

# HOME STRUCTURE FIRES

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**January 2009**



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## **Abstract**

NFPA estimates that U.S. fire departments responded to an average of 378,600 reported home structure fires per year during the four-year-period of 2003-2006. These fires caused an estimated average of 2,850 civilian deaths, 13,090 civilian injuries, and \$6.1 billion in direct property damage per year. More than two-thirds (70%) of the reported home structure fires and 84% of the fatal home fire injuries occurred in one- or two-family dwellings, including manufactured homes. The remainder occurred in apartments or similar properties.

Cooking equipment is the leading cause of home structure fires and home fire injuries, while smoking materials are the leading causes of home fire deaths. Roughly half of all home fire deaths result from incidents reported between 11:00 p.m. and 7:00 a.m. Twenty-four percent of all home fire deaths were caused by fires that started in the bedroom; 23% resulted from fires originating in the living room, family room, or den. Although smoke alarms operated in 52% of the reported home fires, no working smoke alarm was present in 63% of the home fire deaths.

These estimates are based on data 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 fire department experience survey.

Keywords: fire statistics, home fires, residential fires, apartment fires

## **Acknowledgements**

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 make this analysis possible. Their contributions allow us to estimate the size of the fire problem.

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

During the four-year period of 2003-2006, an estimated 378,600 home structure fires, on average, were reported per year. These fires caused an annual average of 2,850 civilian deaths, 13,090 civilian fire injuries, and \$6.1 billion in direct property damage. Home fires accounted for 73% of all reported structure fires, 91% of civilian structure fire deaths, 86% of the civilian structure fire injuries, and 69% of the direct property loss.

The statistics about fires and associated losses in this analysis 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. These national 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 5.0) and the National Fire Protection Association's (NFPA's) annual fire department experience survey.

During 2003-2006, a home fire was reported in one of every 326 housing units, including seasonal and unoccupied units.

Substantial progress has been made since 1980, the first year in which national estimates of specific fire problems were available. The 399,000 home fires reported in 2007 are 46% lower than the 734,000 reported in 1980. Home structure fire deaths fell 45% from 5,200 in 1980 to 2,865 in 2007. The declines alternated with plateaus, with such plateaus seen in the mid to late 1980s's, a second in the mid 1990s, and a third occurring since 1999. Home fires caused roughly 84% of all civilian fire deaths (including deaths from vehicle and outside fires) in 2007. On average, eight people died in U.S. home fires every day.

In 2003-2006, 30% of reported home structure fires and 37% of home structure fire deaths occurred in the months of December, January, and February. Reported home fires peaked around the dinner hours of 5:00 to 8:00 p.m. Only one-fifth (20%) of the reported home fires occurred between 11:00 p.m. and 7:00 a.m., but 52% of the home fire deaths resulted from fires reported during these hours.

Cooking equipment continues to be the leading cause of home structure fires and civilian fire injuries. It is also the leading cause of unreported fires. The Consumer Product Safety Commission found that in 2004-2005, for every household cooking fire reported to the fire department, U.S. households experienced 49.9 cooking equipment fires that they did not report.

Smoking materials have historically caused the largest number of fire deaths, and this was the case in 2003-2006. However, heating equipment was the leading cause of deaths resulting from fires in one- or two-family dwellings. Heating equipment fires caused the largest percentage of direct property damage.

Forty-one percent of reported home fires started in the kitchen or cooking area. Fifteen percent of the home fire deaths and 36% of the civilian fire injuries occurred in this area. Reported apartment fires were more likely to start in the kitchen than were fires in one- or two-family

dwellings. The 8% of home structure fires originating in the bedroom caused 24% of the civilian deaths and 21% of the civilian injuries. The 4% of home structure fires originating in the living room, family room, or den caused 23% of the civilian fire deaths and 10% of the civilian injuries. Historically, the largest number of fire deaths resulted from fires starting in living rooms, family rooms, or dens. In four of the last five years for which data is available, the number of fire deaths from fires starting in the bedroom was slightly higher than the number of deaths from fires starting in the living room, family room, or den.

The two leading items in home fire deaths remain 1) upholstered furniture, first ignited in 21% of home fire deaths, and 2) mattresses and bedding, first ignited in 13% of the deaths. However, the average number of deaths from fires starting with these items decreased 52-53% from 1980-1983 to 2003-2006.

