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Home Fires Involving Heating Equipment

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Abstract

In 2011-2015, U.S. fire departments responded to an estimated average of 54,030 structure fires per year in homes that involved heating equipment. These fires resulted in annual losses of 480 civilian deaths, 1,470 civilian injuries, and $1.1 billion in direct property damage. These homes included one- and two-family homes (including manufactured homes) and apartments (including townhouses and other multi-family dwellings).

Space heaters are the type of equipment most often involved in home heating equipment fires, figuring in two of every five fires (43%). The fires involving space heaters accounted for 85% of the civilian deaths and 78% of civilian injuries in home fires caused by heating equipment, as well as over half (53%) of direct property damage. Another 31% of fires involved a fireplace or chimney, but these fires accounted for a much smaller share of civilian fatalities (7%) and civilian injuries (6%). Central heat and water heaters were responsible for 11% and 10% of home fires caused by heating equipment, respectively.

Keywords: fire statistics, home heating fires, space heater fires, fireplace and chimney fires, central heating fires

Acknowledgements

The National Fire Protection Association thanks all the fire departments and state fire authorities who participate in the National Fire Incident Reporting System (NFIRS) and the annual NFPA fire experience survey. These firefighters are the original sources of the detailed data that make this analysis possible. Their contributions allow us to estimate the size of the fire problem.

We are also grateful to the U.S. Fire Administration for its work in developing, coordinating, and maintaining NFIRS.

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U.S. Home Heating Equipment Fires

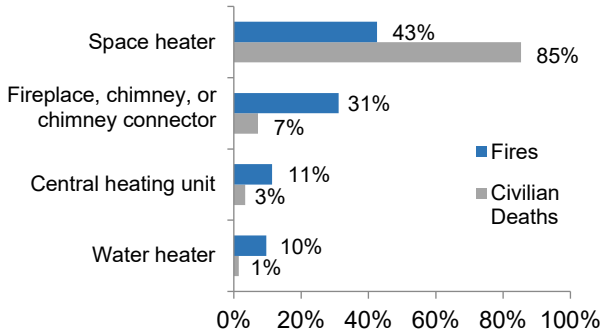
In 2011–2015, U.S. fire departments responded to **54,030** home[1] structure fires that involved heating equipment.

These fires caused:

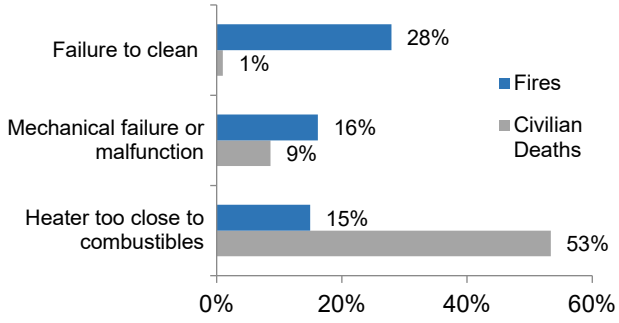
- 480 civilian fire deaths
- 1,470 civilian fire injuries
- $1.1 billion in direct property damage

- ▶ Heating equipment fires accounted for 15% of all reported home fires in 2011–2015 (second behind cooking) and 19% of home fire deaths.
- ▶ The leading factor contributing to home heating fires (28%) was failure to clean, principally from solid-fueled heating equipment, primarily chimneys.
- ▶ The leading factor contributing to ignition for home heating fire deaths (53%) was heating equipment too close to flammable items, such as upholstered furniture, clothing, mattress, or bedding.
- ▶ Most home heating fire deaths (85%) involved stationary or portable space heaters.
- ▶ Nearly half (48%) of all home heating fires occurred in December, January, and February.
- ▶ The number of home heating fires peaked in the hours between 5 p.m. to 9 p.m.

U.S. Home Heating Fires by Equipment Involved: 2011–2015



Leading Factors in Home Heating Fires 2011–2015



[1]Homes are dwellings, duplexes, manufactured homes, apartments, townhouses, row houses, and condominiums.

Source: NFPA Research: www.nfpa.org/research
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Executive Summary

In 2011-2015, U.S. fire departments responded to an estimated average of 54,030 structure fires per year in homes that involved heating equipment. These fires resulted in average annual losses of 480 civilian deaths, 1,470 civilian injuries, and $1.1 billion in direct property damage. These homes included one- and two-family homes (including manufactured homes) and apartments (including townhouses and other multi-family dwellings).

Heating equipment is a leading cause of fires in U.S. homes. Heating equipment caused 15% of home structure fires in 2011-2015, ranking as the second leading cause behind fires caused by cooking equipment. Home heating equipment fires also accounted for nearly one-fifth (19%) of civilian deaths (third behind fires caused by smoking materials and cooking), 12% of civilian injuries (second behind cooking equipment), and 16% of direct property damage (third behind electrical distribution and lighting equipment and cooking equipment).

Space heaters are the type of equipment most often involved in home heating equipment fires, figuring in just over two of every five fires (43%). Significantly, the fires involving space heaters accounted for 85% of the civilian deaths and 78% of civilian injuries in home fires caused by heating equipment, as well as over half (53%) of direct property damage. Another 31% of fires involved a fireplace or chimney, but these fires accounted for a much smaller share of civilian fatalities (7%) and civilian injuries (6%). Central heat and water heaters were responsible for 11% and 10% of home fires caused by heating equipment, respectively.

Home fires caused by heating equipment are influenced by seasonal changes and time of day. The peak months for home heating fires are the cold weather months of December, January, and February, which together account for nearly one-half (48%) of the annual total. (Figure 2) Three out of five (58%) of home heating fire deaths occur in these months. Fires in March and November, each with 12% of fires, also experienced a disproportionate share of heating equipment fires.

A variety of factors were identified as contributing to the ignition of home heating equipment fires. The leading factor that contributed to the failure of home heating equipment fires was "failure to clean," accounting for 28% of fires, the majority of which were confined fires (25% of total). The second leading factor, "mechanical failure or malfunction," accounted for 16% of fires, while "heat source too close to combustibles" accounted for 15% of fires, but was responsible for the greatest share of heating fire losses – 53% of civilian deaths, 29% of civilian injuries, and 31% of direct property damage. An electrical failure or malfunction (8% of fires), and equipment unattended (7%) were other leading factors contributing to ignition.

Fuel and power sources. Heating equipment powered by a solid-fueled source accounted for two of every five home fires (41%) attributed to heating equipment, and these fires were associated with 23% of civilian deaths, 10% of civilian injuries, and 31% of direct property damage. Electric-powered heating equipment was responsible for a smaller share of the fires (34%), but larger shares of civilian fatalities (54%), civilian injuries (57%), and direct property damage (42%). Gas-fueled heating equipment accounted for another 17% of fires, 15% of civilian deaths, 27% of civilian injuries, and 24% of direct property damage.

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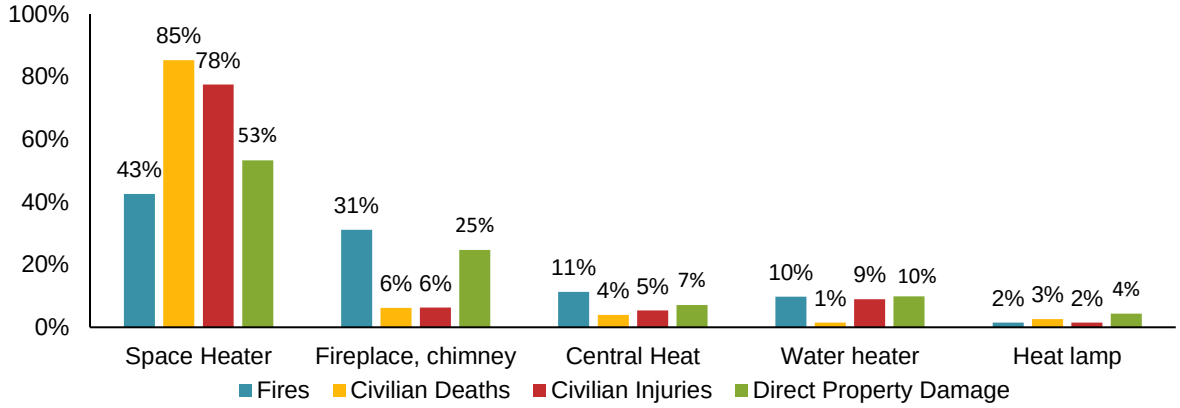
Section 1: Home Fires Involving Heating Equipment

In 2011-2015, U.S. fire departments responded to an estimated average of 54,030 structure fires per year in homes that involved heating equipment. These fires resulted in annual losses of 480 civilian deaths, 1,470 civilian injuries, and $1.1 billion in direct property damage. These homes included one- and two-family homes (including manufactured homes) and apartments (including townhouses and other multi-family dwellings).

Heating equipment is a leading cause of fires in U.S. homes. As indicated in a separate report, *Home Structure Fires* by Marty Ahrens, heating equipment caused 15% of home structure fires in 2011-2015, ranking as the second leading cause behind fires caused by cooking equipment.[1] Home heating equipment fires also accounted for nearly one-fifth (19%) of civilian deaths (third behind fires caused by smoking materials and cooking), 12% of civilian injuries (second behind cooking equipment), and 16% of direct property damage (third behind electrical distribution and lighting equipment and cooking equipment).

Space heaters are the type of equipment most often involved in home heating equipment fires, figuring in just over two of every five fires (43%) (See Figure 1 below). Significantly, the fires involving space heaters accounted for 85% of the civilian deaths and 78% of civilian injuries in home fires caused by heating equipment, as well as over half (53%) of direct property damage. Another 31% of fires involved a fireplace or chimney, but these fires accounted for a much smaller share of civilian fatalities (6%) and civilian injuries (6%). Central heat and water heaters were responsible for 11% and 10% of home fires caused by heating equipment, respectively.

Figure 1. Home Structure Fires Involving Heating Equipment, by Type of Equipment, 2011-2015 Annual Averages

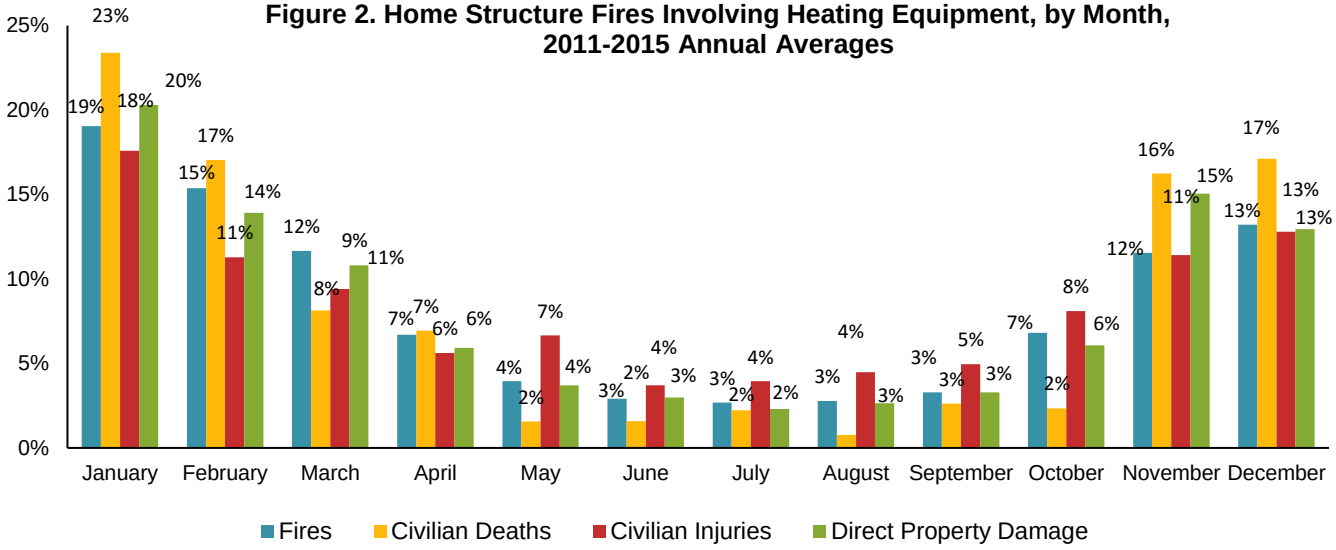


Note and Source: See Table 2.

[1] Marty Ahrens, *Home Structure Fires*, Quincy, MA: National Fire Protection Association, Fire Analysis and Research Division, 2015.

Home fires caused by heating equipment are influenced by seasonal changes and time of day. The peak months for home heating fires are the cold weather months of December, January, and February, which together account for nearly one-half (48%) of the annual total. (Figure 2 and Table 3). Three out of five (58%) of home heating fire deaths occur in these months. Fires in March and November, each with 12% of fires, also experienced a disproportionate share of heating equipment fires by month.

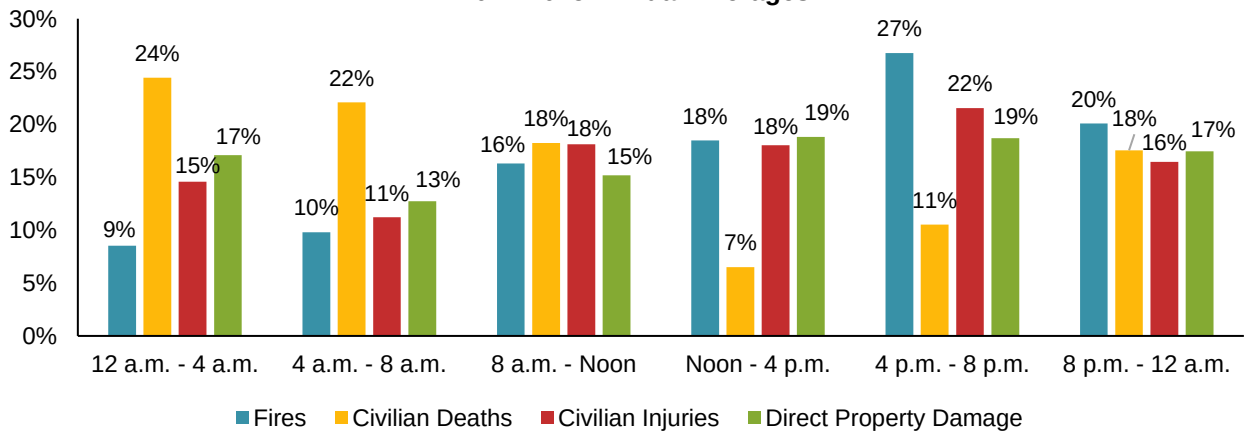
Figure 2. Home Structure Fires Involving Heating Equipment, by Month, 2011-2015 Annual Averages



Note and Source: See Table 3.

The peak time of day for home heating equipment fires are the hours between 4:00 p.m. and 8:00 p.m. (27% of fires), with another 20% of fires occurring between 8:00 p.m. and 12:00 a.m. (Figure 3). The fewest fires occurred in the hours between 12:00 a.m. and 8:00 a.m. The timing of fires is likely to reflect a decrease in the use of heating equipment during the overnight hours. However, it should be noted that the greatest share of civilian deaths occur during the times of day that accounted for the fewest fires, with 47% of civilian deaths recorded in the hours between 12:00 a.m. and 8:00 a.m., which accounted for 18% of fires.

Figure 3. Home Structure Fires Involving Heating Equipment, by Time of Day 2011-2015 Annual Averages



Note and Source: See Table 5.

Home heating fires show little variation by day of week, although Saturday and Sunday had a slightly higher share of fires – each with 15% -- than the remaining days of the week, which each recorded 14% of fires, indicating that people are more likely to be home and using heating equipment over the weekend.

Home structure fires and heating equipment. Fires caused by heating equipment include fires that the National Fire Incident Reporting System (NFIRS 5.0) distinguishes as "non-confined" and "confined" fires. Confined heating equipment fires include: 1) confined chimney or flue fires, and 2) confined fuel burner or boiler fires. Losses are generally minimal in these fires, which are by definition assumed to be limited to the object of fire origin. Table A below shows that 52% of home heating equipment fires involved confined heating equipment, primarily confined chimney or flue fires (35%), but that all of the associated civilian deaths, 96% of civilian injuries, and 99% of direct property damage were associated with non-confined fires caused by heating equipment. A small number of fires that were confined to either the chimney/flue or fuel burner/boiler were coded as not involving heating equipment.

Table A. Home Fires Involving Heating Equipment, By Equipment Involved in Ignition, Annual Average of 2011-2015 Structure Fires Reported to U.S. Fire Departments

Equipment Involved in Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Non-confined heating equipment	**26,050**	**(48%)**	**480**	**(100%)**	**1,420**	**(96%)**	**$1,052**	**(99%)**
Confined heating equipment	**27,980**	**(52%)**	**0**	**(0%)**	**60**	**(4%)**	**$8**	**(1%)**
Confined chimney or flue	19,050	(35%)	0	(0%)	20	(2%)	$6	(1%)
Confined chimney, flue, with heating equipment	18,360	(34%)	0	(0%)	20	(1%)	$6	(1%)
Confined to chimney, flue, no heating equipment	690	(1%)	0	(0%)	10	(0%)	$0	(0%)
Confined fuel burner or boiler	8,930	(17%)	0	(0%)	30	(2%)	$2	(0%)
Confined fuel burner, boiler, with heating equipment	7,860	(15%)	0	(0%)	30	(2%)	$2	(0%)
Confined fuel burner, boiler, no heating equipment	1,070	(2%)	0	(0%)	10	(0%)	$0	(0%)
Total	**54,030**	**(100%)**	**480**	**(100%)**	**1,470**	**(100%)**	**$1,060**	**(100%)**

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

A variety of factors were identified as contributing to the ignition of home heating equipment fires. The leading factor that contributed to the failure of home heating equipment fires was "failure to clean," accounting for 28% of fires, the majority of which were confined fires (25% of total). The second leading factor, "mechanical failure or malfunction," accounted for 16% of fires, as well as 9% of civilian deaths and injuries and 19% of direct property damage. A heat source too close to combustibles was accounted for 15% of fires and the greatest share of heating fire losses – 53% of civilian deaths, 29% of civilian injuries, and 31% of direct property damage. An electrical failure or malfunctions (8% of fires) and equipment unattended (7%) were other leading factors contributing to ignition. Unattended equipment was a factor

associated with a disproportionate share of civilian heating equipment deaths (14%), injuries (20%), and direct property damage (10%). See Table 6.

