Home Fire Victims by Age and Gender

Marty Ahrens
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Key Findings

Home is a word most people associate with safety and comfort. However, the majority of fire deaths and injuries are caused by fires in the home.¹

Males were more likely to be killed or injured in home fires than females and accounted for larger percentages of the victims. (57% of the deaths and 54% of the injuries).

Those at highest risk do not necessarily account for the largest number of casualties. Although people 85 and over had the highest rate of fire death and injuries per million population, they only account for 2% of the population. Consequently, the actual number of victims that age is smaller than victims in most lower-risk age groups.

The largest number of deaths (19%) in a single age group was among people 55-64. Twelve percent of the population was in that age group.

- Half (50%) of the victims of fatal home fires were between 25 and 64, as were three of every five (62%) of the non-fatally injured.
- One-third (33%) of the fatalities were 65 or older; only 15% of the non-fatally injured were in that age group.
- Children under 15 accounted for 12% of the home fire fatalities and 10% of the injuries. Children under five account for 6% of the deaths and 4% of the injuries.
- Adults of all ages had higher rates of non-fatal fire injuries than children. Less variation is seen in non-fatal injury rates between age groups than with death rates.

The risk associated with different fire causes varies by age group.

- While smoking materials were the leading cause of home fire deaths overall, this was true only for people in the 45-84 age groups.
- For adults 85 and older, cooking was the leading cause of fire death.

Supporting tables are available here.

¹ Homes include one- or two-family homes, including manufactured homes, and apartments or other multi-family housing.
Home Fire Deaths and Injuries by Age Group

Understanding patterns of age and gender among five victims is critical to developing appropriate, targeted prevention strategies. Victim patterns by age groups can be described in terms of actual estimates, percentages of all casualties, or death and injury rates per million population. Because of the different characteristics of young people at different ages, this study uses five-year spreads until age 24 and 10-year spreads until age 85.

Figure 1 shows that the largest number of deaths in a single age group was among people 55-64. While the home fire death rate per million population for those 85 and older was 3.3 times that of the overall population, only 2% of the population was in that age group. Consequently, the number of deaths in that age group is much smaller. Half (50%) of the fatal home fire victims and almost two-thirds (62%) of the people injured in home fires were between 25 and 64.

Figure 1. Home fire deaths and injuries by age group
2011-2015 annual averages

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Deaths</th>
<th>Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 5</td>
<td></td>
<td></td>
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<tr>
<td>5-9</td>
<td>150</td>
<td>510</td>
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<td>540</td>
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</table>
Figure 2 shows the death and injury rates per million population for reported home fires. Much of the fire prevention efforts are targeted to children and older adults as these groups have traditionally been seen as those at most risk.

Yet today, children below the age of 5 are at lower risk of fire death than people over 45. To effectively reduce fire deaths and injuries, attention must be focused on the groups with the largest number of casualties.

**Figure 2.**
Home fire death and injury rates per million population by age group
2011-2015 annual averages

### A. Death rates

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Deaths per million population</th>
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<tbody>
<tr>
<td>Under 5</td>
<td>7.5</td>
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<tr>
<td>5-9</td>
<td>4.9</td>
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<tr>
<td>10-14</td>
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<tr>
<td>15-19</td>
<td>2.4</td>
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<td>4.3</td>
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<td>35-44</td>
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<td>8.8</td>
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<td>55-64</td>
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</tr>
<tr>
<td>Total</td>
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</table>

### B. Injury rates

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Injuries per million population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 5</td>
<td>25.5</td>
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<tr>
<td>5-9</td>
<td>16.2</td>
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<tr>
<td>10-14</td>
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<tr>
<td>15-19</td>
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<td>54.2</td>
</tr>
<tr>
<td>Total</td>
<td>38.8</td>
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</tbody>
</table>
Figure 3 shows that the decrease in the death toll among preschoolers has been particularly pronounced since the mid-1990s. In July 1994, the U.S. Consumer Product Safety Commission’s (CPSC’s) requirements for child resistance in disposable lighters took effect. This regulation was very successful.

Since 1996, the fire death rate of children under five has been consistently lower than that of those 65 and older. An increase in indoor smoking bans, particularly in homes with smokers and children, has likely played a role as well. The reduction in adult smoking may have also made it harder for young children to obtain matches and lighters.

Why are there breaks in trend graphs?

NFIRS 5.0 was gradually introduced beginning in 1999. Due to limited participation in 1999-2001, estimates for these years are unstable and should be used with caution. They are shown in the supporting tables but not in the graphs.

