



RESEARCH

Home Fires Involving Heating Equipment

Supporting Tables

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Home Fires Involving Heating Equipment: Supporting Tables

The tables in this document are a companion to the report of the same name.

Most tables, with the exception of fires by year, show estimates of 2012-2016 annual averages. Fires that occurred outside the home and not on the structure are excluded. Estimates were derived from the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS) and NFPA's annual fire department experience survey and include proportional shares of unknown or missing data. Fires are rounded to the nearest 100, deaths and injuries are rounded to the nearest ten, and property loss is rounded to the nearest million dollars. Inflation adjustments were made only for the trend table. Percentages were calculated on unrounded estimates.

Fires with NFIRS incident type code 113 indicating a confined cooking fire were analyzed separately from fires with non-confined structure fire incident types and summed. Estimates include proportional shares of fires in which the equipment involved was unknown or not reported. Other causal factors were allocated separately. For more information on how these estimates were calculated, please see the [full report](#) and [How NFPA's National Estimates Are Calculated for Home Structure Fires](#)

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**Table 1.
Home Fires Involving Heating Equipment, by Year, 1980-2016**

Year	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions of Current Dollars)	Direct Property Damage (in Millions of 2016 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)	\$1,170 (\$1,088)
2000	72,500	810 (810)	1,980 (1,890)	\$929 (\$908)	\$1,294 (\$1,265)
2001	71,900	410 (410)	1,670 (1,580)	\$849 (\$830)	\$1,150 (\$1,125)
2002	73,600	660 (660)	1,580 (1,550)	\$1,310 (\$1,288)	\$1,747 (\$1,717)
2003	71,000	550 (550)	1,750 (1,620)	\$961 (\$940)	\$1,254 (\$1,226)
2004	69,500	670 (670)	1,660 (1,520)	\$922 (\$907)	\$1,172 (\$1,153)
2005	64,900	730 (730)	1,630 (1,510)	\$966 (\$943)	\$1,186 (\$1,158)
2006	64,100	540 (540)	1,400 (1,300)	\$943 (\$937)	\$1,122 (\$1,115)
2007	66,400	580 (580)	1,850 (1,710)	\$608 (\$601)	\$703 (\$695)
2008	66,100	480 (480)	1,660 (1,570)	\$1,090 (\$1,081)	\$1,215 (\$1,205)
2009	58,900	480 (480)	1,520 (1,470)	\$1,053 (\$1,043)	\$1,177 (\$1,166)
2010	57,100	490 (490)	1,530 (1,470)	\$1,072 (\$1,064)	\$1,180 (\$1,171)
2011	53,600	400 (400)	1,520 (1,480)	\$893 (\$886)	\$953 (\$945)
2012	51,800	470 (470)	1,380 (1,320)	\$938 (\$930)	\$981 (\$972)

Table 1.
Home Fires Involving Heating Equipment by Year, 1980-2016 (continued)

Year	Fires	Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions of Current Dollars)		Direct Property Damage (in Millions of 2016 Dollars)	
2013	56,800	510	(510)	1,470	(1,430)	\$1,133	(\$1,125)	\$1,166	(\$1,157)
2014	55,000	560	(560)	1,600	(1,530)	\$1,318	(\$1,310)	\$1,334	(\$1,326)
2015	48,300	420	(420)	1,330	(1,290)	\$948	(\$941)	\$960	(\$953)
2016	44,900	490	(490)	1,210	(1,190)	\$779	(\$774)	\$779	(\$774)

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 2016 dollars is calculated using the Consumer Price Index.

Source: NFIRS 5.0 and NFPA Fire Experience Survey, 2012-2016.