The leading items first ignited in home fires caused by heating equipment were unclassified items (14% of fires, unclassified organic materials (11%), and flammable and combustible liquids and gases, piping or filters (11%). Cooking materials were the item first ignited in 8% of fires and accounted for the largest share of civilian injuries (26%). Fires in which a structural member of framing was first ignited (7% of total) accounted for the largest share of direct property damage (27%). See Table 7. In some cases, fire places, wood stoves, or other heating equipment may have been used to cook food.

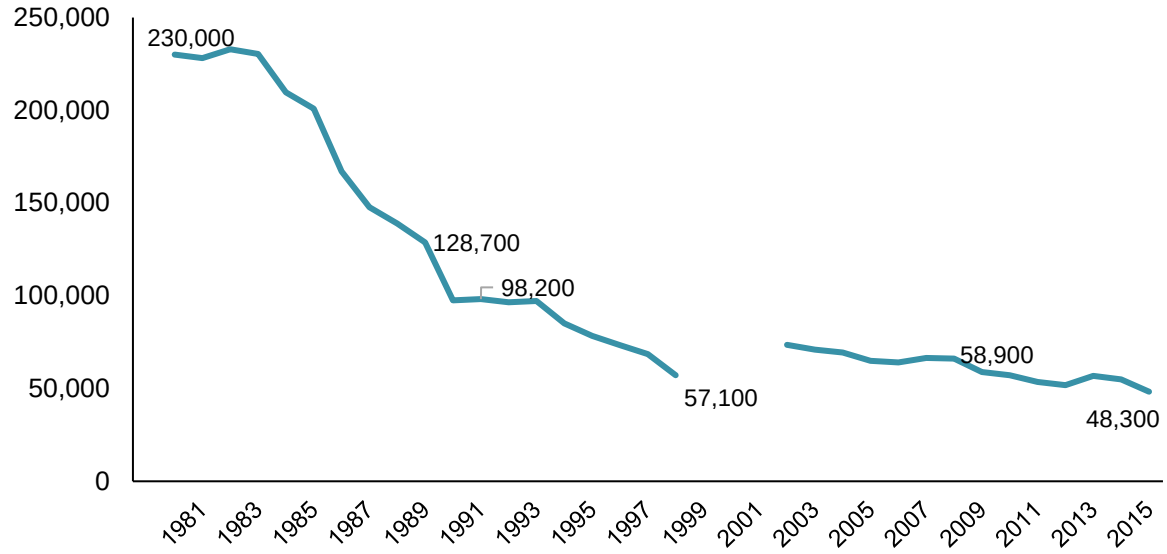
The primary heat sources for home fires caused by heating equipment were "radiated or conducted heat from operating equipment" (20% of fires), "hot ember or ash" (18%), "unclassified heat from powered equipment" (13%), and a "spark, ember, or flame from operating equipment" (12%). Fires caused by radiated or conducted heat from operating equipment accounted for 52% of civilian deaths, 36% of civilian injuries, and 37% of direct property damage. Fires in which unclassified heat from powered equipment acted as the heat source were associated with 17% of civilian deaths, 24% of civilian injuries, and 17% of direct property damage. Fires with spark, ember, or flame from operating equipment as the heat source were associated with 10% of civilian deaths, 16% of civilian injuries, and 17% of direct property damage. See Table 8.

Excluding confined chimney or flue fires, the leading area of origin for heating equipment fires in the home was a kitchen or cooking area, with 14% of fires. As shown in Table 9, other leading areas of origin included heating equipment rooms (13% of fires), a living room, family room or den, (5%), and bedroom (4%). The fires originating in the kitchen or cooking area were associated with 17% of civilian deaths, 44% of civilian injuries, and 15% of direct property damage, while those originating in the living room, family room, or den caused 29% of civilian deaths, as well as 12% of civilian injuries and 11% of direct property damage. Fires originating in the bedroom accounted for 20% of civilian deaths, 9% of civilian injuries, and 9% of direct property damage.

Type of fuel or power with heating equipment fires. Heating equipment powered by a solid-fueled source accounted for two of every five home fires (41%) attributed to heating equipment, and these fires were associated with 23% of civilian deaths, 10% of civilian injuries, and 31% of direct property damage. See Table 10. Electric-powered heating equipment was responsible for a smaller share of the fires (34%), but a larger share of civilian fatalities (54%), civilian injuries (57%), and direct property damage (42%). Gas-fueled heating equipment accounted for another 17% of fires, 15% of civilian deaths, 27% of civilian injuries, and 23% of direct property damage.

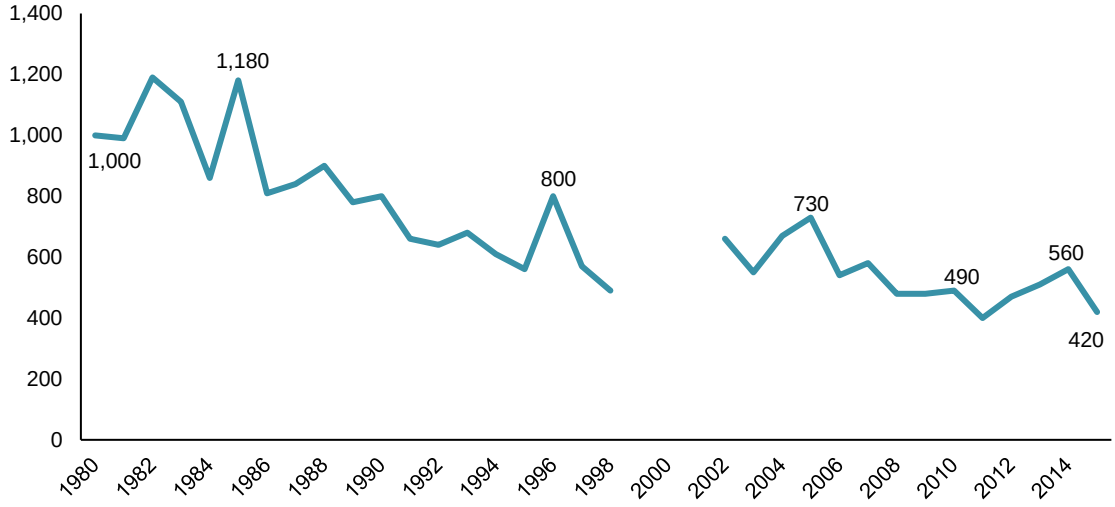
Since 1980, there has been a substantial decline in the estimated number of home structure fires involving heating equipment each year, as shown in Figure 4 and Table 1. Between 1980 and 1985, over 200,000 home fires were attributed to heating equipment each year, while an estimated 128,700 fires in 1989 represented the fewest number of fires during the 1980s. The number of home heating equipment fires dropped below 100,000 in 1990 for the first time (with 97,500), and have since continued to decline, despite occasional yearly fluctuations. There have been fewer than 60,000 home fires due to heating equipment each year since 2009 -- roughly one-quarter of the totals recorded in the first six years of NFIRS from 1980 to 1985.

Figure 4. Number of Home Heating Fires, 1980-2015



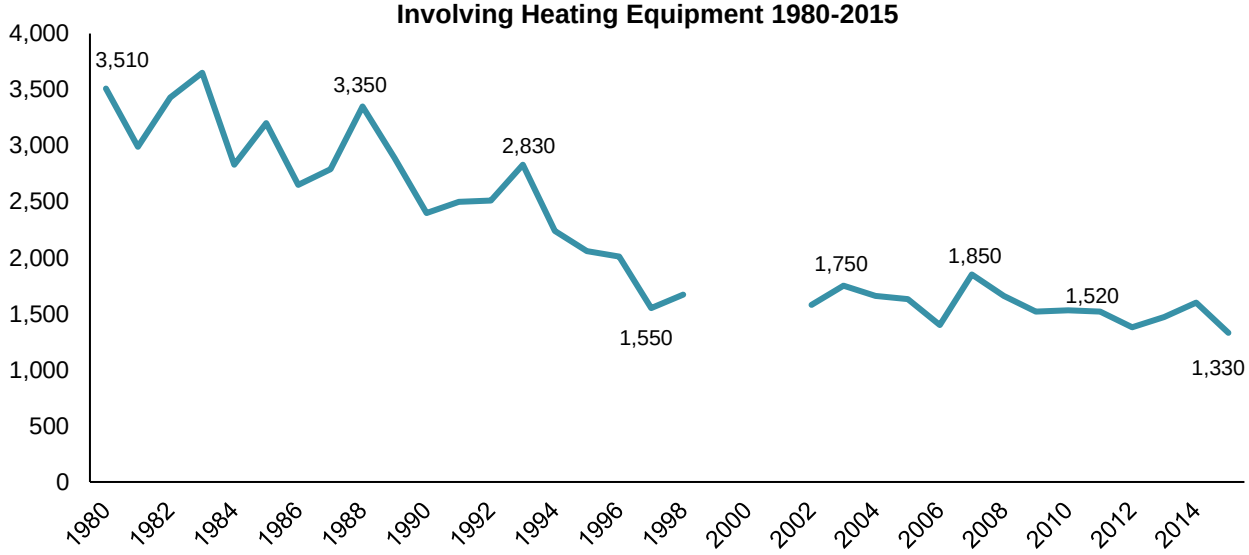
There have also been substantial reductions in civilian deaths and injuries associated with home heating equipment fires since 1980. Despite year to year fluctuations, civilian deaths show a downward trend, as shown in Figure 5. From annual death totals over 1,000 in the early 1980s, there have been fewer than 600 deaths per year since 2005.

Figure 5. Civilian Deaths in Home Structure Fires Involving Heating Equipment, 1980-2015



Civilian injuries have also declined, although these have also fluctuated from one year to the next. As shown in Figure 6, injuries have fallen from well over 3,000 a year to approximately 1,500 or fewer since 2009, as shown in Figure 6. As shown in Table 1 at the back of this report, the trend in direct property damage when adjusted for inflation has been inconsistent since the early 1990s and does not show a clear decline.

Figure 6. Civilian Injuries in Home Structue Fires Involving Heating Equipment 1980-2015



Note and Source for Figures 4 - 6: See Table 1. Because of low participation in NFIRS Version 5.0 during 1999-2001, data for those years must be treated with caution and is not reported in these tables.

Section 2. Home Structure Fires Involving Space Heaters

Space heaters account for the vast majority of civilian deaths and injuries associated with home structure fires involving heating equipment, as well as just over half of the direct property damage. In the 2011-2015 period, there were an estimated average of 23,000 home structure fires involving space heaters per year, resulting in 410 civilian deaths, 1,140 civilian injuries, and $565 million in direct property damage. Non-confined fires accounted for all of the civilian deaths and nearly all of the civilian injuries and direct property damage from these incidents.

Heating stoves are responsible for the largest share of space heater fires, 47% of the total. As Table B indicates, these fires accounted for one-third (33%) of civilian deaths and 61% of civilian injuries, as well as 41% of direct property damage. Heaters, including catalytic and oil-filled heaters, were involved in 27% of fires involving space heaters, but they resulted in disproportionately higher shares of losses -- 59% of civilian deaths, as well as 32% of civilian injuries, and 41% of direct property damage. Fires involving a fireplace with insert accounted for 15% of space heater fires, with 3% of civilian deaths, 2% of civilian injuries, and 10% of direct property damage associated with these fires. A local furnace was involved in 11% of space heater fires. These fires also accounted for 5% of civilian deaths, as well as 5% of civilian injuries and 8% of direct property damage. See also Table 15.

Table B. Home Fires Involving Space Heaters, by Type of Device
2011-2015 Annual Averages

Type of Device	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Heating stove	10,780	(47%)	130	(33%)	700	(61%)	$229	(41%)
Heater (including catalytic and oil-filled)	6,220	(27%)	240	(59%)	360	(32%)	$233	(41%)
Fireplace with insert	3,400	(15%)	10	(3%)	20	(2%)	$58	(10%)
Local furnace	2,600	(11%)	20	(5%)	60	(5%)	$0	(8%)
Total	23,000	(100%)	410	(100%)	1,140	(100%)	$565	(100%)

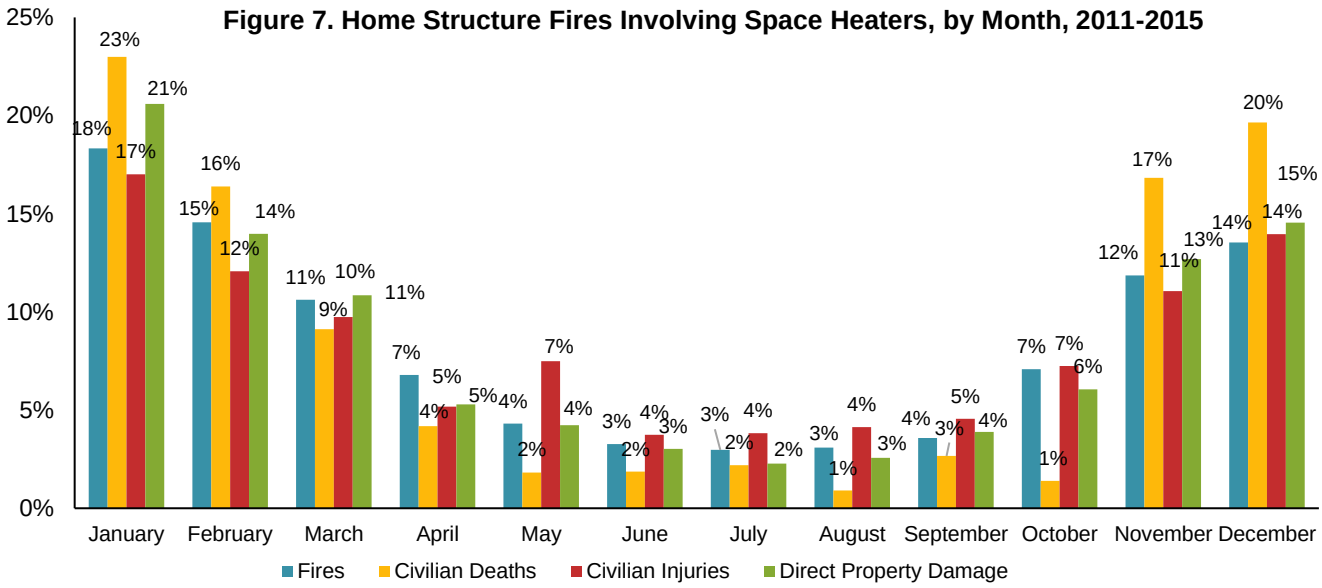
Note and Source: See Table 15.

Almost one-half of the space heater fires (49%) involved electric-powered equipment, as shown in Table 11. These fires accounted for 59% of civilian deaths, 67% of civilian injuries, and 57% of direct property damage. Solid-fueled devices were involved in 28% of space heater fires, accounting for 20% of civilian deaths, 7% of civilian injuries, and 22% of direct property damage. Space heaters that were gas-fueled were involved in 15% of space heater fires, accounting for 13% of civilian deaths, 20% of civilian injuries, and 17% of direct property damage. Liquid-fueled space heaters were involved in 7% of space heater fires. These fires accounted for 7% of civilian deaths, 5% of civilian injuries, and 4% of direct property damage.

Home structure fires involving space heaters follow a monthly pattern similar to home fires involving all categories of heating equipment. These fires peaked in the cold weather months of December (14% of yearly total), January (18%), and February (15%), followed by November (12%) and March (11%). A disproportionate share of civilian deaths (43%) occurred in the 32% of annual space heater fires in December and January. Civilian injuries and direct property damage were generally proportional to the monthly share of annual fires. See Figure 7 below and Table 12.

Table 13 shows that fires involving space heaters showed little variation by day of week.

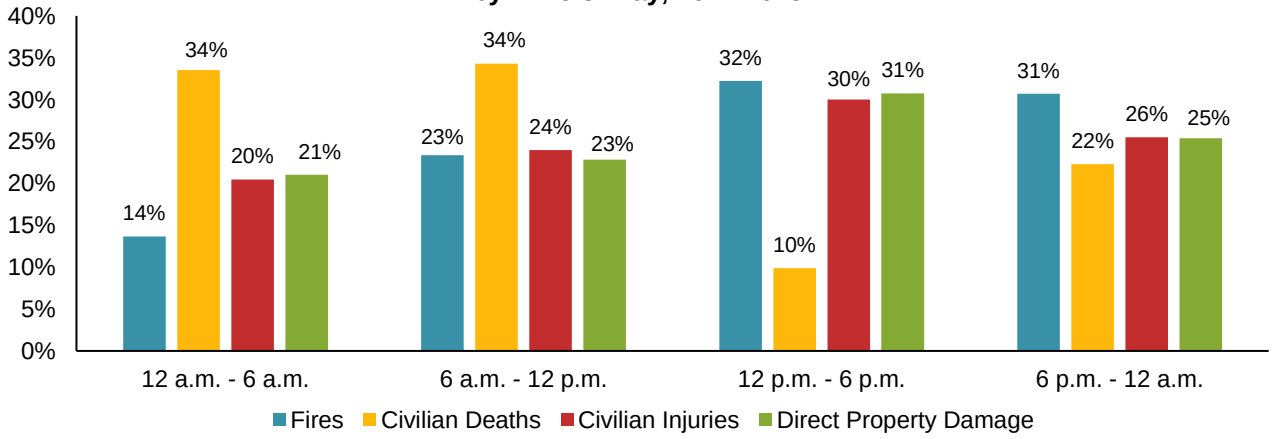
Figure 7. Home Structure Fires Involving Space Heaters, by Month, 2011-2015



Note and Source: See Table 12.

Home structure fires involving space heaters peaked in the hours between noon and midnight. Figure 8 and Table 14 show that 32% of fires occurred between 12 p.m. and 6 p.m. and another 31% between 6 p.m. and midnight. Fires in the overnight and morning hours were associated with a higher proportion of civilian deaths: 68% of deaths occurred in fires between 12 a.m. and 12 p.m. No clear trend was apparent in civilian injuries and direct property damage by time of day.

