

HOME FIRES INVOLVING COOKING EQUIPMENT

**Marty Ahrens
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**National Fire Protection Association
Fire Analysis and Research Division**

Abstract

During 2003-2006, U.S. fire departments responded to an estimated average of 150,200 home structure fires involving cooking equipment per year. These fires caused an annual average of 500 civilian deaths, 4,660 civilian injuries, and \$756 million in direct property damage.

Ranges, with or without ovens, account for the majority (59%) of total reported home structure fires involving cooking equipment and even larger shares of associated civilian deaths (88%) and civilian injuries (77%). Unattended equipment is the leading cause of cooking fires.

Keywords: Range, stove, oven, microwave, toaster, grill, frying, fryer, fire statistics, home fires, residential fires

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We are also grateful to the U.S. Fire Administration for its work in developing, coordinating, and maintaining NFIRS.

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Copies of this analysis are available from:

National Fire Protection Association
One-Stop Data Shop
1 Batterymarch Park
Quincy, MA 02169-7471
www.nfpa.org
e-mail: osds@nfpa.org
phone: 617-984-7450

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Executive Summary

Cooking is, and has long been, the leading cause of home structure fires and civilian home fire injuries. This is true for both fires reported to fire departments and those handled without fire department assistance.

During the four-year period of 2003-2006, U.S. fire departments responded to an estimated average of 150,200 home structure fires in which cooking equipment was involved in the ignition or in which the fire department used an incident type that identified a cooking fire that did not spread beyond the cooking vessel. These fires caused an average of 500 civilian deaths, 4,660 reported civilian fire injuries, and \$756 million in direct property damage. Overall, these incidents accounted for 40% of all reported home fires, 17% of home fire deaths, 36% of home civilian injuries, and 12% of the direct property damage resulting from home fires. These statistics are estimates derived from Version 5.0 of the U.S. Fire Administration's National Fire Incident Reporting System and NFPA's annual fire department experience survey.

The number of reported home fires involving cooking equipment hit a new high in 2006. These fires have increased fairly steadily as NFIRS 5.0 became widely used. NFIRS 5.0 requires very little causal information on several categories of minor structure fires, including fires that are confined to a cooking vessel. Because it is so much easier to document these "confined fires," it is hard to tell how much of the increase is due to changes in the data collections system. The 1980-1983 annual average for cooking fire deaths was 500, the same average seen in 2003-2006.

Ranges or cooktops were the heat sources in 59% of the reported home fires involving cooking equipment, 88% of the civilian deaths, 77% of the civilian injuries, and 69% of the associated direct property damages. The leading factors contributing to ignition for 2003-2006 non-confined home structure fires involving cooking equipment were equipment unattended (38%), heat source too close to combustibles (12%), unintentionally turned on or not turned off (10%), and abandoned or discarded material or product (8%). Households that use electric ranges have a higher risk of fires and associated losses than those using gas ranges.

Not surprisingly, the majority of non-confined home structure fires involving cooking equipment began with the ignition of cooking materials or food. Clothing was the item first ignited in only 1% of these fires but clothing ignitions led to 13% of the home cooking equipment fire deaths. When cooking, it is important to wear short, close-fitting or tightly rolled sleeves. Loose clothing can dangle onto stove burners and can catch fire if it comes in contact with a gas flame or electric burner. It is also important to keep the cooking area clean and free from of

Cooking equipment includes equipment such as ranges, ovens, and other equipment designed to cook, heat, or warm food. Other kitchen equipment associated with food storage and preparation such as refrigerators, food processors, and dishwashers are examined in John Hall's 2009 NFPA report, *Home Structure Fires Involving Kitchen Equipment Other than Cooking Equipment*

combustible materials. Built-up grease can catch fire in the oven or on the stovetop. Wrappers and other materials on or near the stove may also catch fire.

