



2012–2014 Residential Fire Loss Estimates*

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

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CPSC 640(1) CLEARED for PUBLIC

NO MFRS/PRVTLBLRS OR
PRODUCTS IDENTIFIED

EXCEPTED BY: PETITION
RULEMAKING ADMIN. PRCDG

WITH PORTIONS REMOVED: _____

John
7/17/17

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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 2012 through 2014, 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:

- 351,400 fires, 1,960 deaths, 11,860 injuries, and \$6.38 billion in property loss in 2012; and
- 359,400 fires, 2,290 deaths, 11,420 injuries, and \$6.22 billion in property loss in 2013; and
- 361,500 fires, 2,420 deaths, 11,120 injuries, and \$6.35 billion in property loss in 2014; and
- an estimated annual average of 357,400 fires, 2,220 deaths, 11,470 injuries, and \$6.32 billion in property loss over the three-year period 2012–2014.

Consumer products involved in fires can be categorized as “sources of ignition” or as “the materials first ignited.” Sources of ignition can be small, such as candles, or large, such as ranges. The larger sources of ignition, which are operating equipment, are identified in NFIRS as “equipment.” Smaller sources of ignition that are not equipment, such as candles, matches, and lighters, are identified in NFIRS as “heat sources.”

Because the fire losses are derived separately for sources of ignition and materials first ignited, estimates presented in this report can overlap in some cases. For example, a fire involving a candle igniting a mattress can count as both a candle fire (heat source) and a mattress fire (item first ignited). Additionally, these estimates do not account for all of the involvement of materials, because items that are neither the heat source, nor the item **first** ignited, can still be involved in (and in some cases be a significant factor in) residential fire losses. An example is a cigarette igniting newspapers and then the flaming newspapers igniting upholstered furniture.

For 2012 through 2014, the relative ranking of the greatest contributors to fire losses (as measured by heat sources and items first ignited) remained largely unchanged from what was reported for 2011–2013. Tables 1a–1d show:

- Cooking equipment accounted for the largest percentage of fires. An estimated annual average of 156,900 cooking equipment-related fires during 2012–2014 accounted for 43.9 percent of the average annual estimate of total residential fires for the same period. The corresponding death estimate is an annual average of 180 deaths, which is 7.9 percent of the average annual estimate of total residential fire deaths. The annual average number of cooking fire injuries for 2012–2014 was estimated to be 3,280, which represents 28.6 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 43,700 fires for 2012–2014 was 12.2 percent of the annual average estimate of total residential fires during the same period. The corresponding death estimate is an annual average of 210 deaths, which is 9.3 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 810. This accounts for 7.0 percent of the annual average estimate of total injuries during 2012–2014.

- During 2012–2014, an estimated annual average of 9,400 fires was attributable to electrical distribution equipment (*e.g.*, installed wiring, lighting). This is 2.6 percent of the estimated annual average number of residential fires for this period. The annual average death estimate is 140 (6.4 percent of average annual estimated residential fire deaths); the injury estimates averaged 450, which is 3.9 percent of the estimated annual average of residential fire injuries.
- For item first ignited, upholstered furniture was involved in the greatest number of fire deaths. From 2012 through 2014, an estimated annual average of 440 deaths was associated with these fires. This constitutes 19.7 percent of the estimated annual average of total deaths associated with residential structure fires for the same period. On average, during 2012 to 2014, mattress or bedding ignitions accounted for an annual average of 340 deaths, which is 15.2 percent of the average annual estimated number of total residential fire deaths.
- For heat source, smoking materials were the largest contributor to deaths, associated with an annual average of 450 deaths from 2012 to 2014. This is 20.5 percent of the estimated annual average of total residential fire deaths. Smoking materials, however, comprise only 3.0 percent of the total estimated residential fires.
- Among products that are heat sources, candles were involved the second highest number of deaths. The estimated annual average of deaths from candle fires is 70, which is 3.0 percent of the average estimated total number of residential fire deaths from 2012 to 2014. Candles account for an estimated 1.7 percent of the fires.
- There were an estimated 50 deaths from lighter fires (2.4 percent of the estimated annual average of total residential fire deaths), although lighters are only involved in an estimated 0.5 percent of the fires.
- On average, matches were responsible for 20 deaths, or 0.9 percent of total deaths annually. Matches were involved in only 0.1 percent of residential fires.
- The estimates for fire injuries fell during the 2012–2014 time period from 11,860 in 2012, to 11,420 in 2013, and 11,120 in 2014.

The USFA implemented a new coding rule for NFIRS cases beginning with 2012 data. The new rule states that if the Heat Source or the Factor Contributing to Ignition codes suggest that there was equipment involved, the Equipment Involved in Ignition must be coded and cannot be coded as “NNN – No equipment.” For example, if the heat source was coded as “13 – Arcing,” then the coder must code the equipment involved. This coding rule appears to have impacted the data in two ways. First, the coding reduced the proportion of fires coded with Heat Source codes that suggest that equipment was involved.¹ Second, this coding rule increased the coding of specific equipment codes, particularly “Electrical Equipment,” and reduced the proportion of “Missing Equipment” data.

Given the large proportion of missing data in NFIRS (see Tables 9a-9d on page 33) that must be imputed, the questionnaire change would substantially alter estimates based on heat source or equipment involved, unless an adjustment is made to account for the questionnaire change. Therefore, an adjustment was made to the raw counts for electrical equipment involved, electrical heat sources, and the proportion of missing values for the equipment and heat source variables. This was done before imputation to match historically observed proportions to prevent estimates from being altered dramatically (and implausibly) by this design change. However, these adjustments alone cannot fully account for the impact of the change. Interpretations of changes (or lack thereof) in estimates between 2011 (and before) and 2012 to 2014 should be done with caution.

Due to the effect that this new coding rule had on the data, USFA decided to revert back to the old rule beginning with 2015 data. So, beginning in 2015, coders have once again been able to leave the Equipment Involved in Ignition code blank or code it as “NNN – No equipment,” even if they used a Heat Source code or Factor Contributing to Ignition code that implied there was equipment involved in the fire. The three years where the coders were not permitted to do this are the three years explored in this report, 2012, 2013, and 2014.

¹ There are four of these heat source codes: “10 – Heat from powered equipment, other”; “11 – Spark, ember, or flame from operating equipment”; “12 – Radiated, conducted heat from operating equipment”; “13 – Arcing.”

Introduction

The fire loss estimates presented in this report are based on the National Fire Protection Association's (NFPA) national fire loss estimates² and the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) data. The NFPA makes national estimates of fires, deaths, injuries, and property losses based on a probability sample survey of U.S. fire departments. The NFIRS compiles fire incident reports submitted voluntarily to the USFA by U.S. fire departments. Not all the states reporting include data from all fire departments in the state. Among the wealth 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 was made to the NFIRS data coding system, version 5.0, was implemented. In 1999, 5 percent of the residential fire data were coded by fire departments in the new NFIRS version 5.0; in 2000, 20 percent were 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 through 2014.

