

HOME FIRES INVOLVING COOKING EQUIPMENT

**Marty Ahrens
November 2010**



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

HOME FIRES INVOLVING COOKING EQUIPMENT

**Marty Ahrens
November 2010**



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

Abstract

During 2004-2008, U.S. fire departments responded to an estimated average of 154,700 home structure fires involving cooking equipment per year. These fires caused an annual average of 460 civilian deaths, 4,850 civilian injuries, and \$724 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 (89%) and civilian injuries (77%). Unattended equipment is the leading cause of cooking fires. Three of every five reported civilian cooking fire injuries occurred when the victims were trying to fight the fire themselves.

National estimates of reported fires were derived from the U.S. Fire Administration's National Fire Incident Reporting System and NFPA's annual fire department experience survey.

Keywords: Range, stove, oven, microwave, toaster, grill, frying, fryer, fire statistics, home fires, residential 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 Consumer Product Safety Commission for their work that helps us understand home fires that are not reported to the fire department.

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

For more information about the National Fire Protection Association, visit www.nfpa.org or call 617-770-3000. To learn more about the One-Stop Data Shop go to www.nfpa.org/osds or call 617-984-7443.

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: 617-984-7443

NFPA No. USS11
Copyright © 2010, National Fire Protection Association, Quincy, MA

Contents

	Page
Table of Contents	i
List of Numbered Tables and Figures	iii
Executive Summary	vii
Home Fires Involving Cooking Equipment Fact Sheet	xi
Cooking Safety Tips	xii
Home Fires Involving Grills Fact Sheet	xiii
Grilling Safety Tips	xiv
Section 1. Home Fires Involving Cooking Equipment	1
Trends in Reported Home Structure Fires Involving Cooking Equipment	3
The When and Where of Home Structure Fires Involving Cooking Equipment	6
Causal Factors	8
Victims of Home Structure Fires Involving Cooking Equipment	13
Fire Control by Civilians	16
Specific Uses of Cooking Equipment	19
Non-Fire Burn Injuries Associated with Cooking Equipment	21
Cooking Equipment and Non-Fire Carbon Monoxide Deaths	23
Section 2. Ranges	41
Section 3. Ovens or Rotisseries	67
Section 4. Microwave Ovens	85
Section 5. Portable Cooking or Warming Devices	95
Section 6. Grills	109
Section 7. Deep Fryers	145
Section 8. Grease Hoods or Duct Exhaust Fans	153
Appendix A: How National Estimates Statistics Are Calculated	159
Appendix B. Selected Published Incidents	167

List of Tables and Figures

	Page
Section 1. Home Fires Involving Cooking Equipment Fires	
Table A. Home Fires Involving Cooking Equipment: 2004-2008	3
Figure 1.1. Reported Home Structure Fires Involving Cooking Equipment, by Year	4
Figure 1.2. Civilian Fire Deaths Resulting from Home Structure Fires Involving Cooking Equipment, by Year	4
Figure 1.3. Civilian Fire Injuries Resulting from Reported Home Structure Fires Involving Cooking Equipment, by Year	6
Table B. Leading Dates for 2008 Home Fires Involving Cooking Equipment Structure Fires Reported to U.S. Fire Departments	7
Figure 1.4. Reported Home Cooking Equipment Fires, Injuries and Percent of Population Cooking, by Time of Alarm	8
Table C. Reported Home Structure Fires Involving Cooking Equipment by Type of Device, Risk of Death and Injury per 1,000 Fires and Average Loss Per Fire 2004-2008	9
Figure 1.5. Home Fires Involving Cooking Equipment by Extent of Flame Damage	10
Figure 1.6. Smoke Alarm Status in Reported Home Fires Involving Cooking Equipment	11
Figure 1.7. Method of Fire Discovery in CPSC 2004-2005 Sample Survey of Unreported Residential Fires	12
Figure 1.8. Relative Risk of Civilian Death and Injury Resulting From Reported Non-Confined Home Fires Involving Cooking Equipment	14
Figure 1.9. Cooking Equipment Fire Victims by Gender	15
Figure 1.10. Civilian Casualties Incurred at Home Fires Involving Cooking Equipment by Primary Apparent Symptom as Identified by the Fire Department	15
Figure 1.11. Severity of Reported Non-Fatal Home Fire Injuries Involving Cooking Equipment	16
Figure 1.12. Who Put Out Fire in CPSC 2004-2005 Sample Survey of Unreported Fires	17
Figure 1.13. Extinguishment Method Used in CPSC 2004-2005 Sample Survey of Unreported Fires	17
Figure 1.14. 2008 Non-Fire Burn Injury Emergency Room Visits Associated with Cooking Equipment and Products by Equipment and Burn Type and Percent of Patients under Five Years of Age	22
Table 1.1. Home Fires Involving Cooking Equipment by Year	26
Table 1.2. Home Fires Involving Cooking Equipment by Month	27
Table 1.3. Home Fires Involving Cooking Equipment by Day of Week	27
Table 1.4. Home Fires Involving Cooking Equipment by Hour of Alarm	28
Table 1.5. Home Fires Involving Cooking Equipment by Area of Origin	29
Table 1.6. Home Fires Involving Cooking Equipment by Factor Contributing to Ignition	30
Table 1.7. Home Fires Involving Cooking Equipment, by Human Factor Contributing to Ignition	32