Several studies, including the U.S. Consumer Product Safety Commission's (CPSC's) 1999 study of range fires by Linda Smith, Ron Monticone, and Brenda Gillum, and the 1998 New Zealand Fire Service Bay-Waikato Region Kitchen Fire Research found that frying dominated the cooking fire problem. Frying accounted for 63% of 218 range top cooking-material ignitions in the CPSC study. Eighty-three percent of these food ignitions by frying occurred during the first fifteen minutes of cooking. Because the frying involves heating cooking oil or grease, substances that can catch fire in an open container from which fire can quickly spread, constant supervision is required. Stay in the kitchen when you are frying, grilling, or broiling food. If you leave the kitchen for even a short period of time, turn off the stove.

Deep fryers use larger quantities of hot cooking oil than are typically used in regular frying. Turkey fryers use extremely large quantities of hot cooking oil. These conditions may add to the fire or scald risk of these devices.

Boiling and simmering involve heating water or foods with a lot of water. Water boil-overs can be messy and may cause scalds, but the liquid will not ignite. If the liquid boils away, a fire may result. Baking and roasting are generally done in a closed oven which will typically delay fire spread. If you are simmering, baking, roasting, or boiling food, check it regularly, remain in the home while food is cooking, and use a timer to remind you that you're cooking.

The statistics on fires involving cooking equipment reported to local fire departments represent a tiny fraction of all home fires involving home cooking equipment. In their analysis of CPSC's 2004-2005 Residential Fire Survey, Michael Greene and Craig Andres found that U.S. households handled an average of 4.7 million home fires involving cooking equipment per year without having the fire department on scene. Roughly one of every 23 occupied households had a cooking fire. The study also found that 102,000 injuries resulted from cooking equipment fires with no fire department presence. This is 22 times the average number of civilian injuries per year in reported fires during 2003-2006. Total direct property damage from unreported home fires involving cooking equipment was estimated at \$328 million, with an average loss of \$70 dollars per fire. Unreported cooking equipment fires fell 63% from the 12.3 million such incidents in the 1984 survey of unreported residential fires done for the CPSC.

Three-fifths (57%) of civilian injuries suffered in reported non-confined home structure fires involving cooking equipment occurred while the victim was trying to fight the fire, compared to one-third (35%) of injuries suffered in any other type of home structure fire. Roughly three-quarters of reported cooking injuries were minor. The ratio of 50 unreported home cooking fires found by the CPSC in their 2004-2005 Residential Fire Survey for every reported home cooking fire shows that the overwhelming majority of home cooking fires are handled safely by individuals without fire department assistance.

People who cook need to know what to do if they have a cooking fire. That means thinking about it before a fire occurs and being prepared.

- Always keep a lid nearby when cooking.
- If you do try to fight the fire, be sure others are already getting out and you have a clear path to the exit.
- If a small grease fire starts in a pan, smother the flames by carefully sliding the lid over the pan. Turn off the burner. Do not move the pan. To keep the fire from restarting, leave the lid on until the pan is completely cool.
- In case of an oven fire, turn off the heat and keep the door closed.

In many cases, the smartest thing to do is leave the home, closing the door on the way, and calling the fire department from outside or a neighbor's.

Compared to their share of the population, children under five and adults 65 or older faced the highest risk of death from home fires involving cooking equipment. Young children were at much lower risk of a non-fatal fire injury from cooking equipment. These patterns are consistent with findings from overall home fires. However, children under five face a much higher risk of non-fire burn injuries from cooking equipment, tableware, and cookware. Based on data from the CPSC's National Electronic Injury Surveillance System (NEISS), children under five suffered an estimated:

- 6,680 thermal non-fire burns associated with range or ovens, with most caused by contact with the equipment;
- 2,900 scald burns associated with tableware such as coffee cups and soup bowls;
- 1,970 thermal non-fire burns (mostly contact burns) associated with grills or barbecues;
- 1,100 scald burns from cookware such as pots and pans;
- 910 scald burns from ranges or ovens;
- 990 burns from contact with hot cookware; and
- 450 scald burns associated with microwave ovens.