To arrive at the product-specific estimates presented in this report, the NFIRS data were weighted up to the 2012, 2013, and 2014 NFPA estimates for total U.S. fire losses. This was done separately for fires, deaths, injuries, and property loss.

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 forward, as the use of version 5.0 increased, an increasingly large number of confined fires were reported. In 1999, about 2 percent of residential structure fires were reported as confined; by 2014, 49 percent of residential structure fires reported to NFIRS were confined.

In confined fire cases, frequently it is not possible to determine the type of equipment involved because the equipment is rarely coded. For example, when a fire is identified as a "confined cooking fire" in NFIRS, it is rarely possible to distinguish a fire started by a range versus other cooking equipment, such as a microwave oven or toaster. Consequently, confined cooking fire

² M.J. Karter, "Fire Loss in the U.S. During 2012," National Fire Protection Association (NFPA), September 2013; M.J. Karter, "Fire Loss in the U.S. During 2013," National Fire Protection Association (NFPA), September 2014; M.J. Karter, "Fire Loss in the U.S. During 2014," National Fire Protection Association (NFPA), September 2015.

losses are only included as part of the “Total Cooking Equipment” fires, but they are not included in subcategories that define the equipment involved or the power source. Because ranges certainly are involved in some confined fires, this should be considered in evaluating the cooking fire hazard. The same is true for microwave ovens and other cooking equipment.

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

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

In some instances, consumer products ignited by the fire may contribute to the spread or severity of the fire, but not be included in the category Item First Ignited. An example would be where carpeting is the item first ignited in the fire, but upholstered furniture ignites next and increases the severity of the fire. In that case, upholstered furniture plays a role in the fire, but the fire is not counted toward the estimates for upholstered furniture fires and losses.

Results

Consistent with previous years' reports, CPSC staff has presented data here using five main tables. Each numbered table (1–5) has four associated sub-tables: Table “a” presents the fire estimates; “b” presents the death estimates; “c” presents the injury estimates; and “d” presents the property loss estimates. 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; meanwhile, in Table 2, either the heat source or the item first ignited was the primary means of identifying the product. Thus, some estimates provided in the different sections of the tables overlap. For example, in Table 2, estimates of fires involving cigarette ignition of upholstered furniture are included in the estimates for cigarettes (by heat source), as well as in the estimates for upholstered furniture-smoking material ignition (by item first ignited). 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, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential³	351,400	359,400	361,500	357,400
Total Heating and Cooling Equipment²	41,800	44,900	44,300	43,700
Local Fixed Heater	3,700	4,200	4,400	4,100
Portable Heater	1,100	1,400	1,600	1,400
Central Heating	600	800	800	700
Fireplace, Chimney, Chimney Connector ²	21,200	23,100	22,500	22,300
Water Heater	1,500	1,500	1,500	1,500
Air Conditioning	1,200	1,000	1,100	1,100
Other ²	13,300	13,600	13,300	13,400
Total Cooking Equipment²	153,000	157,800	159,900	156,900
Range/Oven	13,200	13,300	13,100	13,200
<i>Gas</i>	1,800	2,000	1,800	1,900
<i>Electric</i>	11,300	11,300	11,300	11,300
<i>Other</i>	*	*	*	*
Microwave Oven	600	600	500	500
All Other Cooking	4,100	3,300	3,300	3,500
<i>Gas</i>	900	800	800	800
<i>Electric</i>	2,900	2,200	2,300	2,500
<i>Other</i>	400	200	200	300
Total Electrical Distribution	9,500	9,500	9,400	9,400
Installed Wiring	4,400	4,600	4,700	4,600
Cord, Plug	900	900	900	900
Receptacle, Switch	1,200	1,300	1,200	1,200
Lighting	1,400	1,300	1,200	1,300
Other	1,500	1,400	1,400	1,400
Other Selected Equipment	7,700	7,800	7,600	7,700
Audio/Visual Equipment	300	300	300	300
Clothes Dryer	5,100	5,200	4,900	5,100
Dishwasher	400	300	400	400
Washing Machine	200	200	200	200
Torch	400	500	500	500
Refrigerator/Freezer	600	600	600	600
Shop/Garden Tool	600	600	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.

³ 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. 32 for details.

TABLE 1b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential⁴	1,960	2,290	2,420	2,220
Total Heating and Cooling Equipment	210	180	230	210
Local Fixed Heater	80	70	70	80
Portable Heater	70	80	90	80
Central Heating	20	*	10	10
Fireplace, Chimney, Chimney Connector ³	20	10	20	20
Water Heater	*	*	*	*
Air Conditioning	10	10	10	10
Other ³	20	20	30	20
Total Cooking Equipment³	130	190	210	180
Range/Oven	100	180	190	160
<i>Gas</i>	10	60	20	30
<i>Electric</i>	90	120	170	120
<i>Other</i>	*	*	*	*
Microwave Oven	*	*	10	*
All Other Cooking	20	*	20	10
<i>Gas</i>	10	*	10	10
<i>Electric</i>	20	*	10	10
<i>Other</i>	*	*	*	*
Total Electrical Distribution	130	150	150	140
Installed Wiring	80	50	70	70
Cord, Plug	30	50	40	40
Receptacle, Switch	*	20	20	10
Lighting	10	10	10	10
Other	10	10	10	10
Other Selected Equipment	20	20	10	10
Audio/Visual Equipment	*	*	*	*
Clothes Dryer	10	10	*	*
Dishwasher	*	*	*	*
Washing Machine	*	*	*	*
Torch	*	*	*	*
Refrigerator/Freezer	10	10	10	10
Shop/Garden Tool	*	*	*	*

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

⁴ There were no NFIRS confined fire deaths in 2012, 2013, or 2014.

TABLE 1c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential⁵	11,860	11,420	11,120	11,470
Total Heating and Cooling Equipment⁴	790	790	830	810
Local Fixed Heater	340	340	330	330
Portable Heater	90	130	140	120
Central Heating	40	30	30	30
Fireplace, Chimney, Chimney Connector ⁴	60	50	70	60
Water Heater	50	60	60	50
Air Conditioning	80	50	50	60
Other ⁴	180	160	210	180
Total Cooking Equipment⁴	3,470	3,300	3,080	3,280
Range/Oven	1,390	1,400	1,410	1,400
<i>Gas</i>	180	220	160	190
<i>Electric</i>	1,200	1,180	1,250	1,210
<i>Other</i>	10	10	*	10
Microwave Oven	30	40	30	30
All Other Cooking	360	300	280	310
<i>Gas</i>	80	70	60	70
<i>Electric</i>	260	210	200	220
<i>Other</i>	20	10	20	20
Total Electrical Distribution	460	440	430	450
Installed Wiring	170	150	180	170
Cord, Plug	80	90	90	90
Receptacle, Switch	60	80	40	60
Lighting	90	60	60	70
Other	70	70	60	70
Other Selected Equipment	320	260	260	280
Audio/Visual Equipment	40	20	20	30
Clothes Dryer	180	150	160	160
Dishwasher	20	10	10	10
Washing Machine	10	*	*	*
Torch	20	20	20	20
Refrigerator/Freezer	40	40	20	30
Shop/Garden Tool	20	30	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.