List of Tables and Figures (Continued)

	Page
Table 1.8. Home Fires Involving Cooking Equipment, by Item First Ignited	33
Table 1.9. Home Fires Involving Cooking Equipment, by Extent of Flame Damage	34
Table 1.10. Home Fires Involving Cooking Equipment, by Smoke Alarm Status	35
Table 1.11. Home Fires Involving Cooking Equipment, by Automatic Extinguishing System (AES) Status,	36
Table 1.12. Home Fires Involving Cooking Equipment, by AES Type when Present	37
Table 1.13. Casualties in Home Structure Fires Involving Cooking Equipment by Age of Victim	38
Table 1.14. Home Fire Casualties Involving Cooking Equipment, by Victim's Location at Time of Incident	38
Table 1.15. Home Fire Casualties Involving Cooking Equipment, by Victim's Activity at Time of Injury	39
Table 1.16. 2008 Estimates of Emergency Room Visits for Burn Injuries Associated with Cooking Equipment and Related Products	39
Table 1.17. U.S. Non-Fire Carbon Monoxide Deaths Involving Cooking Equipment	40
 Section 2. Ranges	
Figure 2.1. Reported Home Structure Fires Involving Ranges or Cooktops, by Year	42
Figure 2.2. Percentage of Households Using Gas, Electricity, and Other Fuel as a Primary Cooking Power Source over Time	43
Figure 2.3. Percentages of 2004-2008 Reported Home Structure Fires and Associated Losses Involving Cooking Equipment by Cooking Equipment Power Source	44
Figure 2.4. Injuries Involving Ranges or Ovens Seen at Hospital Emergency Rooms in 2009, by Diagnosis	47
Table 2.1. Ranges, by Year	50
Table 2.2. Gas-Fueled Ranges, by Year	51
Table 2.3. Electric-Powered Ranges, by Year	52
Table 2.4. Trends in U.S. Use of Primary Cooking Power Sources Percentage of Households	53
Table 2.5. Comparative Risks of Reported Fires and Associated Losses of Gas Versus Electric Stoves	54
Table 2.6. Ranges, by Factor Contributing to Ignition	55
Table 2.7. Gas-Fueled Ranges, by Factor Contributing to Ignition	57
Table 2.8. Electric-Powered Ranges, by Factor Contributing to Ignition	59
Table 2.9. Ranges, by Item First Ignited	61
Table 2.10. Gas-Fueled Ranges, by Item First Ignited	62
Table 2.11. Electric-Powered Ranges, by Item First Ignited	63
Table 2.12. Ranges, by Extent of Flame Damage	64
Table 2.13. Gas Ranges, by Extent of Flame Damage	64
Table 2.14. Electric-Powered Ranges, by Extent of Flame Damage	64
Table 2.15. Hospital Emergency Room Visits for Injuries Involving Ranges or Ovens During 2009 by Diagnosis	65

List of Tables and Figures (Continued)

