



RESEARCH



Playing with Fire: Structure Fires

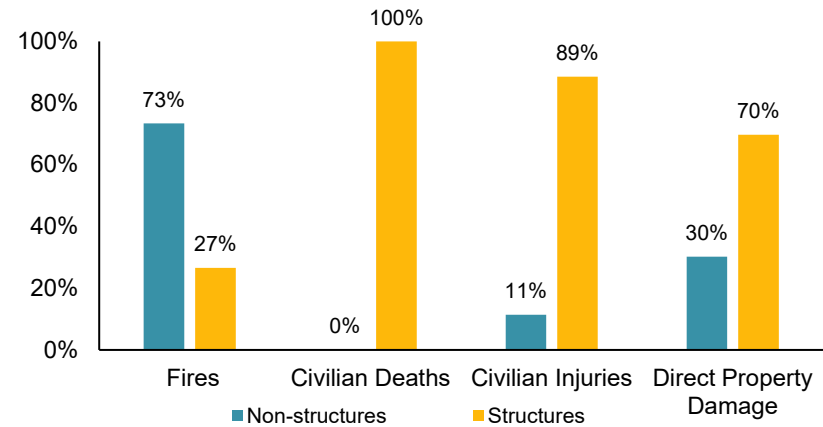
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Fires Caused by Playing with Fire

Municipal fire departments responded to an estimated annual average of 30,460 fires caused by playing with fire in 2014–2018. These fires resulted in an estimated 50 deaths, 510 injuries, and \$205 million in direct property damage each year. The vast majority of these fires were incidents that did not involve structures; these incidents included outside or unclassified fires, outside trash or rubbish fires, and vehicle fires. Structure fires accounted for the largest shares of the losses from the fires caused by fire play, including all of the deaths, nearly three-quarters of the fires caused by playing with fire were non-structure fires, as shown in Figure 1.

This report focuses on fires in **homes and non-home structures** caused by playing with fire. Non-structure fires are the subject of a separate report.

Figure 1. Fires Caused by Playing with Fire by Incident Type: 2014–2018 Annual Averages



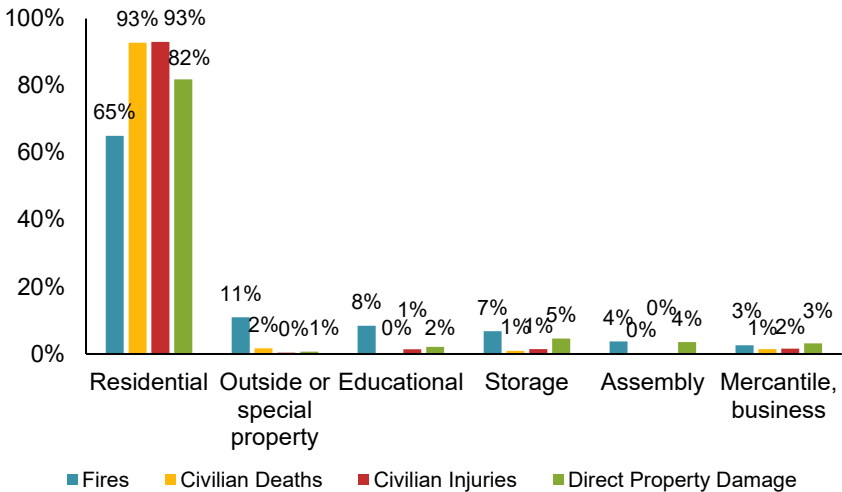
Structure Fires Caused by Playing with Fire

In 2014–2018, municipal fire departments in the US responded to an estimated 8,100 structure fires each year that were caused by playing with fire. These fires resulted in an estimated 50 civilian deaths, 450 civilian injuries, and \$143 million in direct property damage each year. Children

were responsible for the vast majority of the incidents that involved playing with fire.

As shown in Figure 1, more than three in five structure fires caused by playing with fire in 2014–2018 occurred in residential properties. These fires accounted for even greater shares of the civilian deaths, injuries, and direct property damage associated with fires due to fire play, as shown in Figure 2.

Figure 2. Fires Caused by Playing with Fire by Property Use: 2014–2018

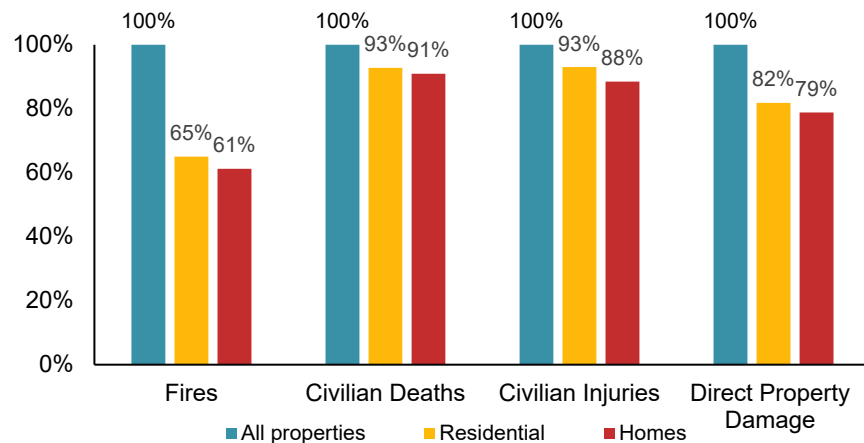


Outside or special properties were the second leading site of fires caused by playing with fire, accounting for approximately one in ten fires, but minimal losses. Educational properties and storage properties were the next leading locations and were also associated with minimal losses, although storage properties accounted for the second-highest share of direct property damage in fires due to fire play.

