



2002 - 2004 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 2002 through 2004 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:

- 369,000 fires, 2,270 deaths, 12,870 injuries, and \$5.32 billion in property loss in 2002
- 374,700 fires, 2,740 deaths, 13,120 injuries, and \$5.31 billion in property loss in 2003
- 386,100 fires, 2,850 deaths, 13,330 injuries, and \$5.31 billion in property loss in 2004
- An estimated annual average of 376,600 fires, 2,620 deaths, 13,110 injuries, and \$5.31 billion in property loss over the three year period 2002-2004.

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

For each year from 2002 through 2004, the relative ranking of the greatest contributors to fire loss has remained unchanged. For example, Tables 1a-1d show that:

- Cooking equipment accounted for the largest percentage of fires. An estimated annual average of 130,800 cooking equipment-related fires during 2002-2004 accounted for 34.7% of total residential fires for the same period. The corresponding death estimates averaged around 7.8% of total deaths annually. The injury estimates remained steady; the annual average number of injuries for 2002-2004 was estimated to be 3,590 which is 27.4% of the total estimated annual average number of injuries for the same time period. Most 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 57,200 fires for 2002-2004 was 15.2% of the annual average estimate of total residential fires during the same period. The death estimates averaged around 10.6% of total deaths annually. The corresponding injury estimates for the three years remained relatively stable with an estimated annual average of 1,030 injuries. This accounts for 7.8% of the annual average estimate of total injuries during 2002-2004.
- During 2002-2004, an estimated annual average of 18,200 fires was attributable to electrical distribution system components (e.g., installed wiring, lighting, etc.). This corresponds to 4.8% of the estimated annual average of total residential fires for the same time period. The death estimates remained quite stable, averaging around 4.7% of total deaths. The injury estimates averaged around 4.1% of total injuries annually.
- By item first ignited, upholstered furniture ignition was involved in the greatest number of deaths. From 2002 through 2004, an estimated annual average of 540 deaths was associated with these fires. This constitutes 20.7% of the estimated annual average of total deaths associated with residential structure fires for the same period. On average, during 2002-2004, mattress or bedding ignitions accounted for 14.3% of the total deaths annually.

- By heat source, smoking materials were the largest contributor to deaths, associated with an annual average of 630 deaths from 2002-2004. This accounts for 23.9% of the estimated annual average of total residential fire deaths. The estimated annual average number of deaths from candle fires constituted around 6.2% of total deaths during 2002-2004. Death estimates from lighter fires averaged around 2.6% of total deaths annually, while, on average, matches were responsible for 1.3% of total deaths annually over the three years.

During the period covered in this report, the NFIRS system underwent some major changes. As such, the staff at the U.S. Consumer Product Safety Commission (CPSC) recommends against comparing fire loss estimates from the old system with those of the new system. Rather, the estimates in this report are best viewed as reflecting estimates from a substantially different reporting system which, because of the inherent system design differences. This report presents annual estimates and estimates averaged across three consecutive years because of the year-to-year variability.

Introduction

The fire loss estimates presented in this report are based on the National Fire Protection Association's (NFPA) national fire loss estimates¹ and the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) data. The NFPA makes national estimates of aggregated fires, deaths, injuries, and property loss based on a probability sample survey. The NFIRS is a compilation of voluntarily submitted incident reports completed by U.S. fire departments. These reports come from the states and the District of Columbia. However, not all the states reporting data include data from all fire departments in the state. Among the multitude of information collected, product specific information such as the equipment involved in the ignition of the fire or the item that was first ignited in the fire is available in NFIRS data. The NFIRS product specific frequency counts are weighted up to the NFPA estimates for total U.S. fire losses to arrive at the estimates that are presented in this report.

In keeping with reports from previous years, there are five main tables in this report. Each numbered table (1-5) has four tables associated with it; table "a" presents the fire estimates, "b" presents the death estimates, "c" presents the injury estimates, and "d" presents the property loss estimates. As in previous years, only selected product-specific estimates are included in these tables. Therefore, the detail may not add to the totals that appear in the headings. All the product categories in the tables, with the exception of smoking materials, contain products within the jurisdiction of the CPSC. Intentionally set fires, which include the deliberate misuses of heat sources or fires of an incendiary nature, are excluded from the estimates.

The fires and fire losses pertain only to fires in residential properties. These include single family and multifamily dwellings. Mobile and motor homes, while used as a structure and not in transit, are also included. Injury and death estimates pertain to civilian casualties only. The property losses include property and content losses. For convenience, they are referred to as "property loss" only in this report. Fire departments provide a rough estimate for this figure. As such, these property loss estimates are based on crude estimates themselves and the significance of variations in these estimates is ambiguous.

In Tables 1, 3, 4, and 5, equipment codes were used to identify the products, while in Table 2 either the heat source or the item first ignited was the primary means of identifying the product. As such, some estimates provided in the different sections of the tables overlap. For example, in Table 2, estimates of fires involving cigarette ignition of upholstered furniture are included in estimates for cigarettes (by heat source) and estimates for upholstered furniture-smoking material ignition (by item first ignited). Additional details about the estimates and the data system are included in the Methodology section of this report.

The estimates for 1999 through 2003 were published in the October 2006 Residential Fire Loss Estimates report. The estimates for 2002 and 2003 that are presented here remain unchanged from that earlier report. Starting with this report, annual average estimates generated from the most recent three years of data, are also presented.

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

¹ M.J. Karter, "Fire Loss in the U.S. During 2002", National Fire Protection Association (NFPA), September 2003; M.J. Karter, "Fire Loss in the U.S. During 2003", NFPA, October 2004; M.J. Karter, "Fire Loss in the U.S. During 2004", NFPA, September 2005.

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

A direct effect of the conversion process has been the combining of codes for “Other” and “Unknown” values within sub-groups of several variables. This has resulted in larger estimates for “Other” categories and smaller estimates for some specific product categories.

Beginning with version 5.0, NFIRS has introduced newly created codes to identify confined fires (those that do not spread beyond the originating item). To encourage the reporting of these fires, NFIRS requires only limited information on these fires. From 1999 onwards, as the use of version 5.0 increased, an increasingly larger number of confined fires were reported. In 1999, about 2% of residential fires were reported as confined; by 2004, almost 41% of fires reported to NFIRS were confined fires. However, very few data elements are required to be reported for confined fires.

Some apparent decreases in estimates, for example in the detail lines in the tables showing fire losses for ranges and chimneys, are related to the increase in the reported confined fires. Because it is not required information, in most confined fire cases it is not possible to determine the type of equipment involved. When a fire is a confined cooking fire, it is not possible to separate ranges from other cooking equipment. In particular, confined cooking fire losses are only included as part of the “cooking equipment” totals and cannot be broken down further into ranges and by the power source. However, since ranges undoubtedly are involved in confined fires, evaluation of the range-related hazard needs to take into account that some cooking fires that are included only in the totals are actually range fires. A similar problem affects fires involving chimneys.