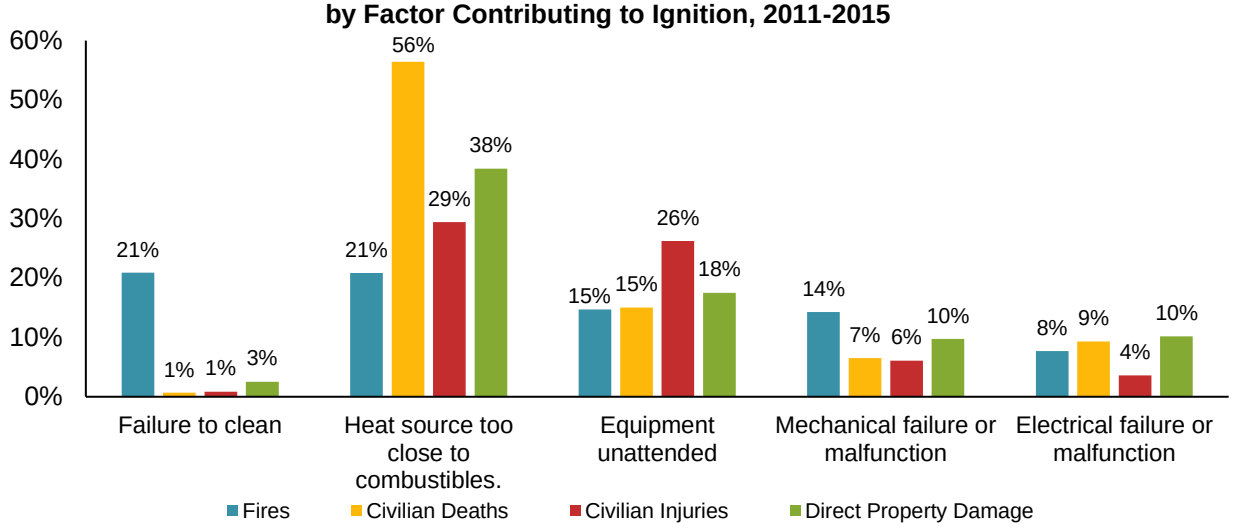
Figure 8. Home Structure Fires Involving Space Heaters by Time of Day, 2011-2015



Notes and Source: See Table 14.

The leading factors contributing to the ignition of home fires caused by space heaters were failure to clean and heat source too close to combustibles, each accounting for 21% of fires. See Figure 9 and Table 16. The vast majority (89%) of failure to clean fires were confined fires and losses in this category accounted for just 1% of space heater deaths, 1% of injuries, and 3% of direct property damage. Many of the incidents involving wood stoves, fireplace inserts, or related equipment ignited creosote in the chimney. Fires associated with a heat source too close to combustibles accounted for 56% of the civilian heating equipment deaths, 29% of civilian injuries, and 38% of direct property damage from home space heater fires. Other leading factors contributing to the ignition of space heater fires were equipment unattended (15% of fires) and mechanical failure or malfunction (14% of fires), with the former accounting for 26% of civilian injuries.

Figure 9. Home Structure Fires Involving Space Heaters by Factor Contributing to Ignition, 2011-2015



Note and Source: See Table 16.

Cooking materials, including food were the leading item first ignited in home fires involving space heaters, with 17% of the space heater total. These fires accounted for 5% of civilian deaths, 34% of civilian injuries, and 14% of direct property damage. Another 11% of fires occurred when flammable and combustible liquids and gases, piping or filters were first ignited, with 5% of civilian deaths, 9% of civilian injuries, and 4% of direct property damage. Unclassified organic materials accounted for 7% of fires, with minimal losses. A structural member of framing was first ignited in 6% of space heater fires, but accounted for 18% of direct property damage. Fires in which a mattress or bedding (3% of fires) and upholstered furniture (2% of fires) were first ignited each accounted for 12% of civilian deaths. See Table 17.

A kitchen or cooking area was the area of origin for 30% of home fires involving space heaters, and these fires accounted for 56% of civilian injuries, as well as 19% of civilian deaths and 27% of direct property damage. One-fifth (21%) of the fires were confined fires originating in the chimney or flue, with minimal losses. Fires originating in a bedroom accounted for 8% of space heater fires, 22% of civilian deaths, 11% of civilian injuries, and 15% of direct property damage. Another 8% of fires originated in a living room, family room, or den, and these fires accounted for the greatest share of civilian deaths (30%), as well as 13% of civilian injuries and 14% of direct property damage. See Table 18.

Section 3. Home Structure Fires Involving Fireplaces, Chimneys, and Chimney Connectors

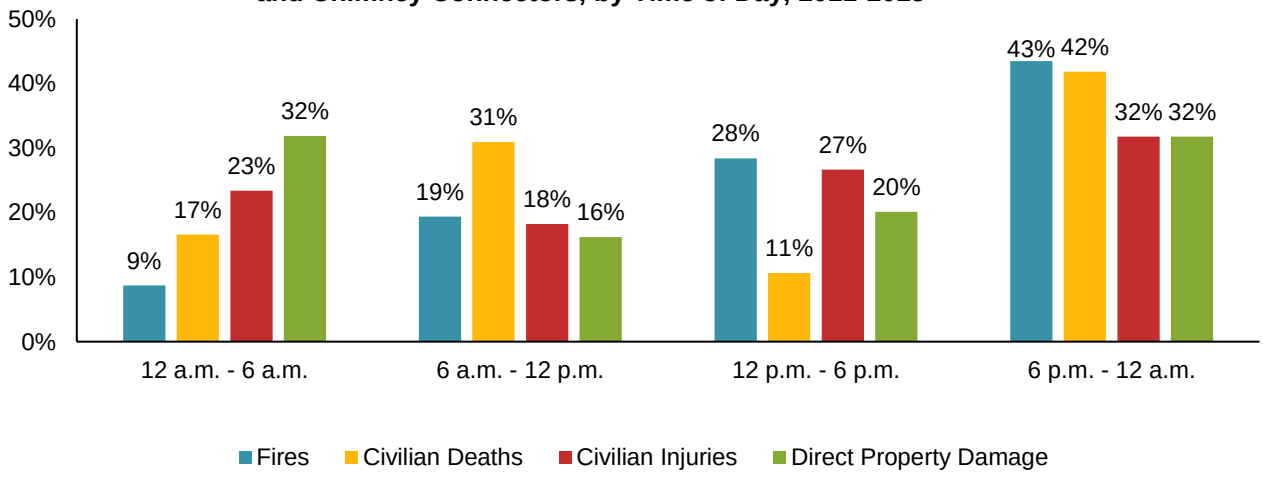
In the 2011 to 2015 period, there were an estimated annual average of 16,810 home structure fires involving fireplaces, chimneys, and chimney connectors, resulting in an estimated 30 deaths, 90 civilian injuries, and $262 million in direct property damage per year. Fires involving fireplaces, chimneys, and chimney connectors comprised 31% of the 2011-2015 home fires involving heating equipment, as well as 6% of the associated civilian deaths, 6% of civilian injuries, and 25% of direct property damage. The vast majority of these fires (94%) involved solid-fueled equipment, which accounted for 85% of civilian deaths, 88% of civilian injuries, and 79% of direct property damage, as indicated in Table 19.

Nearly three-fifths of home structure fires involving fireplaces, chimneys, and chimney connectors occurred in December, January, and February (56%). The fires in January and February alone accounted for 58% of civilian deaths, although these results should be interpreted cautiously due to the comparatively small number of deaths. January was the peak month for civilian injuries (34% of yearly total), followed by December (15%) and November (12%). The warm weather months of June, July, and August combined to account for just 2% of fires, 2% of civilian injuries, and 2% of direct property damage, with no civilian fatalities. See Table 20.

There was little variation in fires by day of week. Saturday (15% of weekly total) and Sunday (16%) were the days of the week with the largest shares of fires. The remaining days each had 13% to 14% of fires. See Table 21.

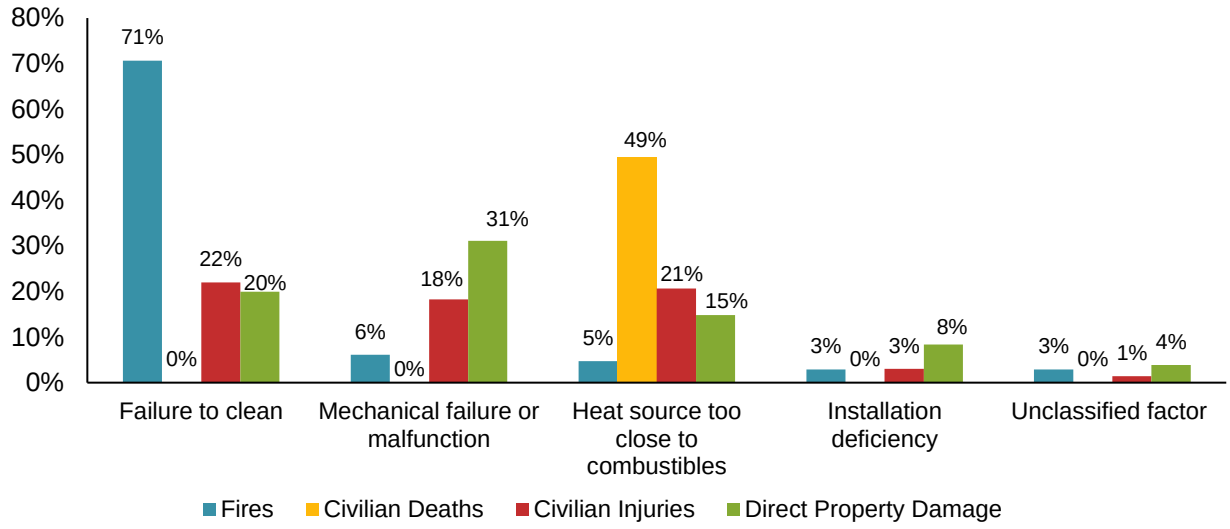
The peak period for fires involving fireplaces, chimneys, and chimney connectors was between 6:00 p.m. and 12:00 a.m., with 43% of fires, followed by 12:00 p.m. to 6:00 p.m. (28%) As shown in Figure 10 and Table 22, just 9% of fires occurred between midnight and 6:00 a.m., but these overnight fires accounted for 17% of civilian deaths, 23% of civilian injuries, and 32% of direct property damage. Fires that began between 6 a.m. and 12 p.m. (19% of the total) accounted for 31% of civilian deaths, 18% of civilian injuries, and 16% of direct property damage.

Figure 10. Home Structure Fires Involving Fireplaces, Chimneys, and Chimney Connectors, by Time of Day, 2011-2015



Failure to clean was a factor contributing to the ignition of 71% of home structure fires involving fireplaces, chimneys, or chimney connectors. These fires were not associated with any civilian deaths, and just 22% of civilian injuries from fires involving fireplaces, chimneys, or chimney connectors, as well as 20% of direct property damage. A mechanical failure or malfunction contributed to 6% of the fires, but these fires accounted for 18% of civilian injuries, and 31% of direct property damage. Fires in which a heat source too close to combustibles was a factor contributing to ignition of 5% of the fires, but accounted for nearly half (49%) of civilian deaths, 21% of civilian injuries, and 15% of direct property damage. Equipment not operated properly was a factor in 2% of fires involving fireplaces, chimneys or chimney connectors, but were associated with a disproportionate share of the civilian deaths (12%). See Figure 11 and Table 23.

Figure 11. Home Structure Fires Involving Fireplaces, Chimneys, and Chimney Connectors by Factor Contributing to Ignition, 2011-2015 Annual Averages



Note and Source: See Table 23.

The leading items first ignited in home fires involving fireplaces, chimneys, or chimney connectors were unclassified organic materials (21% of total), film or residue, including paint, resin and creosote (17%), unclassified items (also 17%), and structural member or framing (10%). As shown in Table 24, the item first ignited associated with the greatest losses was structural member or framing (10g% of fires), which accounted for 20% of civilian injuries and 58% of direct property damage. Fires in which an unclassified structural component or finish was first ignited accounted for 3% of fires, but 6% of civilian deaths, 10% of civilian injuries, and 10% of direct property damage.

Most of the home structure fires involving fireplaces, chimneys, or chimney connectors were confined fires originating in the chimney or flue (78%). These fires were associated with 18% of civilian injuries and 2% of direct property damage. A wall assembly or concealed space was the area of origin in 5% of fires, accounting for 12% of civilian deaths, 9% of civilian injuries, and 22% of direct property damage, while 4% of fires originated in a living room, family room, or den, with 47% of civilian deaths, 31% of civilian injuries, and 14% of direct property damage. Fires originating in the attic or ceiling/roof assembly or concealed space accounted for 3% of fires, but 10% of civilian injuries and 16% of direct property damage. See Table 25.

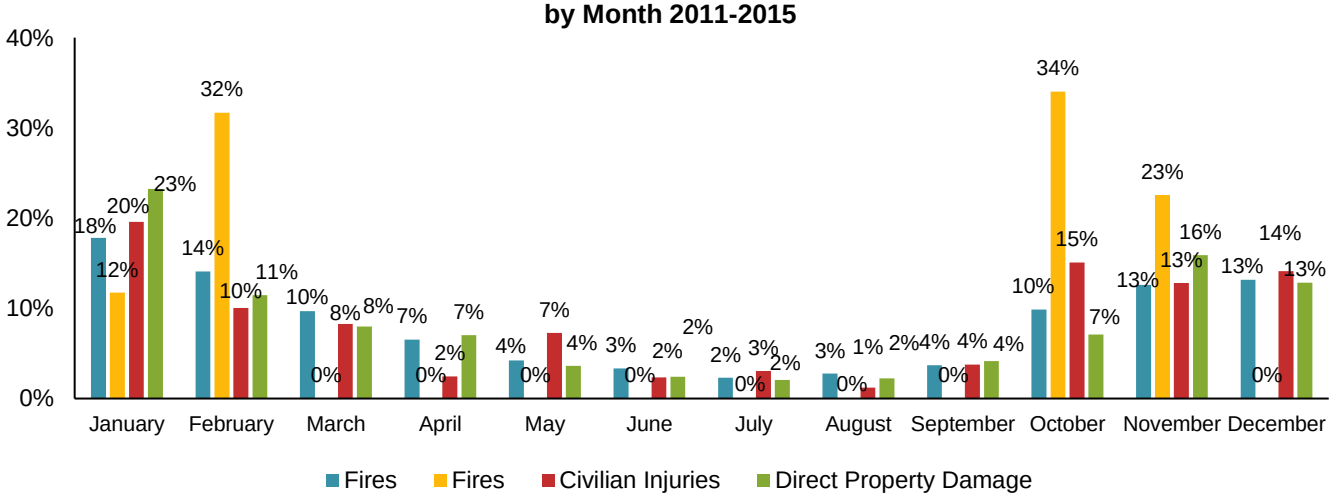
Section 4. Home Structure Fires Involving Central Heating Units

In 2011-2015, there were an estimated average of 6,130 home structure fires per year that involved central heating units. These fires resulted in an estimated 20 civilian deaths, 70 civilian injuries, and $75 million in direct property damage each year. The fires involving central heating units comprised 11% of the home structure fires involving heating equipment during this period, as well as 4% of civilian deaths, 5% of civilian injuries, and 7% of direct property damage arising from home heating equipment fires. See Table 26.

Electric-powered equipment accounted for 38% of home structure fires involving central heating units during 2011-2015. These fires accounted for 35% of the civilian deaths, 26% of civilian injuries, and 43% of direct property damage from central heating unit fires. Another 33% of central heating unit fires involved gas-fueled equipment, and these fires accounted for 43% of civilian deaths, 55% of civilian injuries, and 44% of direct property damage. Liquid-fueled central heating units accounted for 27% of central heating unit fires, 22% of associated civilian deaths, 19% of civilian injuries, and 7% of direct property damage. Only 2% of these fires involved solid-fueled equipment, accounting for 6% of direct property damage. See Table 26.

Consistent with seasonal trends already observed, fires involving home heating units peak in cold weather months, with 58% of these fires occurring in November through February. Another 20% of fires occurred in March and October. Fires from October through February accounted for 72% of civilian injuries, while 63% of direct property damage came in fires between November and February, as shown in Figure 12 and Table 27.

Figure 12. Home Structure Fires Involving Central Heating Units by Month 2011-2015

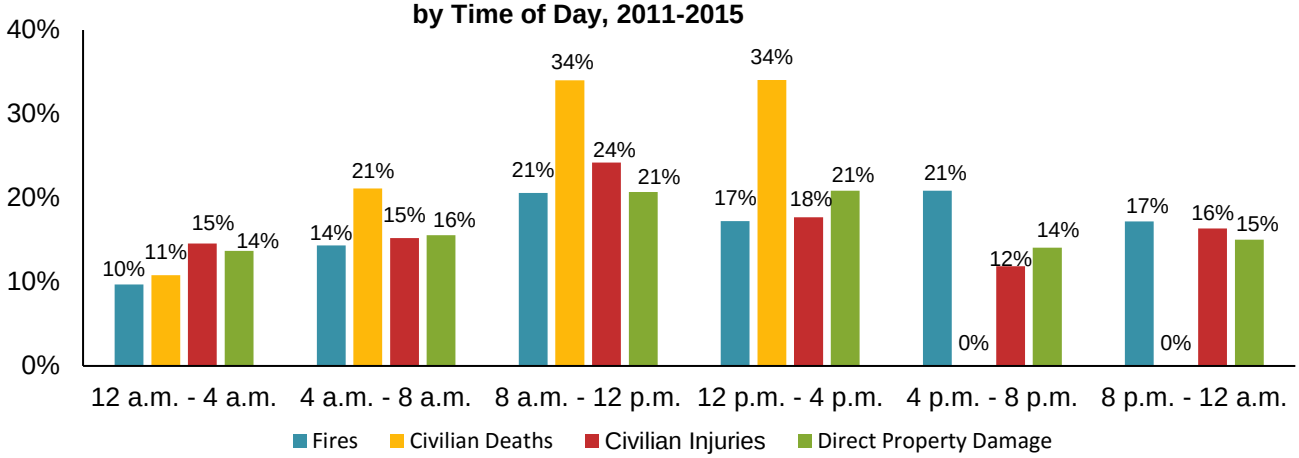


Note and Source: See Table 27.