Home Structure Fires Caused by Playing with Fire

Of the residential properties that account for the greatest share of the structure fires caused by playing with fire, the vast majority of these involve homes, as shown in Figure 3.¹ In 2014–2018, playing with fire is estimated to have caused 4,960 home structure fires each year. These fires caused an estimated 50 civilian deaths, 400 civilian injuries, and \$112 in direct property damage each year. The predominance of homes as venues for fires caused by fire play is not a new phenomenon, and it represents a finding consistent with earlier versions of this report.

Figure 3. Home Fires as a Share of Residential Fires Caused by Playing with Fire: 1990–2018

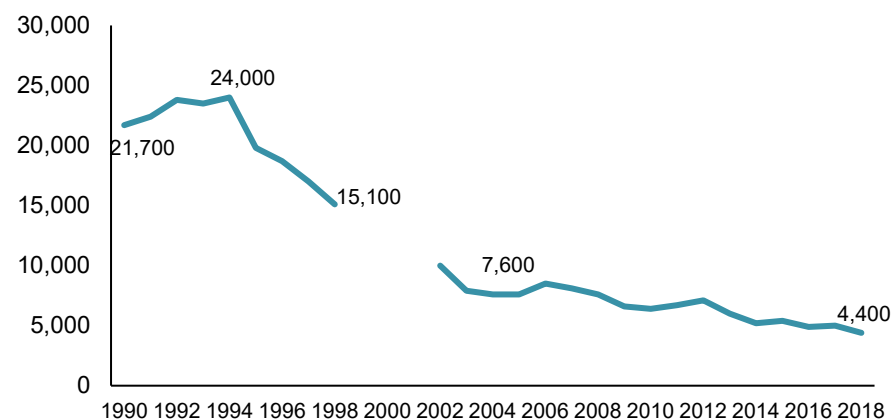


The number of home fires caused by playing with fire has fallen dramatically over the past 30 years. Since 1990, home fires caused by playing with fire have fallen by 80 percent, from nearly 22,000 fires in 1990 to an estimated 4,400 fires in 2018. See Figure 4.

The losses associated with these fires have also shown a substantial decline over the past three decades. Civilian deaths have fallen by 85 percent, from 330 deaths in 1990 to 50 deaths in 2018. Injuries have

fallen from an estimated 2,250 injuries in 1990 to 480 injuries in 2018, a 79 percent decrease. Direct property losses, adjusted for inflation, have fallen by 69 percent, from \$396 million (in 2018 dollars) in 1990 to \$122 million in 2018. [Research](#) has shown that a safety standard requiring disposable cigarette lighters to be child-resistant has been instrumental in reducing fire deaths, injuries, and direct property damage since it came into effect in 1994. More detailed information on these fires by year is available in Table 1 of the [accompanying tables](#).

Figure 4. Home Fires Caused by Playing with Fire: 1990–2018



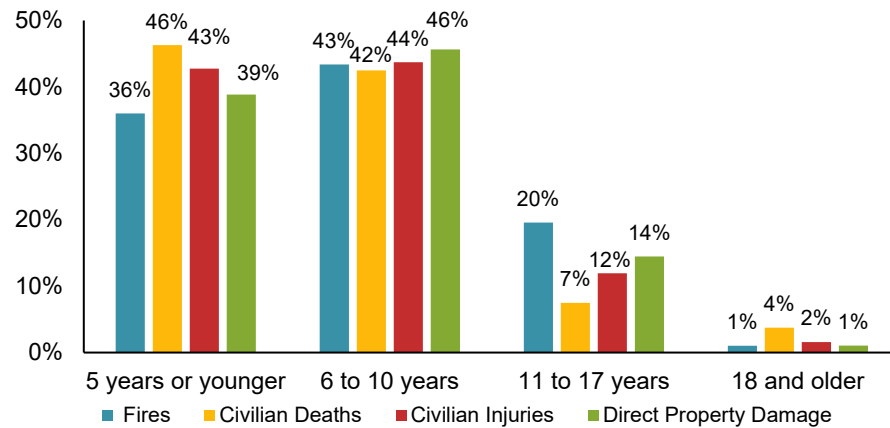
Due to the uncertainty of estimates during the transition to NFIRS 5.0 in 1999–2001, estimates for these years are not shown.

Age of Fire Setters in Home Structure Fires Caused by Playing with Fire

Most fires caused by playing with fire are started by children, many under the age of 10, as indicated in Figure 5. Adults (18 years and older) were responsible for just 1 percent of the home structure fires caused by playing with fire. Fires that were started by children 5 years old or younger accounted for a disproportionate share of the deaths, although the fire setters were not necessarily the victims in these fires.

