300

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.

¹⁸ 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 8a on p. 31 for details.

TABLE 5b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED GAS-FIRED EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential¹⁹	2,210	2,330	2,240	2,260
Total Gas-Fired Equipment	60	110	90	90
Gas Heating Equipment	30	50	30	40
Fixed Heater	20	*	20	10
Portable Heater	10	10	*	10
Central Heating	*	10	*	*
Fireplace, Chimney, Connector	*	*	*	*
Water Heater	*	30	*	10
Fixed, Central Air Conditioning	*	*	*	*
Other	*	*	10	*
Gas Cooking Equipment	20	60	50	40
Range/Oven	10	50	40	40
Open Gas Grill	*	*	10	*
Other	*	10	*	*
Other Selected Gas Equipment	*	10	*	*
Clothes Dryer	*	10	*	*
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.

¹⁹There were no NFIRS confined fire deaths in 2009 or 2010 and a rounded estimate of fewer than 10 confined cooking fire deaths in 2011.

TABLE 5c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED GAS-FIRED EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential²⁰	12,140	12,910	13,400	12,820
Total Gas-Fired Equipment	540	660	650	610
Gas Heating Equipment	180	230	220	210
Fixed Heater	60	60	90	70
Portable Heater	20	10	20	20
Central Heating	20	40	10	20
Fireplace, Chimney, Connector	*	10	*	10
Water Heater	70	80	80	80
Fixed, Central Air Conditioning	*	*	*	*
Other	10	20	20	20
Gas Cooking Equipment	250	280	240	260
Range/Oven	180	210	170	190
Open Gas Grill	20	40	20	30
Other	50	30	40	40
Other Selected Gas Equipment	60	90	130	90
Clothes Dryer	40	50	80	60
Torch	10	20	30	20
Shop/Garden Tool	10	20	20	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.

²⁰ 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 8b on p. 31 for details.

TABLE 5d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED GAS-FIRED EQUIPMENT, 2009–2011

Equipment	2009	2010	2011	2009–2011 Average
Total Residential²¹	\$6,958.7	\$6,627.6	\$6,434.9	\$6,673.7
Total Gas-Fired Equipment	\$219.2	\$250.0	\$241.9	\$237.1
Gas Heating Equipment	\$86.7	\$103.9	\$103.6	\$98.1
Fixed Heater	\$27.8	\$21.5	\$21.8	\$23.7
Portable Heater	\$3.3	\$12.7	\$2.4	\$6.1
Central Heating	\$13.9	\$16.7	\$19.8	\$16.8
Fireplace, Chimney, Connector	\$4.9	\$15.4	\$9.1	\$9.8
Water Heater	\$29.6	\$27.7	\$42.8	\$33.4
Fixed, Central Air Conditioning	*	\$0.2	\$0.5	\$0.2
Other	\$7.1	\$9.8	\$7.2	\$8.0
Gas Cooking Equipment	\$52.3	\$89.3	\$76.8	\$72.8
Range/Oven	\$29.8	\$39.6	\$32.6	\$34.0
Open Gas Grill	\$11.6	\$32.2	\$33.1	\$25.6
Other	\$11.0	\$17.5	\$11.1	\$13.2
Other Selected Gas Equipment	\$59.0	\$43.4	\$49.9	\$50.8
Clothes Dryer	\$10.4	\$15.8	\$13.4	\$13.2
Torch	\$40.9	\$10.5	\$10.9	\$20.8
Shop/Garden Tool	\$7.7	\$17.1	\$25.5	\$16.8

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

Note: Property loss estimates are rounded to the nearest tenth of a million dollars. 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.

²¹ 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 8c 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 and dealing with 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 U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) data.

The NFPA survey is a stratified random sample of fire departments in the United States.²² 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 2009 through 2011.

Table 6. NFPA Estimates of Residential Structure Fires and Associated Losses 2009–2011

	2009	2010	2011
Structure Fires	377,000	384,000	386,000
Civilian Deaths	2,590	2,665	2,550
Civilian Injuries	13,050	13,800	14,360
Property Loss	\$7.80 billion	\$7.08 billion	\$7.05 billion

Source: See footnote 1 below.

The table above contains the only data from the NFPA survey that is used by CPSC staff for making fire loss estimates.