CPSC’s study of unreported residential fires found that households in which at least one person was 65 or older had lower rates of fire (both reported and unreported) per 100 households than any other age group. While fire rates increased with the size of the household, the older adult household rate was less than half the rate seen in one-member households.

This suggests that older adults are actually much less likely than the general population to have a fire, but if they do, their risk of death may be even worse than their already higher death rate per million population indicates.
Home Fire Victims by Gender

More males are born than females. However, women tend to live longer than men. Women start to outnumber men in the 35-44 year old age group. There are roughly twice as many women who are at least 85 as there are men.

According to US Census Bureau data, 51% of the population is female. Figure 4 shows that males in the U.S. have a higher risk of fire death and injury in home structure fires, accounting for more than half of the people killed or injured. Males were 1.2 times as likely as females to be fatally injured in a home fire and 1.1 times as likely to suffer non-fatal injuries.

Figure 5 shows the estimated home fire deaths and injuries by age and gender. The gap between male and female narrows from 65 on. For injuries the trend is already reversed in the 65-74 age group. One could be tempted to think that this narrowing of the gap and ultimate reversal is due to more women than men after the age of 35. However, Figure 6 shows that the death rate is much higher for males than females at all ages.

While injury rate differences between the genders are generally smaller than the differences in death rates, older men have slightly higher rates. Males who were injured in home fires were more likely to have been hurt while engaged in fire control or rescue than females. The population most at risk of fire death and injury varies by the cause of fire. For example, more than half of the people injured or killed in candle fires were female. Middle-aged men were the most frequent victims of fatal intentional home fires. While males had a higher population-based death rate from cooking fires, women 75 and older had higher cooking fire death rates than elderly men. The next section on leading causes of fire deaths and injuries by age group and gender provides more details.

The higher death rates of males are not limited to fire deaths. Susan Sorenson noted that males have higher rates of both intentional and unintentional injury. She wrote that "Gender disparities in injury mortality are consistent and persistent. Gender patterns in injury mortality do not follow typical social justice analyses of health, in that men are greater risk."3

Figure 4. Gender of home fire victims: 2011-2015 annual averages

A. Home fire deaths

- Males, 1,440, 57%
- Females, 1,070, 43%

B. Home fire injuries

- Males, 6,630, 54%
- Females, 5,670, 46%
Figure 5. Estimated home fire deaths and injuries by age group and gender:
2011-2015 annual averages

A. Deaths

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Under 5</th>
<th>5-9</th>
<th>10-14</th>
<th>15-19</th>
<th>20-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
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<th>75-84</th>
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<tbody>
<tr>
<td>Males</td>
<td>60</td>
<td>40</td>
<td>30</td>
<td>40</td>
<td>20</td>
<td>110</td>
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<td>230</td>
<td>300</td>
<td>210</td>
<td>140</td>
<td>70</td>
</tr>
<tr>
<td>Females</td>
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<td>40</td>
<td>30</td>
<td>40</td>
<td>20</td>
<td>110</td>
<td>130</td>
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<td>300</td>
<td>210</td>
<td>140</td>
<td>70</td>
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B. Injuries

<table>
<thead>
<tr>
<th>Age Group</th>
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<th>5-9</th>
<th>10-14</th>
<th>10-14</th>
<th>15-19</th>
<th>20-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>65-74</th>
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<th>85+</th>
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<td>Males</td>
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<td>600</td>
<td>1,160</td>
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<tr>
<td>Females</td>
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<td>200</td>
<td>350</td>
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<td>800</td>
<td>800</td>
<td>310</td>
<td>110</td>
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</table>

Figure 6. Home fire death and injury rates by age group and gender: 2011-2015

A. Deaths

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Under 5</th>
<th>5-9</th>
<th>10-14</th>
<th>15-19</th>
<th>20-24</th>
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<th>65-74</th>
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<tr>
<td>Males</td>
<td>6.2</td>
<td>4.8</td>
<td>2.5</td>
<td>2.6</td>
<td>2.4</td>
<td>4.9</td>
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B. Injuries

<table>
<thead>
<tr>
<th>Age Group</th>
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<th>5-9</th>
<th>10-14</th>
<th>10-14</th>
<th>15-19</th>
<th>20-24</th>
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<th>45-54</th>
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<th>65-74</th>
<th>75-84</th>
<th>85+</th>
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</thead>
<tbody>
<tr>
<td>Males</td>
<td>13.9</td>
<td>18.4</td>
<td>14.7</td>
<td>14.7</td>
<td>28.9</td>
<td>32.4</td>
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<td>46.8</td>
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<td>52.5</td>
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<tr>
<td>Females</td>
<td>18.3</td>
<td>18.3</td>
<td>18.3</td>
<td>18.3</td>
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</tr>
</tbody>
</table>
Leading Causes of Fire Deaths and Injuries by Age Group and Gender

Fire can start in many different ways. Figure 7 shows that the leading cause varies for number of fires, deaths and injuries. Figures 8-11 show death and injury estimates and rates per million population by cause and age group.

