CHILDREN PLAYING WITH FIRE

John R. Hall, Jr.

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National Fire Protection Association
Fire Analysis and Research Division

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Abstract

In 2008, an estimated 53,500 child-playing fires were reported to U.S. municipal fire departments, with associated losses of 70 civilian deaths, 910 civilian injuries, and $279 million in direct damage. Most child-playing home fires begin with lighters or matches. The items ignited by home fire-play are principally mattresses and bedding, papers, trash or waste, clothing, or upholstered furniture. Nineteen percent of people who start reported fires by playing are 4 year olds. Nearly two thirds (63%) of all fatal victims of fires started by playing are children 5 years old and younger. Estimates are based on data from the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA) annual fire department experience survey.

Keywords: Child playing, fire-play, firesetting

Acknowledgements

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

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Executive Summary

In 2008, an estimated 53,500 child-playing fires were reported to U.S. municipal fire departments, with associated losses of 70 civilian deaths, 910 civilian injuries, and $279 million in direct damage. Most (77%) of these fires occurred outdoors. An estimated 7,600 fire-play structure fires occurred in the home, resulting in 70 civilian deaths, 780 civilian injuries, and $202 million in direct property damage.

Most (83%) set fires (that is, fires that are intentional and/or involve playing) are intentional only and do not involve playing. Also, most (77%) set fires specifically in home structures do not involve playing.

Most (64%) child-playing home fires are started with lighters or matches. Child-playing lighter fires and losses increased from 1980 to 1993, then began declining sharply in 1994, which coincided with the introduction of the U.S. Consumer Product Safety Commission (CPSC) child-resistant lighter standard.

Child-playing match fires have been declining since 1980 and also declined faster than child-playing lighter fires after 1994. One reason may be a generally heightened awareness of the child-playing fire problem and growing success in public fire safety education programs, which provided more attention to child supervision and other steps to reduce the child-playing fire problem, and did so at the same time that the lighter standard was being introduced. It is also possible that there is significant miscoding of fire-play with lighters as fire-play with matches – or that there used to be. If there has been a shift from matches to lighters, a point on which we have no information, that could have played a role in the opposing trends seen before 1995.

The leading items first ignited by home fire-play were mattresses and bedding, which accounted for 24% of child-playing home structure fires. Other leading items first ignited were papers (9%), trash or waste (8%), and clothing (8%). Two out of five (41%) child-playing home structure fires began in the bedroom.

Fatal victims of child-playing fires tend to be younger than the firesetters. The median age of fatal victims of child-playing home structure fires was just over 5 years, while the median age of child-playing firesetters, where age was reported as a factor, was just over 6 years. Roughly two of every three (65%) fatal victims of child-playing home structure fires were aged 5 or younger. Non-fatal injuries often involve parents or other caregivers, but fatal injuries rarely do.

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Children Playing with Fire Fact Sheet

In 2004-2008, the annual average of fires involving fire-play reported to U.S. municipal fire departments was as follows:

Total Fires

- 57,700 fires
- 113 civilian deaths
- 916 civilian injuries
- $286 million direct loss

Home Structure Fires

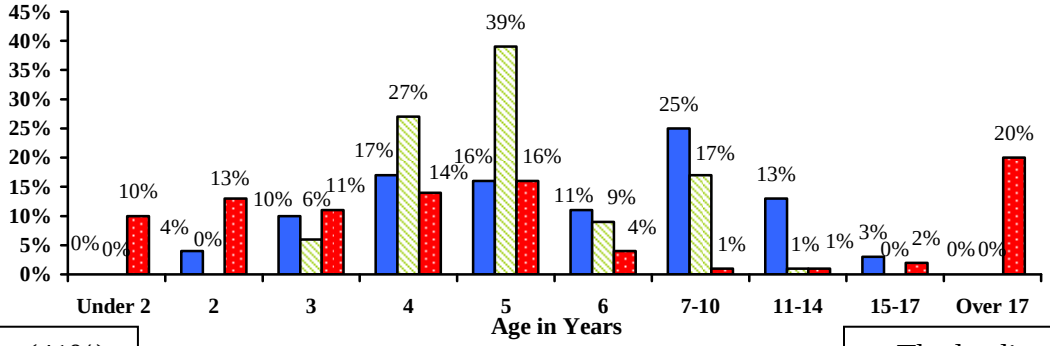
- 7,900 fires
- 104 civilian deaths
- 775 civilian injuries
- $197 million direct loss

Most fire-play fires (77%) started outside, but most associated deaths (92%) were in home structure fires.

Most (65%) child-playing home fires were started with lighters or matches.

July was the peak month for outdoor fire-play. Most of these fires involved fireworks.

Home Child-Playing Fires and Deaths, by Age of Firesetter and Age of Victim
2004-2008 Annual Averages



Two out of five (41%) child-playing home structure fires began in the bedroom.

The leading items first ignited by home fire-play were mattresses and bedding (24% of fires).

47% of people who start reported home fires by playing (where age is a factor) were 5 years old or younger.

65% of all fatal victims of child-playing fires were children 5 years old or younger.

Non-fatal injuries in child-playing home fires often involved parents or other caregivers, but fatal injuries rarely did.

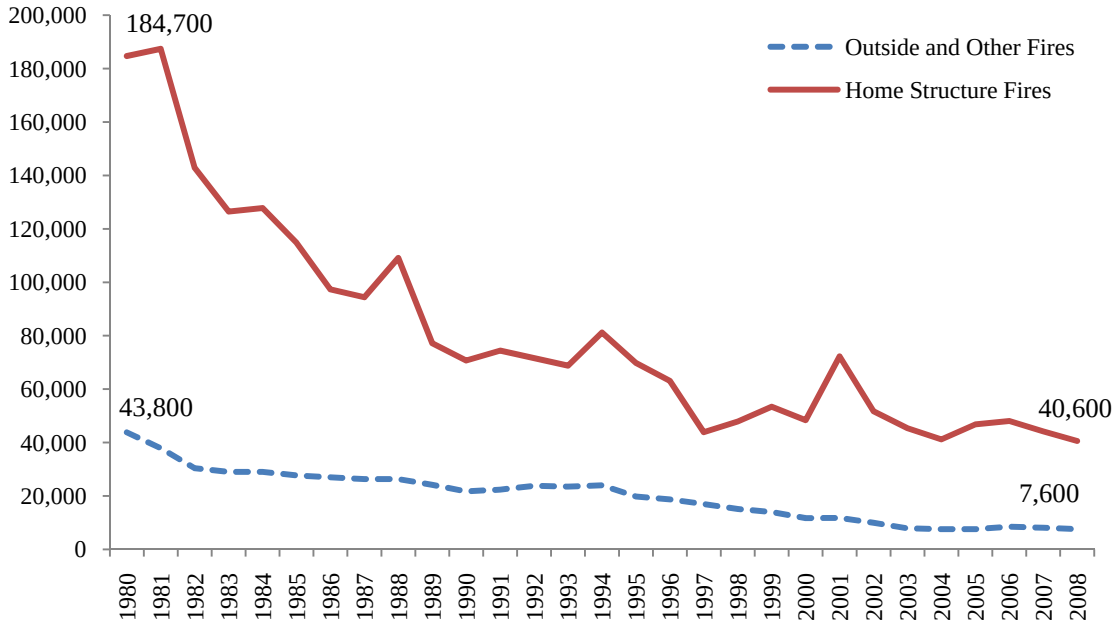
- In 1994, the Consumer Product Safety Commission (CPSC) set a mandatory safety standard requiring the manufacturing and importation of most cigarette lighters to be child-resistant.

- NFPA offers programs to teach children to stay away from hot things and to teach parents and caregivers to keep lighters and matches out of reach and out of sight of children.

Patterns of Child-Playing Fires

In 2008, an estimated 53,500 fires involving fire-play were reported to U.S. municipal fire departments, with associated losses of 70 civilian deaths, 910 civilian injuries, and $279 million in direct property damage.
Child-playing fires have declined by 79% since 1980, and the 2008 estimate is the second lowest in that period. Associated civilian deaths have declined by 84% since 1980, and the 2008 estimate is the lowest in that period. Associated civilian injuries have declined by 61% since 1980, and the 2008 estimate is the third lowest in that period, with the 2006-2007 estimates being the lowest. Associated direct property damage (adjusted for inflation to 2008 dollars) has declined by 38% since 1980, and the 2008 estimate is the lowest in that period. (See Table 1 and Figure 1.)

Figure 1. Trend in Child-Playing Fires, 1980-2008



Source: Table 1A.

In 2008, an estimated 7,600 home structure fires involving fire-play were reported to U.S. municipal fire departments, with associated losses of 70 civilian deaths, 780 civilian injuries, and $202 million in direct property damage.
In 2008, child-playing fires accounted for 2% of total reported home structure fires, 3% of associated civilian deaths, 6% of associated civilian injuries, and 2% of associated direct property damage.

In 1994, the Consumer Product Safety Commission (CPSC) set a mandatory safety standard requiring most manufactured or imported of cigarette lighters to be child-resistant. The standard requires that lighters resist the efforts of 85% of the children to operate them in a specified test.

More than 95% of the estimated half-billion lighters purchased annually in the U.S. are covered by the standard.[1] In an evaluation of the effectiveness of the standard performed in 2002, CPSC found a 58% reduction in fires caused by children younger than five, compared to children over the age of five.[2]

Figure 2 shows that the child-playing percentage of total home structure fire deaths rose fairly steadily from 1980 to 1994, the last year before full implementation of the U.S. Consumer Product Safety Commission's child-resistant lighter requirement. The percentage immediately dropped in 1995 and has continued to drop ever since. This is as clear an indication as we have of the building need for that CPSC requirement and the quick and sustained impact of the requirement after it was introduced.

Identifying Fires Due to Playing With Fire

This report contains data from the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) Version 5.0. Factor contributing to ignition code 19 is defined as:

Playing with heat source; including playing with matches, candles, and lighters and bringing combustibles into a heat source.

Prior to Version 5.0 the counterparts to factor contributing to ignition code 19 were two ignition factors which both paired "playing" with "child". In Version 5.0 the word child was removed and the current code covers all fire-play, regardless of firesetter age. An analysis of who is starting these fires shows that in most cases a child was involved. The term "child-playing" is used throughout this report, but it is possible that some of these fires were not started by children.

Estimates of children playing with fire are based on all fires coded as playing with heat source plus a proportional share of fires with heat source unknown. NFPA's annual fire department survey is used with NFIRS to calculate national estimates. See Appendix A for more information on NFIRS and the methodology used in this analysis. Only fires reported to municipal fire departments are included in these statistics.

NFIRS Version 5.0 has six categories of confined structure fires, including fires confined to a cooking vessel, confined chimney or flue fires, confined incinerator fires, confined fuel burner or boiler fires, confined commercial compactor fires, and confined trash fires. Although causal information is not required for these incidents, it is provided in some cases. Confined fires are analyzed separately from non-confined fires.

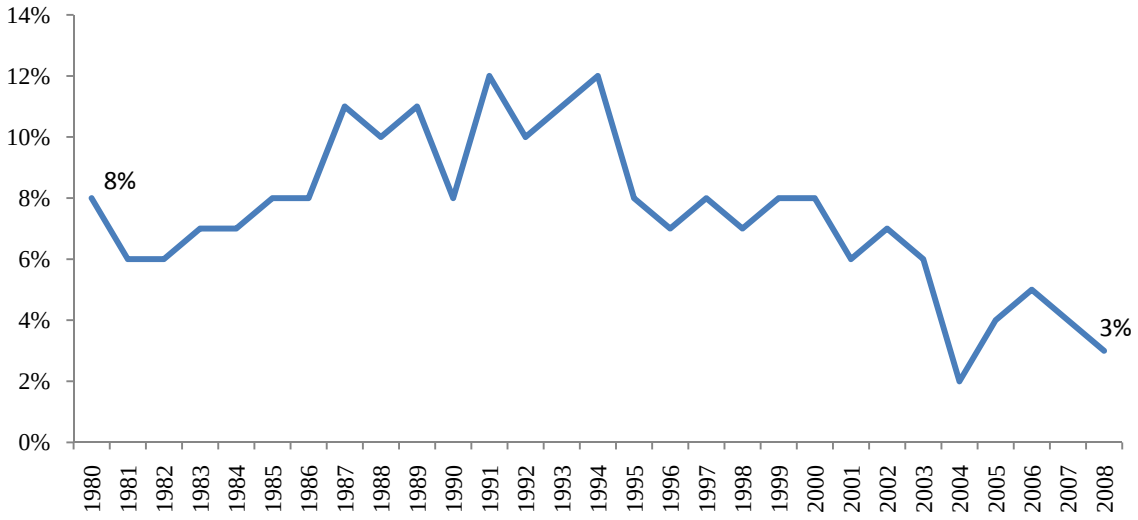
Most child-playing fires (77%) occur outdoors.
In 2004-2008, an estimated 44,200 reported fires per year involving fire-play were outside or other fires. These fires resulted in estimated annual losses of one civilian death, 80 civilian fire

[1] U.S. Consumer Product Safety Commission, "CPSC Issues Final Rule on Child-Resistant Lighters," *News from CPSC,* June 9, 1993, www.cpsc.gov/CPSCPUB/PREREL/prhtml193/93080.html.
[2] L.E. Smith, M.A. Greene, H.A. Singh, "Study of the Effectiveness of the US Safety Standards for Child Resistant Cigarette Lighters," *Injury Prevention,* www.injuryprevention.com, September 2002.

injuries, and $3 million in direct property damage. Slightly more outdoor child playing fires begin in vegetation (35%) than in trash (33%). (See Table A.)

Homes account for most of the losses in child-playing fires, including 92% of associated civilian deaths, 85% of civilian injuries, and 69% of direct property damage. Schools (from pre-K to grade 12) are the leading non-home property for these structure fires. (See Table 2.)

Figure 2. Child-Playing Share of Total Home Structure Fire Civilian Deaths



Source: NFIRS and NFPA survey.