Table 2.
Home Fires Involving Heating Equipment, by Month
2012-2016 Annual Averages

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	9,900	(19%)	120	(24%)	260	(18%)	\$213	(21%)
February	8,000	(15%)	70	(15%)	170	(12%)	\$144	(14%)
March	5,870	(11%)	40	(7%)	130	(9%)	\$104	(10%)
April	3,470	(7%)	30	(7%)	90	(6%)	\$61	(6%)
May	2,110	(4%)	10	(2%)	90	(7%)	\$40	(4%)
June	1,540	(3%)	10	(2%)	60	(4%)	\$31	(3%)
July	1,430	(3%)	0	(1%)	60	(4%)	\$24	(2%)
August	1,430	(3%)	10	(1%)	60	(4%)	\$26	(3%)
September	1,680	(3%)	10	(3%)	70	(5%)	\$34	(3%)
October	3,440	(7%)	20	(4%)	110	(8%)	\$61	(6%)
November	6,080	(12%)	80	(17%)	150	(10%)	\$154	(15%)
December	7,110	(14%)	90	(18%)	170	(12%)	\$138	(13%)
Total	52,050	(100%)	490	(100%)	1,400	(100%)	\$1,031	(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, 2012-2016.

Table 3.
Home Fires Involving Heating Equipment, by Day of the Week
2012-2016 Annual Averages

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	7,640	(15%)	60	(13%)	210	(15%)	\$141	(14%)
Monday	7,300	(14%)	80	(17%)	190	(14%)	\$136	(13%)
Tuesday	7,410	(14%)	60	(11%)	210	(15%)	\$142	(14%)
Wednesday	7,260	(14%)	80	(17%)	190	(13%)	\$141	(14%)
Thursday	7,340	(14%)	60	(13%)	220	(16%)	\$145	(14%)
Friday	7,380	(14%)	70	(14%)	180	(13%)	\$148	(14%)
Saturday	7,710	(15%)	70	(15%)	210	(15%)	\$177	(17%)
Total	52,050	(100%)	490	(100%)	1,400	(100%)	\$1,031	(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, 2012-2016.

Table 4.
Home Fires Involving Heating Equipment, by Time of Day
2012-2016 Annual Averages

Time of Day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	1,410	(3%)	20	(5%)	70	(5%)	\$44	(4%)
1:00-1:59 a.m.	1,120	(2%)	30	(5%)	40	(3%)	\$65	(6%)
2:00-2:59 a.m.	1,000	(2%)	40	(8%)	40	(3%)	\$34	(3%)
3:00-3:59 a.m.	940	(2%)	30	(6%)	50	(3%)	\$35	(3%)
4:00-4:59 a.m.	960	(2%)	20	(4%)	40	(3%)	\$36	(4%)
5:00-5:59 a.m.	1,020	(2%)	20	(4%)	50	(3%)	\$28	(3%)
6:00-6:59 a.m.	1,360	(3%)	50	(10%)	50	(3%)	\$30	(3%)
7:00-7:59 a.m.	1,780	(3%)	30	(6%)	40	(3%)	\$38	(4%)
8:00-8:59 a.m.	1,980	(4%)	20	(3%)	60	(4%)	\$33	(3%)
9:00-9:59 a.m.	2,080	(4%)	30	(6%)	60	(5%)	\$37	(4%)
10:00-10:59 a.m.	2,230	(4%)	30	(6%)	80	(6%)	\$40	(4%)
11:00-11:59 a.m.	2,240	(4%)	10	(2%)	60	(5%)	\$47	(5%)
12:00-12:59 p.m.	2,340	(5%)	10	(2%)	60	(4%)	\$46	(4%)
1:00-1:59 p.m.	2,340	(4%)	10	(2%)	60	(5%)	\$54	(5%)
2:00-2:59 p.m.	2,390	(5%)	0	(0%)	70	(5%)	\$47	(5%)
3:00-3:59 p.m.	2,580	(5%)	10	(2%)	60	(4%)	\$44	(4%)
4:00-4:59 p.m.	2,990	(6%)	10	(2%)	90	(6%)	\$47	(5%)
5:00-5:59 p.m.	3,450	(7%)	10	(2%)	80	(6%)	\$49	(5%)
6:00-6:59 p.m.	3,730	(7%)	10	(2%)	70	(5%)	\$53	(5%)
7:00-7:59 p.m.	3,750	(7%)	20	(4%)	60	(4%)	\$47	(5%)
8:00-8:59 p.m.	3,460	(7%)	10	(2%)	60	(4%)	\$53	(5%)
9:00-9:59 p.m.	2,840	(5%)	20	(3%)	50	(4%)	\$42	(4%)
10:00-10:59 p.m.	2,290	(4%)	30	(7%)	40	(3%)	\$43	(4%)
11:00-11:59 p.m.	1,780	(3%)	30	(7%)	60	(4%)	\$39	(4%)
Total	52,050	(100%)	490	(100%)	1,400	(100%)	\$1,031	(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, 2012-2016.