⁵ There are confined fire injury estimates included in *Total Residential*, *Total Heating and Cooling Equipment*, *Fireplace, Chimney, Chimney Connector*, *Other*, and *Total Cooking Equipment* categories. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment. See Table 8b on p. 32 for details.

TABLE 1d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012 – 2014 Average
Total Residential⁶	\$6,380.7	\$6,218.3	\$6,352.1	\$6,317.0
Total Heating and Cooling Equipment⁵	\$425.2	\$496.6	\$541.5	\$487.8
Local Fixed Heater	\$100.4	\$128.0	\$117.8	\$115.4
Portable Heater	\$52.1	\$65.8	\$69.5	\$62.4
Central Heating	\$19.2	\$32.4	\$23.0	\$24.9
Fireplace, Chimney, Chimney Connector ⁵	\$93.6	\$109.1	\$146.4	\$116.4
Water Heater	\$31.4	\$35.3	\$31.3	\$32.7
Air Conditioning	\$32.9	\$26.2	\$26.0	\$28.4
Other ⁵	\$116.2	\$116.4	\$140.9	\$124.5
Total Cooking Equipment⁵	\$474.1	\$433.1	\$408.5	\$438.6
Range/Oven	\$304.6	\$285.3	\$270.5	\$286.8
<i>Gas</i>	\$38.6	\$43.3	\$40.3	\$40.7
<i>Electric</i>	\$265.4	\$241.4	\$229.7	\$245.5
<i>Other</i>	\$0.7	\$0.7	\$0.5	\$0.6
Microwave Oven	\$11.3	\$9.2	\$9.8	\$10.1
All Other Cooking	\$131.2	\$103.8	\$99.5	\$111.5
<i>Gas</i>	\$47.1	\$30.6	\$25.7	\$34.5
<i>Electric</i>	\$73.3	\$65.1	\$65.7	\$68.0
<i>Other</i>	\$10.8	\$8.1	\$8.1	\$9.0
Total Electrical Distribution	\$334.1	\$313.6	\$326.1	\$324.6
Installed Wiring	\$170.2	\$149.9	\$169.0	\$163.0
Cord, Plug	\$35.9	\$33.3	\$34.3	\$34.5
Receptacle, Switch	\$34.5	\$36.5	\$30.8	\$34.0
Lighting	\$40.1	\$42.9	\$38.9	\$40.6
Other	\$53.4	\$51.0	\$53.0	\$52.5
Other Selected Equipment	\$164.1	\$177.9	\$170.9	\$171.0
Audio/Visual Equipment	\$14.7	\$10.9	\$5.3	\$10.3
Clothes Dryer	\$80.1	\$78.9	\$59.7	\$72.9
Dishwasher	\$11.1	\$11.3	\$12.3	\$11.6
Washing Machine	\$2.5	\$1.8	\$2.4	\$2.2
Torch	\$12.8	\$15.3	\$37.3	\$21.8
Refrigerator/Freezer	\$20.6	\$24.2	\$25.3	\$23.4
Shop/Garden Tool	\$22.9	\$35.6	\$29.0	\$29.2

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

Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Subtotals do not necessarily add to heading totals. Estimates exclude property loss from intentionally set fires.

⁶ 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. 33 for details.

TABLE 2a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED PRODUCTS, 2012–2014

Product	2012	2013	2014	2012–2014 Average
Total Residential⁷	351,400	359,400	361,500	357,400
By Heat Source				
Cigarette, Other Tobacco Products	11,600	10,100	10,000	10,600
Match	500	500	400	500
Lighter	1,700	1,700	1,500	1,600
Candle	6,100	6,200	5,700	6,000
By Item First Ignited				
Upholstered Furniture	4,500	4,600	4,400	4,500
Smoking Material Ignition	1,200	1,100	1,100	1,100
Open-Flame Ignition	600	500	500	500
Other	2,700	3,000	2,900	2,900
Mattress, Bedding	7,300	7,700	7,500	7,500
Smoking Material Ignition	1,500	1,500	1,500	1,500
Open-Flame Ignition	1,400	1,500	1,300	1,400
Other	4,300	4,800	4,800	4,600
Other Materials				
Cooking Materials ⁶	158,500	163,100	164,400	162,000
Electric Cable Insulation	16,300	16,700	17,300	16,800
Interior Wall Covering	6,400	6,400	6,500	6,400
Wearing Apparel-Worn	300	300	300	300
Wearing Apparel-Not Worn	5,400	5,500	4,900	5,300
Floor Covering	3,500	3,500	3,400	3,400
Curtains, Drapes	1,400	1,500	1,300	1,400
Magazines, Newspaper	1,600	1,600	1,600	1,600
Thermal Insulation	5,200	5,700	5,700	5,500
Cabinet, Desk	4,500	4,600	4,700	4,600
Trash, Rubbish ⁶	22,300	22,000	21,600	22,000
Toy, Game	200	200	200	200
Box, Carton, Bag, Basket, Barrel	2,600	2,800	2,600	2,700

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. Subtotals do not necessarily add up to heading totals.

Estimates exclude intentionally set fires.

⁷ 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. 32 for details.

TABLE 2b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED PRODUCTS, 2012–2014

Product	2012	2013	2014	2012–2014 Average
Total Residential⁸	1,960	2,290	2,420	2,220
By Heat Source				
Cigarette, Other Tobacco Products	420	480	460	450
Match	10	20	30	20
Lighter	40	50	70	50
Candle	80	40	80	70
By Item First Ignited				
Upholstered Furniture	370	410	540	440
Smoking Material Ignition	140	210	180	180
Open-Flame Ignition	20	*	40	20
Other	210	200	310	240
Mattress, Bedding	350	310	360	340
Smoking Material Ignition	150	90	190	140
Open-Flame Ignition	30	60	20	40
Other	170	150	150	160
Other Materials				
Cooking Materials ⁷	100	180	170	150
Electric Cable Insulation	100	140	160	130
Interior Wall Covering	90	70	60	70
Wearing Apparel-Worn	70	140	60	90
Wearing Apparel-Not Worn	20	40	40	30
Floor Covering	80	30	80	60
Curtains, Drapes	10	20	20	20
Magazines, Newspaper	30	60	40	40
Thermal Insulation	*	*	10	*
Cabinet, Desk	30	20	40	30
Trash, Rubbish	20	50	20	30
Toy, Game	*	*	*	*
Box, Carton, Bag, Basket, Barrel	30	10	*	10

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

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

⁸ There were no NFIRS confined fire deaths in 2012, 2013 or 2014.