Table A. Child-Playing Fires, by Type of Incident
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments

Type of Incident	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Structure	*12,600*	*(22%)*	*110*	*(97%)*	*823*	*(90%)*	*$265*	*(93%)*
Home	7,900	(14%)	104	(92%)	775	(85%)	$197	(69%)
Other residential	400	(1%)	5	(4%)	17	(2%)	$3	(1%)
Non-residential	4,300	(7%)	1	(1%)	31	(3%)	$66	(23%)
Vehicle	*900*	*(2%)*	*2*	*(2%)*	*14*	*(1%)*	*$18*	*(6%)*
Other or outdoor	*44,200*	*(77%)*	*1*	*(1%)*	*80*	*(9%)*	*$3*	*(1%)*
Outdoor trash	18,900	(33%)	0	(0%)	9	(1%)	$1	(0%)
Outdoor vegetation	20,100	(35%)	0	(0%)	27	(3%)	$1	(0%)
Special outside, other or unknown	5,100	(9%)	1	(1%)	43	(5%)	$2	(1%)
Total	*57,700*	*(100%)*	*113*	*(100%)*	*916*	*(100%)*	*$286*	*(100%)*

Notes: 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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion of one unusually serious fires. For structure fires, analysis is done separately for non-confined and confined fires, because detailed reporting is optional for the latter and the percentage of unknowns is much higher. For other or outdoor fires, analysis is done separately for outdoor trash, because detailed reporting is optional and the percentage of unknowns is much higher. Estimates include a proportional share of fires with factor contributing to ignition coded as unknown, blank, or none. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage (not adjusted for inflation) to the nearest million dollars.
Source: NFIRS and NFPA survey.

Table B. Fires Coded as Child-Playing and/or Intentional, by Type of Incident
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

A. Fires Type of Incidents	Coded as Intentional; Not Coded as Playing		Coded as Intentional; Coded as Playing		Not Coded as Intentional Coded as Playing		Total	
Home structure fire	25,700	(77%)	3,600	(11%)	4,300	(13%)	33,600	(100%)
All structure fires	46,500	(79%)	7,200	(12%)	5,400	(9%)	59,100	(100%)
Outdoor or other fires	206,300	(82%)	27,800	(11%)	16,700	(7%)	250,500	(100%)
Total fires	276,300	(83%)	35,600	(11%)	22,100	(7%)	334,000	(100%)

B. Civilian Death Type of Incident	Coded as Intentional; Not Coded as Playing		Coded as Intentional; Coded as Playing		Not Coded as Intentional Coded as Playing		Total	
Home structure fire	307	(75%)	32	(8%)	72	(18%)	411	(100%)
All structure fires	344	(76%)	34	(7%)	76	(17%)	454	(100%)
Outdoor or other fires	16	(93%)	0	(0%)	1	(7%)	17	(100%)
Total fires	393	(78%)	34	(7%)	79	(16%)	506	(100%)

C. Civilian Injuries Type of Incident	Coded as Intentional; Not Coded as Playing		Coded as Intentional; Coded as Playing		Not Coded as Intentional Coded as Playing		Total	
Home structure fire	615	(44%)	315	(23%)	460	(33%)	1,389	(100%)
All structure fires	780	(49%)	340	(21%)	483	(30%)	1,603	(100%)
Outdoor or other fires	134	(63%)	54	(25%)	25	(12%)	213	(100%)
Total fires	979	(52%)	398	(21%)	519	(27%)	1,896	(100%)

D. Direct Property Damage (in Millions) Type of Incident	Coded as Intentional; Not Coded as Playing		Coded as Intentional; Coded as Playing		Not Coded as Intentional Coded as Playing		Total	
Home structure fire	$531	(73%)	$65	(9%)	$131	(18%)	$727	(100%)
All structure fires	$891	(77%)	$111	(10%)	$154	(13%)	$1,157	(100%)
Outdoor or other fires	$55	(95%)	$2	(3%)	$1	(2%)	$58	(100%)
Total fires	$1,114	(80%)	$130	(9%)	$156	(11%)	$1,400	(100%)

Notes: 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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion of one unusually serious fires. For structure fires, analysis is done separately for non-confined and confined fires, because detailed reporting is optional for the latter and the percentage of unknowns is much higher. For other or outdoor fires, analysis is done separately for outdoor trash, because detailed reporting is optional and the percentage of unknowns is much higher. Estimates include a proportional share of fires with factor contributing to ignition coded as unknown, blank, or none. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage (not adjusted for inflation) to the nearest million dollars.

Source: NFIRS and NFPA survey.

SET FIRES (INTENTIONAL AND/OR PLAYING)

Of the total fires that were intentional and/or involved playing, most did not involve playing.

Child-playing was not cited in 83% of 2004-2008 set fires (where "set fire" is used to mean a fire started by playing or started intentionally), 78% of associated civilian deaths, 52% of associated civilian injuries, and 80% of associated direct property damage. Child-playing fires are more concentrated in homes, but even in homes, child-playing was not cited in 77% of set fires and 75% of associated civilian deaths. (See Table B.)

The child-playing share of set fires (playing and/or intentional, incendiary, or suspicious) was higher 24 years ago. In 1980-1984, child-playing was cited in 30% of set fires (compared to 17% = 100%-83% in 2004-2008) and 48% of associated civilian deaths (compared to 12% = 100%-88% in 2004-2008). Between 1980-1984 and 2004-2008, a number of changes occurred:

- NFIRS coding was changed to permit fires to be recorded as both intentional and playing; this would be expected to increase the percentage of set fires recorded as playing (and increase the percentage recorded as intentional).
- NFIRS coding was changed so that "suspicious" was no longer an option for reporting; this would be expected to decrease the percentage of fires reported as intentional and thereby increase the child-playing percentage.
- NFIRS coding was changed so that "child playing" was replaced by the less restrictive "playing"; this would be expected to increase the playing percentage.
- The U.S. Consumer Product Safety Commission introduced a child-resistance requirement for lighters; this would be expected to decrease the playing percentage.

Only the last of these changes would have been expected to produce the decline in playing percentage that actually occurred for fires and civilian deaths.

The juvenile share of set fires appears to be much greater than the fireplay or curiosity share of set fires.

There are a number of statistics available on the juvenile share of set fires:

- As noted above, fires involving playing accounted for only 17% of total 2004-2008 set fires (intentional and/or playing).
- Fireplay or curiosity was cited as a suspected motive in 25% of 2005-2007 reported set fires (based on fires for which the arson module was completed), 38% of reported set fires for which the cases were closed, and 23% of reported set fires that were cases closed by arrest.[3]
- For fires that were playing and not intentional and for which age was a factor, 100% involved firestarters under age 18. For fires that were playing and intentional and for which age was a factor, 99% involved firestarters under age 18. For fires that were intentional and not playing and for which age was a factor, 78% involved firestarters under age 18. However, the designation of age as a factor would be expected to select for juveniles, and so these percentages – particularly for fires that were intentional and not playing, where only 3% of fires cited age was a factor – are probably overstated.

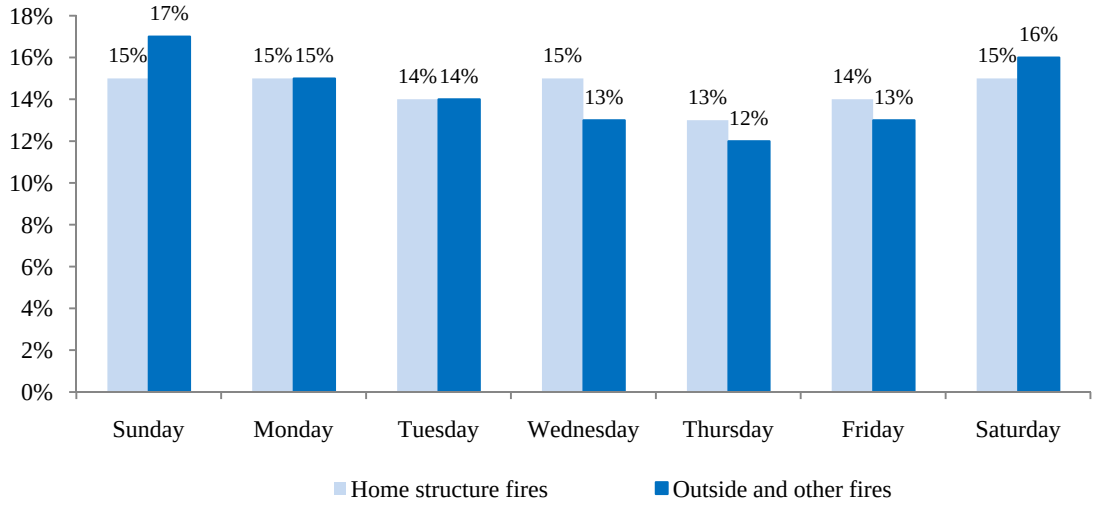
[3] John R. Hall, Jr., *Intentional Fires*, NFPA Fire Analysis and Research Division, Quincy, MA, June 2010, Table 8.

- Juveniles accounted for roughly 48% of arson arrests in 2004-2008.[4] If applied to the 93% of set fires that were intentional, whether or not they also involved playing, and added to the 7% of set fires that involved playing but were not intentional, this results in a combined 52% of firestarters being juveniles.

When playing is involved, the median age of the firestarter is about 6. When playing is not involved but the fire is intentional, the median age of the firestarter is in the early teens. The median age of an arson arrestee is in the late teens.
"Age of firestarter" is based on age of person involved in ignition for those fires coded as age was a factor. "Median age" is the midpoint age, for which half the people were younger and half were older.

Child-play fires peak in the summer months, especially in July for outside and other fires.
Figure 3 and Table 3 show child-playing home structure fires compared to outside and other fires by day of week. If every day had an equal share, that share would be 14.3%. There is no clear peak day for home structure fires involving child playing. The weekend is the peak time for outside and other child-playing fires (32% for Saturday and Sunday, compared to 29% if all days had equal shares).

Figure 3. Child-Playing Fires, by Day of Week

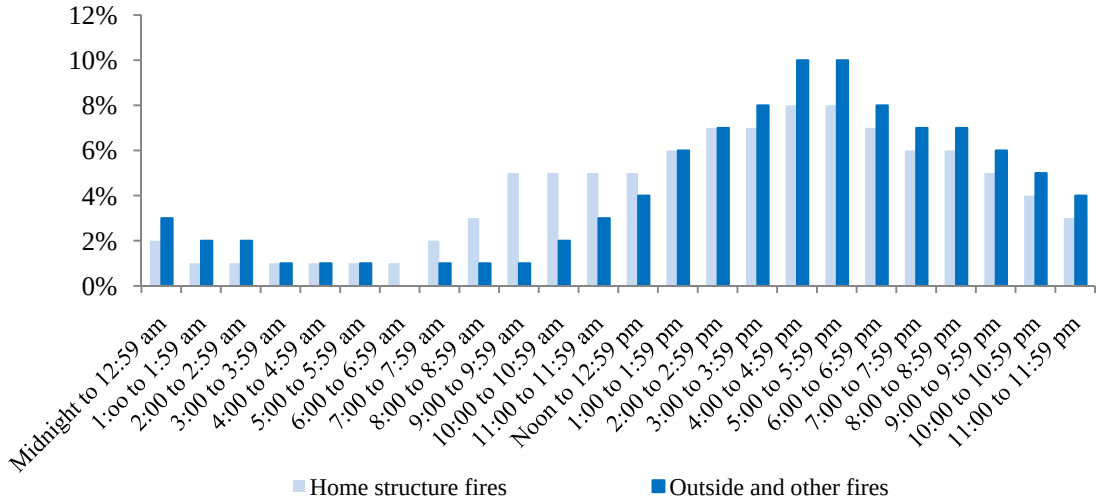


Source: Table 3.

Table 4 and Figure 4 show child-playing home structure fires compared to child-playing outside and other fires by hour of the day. Both home structure and outside and other child-playing fires follow a similar trend, peaking in the after school hours of late afternoon (4 to 6 p.m.), before dinner time. The peak is less pronounced for home structure fires, where each of the 13 hours from 9 a.m. to 10 p.m. has a share in the range of 5-8%, while outside and other child-playing fires has two hours with shares of 10% each and only ten hours with shares of at least 5% each.

[4] *Crime in the U.S.*, cited in John R. Hall, Jr., *Intentional Fires*, NFPA Fire Analysis and Research Division, Quincy, MA, June 2010, Table 20.

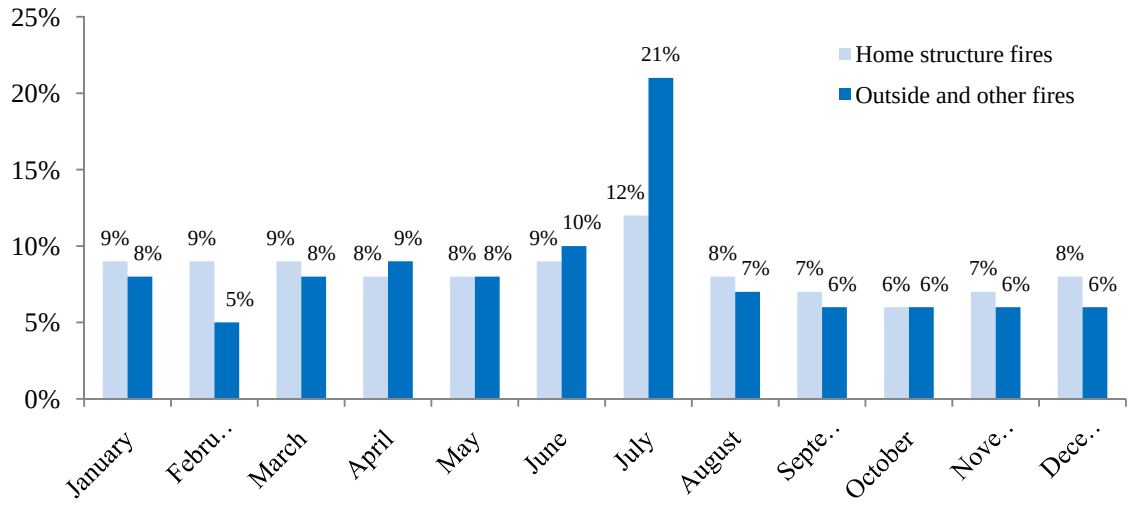
Figure 4. Child-Playing Fires, by Time of Day



Source: Table 4.