NFPA and other safety organizations have long urged people to maintain a "kid-free" zone of at least three feet around the stove. In recent years, this message has been expanded. Young children should also be kept at least three feet away from areas where hot food or drink is prepared. Never hold a child while cooking, drinking or carrying hot foods or liquids.

To prevent these injuries, parents and other caregivers are advised to

- Teach children that hot things burn.
- Place hot food and beverage container so they cannot be pulled or knocked over.
- Turn pot handles away from the stove's edge.
- Keep appliance cords coiled and away from counter edges.
- Cook on the stove's back burners when young children are present.

Home fires involving cooking peak on dates that are major U.S. holidays with traditions of cooking, such as Thanksgiving, Christmas, and Christmas Eve. Thanksgiving had three times the average number of reported home structure fires involving cooking equipment.

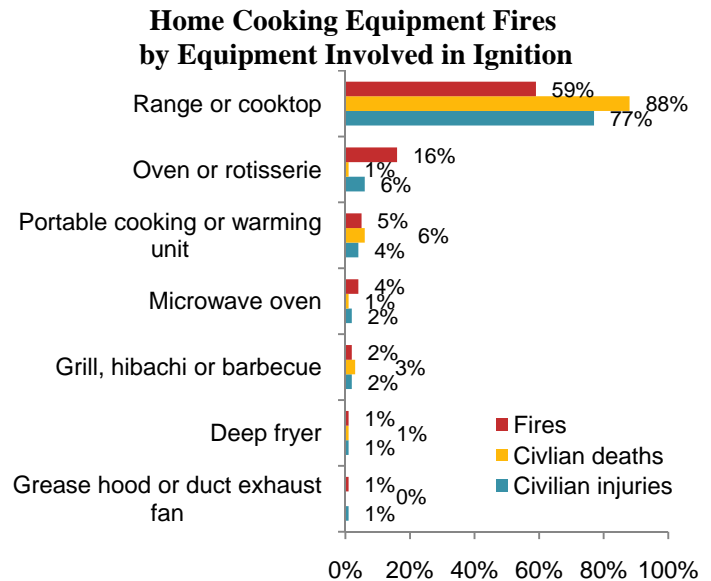


Home Fires Involving Cooking Equipment

Cooking equipment is the leading cause of home structure fires and associated civilian injuries and the third leading cause of home fire deaths.

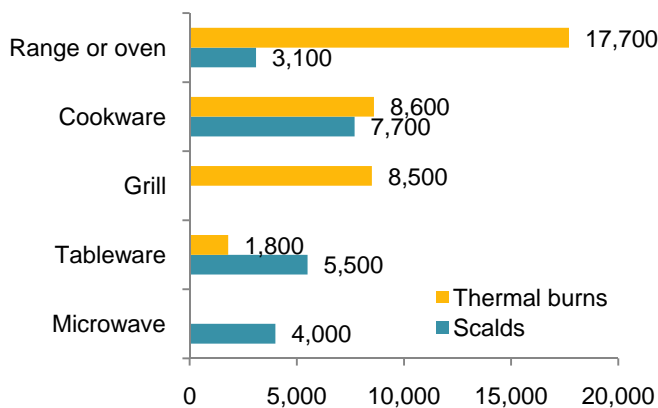
During the four-year period of 2003-2006:

- U.S. fire departments responded to an average of **150,200** home¹ structure fires that involved cooking equipment per year. These fires caused an average of 500 civilian fire deaths, 4,660 civilian fire injuries, and \$756 million in direct property damage.
- Cooking equipment was involved in 40% of all reported home fires, 17% of home fire deaths, 36% of home civilian injuries, and 12% of the direct property damage resulting from home fires.
- Unattended cooking was by far the leading contributing factor in these fires. Something that could catch fire was too close to the equipment ranked second and unintentionally turned on or not turned off ranked third.
- Ranges accounted for the largest share (59%) of home cooking fire incidents. Ovens accounted for 16%.
- Three-fifths (57%) of reported home cooking fire injuries occurred when victims tried to fight the fire themselves.