Table 28 shows fires by day of week involving central heating units. The share of fires ranged between 13% and 16%, with no discernible trend.

The peak period for home structure fires involving central heating units by time of day came in the hours between 8 a.m. and 12 p.m. (21%) and 4 p.m. and 8 p.m. (21%). The fewest fires occurred from midnight to 4 a.m. (10%) and 4 a.m. to 8 a.m. (14%). This is consistent with the timing of heating equipment fires more generally in reflecting a decrease in use during overnight hours. The high point for civilian injuries came in the hours between 8 a.m. and 12 p.m. (24% of the total) and between 12 p.m. and 4 p.m. (18%). Fires in the hours between 8 a.m. and 4 p.m. also accounted for the highest shares of direct property damage (42%). See Figure 13 and Table 29.

Figure 13. Home Structure Fires Involving Central Heating Units by Time of Day, 2011-2015



Note and Source: See Table 29.

Factors contributing to the ignition of home fires involving central heating units. As shown in Table 30, mechanical failure or malfunction was the predominant factor contributing to ignition of fires involving central heating units (56% of fires), as well as associated losses in all categories (72% of civilian deaths, 29% of civilian injuries, and 52% of direct property damage). An electrical failure or malfunction was a factor in 13% of fires, accounting for 5% of civilian injuries and 17% of direct property damage, while failure to clean was a factor in another 11% of fires, with 7% of civilian injuries and just 2% of direct property damage. A heat source too close to combustibles was a factor in 6% of fires, but these fires accounted for 12% of civilian injuries and 14% of direct property damage.

The leading item first ignited in home fires involving central heating units was flammable and combustible liquids and gases, piping or filters, figuring in 47% of the fires. These fires accounted for all civilian deaths in fires involving central heating units, as well as 45% of civilian injuries and 17% of direct property damage. Electrical wire or cable insulation was the item first ignited in 13% of the fires (13% of civilian injuries and 5% of direct property damage), while a structural member or framing was first ignited in 5% of fires, with 12% of injuries and 25% of direct property damage. Appliance housing or casing was also first ignited in 5% of fires, with minimal associated losses. See Table 31.

Over half of the fires involving central heating units (53%) originated in a heating equipment room. These fires accounted for 54% of the civilian deaths, 57% of civilian injuries, and 36% of the direct property damage. A duct for HVAC, cable, exhaust, or air conditioning was the area of origin in 11% of fires, with 12% of civilian deaths, 18% of civilian injuries and 11% of direct property damage, followed by a crawl space or substructure space (7% of fires, 4% of civilian injuries, and 9% of direct property damage). Just 3% of central heating unit fires originated in an attic or ceiling/roof assembly or concealed space, but they were responsible for 11% of direct property damage. See Table 32.

Section 5. Home Structure Fires Involving Water Heaters

In 2011-2015, there were an estimated average of 5,200 home fires involving water heaters each year, resulting in annual losses of 10 civilian deaths, 130 civilian injuries, and $104 million in direct property damage. As Table 33 shows, half (50%) of these fires involved electric-powered equipment, accounting for 18% of civilian injuries and 33% of the direct property damage. Gas-fueled water heaters were involved in nearly as many of the fires (49%), but were associated with all the civilian deaths, 82% of civilian injuries and 66% of direct property damage.

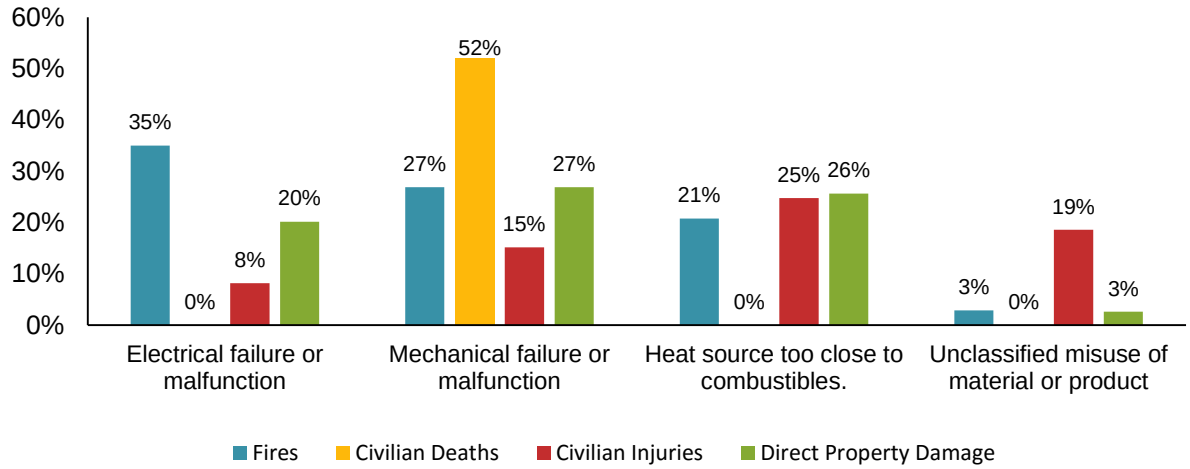
Home fires involving water heaters did not follow as strong a seasonal pattern as fires involving other types of heating equipment. January recorded the highest share of fires, 10%, but March, April, and June each recorded 9% of fires, with the remaining months each with 8% of fires, except for August and September, which had 7% shares of the annual total. See Table 34.

The fewest fires occurred between midnight and 7 a.m. (15% of total). These fires accounted for 24% of civilian deaths, 7% of civilian injuries, and 19% of direct property damage. See Table 36.

There were no evident trends in fires involving water heaters by day of the week. See Table 35.

An electrical failure or malfunction was a factor in 35% of home fires involving water heaters, accounting for no civilian deaths, 8% of civilian injuries, and 20% of direct property damage. A mechanical failure or malfunction was a factor contributing to 27% of fires (52% of civilian deaths, 15% of civilian injuries, 27% of direct property damage), while a heat source too close to combustibles was a factor in 21% of fires (25% of civilian injuries and 26% of direct property damage). Spilled flammable or liquid gas was a factor in just 2% of fires, but these fires accounted for 48% of civilian deaths, 12% of civilian injuries, and 13% of direct property damage. See Figure 14 and Table 37.

Figure 14. Home Fires Involving Water Heaters, by Leading Factors Contributing to Ignition, 2011-2015 Annual Averages



An electrical wire or cable insulation was the item first ignited in approximately one-quarter (26%) of water heater fires, accounting for 4% of civilian injuries and 9% of direct property damage. See Table 38. Fires in which flammable and combustible liquids and gases, piping or filters were the item first ignited represented 16% of water heater fires, but these were associated with a disproportionate losses in all categories -- 75% of civilian deaths, 61% of civilian injuries, and 26% of direct property damage.

More than one-third of home fires involving water heaters originated in a heating equipment room (36%). As shown in Table 39, these fires accounted for 49% of civilian deaths, 36% of civilian injuries, and 32% of direct property damage. A laundry room or area was the area of origin for 14% of fires (24% of civilian deaths, 12% of civilian injuries, and 13% of direct property damage), while 11% of fires originated in a closet (4% of civilian injuries, 6% of direct property damage). A garage or vehicle storage area was the area of origin for 6% of fires (27% of civilian deaths, 10% of civilian injuries, and 18% of direct property damage).

Table 1.
Home Fires Involving Heating Equipment, by Year, 1980-2015

Year	Fires	Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions of Current Dollars)		Direct Property Damage (in Millions of 2015 Dollars)	
1980	230,000	1,000		3,510		$760		$2,188	
1981	228,200	990		2,990		$620		$1,613	
1982	232,900	1,190		3,430		$847		$2,077	
1983	230,400	1,110		3,650		$842		$2,001	
1984	209,700	860		2,830		$777		$1,769	
1985	200,900	1,180		3,200		$884		$1,944	
1986	167,000	810		2,650		$692		$1,497	
1987	147,700	840		2,790		$652		$1,360	
1988	138,900	900		3,350		$809		$1,622	
1989	128,700	780		2,890		$822		$1,572	
1990	97,500	800		2,400		$732		$1,329	
1991	98,200	660		2,500		$1,027		$1,786	
1992	96,500	640		2,510		$703		$1,188	
1993	97,200	680		2,830		$715		$1,172	
1994	85,100	610		2,240		$726		$1,161	
1995	78,400	560		2,060		$733		$1,139	
1996	73,300	800		2,010		$825		$1,247	
1997	68,600	570		1,550		$735		$1,085	
1998	57,100	490		1,670		$648		$943	
1999	78,700	180	(180)	2,080	(2,080)	$813	($756)	$1,156	($1,075)
2000	72,500	810	(810)	1,980	(1,890)	$929	($908)	$1,279	($1,250)
2001	71,900	410	(410)	1,670	(1,580)	$849	($830)	$1,137	($1,111)
2002	73,600	660	(660)	1,580	(1,550)	$1,310	($1,288)	$1,726	($1,697)
2003	71,000	550	(550)	1,750	(1,620)	$961	($940)	$1,239	($1,212)
2004	69,500	670	(670)	1,660	(1,520)	$922	($907)	$1,158	($1,139)
2005	64,900	730	(730)	1,630	(1,510)	$966	($943)	$1,172	($1,144)
2006	64,100	540	(540)	1,400	(1,300)	$943	($937)	$1,108	($1,101)
2007	66,400	580	(580)	1,850	(1,710)	$608	($601)	$694	($686)
2008	66,100	480	(480)	1,660	(1,570)	$1,090	($1,081)	$1,201	($1,191)
2009	58,900	480	(480)	1,520	(1,470)	$1,053	($1,043)	$1,163	($1,152)
2010	57,100	490	(490)	1,530	(1,470)	$1,072	($1,064)	$1,166	($1,157)
2011	53,600	400	(400)	1,520	(1,480)	$893	($886)	$942	($934)
2012	51,800	470	(470)	1,380	(1,320)	$938	($930)	$969	($961)

Table 1.
Home Fires Involving Heating Equipment by Year, 1980-2015 (continued)

Year	Fires	Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions of Current Dollars)		Direct Property Damage (in Millions of 2015 Dollars	
2013	56,800	510	(510)	1,470	(1,430)	$1,133	($1,125)	$1,152	($1,144)
2014	55,000	560	(560)	1,600	(1,530)	$1,318	($1,310)	$1,318	($1,310)
2015	48,300	420	(420)	1,330	(1,290)	$948	($941)	$948	($941)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. Numbers in parentheses exclude confined fires. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires reported as confined to cooking vessel, trash container, incinerator, or commercial compactor are not included in these estimates. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or reported as heating or air conditioning equipment of unknown type. Fires reported as "no equipment" but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated. Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution. Inflation adjustment to 2013 dollars is calculated using the Consumer Price Index.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015

Table 2.
Home Fires Involving Heating Equipment by Type of Equipment
2011-20105 Annual Averages

Equipment	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Space heater	23,000	(43%)	410	(85%)	1,140	(78%)	$565	(53%)
Fireplace or chimney	16,810	(31%)	30	(6%)	90	(6%)	$262	(25%)
Central heat	6,130	(11%)	20	(4%)	70	(5%)	$75	(7%)
Water heater	5,200	(10%)	10	(2%)	130	(9%)	$104	(10%)
Heat lamp	830	(2%)	10	(2%)	20	(1%)	$46	(4%)
Heat tape	240	(0%)	0	(0%)	0	(0%)	$6	(1%)
Steamline, heat pipe, hot air duct	70	(0%)	0	(0%)	10	(1%)	$2	(0%)
Confined fuel burner, boiler with no heating equipment	1,070	(2%)	0	(0%)	10	(1%)	$0	(0%)
Confined chimney, flue with no heating equipment	690	(1%)	0	(0%)	0	(0%)	$0	(0%)
Total	54,030	(100%)	480	(100%)	1,470	(100%)	$1,060	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 3.
Home Fires Involving Heating Equipment, by Month
2011-2015 Annual Averages

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	10,300	(19%)	110	(23%)	260	(18%)	$215	(20%)
February	8,310	(15%)	80	(17%)	170	(11%)	$148	(14%)
March	6,300	(12%)	40	(8%)	140	(9%)	$115	(11%)
April	3,620	(7%)	30	(7%)	80	(6%)	$63	(6%)
May	2,140	(4%)	10	(2%)	100	(7%)	$39	(4%)
June	1,580	(3%)	10	(2%)	50	(4%)	$32	(3%)
July	1,450	(3%)	10	(2%)	60	(4%)	$25	(2%)
August	1,500	(3%)	0	(1%)	70	(4%)	$28	(3%)
September	1,780	(3%)	10	(3%)	70	(5%)	$35	(3%)
October	3,680	(7%)	10	(2%)	120	(8%)	$65	(6%)
November	6,240	(12%)	80	(16%)	170	(11%)	$160	(15%)
December	7,140	(13%)	80	(17%)	190	(13%)	$137	(13%)
Total	54,030	(100%)	480	(100%)	1,470	(100%)	$1,060	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 4.
Home Fires Involving Heating Equipment, by Day of the Week
2011-2015 Annual Averages

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	7,930	(15%)	50	(11%)	220	(15%)	$138	(13%)
Monday	7,570	(14%)	90	(19%)	210	(14%)	$144	(14%)
Tuesday	7,710	(14%)	50	(11%)	210	(14%)	$146	(14%)
Wednesday	7,530	(14%)	80	(16%)	200	(14%)	$147	(14%)
Thursday	7,620	(14%)	60	(13%)	220	(15%)	$154	(15%)
Friday	7,650	(14%)	70	(15%)	190	(13%)	$147	(14%)
Saturday	8,030	(15%)	80	(16%)	230	(15%)	$184	(17%)
Total	54,030	(100%)	480	(100%)	1,470	(100%)	$1,060	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 5.
Home Fires Involving Heating Equipment, by Time of Day
2011-2015 Annual Averages

Time of Day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	1,470	(3%)	20	(5%)	80	(6%)	$45	(4%)
1:00-1:59 a.m.	1,170	(2%)	30	(6%)	40	(3%)	$67	(6%)
2:00-2:59 a.m.	1,000	(2%)	30	(6%)	40	(3%)	$33	(3%)
3:00-3:59 a.m.	970	(2%)	30	(7%)	50	(3%)	$36	(3%)
4:00-4:59 a.m.	960	(2%)	10	(3%)	30	(2%)	$36	(3%)
5:00-5:59 a.m.	1,040	(2%)	20	(4%)	40	(3%)	$30	(3%)
6:00-6:59 a.m.	1,430	(3%)	40	(9%)	40	(3%)	$31	(3%)
7:00-7:59 a.m.	1,880	(3%)	30	(6%)	40	(3%)	$38	(4%)
8:00-8:59 a.m.	2,050	(4%)	20	(4%)	60	(4%)	$36	(3%)
9:00-9:59 a.m.	2,180	(4%)	30	(6%)	70	(5%)	$39	(4%)
10:00-10:59 a.m.	2,290	(4%)	30	(6%)	80	(5%)	$40	(4%)
11:00-11:59 a.m.	2,300	(4%)	10	(2%)	60	(4%)	$46	(4%)
12:00-12:59 p.m.	2,410	(4%)	10	(2%)	60	(4%)	$47	(4%)
1:00-1:59 p.m.	2,420	(4%)	10	(2%)	60	(4%)	$54	(5%)
2:00-2:59 p.m.	2,500	(5%)	0	(1%)	80	(5%)	$55	(5%)
3:00-3:59 p.m.	2,650	(5%)	10	(1%)	60	(4%)	$45	(4%)
4:00-4:59 p.m.	3,090	(6%)	10	(2%)	100	(7%)	$50	(5%)
5:00-5:59 p.m.	3,580	(7%)	10	(2%)	80	(6%)	$51	(5%)
6:00-6:59 p.m.	3,890	(7%)	10	(3%)	80	(5%)	$51	(5%)
7:00-7:59 p.m.	3,900	(7%)	20	(4%)	60	(4%)	$46	(4%)
8:00-8:59 p.m.	3,610	(7%)	10	(3%)	60	(4%)	$54	(5%)
9:00-9:59 p.m.	2,980	(6%)	10	(3%)	60	(4%)	$43	(4%)
10:00-10:59 p.m.	2,420	(4%)	30	(6%)	50	(4%)	$46	(4%)
11:00-11:59 p.m.	1,850	(3%)	30	(6%)	70	(4%)	$42	(4%)
Total	54,030	(100%)	480	(100%)	1,470	(100%)	$1,060	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 6.
Home Fires Involving Heating Equipment, by Factor Contributing to Ignition
2011-2015 Annual Averages