Figure 7. Leading fire causes for home fires, deaths and injuries, 2011-2015

![Bar chart showing leading causes of fire deaths and injuries by age group and gender from 2011 to 2015. Cooking is the leading cause with 47% fires, 45% deaths, and 20% injuries. Other causes include Heating (15% fires, 19% deaths, 10% injuries), Electrical distribution or lighting (9% fires, 18% deaths, 10% injuries), Intentional (8% fires, 15% deaths, 7% injuries), Smoking materials (5% fires, 22% deaths, 10% injuries), Candles (2% fires, 3% deaths, 7% injuries), and Playing with heat source (2% fires, 3% deaths, 5% injuries).]

Source: NFPA’s 2017 report, Home Structure Fires, by Marty Ahrens

ESTIMATES AND RATES OF HOME FIRE DEATHS AND INJURIES BY CAUSE OF FIRE

Figures 8-11 show death and injury estimates and rates per million population by age group for the leading causes of these casualties. A brief overview is provided for each of the causes. More information is in the detailed tables at https://www.nfpa.org/News-and-Research/Data-research-and-tools/Building-and-Life-Safety/Characteristics-of-home-fire-victims. Causes are not mutually exclusive when they have been pulled from different data elements. The causes shown account for at least 5% of injuries or deaths and have clear prevention strategies or have historically been of interest. See NFPA’s Methodology and Definitions Used in “Leading Causes of Structure Fires” Tables for more information about how these causes are defined and calculated.
Figure 8. Estimated home fire deaths by age group and fire cause
2011-2015 annual averages

- Smoking materials
- Cooking
- Heating
- Electrical distribution or lighting
- Intentional
- Candle
- Playing with heat source

Under 5: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

5-9: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

10-14: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

15-19: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

20-24: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

25-34: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

35-44: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

45-54: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

55-64: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

65-74: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

75-84: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source

85+: Smoking materials, Cooking, Heating, Electrical distribution or lighting, Intentional, Playing with heat source
Figure 9. Estimated home fire injuries by age group and fire cause
2011-2015 annual averages

- Smoking materials
- Cooking
- Heating
- Electrical distribution or lighting
- Intentional
- Candle
- Playing
Figure 10. Home fire deaths per million population by age group and fire cause
2011-2015 annual averages

Deaths per million population

Under 5 5-9 10-14 15-19 20-24 25-34 35-44 45-54 55-64 65-74 75-84 85+ Total

- Smoking materials
- Cooking
- Heating
- Electrical distribution or lighting
- Intentional
- Candle
- Playing

2011-2015 annual averages
Figure 11. Estimated home fire injuries per million population by age group and fire cause
2011-2015 annual averages

- Smoking materials
- Cooking
- Heating
- Electrical distribution or lighting
- Intentional
- Candle
- Playing

Injuries per million population

- Under 5
- 5-9
- 10-14
- 15-19
- 20-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65-74
- 75-84
- 85+
- Total
SMOKING MATERIALS

During 2011-2015, an estimated annual average of 18,300 home structure fires started by smoking materials killed an average of 560 (22%) people and caused 1,200 (10%) reported non-fatal injuries. Overall smoking materials were the leading cause of home fire deaths, but this was true only for people in the 45-84 age groups. Population-based death rates were similar for both genders, but the male rate of smoking material fire injuries was 30% higher than the rate for females.

Child casualties are unusual in these fires. A growing percentage of households with children have banned smoking inside the home. According to data from the Tobacco Use Supplements to the Current Population Survey, complete bans on smoking inside the home have become more common across the population. In 2010-2011, three of every five homes with at least one smoker and child under 18 banned indoor smoking. This was true for only 10% of such households in 1992-1993. In 1990-1994, an average of 70 children under five died per year in fires started by smoking materials compared to less than ten per year in 2011-2015.

COOKING

We all need to eat. Some type of cooking occurs in almost all homes. Unfortunately cooking is also a significant cause of fires, deaths and injuries. Cooking was the leading cause of fire death among people 85 and older and the leading cause of fire injury in all age groups. While the cooking death rate per million population increases from 45 up, the injury rate is highest in the 20-44 age groups and for people 85 and older.