TABLE 2c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED PRODUCTS, 2012–2014

Product	2012	2013	2014	2012–2014 Average
Total Residential⁹	11,860	11,420	11,120	11,470
By Heat Source				
Cigarette, Other Tobacco Products	930	1,010	1,020	990
Match	110	70	60	80
Lighter	320	280	240	280
Candle	590	700	690	660
By Item First Ignited				
Upholstered Furniture	610	670	710	660
Smoking Material Ignition	210	190	200	200
Open-Flame Ignition	90	70	80	80
Other	310	410	430	380
Mattress, Bedding	1,090	1,110	1,160	1,120
Smoking Material Ignition	270	360	370	330
Open-Flame Ignition	310	280	360	320
Other	510	470	440	470
Other Materials				
Cooking Materials ⁸	4,110	3,730	3,830	3,890
Electric Cable Insulation	450	400	560	470
Interior Wall Covering	270	160	200	210
Wearing Apparel-Worn	70	120	90	100
Wearing Apparel-Not Worn	320	210	330	290
Floor Covering	250	190	210	220
Curtains, Drapes	130	140	110	130
Magazines, Newspaper	120	80	170	120
Thermal Insulation	120	70	60	80
Cabinet, Desk	270	240	350	290
Trash, Rubbish ⁸	260	280	220	250
Toy, Game	10	30	*	20
Box, Carton, Bag, Basket, Barrel	100	100	160	120

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

Note: Injury estimates are rounded to the nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*).

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

⁹ There are confined fire injury estimates included in *Total Residential*, *Cooking Materials*, and *Trash, Rubbish* categories. Estimates for confined cooking fire injuries are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 8b on p. 32 for details.

TABLE 2d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED PRODUCTS, 2011–2013

Product	2012	2013	2014	2012–2014 Average
Total Residential¹⁰	\$6,380.7	\$6,218.3	\$6,352.1	\$6,317.0
By Heat Source				
Cigarette, Other Tobacco Products	\$431.9	\$391.4	\$334.6	\$386.0
Match	\$16.8	\$21.5	\$17.5	\$18.6
Lighter	\$69.1	\$215.8	\$58.0	\$114.3
Candle	\$216.5	\$212.6	\$223.2	\$217.4
By Item First Ignited				
Upholstered Furniture	\$222.4	\$225.9	\$242.3	\$230.2
Smoking Material Ignition	\$59.9	\$53.0	\$62.4	\$58.4
Open-Flame Ignition	\$29.5	\$26.6	\$30.9	\$29.0
Other	\$133.0	\$146.3	\$149.0	\$142.8
Mattress, Bedding	\$259.3	\$263.2	\$276.1	\$266.2
Smoking Material Ignition	\$47.2	\$48.6	\$47.6	\$47.8
Open-Flame Ignition	\$53.2	\$51.4	\$66.9	\$57.2
Other	\$158.9	\$163.2	\$161.7	\$161.3
Other Materials				
Cooking Materials ⁹	\$522.8	\$534.8	\$549.6	\$535.7
Electric Cable Insulation	\$447.7	\$463.5	\$437.6	\$449.6
Interior Wall Covering	\$296.7	\$277.4	\$301.7	\$291.9
Wearing Apparel-Worn	\$15.6	\$7.7	\$4.4	\$9.2
Wearing Apparel-Not Worn	\$127.0	\$282.1	\$119.3	\$176.1
Floor Covering	\$130.7	\$101.0	\$105.6	\$112.4
Curtains, Drapes	\$37.6	\$53.3	\$62.6	\$51.2
Magazines, Newspaper	\$82.4	\$44.9	\$44.4	\$57.2
Thermal Insulation	\$149.9	\$183.6	\$193.2	\$175.5
Cabinet, Desk	\$179.5	\$178.3	\$174.5	\$177.4
Trash, Rubbish ⁹	\$158.8	\$157.2	\$137.3	\$139.9
Toy, Game	\$3.9	\$3.3	\$4.5	\$3.9
Box, Carton, Bag, Basket, Barrel	\$108.6	\$101.1	\$104.5	\$104.7

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

Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Subtotals do not necessarily add to heading totals. Estimates exclude property loss from intentionally set fires.

¹⁰ 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. 33 for details.

TABLE 3a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
HEATING AND COOLING EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential¹¹	351,400	359,400	361,500	357,400
Total Heating and Cooling Equipment¹⁰	41,800	44,900	44,300	43,700
Solid Fuel	1,900	2,100	2,000	2,000
Fixed Heater	500	500	400	500
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	1,300	1,500	1,400	1,400
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	2,100	2,400	2,300	2,300
Fixed Heater	700	800	800	700
Portable Heater	100	100	100	100
Fireplace, Chimney, Chimney Connector	100	200	200	200
Central Heating	300	300	300	300
Water Heater	700	800	700	800
Fixed, Central Air Conditioning	*	*	*	*
Other	200	200	200	200
Electric	8,300	9,400	10,100	9,300
Fixed Heater	2,500	2,900	3,100	2,800
Portable Heater	1,000	1,200	1,300	1,100
Central Heating	300	400	400	300
Water Heater	700	700	800	700
Fixed, Central Air Conditioning	800	700	800	800
Portable Air Conditioner	400	300	300	300
Other	3,400	4,000	4,300	3,900
Liquid Fuel	200	300	300	300
Fixed Heater	*	100	*	*
Portable Heater	100	100	200	100
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	*	100	100	100
Water Heater	*	*	*	*
Other	*	*	*	*
All Other Fuel	100	100	100	100

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

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

¹¹ There are confined fire estimates included in *Total Residential*, and *Total Heating and Cooling Equipment* categories. These confined fire estimates 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. 32 for details.

TABLE 3b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
HEATING AND COOLING EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential¹²	1,960	2,290	2,420	2,220
Total Heating and Cooling Equipment	210	180	230	210
Solid Fuel	50	40	40	40
Fixed Heater	40	30	10	30
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	20	10	20	20
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	40	10	40	30
Fixed Heater	20	10	20	20
Portable Heater	*	*	20	10
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	20	*	*	10
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Other	*	*	*	*
Electric	110	110	150	120
Fixed Heater	30	30	40	30
Portable Heater	60	60	60	60
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	10	*	*
Portable Air Conditioner	10	*	10	10
Other	10	10	30	20
Liquid Fuel	*	10	10	10
Fixed Heater	*	*	*	*
Portable Heater	*	10	10	10
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
All Other Fuel	*	*	*	*

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

¹² There were no NFIRS confined fire deaths in 2012, 2013 or 2014.