Table 5.
Home Fires Involving Heating Equipment by Type of Equipment
2012-2016 Annual Averages

Equipment	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Space heater	22,480	(44%)	430	(86%)	1,090	(78%)	\$555	(54%)
Fireplace or chimney	16,030	(32%)	40	(7%)	80	(6%)	\$256	(25%)
Central heat	5,830	(12%)	10	(2%)	80	(6%)	\$70	(7%)
Water heater	5,010	(10%)	10	(2%)	120	(9%)	\$94	(9%)
Heat lamp	890	(2%)	10	(3%)	20	(1%)	\$49	(5%)
Heat tape	230	(0%)	0	(0%)	0	(0%)	\$6	(1%)
Steamline, heat pipe, hot air duct	70	(0%)	0	(0%)	10	(0%)	\$2	(0%)
Confined fuel burner, boiler with no heating equipment	920	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Confined chimney, flue with no heating equipment	590	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Total	52,050	(100%)	490	(100%)	1,400	(100%)	\$1,031	(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, 2012-2016.

**Table 6.
Home Fires Involving Heating Equipment, by Factor Contributing to Ignition
2012-2016 Annual Averages**

Factor Contributing to Ignition*	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Failure to clean	14,140	(27%)	0	(0%)	40	(3%)	\$66	(6%)
Non-confined	1,640	(3%)	0	(0%)	30	(2%)	\$63	(6%)
Confined	12,500	(24%)	0	(0%)	0	(0%)	\$3	(0%)
Mechanical failure or malfunction	8,450	(16%)	30	(7%)	120	(9%)	\$193	(19%)
Non-confined	3,660	(7%)	30	(7%)	100	(7%)	\$191	(19%)
Confined	4,790	(9%)	0	(0%)	20	(1%)	\$2	(0%)
Heat source too close to combustibles	7,910	(15%)	260	(54%)	420	(30%)	\$319	(31%)
Non-confined	6,990	(13%)	260	(54%)	420	(30%)	\$318	(31%)
Confined	930	(2%)	0	(0%)	0	(0%)	\$1	(0%)
Electrical failure or malfunction	4,460	(9%)	50	(11%)	70	(5%)	\$108	(10%)
Non-confined	3,690	(7%)	50	(11%)	70	(5%)	\$108	(10%)
Confined	760	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Equipment unattended	3,690	(7%)	60	(13%)	290	(21%)	\$108	(10%)
Non-confined	3,530	(7%)	60	(13%)	290	(21%)	\$108	(10%)
Confined	150	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified factor contributed to ignition	2,400	(5%)	10	(3%)	80	(6%)	\$34	(3%)
Non-confined	770	(1%)	10	(3%)	80	(6%)	\$33	(3%)
Confined	1,640	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified misuse of material or product	1,790	(3%)	10	(2%)	90	(7%)	\$20	(2%)
Non-confined	890	(2%)	10	(2%)	90	(7%)	\$20	(2%)
Confined	900	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified operational deficiency	1,320	(3%)	10	(2%)	30	(2%)	\$25	(2%)
Non-confined	430	(1%)	10	(2%)	30	(2%)	\$24	(2%)
Confined	890	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Installation deficiency	1,260	(2%)	0	(1%)	20	(1%)	\$36	(4%)
Non-confined	860	(2%)	0	(1%)	20	(1%)	\$36	(4%)
Confined	400	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Accidentally turned on, not turned off	1,150	(2%)	10	(2%)	70	(5%)	\$30	(3%)
Non-confined	1,100	(2%)	10	(2%)	60	(5%)	\$30	(3%)
Confined	40	(0%)	0	(0%)	0	(0%)	\$0	(0%)