¹ Residential properties that are not homes include such properties as residential board and care facilities, dormitories, hotels and motels, and barracks.

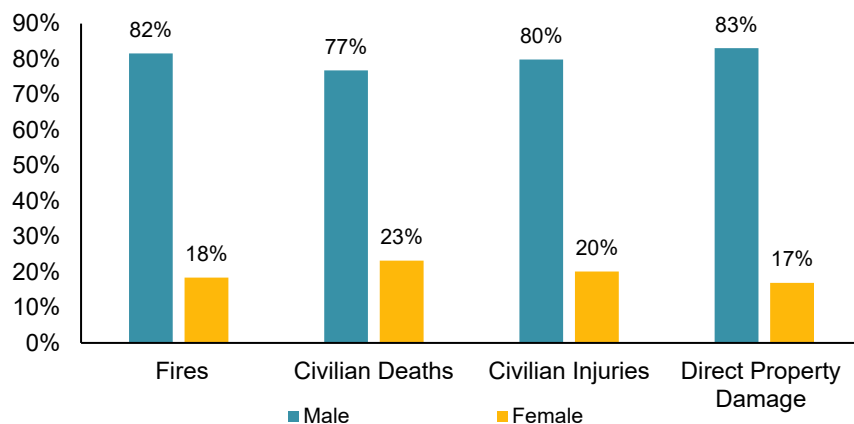
Figure 5. Home Structure Fires Caused by Playing with Fire by Age of Fire Setter: 2014–2018



Sex of Fire Setters in Home Structure Fires Caused by Playing with Fire

Approximately four out of five home structure fires caused by playing with fire were started by boys, as shown in Figure 6. Losses in these fires were generally proportional to the share of fires.

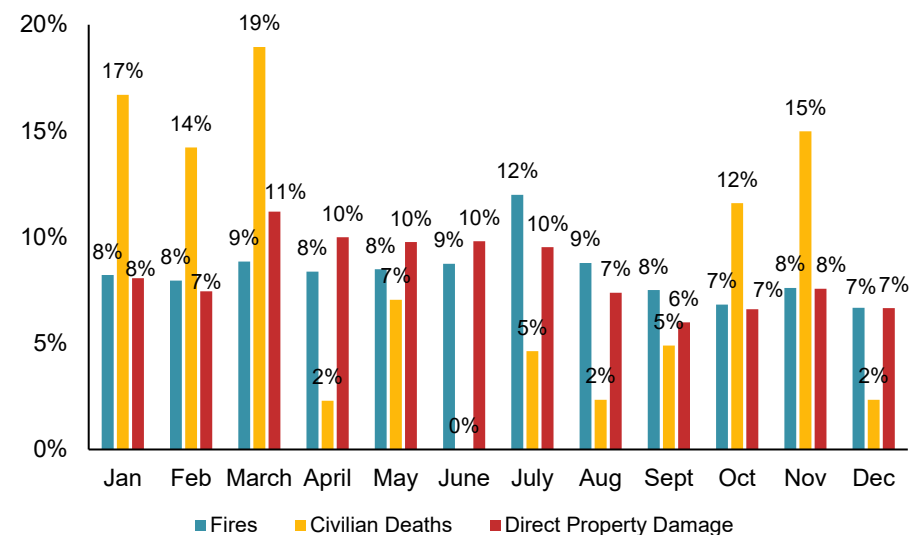
Figure 6. Home Structure Fires Caused by Playing with Fire by Sex of Fire Setter: 2014–2018



Home Structure Fires Caused by Playing with Fire by Month

Fires caused by playing with fire were highest during the school vacation months of June, July, and August, as well as in March, as shown in Figure 7. Children have more opportunities to play with fire when they have fewer structured activities and spend more time at home. Although one-quarter of the home fires caused by playing with fire occurred in the cold weather months of January, February, and March, these fires accounted for half of the civilian deaths. The share of deaths was also nearly double the share of fires in October and November, though not in December.

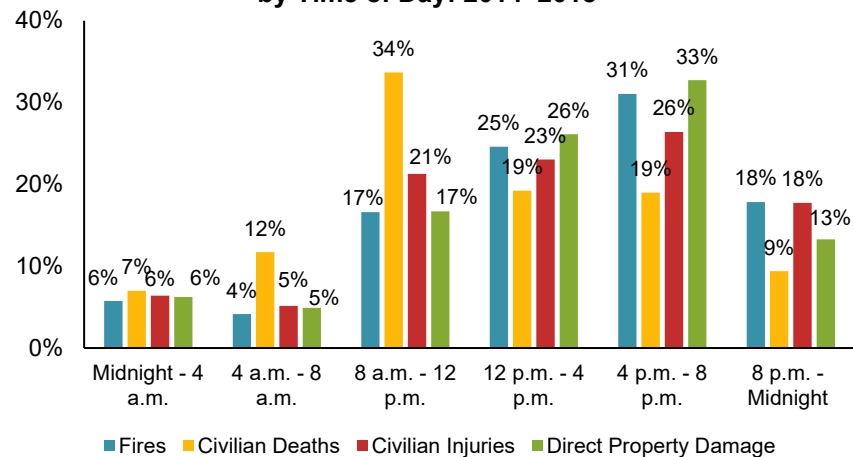
Figure 7. Home Structure Fires Caused by Playing with Fire by Month: 2014–2018



Home Structure Fires Caused by Playing with Fire by Time of Day

Three in ten of the home structure fires caused by playing with fire occurred between the hours of 4:00 p.m. to 8 p.m., the peak period for these fires. The 12 p.m. to 4:00 p.m. period accounted for another one-quarter of the fires. A disproportionately high share of the deaths occurred in fires that took place between 8 a.m. and noon, as shown in Figure 8.