TABLE 3c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
HEATING AND COOLING EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential¹³	11,860	11,420	11,120	11,470
Total Heating and Cooling Equipment¹²	790	790	830	810
Solid Fuel	70	40	50	50
Fixed Heater	30	30	20	30
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	40	20	30	30
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	130	180	170	160
Fixed Heater	40	80	50	60
Portable Heater	10	10	30	20
Fireplace, Chimney, Chimney Connector	*	10	10	*
Central Heating	20	20	10	20
Water Heater	40	40	50	40
Fixed, Central Air Conditioning	*	*	*	*
Other	10	20	30	20
Electric	510	490	510	500
Fixed Heater	260	230	240	250
Portable Heater	60	100	100	90
Central Heating	10	10	10	10
Water Heater	10	10	10	10
Fixed, Central Air Conditioning	30	30	40	30
Portable Air Conditioner	40	30	10	30
Other	130	100	130	120
Liquid Fuel	30	20	30	30
Fixed Heater	*	*	*	*
Portable Heater	20	20	20	20
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	10	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
All Other Fuel	*	*	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.

¹³ 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. 32 for details.

TABLE 3d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
HEATING AND COOLING EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential¹⁴	\$6,380.7	\$6,218.3	\$6,352.1	\$6,317.0
Total Heating and Cooling Equipment¹³	\$425.2	\$496.6	\$541.5	\$487.8
Solid Fuel	\$102.5	\$126.9	\$107.7	\$112.4
Fixed Heater	\$21.7	\$29.0	\$22.6	\$24.4
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	\$78.9	\$94.9	\$82.2	\$85.4
Central Heating	\$1.0	\$2.3	\$1.0	\$1.4
Water Heater	*	*	*	*
Other	\$0.9	\$0.7	\$1.9	\$1.2
Gas-Fired	\$72.1	\$77.2	\$112.9	\$87.4
Fixed Heater	\$19.2	\$24.7	\$17.4	\$20.4
Portable Heater	\$5.2	\$5.9	\$4.8	\$5.3
Fireplace, Chimney, Chimney Connector	\$7.6	\$7.7	\$55.8	\$23.7
Central Heating	\$9.7	\$11.4	\$8.5	\$9.9
Water Heater	\$20.0	\$20.1	\$16.6	\$18.9
Fixed, Central Air Conditioning	\$0.1	*	\$0.1	\$0.1
Other	\$10.3	\$7.3	\$9.7	\$9.1
Electric	\$234.0	\$272.0	\$293.3	\$266.4
Fixed Heater	\$57.5	\$71.6	\$75.3	\$68.1
Portable Heater	\$43.6	\$53.2	\$57.7	\$51.5
Central Heating	\$7.3	\$16.9	\$10.4	\$11.5
Water Heater	\$10.6	\$15.2	\$14.2	\$13.3
Fixed, Central Air Conditioning	\$20.6	\$16.6	\$13.4	\$16.9
Portable Air Conditioner	\$12.1	\$9.6	\$12.4	\$11.4
Other	\$102.8	\$105.5	\$123.2	\$110.5
Liquid Fuel	\$6.7	\$11.4	\$16.5	\$11.5
Fixed Heater	\$1.4	\$2.6	\$2.3	\$2.1
Portable Heater	\$3.2	\$6.6	\$7.0	\$5.6
Fireplace, Chimney, Chimney Connector	\$0.1	\$0.1	\$0.3	\$0.1
Central Heating	\$1.3	\$1.8	\$3.1	\$2.1
Water Heater	\$0.4	*	\$0.4	\$0.3
Other	\$0.3	\$0.2	\$3.4	\$1.3
All Other Fuel	\$1.4	\$0.6	\$2.1	\$1.4

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.

¹⁴ 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. 33 for details.

TABLE 4a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED ELECTRICAL EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential¹⁵	351,400	359,400	361,500	357,400
Total Electrical	42,600	43,100	43,600	43,100
Electric Heating and Cooling	8,300	9,400	10,100	9,300
Central Heating	300	400	400	300
Local Fixed Heater	2,500	2,900	3,100	2,800
Portable Heater	1,000	1,200	1,300	1,100
Water Heater	700	700	800	700
Fixed, Central Air Conditioning	800	700	800	800
Portable Air Conditioner	400	300	300	300
Other	3,400	4,000	4,300	3,900
Electric Cooking Equipment	14,100	13,600	13,600	13,800
Range/Oven	11,300	11,300	11,300	11,300
Range/Oven Hood	200	200	100	200
Deep Fat Fryer	100	100	100	100
Grill	*	*	*	*
Microwave Oven	600	600	500	500
Small Heat-Producing Appliance	500	500	500	500
Other	2,600	2,000	2,000	2,200
Electrical Distribution	9,500	9,500	9,400	9,400
Installed Wiring	4,400	4,600	4,700	4,600
Light Fixture	1,000	900	900	900
Receptacle, Switch	1,200	1,300	1,200	1,200
Cord, Plug	900	900	900	900
Lamp, Light Bulb	500	400	400	400
Panel Board	500	400	400	400
Meter	300	300	300	300
Transformer	*	100	*	100
Other	700	700	700	700
Other Selected Electrical Appliances	6,000	5,800	5,600	5,800
Clothes Dryer	4,100	4,100	3,800	4,000
Dishwasher	400	300	400	400
Audio/Visual Equipment	300	300	300	300
Washing Machine	200	200	200	200
Refrigerator/Freezer	500	600	600	600
Shop/Garden Tools	300	200	300	200
Torch	100	100	100	100

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

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

¹⁵ There are confined fire estimates included in the *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. 32 for details.

TABLE 4b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED ELECTRICAL EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential¹⁶	1,960	2,290	2,420	2,220
Total Electrical	420	440	540	470
Electric Heating and Cooling	110	110	150	120
Central Heating	*	*	*	*
Local Fixed Heater	30	30	40	30
Portable Heater	60	60	60	60
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	10	*	*
Portable Air Conditioner	10	*	10	10
Other	10	10	30	20
Electric Cooking Equipment	110	120	170	130
Range/Oven	90	120	170	120
Range/Oven Hood	*	*	*	*
Deep Fat Fryer	*	*	*	*
Grill	*	*	*	*
Microwave Oven	*	*	10	*
Small Heat-Producing Appliance	20	10	*	10
Other	20	*	*	10
Electrical Distribution	130	150	150	140
Installed Wiring	80	50	70	70
Light Fixture	10	10	10	10
Receptacle, Switch	*	20	20	10
Cord, Plug	30	50	40	40
Lamp, Light Bulb	10	10	*	10
Panel Board	*	*	*	*
Meter	*	*	*	*
Transformer	*	*	*	*
Other	10	10	10	10
Other Selected Electrical Appliances	10	10	10	10
Clothes Dryer	*	*	*	*
Dishwasher	*	*	*	*
Audio/Visual Equipment	*	*	*	*
Washing Machine	*	*	*	*
Refrigerator/Freezer	10	10	10	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.

