



RESEARCH



Home Candle Fires

Marty Ahrens
May 2020

Candle fires

In 2014–2018, US fire departments responded to an average of 7,610 home¹ structure fires that were started by candles per year. These fires caused an annual average of 81 civilian fire deaths, 677 civilian fire injuries, and \$278 million in direct property damage.

Overall, candles caused 2 percent of the reported home fires, 3 percent of the home fire deaths, 6 percent of the home fire injuries, and 4 percent of the direct property damage in reported home fires during this period.

On average, 21 home candle fires were reported per day.

Candle fire seasonality

December was the peak month for candle fires, followed closely by January. Eleven percent of these incidents occurred in each of the two months.

Candle fires appear to be related to holiday decorations. Twelve percent of December candle fires began with decorations. Only 4 percent of candle fires in January to November began with such items.

Almost three times as many fires started by candles were reported on Christmas (average of 58 Christmas fires) as the daily average.

Candle fire victims

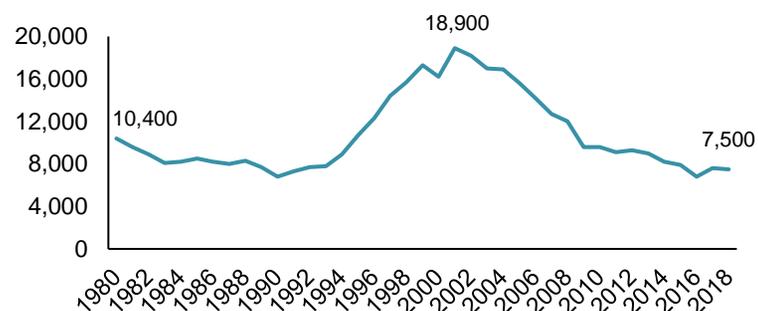
Fifty-eight percent of the candle fire fatalities and 54 percent of the non-fatally injured were female. This is the opposite of overall home fires in which 57 percent of the fatalities and 55 percent of the non-fatally injured were male.

More than one-third of the people who succumbed to candle fires were at least 65 years old (36 percent). Nearly one-fifth were 55–64 years of age (18 percent).

Trends in home candle fires

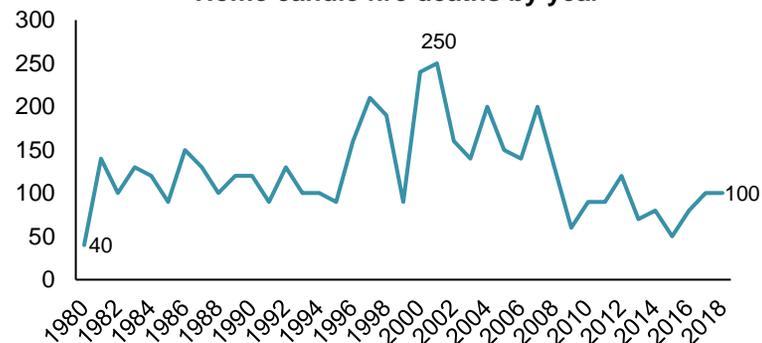
While overall home fires declined through the 1980s and most of the 1990s, candle fires increased sharply through the 1990s as the popularity of candles climbed. These fires peaked in the early years of the 20th century and then started on a downward trend.

Home candle fires by year

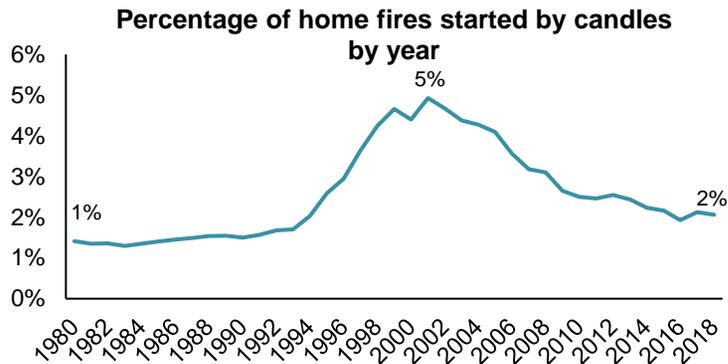


While annual deaths from fires involving candles fluctuate more than candle fires, deaths, too, were higher in the late 1990s and the beginning of the 21st century.

Home candle fire deaths by year



The share of home fires caused by candles increased from 1 percent in the early 1980s to 5 percent in the early years of the 21st century before falling back down to 2 percent.



No standards for candles existed in the 1990s. The Consumer Product Safety Commission (CPSC) requested that ASTM develop candle fire safety standards, a request that the National Candle Association (NCA) supported. An ASTM Consumer Product subcommittee wrote standards addressing safety labels, glass candle containers, maximum flame height, secondary ignitions, end-of-useful-life and tip over requirements.^{2,3} The subcommittee has a task group that reviews publicly available reports of candle fires and recalls to ensure that the circumstances are addressed by the ASTM standards. CPSC’s saferproducts.gov is a primary source of candle fire reports and recalls.

Causes and circumstances of home candle fires

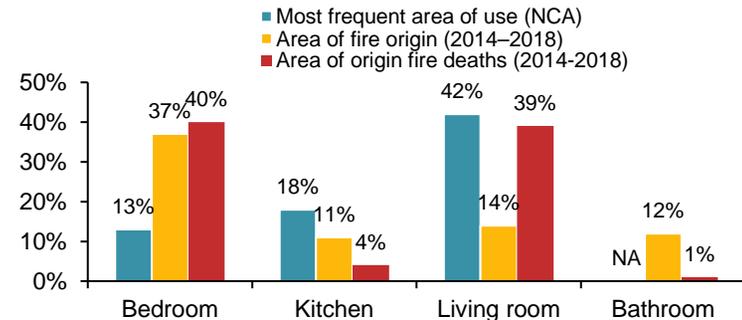
Three of every five (60 percent) candle fires started when something that could burn—such as furniture, mattresses, bedding, curtains, or decorations—was too close to the candle. In 16 percent of the fires, the candles were unattended or abandoned.