Table 5 and Figure 5 show child-playing home structure fires compared to child-playing outside and other fires by month of year. Child-playing fires peak during July. This has to do with the highly seasonal pattern of child-playing fires involving fireworks as the heat source.

Figure 5. Child-Playing Fires, by Month



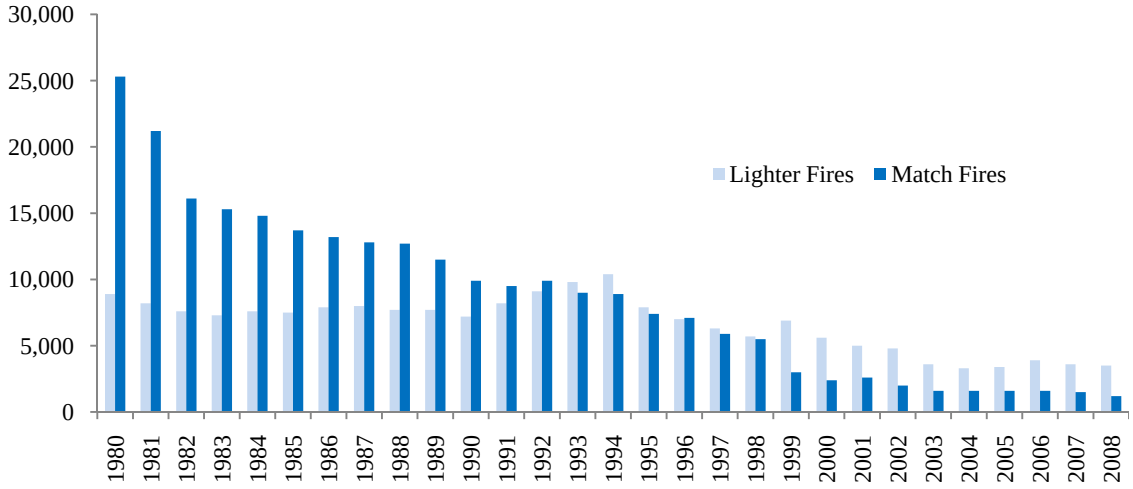
Note and Source: Table 5.

HEAT SOURCES

Most child-playing home fires are started with lighters or matches.
Table 6 shows that in 2004-2008, lighters and matches accounted for 64% of child-playing home structure fires, 83% of associated civilian deaths, 76% of associated civilian injuries, and 67% of associated direct property damage. Table 6 also shows that in 2004-2008, lighters and matches accounted for 49% of child-playing outside and other fires, no associated civilian deaths, 65% of associated civilian injuries, and 59% of associated direct property damage. The principal reason

why these percentages are lower than the home percentages is that fireworks, the fifth leading heat source for child-playing home structure fires with 5% of the total, is the second leading heat source for child-playing outside or other fires with 25% of the total. (See also Figure 6.)

Figure 6. Child-Playing Home Structure Fires Involving Matches or Lighters 1980-2008



Source: Table 7.

Table C. Child-Playing Outdoor and Other Fires, by Heat Source and Month of Year

Month	Lighter	Match	Fireworks	Other	All Heat Sources
January	20%	27%	29%	24%	100%
February	34%	32%	8%	26%	100%
March	38%	28%	9%	24%	100%
April	32%	33%	8%	27%	100%
May	34%	29%	9%	28%	100%
June	24%	22%	29%	25%	100%
July	10%	10%	58%	22%	100%
August	33%	28%	16%	23%	100%
September	31%	33%	8%	28%	100%
October	33%	26%	7%	34%	100%
November	31%	29%	8%	32%	100%
December	22%	22%	28%	27%	100%
Total	25%	24%	25%	26%	100%

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with heat source unknown.

Source: NFIRS and NFPA survey.

Table C shows the seasonality of the use of fireworks in child-playing outdoor and other fires. There is a large peak around Independence Day and another, smaller peak around New Year's Day. The "other" heat sources shown on Table C include a number of partially known heat sources that could also be lighters, matches, or fireworks.

From 1980 to 2008, the combined lighter and match share of child-playing home structure fires declined from 78% to 63%. All of this decline occurred after the introduction of the 1994 CPSC child-resistance requirement. During the same period, associated civilian fire deaths have varied so much from year to year that trends can only be seen through five-year averages. Those averages show no long-term trend up or down. A pattern that may be related is that candles, fireworks, and unclassified or unknown-type open flame all showed increased shares of home child-playing fires between 1984-1998 and 2004-2008, collectively rising from 9% to 16% of the total, but showing essentially no change collectively in their share of associated civilian deaths.

Child-playing lighter fires increased from 1980 to 1993, then declined from 1993 to 2008, while child-playing match fires and child-playing fires not involving matches or lighters declined from 1980 to 1993 and from 1993 to 2008.

If there is some truth to the speculation that the 1994 CPSC child-resistant lighter requirement also raised awareness of the need to keep matches and lighters out of reach and out of sight of children, then we might expect to see parallel declines in child-playing home fires involving lighters or matches, but not such large declines for child-playing home fires involving other heat sources, where such educational messages do not clearly apply.

From 1980 to 1993, child-playing home lighter fires increased by 10%, while child-playing home match fires declined by 64%. In 1980 there were nearly three (2.9) child-playing home match fires for every child-playing home lighter fire. By 1993, the ratio had fallen to less than even (0.9-to-1). From 1993 to 2008, child-playing home lighter fires declined by 64%, while child-playing home match fires declined by 86%. In 2008, there were nearly three (2.8) child-playing home lighter fires for every child-playing home match fire.

It is useful to compare these trends to the trend for child-playing home fires not involving lighters or matches. From 1980 to 1993, while the lighter portion was increasing by 10% and the match portion was declining by 64%, child-playing home fires involving other heat sources declined by 51%. From 1993 to 2008, while the lighter portion was declining by 64% and the match portion was declining by 86%, child-playing home fires involving other heat sources declined by 40%. Matches and lighters accounted for a combined 78% of child-playing home structure fires in 1980 and 80% in 1993 but only 63% in 2008.

All these statistics suggest other factors at work besides the CPSC child-resistant lighter requirement. Some of these other factors may be unrelated to anything specific about child-playing fires and instead be related to the large decline in home structure fires from all causes. One of those other factors may be related to relative ease of access to and ease of use of different heat sources by children, both of which have been affected by efforts to educate children not to play with fire and to educate parents and other caregivers to reduce visibility and access for children to matches and lighters, with less emphasis given to other heat sources used in fire-play, such as cigarettes, fireworks, and candles, as well as kitchen ranges, space heaters, and microwave ovens. Access and availability may also have been affected by the steady decline in

cigarette consumption, which may have reduced demand for matches and lighters, and by any shift in usage from matches to lighters or from lighters to matches. (See Table 8.)

Other factors may be side effects of changes in fire incident coding. In 2004-2008 home structure fires, lighters outnumbered matches by 42% vs. 17% for child-playing fires that were not intentional, but by 54% vs. 22% for child-playing fires that were also intentional. If some of the intentional and playing fires would have been reported only as intentional in the pre-1999 coding, then the introduction of the option of reporting fires as both intentional and playing could have shifted the child-playing home fires toward a larger share for lighters and a smaller share for matches (and also toward a larger share for matches and lighters combined and a smaller share for all other heat sources).

Finally, it is possible that the heightened attention to lighters over matches as part of the child-playing fire problem may have shifted fire reporting practices in ambiguous circumstances so that more child-playing match fires are being misreported as child-playing lighter fires or fewer child-playing lighter fires are being misreported as child-playing match fires.

Other than lighters, the leading types of equipment involved in child-playing home fires are ranges, ovens, space heaters and microwave ovens.

Together, they accounted for only 7% of child-playing home structure fires and no reported deaths.

ITEMS FIRST IGNITED AND AREAS OF ORIGIN

Mattresses and bedding were the first items ignited in 24% of child-playing home structure fires and 29% of associated civilian fire deaths.
Table 9 shows upholstered furniture was the first item ignited in only 6% of child-playing home fires but for 20% of associated civilian deaths. Fire-play affects a wide variety of items, making restrictions on burnable items a more challenging way to attempt to reduce the fire-play problem. Tables 10 and 11 show the items first ignited in child-playing fires that were started by lighters and matches, respectively.

Two out of five (41%) home structure fires involving children playing began in the bedroom.
Tables 12-14 show that other leading areas of origin are kitchens; living rooms, family rooms, and dens; closets; and bathrooms.

AGES OF VICTIMS AND FIRESTARTERS

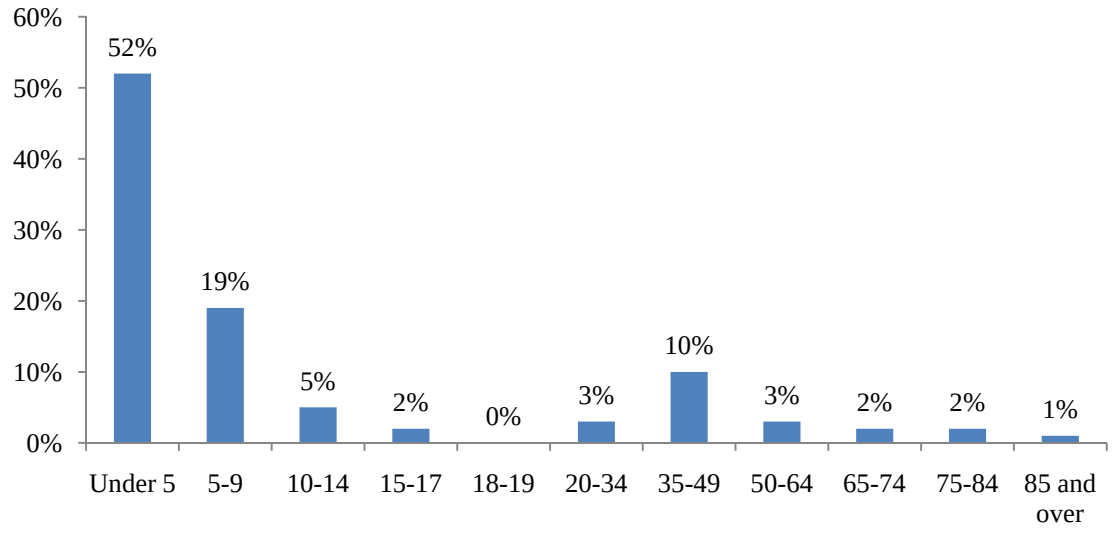
Roughly two of every three (65%) people who die in reported child-playing fires were children aged 5 or younger.
Table 15 shows the age distribution for fatal and non-fatal victims of child-playing fires – overall and for lighter match fires, specifically, as well as death and injury rates for child-playing fires, by age group. The percentage of fatal victims aged 5 or younger was much higher for matches

(85%) than for lighters (68%). It seems clear that non-fatal injuries often involve parents or other caregivers, but fatal injuries rarely do.

Not only are most of the fatal victims of child-playing fires young children, but also a large share of all the fatal home structure fires that kill young children are child-playing fires (23%) of home structure fire deaths for victims under age 5 and 16% for victims ages 5 to 9, compared to 4% for victims of all ages). [5]

In fatal home structure fires caused by playing with a heat source, roughly half of the fatal victims (52%) were children under the age of five. These victims have a risk of fire death that is nearly eight times greater than risk to the general public. By contrast, the overall risk of home fire death for children ages 0-4 is 39% higher than the all-ages risk, but if fire-play fires are excluded, the risk is only 12% higher for ages 0-4. (See Figure 7.)

Figure 7. Home Structure Fire Civilian Deaths in Fires Involving Playing with Heat Source, by Age of Victim, 2003-2007 Annual Averages



	Under 5	5-9	10-14	15-17	18-19	20-34	35-49	50-64	65-74	75-84	85 and over
Risk Index*	7.6	2.9	0.7	0.5	0.0	0.2	0.4	0.2	0.4	0.6	0.5

*The risk index for an age group is the ratio of that age group's civilian fire deaths per million population to the civilian fire injury rate per million population for all age groups combined. The risk index for all age groups combined is 1.00. A risk index higher than 1.00 for a specific age group means that age group is at higher risk of death than the general public.

Source: Jennifer D. Flynn, *Characteristics of Home Fire Victims*, NFPA Fire Analysis and Research, Quincy, MA, March 2010, Figure 13.

The U.S. Consumer Product Safety Commission (CPSC) conducted special studies of samples of 1986-88 child-playing residential fires involving lighters.[6] CPSC found that two-thirds of the

[5] Jennifer D. Flynn, *Characteristics of Home Fire Victims*, NFPA Fire Analysis and Research, Quincy, MA, March 2010, Tables 1 and 15.

[6] Beatrice Harwood, "Letter to the Editor," *Fire Journal*, July/August 1989, p. 86, and Beatrice Harwood and James F. Hoebel, "Notice of Proposed Rulemaking for Cigarette Lighters," Report to the U.S. Consumer Product Safety Commission, December 19, 1990.

victims of the lighter fires were not the children who were playing with the lighters. While both fire-starters and victims tended to be preschoolers – 90% of the children whose lighter play started the fires were under age six – the victims often were younger than those who started the fires. The CPSC special study found that the children playing with lighters were most likely to be three or four years old, slightly older than the typical ages of fatal victims of lighter play fires.

The CPSC special study found boys playing with lighters outnumbered girls by more than four to one. Among *fatal victims* of those fires, however, boys typically outnumber girls by less than two to one. The implication is that girls are often killed by fires started by their male siblings or playmates. A large sex differential is a major factor in the overall gender-related difference in fire death rates for preschoolers. This is consistent with other statistics, such as the male dominance of arrests for every type of crime.