¹⁶ There were no NFIRS confined fire deaths in 2012, 2013, or 2014.

TABLE 4c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED ELECTRICAL EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential¹⁷	11,860	11,420	11,120	11,470
Total Electrical	2,970	2,790	2,840	2,870
Electric Heating and Cooling	510	490	510	500
Central Heating	10	10	10	10
Local Fixed Heater	260	230	240	250
Portable Heater	60	100	100	90
Water Heater	10	10	10	10
Fixed, Central Air Conditioning	30	30	40	30
Portable Air Conditioner	40	30	10	30
Other	130	100	130	120
Electric Cooking Equipment	1,460	1,390	1,450	1,430
Range/Oven	1,200	1,180	1,250	1,210
Range/Oven Hood	10	*	10	10
Deep Fat Fryer	20	10	*	10
Grill	*	*	*	*
Microwave Oven	30	40	30	30
Small Heat-Producing Appliance	50	40	50	50
Other	230	200	190	210
Electrical Distribution	460	440	430	450
Installed Wiring	170	150	180	170
Light Fixture	40	30	40	40
Receptacle, Switch	60	80	40	60
Cord, Plug	80	90	90	90
Lamp, Light Bulb	50	40	20	40
Panel Board	20	10	10	10
Meter	10	10	10	10
Transformer	*	*	*	*
Other	40	50	50	50
Other Selected Electrical Appliances	240	190	180	210
Clothes Dryer	130	110	120	120
Dishwasher	20	10	10	10
Audio/Visual Equipment	40	20	20	30
Washing Machine	10	*	*	*
Refrigerator/Freezer	40	40	20	30
Shop/Garden Tool	10	20	10	10
Torch	*	*	*	*

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.

¹⁷ There are confined fire injury estimates included in the *Total Residential* category. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8b on p. 32 for details.

TABLE 4d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED ELECTRICAL EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential¹⁸	\$6,380.7	\$6,218.3	\$6,352.1	\$6,317.0
Total Electrical	\$1, 207.6	\$1, 176.6	\$1,176.3	\$1,186.8
Electric Heating and Cooling	\$234.0	\$272.0	\$293.3	\$266.4
Central Heating	\$7.3	\$16.9	\$10.4	\$11.5
Local Fixed Heater	\$57.5	\$71.6	\$75.3	\$68.1
Portable Heater	\$43.6	\$53.2	\$57.7	\$51.5
Water Heater	\$10.6	\$15.2	\$14.2	\$13.3
Fixed, Central Air Conditioning	\$20.6	\$16.6	\$13.4	\$16.9
Portable Air Conditioner	\$12.1	\$9.6	\$12.4	\$11.4
Other	\$102.8	\$105.5	\$123.2	\$110.5
Electric Cooking Equipment	\$338.7	\$306.5	\$295.3	\$313.5
Range/Oven	\$265.4	\$241.4	\$229.7	\$245.5
Range/Oven Hood	\$3.9	\$2.4	\$2.0	\$2.8
Deep Fat Fryer	\$2.6	\$4.2	\$3.2	\$3.3
Grill	\$0.9	\$0.3	\$1.5	\$0.9
Microwave Oven	\$11.3	\$9.2	\$9.8	\$10.1
Small Heat-Producing Appliance	\$18.2	\$14.0	\$13.1	\$15.1
Other	\$65.9	\$58.2	\$58.9	\$61.0
Electrical Distribution	\$334.1	\$313.6	\$326.1	\$324.6
Installed Wiring	\$170.2	\$149.9	\$169.0	\$163.0
Light Fixture	\$25.0	\$27.4	\$25.2	\$25.9
Receptacle, Switch	\$34.5	\$36.5	\$30.8	\$34.0
Cord, Plug	\$35.9	\$33.3	\$34.3	\$34.5
Lamp, Light Bulb	\$15.0	\$15.5	\$13.7	\$14.8
Panel Board	\$12.2	\$9.3	\$13.1	\$11.5
Meter	\$7.9	\$8.1	\$6.7	\$7.6
Transformer	\$1.9	\$1.9	\$1.4	\$1.7
Other	\$31.4	\$31.7	\$31.8	\$31.7
Other Selected Electrical Appliances	\$126.0	\$123.6	\$107.5	\$119.0
Clothes Dryer	\$63.4	\$62.5	\$49.1	\$58.4
Dishwasher	\$11.1	\$11.3	\$12.3	\$11.6
Audio/Visual Equipment	\$14.7	\$10.9	\$5.1	\$10.2
Washing Machine	\$2.5	\$1.8	\$2.4	\$2.2
Refrigerator/Freezer	\$20.0	\$24.0	\$25.0	\$23.0
Shop/Garden Tool	\$8.3	\$9.1	\$11.6	\$9.7
Torch	\$5.9	\$4.0	\$2.0	\$4.0

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.

¹⁸ There are confined fire property loss estimates included in the *Total Residential* category. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8c on p. 33 for details.

TABLE 5a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED GAS-FIRED EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential¹⁹	351,400	359,400	361,500	357,400
Total Gas-Fired Equipment	6,700	7,200	7,000	6,900
Gas Heating Equipment	2,100	2,400	2,300	2,300
Fixed Heater	700	800	800	700
Portable Heater	100	100	100	100
Central Heating	300	300	300	300
Fireplace, Chimney, Connector	100	200	200	200
Water Heater	700	800	700	800
Fixed, Central Air Conditioning	*	*	*	*
Other	200	200	200	200
Gas Cooking Equipment	2,700	2,800	2,600	2,700
Range/Oven	1,800	2,000	1,800	1,900
Open Gas Grill	500	400	400	400
Other	400	400	400	400
Other Selected Gas Equipment	1,500	1,700	1,800	1,700
Clothes Dryer	1,000	1,100	1,100	1,000
Torch	300	400	400	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.

¹⁹ There are confined fire estimates included in the *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. 32 for details.

TABLE 5b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED GAS-FIRED EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential²⁰	1,960	2,290	2,420	2,220
Total Gas-Fired Equipment	70	80	80	80
Gas Heating Equipment	40	10	40	30
Fixed Heater	20	10	20	20
Portable Heater	*	*	20	10
Central Heating	20	*	*	*
Fireplace, Chimney, Connector	*	*	*	*
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Other	*	*	*	*
Gas Cooking Equipment	20	60	30	40
Range/Oven	10	60	20	30
Open Gas Grill	*	*	*	*
Other	10	*	10	10
Other Selected Gas Equipment	10	*	*	*
Clothes Dryer	*	*	*	*
Torch	*	*	*	*
Shop/Garden Tool	*	*	*	*

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

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

²⁰There were no NFIRS confined fire deaths in 2012, 2013, or 2014.