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

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

TABLE 1a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED EQUIPMENT, 2002 – 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	369,000	374,700	386,100	376,600
Total Heating and Cooling Equipment¹	55,800	58,000	57,900	57,200
Local Fixed Heater	5,700	4,200	4,200	4,700
Portable Heater	2,800	2,400	1,900	2,400
Central Heating	3,700	2,700	2,000	2,800
Fireplace, Chimney, Chimney Connector ¹	26,300	25,600	25,200	25,700
Water Heater	4,400	3,500	2,800	3,600
Air Conditioning	1,800	1,500	1,100	1,500
Other ¹	11,200	18,000	20,700	16,600
Total Cooking Equipment¹	117,700	132,800	141,900	130,800
Range / Oven	39,900	30,400	23,300	31,200
<i>Gas</i>	11,700	7,400	4,800	8,000
<i>Electric</i>	26,800	22,400	18,000	22,400
<i>Other</i>	1,400	600	500	900
All Other Cooking	11,600	7,900	7,500	9,000
<i>Gas</i>	1,700	1,200	1,200	1,400
<i>Electric</i>	8,700	6,000	5,700	6,800
<i>Other</i>	1,100	600	600	800
Total Electrical Distribution	23,300	17,800	13,600	18,200
Installed Wiring	8,100	6,400	4,700	6,400
Cord, Plug	3,700	3,000	2,100	2,900
Receptacle, Switch	2,800	1,900	1,500	2,000
Lighting	4,900	3,700	3,000	3,800
Other	3,800	2,800	2,400	3,000
Other Selected Equipment	14,700	11,800	10,300	12,300
Audio / Visual Equipment	1,100	800	700	900
Clothes Dryer	9,500	7,600	6,800	8,000
Washing Machine	600	500	400	500
Torch	2,000	1,700	1,200	1,600
Refrigerator / Freezer	800	600	600	700
Shop / Garden Tool	700	700	700	700

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

¹ There are confined fire estimates included in *Total Residential*, *Total Heating and Cooling Equipment*, *Fireplace, Chimney, Chimney Connector*, *Other*, and *Total Cooking Equipment* categories. These confined fire estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment. See Table 7a on pg 31 for details.

TABLE 1b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED EQUIPMENT, 2002 - 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential^{1,2}	2,270	2,740	2,850	2,620
Total Heating and Cooling Equipment¹	290	250	290	280
Local Fixed Heater	80	110	90	90
Portable Heater	140	40	130	100
Central Heating	10	10	10	10
Fireplace, Chimney, Chimney Connector	20	50	20	30
Water Heater	10	20	10	10
Air Conditioning	*	10	*	10
Other ¹	20	10	30	20
Total Cooking Equipment²	140	240	240	210
Range / Oven	120	170	190	160
<i>Gas</i>	30	70	90	60
<i>Electric</i>	70	100	90	90
<i>Other</i>	10	*	10	10
All Other Cooking	20	60	40	40
<i>Gas</i>	10	10	10	10
<i>Electric</i>	10	40	30	30
<i>Other</i>	*	10	*	*
Total Electrical Distribution	100	130	140	120
Installed Wiring ³	10	50	40	30
Cord, Plug	70	40	70	60
Receptacle, Switch ³	*	10	10	10
Lighting	10	20	10	10
Other	*	*	10	10
Other Selected Equipment	20	10	30	20
Audio / Visual Equipment	*	10	10	10
Clothes Dryer	20	*	*	10
Washing Machine	*	*	*	*
Torch	*	*	*	*
Refrigerator / Freezer	*	*	*	*
Shop / Garden Tool	*	*	10	*

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

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

Subtotals do not necessarily add to heading totals. Estimates exclude losses from fires identifiable as intentionally set.

¹ Includes an estimated 10 deaths in 2002 from fires that were confined to the fire box of a burner/boiler.

² Includes an estimated 10 deaths in both 2003 and 2004 from confined cooking fires.

³ Deaths from installed wiring and receptacle/switch were allocated in the same proportion as the fires. See discussion in Methodology section for details.

TABLE 1c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED EQUIPMENT, 2002 – 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	12,870	13,120	13,330	13,110
Total Heating and Cooling Equipment¹	1,040	1,090	950	1,030
Local Fixed Heater	240	220	220	220
Portable Heater	260	250	180	230
Central Heating	90	80	60	80
Fireplace, Chimney, Chimney Connector ¹	60	80	90	80
Water Heater	140	190	140	150
Air Conditioning	50	40	50	50
Other ¹	200	220	210	210
Total Cooking Equipment¹	3,510	3,590	3,680	3,590
Range / Oven	2,050	1,990	1,890	1,980
<i>Gas</i>	420	290	310	340
<i>Electric</i>	1,570	1,680	1,540	1,600
<i>Other</i>	60	20	40	40
All Other Cooking	540	450	450	480
<i>Gas</i>	60	80	90	80
<i>Electric</i>	420	320	320	350
<i>Other</i>	50	40	40	50
Total Electrical Distribution	600	530	480	530
Installed Wiring ²	170	160	130	150
Cord, Plug	210	150	80	150
Receptacle, Switch ²	60	50	40	50
Lighting	100	130	150	120
Other	70	40	80	60
Other Selected Equipment	430	380	390	400
Audio / Visual Equipment	70	40	40	50
Clothes Dryer	240	190	190	210
Washing Machine	10	10	10	10
Torch	60	70	50	60
Refrigerator / Freezer	10	20	30	20
Shop / Garden Tool	30	40	60	40

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

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

¹ There are confined fire injury estimates included in *Total Residential*, *Total Heating and Cooling Equipment*, *Fireplace, Chimney, Chimney Connector*, *Other*, and *Total Cooking Equipment* categories. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment. See Table 7b on pg 31 for details.

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

TABLE 1d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED EQUIPMENT, 2002 – 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	\$5,321.1	\$5,311.5	\$5,308.3	\$5,313.6
Total Heating and Cooling Equipment¹	\$846.9	\$543.3	\$490.8	\$627.0
Local Fixed Heater	\$91.2	\$93.8	\$75.0	\$86.7
Portable Heater	\$146.5	\$75.6	\$60.7	\$94.2
Central Heating	\$64.8	\$54.9	\$50.2	\$56.6
Fireplace, Chimney, Chimney Connector ¹	\$148.6	\$142.9	\$120.2	\$137.2
Water Heater	\$60.1	\$59.8	\$53.9	\$57.9
Air Conditioning	\$218.8	\$22.7	\$37.5	\$93.0
Other ¹	\$117.0	\$93.7	\$93.3	\$101.3
Total Cooking Equipment¹	\$453.1	\$449.2	\$400.5	\$434.3
Range / Oven	\$292.4	\$287.0	\$245.0	\$274.8
<i>Gas</i>	\$39.7	\$43.9	\$31.3	\$38.3
<i>Electric</i>	\$243.0	\$239.3	\$211.1	\$231.1
<i>Other</i>	\$9.8	\$3.7	\$2.7	\$5.4
All Other Cooking	\$138.4	\$136.1	\$132.4	\$135.7
<i>Gas</i>	\$27.2	\$38.8	\$17.4	\$27.8
<i>Electric</i>	\$90.9	\$86.1	\$103.1	\$93.4
<i>Other</i>	\$20.3	\$11.3	\$11.9	\$14.5
Total Electrical Distribution	\$491.0	\$503.8	\$354.4	\$449.7
Installed Wiring	\$166.0	\$204.4	\$126.9	\$165.8
Cord, Plug	\$95.4	\$101.6	\$58.3	\$85.1
Receptacle, Switch	\$54.6	\$35.0	\$35.4	\$41.7
Lighting	\$83.2	\$72.5	\$70.6	\$75.4
Other	\$91.7	\$90.3	\$63.2	\$81.8
Other Selected Equipment	\$203.7	\$244.9	\$160.0	\$202.9
Audio / Visual Equipment	\$17.8	\$22.2	\$16.9	\$19.0
Clothes Dryer	\$77.0	\$107.3	\$60.8	\$81.7
Washing Machine	\$4.1	\$2.1	\$2.2	\$2.8
Torch	\$75.9	\$69.4	\$47.1	\$64.1
Refrigerator / Freezer	\$15.7	\$18.3	\$9.9	\$14.6
Shop / Garden Tool	\$13.2	\$25.8	\$23.0	\$20.7

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

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

¹ There are confined fire property loss estimates included in *Total Residential*, *Total Heating and Cooling Equipment*, *Fireplace, Chimney, Chimney Connector*, *Other*, and *Total Cooking Equipment* categories. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment. See Table 7c on pg 31 for details.