	Page
Table 2.16. Hospital Emergency Room Visits for Injuries Involving Ranges or Ovens During 2009 by Range Power Source	65
Section 3. Ovens or Rotisseries	
Figure 3.1. Reported Home Structure Fires Involving Ovens or Rotisseries, by Year	69
Table 3.1. Ovens or Rotisseries, by Year	72
Table 3.2. Gas-Fueled Ovens or Rotisseries, by Year	73
Table 3.3. Electric-Powered Ovens or Rotisseries, by Year	74
Table 3.4. Ovens or Rotisseries, by Factor Contributing to Ignition	75
Table 3.5. Gas-Fueled Ovens or Rotisseries, by Factor Contributing to Ignition	77
Table 3.6. Electric-Powered Ovens or Rotisseries, by Factor Contributing to Ignition	79
Table 3.7. Ovens or Rotisseries, by Item First Ignited	81
Table 3.8. Gas-Fueled Ovens or Rotisseries, by Item First Ignited	82
Table 3.9. Electric-Powered Ovens or Rotisseries, by Item First Ignited	83
Table 3.10. Ovens or Rotisseries, by Extent of Flame Damage	84
Section 4. Microwave Ovens	
Figure 4.1. Amount of Food Cooked in Microwave Ovens by Households that Use Them According to DOE's 2005 Energy Survey	86
Table 4.1. Microwave Ovens, by Year	89
Table 4.2. Microwave Ovens, by Factor Contributing to Ignition	90
Table 4.3. Microwave Ovens, by Item First Ignited	92
Table 4.4. Microwave Ovens, by Extent of Flame Damage	93
Section 5. Portable Cooking or Warming Devices	
Table 5.1. Portable Cooking or Warming Devices, by Type of Device	96
Figure 5.1. Reported Home Structure Fires Involving Portable Cooking or Warming Devices, by Year	97
Figure 5.2. Portable Cooking or Warming Devices, by Leading Factors Contributing to Ignition	98
Figure 5.3. Specific Portable Cooking or Warming Devices by Leading Items First Ignited	99
Table 5.2. Portable Cooking or Warming Devices, by Year	102
Table 5.3. Portable Cooking or Warming Devices with Largest Shares of Fires, by Year	103
Table 5.4. Portable Cooking or Warming Devices, by Factor Contributing to Ignition	105
Table 5.5. Portable Cooking or Warming Devices, by Item First Ignited	107
Table 5.6. Portable Cooking or Warming Devices, by Area of Origin	108
Table 5.7. Portable Cooking or Warming Devices, by Extent of Flame Damage	108

List of Tables and Figures (Continued)

	Page
Section 6. Grills	
Figure 6.1. Home Grill Fires, by Month	109
Figure 6.2. Home Grill Fires, by Power Source	111
Figure 6.3. Number of Barbecue Grills Shipped in North America, by Power Source	112
Figure 6.4. Home Fires Involving Grills, by Year	112
Figure 6.5. Percent of Home Grill Fires Involving Gas-Fueled Grills, by Year	113
Figure 6.6. Grills, by Leading Areas of Origin	114
Table 6.1. Grills, by Power Source	116
Table 6.2. Gas-Fueled Grills, by Year	119
Table 6.3. Solid-Fueled Grills, by Year	122
Table 6.4. Grills, by Power Source	125
Table 6.5. Grills, by Area of Origin	127
Table 6.6. Gas-Fueled Grills, by Area of Origin	129
Table 6.7. Solid-Fueled Grills, by Area of Origin	131
Table 6.8. Grills, by Factor Contributing to Ignition	132
Table 6.9. Gas-Fueled Grills, by Factor Contributing to Ignition	135
Table 6.10. Solid-Fueled Grills, by Factor Contributing to Ignition	138
Table 6.11. Grills, by Item First Ignited	139
Table 6.12. Gas-Fueled Grills, by Item First Ignited	141
Table 6.13. Solid-Fueled Grills, by Item First Ignited	143
 Section 7. Deep Fryers	
Figure 7.1. Reported Home Structure Fires Involving Deep Fryers, by Year	146
Figure 7.2. Home Structure Fires Involving Deep Fryers, by Area of Origin	147
Table 7.1. Deep Fryers, by Year	149
Table 7.2. Deep Fryers, by Factor Contributing to Ignition	150
Table 7.3. Deep Fryers, by Item First Ignited	151
Table 7.4. Deep Fryers, by Area of Origin	152
Table 7.5. Deep Fryers, by Extent of Flame Damage	152
 Section 8. Grease Hoods or Duct Exhaust Fans	
Figure 8.1. Reported Home Structure Fires Involving Grease Hoods or Duct Fans, by Year	154
Table 8.1. Grease Hoods or Duct Fans, by Year	155
Table 8.2. Grease Hoods or Duct Fans, by Factor Contributing to Ignition	156
Table 8.3. Grease Hoods or Duct Fans, by Item First Ignited	157
Table 8.4. Grease Hoods or Duct Fans, by Extent of Flame Damage	157

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 five-year period of 2004-2008, U.S. fire departments responded to an estimated average of 154,700 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 460 civilian deaths, 4,850 reported civilian fire injuries, and \$724 million in direct property damage. Overall, these incidents accounted for two of every five (41%) reported home fires, 17% of home fire deaths, more than one-third (37%) of reported home fire injuries, and 11% 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 (NFIRS 5.0) and NFPA's annual fire department experience survey.