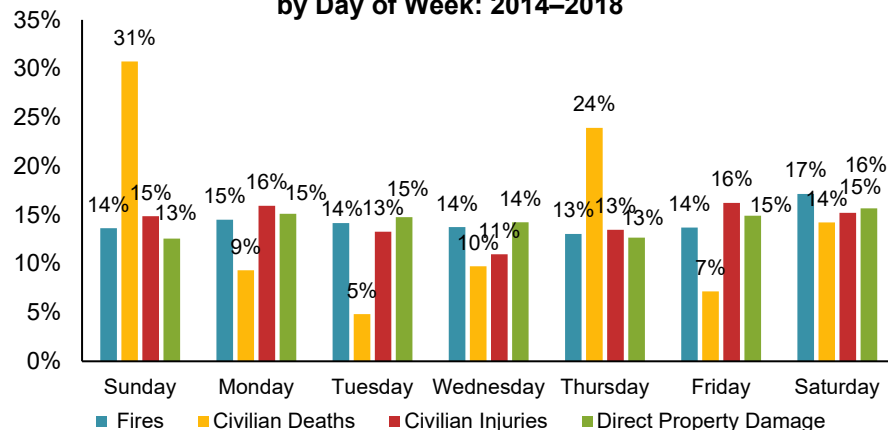
Figure 8. Home Structure Fires Caused by Playing with Fire by Time of Day: 2014–2018



Home Structure Fires Caused by Playing with Fire by Day of the Week

A slightly higher share of home fires caused by playing with fire occurred on Saturdays (17 percent), but there is otherwise little variation in the number of home fires caused by playing with fire by day of the week. A disproportionate share of the deaths was associated with fires occurring on Sundays. Although this is only a small difference, it may reflect a tendency for adults to sleep later on Sundays, leaving younger children unsupervised, which underscores the importance of keeping sources of ignition away from children.

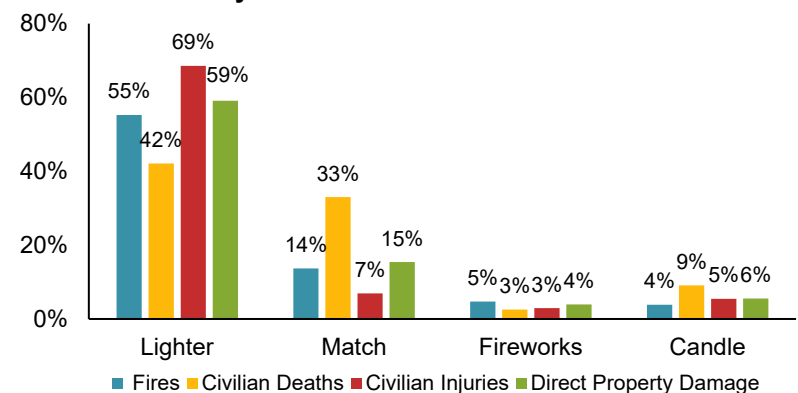
Figure 9. Home Structure Fires Caused by Playing with Fire by Day of Week: 2014–2018



Heat Sources Involved in Home Structure Fires Caused by Playing with Fire

The overwhelming majority of the home fires caused by playing with fire involved lighters, accounting for well over half (55 percent) of these fires. The fires involving lighters also accounted for seven out of ten injuries associated with fires caused by playing with fire in the home. Other leading heat sources for home fires involving fire play include matches, fireworks, and candles. The fires involving matches (14 percent) accounted for a disproportionate share of the deaths (33 percent). See Figure 10.

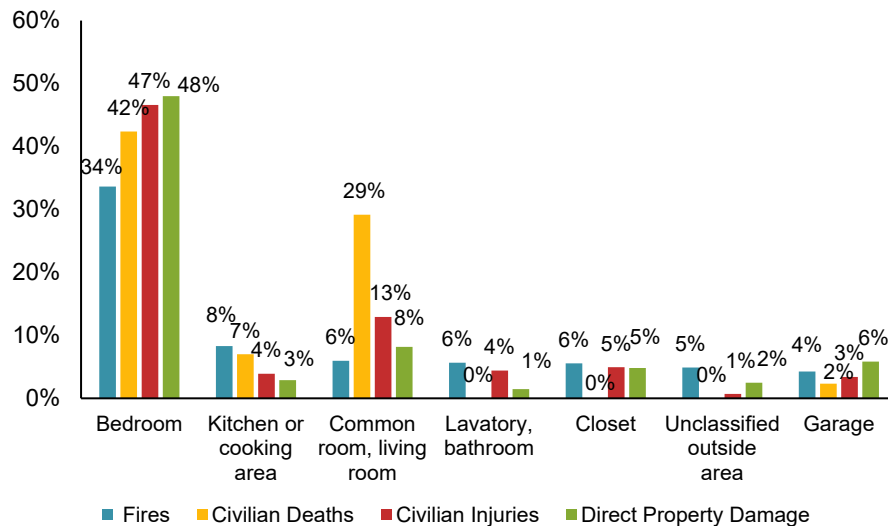
Figure 10. Home Structure Fires Caused by Playing with Fire by Heat Source: 2014–2018