TABLE 2a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED PRODUCTS, 2002 – 2004

Product	2002	2003	2004	2002-2004 Average
Total Residential¹	369,000	374,700	386,100	376,600
By Heat Source				
Cigarette, Other Tobacco Products	16,900	13,600	12,700	14,400
Match	3,000	1,900	1,600	2,100
Lighter	3,600	3,100	2,700	3,100
Candle	14,800	13,700	13,400	14,000
By Item First Ignited				
Upholstered Furniture	8,600	7,500	7,200	7,800
Smoking Material Ignition	3,000	2,500	2,400	2,600
Open Flame Ignition	1,400	1,200	1,200	1,200
Other	4,200	3,800	3,700	3,900
Mattress, Bedding	13,700	12,200	11,700	12,500
Smoking Material Ignition	3,400	2,700	2,600	2,900
Open Flame Ignition	4,000	3,600	3,300	3,600
Other	6,300	5,900	5,800	6,000
Other Materials				
Cooking Materials ¹	112,000	130,300	142,400	128,200
Electric Cable Insulation	22,100	18,900	18,400	19,800
Interior Wall Covering	11,500	10,800	9,700	10,700
Wearing Apparel-Worn	400	400	300	400
Wearing Apparel-Not Worn	9,400	8,100	7,200	8,200
Floor Covering	5,800	5,200	4,900	5,300
Curtains, Drapes	2,900	2,700	2,400	2,700
Magazines, Newspaper	3,200	2,500	2,500	2,700
Thermal Insulation	6,200	5,800	6,200	6,000
Cabinet, Desk	7,000	6,300	6,000	6,400
Trash, Rubbish ¹	18,000	20,300	20,600	19,600
Toy, Game	400	300	300	300
Box, Carton, Bag, Basket, Barrel	3,300	2,900	3,100	3,100

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

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

¹ There are confined fire estimates included in *Total Residential*, *Cooking Materials*, and *Trash, Rubbish* categories. Estimates for confined cooking fires are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 7a on pg 31 for details.

TABLE 2b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED PRODUCTS, 2002 – 2004

Product	2002	2003	2004	2002-2004 Average
Total Residential^{1,2}	2,270	2,740	2,850	2,620
By Heat Source				
Cigarette, Other Tobacco Products	560	650	660	630
Match	30	50	20	40
Lighter	90	80	30	70
Candle	130	200	150	160
By Item First Ignited				
Upholstered Furniture	460	560	610	540
Smoking Material Ignition	200	310	320	280
Open Flame Ignition	30	20	40	30
Other	230	220	240	230
Mattress, Bedding	440	380	300	380
Smoking Material Ignition	220	170	160	180
Open Flame Ignition	60	100	30	60
Other	160	110	110	130
Other Materials				
Cooking Materials ²	90	90	210	130
Electric Cable Insulation	50	60	140	80
Interior Wall Covering	140	200	180	170
Wearing Apparel-Worn	90	100	90	90
Wearing Apparel-Not Worn	60	50	20	40
Floor Covering	90	130	110	110
Curtains, Drapes	10	30	10	20
Magazines, Newspaper	40	50	30	40
Thermal Insulation	10	10	20	20
Cabinet, Desk	40	60	70	60
Trash, Rubbish	40	30	60	40
Toy, Game	*	*	*	*
Box, Carton, Bag, Basket, Barrel	20	*	30	20

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

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

Subtotals do not necessarily add to heading totals. Estimates exclude losses from fires identifiable as intentionally set.

¹ Includes an estimated 10 deaths in 2002 from fires that were confined to the fire box of a burner/boiler.

² Includes an estimated 10 deaths in both 2003 and 2004 from confined cooking fires. Estimates for confined cooking fire deaths are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited.

TABLE 2c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED PRODUCTS, 2002 – 2004

Product	2002	2003	2004	2002-2004 Average
Total Residential¹	12,870	13,120	13,330	13,110
By Heat Source				
Cigarette, Other Tobacco Products	1,230	1,220	1,210	1,220
Match	280	200	170	220
Lighter	600	590	560	580
Candle	1,300	1,280	1,240	1,270
By Item First Ignited				
Upholstered Furniture	940	890	800	870
Smoking Material Ignition	360	360	300	340
Open Flame Ignition	280	180	170	210
Other	300	340	330	320
Mattress, Bedding	1,310	1,470	1,450	1,410
Smoking Material Ignition	380	380	420	390
Open Flame Ignition	490	620	590	570
Other	440	470	450	450
Other Materials				
Cooking Materials ¹	3,440	3,680	4,010	3,710
Electric Cable Insulation	410	400	380	400
Interior Wall Covering	370	410	410	400
Wearing Apparel-Worn	120	90	130	110
Wearing Apparel-Not Worn	420	450	300	390
Floor Covering	330	250	340	310
Curtains, Drapes	190	260	180	210
Magazines, Newspaper	200	160	190	180
Thermal Insulation	120	90	110	110
Cabinet, Desk	400	330	370	360
Trash, Rubbish ¹	280	290	220	260
Toy, Game	40	30	20	30
Box, Carton, Bag, Basket, Barrel	140	160	130	140

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

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

¹There are confined fire injury estimates included in *Total Residential*, *Cooking Materials*, and *Trash, Rubbish* categories. Estimates for confined cooking fire injuries are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 7b on pg 31 for details.

TABLE 2d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED PRODUCTS, 2002 – 2004

Product	2002	2003	2004	2002-2004 Average
Total Residential¹	\$5,321.1	\$5,311.5	\$5,308.3	\$5,313.6
By Heat Source				
Cigarette, Other Tobacco Products	\$364.0	\$353.2	\$319.4	\$345.5
Match	\$80.0	\$46.3	\$36.9	\$54.4
Lighter	\$102.7	\$85.4	\$86.2	\$91.4
Candle	\$362.7	\$352.9	\$390.3	\$368.6
By Item First Ignited				
Upholstered Furniture	\$251.7	\$246.6	\$250.2	\$249.5
Smoking Material Ignition	\$65.6	\$67.8	\$78.1	\$70.5
Open Flame Ignition	\$61.8	\$42.8	\$51.6	\$52.0
Other	\$124.3	\$136.0	\$120.5	\$126.9
Mattress, Bedding	\$288.2	\$360.8	\$329.3	\$326.1
Smoking Material Ignition	\$76.5	\$74.2	\$76.6	\$75.7
Open Flame Ignition	\$92.1	\$135.8	\$100.4	\$109.4
Other	\$119.6	\$150.9	\$152.3	\$140.9
Other Materials				
Cooking Materials ¹	\$351.1	\$391.3	\$362.7	\$368.4
Electric Cable Insulation	\$330.5	\$321.9	\$373.8	\$342.1
Interior Wall Covering	\$262.6	\$313.9	\$297.2	\$291.2
Wearing Apparel-Worn	\$5.3	\$6.0	\$4.5	\$5.3
Wearing Apparel-Not Worn	\$134.7	\$133.5	\$107.8	\$125.3
Floor Covering	\$143.1	\$139.9	\$137.9	\$140.3
Curtains, Drapes	\$71.0	\$52.7	\$74.3	\$66.0
Magazines, Newspaper	\$65.9	\$59.3	\$56.6	\$60.6
Thermal Insulation	\$106.2	\$117.1	\$116.4	\$113.2
Cabinet, Desk	\$208.1	\$158.7	\$146.3	\$171.0
Trash, Rubbish ¹	\$120.8	\$98.4	\$94.8	\$104.6
Toy, Game	\$5.4	\$5.1	\$5.8	\$5.4
Box, Carton, Bag, Basket, Barrel	\$60.9	\$74.8	\$117.0	\$84.2

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

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

¹ There are confined fire property loss estimates included in *Total Residential*, *Cooking Materials*, and *Trash, Rubbish* categories. Estimates for confined cooking fire property losses are included in the *Cooking Materials* fire losses because cooking materials are most likely the item first ignited. See Table 7c on pg 31 for details.