The number of reported home fires involving cooking equipment increased 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 minor fires, it is hard to tell how much of the increase is due to changes in the data collections system. However, it is clear that little progress has been made in reducing deaths from home cooking fires. The average of 460 deaths per year in 2004-2008 was only 7% lower than the 500 per year in 1980-1984.

Ranges or cooktops were the heat sources in three of every five (59%) reported home fires involving cooking equipment, nine of every 10 (89%) associated civilian deaths, three-quarters (77%) of the reported cooking fire civilian injuries, and 71% of the associated direct property damages. Unattended equipment was a factor in one-third (34%) of reported home cooking fires. Abandoned or discarded material, which may be related to unattended equipment, was a factor in 10% of these fires. An additional 10% were caused by an unclassified misuse of material. Nine percent occurred when something that could catch fire was too close to the cooking equipment. Eight percent occurred when the cooking equipment was unintentionally turned on or not turned off.

Households that use electric ranges have a higher risk of cooking fires and associated losses than those using gas ranges.

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*

Not surprisingly, two-thirds (66%) of home structure fires involving cooking equipment began with the ignition of cooking materials or food. Clothing was the item first ignited in less than 1% of these fires, but clothing ignitions led to 15% 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 of 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 survey of residential fires, 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 21 times the average number of civilian injuries per year in reported fires during 2004-2008. 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 of every five (59%) civilians who were non-fatally injured in reported home structure fires involving cooking equipment were hurt while they were trying to fight the fire, compared to roughly one-third (37%) of injuries suffered in overall home structure fires. Almost three-quarters of non-fatal reported home cooking fire 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. Children under five years of age account for only 7% of the U.S. population, but according to 2009 data from the CPSC's National Electronic Injury Surveillance System (NEISS), these young children suffered an estimated:

- 3,510, or 57%, of the scald burns associated with tableware such as coffee cups and soup bowls;
- 5,600, or 36%, of the thermal non-fire burns associated with range or ovens, with most caused by contact with the equipment;
- 1,040, or 36%, of the scald burns associated with ranges or ovens;
- 2,080, or 34%, of the thermal non-fire burns (mostly contact burns) associated with grills or barbecues;
- 1,230, or 31%, of the scald burns associated with microwave ovens;
- 1,000, or 11%, of the scald burns from cookware such as pots and pans; and
- 910, or 10%, of the burns from contact with hot cookware.

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.



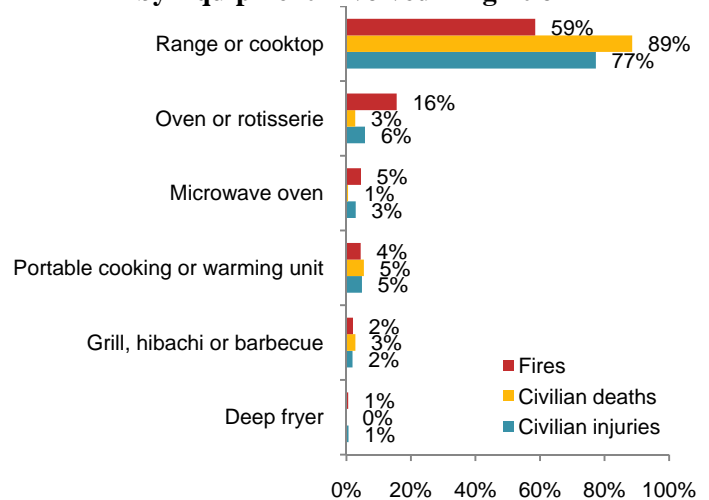
Home Fires Involving Cooking Equipment

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 five year period of 2004-2008:

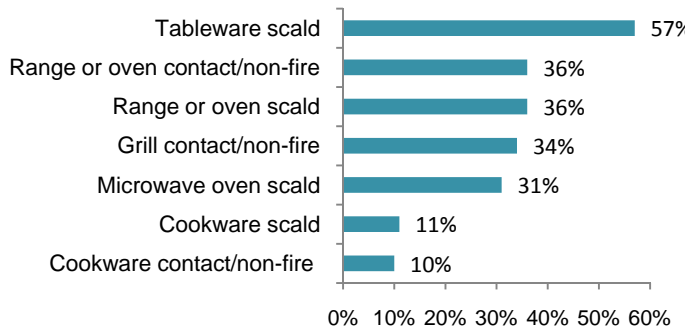
- U.S. fire departments responded to an average of **154,700** home¹ structure fires that involved cooking equipment per year. These fires caused an average of 460 civilian fire deaths, 4,850 civilian fire injuries, and \$724 million in direct property damage.
- Cooking equipment was involved in
 - 2 of every 5 (41%) reported home fires,
 - 1 of every 6 (17%) home fire deaths,
 - More than one-third (37%) of home fire injuries, and
 - 11% of the direct property damage resulting from home fires.
- Unattended cooking was by far the leading contributing factor in these fires.
- Clothing was the item first ignited in less than 1% of these fires, but these incidents accounted for 15% of the cooking fire deaths.
- Ranges accounted for the largest share (59%) of home cooking fire incidents. Ovens accounted for 16%.
- Three of every five (59%) reported non-fatal home cooking fire injuries occurred when the victims tried to fight the fire themselves.