For home child-playing fires involving any heat source, the midpoint (median) age of fatal victims was at the low end of age 5 (near 5 years, 0 months), the midpoint age of firesetters whose fires proved fatal was at the middle of age 5 (near 5 years, 6 months), and the midpoint age of firesetters in general are at the low end of age 6. (The latter two statistics are limited to fires coded as age was a factor.) (See Tables 15-16.)

For home child-playing fires involving lighters, the midpoint (median) ages are all lower. The midpoint age of fatal victims was at the middle of age 4, the midpoint age of firesetters whose fires proved fatal was at the low end of age 5, and the midpoint age of firesetters in general was at the middle of age 5.

For home child-playing fires involving matches, the midpoint age of fatal victims was the lowest of all, at the low end of age 4, but the midpoint age of firesetters whose fires proved fatal was right at age 5, and the midpoint age of firesetters in general was at the high end of age 6.

Fatal victims of child-playing fires, in general and especially when matches are involved, are younger on average than the firesetters who started the fire. In all likelihood, these statistics understate the gap because the calculation of firesetter age only for fires coded age was a factor will tend to shift the age distribution down.

Table 1. Child-Playing Fires, 1980-2008
Fires Reported to U.S. Fire Departments

A. Fires

Year	Home	Other Residential	Non-Residential	Total Structure	Vehicle	Outdoor or Other	Total
1980	43,800	700	15,900	60,400	4,700	184,700	249,800
1981	37,900	500	17,200	55,600	3,800	187,400	246,800
1982	30,400	500	13,600	44,500	3,600	142,900	190,900
1983	29,000	400	11,300	40,800	3,000	126,500	170,200
1984	29,000	400	10,700	40,000	2,900	127,800	170,700
1985	27,700	500	8,800	36,900	2,100	114,800	153,800
1986	27,000	400	8,100	35,500	2,100	97,300	134,800
1987	26,300	400	7,700	34,300	2,100	94,400	130,900
1988	26,300	400	6,900	33,500	1,900	109,100	144,500
1989	24,200	400	5,400	29,900	1,500	77,200	108,600
1990	21,700	300	4,400	26,400	1,400	70,700	98,500
1991	22,400	300	4,700	27,500	1,400	74,400	103,300
1992	23,800	300	5,200	29,300	1,200	71,600	102,000
1993	23,500	300	4,500	28,300	1,300	68,800	98,400
1994	24,000	300	5,200	29,500	1,500	81,200	112,100
1995	19,800	300	4,800	24,900	1,300	69,800	96,000
1996	18,700	300	4,000	23,000	1,200	63,100	87,300
1997	17,000	30	3,100	20,300	800	43,900	65,100
1998	15,100	300	3,300	18,700	900	47,900	67,500
1999	14,000 (13,600)	300 (300)	4,400 (2,700)	18,700 (16,700)	1,300	53,400	73,400
2000	11,700 (11,200)	600 (500)	3,200 (2,400)	15,600 (14,100)	1,400	48,400	65,300
2001	11,800 (10,800)	400 (400)	4,500 (3,200)	16,600 (14,400)	1,400	72,300	90,300
2002	10,000 (8,900)	500 (400)	3,300 (2,400)	13,700 (11,800)	800	51,700	66,300
2003	7,900 (6,900)	500 (300)	3,200 (2,000)	11,600 (9,200)	800	45,400	57,800
2004	7,600 (6,500)	300 (200)	3,000 (1,700)	10,900 (8,500)	800	41,200	52,900
2005	7,600 (6,300)	400 (300)	4,500 91,800)	12,400 (8,500)	900	46,800	60,000
2006	8,500 (7,000)	500 (200)	5,500 (2,100)	14,500 (9,300)	1,100	48,100	63,700
2007	8,100 (6,800)	400 (300)	4,500 (2,100)	13,000 (9,200)	1,000	44,200	58,200
2008	7,600 (6,200)	400 (300)	4,000 (2,000)	12,000 (8,500)	800	40,600	53,500

Notes: 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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion of one unusually serious fire. Statistics in parentheses exclude fires reported as confined to cooking vessel, fuel burner or boiler, chimney or flue, incinerator, commercial compactor, or trash. Detailed reporting is optional for confined fires, which means the unknown percentages are much higher, and the resulting estimates, done separately, are much more volatile. Also volatile are estimates from 1999 to 2001, when participation in NFIRS Version 5.0 was low; these estimates should be treated carefully. Totals may not equal sums because of rounding. For 1980-1998, estimates are based on Ignition Factor codes 36 and 48; these codes cannot be combined with incendiary, suspicious, or intentional. For 1999 and later, estimates are based on Factor Contributing to Ignition Code 19, which is defined as "playing with fire," not limited to children playing; these codes can be combined with Intentional, which is reported on a different field. Estimates include a proportional share of fires with codes blank or unknown. From 1999 on, fires coded as "no factor" are also treated as unknowns, and multiple answers are permitted. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest ten, and direct property damage to the nearest million dollars. Adjustment to 2008 dollars is done using the consumer price index.

Source: NFIRS and NFPA survey.

Table 1. Child-Playing Fires, 1980-2008 (Continued)
Fires Reported to U.S. Fire Departments

B. Civilian Deaths

Year	Home	Other Residential	Non-Residential	Total Structure	Vehicle	Outdoor or Other	Total
1980	430	0	10	440	10	0	440
1981	300	0	20	320	0	0	330
1982	280	0	10	290	0	0	290
1983	310	0	20	330	10	0	330
1984	300	10	0	310	0	0	310
1985	390	20	10	420	0	0	430
1986	380	0	10	390	0	10	400
1987	490	0	10	500	0	0	500
1988	510	0	0	510	10	0	520
1989	460	0	0	460	0	0	470
1990	330	10	10	350	10	0	350
1991	430	0	30	460	0	0	460
1992	370	0	0	370	10	0	380
1993	400	0	10	410	0	0	410
1994	410	0	0	410	0	0	410
1995	300	0	0	300	10	0	300
1996	280	0	0	280	0	0	280
1997	270	0	10	280	0	0	280
1998	220	0	0	220	10	0	230
1999	230 (230)	0 (0)	0 (0)	240 (240)	0	10	250
2000	250 (250)	0 (0)	20 (20)	270 (270)	0	10	280
2001	200 (200)	0 (0)	10 (10)	220 (220)	0	0	220
2002	200 (200)	0 (0)	0 (0)	190 (190)	10	0	210
2003	180 (180)	10 (10)	150 (150)	350 (350)	0	0	350
2004	80 (80)	10 (10)	0 (0)	90 (90)	10	0	90
2005	130 (130)	0 (0)	0 (0)	130 (130)	0	0	130
2006	120 (120)	0 (0)	10 (10)	130 (130)	0	0	130
2007	110 (110)	10 (10)	0 (0)	120 (120)	0	0	130
2008	70 (70)	10 (10)	0 (0)	70 (70)	0	0	70

Notes: 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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion of one unusually serious fire. Statistics in parentheses exclude fires reported as confined to cooking vessel, fuel burner or boiler, chimney or flue, incinerator, commercial compactor, or trash. Detailed reporting is optional for confined fires, which means the unknown percentages are much higher, and the resulting estimates, done separately, are much more volatile. Also volatile are estimates from 1999 to 2001, when participation in NFIRS Version 5.0 was low; these estimates should be treated carefully. Totals may not equal sums because of rounding. For 1980-1998, estimates are based on Ignition Factor codes 36 and 48; these codes cannot be combined with incendiary, suspicious, or intentional. For 1999 and later, estimates are based on Factor Contributing to Ignition Code 19, which is defined as "playing with fire," not limited to children playing; these codes can be combined with Intentional, which is reported on a different field. Estimates include a proportional share of fires with codes blank or unknown. From 1999 on, fires coded as "no factor" are also treated as unknowns, and multiple answers are permitted. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest ten, and direct property damage to the nearest million dollars. Adjustment to 2008 dollars is done using the consumer price index.

Source: NFIRS and NFPA survey.

Table 1. Child-Playing Fires, 1980-2008 (Continued)
Fires Reported to U.S. Fire Departments

C. Civilian Injuries

Year	Home		Other Residential		Non-Residential		Total Structure		Vehicle	Outdoor or Other	Total
1980	2,060		0		90		2,150		60	90	2,310
1981	1,770		10		150		1,930		20	120	2,070
1982	1,870		10		100		1,990		20	170	2,170
1983	2,010		20		130		2,160		70	110	2,340
1984	2,020		10		80		2,110		30	160	2,290
1985	2,040		20		100		2,150		40	130	2,320
1986	2,020		10		100		2,120		40	90	2,250
1987	2,330		20		80		2,430		20	110	2,560
1988	2,420		20		100		2,540		40	130	2,700
1989	2,360		20		140		2,520		40	110	2,660
1990	2,250		10		120		2,380		20	80	2,480
1991	2,610		20		70		2,690		20	130	2,850
1992	2,810		30		70		2,910		30	150	3,090
1993	2,840		20		100		2,970		10	90	3,070
1994	2,620		50		70		2,740		40	130	2,920
1995	2,310		20		50		2,370		30	130	2,530
1996	2,020		20		60		2,100		40	260	2,390
1997	1,940		20		40		2,000		20	130	2,160
1998	1,650		0		30		1,670		30	110	1,800
1999	2,090	(2,090)	30	(30)	30	(30)	2,160	(2,160)	0	180	2,330
2000	1,450	(1,320)	50	(50)	50	(50)	1,550	(1,420)	0	30	1,580
2001	1,200	(1,180)	20	(20)	40	(40)	1,260	(1,240)	30	100	1,390
2002	1,050	(1,050)	60	(60)	40	(40)	1,150	(1,150)	30	70	1,260
2003	870	(870)	10	(10)	100	(100)	970	(970)	30	100	1,100
2004	850	(840)	20	(20)	30	(30)	900	(890)	10	100	1,020
2005	740	(740)	20	(20)	30	(30)	790	(790)	20	130	950
2006	770	(750)	10	(10)	40	(30)	810	(790)	10	60	880
2007	740	(720)	10	(10)	30	(30)	780	(760)	10	60	850
2008	780	(780)	30	(30)	30	(10)	840	(820)	20	60	910

Notes: 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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion of one unusually serious fire. Statistics in parentheses exclude fires reported as confined to cooking vessel, fuel burner or boiler, chimney or flue, incinerator, commercial compactor, or trash. Detailed reporting is optional for confined fires, which means the unknown percentages are much higher, and the resulting estimates, done separately, are much more volatile. Also volatile are estimates from 1999 to 2001, when participation in NFIRS Version 5.0 was low; these estimates should be treated carefully. Totals may not equal sums because of rounding. For 1980-1998, estimates are based on Ignition Factor codes 36 and 48; these codes cannot be combined with incendiary, suspicious, or intentional. For 1999 and later, estimates are based on Factor Contributing to Ignition Code 19, which is defined as "playing with fire," not limited to children playing; these codes can be combined with Intentional, which is reported on a different field. Estimates include a proportional share of fires with codes blank or unknown. From 1999 on, fires coded as "no factor" are also treated as unknowns, and multiple answers are permitted. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest ten, and direct property damage to the nearest million dollars. Adjustment to 2008 dollars is done using the consumer price index.

Source: NFIRS and NFPA survey.

Table 1. Child-Playing Fires, 1980-2008 (Continued)
Fires Reported to U.S. Fire Departments

D. Direct Property Damage (in Millions)

Year	Home	Other Residential	Non-Residential	Total Structure	Vehicle	Outdoor or Other	Total As Reported	Total in 2008 Dollars
1980	$140	$1	$26	$167	$3	$1	$171	$447
1981	$145	$2	$35	$182	$3	$1	$186	$441
1982	$131	$1	$21	$153	$2	$3	$159	$354
1983	$154	$1	$29	$184	$3	$1	$188	$407
1984	$162	$1	$17	$181	$3	$1	$184	$382
1985	$189	$1	$26	$215	$1	$6	$222	$444
1986	$186	$2	$16	$204	$1	$1	$206	$406
1987	$203	$1	$19	$223	$2	$20	$245	$465
1988	$208	$2	$26	$236	$2	$2	$239	$436
1989	$229	$3	$12	$244	$1	$2	$247	$430
1990	$206	$1	$16	$223	$2	$2	$227	$375
1991	$285	$3	$16	$304	$14	$1	$319	$505
1992	$206	$3	$18	$226	$1	$12	$239	$368
1993	$269	$3	$26	$297	$1	$2	$301	$448
1994	$269	$2	$21	$292	$2	$4	$298	$434
1995	$255	$2	$24	$282	$3	$2	$287	$405
1996	$255	$5	$16	$275	$2	$1	$278	$383
1997	$262	$2	$17	$281	$1	$1	$283	$380
1998	$210	$2	$16	$229	$2	$4	$235	$311
1999	$238 ($238)	$4 ($4)	$23 ($23)	$265 ($265)	$3	$2	$271	$350
2000	$275 ($273)	$13($13)	$19 ($19)	$306 ($305)	$4	$4	$314	$393
2001	$246 ($246)	$11($11)	$39 ($39)	$296 ($296)	$6	$2	$304	$370
2002	$233 ($233)	$9 ($9)	$79 ($79)	$320 ($320)	$2	$2	$324	$389
2003	$227 ($227)	$7 ($6)	$43 ($43)	$277 ($277)	$3	$4	$284	$332
2004	$203 ($203)	$2 ($2)	$41 ($41)	$246 ($246)	$2	$2	$250	$285
2005	$225 ($225)	$6 ($6)	$41 ($41)	$272 ($272)	$3	$3	$278	$306
2006	$202 ($201)	$3 ($3)	$123 ($123)	$328 ($328)	$3	$5	$336	$359
2007	$160 ($160)	$4 ($4)	$44 ($44)	$208 ($208)	$87	$4	$298	$310
2008	$202 ($202)	$0 ($0)	$70 ($70)	$271 ($271)	$3	$5	$279	$279

Notes: 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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion of one unusually serious fire. Statistics in parentheses exclude fires reported as confined to cooking vessel, fuel burner or boiler, chimney or flue, incinerator, commercial compactor, or trash. Detailed reporting is optional for confined fires, which means the unknown percentages are much higher, and the resulting estimates, done separately, are much more volatile. Also volatile are estimates from 1999 to 2001, when participation in NFIRS Version 5.0 was low; these estimates should be treated carefully. Totals may not equal sums because of rounding. For 1980-1998, estimates are based on Ignition Factor codes 36 and 48; these codes cannot be combined with incendiary, suspicious, or intentional. For 1999 and later, estimates are based on Factor Contributing to Ignition Code 19, which is defined as "playing with fire," not limited to children playing; these codes can be combined with Intentional, which is reported on a different field. Estimates include a proportional share of fires with codes blank or unknown. From 1999 on, fires coded as "no factor" are also treated as unknowns, and multiple answers are permitted. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest ten, and direct property damage to the nearest million dollars. Adjustment to 2008 dollars is done using the consumer price index.