TABLE 3a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
HEATING AND COOLING EQUIPMENT, 2002 – 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	369,000	374,700	386,100	376,600
Total Heating and Cooling Equipment¹	55,800	58,000	57,900	57,200
Solid Fuel	6,600	4,800	3,800	5,100
Fixed Heater	1,400	800	800	1,000
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	5,000	3,800	2,900	3,900
Central Heating	100	100	*	*
Water Heater	*	*	*	*
Other	100	*	100	100
Gas-Fired	6,900	5,400	4,300	5,500
Fixed Heater	1,600	1,100	1,100	1,300
Portable Heater	300	300	200	300
Fireplace, Chimney, Chimney Connector	400	300	200	300
Central Heating	1,300	1,100	700	1,100
Water Heater	2,600	2,300	1,700	2,200
Fixed, Central Air Conditioning	*	*	*	*
Other	500	300	300	400
Electric	13,200	10,900	9,400	11,200
Fixed Heater	2,300	2,100	2,100	2,100
Portable Heater	2,000	1,600	1,200	1,600
Central Heating	1,700	1,200	800	1,200
Water Heater	1,600	1,100	1,000	1,200
Fixed, Central Air Conditioning	1,200	1,000	700	1,000
Portable Air Conditioner	500	500	300	500
Other	4,000	3,400	3,200	3,500
Liquid Fuel	1,800	1,400	1,200	1,400
Fixed Heater	200	200	100	200
Portable Heater	500	500	400	500
Fireplace, Chimney, Chimney Connector	200	100	100	100
Central Heating	700	400	400	500
Water Heater	200	100	*	100
Other	100	100	100	100
All Other Fuel	200	200	300	200

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

¹ There are confined fire estimates included in *Total Residential*, and *Total Heating and Cooling Equipment* categories. These confined fire estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 7a on pg 31 for details.

TABLE 3b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
HEATING AND COOLING EQUIPMENT, 2002 – 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential^{1,2}	2,270	2,740	2,850	2,620
Total Heating and Cooling Equipment¹	290	250	290	280
Solid Fuel	20	80	80	60
Fixed Heater	*	30	50	30
Portable Heater	*	*	*	*
Fireplace, Chimney, Chimney Connector	20	50	20	30
Central Heating	*	*	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	70	70	50	60
Fixed Heater	40	50	10	40
Portable Heater	10	*	30	10
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	*	*	*	*
Water Heater	10	20	*	10
Fixed, Central Air Conditioning	*	*	*	*
Other	*	*	*	*
Electric	140	80	120	120
Fixed Heater	30	30	20	20
Portable Heater	90	30	70	60
Central Heating	10	*	*	*
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Portable Air Conditioner	*	10	*	10
Other	10	10	30	20
Liquid Fuel	50	20	40	30
Fixed Heater	10	*	*	*
Portable Heater	40	10	40	30
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	*	10	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
All Other Fuel	*	*	*	*

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

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

Subtotals do not necessarily add to heading totals. Estimates exclude losses from fires identifiable as intentionally set.

¹ Includes an estimated 10 deaths in 2002 from fires confined to the fire box of a burner/boiler but fuel type was unknown.

² Includes an estimated 10 deaths in both 2003 and 2004 from confined cooking fires.

TABLE 3c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
HEATING AND COOLING EQUIPMENT, 2002 – 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	12,870	13,120	13,330	13,110
Total Heating and Cooling Equipment¹	1,040	1,090	950	1,030
Solid Fuel	60	80	80	70
Fixed Heater	10	20	30	20
Portable Heater	10	*	*	*
Fireplace, Chimney, Chimney Connector	40	50	50	50
Central Heating	*	10	*	*
Water Heater	*	*	*	*
Other	*	*	*	*
Gas-Fired	300	290	260	280
Fixed Heater	90	50	50	60
Portable Heater	10	10	20	10
Fireplace, Chimney, Chimney Connector	*	*	10	*
Central Heating	60	60	50	60
Water Heater	130	160	120	140
Fixed, Central Air Conditioning	*	*	*	*
Other	10	10	10	10
Electric	530	460	420	470
Fixed Heater	120	140	120	130
Portable Heater	160	120	140	140
Central Heating	30	10	10	20
Water Heater	10	10	10	10
Fixed, Central Air Conditioning	20	20	20	20
Portable Air Conditioner	30	20	30	30
Other	150	130	90	120
Liquid Fuel	90	160	40	100
Fixed Heater	*	*	*	*
Portable Heater	80	120	30	80
Fireplace, Chimney, Chimney Connector	*	*	*	*
Central Heating	*	*	*	*
Water Heater	*	10	*	10
Other	*	20	10	10
All Other Fuel	10	*	10	10

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

¹ There are confined fire injury estimates included in *Total Residential*, and *Total Heating and Cooling Equipment* categories. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 7b on pg 31 for details.

TABLE 3d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
HEATING AND COOLING EQUIPMENT, 2002 – 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	\$5,321.1	\$5,311.5	\$5,308.3	\$5,313.6
Total Heating and Cooling Equipment¹	\$846.9	\$543.3	\$490.8	\$627.0
Solid Fuel	\$138.3	\$143.9	\$112.0	\$131.4
Fixed Heater	\$27.8	\$21.6	\$18.8	\$22.8
Portable Heater	\$0.5	\$0.6	\$0.8	\$0.6
Fireplace, Chimney, Chimney Connector	\$101.7	\$120.4	\$85.8	\$102.6
Central Heating	\$3.2	\$0.8	\$5.7	\$3.2
Water Heater	*	\$0.2	\$0.3	\$0.2
Other	\$5.0	\$0.4	\$0.6	\$2.0
Gas-Fired	\$140.4	\$119.1	\$109.0	\$122.8
Fixed Heater	\$25.6	\$20.1	\$17.4	\$21.0
Portable Heater	\$6.4	\$8.4	\$7.2	\$7.3
Fireplace, Chimney, Chimney Connector	\$32.4	\$4.9	\$16.6	\$18.0
Central Heating	\$21.9	\$23.2	\$15.8	\$20.3
Water Heater	\$38.2	\$49.6	\$46.5	\$44.7
Fixed, Central Air Conditioning	\$0.3	\$0.2	*	\$0.2
Other	\$15.7	\$12.7	\$5.6	\$11.3
Electric	\$507.6	\$216.5	\$197.8	\$307.3
Fixed Heater	\$29.7	\$44.6	\$34.1	\$36.1
Portable Heater	\$129.3	\$50.6	\$36.3	\$72.1
Central Heating	\$26.5	\$17.2	\$8.5	\$17.4
Water Heater	\$16.4	\$9.3	\$6.3	\$10.7
Fixed, Central Air Conditioning	\$209.7	\$11.4	\$30.8	\$84.0
Portable Air Conditioner	\$8.4	\$11.0	\$6.6	\$8.7
Other	\$87.5	\$72.3	\$75.2	\$78.3
Liquid Fuel	\$39.8	\$34.1	\$52.8	\$42.3
Fixed Heater	\$2.6	\$4.2	\$4.7	\$3.9
Portable Heater	\$10.2	\$15.6	\$16.3	\$14.1
Fireplace, Chimney, Chimney Connector	\$3.7	\$3.3	\$3.1	\$3.4
Central Heating	\$13.1	\$6.5	\$20.3	\$13.3
Water Heater	\$5.5	\$0.7	\$0.8	\$2.3
Other	\$4.7	\$3.8	\$7.6	\$5.3
All Other Fuel	\$6.6	\$12.1	\$4.2	\$7.6

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

Note: Property loss estimates are rounded to the nearest tenth of a million dollars. Rounded estimates less than \$0.1m are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. Estimates exclude losses from fires identifiable as intentionally set.