Table 6.
Home Fires Involving Heating Equipment, by Factor Contributing to Ignition
2012-2016 Annual Averages (continued)

Factor contributing to ignition*	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Abandoned or discarded material or product	1,140	(2%)	10	(2%)	40	(3%)	\$21	(2%)
Non-confined	890	(2%)	10	(2%)	40	(3%)	\$21	(2%)
Confined	250	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Equipment not being operated properly	960	(2%)	10	(2%)	50	(4%)	\$20	(2%)
Non-confined	540	(1%)	10	(2%)	50	(3%)	\$20	(2%)
Confined	430	(1%)	0	(0%)	10	(0%)	\$0	(0%)
Other known factor contributing to ignition	5,800	(11%)	40	(9%)	180	(13%)	\$146	(14%)
Non-confined	2,690	(5%)	40	(9%)	170	(12%)	\$145	(14%)
Confined	3,120	(6%)	0	(0%)	10	(1%)	\$1	(0%)
			0					
Total fires	52,050	(100%)	490	(100%)	1,400	(100%)	\$1,031	(100%)
Non-confined	25,880	(50%)	490	(100%)	1,350	(97%)	\$1,024	(99%)
Confined	26,170	(50%)	0	(0%)	50	(3%)	\$8	(1%)
Total factors	54,470	(105%)	530	(107%)	1,510	(107%)	\$1,126	(109%)
Non-confined	27,670	(53%)	530	(107%)	1,460	(104%)	\$1,118	(108%)
Confined	26,800	(51%)	0	(0%)	50	(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, 2012-2016.

Table 7.
Home Fires Involving Heating Equipment, by Item First Ignited
2012-2016 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified item first ignited	6,630	(13%)	20	(4%)	40	(3%)	\$24	(2%)
Non-confined	940	(2%)	20	(4%)	30	(2%)	\$22	(2%)
Confined	5,690	(11%)	0	(0%)	10	(1%)	\$2	(0%)
Unclassified organic materials	6,040	(12%)	10	(1%)	10	(1%)	\$7	(1%)
Non-confined	320	(1%)	10	(1%)	10	(1%)	\$7	(1%)
Confined	5,720	(11%)	0	(0%)	10	(0%)	\$1	(0%)
Flammable or combustible liquids or gases, piping or filter	5,890	(11%)	40	(8%)	200	(15%)	\$58	(6%)
Non-confined	1,600	(3%)	40	(8%)	180	(13%)	\$57	(6%)
Confined	4,300	(8%)	0	(0%)	20	(1%)	\$1	(0%)
Cooking materials, including food	4,210	(8%)	20	(5%)	380	(27%)	\$82	(8%)
Non-confined	4,110	(8%)	20	(5%)	380	(27%)	\$81	(8%)
Confined	100	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Structural member or framing	3,940	(8%)	30	(6%)	60	(4%)	\$296	(29%)
Non-confined	3,680	(7%)	30	(6%)	60	(4%)	\$295	(29%)
Confined	260	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Film or residue, including paint, resin and creosote	2,960	(6%)	0	(0%)	0	(0%)	\$3	(0%)
Non-confined	120	(0%)	0	(0%)	0	(0%)	\$3	(0%)
Confined	2,840	(5%)	0	(0%)	0	(0%)	\$0	(0%)
Electrical wire or cable insulation	2,820	(5%)	20	(4%)	50	(4%)	\$32	(3%)
Non-confined	2,120	(4%)	20	(4%)	50	(4%)	\$32	(3%)
Confined	700	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Appliance housing or casing	1,580	(3%)	10	(2%)	40	(3%)	\$16	(2%)
Non-confined	990	(2%)	10	(2%)	40	(3%)	\$16	(2%)
Confined	590	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Interior wall covering, excluding drapes	1,280	(2%)	20	(3%)	40	(3%)	\$58	(6%)
Non-confined	1,180	(2%)	20	(3%)	40	(3%)	\$58	(6%)
Confined	100	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Heavy vegetation including trees	1,200	(2%)	0	(0%)	0	(0%)	\$2	(0%)
Non-confined	70	(0%)	0	(0%)	0	(0%)	\$2	(0%)
Confined	1,130	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified structural component or finish	1,190	(2%)	10	(2%)	20	(2%)	\$61	(6%)
Non-confined	960	(2%)	10	(2%)	20	(2%)	\$61	(6%)
Confined	230	(0%)	0	(0%)	0	(0%)	\$0	(0%)