Home Cooking Equipment Fires by Equipment Involved in Ignition



- 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.

Percent of Non-Fire Cooking-Related Burns Seen at Emergency Rooms that Were Incurred by Children under Five Years Old



Source: CPSC's NEISS data, queried in October 2010.

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

In 2009, ranges or ovens were involved in an estimated 17,300 thermal burn injuries seen in U.S. hospital emergency rooms.²

- 90% resulted from contact with the hot equipment or some other non-fire source.

Children under five face a higher risk of non-fire burns associated with cooking than of being burned in a cooking fire.

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

²Data from the Consumer Product Safety Commission's National Electronic Injury Surveillance System, queried in August 2009.

Cooking Safety

Cooking brings family and friends together, provides an outlet for creativity and can be relaxing. But did you know that cooking fires are the number one cause of home fires and home injuries? By following a few safety tips you can prevent these fires.

“COOK WITH CAUTION”

- » Be on alert! If you are sleepy or have consumed alcohol don't use the stove or stovetop.
- » Stay in the kitchen while you are frying, grilling, or broiling food. If you leave the kitchen for even a short period of time, turn off the stove.
- » 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 are cooking.
- » Keep anything that can catch fire — oven mitts, wooden utensils, food packaging, towels or curtains — away from your stovetop.

IF YOU HAVE A COOKING FIRE...

- » Just get out! When you leave, close the door behind you to help contain the fire.
- » Call **9-1-1** or the local emergency number after you leave.
- » If you try to fight the fire, be sure others are getting out and you have a clear way out.
- » Keep a lid nearby when you're cooking to smother small grease fires. Smother the fire by sliding the lid over the pan and turn off the stovetop. Leave the pan covered until it is completely cooled.
- » For an oven fire turn off the heat and keep the door closed.



Cooking and Kids

Have a “kid-free zone” of at least 3 feet around the stove and areas where hot food or drink is prepared or carried.

FACTS

- ! The leading cause of fires in the kitchen is unattended cooking.
- ! Most cooking fires in the home involve the stovetop.



www.nfpa.org/education



Your Source for SAFETY Information

NFPA Public Education Division • 1 Batterymarch Park, Quincy, MA 02169



Home Fires Involving Grills

In 2004-2008, U.S. fire departments responded to an average of 7,700 home¹ fires involving grills, hibachis, or barbecues per year, including an average of 3,200 structure fires and 4,500 outside fires. These 7,700 fires caused annual average of 13 civilian deaths, 120 reported injuries, and \$70 million in direct property damage.

- Almost all the losses resulted from structure fires.
- July was the peak month for grill fires but these incidents occur throughout the year.

Gas vs. Solid-Fueled Grills

Four of every five grills involved in home fires (81%) were fueled by gas while 17% used charcoal or other solid fuel.

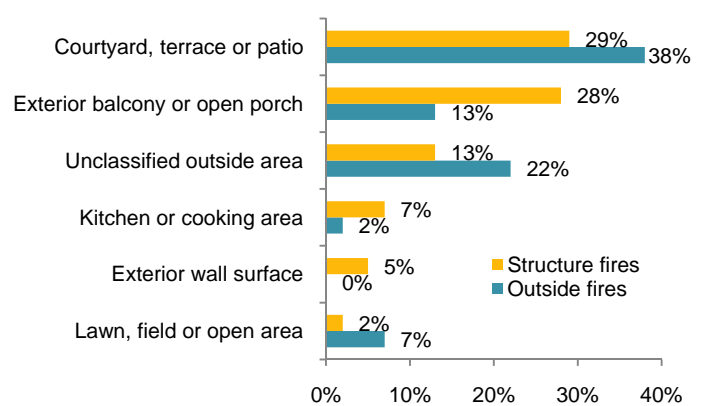
Gas grills were involved in an average of 6,200 home fires per year, including 2,400 structure fires and 3,800 outdoor fires annually.

- 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 700 structure fires and 600 outside fires.

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

Home Grill Fires by Leading Areas of Origin 2004-2008



- More than one-quarter (29%) of the home structure fires involving grills started on a courtyard, terrace, or patio;
- 28% started on an exterior balcony or open porch;
 - 7% began in the kitchen; and
 - 5% started on an exterior wall surface.