- Households that use electric ranges have a higher risk of fires and associated losses than those using gas ranges.
- In a 1999 study of range fires by the U.S. Consumer Product Safety Commission, 83% of frying fires began in the first 15 minutes of cooking.

2008 Emergency Room Visits for Burns Associated with Cooking and Related Equipment



Most burns associated with cooking equipment, cookware, and tableware were not caused by fire or flame.

In 2008, ranges or ovens were involved in an estimated 17,700 thermal burn injuries seen in U.S. hospital emergency rooms.¹

- 92% resulted from contact with the hot equipment or some other non-fire source.

Children under five accounted for 52% of the tableware scalds.

¹ Data from the Consumer Product Safety Commission's National Electronic Injury Surveillance System, queried in August 2009.



Home Fires Involving Grills

In 2003-2006, U.S. fire departments responded to an average of 7,900 home¹ fires involving grills, hibachis or barbecues per year, including an average of 2,900 structure fires and 5,000 outside fires. These 7,900 fires caused annual average of 10 civilian deaths (to the nearest ten), 120 reported injuries and \$80 million in direct property damage.

- Almost all the losses occurred in structure fires.
- June and July are peak months for grills fires but these incidents occur throughout the year.

Gas vs. Solid-Fueled Grills

Four-fifths (81%) of the grills were fueled by gas and 16% used charcoal or other solid fuel.

Gas grills were involved in 6,400 home fires, including 2,100 structure fires and 4,300 outdoor fires.

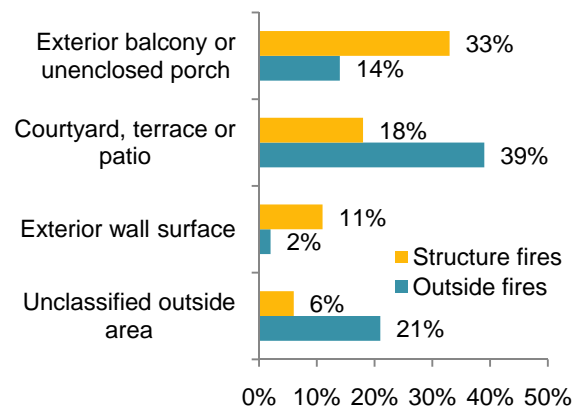
- Leak or break was the leading factor contributing to gas grill fires.

Charcoal or other solid-fueled grills were involved in 1,300 home fires, including 600 structure fires and 600 outside fires.

- The leading cause was something that could burn being too close to the grill.

Although gas grills are used roughly 1.5 times as often as charcoal grills, they were involved in five times as many fires.

Home Grill Fires by Leading Areas of Origin 2003-2006



One-third (33%) of the home structure fires² involving grills started on an exterior balcony or unenclosed porch, 18% started on a courtyard, terrace or patio, and 11% started on an exterior wall surface.

Emergency Room Visits Due to Grills

In 2007, 18,600 patients went to emergency rooms because of injuries involving grills.³

Roughly half (9,600) of the injuries were thermal burns.

- Children under five accounted for roughly one-quarter, of the thermal grill burns. These were typically contact burns rather than flame burns.
- Roughly one-third of the gas grill injuries were burns incurred while lighting the grill.
- Gasoline or lighter fluid was a factor in roughly one-quarter of the charcoal or wood burning grill burns.

1. Homes include one- and two-family dwellings, apartments, town houses, row houses, and manufactured housing.

2. Little causal detail is required about certain categories of minor fires, identified by incident type and collectively called confined fires, by the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS). Causes and area of origin omitted these fires.

3. U.S. Consumer Product Safety Commission's National Electronic Injury Surveillance System.