Table 7.
Home Fires Involving Heating Equipment, by Item First Ignited
2012-2016 Annual Averages (continued)

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Dust, fiber, lint, including sawdust or excelsior	1,050	(2%)	0	(1%)	10	(1%)	\$5	(0%)
Non-confined	280	(1%)	0	(1%)	10	(0%)	\$5	(0%)
Confined	770	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Multiple items first ignited	950	(2%)	30	(7%)	30	(2%)	\$36	(3%)
Non-confined	500	(1%)	30	(7%)	30	(2%)	\$35	(3%)
Confined	450	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Clothing	930	(2%)	50	(10%)	60	(5%)	\$33	(3%)
Non-confined	850	(2%)	50	(10%)	60	(4%)	\$33	(3%)
Confined	80	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Magazine, newspaper, or writing paper	900	(2%)	10	(3%)	20	(1%)	\$8	(1%)
Non-confined	250	(0%)	10	(3%)	20	(1%)	\$8	(1%)
Confined	660	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Mattress or bedding	860	(2%)	40	(8%)	70	(5%)	\$39	(4%)
Non-confined	840	(2%)	40	(8%)	70	(5%)	\$39	(4%)
Confined	20	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Floor covering rug, carpet, or mat	860	(2%)	40	(9%)	40	(3%)	\$26	(3%)
Non-confined	820	(2%)	40	(9%)	40	(3%)	\$26	(3%)
Confined	30	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Cabinetry	850	(2%)	10	(2%)	50	(4%)	\$23	(2%)
Non-confined	810	(2%)	10	(2%)	50	(4%)	\$23	(2%)
Confined	40	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Insulation within structural area	840	(2%)	0	(0%)	10	(1%)	\$24	(2%)
Non-confined	730	(1%)	0	(0%)	10	(1%)	\$24	(2%)
Confined	110	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Chips, including wood chips	820	(2%)	10	(1%)	0	(0%)	\$3	(0%)
Non-confined	80	(0%)	10	(1%)	0	(0%)	\$3	(0%)
Confined	740	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known item first ignited	6,260	(12%)	120	(25%)	260	(18%)	\$193	(19%)
Non-confined	4,650	(9%)	120	(25%)	260	(18%)	\$193	(19%)
Confined	1,620	(3%)	0	(0%)	0	(0%)	\$1	(0%)
Total	52,050	(100%)	490	(100%)	1,400	(100%)	\$1,031	(100%)
Non-confined	25,880	(50%)	490	(100%)	1,350	(97%)	\$1,024	(99%)
Confined	26,170	(50%)	0	(0%)	50	(3%)	\$8	(1%)

Table 7.
Home Fires Involving Heating Equipment, by Item First Ignited
2012-2016 Annual Averages (continued)

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 reported 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, 2012-2016.