Factor Contributing to Ignition*	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Failure to clean	15,080	(28%)	0	(1%)	40	(2%)	$66	(6%)
Non-confined	1,600	(3%)	0	(1%)	30	(2%)	$64	(6%)
Confined	13,480	(25%)	0	(0%)	10	(0%)	$3	(0%)
Mechanical failure or malfunction	8,740	(16%)	40	(9%)	140	(9%)	$203	(19%)
Non-confined	3,780	(7%)	40	(9%)	120	(8%)	$201	(19%)
Confined	4,960	(9%)	0	(0%)	20	(1%)	$2	(0%)
Heat source too close to combustibles	8,070	(15%)	250	(53%)	430	(29%)	$327	(31%)
Non-confined	7,070	(13%)	250	(53%)	430	(29%)	$327	(31%)
Confined	1,000	(2%)	0	(0%)	0	(0%)	$1	(0%)
Electrical failure or malfunction	4,480	(8%)	50	(11%)	70	(5%)	$104	(10%)
Non-confined	3,670	(7%)	50	(11%)	70	(5%)	$104	(10%)
Confined	810	(1%)	0	(0%)	0	(0%)	$0	(0%)
Equipment unattended	3,710	(7%)	70	(14%)	290	(20%)	$109	(10%)
Non-confined	3,560	(7%)	70	(14%)	290	(20%)	$109	(10%)
Confined	150	(0%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified factor contributed to ignition	2,720	(5%)	10	(2%)	90	(6%)	$39	(4%)
Non-confined	800	(1%)	10	(2%)	90	(6%)	$39	(4%)
Confined	1,920	(4%)	0	(0%)	10	(0%)	$1	(0%)
Unclassified misuse of material or product	1,880	(3%)	10	(1%)	100	(7%)	$23	(2%)
Non-confined	860	(2%)	10	(1%)	100	(7%)	$22	(2%)
Confined	1,020	(2%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified operational deficiency	1,400	(3%)	10	(2%)	30	(2%)	$25	(2%)
Non-confined	450	(1%)	10	(2%)	30	(2%)	$25	(2%)
Confined	950	(2%)	0	(0%)	0	(0%)	$0	(0%)
Installation deficiency	1,330	(2%)	0	(1%)	30	(2%)	$39	(4%)
Non-confined	910	(2%)	0	(1%)	30	(2%)	$38	(4%)
Confined	420	(1%)	0	(0%)	0	(0%)	$0	(0%)
Accidentally turned on, not turned off	1,140	(2%)	10	(2%)	70	(5%)	$31	(3%)
Non-confined	1,100	(2%)	10	(2%)	70	(5%)	$31	(3%)
Confined	40	(0%)	0	(0%)	0	(0%)	$0	(0%)

Table 6.
Home Fires Involving Heating Equipment, by Factor Contributing to Ignition
2011-2015 Annual Averages (continued)

Factor contributing to ignition*	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Abandoned or discarded material or product	1,130	(2%)	10	(2%)	40	(3%)	$20	(2%)
Non-confined	870	(2%)	10	(2%)	40	(3%)	$20	(2%)
Confined	260	(0%)	0	(0%)	0	(0%)	$0	(0%)
Equipment not being operated properly	980	(2%)	10	(2%)	50	(3%)	$22	(2%)
Non-confined	530	(1%)	10	(2%)	50	(3%)	$22	(2%)
Confined	450	(1%)	0	(0%)	10	(0%)	$0	(0%)
Other known factor contributing to ignition	6,310	(12%)	50	(10%)	220	(15%)	$177	(17%)
Non-confined	3,160	(6%)	50	(10%)	210	(14%)	$176	(17%)
Confined	3,150	(6%)	0	(0%)	20	(1%)	$1	(0%)
Total fires	54,030	(100%)	480	(100%)	1,470	(100%)	$1,060	(100%)
Non-confined	26,050	(48%)	480	(100%)	1,420	(96%)	$1,052	(99%)
Confined	27,980	(52%)	0	(0%)	60	(4%)	$8	(1%)
Total factors	56,580	(105%)	510	(108%)	1,600	(108%)	$1,163	(110%)
Non-confined	27,960	(52%)	510	(108%)	1,540	(105%)	$1,155	(109%)
Confined	28,620	(53%)	0	(0%)	60	(4%)	$8	(1%)

*Multiple entries are allowed, which can result in sums higher than totals

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 7.
Home Fires Involving Heating Equipment, by Item First Ignited
2011-2015 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified item first ignited	7,730	(14%)	20	(4%)	40	(3%)	$25	(2%)
Non-confined	990	(2%)	20	(4%)	30	(2%)	$23	(2%)
Confined	6,740	(12%)	0	(0%)	10	(1%)	$2	(0%)
Unclassified organic materials	6,120	(11%)	10	(1%)	10	(1%)	$7	(1%)
Non-confined	310	(1%)	10	(1%)	10	(1%)	$7	(1%)
Confined	5,810	(11%)	0	(0%)	10	(0%)	$1	(0%)
Flammable or combustible liquids or gases, piping or filter	6,090	(11%)	50	(10%)	220	(15%)	$68	(6%)
Non-confined	1,620	(3%)	50	(10%)	200	(14%)	$67	(6%)
Confined	4,470	(8%)	0	(0%)	20	(1%)	$1	(0%)
Cooking materials, including food	4,170	(8%)	20	(4%)	390	(26%)	$82	(8%)
Non-confined	4,070	(8%)	20	(4%)	390	(26%)	$82	(8%)
Confined	100	(0%)	0	(0%)	0	(0%)	$0	(0%)
Structural member or framing	4,020	(7%)	20	(4%)	60	(4%)	$299	(28%)
Non-confined	3,740	(7%)	20	(4%)	60	(4%)	$299	(28%)
Confined	280	(1%)	0	(0%)	0	(0%)	$0	(0%)
Film or residue, including paint, resin and creosote	3,160	(6%)	0	(0%)	0	(0%)	$3	(0%)
Non-confined	120	(0%)	0	(0%)	0	(0%)	$3	(0%)
Confined	3,040	(6%)	0	(0%)	0	(0%)	$1	(0%)
Electrical wire or cable insulation	2,870	(5%)	20	(4%)	50	(3%)	$32	(3%)
Non-confined	2,140	(4%)	20	(4%)	50	(3%)	$32	(3%)
Confined	730	(1%)	0	(0%)	0	(0%)	$0	(0%)
Appliance housing or casing	1,560	(3%)	10	(2%)	30	(2%)	$14	(1%)
Non-confined	980	(2%)	10	(2%)	30	(2%)	$14	(1%)
Confined	580	(1%)	0	(0%)	0	(0%)	$0	(0%)
Interior wall covering, excluding drapes	1,320	(2%)	20	(4%)	40	(3%)	$60	(6%)
Non-confined	1,210	(2%)	20	(4%)	40	(3%)	$60	(6%)
Confined	110	(0%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified structural component or finish	1,240	(2%)	0	(0%)	20	(2%)	$67	(6%)
Non-confined	990	(2%)	0	(0%)	20	(2%)	$67	(6%)
Confined	250	(0%)	0	(0%)	0	(0%)	$0	(0%)
Heavy vegetation including trees	1,180	(2%)	0	(0%)	10	(0%)	$2	(0%)
Non-confined	60	(0%)	0	(0%)	0	(0%)	$2	(0%)
Confined	1,120	(2%)	0	(0%)	0	(0%)	$0	(0%)

Table 7.
Home Fires Involving Heating Equipment, by Item First Ignited
2011-2015 Annual Averages (continued)

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Dust, fiber, lint, including sawdust or excelsior	1,080	(2%)	10	(1%)	10	(1%)	$5	(0%)
Non-confined	270	(0%)	10	(1%)	10	(0%)	$5	(0%)
Confined	810	(1%)	0	(0%)	0	(0%)	$0	(0%)
Clothing	960	(2%)	40	(8%)	60	(4%)	$34	(3%)
Non-confined	890	(2%)	40	(8%)	50	(4%)	$34	(3%)
Confined	70	(0%)	0	(0%)	0	(0%)	$0	(0%)
Magazine, newspaper, or writing paper	950	(2%)	20	(3%)	20	(1%)	$8	(1%)
Non-confined	230	(0%)	20	(3%)	20	(1%)	$8	(1%)
Confined	720	(1%)	0	(0%)	0	(0%)	$0	(0%)
Multiple items first ignited	910	(2%)	40	(8%)	40	(3%)	$38	(4%)
Non-confined	490	(1%)	40	(8%)	40	(3%)	$37	(4%)
Confined	420	(1%)	0	(0%)	0	(0%)	$0	(0%)
Mattress or bedding	900	(2%)	50	(10%)	80	(5%)	$42	(4%)
Non-confined	880	(2%)	50	(10%)	80	(5%)	$42	(4%)
Confined	20	(0%)	0	(0%)	0	(0%)	$0	(0%)
Floor covering rug, carpet, or mat	890	(2%)	30	(6%)	50	(3%)	$27	(3%)
Non-confined	850	(2%)	30	(6%)	50	(3%)	$26	(2%)
Confined	40	(0%)	0	(0%)	0	(0%)	$0	(0%)
Insulation within structural area	870	(2%)	0	(0%)	20	(1%)	$26	(2%)
Non-confined	740	(1%)	0	(0%)	20	(1%)	$26	(2%)
Confined	130	(0%)	0	(0%)	0	(0%)	$0	(0%)
Chips, including wood chips	860	(2%)	0	(1%)	0	(0%)	$3	(0%)
Non-confined	90	(0%)	0	(1%)	0	(0%)	$3	(0%)
Confined	770	(1%)	0	(0%)	0	(0%)	$0	(0%)
Cabinetry	820	(2%)	10	(2%)	50	(3%)	$21	(2%)
Non-confined	770	(1%)	10	(2%)	50	(3%)	$21	(2%)
Confined	50	(0%)	0	(0%)	0	(0%)	$0	(0%)

Table 7.
Home Fires Involving Heating Equipment, by Item First Ignited
2011-2015 Annual Averages (continued)

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Other known item first ignited	6,360	(12%)	130	(28%)	270	(18%)	$197	(19%)
Non-confined	4,630	(9%)	130	(28%)	270	(18%)	$196	(18%)
Confined	1,730	(3%)	0	(0%)	10	(0%)	$1	(0%)
Total	54,030	(100%)	480	(100%)	1,470	(100%)	$1,060	(100%)
Non-confined	26,050	(48%)	480	(100%)	1,420	(96%)	$1,052	(99%)
Confined	27,980	(52%)	0	(0%)	60	(4%)	$8	(1%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 8.
Home Fires Involving Heating Equipment, by Heat Source
2011-2015 Annual Averages

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Radiated or conducted heat from operating equipment	10,750	(20%)	250	(52%)	540	(36%)	$391	(37%)
Non-confined	8,960	(17%)	250	(52%)	530	(36%)	$390	(37%)
Confined	1,790	(3%)	0	(0%)	10	(1%)	$1	(0%)
Hot ember or ash	9,880	(18%)	10	(2%)	40	(3%)	$57	(5%)
Non-confined	1,070	(2%)	10	(2%)	30	(2%)	$55	(5%)
Confined	8,810	(16%)	0	(0%)	10	(1%)	$2	(0%)
Unclassified heat from powered equipment	7,030	(13%)	80	(17%)	360	(24%)	$178	(17%)
Non-confined	5,470	(10%)	80	(17%)	350	(24%)	$177	(17%)
Confined	1,560	(3%)	0	(0%)	10	(1%)	$1	(0%)
Spark, ember or flame from operating equipment	6,670	(12%)	50	(10%)	230	(16%)	$175	(17%)
Non-confined	3,430	(6%)	50	(10%)	220	(15%)	$174	(16%)
Confined	3,240	(6%)	0	(0%)	10	(1%)	$1	(0%)
Unclassified heat source	3,560	(7%)	10	(2%)	70	(5%)	$36	(3%)
Non-confined	940	(2%)	10	(2%)	70	(5%)	$36	(3%)
Confined	2,620	(5%)	0	(0%)	0	(0%)	$0	(0%)
Heat from direct flame or convection currents	3,270	(6%)	10	(2%)	50	(4%)	$33	(3%)
Non-confined	910	(2%)	10	(2%)	50	(4%)	$32	(3%)
Confined	2,360	(4%)	0	(0%)	0	(0%)	$1	(0%)
Arcing	3,130	(6%)	30	(6%)	60	(4%)	$56	(5%)
Non-confined	2,680	(5%)	30	(6%)	60	(4%)	$56	(5%)
Confined	450	(1%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified hot or smoldering object	2,480	(5%)	10	(2%)	40	(3%)	$34	(3%)
Non-confined	820	(2%)	10	(2%)	40	(2%)	$34	(3%)
Confined	1,660	(3%)	0	(0%)	0	(0%)	$0	(0%)
Match	1,560	(3%)	8	(2%)	10	(1%)	$4	(0%)
Non-confined	120	(0%)	8	(2%)	0	(0%)	$4	(0%)
Confined	1,440	(3%)	0	(0%)	0	(0%)	$0	(0%)
Radiated heat from another fire	850	(2%)	2	(0%)	0	(0%)	$18	(2%)
Non-confined	310	(1%)	2	(0%)	0	(0%)	$17	(2%)
Confined	540	(1%)	0	(0%)	0	(0%)	$0	(0%)
Flame or torch used for lighting	820	(2%)	0	(0%)	20	(2%)	$18	(2%)
Non-confined	250	(0%)	0	(0%)	20	(1%)	$17	(2%)
Confined	570	(1%)	0	(0%)	0	(0%)	$0	(0%)

Table 8.
Home Fires Involving Heating Equipment, by Heat Source
2011-2015 Annual Averages (continued)

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Other known heat source	4,030	(7%)	30	(6%)	40	(3%)	$61	(6%)
Non-confined	1,100	(2%)	30	(6%)	40	(3%)	$60	(6%)
Confined	2,930	(5%)	0	(0%)	0	(0%)	$1	(0%)
Total	54,030	(100%)	480	(100%)	1,470	(100%)	$1,060	(100%)
Non-confined	26,050	(48%)	480	(100%)	1,420	(96%)	$1,052	(99%)
Confined	27,980	(52%)	0	(0%)	60	(4%)	$8	(1%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 9.
Home Fires Involving Heating Equipment, by Area of Origin
2011-2015 Annual Averages

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined chimney or flue fire*	19,050	(35%)	0	(0%)	20	(2%)	$6	(1%)
Kitchen or cooking area	7,510	(14%)	80	(17%)	650	(44%)	$159	(15%)
Heating equipment room	6,790	(13%)	20	(4%)	110	(8%)	$86	(8%)
Living room, family room, or den	2,480	(5%)	140	(29%)	180	(12%)	$117	(11%)
Bedroom	2,120	(4%)	90	(20%)	140	(9%)	$94	(9%)
Unclassified function area	1,720	(3%)	30	(7%)	50	(3%)	$39	(4%)
Duct for HVAC, cable, exhaust, heating, or AC	1,450	(3%)	10	(1%)	20	(1%)	$22	(2%)
Wall assembly or concealed space	1,430	(3%)	10	(2%)	20	(1%)	$93	(9%)
Crawl space or substructure space	1,270	(2%)	0	(0%)	20	(1%)	$62	(6%)
Attic or ceiling/roof assembly or concealed space	1,160	(2%)	0	(0%)	20	(1%)	$75	(7%)
Laundry room or area	1,160	(2%)	0	(1%)	30	(2%)	$24	(2%)
Garage or vehicle storage area	890	(2%)	10	(3%)	50	(3%)	$62	(6%)
Closet	780	(1%)	0	(0%)	10	(1%)	$12	(1%)
Bathroom	760	(1%)	10	(3%)	20	(1%)	$16	(2%)
Unclassified area of origin	760	(1%)	0	(0%)	0	(0%)	$6	(1%)
Other known area of origin	5,450	(10%)	70	(14%)	130	(9%)	$187	(18%)
Total	54,030	(100%)	480	(100%)	1,470	(100%)	$1,060	(100%)

*NFIRS 5.0 does not have a separate area of origin code for fires starting in chimneys. Any home fire with NFIRS incident type 114 (Chimney or flue fire originating in and confined to a chimney or flue) is captured here.

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 10.
Home Fires Involving Heating Equipment, by Type of Fuel or Power
2011-2015 Annual Averages

Fuel or Power	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Solid fueled	22,410	(41%)	110	(23%)	150	(10%)	$330	(31%)
Electric powered	18,530	(34%)	260	(54%)	840	(57%)	$450	(42%)
Gas fueled	9,310	(17%)	70	(15%)	400	(27%)	$249	(23%)
Liquid fueled	3,340	(6%)	30	(7%)	80	(5%)	$28	(3%)
Other	440	(1%)	0	(0%)	0	(0%)	$4	(0%)
Total	54,030	(100%)	480	(100%)	1,470	(100%)	$1,060	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 11.
Home Fires Involving Space Heaters, by Type of Fuel or Power and Portability
2011-2015 Annual Averages

Equipment Power	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Electric powered	11,290	(49%)	240	(59%)	770	(67%)	$323	(57%)
Portable	3,650	(16%)	160	(40%)	250	(22%)	$159	(28%)
Stationary	7,640	(33%)	80	(19%)	510	(45%)	$165	(29%)
Solid fueled	6,540	(28%)	80	(20%)	80	(7%)	$122	(22%)
Portable	270	(1%)	0	(0%)	0	(0%)	$3	(1%)
Stationary	6,270	(27%)	80	(20%)	80	(7%)	$119	(21%)
Gas fueled	3,450	(15%)	50	(13%)	230	(20%)	$96	(17%)
Portable	560	(2%)	10	(3%)	50	(4%)	$31	(5%)
Stationary	2,890	(13%)	40	(11%)	180	(16%)	$65	(12%)
Liquid fueled	1,610	(7%)	30	(7%)	60	(5%)	$22	(4%)
Portable	490	(2%)	30	(7%)	50	(5%)	$17	(3%)
Stationary	1,130	(5%)	0	(0%)	10	(1%)	$5	(1%)
Other fuel source	100	(0%)	0	(0%)	0	(0%)	$1	(0%)
Portable	10	(0%)	0	(0%)	0	(0%)	$0	(0%)
Stationary	90	(0%)	0	(0%)	0	(0%)	$1	(0%)
Total	23,000	(100%)	410	(100%)	1,140	(100%)	$565	(100%)
Total Portable	4,990	(22%)	200	(50%)	360	(32%)	$209	(37%)
Total Stationary	18,015	(78%)	203	(50%)	780	(68%)	$355	(63%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 12.
Home Fires Involving Space Heaters, by Month
2011-2015 Annual Averages

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	4,220	(18%)	90	(23%)	190	(17%)	$116	(21%)
February	3,350	(15%)	70	(16%)	140	(12%)	$79	(14%)
March	2,440	(11%)	40	(9%)	110	(10%)	$61	(11%)
April	1,560	(7%)	20	(4%)	60	(5%)	$30	(5%)
May	990	(4%)	10	(2%)	90	(7%)	$24	(4%)
June	750	(3%)	10	(2%)	40	(4%)	$17	(3%)
July	680	(3%)	10	(2%)	40	(4%)	$13	(2%)
August	710	(3%)	0	(1%)	50	(4%)	$15	(3%)
September	820	(4%)	10	(3%)	50	(5%)	$22	(4%)
October	1,630	(7%)	10	(1%)	80	(7%)	$34	(6%)
November	2,730	(12%)	70	(17%)	130	(11%)	$72	(13%)
December	3,110	(14%)	80	(20%)	160	(14%)	$82	(15%)
Total	23,000	(100%)	410	(100%)	1,140	(100%)	$565	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 13.
Homer Fires Involving Space Heaters, by Day of Week
2011-2015 Annual Averages