¹ There are confined fire property loss estimates included in *Total Residential*, and *Total Heating and Cooling Equipment* categories. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 7c on pg 31 for details.

TABLE 4a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED ELECTRICAL EQUIPMENT, 2002 - 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	369,000	374,700	386,100	376,600
Total Electrical	87,200	69,600	57,700	71,500
Electric Heating and Cooling	13,200	10,900	9,400	11,200
Central Heating	1,700	1,200	800	1,200
Local Fixed Heater	2,300	2,100	2,100	2,100
Portable Heater	2,000	1,600	1,200	1,600
Water Heater	1,600	1,100	1,000	1,200
Fixed, Central Air Conditioning	1,200	1,000	700	1,000
Portable Air Conditioner	500	500	300	500
Other	4,000	3,400	3,200	3,500
Electric Cooking Equipment	35,500	28,400	23,600	29,200
Range / Oven	26,800	22,400	18,000	22,400
Range / Oven Hood	600	400	300	400
Deep Fat Fryer	200	100	100	100
Grill	100	*	*	*
Small Heat-Producing Appliance	1,700	1,300	1,000	1,400
Other	6,200	4,200	4,200	4,900
Electrical Distribution	23,300	17,800	13,600	18,200
Installed Wiring	8,100	6,400	4,700	6,400
Light Fixture	3,100	2,200	1,800	2,300
Receptacle, Switch	2,800	1,900	1,500	2,000
Cord, Plug	3,700	3,000	2,100	2,900
Lamp, Light Bulb	1,800	1,500	1,200	1,500
Panel Board	1,100	900	800	900
Meter	600	400	300	500
Transformer	200	100	100	100
Other	1,900	1,400	1,200	1,500
Other Selected Electrical Appliances	10,200	8,400	7,300	8,600
Clothes Dryer	7,300	6,000	5,300	6,200
Audio / Visual Equipment	1,000	800	700	900
Washing Machine	600	500	400	500
Refrigerator / Freezer	800	600	600	600
Shop / Garden Tools	300	300	300	300
Torch	200	200	100	200

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

¹ There are confined fire estimates included in *Total Residential* category. These confined fire estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 7a on pg 31 for details.

TABLE 4b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED ELECTRICAL EQUIPMENT, 2002 – 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	2,270	2,740	2,850	2,620
Total Electrical	400	390	490	430
Electric Heating and Cooling	140	80	120	120
Central Heating	10	*	*	*
Local Fixed Heater	30	30	20	20
Portable Heater	90	30	70	60
Water Heater	*	*	*	*
Fixed, Central Air Conditioning	*	*	*	*
Portable Air Conditioner	*	10	*	10
Other	10	10	30	20
Electric Cooking Equipment	80	140	120	110
Range / Oven	70	100	90	90
Range / Oven Hood	*	*	*	*
Deep Fat Fryer	*	*	*	*
Grill	*	*	*	*
Small Heat-Producing Appliance	10	10	*	10
Other	*	30	20	20
Electrical Distribution	100	130	140	120
Installed Wiring ²	10	50	40	30
Light Fixture	10	10	*	10
Receptacle, Switch ²	*	10	10	10
Cord, Plug	70	40	70	60
Lamp, Light Bulb	*	20	*	10
Panel Board	*	*	*	*
Meter	*	*	*	*
Transformer	*	*	*	*
Other	*	*	10	*
Other Selected Electrical Appliances	10	10	20	20
Clothes Dryer	10	*	*	10
Audio / Visual Equipment	*	10	10	10
Washing Machine	*	*	*	*
Refrigerator / Freezer	*	*	*	*
Shop / Garden Tool	*	*	*	*
Torch	*	*	*	*

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

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

¹ Includes an estimated 10 deaths in 2002 from fires that were confined to the fire box of a burner/boiler but fuel type was unknown and an estimated 10 deaths in both 2003 and 2004 from confined cooking fires.

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

TABLE 4c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED ELECTRICAL EQUIPMENT, 2002 – 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	12,870	13,120	13,330	13,110
Total Electrical	3,560	3,440	3,240	3,420
Electric Heating and Cooling	530	460	420	470
Central Heating	30	10	10	20
Local Fixed Heater	120	140	120	130
Portable Heater	160	120	140	140
Water Heater	10	10	10	10
Fixed, Central Air Conditioning	20	20	20	20
Portable Air Conditioner	30	20	30	30
Other	150	130	90	120
Electric Cooking Equipment	1,990	2,000	1,860	1,950
Range / Oven	1,570	1,680	1,540	1,600
Range / Oven Hood	10	30	10	20
Deep Fat Fryer	10	*	10	10
Grill	*	*	*	*
Small Heat-Producing Appliance	90	60	40	60
Other	300	230	260	260
Electrical Distribution	600	530	480	530
Installed Wiring ²	170	160	130	150
Light Fixture	50	70	80	70
Receptacle, Switch ²	60	50	40	50
Cord, Plug	210	150	80	150
Lamp, Light Bulb	50	60	60	60
Panel Board	10	10	20	10
Meter	10	*	10	10
Transformer	*	*	10	*
Other	50	30	30	40
Other Selected Electrical Appliances	280	250	280	270
Clothes Dryer	180	160	140	160
Audio / Visual Equipment	70	40	40	50
Washing Machine	10	10	10	10
Refrigerator / Freezer	10	20	30	20
Shop / Garden Tool	*	10	30	20
Torch	10	*	10	10

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

¹ There are confined fire injury estimates included in *Total Residential* category. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 7b on pg 31 for details.

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

TABLE 4d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED ELECTRICAL EQUIPMENT, 2002 – 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	\$5,321.1	\$5,311.5	\$5,308.3	\$5,313.6
Total Electrical	\$1,569.6	\$1,306.5	\$1,062.6	\$1,312.9
Electric Heating and Cooling	\$507.6	\$216.5	\$197.8	\$307.3
Central Heating	\$26.5	\$17.2	\$8.5	\$17.4
Local Fixed Heater	\$29.7	\$44.6	\$34.1	\$36.1
Portable Heater	\$129.3	\$50.6	\$36.3	\$72.1
Water Heater	\$16.4	\$9.3	\$6.3	\$10.7
Fixed, Central Air Conditioning	\$209.7	\$11.4	\$30.8	\$84.0
Portable Air Conditioner	\$8.4	\$11.0	\$6.6	\$8.7
Other	\$87.5	\$72.3	\$75.2	\$78.3
Electric Cooking Equipment	\$333.9	\$325.4	\$314.2	\$324.5
Range / Oven	\$243.0	\$239.3	\$211.1	\$231.1
Range / Oven Hood	\$2.8	\$1.8	\$7.5	\$4.1
Deep Fat Fryer	\$1.9	\$2.4	\$1.1	\$1.8
Grill	\$0.1	\$0.9	\$3.8	\$1.6
Small Heat-Producing Appliance	\$22.0	\$22.3	\$26.8	\$23.7
Other	\$64.1	\$58.6	\$63.9	\$62.2
Electrical Distribution	\$491.0	\$503.8	\$354.4	\$449.7
Installed Wiring	\$166.0	\$204.4	\$126.9	\$165.8
Light Fixture	\$47.3	\$40.3	\$43.6	\$43.7
Receptacle, Switch	\$54.6	\$35.0	\$35.4	\$41.7
Cord, Plug	\$95.4	\$101.6	\$58.3	\$85.1
Lamp, Light Bulb	\$35.9	\$32.2	\$27.0	\$31.7
Panel Board	\$23.7	\$25.3	\$17.1	\$22.0
Meter	\$13.2	\$10.4	\$7.6	\$10.4
Transformer	\$3.5	\$2.3	\$0.6	\$2.1
Other	\$51.4	\$52.4	\$37.8	\$47.2
Other Selected Electrical Appliances	\$126.6	\$147.4	\$93.7	\$122.6
Clothes Dryer	\$63.6	\$96.5	\$51.3	\$70.4
Audio / Visual Equipment	\$17.0	\$22.2	\$16.9	\$18.7
Washing Machine	\$4.0	\$2.1	\$2.2	\$2.8
Refrigerator / Freezer	\$15.6	\$18.1	\$9.9	\$14.5
Shop / Garden Tool	\$6.8	\$6.7	\$7.2	\$6.9
Torch	\$19.6	\$1.8	\$6.3	\$9.2

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

¹ There are confined fire property loss estimates included in *Total Residential* category. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 7c on pg 31 for details.