Emergency Room Visits Due to Grills

In 2009, 17,700 patients went to emergency rooms because of injuries involving grills.²

Roughly half (9,400) of the injuries were thermal burns.

- Children under five accounted for almost one-quarter (22%) 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.

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

²Data from the Consumer Product Safety Commission's National Electronic Injury Surveillance System, queried in August 2009.



GRILLING SAFETY TIPS

Fire in the grill, under hot dogs and burgers, is a welcome sight at the family cookout. But fire anywhere else can make your summer kick-off barbecue memorable for all the wrong reasons.

Safety tips

- Propane and charcoal BBQ grills must only be used outdoors. If used indoors, or in any enclosed spaces, such as tents, they pose both a fire hazard and the risk of exposing occupants to toxic gases and potential asphyxiation.
- Position the grill well away from siding, deck railings and out from under eaves and overhanging branches.
- Place the grill a safe distance from lawn games, play areas, and foot traffic.
- Keep children and pets away from the grill area: declare a three-foot "safe zone" around the grill.
- Put out several long-handled grilling tools to give the chef plenty of clearance from heat and flames when flipping burgers.
- Periodically remove grease or fat buildup in trays below grill so it cannot be ignited by a hot grill.

Charcoal grills

- Purchase the proper starter fluid and store the can out of reach of children, and away from heat sources.
- Never add charcoal starter fluid when coals or kindling have already been ignited, and never use any flammable or combustible liquid other than charcoal starter fluid to get the fire going.

Propane grills

- Check the gas cylinder hose for leaks before using it for the first time each year. A light soap and water solution applied to the hose will quickly reveal escaping propane by releasing bubbles. If you determine your grill has a gas leak, by smell or the soapy bubble test, and there is no flame, turn off the gas tank and grill. If the leak stops, get the grill serviced by a professional before using it again. If the leak does not stop, call the fire department.
- If you smell gas while cooking, immediately get away from the grill and call the fire department. Do not attempt to move the grill.
- Use only equipment with the label of a recognized testing laboratory. Follow the manufacturers' instructions on how to set up the grill and maintain it.

Home Fires Involving Cooking Equipment

The leading cause of home fires and home fire injuries is cooking equipment.

During the five- year-period of 2004-2008, cooking equipment was involved in an estimated annual average of 154,700 reported home¹ structure fires. Table A shows that these fires caused an average of 460 civilian deaths, 4,850 civilian injuries, and \$724 million in direct property damage per year. Overall, these incidents accounted for 41% of all reported home fires, 17% of home fire deaths, 37% of home civilian injuries, and 11% of the direct property damage resulting from home fires.

The term “cooking equipment” is used to describe equipment that heats food or processes heat during food preparation (grease hoods). Other kitchen equipment, such as refrigerators, freezers, and dishwashers are discussed in John Hall’s August 2009 NFPA report, *Home Structure Fires Involving Kitchen Equipment Other than Cooking Equipment*. When any type of equipment is described as involved in ignition, it simply means that the equipment was the heat source that started the fire.

In Version 5.0 of the U.S. Fire Administration’s National Fire Incident Reporting System (NFIRS 5.0), six incident types are used to identify specific types of minor fires in or on structures that did not spread beyond a confined cooking vessel, a chimney or flue, a fuel burner or boiler, a compactor, an incinerator or beyond ignited trash to other contents or the structure itself. Incident type 113 identifies confined cooking fires. While additional casual information is not required, it is sometimes provided.

Choices must be made in calculating the best estimate of the number of fires associated with cooking activities or cooking equipment. The simplest approach and the approach used here, counts all non-confined fires involving cooking equipment and all fires with an incident type indicating a cooking fire confined to the vessel origin as cooking fires, and ignores any cooking equipment in other confined fire incident types.

The first section of Table A shows specific types of cooking equipment summed from both non-confined and confined fires. The second section shows estimates of confined cooking fires in which the equipment involved was coded as something other than cooking equipment. While some homes do have kitchen ranges that are also designed to produce to heat, the category “heating stove” may also include some wood stoves that were incidentally used for cooking and conventional kitchen ranges grouped here because of the word “stove.” (We have no way of statistically estimating the fires in which cooking equipment is inappropriately used for heat.) Fires coded as no equipment involved may reflect a reluctance to identify equipment in cases of human error. Roughly one-third (32%) of the other known non-cooking equipment in confined cooking fires were completely unclassified equipment, 15% were burners (a code in the torch category), and another 11% were unclassified personal or household equipment.

