

Residential Fire Statistics

Introduction

While fire death rates have decreased in most countries worldwide since the 1980s, structural fire is still a threat. More than 3 million fires, 16.8 thousand civilian fire deaths, and 47.9 thousand civilian fire injuries were reported in 2017 among 34 countries representing 1.1 billion inhabitants (15% of the world’s population).¹ The highest fire call rates relative to population (2013-2017) were found in the U.S., France, and Japan, however the highest fire rates relative to population were in Cyprus, Israel, and Suriname.¹

Fatal fires occurring throughout the U.S. was recognized as a growing problem in the 1960s, which ultimately led to an establishment of the U.S. Fire Administration in 1974.² Since then, rates of residential fires and involvement of upholstered furniture have been documented and are summarized below.

U.S. Fire Statistics

- On average in 2018 in the U.S., a structure fire occurred every 63 seconds, and a home fire occurred every 87 seconds.³
- Deaths per 1,000 reported home fires was 8.2 in 2019.⁴
- Residential by far had the most fire deaths by property use (2014-2018), causing annual average of 2,620 deaths, which accounted for 77% of the total civilian fire deaths.⁴
- Residential building fires and loss rates have been consistent over the last ten years.³
- Fifty-five percent of the fatal home fire victims were 55 and over, and one-third (35%) were at least 65 years old.⁴
- Both NFPA and the American Red Cross report that people have only one to two minutes to escape a home once the fire alarm sounds.^{5,6} Residential living room experiments showed flashover times of less than 5 minutes.⁷
- Residential fires are more common in cooler months when people spend more time inside and more time awake in the home.⁴
- Forty-nine percent of fires occur in living rooms and bedrooms, where upholstered furniture can be found. Deaths per 1,000 fires included 54 in living rooms and 28 in bedrooms.⁴
- Both residential fire injuries and deaths are most likely to occur while occupants are asleep (17% and 27% respectively),⁸ and this is consistent for other countries.⁹
- Over the past decades (especially since 1980s), the reduction in fire deaths has been linked to the reduction in fires rather than the prevention of harm after a fire is reported.⁴

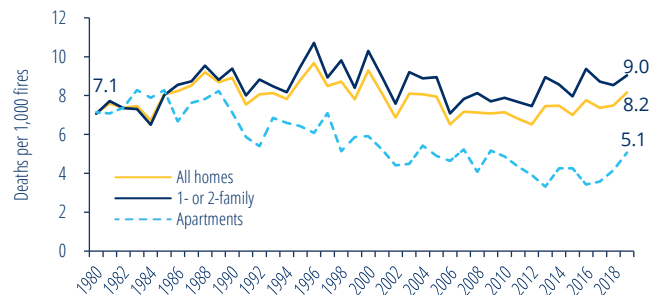


Figure 1: Deaths per 1,000 reported home fires by year and occupancy: 1980-2019⁴

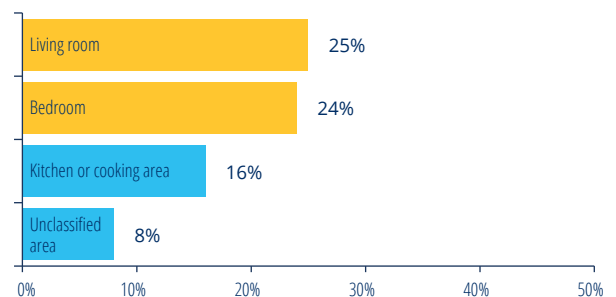


Figure 2: Leading areas of origin for death in home structure fires: 2014-2018⁴

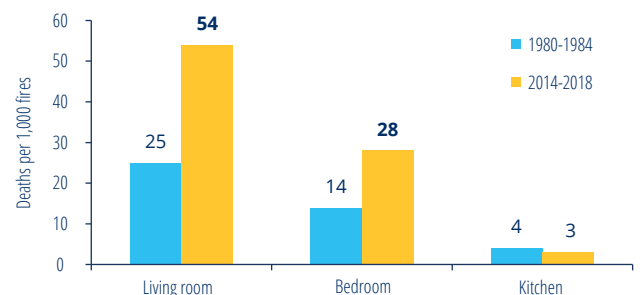


Figure 3: Deaths per 1,000 fires in leading areas of origin: 1980-1984 vs. 2014-2018⁴