TABLE 5c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED GAS-FIRED EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential²¹	11,860	11,420	11,120	11,470
Total Gas-Fired Equipment	480	550	480	500
Gas Heating Equipment	130	180	170	160
Fixed Heater	40	80	50	60
Portable Heater	10	10	30	20
Central Heating	20	20	10	20
Fireplace, Chimney, Connector	*	10	10	*
Water Heater	40	40	50	40
Fixed, Central Air Conditioning	*	*	*	*
Other	10	20	30	20
Gas Cooking Equipment	260	290	210	260
Range/Oven	180	220	160	190
Open Gas Grill	20	30	20	20
Other	60	40	40	50
Other Selected Gas Equipment	70	60	70	60
Clothes Dryer	40	40	30	40
Torch	20	10	20	20
Shop/Garden Tool	10	10	20	10

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

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

²¹ There are confined fire injury estimates included in the *Total Residential* category. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8b on p. 32 for details.

TABLE 5d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED GAS-FIRED EQUIPMENT, 2012–2014

Equipment	2012	2013	2014	2012–2014 Average
Total Residential²²	\$6,380.7	\$6,218.3	\$6,352.1	\$6,317.0
Total Gas-Fired Equipment	\$205.0	\$208.6	\$247.7	\$220.4
Gas Heating Equipment	\$72.1	\$77.2	\$112.9	\$87.4
Fixed Heater	\$19.2	\$24.7	\$17.4	\$20.4
Portable Heater	\$5.2	\$5.9	\$4.8	\$5.3
Central Heating	\$9.7	\$11.4	\$8.5	\$9.9
Fireplace, Chimney, Connector	\$7.6	\$7.7	\$55.8	\$23.7
Water Heater	\$20.0	\$20.1	\$16.6	\$18.9
Fixed, Central Air Conditioning	\$0.1	*	\$0.1	\$0.1
Other	\$10.3	\$7.3	\$9.7	\$9.1
Gas Cooking Equipment	\$85.7	\$73.9	\$66.0	\$75.2
Range/Oven	\$38.6	\$43.3	\$40.3	\$40.7
Open Gas Grill	\$34.8	\$17.9	\$16.1	\$22.9
Other	\$12.3	\$12.7	\$9.7	\$11.6
Other Selected Gas Equipment	\$34.5	\$48.8	\$56.3	\$46.6
Clothes Dryer	\$16.6	\$16.2	\$10.5	\$14.5
Torch	\$6.7	\$10.1	\$33.6	\$16.8
Shop/Garden Tool	\$11.2	\$22.6	\$12.1	\$15.3

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.

²² There are confined fire property loss estimates included in the *Total Residential* category. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 8c on p. 33 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. 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.²³ 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 2012 through 2014.

Table 6. NFPA Estimates of Residential Structure Fires and Associated Losses 2012–2014

	2012	2013	2014
Structure Fires	381,000	387,000	386,500
Civilian Deaths	2,405	2,785	2,795
Civilian Injuries	13,175	12,575	12,175
Property Loss	\$7.20 billion	\$6.97 billion	\$6.99 billion

Source: See footnote 1 below.

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

NFIRS compiles incident reports submitted voluntarily to the U.S. Fire Administration (USFA) by U.S. fire departments. Thus, NFIRS is not a probability sample and is insufficient to support precision estimation. The reports come from all 50 states, the District of Columbia, and U.S. territories in 2012 and 2014. There were no reports from Wyoming in 2013. Not all the states reporting included data from every fire department in the state. The number of fire departments participating in NFIRS decreased from 21,960 in 2012 to 21,585 in 2013 and then increased to 21,980 in 2014. Table 7 shows the number of residential structure fires and the corresponding losses reported to USFA from 2012 through 2014.

²³ M.J. Karter, "Fire Loss in the U.S. During 2012," National Fire Protection Association (NFPA), September 2013; M.J. Karter, "Fire Loss in the U.S. During 2013," National Fire Protection Association (NFPA), September 2014; M.J. Karter, "Fire Loss in the U.S. During 2014," National Fire Protection Association (NFPA), September 2015.

Table 7. Residential Structure Fires and Associated Losses Reported to NFIRS 2012–2014

	2012	2013	2014
Structure Fires	253,379	263,903	272,209
Civilian Deaths	1,393	1,404	1,489
Civilian Injuries	7,266	6,916	7,147
Property Loss	\$3.85 billion	\$4.28 billion	\$4.50 billion

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

According to NFPA, there was an estimated annual average of 384,800 residential structure fires in the United States during 2012 to 2014, and an annual average of 2,660 deaths, 12,640 injuries, and \$7.1 billion in property losses during the same period (Table 6). NFIRS captured about 68 percent of these fires, 54 percent of the deaths, 56 percent of the injuries, and 60 percent of the property losses (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 CPSC staff used in this report 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. Content losses are 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 that started the fire (e.g., 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 (e.g., candle, lighter, cigarette, heat from operating equipment, hot object).
<i>Item First Ignited</i>	The functional description or use of that item that was first ignited by the heat source (e.g., 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”. A required field means that, if known, a value must be supplied for that variable. Other variables may or may not be supplied at the discretion of the reporting department. In the list above, the categories Equipment Involved, Power Source, Equipment Portability, Factors Contributing to Ignition, Human Factors Contributing to Ignition, and Age are not required fields. In the change that was incorporated beginning with 2012 data, Equipment Involved became required if certain Heat Source or Factor Contributing to Ignition codes were entered. Variables that are not required are more likely to be missing from a given fire incident report in NFIRS than those that are required.²⁴

In the change that was incorporated beginning with 2012 data, Equipment Involved became required if certain Heat Source or Factor Contributing to Ignition codes were entered. This, not surprisingly, has led to a smaller proportion of missing data for Equipment Involved in 2012, 2013, and 2014. Because the code ‘NNN – No equipment involved in ignition’ was also not permitted for fires with these particular Heat Source and Factor Contributing to Ignition codes, the proportion of fires coded as “NNN – No equipment involved in ignition” is much lower in 2012, 2013, and 2014, than in previous years. Requiring Equipment Involved to be coded if certain Heat Source²⁵ codes are entered also appears to have led to entering fewer fires with Heat Source codes in 2012, 2013, and 2014.

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, after consulting with USFA technical staff. For example, if the heat source is known to be matches, lighters, or candles, and no equipment is reported, 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.

²⁴ NFIRS Complete Reference Guide, January 2015.

²⁵ There are four of these heat source codes: ‘10 – Heat from powered equipment, other’; ‘11 – Spark, ember, or flame from operating equipment’; ‘12 – Radiated, conducted heat from operating equipment’; ‘13 – Arcing’.

In another scenario, the reported equipment code is electrical but the Equipment Power Source is missing. It is evident that the power source should have been reported as electrical. Similarly, when it is known that no electrical equipment is involved, the 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” and are numbered from “zero,” up to as many structures as 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 the fire spreads to homes, the wildfire would not count as a residential structure fire, but the exposure home fires would. The cigarette as the heat source would not be passed on to the home fires in this case. The cause information for the exposure home fires would be left as is.