Area of Origin for Home Structure Fires Caused by Playing with Fire

Many of the home fires caused by playing with fire are areas where younger children may spend time without the presence of an adult. The bedroom was the most common area of origin for home fires involving playing with fire, accounting for one-third (34 percent) of the total. These fires were responsible for two in five deaths and nearly one-half of the injuries and direct property damage associated with fires involving fire play. Other leading areas of origin included the kitchen, living room, bathroom, and closets. Fires originating in a common room or living room accounted for a substantially disproportionate share of the deaths caused by fires involving fire play, as indicated in Figure 11.

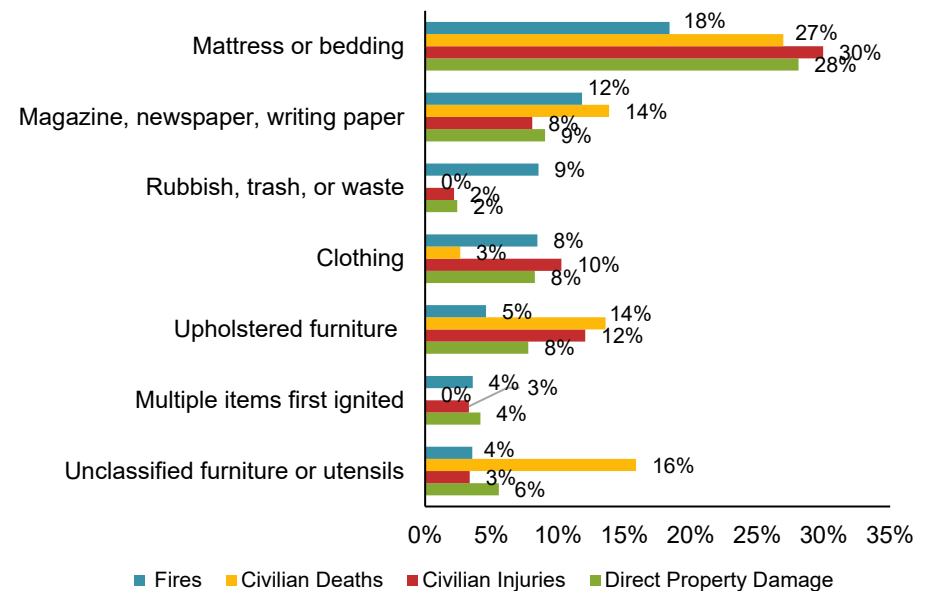
Figure 11. Home Structure Fires Caused by Playing with Fire by Area of Origin: 2014–2018



Item First Ignited in Home Structure Fires Caused by Playing with Fire

Almost one in five home fires caused by playing with fire (18 percent) began with the ignition of a mattress or bedding, consistent with the bedroom as a leading area of origin. These fires were associated with the highest shares of the deaths, injuries, and direct property damage, as indicated in Figure 12. Items of convenience were often among the items ignited during fire play, including magazines and paper, rubbish, and clothing. Fires involving the ignition of upholstered furniture accounted for disproportionately higher shares of the deaths and injuries.

Figure 12. Home Structure Fires Caused by Playing with Fire by Item First Ignited: 2014–2018



Non-Home Structure Fires Caused by Playing with Fire

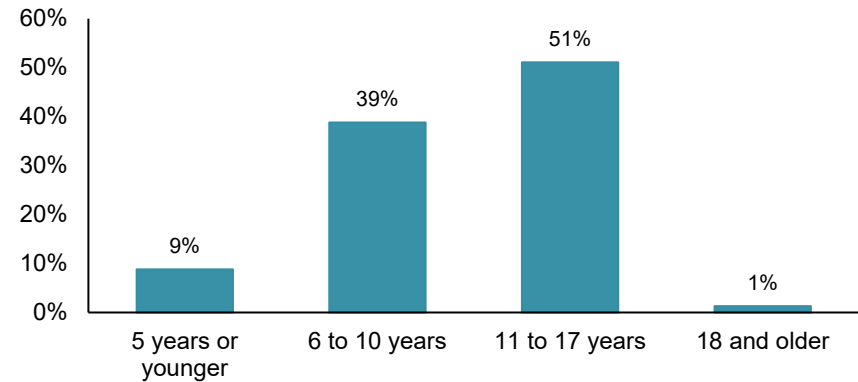
Playing with fire is estimated to have caused 3,140 fires each year in structures other than homes in 2014–2018. These fires resulted in an estimated five civilian deaths, 50 civilian injuries, and \$30 million in direct property damage each year. Due to the low numbers, deaths have been excluded from the following analysis.