The NFIRS is a compilation of incident reports submitted voluntarily to the U.S. Fire Administration (USFA) 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, the District of Columbia, and U.S. territories in each of the three years (2009, 2010, and 2011). Not all the states reporting included data from every fire department in the state. The number of fire departments participating in NFIRS increased from 21,457 in 2009, to 21,502 in 2010, to 21,915 in 2011. The next table shows the number of residential structure fires and the corresponding losses reported to USFA during the years 2009 through 2011.

²² M.J. Karter, "Fire Loss in the U.S. During 2009," National Fire Protection Association (NFPA), August 2010; M.J. Karter, "Fire Loss in the U.S. During 2010," National Fire Protection Association (NFPA), September 2011; M.J. Karter, "Fire Loss in the U.S. During 2011," National Fire Protection Association (NFPA), September 2012.

Table 7. Residential Structure Fires and Associated Losses Reported to NFIRS 2009–2011

	2009	2010	2011
Structure Fires	264,076	287,475	286,136
Civilian Deaths	1,442	1,530	1,512
Civilian Injuries	7,514	8,207	8,273
Property Loss	\$4.20 billion	\$4.21 billion	\$4.21 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 382,333 residential structure fires in the U.S. during 2009 to 2011 and an annual average of 2,602 deaths, 13,737 injuries, and \$7.3 billion in property losses during that time period (Table 6). NFIRS captured about 73 percent of these fires, 57 percent of the deaths, 58 percent of the injuries, and 58 percent of the property loss (Table 7).

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"> 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>CPSC staff regrouped the codes as:</p> <ul style="list-style-type: none"> 1: intentional 0, 2, 3, 4 or fire involving child play*: unintentional 5, U, missing information: unknown.
<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.

* 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.²³

Data Preparation—Addressing Different Types of Missing Data

There are four general types of missing data in NFIRS: (1) data where the value of the missing variable can be inferred logically; (2) missing data from exposure fires; (3) missing data from confined fires; and (4) other missing data. Standard practice in analysis of fire data over the last 20 years 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 fewer are required for confined fires, which will be discussed below. Tables 1, 3, 4, and 5 in this report rely heavily on the variables Equipment Involved and Equipment Power Source. To reduce the extent of missing data, CPSC staff has implemented some conventions, as necessary, following consultation with USFA technical staff. For example, if the heat source is known to be matches, lighters, or candles, and no equipment is reported, then it is likely that equipment was not involved, rather than equipment being unknown. Similarly, if the factor contributing to the ignition of a fire is reported to be an act of nature— such as an earthquake or a storm—and no equipment is reported, then it is likely that no equipment was involved.

Another scenario is 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. Similarly, when it is known that there is no electrical equipment involved, the power source should be reported as “none” instead of “unknown.”

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

²³ 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 these codes were created in version 5.0 to simplify the coding of these fires. When reporting confined fires, the Cause of Ignition, Equipment Involved, Item First Ignited, and Power Source are not required.

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 of 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 8a. Estimated Residential Confined Fires: 2009–2011

Included in Table Categories:	Appear in Tables:	2009	2010	2011
Total Residential	1a, 2a, 3a, 4a, 5a	183,600	180,600	178,900
Total Heating and Cooling Equipment	1a, 3a	36,900	33,800	31,300
<i>Fireplace, Chimney, Connector</i>	<i>1a, 3a</i>	<i>24,200</i>	<i>22,400</i>	<i>20,800</i>
<i>Other (Burner/Boiler)</i>	<i>1a, 3a</i>	<i>12,700</i>	<i>11,400</i>	<i>10,500</i>
Cooking	1a, 2a	129,700	129,900	129,500
Trash, Rubbish	2a	15,300	15,400	16,600
Incinerator	-	600	700	600
Trash Compactor	-	1,200	900	900

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 2009 and 2010 there were no reported confined fire deaths. In 2011 there was one reported confined fire cooking death which lead to an estimate of fewer than ten deaths.