Source: NFIRS and NFPA survey.

Table 2. Child-Playing Structure Fires, by Property Use
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Department

Property Use	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
One- or two-family home	5,970	(47%)	88	(80%)	562	(68%)	$139	(52%)
Apartment	1,920	(15%)	16	(15%)	213	(26%)	$58	(22%)
Preschool through grade 12	900	(7%)	0	(0%)	6	(1%)	$32	(12%)
Street, road or driveway in residential area	600	(5%)	0	(0%)	0	(0%)	$0	(0%)
Outbuilding or shed	470	(4%)	0	(0%)	2	(0%)	$4	(1%)
Dwelling garage	240	(2%)	1	(1%)	3	(0%)	$3	(1%)
Unclassified or unknown-type residential property	230	(2%)	4	(3%)	9	(1%)	$2	(1%)
Vehicle parking garage	150	(1%)	0	(0%)	1	(0%)	$0	(0%)
Outbuilding or protective shelter	140	(1%)	0	(0%)	2	(0%)	$1	(0%)
Open land or field	110	(1%)	0	(0%)	0	(0%)	$0	(0%)
Playground	110	(1%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified outside or special property	100	(1%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified street	90	(1%)	0	(0%)	0	(0%)	$0	(0%)
Vacant lot	80	(1%)	0	(0%)	0	(0%)	$0	(0%)
Dormitory or barracks	70	(1%)	0	(0%)	0	(0%)	$0	(0%)
Street or road in commercial area	60	(1%)	0	(0%)	0	(0%)	$0	(0%)
Other known property use	1,300	(10%)	2	(1%)	24	(3%)	$25	(9%)
Unknown property use	70	(1%)	0	(0%)	1	(0%)	$1	(0%)
Total	12,580	(100%)	110	(100%)	823	(100%)	$265	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children.

Source: NFIRS and NFPA survey.

Table 3. Child-Playing Fires, by Day of Week
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

A. Home Structure Fires

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	1,150	(15%)	8	(8%)	108	(14%)	$27	(14%)
Monday	1,160	(15%)	16	(15%)	126	(16%)	$31	(16%)
Tuesday	1,090	(14%)	14	(14%)	101	(13%)	$26	(13%)
Wednesday	1,140	(15%)	13	(13%)	102	(13%)	$26	(13%)
Thursday	1,060	(13%)	19	(18%)	114	(15%)	$29	(15%)
Friday	1,120	(14%)	24	(23%)	127	(16%)	$30	(15%)
Saturday	1,160	(15%)	10	(10%)	97	(13%)	$27	(14%)
Total	7,880	(100%)	104	(100%)	775	(100%)	$197	(100%)

B. Outside and Other Fires

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	7,310	(17%)	0	(0%)	13	(16%)	$1	(25%)
Monday	6,660	(15%)	0	(0%)	11	(13%)	$0	(15%)
Tuesday	6,220	(14%)	0	(28%)	8	(10%)	$0	(9%)
Wednesday	5,750	(13%)	0	(0%)	9	(12%)	$0	(10%)
Thursday	5,390	(12%)	0	(0%)	13	(16%)	$0	(11%)
Friday	5,890	(13%)	1	(72%)	14	(17%)	$1	(17%)
Saturday	6,960	(16%)	0	(0%)	12	(15%)	$0	(14%)
Total	44,190	(100%)	1	(100%)	80	(100%)	$3	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children.

Source: NFIRS and NFPA survey.

Table 4. Child-Playing Fires, by Time of Day
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

A. Home Structure Fires

Hour of day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight to 12:59 am	150	(2%)	4	(4%)	21	(3%)	$3	(2%)
1:00 to 1:59 am	100	(1%)	7	(7%)	11	(1%)	$2	(1%)
2:00 to 2:59 am	80	(1%)	1	(1%)	7	(1%)	$3	(1%)
3:00 to 3:59 am	50	(1%)	1	(1%)	8	(1%)	$2	(1%)
4:00 to 4:59 am	50	(1%)	0	(0%)	5	(1%)	$1	(1%)
5:00 to 5:59 am	40	(1%)	0	(0%)	5	(1%)	$1	(0%)
6:00 to 6:59 am	60	(1%)	2	(2%)	7	(1%)	$2	(1%)
7:00 to 7:59 am	170	(2%)	10	(10%)	19	(2%)	$4	(2%)
8:00 to 8:59 am	230	(3%)	10	(9%)	56	(7%)	$8	(4%)
9:00 to 9:59 am	380	(5%)	15	(14%)	66	(8%)	$12	(6%)
10:00 to 10:59 am	400	(5%)	13	(12%)	54	(7%)	$13	(7%)
11:00 to 11:59 am	430	(5%)	4	(4%)	61	(8%)	$11	(5%)
Noon to 12:59 pm	420	(5%)	1	(1%)	45	(6%)	$12	(6%)
1:00 to 1:59 pm	470	(6%)	6	(6%)	41	(5%)	$14	(7%)
2:00 to 2:59 pm	520	(7%)	4	(3%)	39	(5%)	$15	(8%)
3:00 to 3:59 pm	580	(7%)	4	(4%)	48	(6%)	$16	(8%)
4:00 to 4:59 pm	660	(8%)	3	(3%)	52	(7%)	$16	(8%)
5:00 to 5:59 pm	620	(8%)	1	(1%)	35	(4%)	$11	(6%)
6:00 to 6:59 pm	550	(7%)	5	(5%)	33	(4%)	$11	(6%)
7:00 to 7:59 pm	500	(6%)	2	(2%)	44	(6%)	$13	(7%)
8:00 to 8:59 pm	460	(6%)	7	(7%)	49	(6%)	$9	(4%)
9:00 to 9:59 pm	390	(5%)	1	(1%)	29	(4%)	$8	(4%)
10:00 to 10:59 pm	330	(4%)	3	(3%)	22	(3%)	$7	(4%)
11:00 to 11:59 pm	210	(3%)	0	(0%)	17	(2%)	$4	(2%)
Total	7,880	(100%)	104	(100%)	775	(100%)	$197	(100%)

Table 4. Child-Playing Fires, by Time of Day (Continued)
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

B. Outside and Other Fires

Hour of day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight to 12:59 am	1,350	(3%)	0	(0%)	1	(1%)	$0	(1%)
1:00 to 1:59 am	970	(2%)	0	(0%)	1	(1%)	$0	(1%)
2:00 to 2:59 am	720	(2%)	0	(0%)	1	(1%)	$0	(1%)
3:00 to 3:59 am	550	(1%)	0	(0%)	0	(0%)	$0	(1%)
4:00 to 4:59 am	290	(1%)	0	(0%)	1	(1%)	$0	(0%)
5:00 to 5:59 am	270	(1%)	0	(0%)	0	(0%)	$0	(0%)
6:00 to 6:59 am	180	(0%)	0	(0%)	0	(0%)	$0	(0%)
7:00 to 7:59 am	290	(1%)	0	(0%)	0	(0%)	$0	(1%)
8:00 to 8:59 am	320	(1%)	0	(0%)	1	(1%)	$0	(0%)
9:00 to 9:59 am	440	(1%)	0	(0%)	1	(1%)	$0	(1%)
10:00 to 10:59 am	760	(2%)	0	(28%)	1	(1%)	$0	(2%)
11:00 to 11:59 am	1,190	(3%)	0	(0%)	2	(3%)	$0	(4%)
Noon to 12:59 pm	1,840	(4%)	0	(0%)	5	(6%)	$0	(3%)
1:00 to 1:59 pm	2,590	(6%)	0	(0%)	8	(10%)	$0	(8%)
2:00 to 2;59 pm	2,970	(7%)	1	(72%)	9	(11%)	$0	(11%)
3:00 to 3:59 pm	3,750	(8%)	0	(0%)	6	(8%)	$0	(5%)
4:00 to 4:59 pm	4,560	(10%)	0	(0%)	15	(19%)	$0	(12%)
5:00 to 5:59 pm	4,400	(10%)	0	(0%)	7	(9%)	$0	(7%)
6:00 to 6:59 pm	3,710	(8%)	0	(0%)	10	(12%)	$0	(11%)
7:00 to 7:59 pm	3,240	(7%)	0	(0%)	3	(4%)	$0	(4%)
8:00 to 8:59 pm	3,140	(7%)	0	(0%)	2	(2%)	$0	(5%)
9:00 to 9:59 pm	2,640	(6%)	0	(0%)	3	(4%)	$0	(14%)
10:00 to 10:59 pm	2,360	(5%)	0	(0%)	0	(0%)	$0	(4%)
11:00 to 11:59 pm	1,650	(4%)	0	(0%)	4	(5%)	$0	(1%)
Total	44,190	(100%)	1	(100%)	80	(100%)	$3	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children.

Source: NFIRS and NFPA survey.

Table 5. Child-Playing Fires, by Month
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

A. Home Structure Fires

Month of year	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	720	(9%)	21	(20%)	75	(10%)	$22	(11%)
February	670	(9%)	17	(16%)	85	(11%)	$21	(10%)
March	680	(9%)	7	(7%)	84	(11%)	$16	(8%)
April	630	(8%)	10	(10%)	64	(8%)	$15	(8%)
May	630	(8%)	9	(8%)	65	(8%)	$18	(9%)
June	700	(9%)	8	(8%)	48	(6%)	$15	(8%)
July	950	(12%)	8	(8%)	65	(8%)	$24	(12%)
August	650	(8%)	5	(5%)	81	(10%)	$20	(10%)
September	560	(7%)	5	(5%)	46	(6%)	$12	(6%)
October	510	(6%)	1	(1%)	55	(7%)	$10	(5%)
November	560	(7%)	5	(4%)	43	(6%)	$13	(7%)
December	620	(8%)	8	(7%)	64	(8%)	$12	(6%)
Total	7,880	(100%)	104	(100%)	775	(100%)	$197	(100%)

B. Outside and Other Fires

Month of year	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	3,520	(8%)	0	(0%)	6	(8%)	$0	(4%)
February	2,370	(5%)	0	(0%)	5	(6%)	$1	(20%)
March	3,590	(8%)	0	(0%)	11	(14%)	$0	(7%)
April	3,940	(9%)	0	(0%)	7	(9%)	$0	(11%)
May	3,350	(8%)	1	(72%)	6	(7%)	$0	(5%)
June	4,530	(10%)	0	(0%)	10	(13%)	$0	(8%)
July	9,270	(21%)	0	(28%)	9	(11%)	$0	(11%)
August	3,070	(7%)	0	(0%)	5	(6%)	$0	(14%)
September	2,720	(6%)	0	(0%)	8	(10%)	$0	(5%)
October	2,750	(6%)	0	(0%)	5	(6%)	$0	(7%)
November	2,480	(6%)	0	(0%)	5	(7%)	$0	(3%)
December	2,610	(6%)	0	(0%)	3	(4%)	$0	(4%)
Total	44,190	(100%)	1	(100%)	80	(100%)	$3	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children.

Source: NFIRS and NFPA survey.

Table 6. Child Playing Fires, by Heat Source
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

A. Home Structure Fires

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cigarette lighter	3,590	(46%)	65	(62%)	445	(57%)	$97	(50%)
Match	1,470	(19%)	22	(21%)	140	(18%)	$35	(18%)
Candle	480	(6%)	2	(2%)	62	(8%)	$18	(9%)
Heat from unclassified or unknown-type open flame or smoking material	430	(5%)	7	(7%)	34	(4%)	$10	(5%)
Fireworks	400	(5%)	1	(1%)	8	(1%)	$9	(5%)
Radiated or conducted heat from operating equipment	240	(3%)	0	(0%)	7	(1%)	$2	(1%)
Unclassified hot or smoldering object	200	(3%)	2	(1%)	12	(2%)	$4	(2%)
Unclassified heat from powered equipment	170	(2%)	0	(0%)	4	(0%)	$1	(1%)
Unclassified heat source	150	(2%)	0	(0%)	13	(2%)	$2	(1%)
Flame or torch used for lighting	140	(2%)	0	(0%)	13	(2%)	$6	(3%)
Hot ember or ash	120	(2%)	0	(0%)	11	(1%)	$3	(1%)
Spark, ember or flame from operating equipment	110	(1%)	4	(4%)	5	(1%)	$2	(1%)
Unclassified fireworks or explosives	70	(1%)	0	(0%)	4	(0%)	$2	(1%)
Incendiary device	60	(1%)	1	(1%)	1	(0%)	$1	(1%)
Cigarette	60	(1%)	0	(0%)	3	(0%)	$1	(0%)
Heat from undetermined smoking material	50	(1%)	0	(0%)	2	(0%)	$1	(0%)
Other known heat source	150	(2%)	0	(0%)	12	(2%)	$3	(2%)
Total	7,880	(100%)	104	(100%)	775	(100%)	$197	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with heat source unknown.

Source: NFIRS and NFPA survey.