Table 8.
Home Fires Involving Heating Equipment, by Area of Origin
2012-2016 Annual Averages

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined chimney or flue fire*	17,810	(34%)	0	(0%)	20	(1%)	\$6	(1%)
Kitchen or cooking area	7,580	(15%)	80	(16%)	640	(45%)	\$159	(15%)
Heating equipment room	6,380	(12%)	10	(2%)	110	(8%)	\$82	(8%)
Living room, family room, or den	2,430	(5%)	150	(31%)	160	(11%)	\$113	(11%)
Bedroom	2,090	(4%)	110	(22%)	130	(9%)	\$90	(9%)
Unclassified function area	1,570	(3%)	40	(7%)	50	(3%)	\$37	(4%)
Duct for HVAC, cable, exhaust, heating, or AC	1,420	(3%)	10	(1%)	20	(1%)	\$22	(2%)
Wall assembly or concealed space	1,410	(3%)	10	(2%)	20	(1%)	\$92	(9%)
Crawl space or substructure space	1,290	(2%)	0	(0%)	20	(1%)	\$62	(6%)
Laundry room or area	1,130	(2%)	10	(1%)	30	(2%)	\$24	(2%)
Attic or ceiling/roof assembly or concealed space	1,130	(2%)	0	(0%)	10	(1%)	\$72	(7%)
Garage or vehicle storage area	880	(2%)	10	(3%)	50	(3%)	\$55	(5%)
Closet	750	(1%)	0	(0%)	10	(1%)	\$12	(1%)
Lavatory, bathroom, locker room or check room	750	(1%)	10	(3%)	30	(2%)	\$16	(2%)
Unclassified area of origin	740	(1%)	0	(0%)	0	(0%)	\$6	(1%)
Other known area of origin	4,700	(9%)	60	(12%)	110	(8%)	\$184	(18%)
Total	52,050	(100%)	490	(100%)	1,400	(100%)	\$1,031	(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, 2012-2016.

Table 9.
Home Fires Involving Heating Equipment, by Heat Source
2012-2016 Annual Averages

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Radiated or conducted heat from operating equipment	10,590	(20%)	250	(51%)	540	(38%)	\$379	(37%)
Non-confined	8,970	(17%)	250	(51%)	530	(38%)	\$379	(37%)
Confined	1,620	(3%)	0	(0%)	10	(1%)	\$1	(0%)
Hot ember or ash	9,470	(18%)	10	(1%)	30	(2%)	\$52	(5%)
Non-confined	1,020	(2%)	10	(1%)	20	(1%)	\$50	(5%)
Confined	8,450	(16%)	0	(0%)	10	(0%)	\$2	(0%)
Unclassified heat from powered equipment	7,000	(13%)	90	(18%)	340	(24%)	\$177	(17%)
Non-confined	5,530	(11%)	90	(18%)	330	(23%)	\$176	(17%)
Confined	1,470	(3%)	0	(0%)	10	(1%)	\$1	(0%)
Spark, ember or flame from operating equipment	6,250	(12%)	50	(10%)	210	(15%)	\$172	(17%)
Non-confined	3,370	(6%)	50	(10%)	210	(15%)	\$171	(17%)
Confined	2,870	(6%)	0	(0%)	10	(1%)	\$1	(0%)
Unclassified heat source	3,430	(7%)	10	(2%)	70	(5%)	\$33	(3%)
Non-confined	900	(2%)	10	(2%)	70	(5%)	\$33	(3%)
Confined	2,520	(5%)	0	(0%)	0	(0%)	\$1	(0%)
Arcing	3,110	(6%)	30	(7%)	50	(4%)	\$59	(6%)
Non-confined	2,700	(5%)	30	(7%)	50	(4%)	\$59	(6%)
Confined	410	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Heat from direct flame or convection currents	3,010	(6%)	10	(2%)	50	(3%)	\$31	(3%)
Non-confined	870	(2%)	10	(2%)	50	(3%)	\$31	(3%)
Confined	2,140	(4%)	0	(0%)	0	(0%)	\$1	(0%)
Unclassified hot or smoldering object	2,360	(5%)	10	(2%)	40	(3%)	\$34	(3%)
Non-confined	820	(2%)	10	(2%)	40	(3%)	\$34	(3%)
Confined	1,540	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Match	1,360	(3%)	10	(1%)	10	(1%)	\$3	(0%)
Non-confined	120	(0%)	10	(1%)	0	(0%)	\$3	(0%)
Confined	1,240	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Radiated heat from another fire	820	(2%)	0	(1%)	10	(0%)	\$18	(2%)
Non-confined	320	(1%)	0	(1%)	10	(0%)	\$17	(2%)
Confined	500	(1%)	0	(0%)	0	(0%)	\$0	(0%)