Most reported home fires were small. Flame damage spread beyond the room of origin in only 23% of the reported fires.

Sixty-three percent of home fire deaths occurred in homes with no working smoke alarms. Residential fire sprinklers are in too few homes. The death rate per 1,000 reported non-confined apartment fires was 57% lower when sprinkler systems were present compared to such fires in apartments without automatic extinguishing systems.

The annual average death toll from fires started by smoking materials was 57% lower in 2003-2006 than it was in 1980-1983. The average number of deaths from fires started by lighters, candles, or matches was 41% lower in the more recent period than the earlier years. The death toll from fires started by some type of operating equipment was also 41% lower in 2003-2006 than in 1980-1983.

In 1980-1983, 61% of the people killed in home fires were outside the room or area of origin. In 2003-2006, only 47% of the victims were outside the room or area where the fire started.

This analysis shows that considerable progress has been made but more is left to be done. The vast majority of homes have at least one smoke alarm, but almost two-thirds of the deaths resulted from fires in homes without working smoke alarms. People who are in the room of fire origin may be intimately involved with ignition. Traditional means of fire protection may not save them. Even if they are not intimately involved, their proximity to the fire dramatically reduces the time they would have to escape.

Human errors are often involved. However, equipment and other product redesign, such as the “fire-safe” cigarette which stops burning if not actively smoked, or automatic shut-offs on heating equipment, cooking equipment, or irons can improve safety. Such changes may be the most effective and inexpensive approach to fire prevention. The U.S. Consumer Product Safety Commission issues safety standards and recalls of unsafe consumer products. Public education with respect to fire safety is clearly needed to address all types of home fires. Active fire protection systems – like smoke alarms and residential sprinklers – and practiced escape plans can provide safety margins after a fire has begun.

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## U.S. Home Structure Fires

U.S. fire departments responded to an estimated 399,000 home<sup>1</sup> structure fires in 2007. These fires caused:



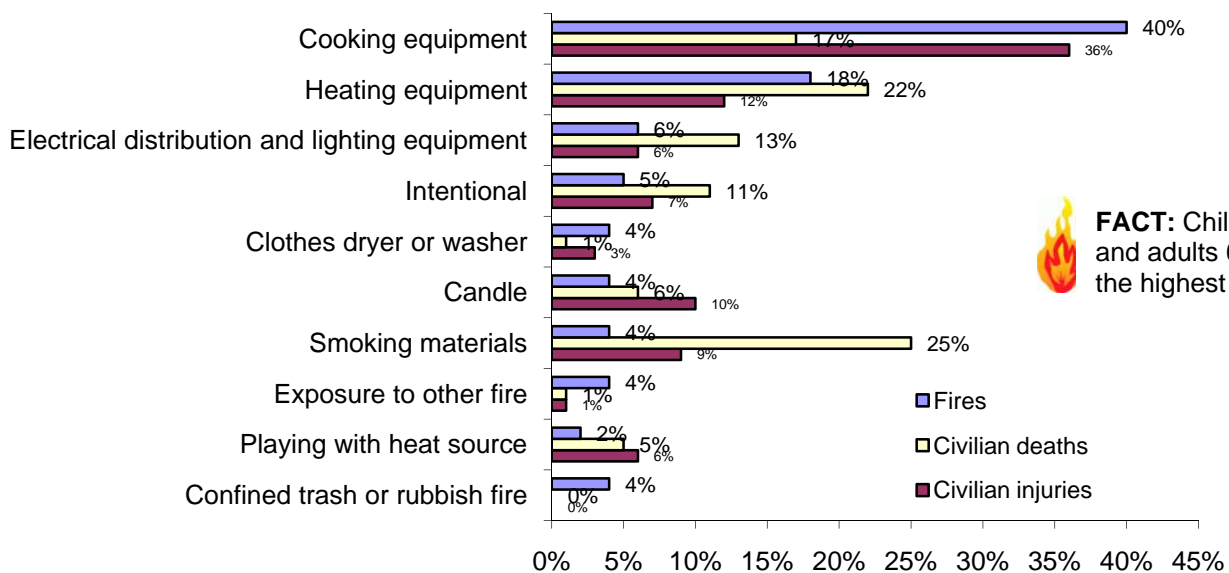
- 2,865 civilian fire deaths,
- 13,600 civilian fire injuries, and
- \$7.4 billion in direct damage.
- Roughly 84% of all civilian fire deaths in 2007 resulted from home structure fires.
- On average, eight people died in U.S. home fires every day.