Age of Fire Setters in Non-Home Structure Fires Caused by Playing with Fire

As with home fires, the vast majority of non-home fires caused by playing with fire were started by children 17 years old or younger. However, over half of the fire setters (51 percent) were in the older age group of 11 to 17 years old, a much higher share than was the case for home fires. One in ten (9 percent) of these fires were started by children five years old or younger, the youngest age group, which accounted for approximately two

in five of the home fires caused by fire play. The older age of fire setters in non-home fires is likely to reflect the greater independence of older children and greater time outside the home.

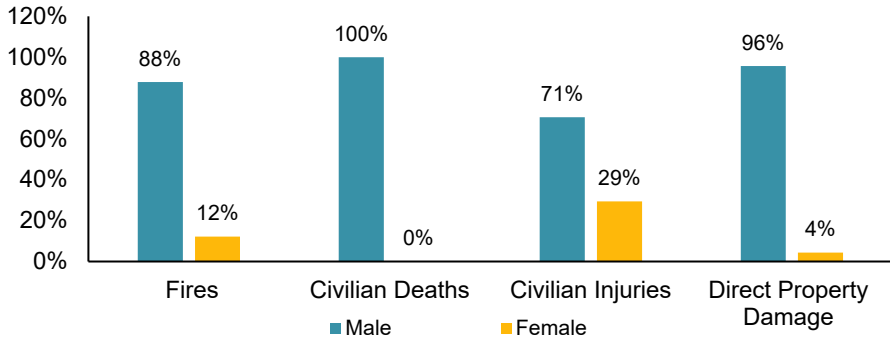
Figure 13. Non-Home Structure Fires Caused by Playing with Fire by Age of Fire Setter: 2014–2018



Sex of Fire Setters in Non-Home Structure Fires Caused by Playing with Fire

Approximately nine out of ten (88 percent) home structure fires caused by playing with fire were started by boys, as shown in Figure 13. Fires started by girls accounted for a somewhat disproportionate share of the injuries (29 percent).

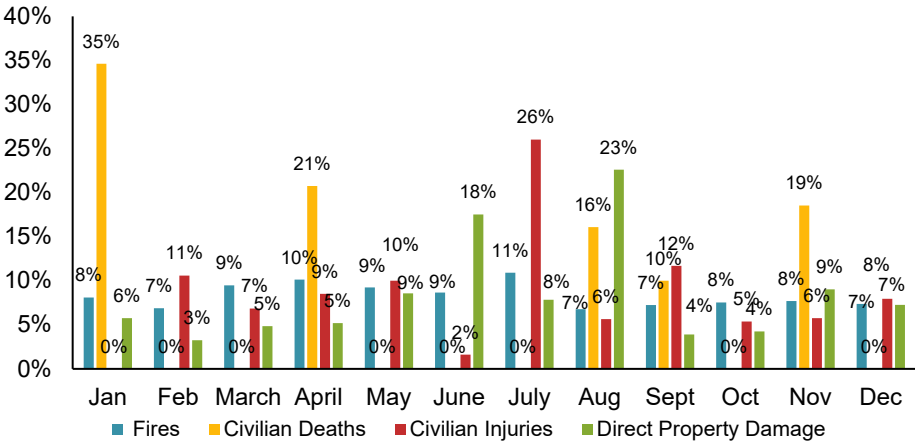
Figure 14. Non-Home Structure Fires Caused by Playing with Fire by Sex of Fire Setter: 2014–2018



Non-Home Structure Fires Caused by Playing with Fire by Month

Non-home fires caused by playing with fire showed a somewhat different monthly pattern than home fires, which were highest during the summer months. As shown in Figure 15, non-home fires were highest from March through July, with April and July being the peak months. Fires in July, which accounted for approximately one in ten fires, caused approximately one-quarter of the injuries (26 percent). Fewer than one in ten fires occurred in August, but these fires accounted for nearly one-quarter of the direct property damage (23 percent).

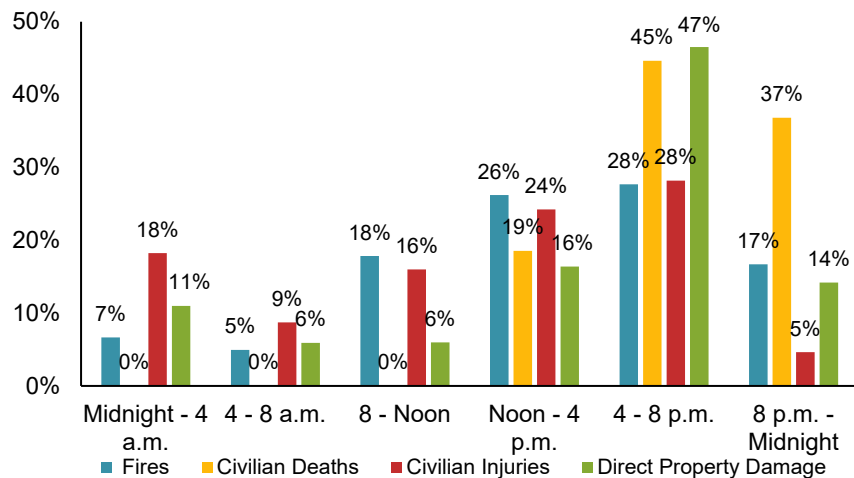
Figure 15. Non-Home Structure Fires Caused by Playing with Fire by Month: 2014–2018