¹ The term “home” includes two broad categories of properties: 1) one- or two family homes, including manufactured homes; and 2) apartments, town houses and flats, regardless of ownership.

Data Sources, Definitions and Conventions Used in this Report

The fire statistics 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 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 NFPA's annual fire department experience survey. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Fires are typically rounded to the nearest hundred, civilian deaths and civilian injuries are expressed to the nearest ten and property damage is rounded to the nearest million dollars. Less rounding is used when totals for an equipment group are smaller.

NFIRS incident type codes in the range of 110-129 were used to identify structure fires. Unknown data were allocated proportionally in most fields analyzed except for incident type. NFIRS incident type 113, a confined cooking fire, is used to capture structure fires involving the contents of cooking vessel with no fire extension beyond vessel. Causal information, including equipment involved in ignition, is not required for confined cooking fires or other structure fires with confined fire incident types (incident types 113-118). Equipment involved in ignition was reported in 23% of the non-confined fires and 5% of the confined fires. Confined and non-confined structure fires were analyzed separately and then summed to obtain estimates

Several types of cooking equipment are examined in this report:

Equipment Involved in Ignition	Equipment Involved NFIRS Code
Range or cooktop, with or without an oven	646
Oven or rotisserie	645
Portable cooking or warming device, including: coffee makers or teapots; food warmers or hot plates; kettles; popcorn poppers; pressure cookers or canners; slow cookers, toasters, toaster ovens or countertop broilers; woks, frying pans or skillets; and bread making machines	631-641
Microwave oven	644
Grill, hibachi or barbecue	643
Deep fryer	642
Grease hood or duct exhaust fan	654

The estimates reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined type. Fires reported as "no equipment" but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated.

Unless otherwise specified, property damage has not been adjusted for inflation. Additional details on the methodology used may be found in Appendix A. Our analysis methods are continually being refined and previous estimates updated.

NFIRS 5.0, first introduced in 1999, brought major changes to fire incident data, including changes in some definitions and coding rules. Because of these changes, caution should be used when comparing data before 1998 with data from 1999 on.

Table A.
Home Structure Fires Involving Cooking Equipment
2004-2008 Annual Averages

Equipment Type	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Specific types of cooking equipment	133,300	(86%)	460	(100%)	4,540	(94%)	\$719	(99%)
Range or cooktop	90,500	(59%)	410	(89%)	3,750	(77%)	\$516	(71%)
Oven or rotisserie	24,100	(16%)	10	(3%)	280	(6%)	\$32	(4%)
Microwave oven	7,000	(5%)	0	(1%)	140	(3%)	\$22	(3%)
Portable cooking or warming unit	6,800	(4%)	20	(5%)	230	(5%)	\$62	(9%)
Grill, hibachi or barbecue	3,200	(2%)	10	(3%)	90	(2%)	\$69	(10%)
Deep fryer	900	(1%)	0	(0%)	30	(1%)	\$12	(2%)
Grease hood or duct exhaust fan	700	(0%)	0	(0%)	20	(0%)	\$6	(1%)
Confined cooking fire incident type but equipment involved was not cooking equipment	21,300	(14%)	0	(0%)	310	(6%)	\$4	(1%)
Heating stove in confined cooking fire	10,600	(7%)	0	(0%)	190	(4%)	\$3	(0%)
Other known non-cooking equipment in confined cooking fire	9,500	(6%)	0	(0%)	110	(2%)	\$2	(0%)
No equipment involved in confined cooking fire	1,300	(1%)	0	(0%)	10	(0%)	\$0	(0%)
Total cooking equipment fires including all fires with confined cooking fire incident type and non-confined fires with cooking equipment involved	154,700	(100%)	460	(100%)	460	(100%)	\$724	(100%)

Note: Total line is the sum of the non-confined fires in which cooking equipment was involved and all confined cooking fires identified by confined cooking fire incident type. Confined cooking fires are fires with incident type 113 indicating the fire was confined to a cooking vessel. Sums may not equal totals due to rounding errors.

Source: Data from NFIRS Version 5.0 and from NFPA survey.

The estimates of identified cooking equipment are sums of cooking equipment in both non-confined fires and confined cooking fires, and include proportional shares of fires in which the equipment involved in ignition was unknown or not reported. While it is also possible that non-cooking equipment in non-confined fires was occasionally used for cooking, those incidents cannot be tracked.