Sleep was a factor in 10 percent of the fires, 15 percent of the fire deaths, and 22 percent of the injuries. Drug or alcohol impairment was also a possible factor in 15 percent of the deaths. Only 3 percent of candle fires were intentional.

Based on information on the NCA’s website on where candle fires are most frequently used,⁴ candles in the bedroom cause a disproportionate number of fires and fire deaths.

The leading items first ignited are consistent with the leading areas of origin. While upholstered furniture and mattresses and bedding are the leading items associated with overall home fire fatalities,⁵ it is unusual to see 15 percent of deaths resulting from fires associated with magazines, newspapers, or writing paper. Although the data are not sufficiently robust to confirm this, it is likely that in fires that began with items such as paper and curtains, the initial fire spread to other items such as furniture and bedding or into the walls.

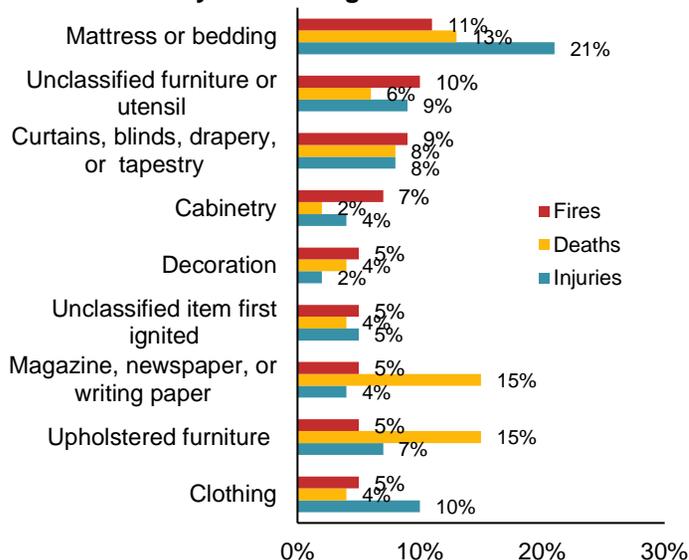
Home candle fires by leading areas of use and fire origin



Smoke detectors alerted occupants of a 25-story California apartment building to a fire that began in the living room of a 12th floor unit when a candle ignited window treatments. The fire was able to spread from the 12th to 16th floor through voids. Property damage was estimated at \$8 million to the structure and \$2 million to the contents⁶.

The fire was confined to the object of origin in 22 percent of home candle fires and only 1 percent of candle fire deaths. Thirty-two percent of candle fire deaths resulted from the three-quarters (74 percent) of fires that were confined to the room of origin.

Home fires started by candles by item first ignited: 2014–2018



Candles used for light

While candles are typically used for mood, decoration, or scent, the situation is different when candles are used for light due to power outages or shutoff.

Several years ago, NFPA reviewed news clips and files on 117 fatal candle fires that caused 177 deaths between January 2005 and December 2010. Unless power was specifically mentioned, it was assumed to be operational. According to reports from the fire service, fire investigators,

or and the newspapers, the home was without power in one-quarter (26 percent) of the fatal candle fires studied and in one-third (34 percent) of the associated deaths. Percentages were based on incidents in which the reason for the lack of power was known. In 68 percent of the fires resulting in 62 percent of the deaths, the power had been shut off or the home lacked utilities. In six fires (24 percent) resulting in six deaths (12 percent), candles were used during a temporary power outage. In two fires (8 percent) resulting in 13 deaths (26 percent), new occupants were moving in and the power had not yet been turned on.

Texas apartment fire claimed the life of an elderly man and injured his wife after a candle started a fire on a bedroom nightstand during a power outage. The deceased had a mobility disability, and his wife had left the candle on the nightstand for him. Her attempts to rescue him and to extinguish the fire were unsuccessful. The fire was confined to the unit of origin.⁷

For more information

The fire estimates in this analysis were derived from the US Fire Administration’s National Fire Incident Reporting System (NFIRS) and NFPA’s annual Fire Experience Survey. See "[How the NFPA National Estimates Are Calculated for Home Structure Fires](#)" for more information.

For more details about candle fires, see the [companion supporting tables](#).

To learn more about research at NFPA, visit [nfpa.org/research](https://www.nfpa.org/research).

Email: research@nfpa.org

NFPA No. PKG34

¹ Homes include one- or two-family homes, including manufactured homes, and apartments or other multi-family housing.

² National Candle Association, “Key ASTM standards for candles,” accessed March 5, 2020, <https://candles.org/industry-standards/>

³ Doug Clauson, “Increasing Candle Safety,” *ASTM Standardization News*, March/April 2013, <https://www.astm.org/standardization-news/?q=features/increasing-candle-safety-ma13.html>. Accessed March 5, 2020.

⁴ National Candle Association. “Facts and Figures: Consumer Preferences,” accessed March 5, 2020, <https://candles.org/facts-figures-2/>.

⁵ Marty Ahrens, *Home Structure Fires*, Quincy, MA, 2019, 12.

⁶ Stephen G. Badger, “Large-Loss Fires for 2018,” *NFPA Journal*, November/December 2019.

⁷ Richard Campbell, “Firewatch,” *NFPA Journal*, March/April 2017.