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	3,140	(14%)	40	(10%)	180	(15%)	$72	(13%)
Monday	3,370	(15%)	80	(19%)	170	(15%)	$76	(13%)
Tuesday	3,350	(15%)	40	(10%)	150	(13%)	$89	(16%)
Wednesday	3,210	(14%)	50	(13%)	150	(13%)	$83	(15%)
Thursday	3,370	(15%)	50	(13%)	170	(15%)	$83	(15%)
Friday	3,340	(15%)	70	(17%)	140	(12%)	$77	(14%)
Saturday	3,220	(14%)	70	(18%)	180	(16%)	$84	(15%)
Total	23,000	(100%)	410	(100%)	1,140	(100%)	$565	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 14.
Home Fires Involving Space Heaters, by Time of Day
2011-2015 Annual Averages

Time of Day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	650	(3%)	20	(5%)	60	(5%)	$22	(4%)
1:00-1:59 a.m.	570	(2%)	30	(7%)	30	(3%)	$20	(4%)
2:00-2:59 a.m.	520	(2%)	30	(8%)	30	(3%)	$20	(3%)
3:00-3:59 a.m.	480	(2%)	30	(6%)	40	(3%)	$19	(3%)
4:00-4:59 a.m.	480	(2%)	10	(3%)	30	(3%)	$22	(4%)
5:00-5:59 a.m.	440	(2%)	20	(4%)	40	(3%)	$16	(3%)
6:00-6:59 a.m.	630	(3%)	40	(10%)	40	(3%)	$17	(3%)
7:00-7:59 a.m.	840	(4%)	20	(6%)	30	(3%)	$20	(4%)
8:00-8:59 a.m.	850	(4%)	20	(4%)	40	(4%)	$18	(3%)
9:00-9:59 a.m.	920	(4%)	20	(6%)	60	(5%)	$21	(4%)
10:00-10:59 a.m.	1,070	(5%)	30	(7%)	60	(5%)	$26	(5%)
11:00-11:59 a.m.	1,070	(5%)	10	(2%)	40	(4%)	$28	(5%)
12:00-12:59 p.m.	1,150	(5%)	10	(2%)	50	(4%)	$28	(5%)
1:00-1:59 p.m.	1,110	(5%)	10	(2%)	50	(4%)	$35	(6%)
2:00-2:59 p.m.	1,110	(5%)	0	(0%)	60	(5%)	$29	(5%)
3:00-3:59 p.m.	1,190	(5%)	0	(1%)	50	(4%)	$24	(4%)
4:00-4:59 p.m.	1,360	(6%)	10	(2%)	80	(7%)	$28	(5%)
5:00-5:59 p.m.	1,490	(6%)	10	(2%)	60	(5%)	$28	(5%)
6:00-6:59 p.m.	1,500	(7%)	10	(2%)	60	(5%)	$27	(5%)
7:00-7:59 p.m.	1,440	(6%)	10	(3%)	40	(4%)	$25	(5%)
8:00-8:59 p.m.	1,350	(6%)	10	(3%)	50	(4%)	$24	(4%)
9:00-9:59 p.m.	1,100	(5%)	10	(3%)	60	(5%)	$24	(4%)
10:00-10:59 p.m.	960	(4%)	20	(5%)	40	(4%)	$22	(4%)
11:00-11:59 p.m.	700	(3%)	30	(6%)	50	(4%)	$21	(4%)
Total	23,000	(100%)	410	(100%)	1,140	(100%)	$565	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.
Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015

Table 15.
Home Fires Involving Space Heaters, by Type of Device
2011-2015 Annual Averages

Type of Device	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Heating stove	10,780	(47%)	130	(33%)	700	(61%)	$229	(41%)
Non-confined	8,180	(36%)	130	(33%)	700	(61%)	$228	(40%)
Confined	2,610	(11%)	0	(0%)	0	(0%)	$1	(0%)
Heater (including catalytic and oil-filled)	6,220	(27%)	240	(59%)	360	(32%)	$233	(41%)
Non-confined	4,990	(22%)	240	(59%)	360	(32%)	$233	(41%)
Confined	1,230	(5%)	0	(0%)	0	(0%)	$0	(0%)
Fireplace with insert	3,400	(15%)	10	(3%)	20	(2%)	$58	(10%)
Non-confined	860	(4%)	10	(3%)	20	(1%)	$57	(10%)
Confined	2,540	(11%)	0	(0%)	0	(0%)	$1	(0%)
Local furnace	2,600	(11%)	20	(5%)	60	(5%)	$0	(8%)
Non-confined	1,310	(6%)	20	(5%)	50	(4%)	$45	(8%)
Confined	1,290	(6%)	0	(0%)	10	(1%)	$0	(0%)
Total	23,000	(100%)	410	(100%)	1,140	(100%)	$565	(100%)
Non-confined	15,330	(67%)	410	(100%)	1,130	(99%)	$563	(100%)
Confined	7,670	(33%)	0	(0%)	10	(1%)	$2	(0%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 16.
Home Fires Involving Space Heaters, by Factor Contributing to Ignition
2011-20105 Annual Averages

Factor Contributing to Ignition*	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Failure to clean	4,800	(21%)	0	(1%)	10	(1%)	$14	(3%)
Heat source too close to combustibles	4,790	(21%)	230	(56%)	340	(29%)	$217	(38%)
Equipment unattended	3,380	(15%)	60	(15%)	300	(26%)	$99	(18%)
Mechanical failure or malfunction	3,280	(14%)	30	(7%)	70	(6%)	$55	(10%)
Electrical failure or malfunction	1,770	(8%)	40	(9%)	40	(4%)	$57	(10%)
Accidentally turned on, not turned off	1,060	(5%)	10	(2%)	70	(6%)	$30	(5%)
Abandoned or discarded materials or products	790	(3%)	10	(2%)	40	(3%)	$17	(3%)
Misuse of material or product, other	700	(3%)	0	(1%)	70	(6%)	$13	(2%)
Other factor contributed to ignition	630	(3%)	10	(3%)	90	(7%)	$19	(3%)
Equipment not being operated properly	510	(2%)	10	(1%)	30	(3%)	$13	(2%)
Installation deficiency	480	(2%)	0	(1%)	20	(1%)	$13	(2%)
Unclassified operational deficiency	350	(2%)	10	(2%)	30	(2%)	$9	(2%)
Other known factor contributing to ignition	1,780	(8%)	30	(9%)	150	(13%)	$59	(10%)
Total fires	23,000	(100%)	410	(100%)	1,140	(100%)	$565	(100%)
Total factors	24,310	(106%)	440	(108%)	1,240	(109%)	$616	(109%)

*Multiple entries are allowed, which can result in sums higher than totals

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 17.
Home Fires Involving Space Heaters, by Item First Ignited,
2011-2015 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	3,970	(17%)	20	(5%)	390	(34%)	$81	(14%)
Flammable or combustible liquids or gases, piping or filter	2,540	(11%)	20	(5%)	100	(9%)	$25	(4%)
Unclassified organic materials	1,560	(7%)	0	(1%)	10	(1%)	$3	(0%)
Structural member or framing	1,430	(6%)	10	(3%)	30	(3%)	$102	(18%)
Film or residue, including paint, resin and creosote	1,050	(5%)	0	(0%)	0	(0%)	$1	(0%)
Electrical wire or cable insulation	920	(4%)	20	(4%)	30	(3%)	$16	(3%)
Appliance housing or casing	810	(4%)	10	(1%)	30	(3%)	$10	(2%)
Mattress or bedding	800	(3%)	50	(12%)	70	(6%)	$39	(7%)
Interior wall covering. excluding drapes	740	(3%)	10	(3%)	30	(3%)	$35	(6%)
Cabinetry, including built-in	710	(3%)	10	(2%)	50	(4%)	$20	(3%)
Clothing	560	(2%)	30	(9%)	40	(4%)	$21	(4%)
Floor covering rug, carpet, or mat	540	(2%)	30	(7%)	40	(3%)	$19	(3%)
Unclassified structural component or finish	430	(2%)	0	(0%)	10	(1%)	$27	(5%)
Upholstered furniture	410	(2%)	50	(12%)	40	(4%)	$22	(4%)
Household utensils	370	(2%)	0	(0%)	40	(4%)	$6	(1%)
Dust, fiber, lint, including sawdust or excelsior	370	(2%)	0	(1%)	0	(0%)	$1	(0%)
Unclassified item first ignited	1,800	(8%)	10	(3%)	20	(2%)	$11	(2%)
Other known	4,010	(17%)	130	(31%)	200	(18%)	$127	(22%)
Total	23,000	(100%)	410	(100%)	1,140	(100%)	$565	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 18.
Home Fires Involving Space Heaters, by Area of Origin
2011-2015 Annual Averages

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Kitchen or cooking area	6,900	(30%)	80	(19%)	640	(56%)	$151	(27%)
Confined chimney or flue fire	4,920	(21%)	0	(0%)	10	(1%)	$1	(0%)
Bedroom	1,890	(8%)	90	(22%)	120	(11%)	$83	(15%)
Living room, family room, or den	1,770	(8%)	120	(30%)	150	(13%)	$77	(14%)
Heating equipment room	1,520	(7%)	10	(1%)	20	(2%)	$21	(4%)
Unclassified function area	1,220	(5%)	30	(7%)	40	(4%)	$26	(5%)
Wall assembly or concealed space	570	(2%)	0	(1%)	10	(1%)	$32	(6%)
Bathroom	530	(2%)	10	(3%)	10	(1%)	$13	(2%)
Duct for HVAC, cable, exhaust, heating, or AC	450	(2%)	0	(0%)	0	(0%)	$6	(1%)
Garage or vehicle storage area	350	(2%)	10	(2%)	30	(3%)	$29	(5%)
Crawl space or substructure space	350	(2%)	0	(0%)	10	(1%)	$13	(2%)
Other known area of origin	2,340	(10%)	60	(14%)	90	(8%)	$108	(19%)
Unclassified area of origin	180	(1%)	0	(0%)	0	(0%)	$3	(1%)
Total	23,000	(100%)	410	(100%)	1,140	(100%)	$565	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 19.
Home Fires Involving Fireplaces, Chimneys, or Chimney Connectors, by Type of Fuel or Power
2011-2015 Annual Averages

Equipment Power	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Solid fueled	15,720	(94%)	30	(85%)	80	(88%)	$206	(79%)
Gas fueled	560	(3%)	0	(10%)	10	(8%)	$49	(19%)
Electric powered	240	(1%)	0	(5%)	0	(3%)	$5	(2%)
Liquid fueled	70	(0%)	0	(0%)	0	(0%)	$1	(0%)
Other	210	(1%)	0	(0%)	0	(1%)	$2	(1%)
Total	16,810	(100%)	30	(100%)	90	(100%)	$262	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015

Table 20.
Home Fires Involving Fire Places, Chimneys, or Chimney Connectors, by Month
2011-2015 Annual Averages

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	3,650	(22%)	10	(36%)	30	(34%)	$56	(21%)
February	3,130	(19%)	10	(22%)	10	(11%)	$42	(16%)
March	2,230	(13%)	0	(5%)	10	(9%)	$26	(10%)
April	990	(6%)	10	(22%)	0	(5%)	$15	(6%)
May	370	(2%)	0	(0%)	0	(0%)	$3	(1%)
June	100	(1%)	0	(0%)	0	(2%)	$2	(1%)
July	70	(0%)	0	(0%)	0	(0%)	$1	(0%)
August	80	(1%)	0	(0%)	0	(0%)	$1	(0%)
September	200	(1%)	0	(0%)	10	(7%)	$4	(1%)
October	880	(5%)	0	(0%)	0	(5%)	$14	(5%)
November	2,440	(15%)	0	(11%)	10	(12%)	$63	(24%)
December	2,660	(16%)	0	(5%)	10	(15%)	$34	(13%)
Total	16,810	(100%)	30	(100%)	90	(100%)	$262	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 21.
Home Fires Involving Fireplaces, Chimneys, or Chimney Connectors, by Day of Week
2011-2015 Annual Averages

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	2,610	(16%)	10	(21%)	10	(12%)	$39	(15%)
Monday	2,370	(14%)	0	(5%)	10	(12%)	$34	(13%)
Tuesday	2,320	(14%)	0	(6%)	10	(11%)	$28	(11%)
Wednesday	2,330	(14%)	20	(64%)	10	(17%)	$32	(12%)
Thursday	2,330	(14%)	0	(5%)	10	(11%)	$28	(11%)
Friday	2,260	(13%)	0	(0%)	10	(15%)	$37	(14%)
Saturday	2,590	(15%)	0	(0%)	20	(23%)	$65	(25%)
Total	16,810	(100%)	30	(100%)	90	(100%)	$262	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 22.
Home Fires Involving Fireplaces, Chimneys, or Chimney Connectors, by Time of Day
2011-2015 Annual Averages

Time of Day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	390	(2%)	0	(0%)	10	(13%)	$14	(6%)
1:00-1:59 a.m.	300	(2%)	0	(0%)	0	(1%)	$39	(15%)
2:00-2:59 a.m.	210	(1%)	0	(0%)	0	(2%)	$7	(3%)
3:00-3:59 a.m.	170	(1%)	0	(11%)	0	(3%)	$9	(3%)
4:00-4:59 a.m.	170	(1%)	0	(0%)	0	(0%)	$6	(2%)
5:00-5:59 a.m.	220	(1%)	0	(6%)	0	(4%)	$8	(3%)
6:00-6:59 a.m.	340	(2%)	0	(10%)	0	(4%)	$8	(3%)
7:00-7:59 a.m.	500	(3%)	0	(5%)	0	(1%)	$8	(3%)
8:00-8:59 a.m.	550	(3%)	0	(10%)	10	(8%)	$7	(3%)
9:00-9:59 a.m.	720	(4%)	0	(6%)	0	(3%)	$8	(3%)
10:00-10:59 a.m.	610	(4%)	0	(0%)	0	(2%)	$5	(2%)
11:00-11:59 a.m.	540	(3%)	0	(0%)	0	(0%)	$7	(3%)
12:00-12:59 p.m.	590	(3%)	0	(0%)	0	(1%)	$6	(2%)
1:00-1:59 p.m.	570	(3%)	0	(0%)	0	(1%)	$7	(3%)
2:00-2:59 p.m.	630	(4%)	0	(5%)	10	(8%)	$9	(3%)
3:00-3:59 p.m.	750	(4%)	0	(0%)	0	(3%)	$8	(3%)
4:00-4:59 p.m.	980	(6%)	0	(6%)	10	(6%)	$12	(4%)
5:00-5:59 p.m.	1,250	(7%)	0	(0%)	10	(6%)	$11	(4%)
6:00-6:59 p.m.	1,640	(10%)	0	(5%)	10	(9%)	$14	(5%)
7:00-7:59 p.m.	1,540	(9%)	10	(16%)	0	(2%)	$11	(4%)
8:00-8:59 p.m.	1,550	(9%)	0	(5%)	0	(2%)	$17	(7%)
9:00-9:59 p.m.	1,180	(7%)	0	(5%)	0	(5%)	$13	(5%)
10:00-10:59 p.m.	840	(5%)	0	(6%)	10	(7%)	$15	(6%)
11:00-11:59 p.m.	560	(3%)	0	(5%)	10	(7%)	$13	(5%)
Total	16,810	(100%)	30	(100%)	90	(100%)	$262	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 23.
Home Fires Involving Fireplaces, Chimneys, or Chimney Connectors, by Factor Contributing to Ignition
2011-20105 Annual Averages

Factor Contributing to Ignition*	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Failure to clean	11,870	(71%)	0	(0%)	20	(22%)	$52	(20%)
Mechanical failure or malfunction	1,030	(6%)	0	(0%)	20	(18%)	$82	(31%)
Heat source too close to combustibles	790	(5%)	20	(49%)	20	(21%)	$39	(15%)
Other factor contributed to ignition	490	(3%)	0	(0%)	0	(1%)	$10	(4%)
Installation deficiency	480	(3%)	0	(0%)	0	(3%)	$22	(8%)
Equipment not being operated properly	410	(2%)	0	(12%)	0	(5%)	$4	(2%)
Construction deficiency	360	(2%)	0	(0%)	0	(3%)	$16	(6%)
Unclassified operational deficiency	360	(2%)	0	(0%)	0	(5%)	$12	(5%)
Other known factor contributing to ignition	1,750	(10%)	10	(38%)	30	(30%)	$56	(21%)
Total fires	16,810	(100%)	30	(100%)	90	(100%)	$262	(100%)
Total factors	17,540	(104%)	30	(100%)	90	(109%)	$293	(112%)

*Multiple entries are allowed, which can result in sums higher than totals

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 24.
Home Fires Involving Fireplaces, Chimneys, or Chimney Connectors, by Item First Ignited
2011-2015 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified organic materials	3,540	(21%)	0	(0%)	10	(8%)	$3	(1%)
Film or residue, including paint, resin and creosote	2,920	(17%)	0	(0%)	0	(3%)	$3	(1%)
Unclassified item first ignited	2,850	(17%)	10	(20%)	0	(4%)	$7	(3%)
Structural member or framing	1,750	(10%)	0	(13%)	20	(20%)	$151	(58%)
Flammable or combustible liquids or gases, piping or filter	1,100	(7%)	0	(0%)	0	(2%)	$2	(1%)
Heavy vegetation including trees	790	(5%)	0	(0%)	0	(5%)	$1	(1%)
Chips, including wood chips	460	(3%)	0	(7%)	0	(0%)	$1	(0%)
Unclassified structural component or finish	450	(3%)	0	(6%)	10	(10%)	$27	(10%)
Magazine, newspaper, writing paper	350	(2%)	0	(0%)	0	(4%)	$1	(0%)
Rubbish, trash, or waste	330	(2%)	0	(0%)	0	(1%)	$1	(0%)
Insulation within structural area	260	(2%)	0	(0%)	10	(9%)	$11	(4%)
Dust, fiber, or lint, including sawdust or excelsior	250	(2%)	0	(0%)	0	(1%)	$0	(0%)
Other known item first ignited	1,740	(10%)	20	(55%)	30	(34%)	$53	(20%)
Total	16,810	(100%)	30	(100%)	90	(100%)	$262	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 25.
Home Fires Involving Fireplaces, Chimneys, or Chimney Connectors, by Area of Origin
2011-2015 Annual Averages