Confined fires

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.

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 whether they are at all similar to the rest of the fires by 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 8a through 8c 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: 2012–2014

Included in Table Categories:	Appear in Tables:	2012	2013	2014
Total Residential	1a, 2a, 3a, 4a, 5a	183,600	190,300	191,200
Total Heating and Cooling Equipment	1a, 3a	29,300	30,600	29,600
<i>Fireplace, Chimney, Connector</i>	<i>1a, 3a</i>	<i>19,800</i>	<i>21,300</i>	<i>20,800</i>
<i>Other (Burner/Boiler)</i>	<i>1a, 3a</i>	<i>9,600</i>	<i>9,300</i>	<i>8,700</i>
Cooking	1a, 2a	135,200	140,700	142,900
Trash, Rubbish	2a	17,600	17,500	17,100
Incinerator	-	600	600	600
Trash Compactor	-	900	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.

There were no confined fire deaths in 2012, 2013, or 2014.

Table 8b. Estimated Residential Confined Fire Injuries: 2012–2014

Included in Table Categories:	Appear in Tables:	2012	2013	2014
Total Residential	1c, 2c, 3c, 4c, 5c	1,820	1,690	1,510
Total Heating and Cooling Equipment	1c, 3c	50	50	80
<i>Fireplace, Chimney, Connector</i>	<i>1c, 3c</i>	<i>20</i>	<i>20</i>	<i>30</i>
<i>Other (Burner/Boiler)</i>	<i>1c, 3c</i>	<i>30</i>	<i>30</i>	<i>40</i>
Cooking	1c, 2c	1,700	1,560	1,360
Trash, Rubbish	2c	60	70	70
Incinerator	-	10	10	*
Trash Compactor	-	*	10	*

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

Note: Injury estimates rounded to nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*).

Subtotals do not necessarily add to heading totals. No information was available on the intentionality of these fires.

Table 8c. Estimated Residential Confined Fire Property Loss (In Millions): 2012–2014

Included in Table Categories:	Appear in Tables:	2012	2013	2014
Total Residential	1d, 2d, 3d, 4d, 5d	\$38.5	\$45.9	\$40.8
Total Heating and Cooling Equipment	1d, 3d	\$8.7	\$8.5	\$9.1
<i>Fireplace, Chimney, Connector</i>	1d, 3d	\$6.7	\$6.0	\$7.1
<i>Other (Burner/Boiler)</i>	1d, 3d	\$2.0	\$2.5	\$2.0
Cooking	1d, 2d	\$27.0	\$34.8	\$28.7
Trash, Rubbish	2d	\$2.3	\$2.2	\$2.6
Incinerator	-	\$0.4	\$0.3	\$0.4
Trash Compactor	-	\$0.1	\$0.1	\$0.1

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

Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Rounded estimates less than \$0.1m are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. No information was available on the intentionality of these fires.

Other missing data

Tables 9a–9c show the proportion of data missing after inferring missing data when appropriate. Because most of the data fields for confined fires were not reported, those data fields were excluded from the tabulations.

Table 9a. Missing Data on Residential Structure Fires: 2012–2014

	2012	2013	2014
Cause of Ignition	36%	35%	35%
Heat Source	41%	39%	39%
Item First Ignited	39%	38%	39%
Equipment Involved	36%	36%	37%
Equipment Power	36%	35%	37%

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: 2012–2014

	2012	2013	2014
Cause of Ignition	59%	59%	62%
Heat Source	62%	62%	64%
Item First Ignited	62%	62%	63%
Equipment Involved	49%	49%	52%
Equipment Power	49%	50%	52%

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: 2012–2014

	2012	2013	2014
Cause of Ignition	37%	36%	38%
Heat Source	35%	35%	37%
Item First Ignited	34%	33%	36%
Equipment Involved	29%	28%	29%
Equipment Power	30%	28%	29%

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.²⁶ The raking procedure maintains the marginal distributions for the known data, while allocating the unknown data for all characteristics involved.²⁷ For each year, the raking procedure was applied separately for fires, deaths, injuries, and property loss.

Adjustments for 2012 - 2014 Data

The questionnaire design changes in 2012 made it difficult to assume that unknown values would share the distribution of known values. That is because a reduction in unknowns for electrical equipment was introduced without similar reductions for other kinds of equipment. Likewise, the reduction in heat source for electrical equipment was not observed elsewhere. To address this change, an adjustment factor was applied before raking to restore the proportion of missing equipment and electrical equipment (Tables 1, 3, 4, and 5) and missing heat source and electrical heat source (Table 2) to the proportions observed over the 2009 to 2011 period. Although these adjustments made estimates appear more in line with what had been observed before 2012, it is possible that these adjustments could mute or magnify changes that actually occurred between before 2012 and since. Estimates produced without these adjustments appeared too different from prior estimates to be credible, given how they were concentrated only in one kind of equipment and heat source.

An additional adjustment was made to 2013 estimates to account for volatility in the estimates. This information appears in Table 2b and reflects missing data interactions between the heat source and item first ignited variables. This caused the raking programs to assign a substantially larger amount of fires to upholstered furniture, for example, despite the lack of an increase in the unweighted data. All 3 years of data were pooled before raking the data in table(s) 2b and the year was added as a parameter to allow the raking to be smoothed with prior years. This was not necessary for 2012 or 2014.

Quality Control Checks of NFIRS Data

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

Accordingly, CPSC staff initiated more quality-control checking of the NFIRS data, beginning with the 2007 data. In 2012, 2013, and 2014, residential structure fires with reported property losses of \$5 million or higher were assigned to CPSC field staff to confirm with the fire department the high property loss estimate. There were 10 high property loss fires from 2014 assigned for investigation. In five of the fires, the property loss estimate was confirmed. In the other five fires, a different property loss estimate was obtained, and the data were corrected.

²⁶ 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.

²⁷ M.A. Greene, L.E. Smith, M.S. Levenson, S. Hiser, and J.H. Mah, “Raking Fire Data,” Presented at the Federal Conference on Statistical Methodology, Arlington, VA, 2001.

In addition to the quality-control checking of high property loss fire reports, some quality control was carried out on multiple-death fire incidents for the 2012, 2013, and 2014 data. In cases with three 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 21 cases from 2014 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. From these investigations, eight 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,” after a CPSC field staff investigation. In one instance, the investigation concluded that the deaths involved were not from a fire, and therefore, the data were edited accordingly.

Estimation Procedure

After applying the conventions and the raking procedure previously discussed, CPSC staff completed the estimation process. 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. 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. Accordingly, CPSC analysts excluded all incidents where the “Cause of Ignition” could be identified as intentional. Although 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 3 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 as unintentional. This ensures that the fire and any associated losses will be counted and not excluded as an intentional fire.