Non-Home Structure Fires Caused by Playing with Fire by Time of Day

Over half (54 percent) of the non-home fires caused by playing with fire occurred in the hours between noon and 8 p.m. These fires also accounted for the greatest shares of the deaths, injuries, and direct property damage, with nearly half of the direct property damage (47 percent) being caused by fires taking place between 4 p.m. and 8 p.m. Few fires caused by playing with fire occurred between midnight and 8 a.m., while nearly one-fifth of the injuries were caused by fires occurring between midnight and 4 a.m.

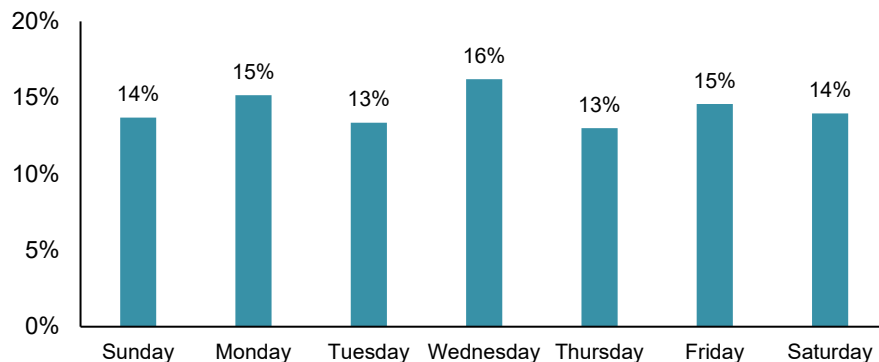
Figure 16. Non-Home Structure Fires Caused by Playing with Fire by Time of Day: 2014–2018



Non-Home Structure Fires Caused by Playing with Fire by Day of the Week

Fires in non-home structures varied between 13 percent and 16 percent the weekly total. Unlike fires caused by fire play in homes, non-home fires did not peak on weekends; they were highest on Mondays, Wednesdays, and Fridays. An earlier NFPA report on *Structure Fires in Schools* found that playing with fire was the third leading cause of school fires, which is likely to partially explain the higher shares of fires during the week.

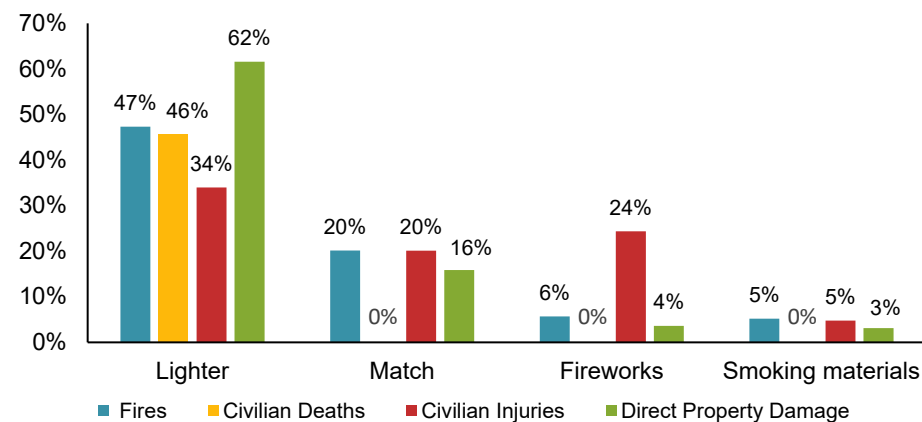
Figure 17. Non-Home Structure Fires Caused by Playing with Fire by Day of Week: 2014–2018



Heat Sources Involved in Non-Home Structure Fires Caused by Playing with Fire

Nearly one-half (47 percent) of the non-home structure fires caused by playing with fire were ignited by a lighter, and another one in five fires were ignited by a match. Fires ignited by lighters also accounted for the majority of the direct property damage. Fireworks were involved in the ignition of fewer than one in ten fires but were responsible for approximately one-quarter of the injuries.