Table 9.
Home Fires Involving Heating Equipment, by Heat Source
2012-2016 Annual Averages (continued)

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Other known heat source	4,670	(9%)	20	(5%)	60	(4%)	\$73	(7%)
Non-confined	1,260	(2%)	20	(5%)	60	(4%)	\$71	(7%)
Confined	3,410	(7%)	0	(0%)	0	(0%)	\$1	(0%)
Total	52,050	(100%)	490	(100%)	1,400	(100%)	\$1,031	(100%)
Non-confined	25,880	(50%)	490	(100%)	1,350	(97%)	\$1,024	(99%)
Confined	26,170	(50%)	0	(0%)	50	(3%)	\$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, 2012-2016.

Table 10.
Home Fires Involving Heating Equipment, by Type of Fuel or Power
2012-2016 Annual Averages

Fuel or Power	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Solid fueled	21,240	(41%)	110	(23%)	140	(10%)	\$320	(31%)
Electric powered	18,370	(35%)	270	(55%)	820	(59%)	\$446	(43%)
Gas fueled	8,880	(17%)	70	(15%)	370	(26%)	\$234	(23%)
Liquid fueled	3,190	(6%)	30	(6%)	70	(5%)	\$26	(3%)
Other power source	370	(1%)	0	(0%)	0	(0%)	\$5	(0%)
Total	52,050	(100%)	490	(100%)	1,400	(100%)	\$1,031	(100%)

Table 10a.
Non-Confined Home Fires Involving Heating Equipment, by Type of Fuel or Power
2012-2016 Annual Averages

Fuel or Power	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Electric powered	14,540	(56%)	270	(55%)	820	(60%)	\$445	(43%)
Electrical line voltage (>= 50 volts)	10,920	(42%)	240	(48%)	660	(49%)	\$335	(33%)
Unclassified electrical	3,340	(13%)	40	(7%)	150	(11%)	\$103	(10%)
Batteries and low voltage (< 50 volts)	280	(1%)	0	(0%)	10	(1%)	\$8	(1%)
Gas fueled	5,710	(22%)	70	(15%)	350	(26%)	\$233	(23%)
Natural gas or other lighter than air gas	4,480	(17%)	50	(10%)	280	(20%)	\$173	(17%)
LP gas or other heavier than air gas	980	(4%)	20	(4%)	60	(4%)	\$52	(5%)
Unclassified gas fuel	250	(1%)	10	(1%)	20	(1%)	\$8	(1%)
Solid fueled	4,870	(19%)	110	(23%)	120	(9%)	\$315	(31%)
Wood or paper	4,650	(18%)	110	(22%)	110	(8%)	\$301	(29%)
Unclassified solid fuel	170	(1%)	0	(0%)	10	(0%)	\$11	(1%)
Liquid fueled	640	(2%)	30	(6%)	70	(5%)	\$26	(3%)
Other power source	120	(0%)	0	(0%)	0	(0%)	\$4	(0%)
Total	25,880	(100%)	490	(100%)	1,350	(100%)	\$1,024	(100%)

Table 10b.
Confined Chimney or Flue Fires, by Type of Fuel or Power
2012-2016 Annual Averages*