Cooking is such a normal part of daily life that it is easy to forget how hot the temperatures used really are and how high the risk of fire really is.

During 2011-2015, an estimated annual average of 170,200 home cooking fires killed an average of 510 (20%) civilians and caused 5,470 (45%) reported non-fatal injuries. Figure 10 shows that among older adults, the rate of deaths caused by cooking increases with age.

More than half (55%) of the civilians non-fatally injured in home cooking fires were hurt while trying to control the fire themselves. This is consistent with the higher injury rates seen among young and middle-age adults. While many people have safely extinguished cooking fires on their own, some actions make the fire worse.

- Investigators believe that a Maine man threw water on a pan of cooking oil that ignited after he fell asleep in an adjacent room while waiting for the oil to heat. This caused the fire to spread rapidly. He succumbed to burn and smoke inhalation injuries.

New technologies that reduce the likelihood of a cooking fire should be promoted, as should more education about appropriate ways to control various types of cooking fires.

Less than 1% of all reported cooking fires started with clothing ignitions, but these fires caused 18% of the deaths. Eighty-two percent of the victims were 65 or older; those 85 and older had the highest risk of these deaths.
• An elderly Oklahoma woman was fatally burned when a flame from the gas stove ignited her clothes as she was trying to make coffee. She called the fire department to report that her clothing was on fire and she could not escape on her own. She died at the hospital.  

• An Alabama health services worker alerted the fire department to a fire in a nearby building. An elderly woman with a mobility disability was cooking when the stove’s burner ignited her sleeve. She fell before she could reach the phone or put out the fire. While the smoke alarm did sound, investigators believe that there was a half-hour delay before 911 was called. She was not found during a primary search. With a thermal imaging camera and additional flashlight, crews found her between the kitchen and dining room during a secondary search. She died at the hospital. 

While clothing with shorter or tight-fitting sleeves is important for all cooks, this is especially critical for older adults and those with mobility disabilities.

The overall rate of cooking fire deaths per million population was 26% higher for males while the injury rate was identical for both genders. However, women 75 and older had cooking fire death rates that were higher than the rate for men. Female cooking fire injury rates were higher than male rates for those 55 and older.

For more information, see NFPA’s report, *Home Fires Involving Cooking Equipment.*

**HEATING**

During 2011-2015, an estimated average of 54,000 home fires involving heating equipment per year killed an average of 480 (19%) civilians annually and caused 1,470 (12%) reported non-fatal injuries per year.

Heating was the leading cause of fire deaths in the under 5 and the 5-9 age groups.

• In 2016, a poorly installed wood-burning heater caused a Georgia manufactured home fire that killed two adults and four children under four.

• After a kerosene heater tipped over in an Ohio manufactured home and ignited the carpet and paneling, fire spread rapidly. The family was using the heater to save on heating bills. Three children died in the fire.

Central heating equipment is much less likely to be involved in a fire than is a space heater. When a central heating fire does occur, it is much less likely to result in death or injury than are space heater fires. Reducing the use of space heaters reduces the risk of fatal fire. For more information, see NFPA’s report, *Home Fires Involving Heating Equipment,* by Richard Campbell.
ELECTRICAL DISTRIBUTION AND LIGHTING EQUIPMENT

During 2011-2015, an estimated average of 34,000 home fires involving electrical distribution or lighting equipment killed an estimated average of 440 (18%) civilians annually and caused 1,170 (10%) reported non-fatal injuries per year. Wiring and outlets or receptacles were involved in more than half (56%) of the deaths from these fires; cords, particularly extension cords or plugs, were involved in more than one-quarter (28%); and lamps, light fixtures or light bulbs were involved in 13%.12

Fifty-eight percent of the people killed in these fires were at least 55 years old. People 85 and older had the highest death and injury rates per million population. Older adults are more likely to live in older homes. Older homes often have wiring that does not meet today’s codes. These homes may not have enough outlets or the capacity to safely power all of the appliances used by today’s consumers. Outlets may be overloaded and extension cords may be used unsafely. Electrical systems may be showing signs of age. Overall, 56% of households live in homes built before 1970.13

- An elderly North Carolina couple were killed by an early-morning fire caused by an extension cord that overheated due to a space heater that had been plugged into it. Melting was seen in the extension cord. An electrical arc ignited material on the sofa and bedding, and the fire then spread. It appeared the man tried to fight the fire. The woman had a mobility disability.14
- An elderly New York woman with limited mobility died in a fire that began in a wooden attachment that held the furnace for her manufactured home. Investigators learned that the victim, out of fuel oil, had plugged two space heaters and an electric blanket into the same circuit. The overheated wiring ignited framing at floor level of the attachment, with the fire spreading up studs and breaking out at the ceiling.15

For more information, see NFPA’s report on electrical fires by Richard Campbell.