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined chimney or flue fire	13,170	(78%)	0	(0%)	20	(18%)	$4	(2%)
Wall assembly or concealed space	780	(5%)	0	(12%)	10	(9%)	$59	(22%)
Living room, family room, or den	610	(4%)	20	(47%)	30	(31%)	$36	(14%)
Attic or ceiling/roof assembly or concealed space	540	(3%)	0	(0%)	10	(10%)	$42	(16%)
Other known area of origin	1,710	(10%)	10	(41%)	30	(31%)	$121	(46%)
Total	16,810	(100%)	30	(100%)	90	(100%)	$262	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 26.
Home Fires Involving Central Heating Equipment, by Type of Fuel or Power
2011-2015 Annual Averages

Fuel or Power	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Electric powered	2,300	(38%)	10	(35%)	20	(26%)	$32	(43%)
Gas fueled	2,030	(33%)	10	(43%)	40	(55%)	$33	(44%)
Liquid fueled	1,630	(27%)	0	(22%)	10	(19%)	$5	(7%)
Solid fueled	150	(2%)	0	(0%)	0	(0%)	$5	(6%)
Other fuel source	20	(0%)	0	(0%)	0	(0%)	0	(0%)
Totals	6,130	(100%)	20	(100%)	70	(100%)	$75	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 27.
Home Fires Involving Central Heating Equipment, by Month
2011-2015 Annual Averages

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	1,090	(18%)	0	(12%)	10	(20%)	$17	(23%)
February	860	(14%)	10	(32%)	10	(10%)	$9	(11%)
March	590	(10%)	0	(0%)	10	(8%)	$6	(8%)
April	400	(7%)	0	(0%)	0	(2%)	$5	(7%)
May	260	(4%)	0	(0%)	10	(7%)	$3	(4%)
June	200	(3%)	0	(0%)	0	(2%)	$2	(2%)
July	140	(2%)	0	(0%)	0	(3%)	$2	(2%)
August	170	(3%)	0	(0%)	0	(1%)	$2	(2%)
September	230	(4%)	0	(0%)	0	(4%)	$3	(4%)
October	610	(10%)	10	(34%)	10	(15%)	$5	(7%)
November	770	(13%)	0	(23%)	10	(13%)	$12	(16%)
December	810	(13%)	0	(0%)	10	(14%)	$10	(13%)
Total	6,130	(100%)	20	(100%)	70	(100%)	$75	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 28.
Home Fires Involving Central Heating Equipment, by Day of Week
2011-2015 Annual Averages

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	780	(13%)	0	(11%)	10	(17%)	$7	(9%)
Monday	990	(16%)	10	(32%)	10	(10%)	$15	(20%)
Tuesday	860	(14%)	0	(22%)	20	(25%)	$11	(14%)
Wednesday	870	(14%)	0	(0%)	10	(19%)	$10	(14%)
Thursday	860	(14%)	0	(24%)	0	(5%)	$9	(12%)
Friday	840	(14%)	0	(0%)	10	(12%)	$10	(14%)
Saturday	920	(15%)	0	(12%)	10	(12%)	$13	(17%)
Total	6,130	(100%)	20	(100%)	70	(100%)	$75	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 29.
Home Fires Involving Central Heating Equipment, by Time of Day
2011-2015 Annual Averages

Time of Day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	160	(3%)	0	(11%)	0	(2%)	$3	(4%)
1:00-1:59 a.m.	130	(2%)	0	(0%)	0	(3%)	$3	(4%)
2:00-2:59 a.m.	140	(2%)	0	(0%)	0	(1%)	$1	(2%)
3:00-3:59 a.m.	170	(3%)	0	(0%)	10	(8%)	$2	(3%)
4:00-4:59 a.m.	140	(2%)	0	(0%)	0	(5%)	$2	(3%)
5:00-5:59 a.m.	210	(3%)	0	(0%)	0	(3%)	$3	(4%)
6:00-6:59 a.m.	240	(4%)	0	(0%)	0	(1%)	$3	(3%)
7:00-7:59 a.m.	300	(5%)	0	(21%)	0	(6%)	$4	(5%)
8:00-8:59 a.m.	310	(5%)	0	(0%)	10	(8%)	$4	(5%)
9:00-9:59 a.m.	340	(6%)	10	(34%)	0	(5%)	$4	(5%)
10:00-10:59 a.m.	340	(6%)	0	(0%)	0	(6%)	$4	(6%)
11:00-11:59 a.m.	260	(4%)	0	(0%)	0	(5%)	$4	(5%)
12:00-12:59 p.m.	260	(4%)	0	(12%)	10	(7%)	$4	(5%)
1:00-1:59 p.m.	270	(4%)	0	(11%)	0	(4%)	$4	(5%)
2:00-2:59 p.m.	270	(4%)	0	(0%)	0	(4%)	$4	(5%)
3:00-3:59 p.m.	260	(4%)	0	(12%)	0	(3%)	$4	(6%)
4:00-4:59 p.m.	350	(6%)	0	(0%)	0	(1%)	$2	(3%)
5:00-5:59 p.m.	270	(4%)	0	(0%)	0	(3%)	$2	(3%)
6:00-6:59 p.m.	370	(6%)	0	(0%)	0	(5%)	$4	(5%)
7:00-7:59 p.m.	290	(5%)	0	(0%)	0	(3%)	$3	(3%)
8:00-8:59 p.m.	320	(5%)	0	(0%)	0	(4%)	$3	(4%)
9:00-9:59 p.m.	280	(5%)	0	(0%)	0	(1%)	$2	(2%)
10:00-10:59 p.m.	250	(4%)	0	(0%)	0	(4%)	$3	(4%)
11:00-11:59 p.m.	210	(3%)	0	(0%)	10	(8%)	$3	(4%)
Total	6,130	(100%)	20	(100%)	70	(100%)	$75	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 30.
Home Fires Involving Central Heating Equipment, by Factor Contributing to Ignition
2011-2015 Annual Averages

Factor Contributing to Ignition*	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Mechanical failure or malfunction	3,450	(56%)	10	(72%)	20	(29%)	$39	52%
Electrical failure or malfunction	790	(13%)	0	(0%)	0	(5%)	$13	17%
Failure to clean	650	(11%)	0	(0%)	10	(7%)	$1	2%
Heat source too close to combustibles.	340	(6%)	0	(0%)	10	(12%)	$10	14%
Equipment not being operated properly	180	(3%)	0	(0%)	10	(12%)	$3	5%
Unclassified operational deficiency	150	(2%)	0	(0%)	0	(0%)	$3	4%
Unclassified factor contributed to ignition	120	(2%)	0	(0%)	0	(3%)	$4	6%
Installation deficiency	110	(2%)	0	(0%)	10	(11%)	$2	3%
Improper startup	100	(2%)	0	(0%)	10	(10%)	$0	0%
Other known factor contributing to ignition	450	(7%)	0	(28%)	10	(17%)	$9	11%
Total fires	6,130	(100%)	20	(100%)	70	(100%)	$75	100%
Total factors	6,340	(103%)	20	(100%)	80	(106%)	$84	113%

*Multiple entries are allowed, which can result in sums higher than totals

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 31.
Home Fires Involving Central Heating Equipment, by Item First Ignited
2011-2015 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Flammable or combustible liquids or gases, piping or filter	2,860	(47%)	20	(100%)	30	(45%)	$13	(17%)
Electrical wire or cable insulation	820	(13%)	0	(0%)	10	(13%)	$4	(5%)
Unclassified item first ignited	510	(8%)	0	(0%)	0	(4%)	$3	(3%)
Structural member or framing	320	(5%)	0	(0%)	10	(12%)	$19	(25%)
Appliance housing or casing	300	(5%)	0	(0%)	0	(1%)	$1	(2%)
Dust, fiber, lint, including sawdust or excelsior	270	(4%)	0	(0%)	0	(6%)	$1	(1%)
Insulation within structural area	100	(2%)	0	(0%)	0	(5%)	$5	(6%)
Other known item first ignited	950	(15%)	0	(0%)	10	(13%)	30	(40%)
Totals	6,130	(100%)	20	(100%)	70	(100%)	$75	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 32.
Home Fires Involving Central Heating Equipment, by Area of Origin
2011-20105 Annual Averages

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Heating equipment room	3,270	(53%)	10	(54%)	40	(57%)	$27	(36%)
Duct for HVAC, cable, exhaust, heating, or AC	680	(11%)	0	(12%)	10	(18%)	$8	(11%)
Crawl space or substructure space	420	(7%)	0	(0%)	0	(4%)	$7	(9%)
Unclassified function area	250	(4%)	0	(12%)	0	(0%)	$1	(1%)
Attic or ceiling/roof assembly or concealed space	200	(3%)	0	(0%)	0	(1%)	$9	(11%)
Confined chimney or flue fire*	200	(3%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified equipment or service area	160	(3%)	0	(0%)	0	(0%)	$1	(1%)
Laundry room or area	130	(2%)	0	(0%)	0	(4%)	$3	(3%)
Unclassified area of origin	130	(2%)	0	(0%)	0	(0%)	$1	(1%)
Closet	100	(2%)	0	(0%)	0	(2%)	$2	(3%)
Other known	590	(10%)	0	(22%)	10	(15%)	$17	(23%)
Totals	6,130	(100%)	20	(100%)	70	(100%)	$75	(100%)

*NFIRS 5.0 does not have a separate area of origin code for fires starting in chimneys. Any home fire with NFIRS incident type 114 (Chimney or flue fire originating in and confined to a chimney or flue) is captured here.

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 33.
Home Fires Involving Water Heaters, by Type of Fuel or Power
2011-2015 Annual Averages

Type of Fuel or Power	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Electrical	2,580	(50%)	0	(0%)	20	(18%)	$34	(33%)
Gas fuels	2,570	(49%)	10	(100%)	110	(82%)	$69	(66%)
Liquid fuels	30	(1%)	0	(0%)	0	(0%)	$0	(0%)
Solid fuels	0	(0%)	0	(0%)	0	(0%)	$0	(0%)
Other	10	(0%)	0	(0%)	0	(0%)	$0	(0%)
Total	5,200	(100%)	10	(100%)	130	(100%)	$104	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 34.
Home Fires Involving Water Heaters, by Month
2011-2015 Annual Averages

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	520	(10%)	0	(27%)	10	(10%)	$13	(12%)
February	440	(8%)	0	(0%)	10	(5%)	$7	(7%)
March	480	(9%)	0	(0%)	10	(9%)	$14	(14%)
April	470	(9%)	0	(25%)	10	(9%)	$9	(9%)
May	440	(8%)	0	(0%)	0	(3%)	$7	(6%)
June	460	(9%)	0	(0%)	10	(5%)	$9	(8%)
July	410	(8%)	0	(24%)	10	(8%)	$9	(9%)
August	390	(7%)	0	(0%)	20	(12%)	$9	(9%)
September	360	(7%)	0	(24%)	10	(8%)	$4	(4%)
October	430	(8%)	0	(0%)	20	(15%)	$8	(7%)
November	400	(8%)	0	(0%)	20	(12%)	$9	(8%)
December	410	(8%)	0	(0%)	0	(3%)	$6	(6%)
Total	5,200	(100%)	10	(100%)	130	(100%)	$104	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 35.
Home Fires Involving Water Heaters, by Day of Week
2011-2015 Annual Averages

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	740	(14%)	0	(25%)	20	(13%)	$14	(14%)
Monday	690	(13%)	0	(0%)	20	(15%)	$10	(9%)
Tuesday	790	(15%)	0	(51%)	30	(19%)	$12	(11%)
Wednesday	750	(14%)	0	(0%)	20	(12%)	$15	(15%)
Thursday	760	(15%)	0	(0%)	20	(16%)	$24	(23%)
Friday	720	(14%)	0	(0%)	20	(14%)	$13	(13%)
Saturday	750	(14%)	0	(24%)	10	(11%)	$16	(16%)
Total	5,200	(100%)	10	(100%)	130	(100%)	$104	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 36.
Home Fires Involving Water Heaters, by Time of Day
2011-2015 Annual Averages

Time of Day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	150	(3%)	0	(0%)	0	(3%)	$3	(3%)
1:00-1:59 a.m.	130	(2%)	0	(0%)	0	(1%)	$4	(4%)
2:00-2:59 a.m.	80	(2%)	0	(0%)	0	(1%)	$3	(3%)
3:00-3:59 a.m.	90	(2%)	0	(0%)	0	(0%)	$3	(3%)
4:00-4:59 a.m.	90	(2%)	0	(24%)	0	(0%)	$4	(4%)
5:00-5:59 a.m.	110	(2%)	0	(0%)	0	(2%)	$2	(2%)
6:00-6:59 a.m.	120	(2%)	0	(0%)	0	(1%)	$1	(1%)
7:00-7:59 a.m.	190	(4%)	0	(0%)	0	(1%)	$4	(4%)
8:00-8:59 a.m.	220	(4%)	0	(0%)	10	(4%)	$4	(4%)
9:00-9:59 a.m.	240	(5%)	0	(0%)	10	(6%)	$3	(3%)
10:00-10:59 a.m.	250	(5%)	0	(0%)	10	(9%)	$3	(3%)
11:00-11:59 a.m.	240	(5%)	0	(0%)	10	(5%)	$5	(5%)
12:00-12:59 p.m.	270	(5%)	0	(0%)	0	(3%)	$5	(5%)
1:00-1:59 p.m.	280	(5%)	0	(0%)	10	(7%)	$6	(5%)
2:00-2:59 p.m.	270	(5%)	0	(0%)	10	(9%)	$12	(11%)
3:00-3:59 p.m.	290	(6%)	0	(0%)	10	(5%)	$4	(4%)
4:00-4:59 p.m.	320	(6%)	0	(0%)	10	(5%)	$7	(7%)
5:00-5:59 p.m.	300	(6%)	0	(0%)	10	(8%)	$7	(7%)
6:00-6:59 p.m.	290	(5%)	0	(51%)	10	(9%)	$4	(4%)
7:00-7:59 p.m.	310	(6%)	0	(0%)	10	(4%)	$4	(4%)
8:00-8:59 p.m.	270	(5%)	0	(0%)	10	(4%)	$6	(6%)
9:00-9:59 p.m.	260	(5%)	0	(0%)	0	(2%)	$3	(3%)
10:00-10:59 p.m.	250	(5%)	0	(25%)	10	(4%)	$3	(3%)
11:00-11:59 p.m.	190	(4%)	0	(0%)	10	(4%)	$3	(3%)
Total	5,200	(100%)	10	(100%)	130	(100%)	$104	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 37.
Home Fires Involving Water Heaters, by Factor Contributing to Ignition
2011-2015 Annual Averages

Factor Contributing to Ignition*	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Electrical failure or malfunction	1,820	(35%)	0	(0%)	10	(8%)	$21	(20%)
Mechanical failure or malfunction	1,400	(27%)	0	(52%)	20	(15%)	$28	(27%)
Heat source too close to combustibles.	1,080	(21%)	0	(0%)	30	(25%)	$27	(26%)
Unclassified misuse of material or product, other	150	(3%)	0	(0%)	20	(19%)	$3	(3%)
Installation deficiency	120	(2%)	0	(0%)	0	(2%)	$2	(2%)
Improper container or storage	110	(2%)	0	(0%)	10	(6%)	$4	(4%)
Unclassified factor contributing to ignition	110	(2%)	0	(0%)	10	(5%)	$3	(3%)
Flammable liquid or gas spilled	100	(2%)	0	(48%)	20	(12%)	$13	(13%)
Other known factor contributing to ignition	590	(11%)	0	(52%)	20	(14%)	$10	(10%)
Total fires	5,200	(100%)	10	(100%)	130	(100%)	$104	(100%)
Total factors	5,470	(105%)	10	(152%)	140	(106%)	$111	(107%)

*Multiple entries are allowed, which can result in sums higher than totals.