Upholstered Furniture and Residential Fire

- U.S. fire departments responded to an annual average of 5,630 home structure fires between 2010-2014 in which upholstered furniture was the first item ignited. These fires caused an annual average of 440 civilian fire deaths, 700 fire injuries, and \$269 million in direct property damage.⁸
- Relatively, fires starting with upholstered furniture are low-frequency, but high-consequence fires.⁴
- As the item first ignited, upholstered furniture was involved in the greatest number of fire deaths. From 2013 through 2015, an estimated annual average of 480 deaths was associated with these fires. This constitutes 20.9% of the estimated annual average of total deaths associated with residential structure fires for the same period.¹⁰
- Upholstered furniture is the leading item first ignited when residential fire deaths in the U.S. and the Netherlands are considered.^{8,9}
- Upholstered furniture has been found to be the greatest factor to enhance fire in fatal domestic fires.⁹
- On average, one of every 12 reported upholstered furniture fires resulted in death.⁴
- Overall, fires beginning with upholstered furniture accounted for only 2% of reported residential fires, but 18% of residential fire deaths.⁸
- Death rate per cases of residential fire in a living room and bedroom has increased, more than doubled, since 1980s.^{4,8}
- One of every 6.6 upholstered furniture fires started by smoking materials resulted in death.⁸
- Smoking materials remain the leading cause of home fire deaths⁴ and upholstered furniture fires.⁸ Other cause of home fire deaths include cooking, heating equipment, and electrical distribution.⁴
- In some instances, consumer products ignited by the fire may contribute to the spread or severity of the fire, but not recorded. An example would be where carpeting is ignited first, but upholstered furniture ignites next and increases the severity of the fire. In that case, upholstered furniture plays a role in the fire, but the fire is not counted toward the estimates for upholstered furniture fires and losses.¹⁰
- The proportion of fire deaths caused by inhalation of toxic smoke has increased over time in UK.^{8,9}
- Upholstered furniture/textile is the second leading factor enhancing smoke development in fatal residential fires.⁹



References

1. Brushlinsky, N. N.; Ahrens, M.; Sokolov, S. V.; Wagner, P. *World Fire Statistics*. CTIF 2019.
2. The National Commission of Fire Prevention and Control. *America Burning*; The National Commission of Fire Prevention and Control: Washington DC, US, 1973.
3. Everts, B. *Fire Loss in the United States During 2018*. *National Fire Protection Association* 2019, 20.
4. Ahrens, M.; Maheshwari, R. *Home Structure Fires*; National Fire Protection Association: Quincy, MA, 2020.
5. NFPA. *Time to Escape*. NFPA 2019.
6. American Red Cross. *2 Minutes to Escape a Burning Building*. American Red Cross 2020.
7. Kerber, S. Analysis of Changing Residential Fire Dynamics and Its Implications on Firefighter Operational Timeframes. *Fire Technol* 2012, 48 (4), 865–891. <https://doi.org/10.1007/s10694-011-0249-2>.
8. Ahrens, M. *Home Fires That Began With Upholstered Furniture*; National Fire Protection Association: Quincy, MA, 2017.
9. Netherlands Institute for Safety Nibra. *Consumer Fire Safety; European Statistics and Potential Fire Safety Measures*; Netherlands Institute for Safety Nibra: Arnhem, The Netherlands, 2009.
10. Miller, D. 2013 to 2015 *Residential Fire Loss Estimates*; U.S. Consumer Product Safety Commission: Bethesda, MD, 2018.