Table 6. Child-Playing Fires, by Heat Source (Continued)
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

B. Outside and Other Fires

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cigarette lighter	11,220	(25%)	0	(0%)	38	(48%)	$1	(42%)
Fireworks	11,020	(25%)	1	(100%)	12	(16%)	$0	(15%)
Match	10,600	(24%)	0	(0%)	14	(17%)	$1	(17%)
Heat from unclassified or unknown-type open flame or smoking material	3,130	(7%)	0	(0%)	4	(6%)	$0	(11%)
Unclassified fireworks or explosives	1,720	(4%)	0	(0%)	1	(1%)	$0	(2%)
Unclassified heat source	1,060	(2%)	0	(0%)	0	(0%)	$0	(3%)
Unclassified hot or smoldering object	940	(2%)	0	(0%)	1	(2%)	$0	(2%)
Hot ember or ash	910	(2%)	0	(0%)	0	(0%)	$0	(1%)
Heat from undetermined smoking material	740	(2%)	0	(0%)	0	(0%)	$0	(2%)
Incendiary device	680	(2%)	0	(0%)	1	(2%)	$0	(1%)
Flame or torch used for lighting	450	(1%)	0	(0%)	2	(2%)	$0	(1%)
Cigarette	450	(1%)	0	(0%)	0	(0%)	$0	(0%)
Other known heat source	1,270	(3%)	0	(0%)	5	(7%)	$0	(3%)
Total	44,190	(100%)	1	(100%)	80	(100%)	$3	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with heat source unknown.

Source: NFIRS and NFPA survey.

Table 7. Child-Playing Home Structure Fires Involving Matches or Lighters, by Year

	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Lighter	Match	Lighter	Match	Lighter	Match	Lighter	Match
1980	8,900	25,300	220	170	780	910	$36	$75
1981	8,200	21,200	100	180	550	940	$36	$78
1982	7,600	16,100	100	120	700	840	$38	$69
1983	7,300	15,300	120	140	760	820	$45	$76
1984	7,600	14,800	60	160	730	920	$45	$80
1985	7,500	13,700	120	190	850	780	$58	$93
1986	7,900	13,200	170	160	920	740	$64	$87
1987	8,000	12,800	170	210	970	940	$66	$92
1988	7,700	12,700	200	230	1,020	940	$68	$99
1989	7,700	11,500	160	170	1,060	940	$81	$92
1990	7,200	9,900	130	120	1,060	850	$83	$83
1991	8,200	9,500	230	140	1,400	790	$119	$114
1992	9,100	9,900	190	120	1,490	840	$99	$73
1993	9,800	9,000	150	150	1,570	800	$136	$92
1994	10,400	8,900	230	140	1,520	740	$135	$93
1995	7,900	7,400	180	100	1,190	680	$107	$95
1996	7,000	7,100	120	80	1,070	620	$110	$92
1997	6,300	5,900	120	70	810	700	$107	$96
1998	5,700	5,500	120	70	770	540	$89	$70
1999	6,900	3,000	120	0	1,730	140	$148	$39
2000	5,600	2,400	150	40	930	210	$156	$47
2001	5,000	2,600	120	60	760	160	$110	$55
2002	4,800	2,000	140	20	760	150	$131	$41
2003	3,600	1,600	60	10	540	170	$111	$42
2004	3,300	1,600	60	0	490	180	$110	$38
2005	3,400	1,600	110	10	430	80	$98	$35
2006	3,900	1,600	60	40	440	150	$97	$39
2007	3,600	1,500	60	40	380	180	$77	$32
2008	3,500	1,200	30	10	470	110	$111	$32

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with heat source unknown. *Participation in NFIRS Version 5.0 was low in 1999-2001, and so estimates for those years are more volatile and should be viewed with caution.*

Source: NFIRS and NFPA survey.

Table 8. Child-Playing Home Structure Fires, by Equipment Involved in Ignition
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

Equipment Involved in Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
No equipment involved	6,250	(79%)	78	(75%)	644	(83%)	$169	(86%)
Cigarette or pipe lighter*	700	(9%)	14	(14%)	100	(13%)	$14	(7%)
Range with or without oven	260	(3%)	0	(0%)	2	(0%)	$1	(1%)
Oven or rotisserie	130	(2%)	0	(0%)	0	(0%)	$0	(0%)
Portable or fixed space heater	130	(2%)	0	(0%)	6	(1%)	$1	(1%)
Microwave oven	60	(1%)	0	(0%)	8	(1%)	$0	(0%)
Unclassified or unknown-type kitchen equipment	60	(1%)	0	(0%)	0	(0%)	$0	(0%)
Charcoal lighter	50	(1%)	11	(11%)	5	(1%)	$3	(2%)
Lamp or lighting equipment	40	(1%)	0	(0%)	2	(0%)	$0	(0%)
Other known equipment	210	(3%)	0	(0%)	9	(1%)	$7	(3%)
Total	7,880	(100%)	104	(100%)	775	(100%)	$197	(100%)

* Most lighter fires are reported as lighter under heat source but as no equipment under equipment involved in ignition.

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with equipment involved in ignition unknown.

Source: NFIRS and NFPA survey.

Table 9. Child-Playing Home Structure Fires, by Item First Ignited
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Mattress or bedding	1,900	(24%)	30	(29%)	289	(37%)	$65	(33%)
Papers	740	(9%)	13	(13%)	61	(8%)	$20	(10%)
Trash or waste	650	(8%)	3	(3%)	17	(2%)	$4	(2%)
Clothing	600	(8%)	4	(3%)	76	(10%)	$14	(7%)
Upholstered furniture	460	(6%)	21	(20%)	66	(9%)	$21	(11%)
Unclassified furniture or utensil	370	(5%)	6	(6%)	36	(5%)	$13	(7%)
Unclassified item first ignited	300	(4%)	3	(3%)	20	(3%)	$4	(2%)
Box or bag	230	(3%)	1	(1%)	11	(1%)	$5	(3%)
Curtain or drape	220	(3%)	5	(5%)	28	(4%)	$3	(2%)
Unclassified soft goods or clothing	210	(3%)	4	(4%)	17	(2%)	$4	(2%)
Flammable or combustible gas or liquid	200	(3%)	1	(1%)	41	(5%)	$5	(2%)
Multiple items first ignited	170	(2%)	3	(3%)	21	(3%)	$6	(3%)
Light vegetation including grass	170	(2%)	0	(0%)	3	(0%)	$2	(1%)
Floor covering	160	(2%)	0	(0%)	11	(1%)	$2	(1%)
Toy or game	140	(2%)	0	(0%)	16	(2%)	$3	(1%)
Exterior wall covering	140	(2%)	0	(0%)	1	(0%)	$2	(1%)
Cooking material including food	120	(2%)	0	(0%)	0	(0%)	$0	(0%)
Linen other than bedding	110	(1%)	0	(0%)	7	(1%)	$1	(1%)
Household utensil	90	(1%)	0	(0%)	1	(0%)	$1	(0%)
Structural member or framing	70	(1%)	0	(0%)	1	(0%)	$2	(1%)
Rolled or wound material	70	(1%)	0	(0%)	4	(1%)	$1	(1%)
Unclassified organic material	70	(1%)	0	(0%)	2	(0%)	$0	(0%)
Decoration	60	(1%)	2	(2%)	3	(0%)	$1	(0%)
Interior wall covering	50	(1%)	0	(0%)	3	(0%)	$2	(1%)
Unclassified structural component or finish	50	(1%)	0	(0%)	2	(0%)	$1	(0%)
Exterior roof covering	40	(1%)	0	(0%)	0	(0%)	$2	(1%)
Other known item	480	(6%)	7	(7%)	36	(5%)	$12	(6%)
Total	7,880	(100%)	104	(100%)	775	(100%)	$197	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with item first ignited unknown.

Source: NFIRS and NFPA survey.

Table 10. Child-Playing Home Structure Fires Involving Lighters, by Item First Ignited
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Mattress or bedding	1,180	(33%)	21	(32%)	182	(41%)	$37	(37%)
Clothing	360	(10%)	3	(5%)	51	(11%)	$7	(7%)
Papers	350	(10%)	11	(17%)	34	(8%)	$12	(12%)
Upholstered furniture	230	(6%)	17	(26%)	39	(9%)	$11	(11%)
Unclassified furniture or utensil	210	(6%)	3	(4%)	21	(5%)	$7	(7%)
Trash or waste	200	(6%)	0	(0%)	6	(1%)	$1	(1%)
Curtain or drape	140	(4%)	3	(5%)	17	(4%)	$2	(2%)
Unclassified item first ignited	90	(3%)	3	(4%)	12	(3%)	$2	(2%)
Unclassified soft goods or clothing	90	(3%)	0	(0%)	10	(2%)	$1	(2%)
Flammable or combustible gas or liquid	90	(3%)	0	(0%)	22	(5%)	$3	(3%)
Box or bag	90	(2%)	0	(0%)	6	(1%)	$3	(3%)
Linen other than bedding	60	(2%)	0	(0%)	4	(1%)	$1	(1%)
Multiple items first ignited	60	(2%)	1	(2%)	6	(1%)	$1	(1%)
Light vegetation including grass	50	(2%)	0	(0%)	2	(0%)	$1	(1%)
Floor covering	50	(1%)	0	(0%)	5	(1%)	$1	(1%)
Toy or game	50	(1%)	0	(0%)	8	(2%)	$2	(2%)
Decoration	30	(1%)	2	(3%)	2	(1%)	$0	(0%)
Rolled or wound material	30	(1%)	0	(0%)	4	(1%)	$0	(0%)
Exterior wall covering	20	(1%)	0	(0%)	0	(0%)	$0	(0%)
Book	20	(1%)	0	(0%)	1	(0%)	$0	(0%)
Other known item	190	(5%)	1	(2%)	13	(3%)	$5	(5%)
Total	3,590	(100%)	65	(100%)	445	(100%)	$97	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with heat source unknown and child-playing lighter fires with item first ignited.

Source: NFIRS and NFPA survey.

Table 11. Child-Playing Home Structure Fires Involving Matches, by Item First Ignited
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Mattress or bedding	380	(26%)	3	(14%)	60	(43%)	$14	(39%)
Trash or waste	170	(12%)	5	(22%)	5	(3%)	$1	(2%)
Papers	150	(10%)	0	(0%)	10	(7%)	$3	(10%)
Clothing	90	(6%)	0	(0%)	12	(8%)	$4	(11%)
Upholstered furniture	80	(6%)	0	(0%)	11	(8%)	$3	(9%)
Unclassified furniture or utensil	70	(5%)	2	(11%)	7	(5%)	$1	(4%)
Flammable or combustible gas or liquid	60	(4%)	0	(0%)	14	(10%)	$1	(2%)
Box or bag	50	(3%)	0	(0%)	1	(1%)	$1	(2%)
Unclassified soft goods or clothing	40	(3%)	5	(22%)	5	(3%)	$1	(2%)
Floor covering	40	(3%)	0	(0%)	0	(0%)	$1	(2%)
Unclassified item first ignited	40	(2%)	0	(0%)	2	(1%)	$0	(1%)
Curtain or drape	30	(2%)	2	(11%)	2	(1%)	$0	(1%)
Light vegetation including grass	30	(2%)	0	(0%)	0	(0%)	$1	(2%)
Multiple items first ignited	20	(2%)	0	(0%)	2	(1%)	$1	(4%)
Exterior wall covering	20	(1%)	0	(0%)	0	(0%)	$0	(1%)
Toy or game	20	(1%)	0	(0%)	1	(1%)	$0	(1%)
Rolled or wound material	20	(1%)	0	(0%)	0	(0%)	$0	(1%)
Linen other than bedding	10	(1%)	0	(0%)	1	(1%)	$0	(0%)
Structural member or framing	10	(1%)	0	(0%)	0	(0%)	$1	(1%)
Packing or wrapping material	10	(1%)	0	(0%)	0	(0%)	$0	(0%)
Decoration	10	(1%)	0	(0%)	1	(1%)	$0	(0%)
Book	10	(1%)	0	(0%)	0	(0%)	$0	(1%)
Other known item	100	(7%)	5	(21%)	8	(6%)	$2	(4%)
Total	1,470	(100%)	22	(100%)	140	(100%)	$35	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with heat source unknown and child-playing match fires with item first ignited unknown.

Source: NFIRS and NFPA survey.

Table 12. Child-Playing Home Structure Fires, by Area of Origin
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Bedroom	3,220	(41%)	50	(48%)	456	(59%)	$104	(53%)
Kitchen	660	(8%)	4	(4%)	28	(4%)	$4	(2%)
Living room, family room, or den	460	(6%)	26	(25%)	82	(11%)	$18	(9%)
Closet	370	(5%)	5	(5%)	37	(5%)	$11	(6%)
Bathroom	360	(5%)	1	(1%)	15	(2%)	$1	(1%)
Unclassified function area	320	(4%)	5	(5%)	40	(5%)	$14	(7%)
Garage*	310	(4%)	3	(3%)	29	(4%)	$9	(5%)
Exterior wall surface	200	(2%)	0	(0%)	1	(0%)	$3	(2%)
Unclassified outside area	190	(2%)	0	(0%)	5	(1%)	$2	(1%)
Laundry room or area	150	(2%)	1	(1%)	4	(0%)	$2	(1%)
Crawl space or substructure space	130	(2%)	2	(2%)	9	(1%)	$2	(1%)
Unclassified area of origin	120	(2%)	0	(0%)	5	(1%)	$2	(1%)
Exterior balcony or unenclosed porch	120	(2%)	0	(0%)	3	(0%)	$4	(2%)
Unclassified structural area	120	(2%)	1	(1%)	14	(2%)	$4	(2%)
Courtyard, terrace or patio	120	(1%)	0	(0%)	3	(0%)	$3	(1%)
Lawn, field or open area	100	(1%)	0	(0%)	1	(0%)	$1	(0%)
Interior stairway	90	(1%)	1	(1%)	1	(0%)	$1	(0%)
Trash chute, area or container	80	(1%)	0	(0%)	1	(0%)	$1	(0%)
Lobby or entrance way	70	(1%)	0	(0%)	2	(0%)	$1	(0%)
Exterior stairway or fire escape	70	(1%)	0	(0%)	8	(1%)	$1	(1%)
Unclassified storage area	70	(1%)	1	(1%)	3	(0%)	$1	(1%)
Unclassified means of egress	50	(1%)	0	(0%)	2	(0%)	$1	(0%)
Wall assembly or concealed space	50	(1%)	1	(1%)	0	(0%)	$1	(0%)
Exterior roof surface	50	(1%)	0	(0%)	0	(0%)	$2	(1%)
Storage of supplies or tools	50	(1%)	1	(1%)	2	(0%)	$1	(0%)
Attic or ceiling/roof assembly or concealed space	50	(1%)	0	(0%)	4	(1%)	$1	(0%)
Hallway or corridor	50	(1%)	0	(0%)	7	(1%)	$0	(0%)
Vacant structural area	40	(1%)	0	(0%)	1	(0%)	$0	(0%)
Multiple areas of origin	40	(1%)	0	(0%)	1	(0%)	$1	(0%)
Storage room, area, tank, or bin	40	(1%)	0	(0%)	2	(0%)	$1	(0%)
Other known area	150	(2%)	0	(0%)	11	(1%)	$3	(1%)
Total	7,880	(100%)	104	(100%)	775	(100%)	$197	(100%)

* Does not include residential garages coded as separate properties.