### Causes and Circumstances of Home Fires

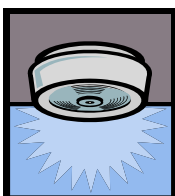
Details from the U.S. Fire Administration's National Fire Incident Reporting System show that in 2003-2006:

- Cooking was the leading cause of home structure fires and home fire injuries.
- Smoking was the leading cause of civilian home fire deaths. Heating ranked second in home fire deaths overall, but was the leading cause in one- or two-family dwellings.

**Figure 5. Leading Causes of Home Structure Fires: 2003-2006**



**FACT:** Children under five and adults 65 and over face the highest risk of fire death.



63% of reported home fire deaths in 2003-2006 resulted from fires in homes with no smoke alarms or no working smoke alarms.

Based on a telephone survey done in 2008, 96% of all homes have at least one smoke alarm.

<sup>1</sup>Homes are dwellings, duplexes, manufactured homes, apartments, townhouses, rowhouses, and condominiums.

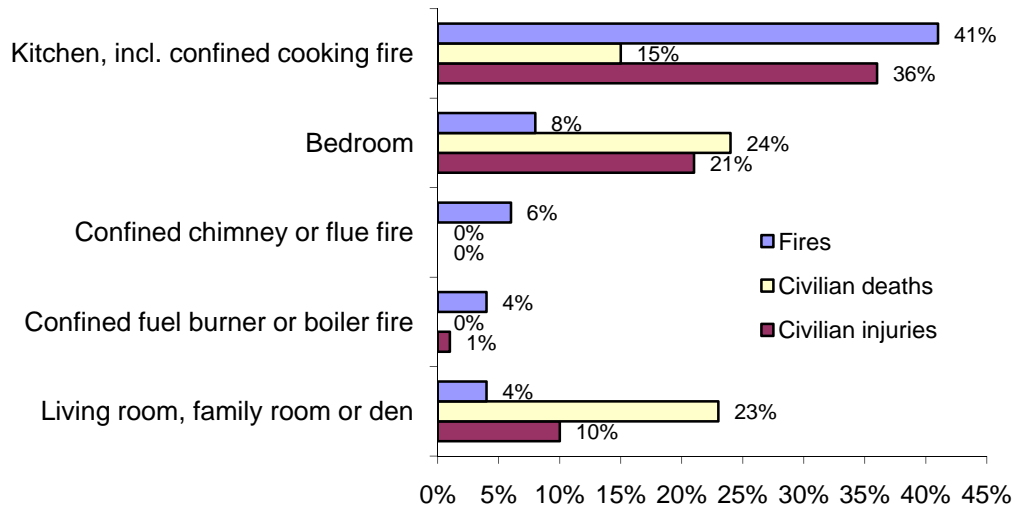
**Kitchens were the leading area of origin.**

- 41% of home structure fires and 36% of civilian home fire injuries resulted from kitchen fires. (Kitchen fires include confined cooking fires.)
  - 15% of home fire deaths also resulted from kitchen fires.
- 8% of reported home fires started in the bedroom. These fires caused 24% of home fire deaths and 21% of home fire injuries.
- 4% of home fire deaths started in the living room, family room, or den. These fires caused 23% of home fire deaths and 10% of the home fire injuries.
- Fires confined to chimneys or flues accounted for 6% of all reported home fires. Confined fuel burner or boiler fires accounted for 4%. These fires caused very few casualties.

**Figure 5. Leading Areas of Origin in Home Structure Fires: 2003-2006**



**Fact:** 21% of home fire deaths resulted from fires beginning with upholstered furniture.



**Roughly one-third of home fires and home fire deaths occur in December, January and February.**

- 20% of reported home structure fires occurred between 11:00 PM and 7:00 AM. These fires caused 52% of all home fire deaths.
- Home structure fires peaked around the dinner hours between 5:00 and 8:00 PM.

**Figure 5. Home Structure Fires by Month: 2003-2006**