TABLE 5a
ESTIMATED RESIDENTIAL STRUCTURE FIRES
SELECTED GAS-FIRED EQUIPMENT, 2002 - 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	369,000	374,700	386,100	376,600
Total Gas-Fired Equipment	24,500	17,300	13,400	18,400
Gas Heating Equipment	6,900	5,400	4,300	5,500
Fixed Heater	1,600	1,100	1,100	1,300
Portable Heater	300	300	200	300
Central Heating	1,300	1,100	700	1,100
Fireplace, Chimney, Connector	400	300	200	300
Water Heater	2,600	2,300	1,700	2,200
Fixed, Central Air Conditioning	*	*	*	*
Other	500	300	300	400
Gas Cooking Equipment	13,400	8,600	6,000	9,300
Range / Oven	11,700	7,400	4,800	8,000
Open Gas Grill	500	400	400	400
Other	1,200	900	800	1,000
Other Selected Gas Equipment	3,800	3,100	2,700	3,200
Clothes Dryer	2,000	1,500	1,500	1,600
Torch	1,600	1,300	1,000	1,300
Shop / Garden Tool	300	300	300	300

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

¹ There are confined fire estimates included in *Total Residential* category. These confined fire estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 7a on pg 31 for details.

TABLE 5b
ESTIMATED RESIDENTIAL STRUCTURE FIRE DEATHS
SELECTED GAS-FIRED EQUIPMENT, 2002 - 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	2,270	2,740	2,850	2,620
Total Gas-Fired Equipment	120	160	160	150
Gas Heating Equipment	70	70	50	60
Fixed Heater	40	50	10	40
Portable Heater	10	*	30	10
Central Heating	*	*	*	*
Fireplace, Chimney, Connector	*	*	*	*
Water Heater	10	20	*	10
Fixed, Central Air Conditioning	*	*	*	*
Other	*	*	*	*
Gas Cooking Equipment	40	90	100	80
Range / Oven	30	70	90	60
Open Gas Grill	*	10	*	*
Other	10	*	10	10
Other Selected Gas Equipment	10	*	10	10
Clothes Dryer	10	*	*	*
Torch	*	*	*	*
Shop / Garden Tool	*	*	10	*

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

¹Includes an estimated 10 deaths in 2002 from fires that were confined to the fire box of a burner/boiler but fuel type was unknown and an estimated 10 deaths in both 2003 and 2004 from confined cooking fires.

TABLE 5c
ESTIMATED RESIDENTIAL STRUCTURE FIRE INJURIES
SELECTED GAS-FIRED EQUIPMENT, 2002 - 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	12,870	13,120	13,330	13,110
Total Gas-Fired Equipment	920	830	810	850
Gas Heating Equipment	300	290	260	280
Fixed Heater	90	50	50	60
Portable Heater	10	10	20	10
Central Heating	60	60	50	60
Fireplace, Chimney, Connector	*	*	10	*
Water Heater	130	160	120	140
Fixed, Central Air Conditioning	*	*	*	*
Other	10	10	10	10
Gas Cooking Equipment	490	380	400	420
Range / Oven	420	290	310	340
Open Gas Grill	20	20	40	30
Other	40	60	50	50
Other Selected Gas Equipment	90	110	100	100
Clothes Dryer	40	30	50	40
Torch	30	70	40	50
Shop / Garden Tool	20	10	10	10

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

¹ There are confined fire injury estimates included in *Total Residential* category. These confined fire injury estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 7b on pg 31 for details.

TABLE 5d
ESTIMATED RESIDENTIAL STRUCTURE FIRE PROPERTY LOSS (In Millions)
SELECTED GAS-FIRED EQUIPMENT, 2002 - 2004

Equipment	2002	2003	2004	2002-2004 Average
Total Residential¹	\$5,321.1	\$5,311.5	\$5,308.3	\$5,313.6
Total Gas-Fired Equipment	\$282.1	\$301.3	\$224.5	\$269.3
Gas Heating Equipment	\$140.4	\$119.1	\$109.0	\$122.8
Fixed Heater	\$25.6	\$20.1	\$17.4	\$21.0
Portable Heater	\$6.4	\$8.4	\$7.2	\$7.3
Central Heating	\$21.9	\$23.2	\$15.8	\$20.3
Fireplace, Chimney, Connector	\$32.4	\$4.9	\$16.6	\$18.0
Water Heater	\$38.2	\$49.6	\$46.5	\$44.7
Fixed, Central Air Conditioning	\$0.3	\$0.2	*	\$0.2
Other	\$15.7	\$12.7	\$5.6	\$11.3
Gas Cooking Equipment	\$66.9	\$82.7	\$48.6	\$66.1
Range / Oven	\$39.7	\$43.9	\$31.3	\$38.3
Open Gas Grill	\$11.7	\$22.3	\$8.1	\$14.0
Other	\$15.5	\$16.5	\$9.3	\$13.8
Other Selected Gas Equipment	\$67.5	\$91.2	\$54.3	\$71.0
Clothes Dryer	\$11.2	\$10.8	\$9.5	\$10.5
Torch	\$52.1	\$63.8	\$34.9	\$50.2
Shop / Garden Tool	\$4.2	\$16.7	\$9.9	\$10.3

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

¹ There are confined fire property loss estimates included in *Total Residential* category. These confined fire property loss estimates could not be included in the detail lines because NFIRS does not provide information to determine the type of equipment or the power source of the equipment. See Table 7c on pg 31 for details.

Methodology

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

Data

Sources of Data for Fire Loss Estimates

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

The NFPA survey is a stratified random sample of fire departments in the U.S.¹ 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 2002 through 2004.

NFPA Estimates of Residential Structure Fires and Associated Losses 2002 - 2004

	2002	2003	2004
Structure Fires	401,000	402,000	410,500
Civilian Deaths	2,695	3,165	3,225
Civilian Injuries	14,050	14,075	14,175
Property Loss	\$6.06 billion	\$6.07 billion	\$5.95 billion

Source: See footnote 1 below.

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

The NFIRS is a compilation of voluntarily submitted incident reports completed by U.S. fire departments. As such, the NFIRS is not a probability sample and is insufficient to support precision estimation. The reports come from states (49 in 2002, and 50 since 2003) and the District of Columbia. Not all the states reporting data included data from all fire departments in the state. In 2004, there were nearly 15,000 fire departments that participated in NFIRS. The table below shows the number of residential structure fires and the corresponding losses reported to USFA during the years 2002 through 2004.

Residential Structure Fires and Associated Losses Reported to USFA 2002 - 2004

	2002	2003	2004
Structure Fires	156,631	213,161	229,447
Civilian Deaths	1,029	1,370	1,416
Civilian Injuries	5,908	7,108	6,997
Property Loss	\$2.00 billion	\$2.35 billion	\$2.60 billion

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

¹ M.J. Karter, “Fire Loss in the U.S. During 2002”, National Fire Protection Association (NFPA), September 2003; M.J.Karter, “Fire Loss in the U.S. During 2003”, NFPA, October 2004; M.J.Karter, “Fire Loss in the U.S. During 2004”, NFPA, September 2005.