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with area of origin unknown.

Source: NFIRS and NFPA survey.

Table 13. Child-Playing Home Structure Fires Involving Lighters, by Area of Origin
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Bedroom	2,000	(56%)	34	(53%)	300	(67%)	$60	(62%)
Closet	240	(7%)	3	(4%)	27	(6%)	$6	(6%)
Living room, family room, or den	200	(6%)	18	(28%)	44	(10%)	$8	(8%)
Bathroom	160	(5%)	0	(0%)	8	(2%)	$1	(1%)
Unclassified function area	140	(4%)	4	(6%)	16	(3%)	$8	(8%)
Garage*	130	(3%)	0	(0%)	11	(3%)	$2	(2%)
Kitchen	80	(2%)	0	(0%)	3	(1%)	$1	(1%)
Laundry room or area	70	(2%)	0	(0%)	0	(0%)	$0	(0%)
Exterior wall surface	60	(2%)	0	(0%)	0	(0%)	$1	(1%)
Unclassified area of origin	40	(1%)	0	(0%)	0	(0%)	$1	(1%)
Unclassified outside area	40	(1%)	0	(0%)	2	(1%)	$1	(1%)
Unclassified structural area	40	(1%)	1	(2%)	9	(2%)	$2	(2%)
Exterior balcony or unenclosed porch	40	(1%)	0	(0%)	2	(0%)	$1	(1%)
Courtyard, terrace or patio	40	(1%)	0	(0%)	1	(0%)	$2	(2%)
Crawl space or substructure space	30	(1%)	0	(0%)	4	(1%)	$0	(0%)
Interior stairway or ramp	30	(1%)	2	(2%)	0	(0%)	$1	(1%)
Lobby or entrance way	20	(1%)	0	(0%)	1	(0%)	$0	(0%)
Lawn, field or open area	20	(1%)	0	(0%)	1	(0%)	$0	(0%)
Unclassified storage area	20	(1%)	1	(2%)	1	(0%)	$0	(0%)
Hallway or corridor	20	(1%)	0	(0%)	3	(1%)	$0	(0%)
Attic or ceiling/roof assembly or concealed space	20	(1%)	0	(0%)	4	(1%)	$0	(0%)
Other known area	140	(4%)	2	(2%)	9	(2%)	$2	(2%)
Total	3,590	(100%)	65	(100%)	445	(100%)	$97	(100%)

* Does not include residential garages coded as separate properties.

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with heat source unknown and child-playing lighter fires with area of origin unknown.

Source: NFIRS and NFPA survey.

Table 14. Child-Playing Home Structure Fires Involving Matches, by Area of Origin
Annual Average for 2004-2008 Fires Reported to U.S. Municipal Fire Departments

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Bedroom	590	(40%)	10	(43%)	87	(62%)	$21	(60%)
Living room, family room, or den	100	(7%)	8	(36%)	13	(9%)	$3	(9%)
Bathroom	90	(6%)	1	(5%)	4	(3%)	$0	(1%)
Garage*	80	(5%)	0	(0%)	6	(5%)	$2	(5%)
Closet	60	(4%)	1	(5%)	3	(2%)	$2	(6%)
Kitchen	50	(3%)	1	(5%)	3	(2%)	$0	(1%)
Unclassified function area	50	(3%)	0	(0%)	6	(4%)	$2	(5%)
Unclassified outside area	40	(3%)	0	(0%)	2	(1%)	$0	(1%)
Laundry room or area	40	(3%)	0	(0%)	2	(1%)	$1	(2%)
Courtyard, terrace or patio	30	(2%)	0	(0%)	0	(0%)	$0	(1%)
Exterior balcony or unenclosed porch	30	(2%)	0	(0%)	1	(0%)	$0	(1%)
Exterior wall surface	30	(2%)	0	(0%)	0	(0%)	$1	(1%)
Crawl space or substructure space	30	(2%)	0	(0%)	1	(0%)	$0	(0%)
Interior stairway or ramp	20	(1%)	0	(0%)	1	(1%)	$0	(1%)
Unclassified area or origin	20	(1%)	0	(0%)	1	(0%)	$0	(1%)
Lawn, field or open area	20	(1%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified structural area	20	(1%)	0	(0%)	1	(1%)	$1	(2%)
Trash chute, area or container	20	(1%)	0	(0%)	1	(1%)	$0	(0%)
Exterior stairway or fire escape	20	(1%)	0	(0%)	1	(1%)	$0	(0%)
Unclassified storage area	10	(1%)	0	(0%)	1	(1%)	$0	(1%)
Unclassified means of egress	10	(1%)	0	(0%)	0	(0%)	$0	(1%)
Multiple areas of origin	10	(1%)	0	(0%)	0	(0%)	$0	(0%)
Lobby or entrance way	10	(1%)	0	(0%)	1	(0%)	$0	(0%)
Storage room, area, tank, or bin	10	(1%)	0	(0%)	3	(2%)	$0	(0%)
Vacant structural area	10	(1%)	0	(0%)	0	(0%)	$0	(0%)
Wall assembly or concealed space	10	(1%)	0	(0%)	0	(0%)	$0	(0%)
Storage of supplies or tools	10	(1%)	1	(5%)	0	(0%)	$0	(0%)
Other known area	50	(3%)	0	(0%)	5	(3%)	$0	(1%)
Total	1,470	(100%)	22	(100%)	140	(100%)	$35	(100%)

* Does not include residential garages coded as separate properties.

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with heat source unknown and child-playing match fires with area of origin unknown.

Source: NFIRS and NFPA survey.

Table 15. Victims of Child-Playing Home Fires by Age of Victim and Heat Source
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

A. All Heat Sources, Including Matches and Lighters

	Annual Average				Rate per Million Population	
Age of Victim	**Civilian Deaths**		**Civilian Injuries**		**Civilian Deaths**	**Civilian Injuries**
Under 2 years old	11	(10%)	34	(4%)	1.3	4.1
2 years old	14	(13%)	27	(3%)	3.4	6.5
3 years old	11	(11%)	43	(6%)	2.8	10.6
4 years old	15	(14%)	45	(6%)	3.7	11.2
5 years old	17	(16%)	33	(4%)	4.1	8.0
6 years old	4	(4%)	25	(3%)	1.0	6.5
7 years old	1	(1%)	17	(2%)	0.4	4.4
8 years old	1	(1%)	12	(2%)	0.3	3.1
9 years old	2	(2%)	10	(1%)	0.6	2.6
10 years old	4	(3%)	14	(2%)	0.9	3.4
11-14 years old	0	(0%)	50	(6%)	0.0	3.0
15-17 years old	2	(2%)	32	(4%)	0.2	2.5
18-20 years old	0	(0%)	24	(3%)	0.0	1.9
21-34 years old	3	(3%)	212	(27%)	0.1	3.7
35-49 years old	8	(8%)	126	(16%)	0.1	1.9
50-64 years old	5	(5%)	55	(7%)	0.1	1.1
65 years old or more	5	(5%)	16	(2%)	0.1	0.4
Total	104	(100%)	775	(100%)	0.3	2.6
0-4 years old	51	(49%)	149	(19%)	2.5	7.3
0-14 years old	80	(77%)	310	(40%)	1.3	5.1
0-17 years old	83	(80%)	342	(44%)	1.1	4.6

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with victim age unknown.

Source: NFIRS and NFPA survey.

Table 15. Victims of Child-Playing Home Fires by Age of Victim and Heat Source (Continued)
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

B. Lighters

	Annual Average				Rate per Million Population	
Age of Victim	**Civilian Deaths**		**Civilian Injuries**		**Civilian Deaths**	**Civilian Injuries**
Under 2 years old	9	(17%)	20	(7%)	1.1	2.5
2 years old	9	(16%)	15	(5%)	2.1	3.6
3 years old	7	(13%)	25	(8%)	1.8	6.1
4 years old	4	(7%)	28	(9%)	1.0	6.9
5 years old	7	(14%)	22	(8%)	1.8	5.5
6 years old	4	(7%)	21	(7%)	1.0	5.3
7 years old	2	(3%)	9	(3%)	0.4	2.2
8 years old	1	(2%)	6	(2%)	0.3	1.5
9 years old	2	(4%)	3	(1%)	0.6	0.9
10 years old	3	(5%)	9	(3%)	0.6	2.2
11-14 years old	0	(0%)	24	(8%)	0.0	1.4
15-17 years old	3	(5%)	23	(8%)	0.2	1.8
18-20 years old	0	(0%)	19	(6%)	0.0	1.5
21-34 years old	0	(0%)	33	(11%)	0.0	0.6
35-49 years old	1	(3%)	26	(9%)	0.0	0.4
50-64 years old	0	(0%)	11	(4%)	0.0	0.2
65 years old or more	1	(3%)	3	(1%)	0.0	0.1
Total	53	(100%)	296	(100%)	0.2	1.0
0-4 years old	29	(54%)	88	(30%)	1.4	4.3
0-14 years old	48	(90%)	181	(61%)	0.8	3.0
0-17 years old	50	(95%)	200	(67%)	0.7	2.7

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with heat source unknown and child-playing lighter fires with victim age unknown.

Source: NFIRS and NFPA survey.

Table 15. Victims of Child-Playing Home Fires by Age of Victim and Heat Source (Continued)
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

C. Matches

	Annual Average				Rate per Million Population	
Age of Victim	**Civilian Deaths**		**Civilian Injuries**		**Civilian Deaths**	**Civilian Injuries**
Under 2 years old	2	(10%)	5	(4%)	0.3	0.7
2 years old	6	(26%)	3	(2%)	1.4	0.7
3 years old	1	(5%)	8	(6%)	0.3	1.9
4 years old	6	(26%)	12	(8%)	1.4	2.9
5 years old	4	(17%)	3	(2%)	0.9	0.8
6 years old	0	(0%)	2	(1%)	0.0	0.5
7 years old	0	(0%)	3	(2%)	0.0	0.8
8 years old	0	(0%)	2	(2%)	0.0	0.6
9 years old	0	(0%)	3	(2%)	0.0	0.8
10 years old	0	(0%)	2	(2%)	0.0	0.6
11-14 years old	0	(0%)	12	(9%)	0.0	0.7
15-17 years old	0	(0%)	6	(4%)	0.0	0.4
18-20 years old	0	(0%)	4	(3%)	0.0	0.4
21-34 years old	1	(5%)	34	(24%)	0.0	0.6
35-49 years old	1	(5%)	25	(18%)	0.0	0.4
50-64 years old	1	(5%)	9	(6%)	0.0	0.2
65 years old or more	0	(0%)	6	(4%)	0.0	0.2
Total	22	(100%)	140	(100%)	0.1	0.5
0-4 years old	15	(68%)	27	(20%)	0.7	1.3
0-14 years old	19	(85%)	56	(40%)	0.3	0.9
0-17 years old	19	(85%)	61	(44%)	0.3	0.8

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with heat source unknown and child-playing match fires with victim age unknown.

Source: NFIRS and NFPA survey.

Table 16. Child-Playing Home Fires with Age as a Factor, by Heat Source and Age of Firesetter
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

A. All Heat Sources, Including Matches and Lighters

Age of Firesetter	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Under 2 years old	20	(0%)	0	(0%)	0	(0%)	$1	(1%)
2 years old	140	(4%)	0	(0%)	13	(3%)	$2	(2%)
3 years old	370	(10%)	4	(6%)	65	(16%)	$12	(11%)
4 years old	640	(17%)	20	(27%)	106	(25%)	$20	(19%)
5 years old	580	(16%)	29	(39%)	72	(17%)	$17	(16%)
6 years old	400	(11%)	6	(9%)	45	(11%)	13	(13%)
7 years old	290	(8%)	3	(4%)	29	(7%)	$7	(7%)
8 years old	230	(6%)	1	(1%)	31	(7%)	$6	(6%)
9 years old	170	(5%)	1	(1%)	15	(3%)	$5	(5%)
10 years old	230	(6%)	8	(11%)	11	(3%)	$5	(4%)
11-14 years old	480	(13%)	1	(1%)	29	(7%)	$12	(12%)
15-17 years old	90	(3%)	0	(0%)	4	(1%)	$2	(2%)
18 years old or more	10	(0%)	0	(0%)	1	(0%)	$0	(0%)
Total	3,650	(100%)	74	(100%)	419	(100%)	$102	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with human factor contributing to ignition unknown and child-playing fires with age as a factor and age of firesetter unknown.

Source: NFIRS and NFPA survey.