Fuel or Power	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Solid fueled	16,120	(91%)	20	(80%)	\$5	(86%)
Wood or paper	15,680	(88%)	20	(80%)	\$5	(83%)
Unclassified solid fuel	350	(2%)	0	(0%)	\$0	(2%)
Electric powered	790	(4%)	0	(0%)	\$0	(6%)
Electrical line voltage (>= 50 volts)	600	(3%)	0	(0%)	\$0	(4%)
Gas fueled	510	(3%)	0	(20%)	\$0	(5%)
Natural gas or other lighter than air gas	380	(2%)	0	(20%)	\$0	(4%)
Other power source	240	(1%)	0	(0%)	\$0	(2%)
Total	17,810	(100%)	20	(100%)	\$6	(100%)

*There were no civilian deaths associated with confined fuel burner or boiler fires.

Table 10c.
Confined Fuel Burner Fires, by Type of Fuel or Power
2012-2016 Annual Averages*

Fuel or Power	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Electric powered	3,030	(36%)	10	(25%)	\$1	(40%)
Electrical line voltage (>= 50 volts)	2,320	(28%)	10	(25%)	\$1	(32%)
Unclassified electrical power	620	(7%)	0	(0%)	\$0	(7%)
Gas fueled	2,660	(32%)	10	(50%)	\$1	(43%)
Natural gas or other lighter than air gas	2,120	(25%)	10	(40%)	\$1	(37%)
LP gas or other heavier than air gas	390	(5%)	0	(10%)	\$0	(5%)
Unclassified gas fuels	160	(2%)	0	(0%)	\$0	(2%)
Liquid fueled	2,410	(29%)	10	(25%)	\$0	(15%)
Kerosene, diesel, No.1 & 2 fuel oil	1,930	(23%)	10	(25%)	\$0	(12%)
No.4, 5 & 6 fuel oils	330	(4%)	0	(0%)	\$0	(2%)
Unclassified liquid fuel	140	(2%)	0	(0%)	\$0	(0%)
Solid fueled	250	(3%)	0	(0%)	\$0	(3%)
Wood or paper	180	(2%)	0	(0%)	\$0	(1%)
Total	8,360	(100%)	30	(100%)	\$2	(100%)

*There were no civilian deaths associated with confined fuel burner or boiler fires.

Table 10. (Continued)

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. 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, 2012-2016.

Methodology

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. Fires reported to federal or state fire departments or industrial fire brigades are not included in these estimates.

Only civilian (non-firefighter) casualties are discussed in this analysis.

NFPA's fire department experience survey provides estimates of the big picture. NFIRS is a voluntary system through which participating fire departments report detailed factors about the fires to which they respond. To compensate for fires reported to local fire departments but not captured in NFIRS, scaling ratios are calculated and then applied to the NFIRS database using the formula below.

$$\frac{\text{NFPA's fire experience survey projections}}{\text{NFIRS totals}}$$

Heating equipment refers to equipment used to provide or transfer heat (codes 120-199). Fire in which central heat, portable and fixed heaters (including wood stoves), chimneys, hot water heaters, and heater transfer equipment (such as hot air ducts or hot water pipes) were involved in the ignition are said to be caused by heating equipment.

All fires with incident type 114- "Chimney or flue fire originated in and confined to a chimney or flue" and incident type 116- "Fuel burner/boiler, delayed ignition or malfunction where flames cause no damage outside the fire box" were considered heating fires regardless of the equipment involved in ignition. Fires with other confined fire incident types were excluded from the analysis.

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. NFPA noticed that many fires in which EII was coded as None (NNN) have had other causal factors that indicated equipment was a factor or were completely unknown. 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

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

In addition, fires and losses associated with code EII 600, kitchen and cooking equipment, other, were allocated proportionally across specific kitchen and equipment codes EII codes 611-699. Equipment that is totally unclassified is not allocated further. Unfortunately, equipment that is truly different is erroneously assigned to other categories.

For more information on the methodology used for this report see, [How NFPA's National Estimates Are Calculated for Home Structure Fires.](#)

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