According to the NFPA, there was an estimated annual average of 404,500 residential structure fires in the U.S. during 2002-2004. NFIRS captured about 49% of these fires. During the same time period, NFPA also estimated an annual average of 3,028 deaths, 14,100 injuries and \$6 billion in property loss. On average, NFIRS captured 42% of the deaths, 47% of the injuries and 38% of the property loss.

NFIRS Variables

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

<u>Variable</u>	<u>Description</u>
<i>Civilian Deaths</i>	Number of people who died in connection with the fire incident other than fire service personnel.
<i>Civilian Injuries</i>	Number of people who were injured (but did not die) in connection with the fire incident other than fire service personnel.
<i>Property Loss</i>	Estimate of loss, in whole dollars, if structure sustained damage from flame, smoke, or suppression efforts. Property loss is not adjusted for inflation.
<i>Contents Loss</i>	Estimate of loss in whole dollars for contents (which had value) that sustained damage from flame, smoke, suppression efforts, or otherwise. Contents loss is not adjusted for inflation.
<i>Property Use</i>	Refers to the specific use of the property where the incident occurred. For residential structure fires, the properties that were deemed appropriate were single / multi family dwellings, any type of boarding houses, dormitories, sorority / fraternity houses, hotels / motels and mobile property not in transit.
<i>Incident Type</i>	Identifies the various types of incidents to which fire departments respond. It may include fires, rescue and emergency medical services, false alarms, etc. For this report, the incident codes of interest included structure fires (which include confined fires) and fires in mobile and portable structures used as fixed residences.
<i>Equipment Involved</i>	Equipment that provided the heat which started the fire, e.g., heater, clothes dryer, etc.
<i>Power Source</i>	The type of power for the equipment involved in the fire's ignition. These are grouped into electrical, gas-fueled, liquid-fueled, solid-fueled, and other.

<i>Equipment Portability</i>	Identifies the equipment involved as stationary or portable.
<i>Heat Source</i>	Source of heat that ignited the fire, e.g., candle, lighter, cigarette, heat from operating equipment, hot object, etc.
<i>Item First Ignited</i>	The functional description or use of that item which was first ignited by the heat source, e.g., upholstered furniture, mattress, bedding, electric cable insulation, curtains or drapes, etc.
<i>Cause of Ignition</i>	This indicates the general causal factor that resulted in a heat source igniting a combustible material. The cause code values are: 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. CPSC staff regrouped the codes as: 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 material first ignited to combine to start the fire. Factors adding specificity to the cause of ignition, such as playing with heat source, heat source too close to combustibles, equipment malfunction, etc.
<i>Human Factors Contributing to Ignition</i>	Factors relating to the person or persons involved with the start of the fire. Examples are asleep, possibly impaired by alcohol or drugs, age, unattended or unsupervised person, etc.
<i>Age</i>	Age of the person if age was considered a factor in contributing to the ignition of the fire.

The NFIRS coding manual defines some variables as “required fields,” that is, if known, values must be supplied for those variables. Other variables may or may not be supplied at the discretion of the reporting department. In the list above Equipment Involved, Power Source, Equipment Portability, Factors Contributing to Ignition, Human Factors Contributing to Ignition, and Age are not required fields. Variables that are not required are more likely to be missing from a given fire incident report in NFIRS than those that are required.¹

* See discussion on child play later in this section.
¹ NFIRS Complete Reference Guide, January 2004.

Data Preparation – Addressing Different Types of Missing Data

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

Missing data that can be logically inferred

As mentioned above, only a few of the available fire incident characteristics were used to generate estimates in this report. Of these, only the variables Incident Type, Property Use, Cause of Ignition, Item First Ignited, Heat Source, and the loss variables are required to be filled out by the fire departments. Even less is required for confined fires, which will be discussed below. Tables 1, 3, 4, and 5 in this report rely heavily on the variables Equipment Involved and the Equipment Power Source. In an effort to lessen the extent of missing data, the CPSC staff has implemented some conventions as necessary following consultation with USFA technical staff.

Some examples illustrate this. If the heat source is known to be matches, lighters, or candles, and no equipment is reported, then it is likely that no equipment was involved. 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 but there is no information on the equipment, then it is likely that no equipment was involved. Another scenario would be when the reported equipment code is electrical but the equipment power source is missing. In this case, it is evident that the power source should have been reported as electrical. On the other hand, when it is known that there is no equipment involved, power source should be reported as “none” instead of “unknown”.

Exposure fires

Some fires involved more than one residential structure. The initial structure is identified as exposure zero in the data file. Structure fires that spread from the initial fire are identified as exposure fires numbered from “one” to however many are necessary. Typically in exposure fires most of the information on the variables listed above is not filled out.

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

Other missing data

Tables 6a-6c below show the extent of data still missing after the conventions discussed above were applied and information transfer was completed for exposure fires. Since most of the data fields for confined fires (those that do not spread beyond the originating item) were not reported per NFIRS reporting instructions, they have been excluded from the tabulations below. Confined fires are discussed later in this section.

Table 6a
Missing Data on Residential Structure Fires: 2002 - 2004

	2002	2003	2004
Cause of Ignition	26%	25%	27%
Heat Source	29%	29%	30%
Item First Ignited	27%	28%	30%
Equipment Involved	36%	39%	45%
Equipment Power	40%	41%	46%

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

Table 6b
Missing Data on Residential Structure Fire Deaths: 2002 - 2004

	2002	2003	2004
Cause of Ignition	47%	50%	52%
Heat Source	48%	54%	55%
Item First Ignited	43%	50%	51%
Equipment Involved	42%	48%	48%
Equipment Power	45%	50%	48%

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

Table 6c
Missing Data on Residential Structure Fire Injuries: 2002 - 2004

	2002	2003	2004
Cause of Ignition	23%	24%	26%
Heat Source	25%	25%	26%
Item First Ignited	22%	22%	24%
Equipment Involved	29%	34%	40%
Equipment Power	32%	38%	41%

Source: U.S. Consumer Product Safety Commission / EPHA, from NFIRS data obtained from the U.S. Fire Administration. 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 used. A SAS[®] macro¹ performed the raking. The raking procedure maintains the marginal distributions for the known data while allocating the unknown data for all characteristics involved.² For each year, the raking procedure was applied separately for fires, deaths, injuries, and property loss.

There is one exception to the use of raking for these other cases. Version 5.0 of NFIRS provides product-specific codes for installed wiring, receptacles, and switches. However, very few deaths and injuries in the data file were associated with these products. Since the raking algorithm cannot

¹ M. Battaglia, D. Hoaglin and D. Izrael, “A SAS Macro for Balancing a Weighted Sample”, SAS[®] Users Group International (SUGI) 25th Annual Conference, April 9-12, 2000, Paper #258-25.

² 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.

appropriately produce raked results when cell values are zero or very low, installed wiring, and receptacle / switch deaths and injuries were allocated in the same proportion as the fires involving installed wiring and receptacle / switch.

Confined fires

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

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

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

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

Since 1999, more and more of the NFIRS data has been reported in version 5.0. With the opportunity to identify confined fires using the specific codes, more and more “confined” fires are also being reported to NFIRS. However, very little other useful information about them is available. With the proportion of reported confined fires increasing, the proportion of missing data also increased. Imputation of the unknowns based on so little known information from the confined fires would be likely to yield misleading estimates. As such, the CPSC staff separated out all confined fires from the data before the product-specific estimates were derived. The confined fire and fire loss counts were weighted up to the NFPA estimates using the same weights as the rest of the data and presented at the aggregate levels (and sometimes at more specific levels as allowed by the Incident Type definitions). See the section on Estimation Procedure below for a discussion on the weights used. Tables 7a through 7c below present all estimates related to confined fires. These estimates are also included in Tables 1a through 5d, as appropriate. Note that they do not appear in Tables 4a through 5d at any of the specific levels since there is no information available on equipment power source.