INTENTIONALLY SET HOME FIRES

During 2011-2015, an estimated average of 28,900 (8%) intentionally set home structure fires per year killed an estimated average of 360 (15%) civilians annually and caused 870 (7%) reported non-fatal injuries per year. There is some overlap between intentionally fires and those in which playing with heat source was a factor contributing to ignition.

Three out of five (58%) people killed in intentional home fires were between 35 and 64 years of age. The highest fire death rate for these fires overall was seen in people 45-64. Two-thirds (68%) of the victims of fatal intentional fires were male.

Queries of death certificate data for suicide and homicide fire or flame deaths in 2011-2015 showed that two-thirds (66%) were suicide rather than homicide. The query could not be restricted to home fire deaths.16 Conventional fire prevention and fire protection methods are unlikely to be effective in preventing suicide by fire. If a risk is identified, mental health services are needed.

Traditional fire protection methods can prevent many, if not most, casualties from fires intentionally set by others.

- A 43-year-old Connecticut man died of smoke inhalation after he intentionally set books, magazines, CDs and CD cases on fire in his apartment. Another occupant of the 50-unit building called 911 after hearing the fire alarm. Fire damage was limited to the apartment of origin.17
**CANDLES**

During 2011-2015, the estimated average of 8,700 home fires per year started by candles killed an average of 80 (3%) civilians annually and caused 800 (7%) reported non-fatal injuries per year. More than half (56%) of the fatal fire victims were female, as were 52% of the non-fatally injured.

Almost half (47%) of the victims of fatal candle fires were at least 55 years old. The highest candle fire death rates were seen in women 75 and older. Almost three-quarters of the injured were between 20 and 64.

**PLAYING WITH HEAT SOURCE**

During 2011-2015, an estimated average of 6,100 home structure fires per year caused by someone playing with fire or other heat source killed an average of 60 (3%) and injured 560 (5%) people per year. It is important to remember that in some cases, the child who died was not the child who started the fire.

Almost two-thirds (63%) of the people killed by these fires were under 15 years old. The highest injury rate from home fire play was seen among boys under 15, followed by women between 20 and 34. It is possible that these women were parents or caretakers of young children.

Only one in five (20%) females injured in these fires was under 15 compared to nearly half (47%) of the males in that age group.

- A young Illinois girl was fatally injured after another child started a fire in a bedroom of an Illinois multi-family residence. Her mother used pitchers of water in an unsuccessful attempt to put out the fire, than grabbed both children to evacuate. Once outside, she discovered her daughter was not with her. Due to the fire conditions, she was unable to rescue the child.18

In NFPA’s 2014 report, *Playing with Fire*, Richard Campbell wrote that 83% of home structure fires caused by playing were started by males, and 43% were started by children under six. Older children were more likely to start outside fires.19

**Methodology**

Unless otherwise specified, the statistics in this analysis are national estimates of fires reported to U.S. local fire departments and so exclude fires reported only to federal or state agencies or industrial fire brigades. The 2011-2015 estimates are projections based on the detailed information collected in Version 5.0 of the U.S. Fire Administration’s [National Fire Incident Reporting System (NFIRS)](https://www.nfirs.gov) (NFIRS 5.0) and the National Fire Protection Association’s (NFPA’s) annual fire department experience survey. Fires with unknown or unreported data were typically allocated proportionally in calculations of national estimates. Estimates may be skewed by the inclusion or exclusion of one unusually serious fire. Only civilian (non-firefighter) casualties are discussed in this analysis. Estimates of zero may be true zeroes or may have rounded to zero. Percentages were calculated on unrounded estimates. For more information, see “How NFPA’s National Estimates Are Calculated for Home Structure Fires.”

The causes shown are those that are well defined and have clear prevention strategies or have historically been of interest. The data comes from several NFIRS data elements. For more information, see “Methodology and Definitions Used in “Leading Causes of Structure Fires”
See *Fire Home Fire Victims by Age and Gender: Supporting Tables* for more detailed information about the material presented in this report.

Population data from the U.S. Census American Community Survey were used to calculate fire death and injury rates by age groups for different causes. Census data were used for annual rates by age group in the trend tables. Only deaths and injuries that were reported to local fire departments are included in the data.

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**References**