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 38.
Home Fires Involving Water Heaters, by Item First Ignited
2011-2015 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Electrical wire or cable insulation	1,370	(26%)	0	(0%)	10	(4%)	$9	(9%)
Flammable or combustible liquids or gases, piping or filter	830	(16%)	10	(75%)	80	(61%)	$27	(26%)
Appliance housing or casing	500	(10%)	0	(0%)	0	(2%)	$2	(2%)
Unclassified item first ignited	350	(7%)	0	(0%)	0	(3%)	$2	(2%)
Clothing	290	(5%)	0	(0%)	0	(3%)	$9	(9%)
Structural member or framing	280	(5%)	0	(25%)	0	(2%)	$10	(10%)
Interior wall covering. excluding drapes	180	(3%)	0	(0%)	0	(2%)	$8	(7%)
Unclassified structural component or finish	160	(3%)	0	(0%)	0	(2%)	$4	(4%)
Insulation within structural area	150	(3%)	0	(0%)	0	(0%)	$3	(3%)
Floor covering rug, carpet, or mat	150	(3%)	0	(0%)	0	(2%)	$1	(1%)
Multiple items first ignited	120	(2%)	0	(0%)	0	(4%)	$7	(7%)
Unclassified soft goods, or wearing apparel	90	(2%)	0	(0%)	0	(1%)	$4	(4%)
Box, carton, bag, basket, barrel	80	(2%)	0	(0%)	0	(2%)	$3	(3%)
Other known item first ignited	650	(13%)	0	(0%)	20	(12%)	$15	(15%)
Total	5,200	(100%)	10	(100%)	130	(100%)	$104	(100%)

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Table 39.
Home Fires Involving Water Heaters, by Area of Origin
2011-2015 Annual Averages

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Heating equipment room	1,890	(36%)	0	(49%)	50	(36%)	$34	(32%)
Laundry room or area	730	(14%)	0	(24%)	20	(12%)	$14	(13%)
Closet	570	(11%)	0	(0%)	10	(4%)	$7	(6%)
Garage or vehicle storage area	300	(6%)	0	(27%)	10	(10%)	$18	(18%)
Kitchen or cooking area	220	(4%)	0	(0%)	10	(5%)	$2	(2%)
Crawl space or substructure space	210	(4%)	0	(0%)	10	(4%)	$4	(4%)
Storage room, area, tank, or bin	200	(4%)	0	(0%)	10	(5%)	$4	(4%)
Unclassified function area	150	(3%)	0	(0%)	0	(1%)	$1	(1%)
Lavatory, bathroom, locker room or check room	130	(2%)	0	(0%)	0	(1%)	$1	(1%)
Unclassified storage area	120	(2%)	0	(0%)	0	(3%)	$3	(3%)
Attic or ceiling/roof assembly or concealed space	90	(2%)	0	(0%)	0	(1%)	$4	(4%)
Confined chimney or flue fire*	50	(1%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified area	40	(1%)	0	(0%)	0	(1%)	$0	(0%)
Other known area of origin	510	(10%)	0	(0%)	20	(16%)	$13	(12%)
Total	5,200	(100%)	10	(100%)	130	(100%)	$104	(100%)

NFIRS 5.0 does not have a separate area of origin code for fires starting in chimneys. Any home fire with NFIRS incident type 114 (Chimney or flue fire originating in and confined to a chimney or flue) is captured here.

Note: These are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported to federal or state agencies or industrial fire brigades. Analyses were performed separately for non-confined fires, fires reported as confined chimney or flue fires, and fires reports as confined to fuel burner or boiler. Fires, deaths, and injuries are rounded to the nearest ten and direct property damage to the nearest million dollars. Totals may not equal sums due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2011-2015.

Appendix A.
How National Estimates Statistics Are Calculated

The statistics in this analysis are estimates derived from the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA's) annual survey of U.S. fire departments. NFIRS is a voluntary system through which participating fire departments report detailed factors about the fires to which they respond. Roughly two-thirds of U.S. fire departments participate, although not all of these departments provide data every year. Fires reported to federal or state fire departments or industrial fire brigades are not included in these estimates.

NFIRS provides the most detailed incident information of any national database not limited to large fires. NFIRS is the only database capable of addressing national patterns for fires of all sizes by specific property use and specific fire cause. NFIRS also captures information on the extent of flame spread, and automatic detection and suppression equipment. For more information about NFIRS visit https://www.usfa.fema.gov/data/nfirs/.

NFIRS has a wide variety of data elements and codes. Many code choices describe several conditions. These cannot be broken down further. For example, area of origin code 83 captures fires starting in vehicle engine areas, running gear areas or wheel areas. It is not possible to tell the portion of each from the coded data.

Methodology may change slightly from year to year. NFPA is continually examining its methodology to provide the best possible answers to specific questions. From time to time, changes are made to methodologies or groupings. *Earlier editions of the same report may have used different methodologies to produce the same analysis, meaning that the estimates are not directly comparable from year to year.* Readers should use the latest report available and contact us if clarification is needed.

NFPA's fire department experience survey provides estimates of the big picture. Each year, NFPA conducts an annual survey of fire departments which enables us to capture a summary of fire department experience on a larger scale. Surveys are sent to all municipal departments protecting populations of 5,000 or more and a random sample, stratified by community size, of the smaller departments. Typically, a total of roughly 3,000 surveys are returned, representing about one of every ten U.S. municipal fire departments serving about one third of the U.S. population.

The survey is stratified by size of population protected to reduce the uncertainty of the final estimate. Small rural communities have fewer people protected per department and are less likely to respond to the survey. A larger number must be surveyed to obtain an adequate sample of those departments. (NFPA also makes follow-up calls to a sample of the smaller fire departments that do not respond, to confirm that those that did respond are truly representative of fire departments their size.) On the other hand, large city departments are so few in number and protect such a large proportion of the total U.S. population that it makes sense to survey all of them. Most respond, resulting in excellent precision for their part of the final estimate.

The survey includes the following information: (1) the total number of fire incidents, civilian deaths, and civilian injuries, and the total estimated property damage (in dollars), for each of the

major property use classes defined in NFIRS; (2) the number of on-duty firefighter injuries, by type of duty and nature of illness; 3) the number and nature of non-fire incidents; and (4) information on the type of community protected (e.g., county versus township versus city) and the size of the population protected, which is used in the statistical formula for projecting national totals from sample results. The results of the survey are published in the annual report *Fire Loss in the United States*.

PROJECTING NFIRS TO NATIONAL ESTIMATES

As noted, NFIRS is a voluntary reporting system. Different states and jurisdictions have different reporting requirements and practices. Participation rates in NFIRS are not necessarily uniform across regions and community sizes, both factors correlated with frequency and severity of fires. This means NFIRS may be susceptible to systematic biases. No one at present can quantify the size of these deviations from the ideal, representative sample. But there is enough reason for concern so that a second database -- the NFPA's fire experience survey -- is needed to project NFIRS to national estimates and to project different parts of NFIRS separately. This multiple calibration approach makes use of the annual NFPA's fire experience survey where its statistical design advantages are strongest.

Scaling ratios are obtained by comparing NFPA's projected totals of residential structure fires, non-residential structure fires, vehicle fires, and outside and other fires, and associated civilian deaths, civilian injuries, and direct property damage with comparable totals in NFIRS. Estimates of specific fire problems and circumstances are obtained by multiplying the NFIRS data by the scaling ratios. Reports for incidents in which mutual aid was given are excluded from NFPA's analyses.

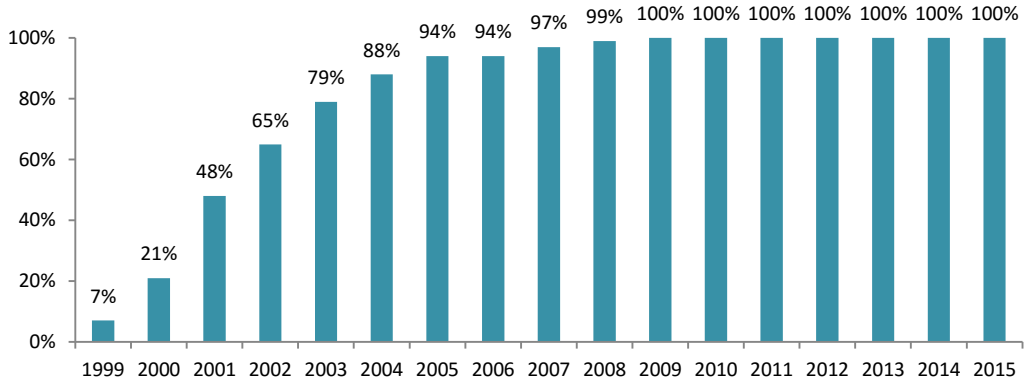
Analysts at the NFPA, the USFA and the Consumer Product Safety Commission developed the analytical rules used in analyzing data from the two data sets. "The National Estimates Approach to U.S. Fire Statistics," by John R. Hall, Jr. and Beatrice Harwood, provides a more detailed explanation of national estimates.

Version 5.0 of NFIRS, first introduced in 1999, used a different coding structure for many data elements, added some property use codes, and dropped others. The essentials of the approach described by Hall and Harwood are still used, but some modifications have been necessary to accommodate the changes in NFIRS 5.0. For 2002 data on, analyses are based on scaling ratios using only data originally collected in NFIRS 5.0:

$$\frac{\text{NFPA's fire experience survey projections}}{\text{NFIRS totals (Version 5.0)}}$$

For 1999 to 2001, the same rules may be applied, but estimates for these years in this form will be less reliable due to the smaller amount of data originally collected in NFIRS 5.0; they should be viewed with extreme caution.

Figure A.1. Fires Originally Collected in NFIRS 5.0 by Year



NFIRS 5.0 introduced six categories of confined structure fires, including:

- cooking fires confined to the cooking vessel,
- confined chimney or flue fires,
- confined incinerator fire,
- confined fuel burner or boiler fire or delayed ignition,
- confined commercial compactor fire, and
- trash or rubbish fires in a structure with no flame damage to the structure or its contents.

Although causal and other detailed information is typically not required for these incidents, it is provided in some cases. Some analyses, particularly those that examine cooking equipment, heating equipment, fires caused by smoking materials, and fires started by playing with fire, may examine the confined fires in greater detail. Because the confined fire incident types describe certain scenarios, the distribution of unknown data differs from that of all fires. Consequently, allocation of unknowns must be done separately.
Some analyses of structure fires show only non-confined fires. In these tables, percentages shown are of non-confined structure fires rather than all structure fires. This approach has the advantage of showing the frequency of specific factors in fire causes, but the disadvantage of possibly overstating the percentage of factors that are seldom seen in the confined fire incident types and of understating the factors specifically associated with the confined fire incident types. Other analyses include entries for confined fire incident types in the causal tables and show percentages based on total structure fires. In these cases, the confined fire incident type is treated as a general causal factor.

For most fields other than Property Use and Incident Type, NFPA allocates unknown data proportionally among known data. This approach assumes that if the missing data were known, it would be distributed in the same manner as the known data. NFPA makes additional adjustments to several fields. *Casualty and loss projections can be heavily influenced by the inclusion or exclusion of unusually serious fire.*

SPECIFIC DATA ELEMENTS

In the formulas that follow, the term "all fires" refers to all fires in NFIRS on the dimension studied. The percentages of fires with known or unknown data are provided for non-confined fires and associated losses, and for confined fires only.

Cause of Ignition: This field is used chiefly to identify intentional fires. "Unintentional" in this field is a specific entry and does not include other fires that were not intentionally set: failure of equipment or heat source, act of nature, or "other" (unclassified)." The last should be used for exposures but has been used for other situations as well. Fires that were coded as under investigation and those that were coded as undetermined after investigation were treated as unknown.

Factor Contributing to Ignition: In this field, the code "none" is treated as an unknown and allocated proportionally. For Human Factor Contributing to Ignition, NFPA enters a code for "not reported" when no factors are recorded. "Not reported" is treated as an unknown, but the code "none" is treated as a known code and not allocated. Multiple entries are allowed in both of these fields. Percentages are calculated on the total number of fires, not entries, resulting in sums greater than 100%. Although Factor Contributing to Ignition is only required when the cause of ignition was coded as: 2) unintentional, 3) failure of equipment or heat source; or 4) act of nature, data is often present when not required. Consequently, any fire in which no factor contributing to ignition was entered was treated as unknown.

In some analyses, all entries in the category of mechanical failure, malfunction (factor contributing to ignition 20-29) are combined and shown as one entry, "mechanical failure or malfunction." This category includes:

21. Automatic control failure;
22. Manual control failure;
23. Leak or break. Includes leaks or breaks from containers or pipes. Excludes operational deficiencies and spill mishaps;
25. Worn out;
26. Backfire. Excludes fires originating as a result of hot catalytic converters;
27. Improper fuel used; Includes the use of gasoline in a kerosene heater and the like; and
20. Mechanical failure or malfunction, other.

Entries in "electrical failure, malfunction" (factor contributing to ignition 30-39) may also be combined into one entry, "electrical failure or malfunction." This category includes:

31. Water-caused short circuit arc;
32. Short-circuit arc from mechanical damage;
33. Short-circuit arc from defective or worn insulation;
34. Unspecified short circuit arc;
35. Arc from faulty contact or broken connector, including broken power lines and loose connections;
36. Arc or spark from operating equipment, switch, or electric fence;
37. Fluorescent light ballast; and
30. Electrical failure or malfunction, other.

Heat Source. In NFIRS 5.0, one grouping of codes encompasses various types of open flames and smoking materials. In the past, these had been two separate groupings. A new code was

added to NFIRS 5.0, which is code 60: "Heat from open flame or smoking material, other." NFPA treats this code as a partial unknown and allocates it proportionally across the codes in the 61-69 range, shown below.

61. Cigarette;
62. Pipe or cigar;
63. Heat from undetermined smoking material;
64. Match;
65. Lighter: cigarette lighter, cigar lighter;
66. Candle;
67 Warning or road flare, fuse;
68. Backfire from internal combustion engine. Excludes flames and sparks from an exhaust system, (11); and
69. Flame/torch used for lighting. Includes gas light and gas-/liquid-fueled lantern.

In addition to the conventional allocation of missing and undetermined fires, NFPA multiplies fires with codes in the 61-69 range by

$$\frac{\text{All fires in range 60-69}}{\text{All fires in range 61-69}}$$

The downside of this approach is that heat sources that are truly a different type of open flame or smoking material are erroneously assigned to other categories. The grouping "smoking materials" includes codes 61-63 (cigarettes, pipes or cigars, and heat from undetermined smoking material, with a proportional share of the code 60s and true unknown data.

Equipment Involved in Ignition (EII). NFIRS 5.0 originally defined EII as the piece of equipment that provided the principal heat source to cause ignition if the equipment malfunctioned or was used improperly. In 2006, the definition was modified to "the piece of equipment that provided the principal heat source to cause ignition." However, much of the data predates the change. Individuals who have already been trained with the older definition may not change their practices. To compensate, NFPA treats fires in which EII = NNN and heat source is not in the range of 40-99 as an additional unknown.

To allocate unknown data for EII, the known data is multiplied by

$$\frac{\text{All fires}}{\text{(All fires – blank – undetermined – [fires in which EII =NNN and heat source <>40-99])}}$$

In addition, the partially unclassified codes for broad equipment groupings (i.e., code 100 - heating, ventilation, and air conditioning, other; code 200 - electrical distribution, lighting and power transfer, other; etc.) were allocated proportionally across the individual code choices in their respective broad groupings (heating, ventilation, and air conditioning; electrical distribution, lighting and power transfer, other; etc.). Equipment that is totally unclassified is not allocated further. This approach has the same downside as the allocation of heat source 60 described above. Equipment that is truly different is erroneously assigned to other categories.

In some analyses, various types of equipment are grouped together.

Code Grouping	**EII Code**	**NFIRS definitions**
Central heat	132	Furnace or central heating unit
	133	Boiler (power, process or heating)

Fixed or portable space heater	131	Furnace, local heating unit, built-in
	123	Fireplace with insert or stove
	124	Heating stove
	141	Heater, excluding catalytic and oil-filled
	142	Catalytic heater
	143	Oil-filled heater
Fireplace or chimney	120	Fireplace or chimney
	121	Fireplace, masonry
	122	Fireplace, factory-built
	125	Chimney connector or vent connector
	126	Chimney – brick, stone or masonry
	127	Chimney-metal, including stovepipe or flue
Fixed wiring and related equipment	210	Unclassified electrical wiring
	211	Electrical power or utility line
	212	Electrical service supply wires from utility
	213	Electric meter or meter box
	214	Wiring from meter box to circuit breaker
	215	Panel board, switch board or circuit breaker board
	216	Electrical branch circuit
	217	Outlet or receptacle
	218	Wall switch
	219	Ground fault interrupter
Transformers and power supplies	221	Distribution-type transformer
	222	Overcurrent, disconnect equipment
	223	Low-voltage transformer
	224	Generator
	225	Inverter
	226	Uninterrupted power supply (UPS)
	227	Surge protector
	228	Battery charger or rectifier
	229	Battery (all types)

Code Grouping	EII Code	NFIRS definitions
Lamp, bulb or lighting	230	Unclassified lamp or lighting
	231	Lamp-tabletop, floor or desk
	232	Lantern or flashlight
	233	Incandescent lighting fixture
	234	Fluorescent light fixture or ballast
	235	Halogen light fixture or lamp
	236	Sodium or mercury vapor light fixture or lamp
	237	Work or trouble light
	238	Light bulb
	241	Nightlight
	242	Decorative lights – line voltage
	243	Decorative or landscape lighting – low voltage
	244	Sign
Cord or plug	260	Unclassified cord or plug
	261	Power cord or plug, detachable from appliance
	262	Power cord or plug- permanently attached
	263	Extension cord
Torch, burner or soldering iron	331	Welding torch
	332	Cutting torch
	333	Burner, including Bunsen burners
	334	Soldering equipment
Portable cooking or warming equipment	631	Coffee maker or teapot
	632	Food warmer or hot plate
	633	Kettle
	634	Popcorn popper
	635	Pressure cooker or canner
	636	Slow cooker
	637	Toaster, toaster oven, counter-top broiler
	638	Waffle iron, griddle
	639	Wok, frying pan, skillet
	641	Breadmaking machine

Area of Origin. Two areas of origin: bedroom for more than five people (code 21) and bedroom for less than five people (code 22) are combined and shown as simply "bedroom." Chimney is no longer a valid area of origin code for non-confined fires.

Item First Ignited. In most analyses, mattress and pillows (item first ignited 31) and bedding, blankets, sheets, and comforters (item first ignited 32) are combined and shown as "mattresses and bedding." In many analyses, wearing apparel not on a person (code 34) and wearing apparel on a person (code 35) are combined and shown as "clothing." In some analyses, flammable and combustible liquids and gases, piping and filters (item first ignited 60-69) are combined and shown together.

Extent of Fire Spread. All structure fires with incident types indicating a confined fire were shown separately and are assumed to be confined to the object of origin. Fires that spread beyond the room of origin are calculated by summing fires with damage:

a) confined to the floor of origin (code 3),
b) confined to the building of origin (code 4), and
c) extending beyond building of origin (code 5).

Rounding and percentages. The data shown are estimates and generally rounded. An entry of zero may be a true zero or it may mean that the value rounds to zero. Percentages are calculated from unrounded values. It is quite possible to have a percentage entry of up to 100% even if the rounded number entry is zero. The same rounded value may account for a slightly different percentage share. Because percentages are expressed in integers and not carried out to several decimal places, percentages that appear identical may be associated with slightly different values.

Inflation. Property damage estimates are not adjusted for inflation unless so indicated.