Table 7a : Estimated Residential Confined Fires: 2002 - 2004

Included in Table Categories:	Appear in Tables:	2002	2003	2004
Total Residential	1a, 2a, 3a, 4a, 5a	103,100	145,300	167,300
Total Heating and Cooling Equipment	1a, 3a	27,100	35,400	38,900
<i>Fireplace, Chimney, Connector</i>	<i>1a, 3a</i>	<i>20,600</i>	<i>21,300</i>	<i>21,900</i>
<i>Other (Burner / Boiler)</i>	<i>1a, 3a</i>	<i>6,500</i>	<i>14,100</i>	<i>17,000</i>
Cooking	1a, 2a	66,300	94,500	111,100
Trash, Rubbish	2a	9,200	13,100	14,900
Incinerator		400	600	600
Trash Compactor		100	1,700	1,800

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

Note: Fire estimates are rounded to nearest 100. Rounded estimates less than 100 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. No information was available on the intentionality of these fires.

There were 10 deaths estimated in 2002 from residential confined fires involving Burners / Boilers (under Total Heating & Cooling Equipment) and 10 deaths estimated in both 2003 and 2004 from residential confined cooking fires. No separate table is presented showing these death estimates.

Table 7b : Estimated Residential Confined Fire Injuries: 2002 - 2004

Included in Table Categories:	Appear in Tables:	2002	2003	2004
Total Residential	1c, 2c, 3c, 4c, 5c	1,010	1,300	1,510
Total Heating and Cooling Equipment	1c, 3c	60	100	130
<i>Fireplace, Chimney, Connector</i>	<i>1c, 3c</i>	<i>20</i>	<i>30</i>	<i>30</i>
<i>Other (Burner / Boiler)</i>	<i>1c, 3c</i>	<i>40</i>	<i>70</i>	<i>100</i>
Cooking	1c, 2c	920	1,150	1,350
Trash, Rubbish	2c	30	50	40
Incinerator		*	*	*
Trash Compactor		*	*	*

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

Note: Injury estimates rounded to nearest 10. Rounded estimates less than 10 are denoted by an asterisk (*). Subtotals do not necessarily add to heading totals. No information was available on the intentionality of these fires.

Table 7c : Estimated Residential Confined Fire Property Loss (In Millions): 2002 - 2004

Included in Table Categories:	Appear in Tables:	2002	2003	2004
Total Residential	1d, 2d, 3d, 4d, 5d	\$39.5	\$46.6	\$39.6
Total Heating and Cooling Equipment	1d, 3d	\$14.2	\$17.5	\$14.9
<i>Fireplace, Chimney, Connector</i>	<i>1d, 3d</i>	<i>\$10.4</i>	<i>\$13.1</i>	<i>\$11.4</i>
<i>Other (Burner / Boiler)</i>	<i>1d, 3d</i>	<i>\$3.8</i>	<i>\$4.4</i>	<i>\$3.5</i>
Cooking	1d, 2d	\$22.2	\$26.1	\$23.0
Trash, Rubbish	2d	\$2.7	\$2.9	\$1.2
Incinerator		\$0.3	\$0.1	\$0.4
Trash Compactor		*	*	\$0.1

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

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

Estimation Procedure

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

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

Estimated annual averages recorded in this report are arithmetic averages of the un-rounded estimates from each of the three years. The reported annual averages are rounded arithmetic average estimates.

Other Issues

Change in Product-Specific Categories in Tables 1-5

Since 1999, the NFIRS data provided by the U.S. Fire Administration was constructed using a new version of NFIRS, version 5.0. However, the reporting fire departments have been allowed to switch over to the new version gradually. In 1999, most fire departments recorded incident and loss data using the older system, NFIRS 4.1. When fire departments transmitted their data to USFA in the 4.1 version, the data was converted to the 5.0 version using specially designed computer programs.¹ The 5.0 codes for some variables are more specific and extensive than the 4.1 codes. When there is no overall one-to-one mapping from the old system to the new, it is sometimes not possible to be sure if the data captured by the fire departments using version 4.1 and the data converted from version 4.1 to 5.0 include the same set of products. For example, data originally coded (in 4.1) as “Indoor fireplace” had the option to convert to “Fireplace, chimney, other”, “Fireplace, masonry”, “Fireplace, factory built”, or “Fireplace, insert/stove” (in 5.0). Since the original data did not contain the specificity required by the latter three categories, it was coded as “Fireplace, chimney, other”. A similar situation arose for chimneys. This resulted in the collapsing of the two separate categories, “Fireplace” and “Chimney”, that existed in 1998 and previous years into one.

In version 5.0, the variable that identifies fuel is called “Power Source” and refers only to the power source of the equipment involved at the start of the fire. In NFIRS version 4.1, the variable that captured fuel was called “Form of Heat of Ignition” and did not always pertain to the equipment involved. So in the new version, if there was no equipment involved in the fire, there is no fuel-type (Power Source) associated with the fire. Power Source is not considered missing so nothing is allocated for power source in these “no equipment” cases. These cases maintain no value for power source. As a result of this change, the estimates for ‘All Other Fuel’ fires and associated losses under Heating and Cooling Equipment (Tables 3a-3d) are lower than in previous years.

¹ U.S. Fire Administration, “National Fire Incident Reporting System Version 5.0 Design Documentation”, January 2002, pp 248 –309. The version 5.0 variables and formats are included in USFA’s “National Fire Incident Reporting System Version 5.0 Quick Reference Guide”. Both documents are available at www.nfirs.fema.gov.

Change in Coding Structure

In version 4.1, each of the data characteristics was assigned a two-digit numerical code by the reporting fire departments. Each two-digit code corresponded to a description appropriate for that characteristic. The codes were organized using a nested structure so that the first digit of a two-digit code indicated the particular category. The first code in a particular category was used to code “partial” unknowns where the exact equipment was not known, but the particular category it belonged to was known. For example, all codes for Equipment Involved in Ignition beginning with ‘2’ belonged to *cooking* equipment and code 20 was used when the fire department was not able to identify the equipment further than the fact that it was *cooking* equipment. In the allocation process, fires with such partially unknown values were distributed among the more specific codes within the same category. In this example, a fire with Equipment Involved in Ignition coded as 20 would be distributed among other codes beginning with ‘2’.

In version 5.0, the codes are often more specific and extensive than the 4.1 codes. However, there is no provision to code any partially unknown data element. Any partially unknown information is either placed in a catch-all “Other” category or treated as completely unknown data for that characteristic. As such, no allocation of partial information can be done.

The consequence of this is that the “Other” categories include more cases and the specific product categories include fewer cases than they would have if it was feasible to allocate the partial unknowns among them.

Child Play

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

In version 4.1 of NFIRS data, the variable Ignition Factor had specific codes to indicate the cause of the fire. The codes allowed for the identification of child play fire losses which were associated with matches and lighters. In version 5.0, there is no one variable reserved to identify child play cases. A combination of variables such as Factors Contributing to Ignition, Human Factors Contributing to Ignition, and Age (of fire starter when age was considered a factor contributing to ignition of fire) provides the means to identify these scenarios. However, for data that is reported in version 5.0, fire departments are not required to fill in these three variable fields. Consequently, much of the data is missing and estimates of child play fires (which were presented in pre 1999 years) have become unreliable for post 1998 years. However, as already mentioned in the previous section, to keep consistency with version 4.1, whenever a fire can be identified as involving child play in version 5.0, the intentionality is designated to be “unintentional”.

Conclusion

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