Table 8b. Estimated Residential Confined Fire Injuries: 2009–2011

Included in Table Categories:	Appear in Tables:	2009	2010	2011
Total Residential	1c, 2c, 3c, 4c, 5c	1,780	1,960	1,770
Total Heating and Cooling Equipment	1c, 3c	50	70	60
<i>Fireplace, Chimney, Connector</i>	<i>1c, 3c</i>	<i>10</i>	<i>30</i>	<i>30</i>
<i>Other (Burner/Boiler)</i>	<i>1c, 3c</i>	<i>50</i>	<i>40</i>	<i>30</i>
Cooking	1c, 2c	1,650	1,810	1,640
Trash, Rubbish	2c	70	70	70
Incinerator	-	*	*	*
Trash Compactor	-	*	*	*

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 8c. Estimated Residential Confined Fire Property Loss (In Millions): 2009–2011

Included in Table Categories:	Appear in Tables:	2009	2010	2011
Total Residential	1d, 2d, 3d, 4d, 5d	\$51.1	\$37.7	\$37.2
Total Heating and Cooling Equipment	1d, 3d	\$10.4	\$7.7	\$8.1
<i>Fireplace, Chimney, Connector</i>	<i>1d, 3d</i>	\$6.4	\$5.8	\$5.9
<i>Other (Burner/Boiler)</i>	<i>1d, 3d</i>	\$4.0	\$1.9	\$2.2
Cooking	1d, 2d	\$37.7	\$27.1	\$26.7
Trash, Rubbish	2d	\$2.3	\$2.3	\$1.9
Incinerator	-	\$0.8	\$0.6	\$0.4
Trash Compactor	-	*	*	*

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 9a–9c 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.

Table 9a. Missing Data on Residential Structure Fires: 2009–2011

	2009	2010	2011
Cause of Ignition	33%	33%	33%
Heat Source	37%	36%	37%
Item First Ignited	36%	36%	37%
Equipment Involved	48%	49%	49%
Equipment Power	48%	49%	49%

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

Table 9b. Missing Data on Residential Structure Fire Deaths: 2009–2011

	2009	2010	2011
Cause of Ignition	59%	57%	60%
Heat Source	58%	57%	58%
Item First Ignited	56%	59%	56%
Equipment Involved	53%	54%	56%
Equipment Power	53%	53%	57%

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

Table 9c. Missing Data on Residential Structure Fire Injuries: 2009–2011

	2009	2010	2011
Cause of Ignition	35%	35%	34%
Heat Source	32%	32%	32%
Item First Ignited	31%	32%	32%
Equipment Involved	41%	42%	40%
Equipment Power	41%	42%	40%

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

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 performed using a SAS[®] macro.²⁴ The raking procedure maintains the marginal distributions for the known data, while allocating the unknown data for all characteristics involved.²⁵ For each year, the raking procedure was applied separately for fires, deaths, injuries, and property loss.

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 2009, 2010, and 2011, 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 33 such high property loss fires assigned for investigation. In 16 of them, the property loss estimate was confirmed. In the remaining 17, a different property loss estimate was obtained, and the data were corrected.

In addition to the quality control checking of high property loss fire reports, some quality control was carried out on multiple-death fire incidents for the 2009, 2010, and 2011 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 97 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, 47 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 some instances the investigation concludes that the deaths involved were not the result of a fire and the data are edited accordingly.

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.

²⁴ M. Battaglia, D. Hoaglin and D. Izrael, “To Rake or Not To Rake Is Not the Question Anymore with the Enhanced Raking Macro,” SAS[®] Users Group International (SUGI) 29th Annual Conference, May 9–12, 2004, Paper #207-29.

²⁵ M.A. Greene, L.E. Smith, M.S. Levenson, S. Hiser, and J.H. Mah, “Raking Fire Data,” Presented at the Federal Conference on Statistical Methodology, Arlington, VA, 2001.

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 fires 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, a review of the 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 2011 (42 percent to 46 percent). This small increase probably has little effect on the fire estimates for specific products.

After a six percent decrease in the total estimate (378,000 to 357,000) from 2008 to 2009 and a larger than six percent decrease for many individual products, the total residential fire estimate increased from 357,000 in 2009 to 364,300 in 2010 to 365,500 in 2011. The 2011 total fire estimates are higher than 2009 but still below 2008. The estimate for total residential structure fire injuries also increased from 2009 to 2011. The estimate went from 12,140 in 2009 to 12,910 in 2010 to 13,400 in 2011 – an increase of ten percent. Unlike fires and injuries, the estimates for total residential structure fire property loss have been decreasing. This estimate reached a peak of \$7.69 billion in 2008 but fell to \$6.96 billion in 2009, \$6.63 billion in 2010, and \$6.43 billion in 2011. This is a decrease of sixteen percent from 2008 to 2011. The estimate for total residential structure fire deaths did not change much from 2009 to 2011. The estimate went from 2,210 in 2009 up to 2,330 in 2010 and down to 2,240 in 2011 for an overall increase of one percent.