Table 16. Child-Playing Home Fires with Age as a Factor, by Heat Source and Age of Firesetter (Continued)
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

B. Lighters

Age of Firesetter	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Under 2 years old	0	(0%)	0	(0%)	0	(0%)	$0	(0%)
2 years old	40	(2%)	0	(0%)	7	(3%)	$1	(2%)
3 years old	210	(11%)	2	(5%)	39	(15%)	$7	(13%)
4 years old	390	(20%)	10	(20%)	64	(25%)	$11	(21%)
5 years old	360	(18%)	19	(40%)	55	(22%)	$11	(20%)
6 years old	250	(13%)	6	(12%)	31	(12%)	$8	(15%)
7 years old	160	(8%)	3	(6%)	10	(4%)	$4	(8%)
8 years old	110	(6%)	1	(2%)	17	(6%)	$3	(5%)
9 years old	70	(4%)	0	(0%)	5	(2%)	$2	(4%)
10 years old	110	(6%)	7	(15%)	8	(3%)	$2	(3%)
11-14 years old	220	(11%)	0	(0%)	15	(6%)	$4	(8%)
15-17 years old	30	(2%)	0	(0%)	3	(1%)	$1	(1%)
18 years old or more	0	(0%)	0	(0%)	1	(0%)	$0	(0%)
Total	1,960	(100%)	48	(100%)	255	(100%)	$54	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with unknown heat source, child-playing lighter fires with human factor contributing to ignition unknown, and child-playing lighter fires with age as a factor and age of firesetter unknown.

Source: NFIRS and NFPA survey.

Table 16. Child-Playing Home Fires with Age as a Factor, by Heat Source and Age of Firesetter (Continued)
Annual Average of 2004-2008 Fires Reported to U.S. Municipal Fire Departments

C. Matches

Age of Firesetter	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Under 2 years old	0	(1%)	0	(0%)	0	(0%)	$0	(0%)
2 years old	10	(2%)	0	(0%)	1	(1%)	$0	(2%)
3 years old	50	(8%)	1	(6%)	9	(14%)	$2	(10%)
4 years old	90	(15%)	8	(44%)	18	(28%)	$4	(22%)
5 years old	110	(17%)	6	(32%)	10	(16%)	$4	(19%)
6 years old	70	(10%)	1	(6%)	6	(10%)	$2	(13%)
7 years old	60	(9%)	0	(0%)	2	(3%)	$2	(9%)
8 years old	50	(8%)	0	(0%)	8	(12%)	$1	(8%)
9 years old	50	(7%)	1	(6%)	2	(3%)	$1	(5%)
10 years old	40	(6%)	0	(0%)	1	(2%)	$0	(1%)
11-14 years old	100	(16%)	1	(6%)	7	(11%)	$2	(10%)
15-17 years old	10	(2%)	0	(0%)	0	(0%)	$0	(0%)
18 years old or more	0	(0%)	0	(0%)	0	(0%)	$0	(0%)
Total	650	(100%)	19	(100%)	64	(100%)	$19	(100%)

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. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Estimates include a proportional share of fires with Factor Contributing to Ignition coded as unknown, blank, or none. Totals may not equal sums because of rounding. All fires attributed to "playing" are included, and so statistics may not be limited to fire-play by children. Estimates include a proportional share of child-playing fires with unknown heat source, child-playing match fires with human factor contributing to ignition unknown, and child-playing fires with age as a factor and age of firesetter unknown.

Source: NFIRS and NFPA survey.

Educational Approaches to Reducing the Child-Playing Fire Problem

Educational approaches seek to accomplish either or both of the following:

(1) Teach parents and other caregivers to keep matches and lighters out of reach and out of sight of children and,
(2) Teach children, especially those in the target age groups, not to play with fire.

Ditsa Kafry studied 99 randomly selected boys from grades K-4 in the Berkeley, California school district in the late 1970s and found that 45% had engaged in fire-play and 21% caused fires through their fire-play.[7] Of the fires set, 18% were set by children who were aged two or younger when they set the fires. By contrast, in 2004-2008 child-playing home structure fires reported to fire departments where age was a factor, only 4% of firesetters were age 2 or younger and only 2% if the heat source was a match or lighter.

"Studies of children in major cities in the U.S. and Canada, over a number of years, have found children's fireplay is common. Studies in Rochester, NY, and Portland, OR from 1990 to 2002 found more than half of children reported having played with fire by the time they were out of elementary school. A similar study in Surrey, British Columbia, found more than 80% of girls and 88% of boys had played with fire by the time they were in high school.

"More recent studies continue to find that fireplay is common. A 2005 study of almost 4,000 adolescents in grades 7 to 12 in Ontario, Canada, found that two-thirds reported having played with fire in their lifetimes, and nearly a third reported firesetting during the past 12 months."[8]

It may be that firesetting behavior is more common in cities than in the country as a whole, but it is very likely that a large fraction of children, or at least of boys, play with fire.

It is also clear that educational programs need to reach at least down to age 3, and ideally even younger, in order to reach children before any of them engage in firesetting behavior.

NFPA tested a television public service announcement (PSA) designed to teach preschoolers to tell grown-ups if they see matches or lighters. The test, conducted with children age 3 to 6 in several day-care centers in low-income communities in Boston and in schools in several towns near Boston, found that children ages 3 to 4 – the primary target group – did not sufficiently comprehend the message without interaction with an adult. As a result, NFPA concluded that effective strategies needed to focus on the NFPA preschool curriculum, where children interact with adults when learning a match or lighter lesson, and on other messages targeted on caregivers.

The NFPA *Learn Not to Burn® Preschool Program* emphasizes eight key behaviors to reduce fire deaths and injuries among children ages 3 to 5 years old. Behavior #2 is "tell a grown-up

[7] Ditsa Kafry, "Playing with Matches: Children and Fire," *Fires and Human Behavior*, 2nd edition, London: David Fulton Publishers, 1990, Chapter 4.
[8] Robert E. Cole, Daryl Sharp, and Carolyn E. Kourofsy, "Counseling children who play with fire," accessed at http://www.fireproofchildren.com on September 20, 2010.

when you find matches or lighters." Of three evaluations of the program, the West Virginia evaluation (of students from 3 to 5 years) provided separate pre-test versus post-test results on learning for the individual behaviors.[9] Grading assigned 10 points when the student performed all of the behavior, 5 points for part of the behavior, and 0 points for unable to answer or wrong answer. Three questions related to this behavior, and all showed improvement from pre-test to post-test:

- Ability to correctly identify a matchbook when shown one (up from 59% of student getting full credit and 84% getting full or partial credit in pre-test to 92% full and 96% full or partial in post-test).
- Ability to correctly identify a cigarette lighter when shown one (up from 59% of students getting full credit and 76% getting full or partial credit to 86% full and 90% full or partial).
- Correct answer (tell a grown-up) to "Let's say that you were alone in a room and you found matches or a cigarette lighter. What would you do?" (up from 37% of students getting full credit and 67% getting full or partial credit to 90% full and 92% full or partial).

The LNTB Preschool Program includes a letter to be delivered to parents or caregivers, and that letter contains the program's instruction to keep matches and lighters "up high out of the reach of children, preferably in a locked cabinet." A more substantial component of parent education can be part of a community programs designed for adults and children and typically arranged and conducted by the local fire department. One resource available for use in these locally customized programs is a free 8-minute NFPA video, "A Lighter Is Not a Toy," which can be requested through NFPA's public education division.

Despite the title of this video, NFPA and many other sources of public educational materials have moved away from the message that lighters and matches are tools for adults rather than toys, because "tool" and "toy" are themselves somewhat advanced concepts that also would have to be taught. Instead, the "tell a grown-up" behavior is linked to the simpler and more generic behavior "to stay away from hot things that can hurt," which is Behavior #1 in the LNTB Preschool Program.

The LNTB Preschool Program and the NFPA lighter video are both designed primarily for children whose firesetting stems from normal curiosity. Studies of firesetting behavior have demonstrated that many young children who start fires are in crisis. They may be crying for help or reacting to other stressful life experiences. It is important that any child suspected of starting fires be assessed by knowledgeable parties so that he or she may be treated in a manner appropriate to the circumstance.

Age, gender, family type, and socioeconomic status are all characteristics correlated with children involved in firesetting behavior.[10] Paul Schwartzman discusses each characteristic in Section 5, Chapter 6, in the *Fire Protection Handbook*, 20th edition.

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[9] Pamela A. Powell, *1995 Learn Not to Burn® Preschool Program Evaluation in West Virginia*, unpublished report to Sharon Gamache, NFPA, December 1995.

[10] Paul Schwartzman, "Juvenile Firesetting," *Fire Protection Handbook*, Volume I, 20th edition, Section 5: Fire and Life Safety Education, 2008.

Schwartzman highlighted findings from a Rochester, New York study that tracked fire incidents over nine years to determine the involvement of children, ages 18 months to 18 years. Schwartzman found that the majority of incidents involved children between the ages of 4 and 9. In this study, females told interviewers that they lit matches and lighters, while males said they used lit matches and lighters to ignite other things.

In addition to these age and gender patterns, poverty is highly correlated with firesetting and firesetting is somewhat overrepresented in single-parent homes, most likely due to increased stress and decreased supervision.

The last strategy based on behavior change is counseling of identified firesetters. The National Fire Academy offers several courses to provide the skills and tools necessary to become a juvenile firesetter intervention specialist. (See www.usfa.dhs.gov.)

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 by 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 http://www.nfirs.fema.gov/. Copies of the paper forms may be downloaded from http://www.nfirs.fema.gov/documentation/design/NFIRS_Paper_Forms_2008.pdf.

NFIRS has a wide variety of data elements and code choices. The NFIRS database contains coded information. 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 impossible 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, methodological and definitional changes can occur. *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.*

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 50,000 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 and 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*. To download a free copy of the report, visit http://www.nfpa.org/assets/files/PDF/OS.fireloss.pdf.

Projecting NFIRS to National Estimates

As noted, NFIRS is a voluntary 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, so no one can say with confidence that they are or are not serious problems. But there is enough reason for concern so that a second database -- the NFPA 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 survey where its statistical design advantages are strongest.

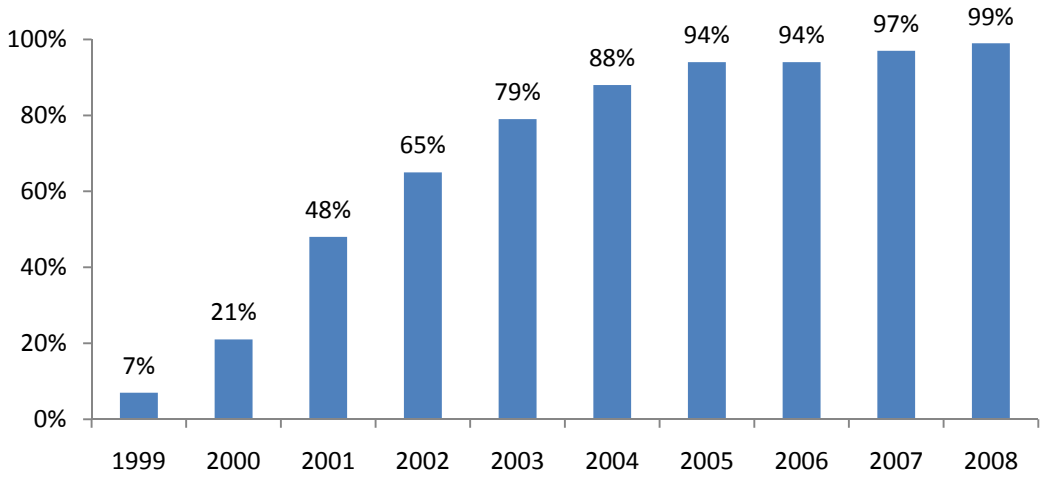
Scaling ratios are obtained by comparing NFPA's projected totals of residential structure fires, non-residential structure fires, vehicle fires, and outside and other fires, and associated civilian deaths, civilian injuries, and direct property damage with comparable totals in NFIRS. Estimates of specific 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 NFPA's analyses.

Analysts at the NFPA, the USFA and the Consumer Product Safety Commission developed the specific basic analytical rules used for this procedure. "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. A copy of the article is available online at http://www.nfpa.org/osds or through NFPA's One-Stop Data Shop.

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.

Figure 1 shows the percentage of fires originally collected in the NFIRS 5.0 system. Each year's release version of NFIRS data also includes data collected in older versions of NFIRS that were converted to NFIRS 5.0 codes.

Figure 1. Fires Originally Collected in NFIRS 5.0 by Year



For 2002 data on, analyses are based on scaling ratios using only data originally collected in NFIRS 5.0:

NFPA survey projections
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.

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 (typically 10-20%). 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 alls 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.

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, 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.*

In the formulas that follow, the term "all fires" refers to all fires in NFIRS on the dimension studied.

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 electrical failure or malfunction (factor contributing to ignition 30-39) are combined and shown as "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.

Type of Material First Ignited (TMI). This field is required only if the Item First Ignited falls within the code range of 00-69. NFPA has created a new code "not required" for this field that is applied when Item First Ignited is in code 70-99 (organic materials, including cooking materials and vegetation, and general materials, such as electrical wire, cable insulation, transformers, tires, books, newspaper, dust, rubbish, etc..) and TMI is blank. The ratio for allocation of unknown data is:

$$\frac{\text{(All fires – TMI Not required)}}{\text{(All fires – TMI Not Required – Undetermined – Blank)}}$$

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 as 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. (Confined fire incident types are not discussed here)

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	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
Wiring, switch or outlet	210	Unclassified electrical wiring
	211	Electrical power or utility line
	212	Electrical service supply wires from utility
	214	Wiring from meter box to circuit breaker
	216	Electrical branch circuit
	217	Outlet, receptacle
	218	Wall switch
Power switch gear or overcurrent protection device	215	Panel board, switch board, circuit breaker board
	219	Ground fault interrupter
	222	Overcurrent, disconnect equipment
	227	Surge protector
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

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

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."

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.