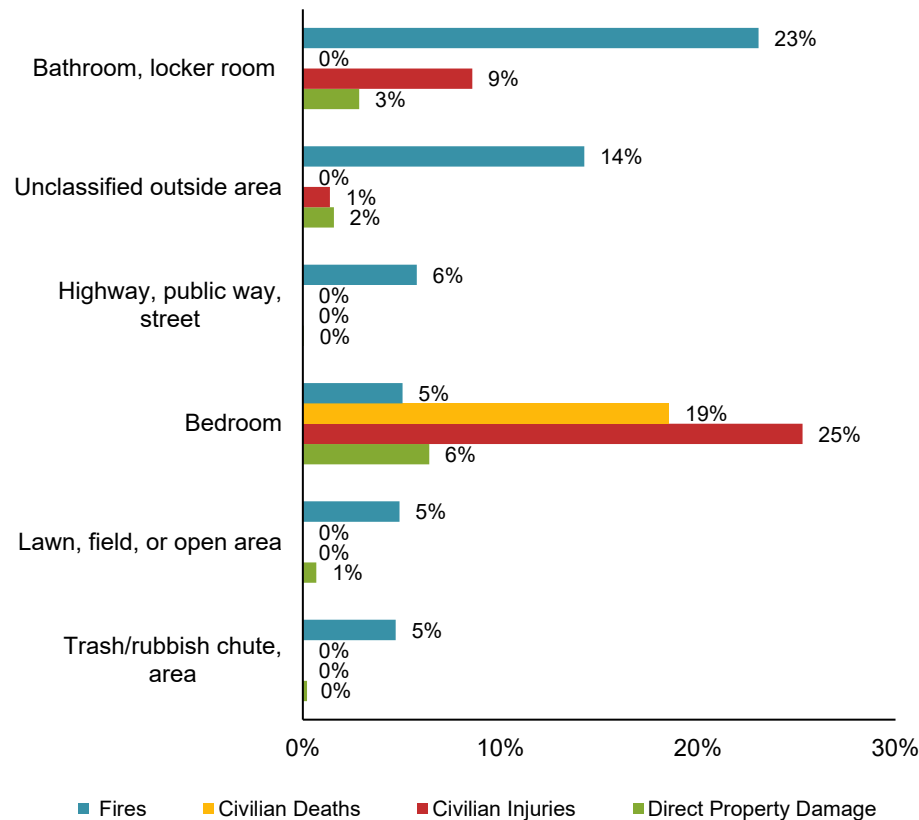
Figure 18. Non-Home Structure Fires Caused by Playing with Fire by Heat Source: 2014–2018



Area of Origin for Non-Home Structure Fires Caused by Playing with Fire

Fires caused by fire play in non-home structures most often originated in a bathroom or locker room (23 percent) or unclassified outdoor area (14 percent). Fires that began in a bedroom accounted for a small share of these fires, but substantially higher shares of the injuries, as shown in Figure 19. Note that non-home structures include a variety of residential properties other than homes, including dormitories, residential board and care facilities, and sorority and fraternity houses.

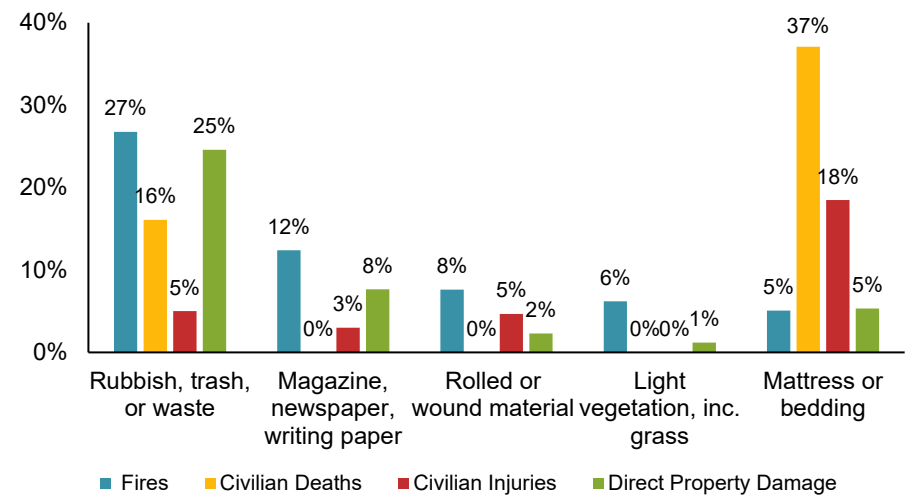
Figure 19. Non-Home Structure Fires Caused by Playing with Fire by Area of Origin: 2014–2018



Item First Ignited in Non-Home Structure Fires Caused by Playing with Fire

The materials first ignited in approximately two of five non-home structure fires caused by playing with fire were either rubbish, trash, or waste (27 percent) or a magazine, newspaper, or writing paper (12 percent), potentially representing materials of convenience. A mattress or bedding was the first material ignited in a small share of fires (5 percent) but was associated with larger shares of injuries, as indicated in Figure 20.

Figure 20. Non-Home Structure Fires Caused by Playing with Fire by Item First Ignited: 2014–2018



Safety Tips to Prevent Fires Caused by Playing with Fire

There are a number of fire safety practices that adults can follow in order to reduce the risk of fires caused by playing with fire. These include:

- Store matches and lighters out of the reach of children, preferably in a locked cabinet.
- Never use lighters or matches as a source of amusement for children since they may try to imitate such behavior.
- Only use lighters that are designed with child-resistant features.
- Teach children to tell an adult if they see matches or lighters in a readily accessible location.
- Never leave matches or lighters in a bedroom or any place children may go without permission.
- Get help if you suspect your child is unduly fascinated with fire or engages in fire play. Local fire departments, schools, or community counseling agencies can facilitate access to trained experts.

Additional information is available at [Children and Fire Safety](#).

Acknowledgments

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

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