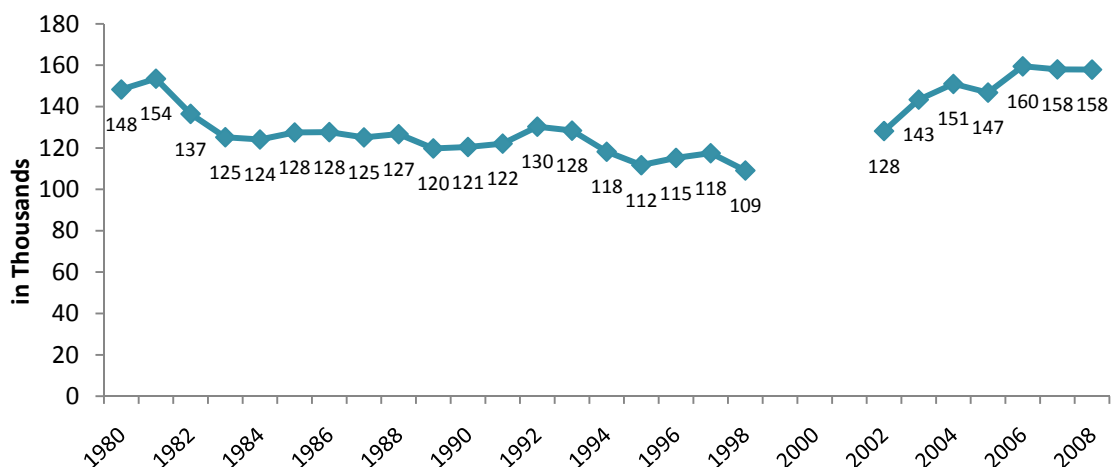
Trends in Reported Home Structure Fires Involving Cooking Equipment

The introduction of NFIRS 5.0 was accompanied by an increase in reported cooking equipment fires.

Figure 1.1 and Table 1.1 show that reported fires involving cooking equipment were generally heading slowly downward through most of the 1980s and 1990s. As mentioned earlier, NFIRS 5.0 made it much easier to document minor cooking fires. Use of NFIRS 5.0 was accompanied

by an increase in reported cooking fires. Reported cooking fires hit their highest point in 2006 with 159,500 such incidents. Because of the changes in NFIRS, it is impossible to tell how much of the increase is due to changes in the data collection system and how much is actually real.

Figure 1.1. Reported Home Structure Fires Involving Cooking Equipment by Year: 1980-2008



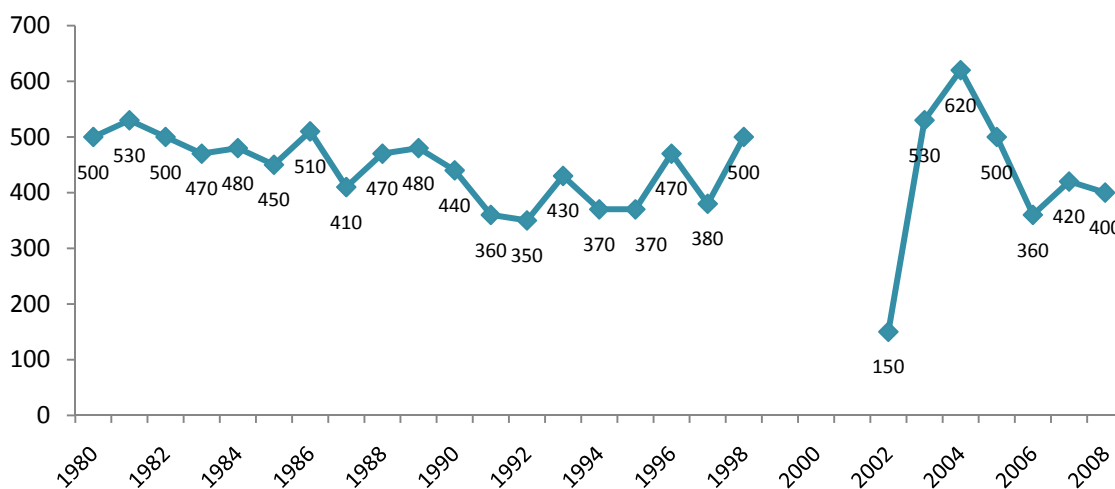
Note: See Notes on Table 1.1.

Source: Data from NFIRS and NFPA Survey.

The average number of cooking fire deaths in 2004-2008 was only 7% lower than the 1980-1984 average.

As Figure 1.2 shows, no clear trend can be seen in the deaths resulting from home fires involving cooking equipment. The average 460 deaths per year in 2004-2008 was only seven percent lower than the average of 500 deaths per year in 1980-1984

Figure 1.2. Civilian Fire Deaths Resulting from Home Structure Fires Involving Cooking Equipment, by Year: 1980-2008



Note: See Notes on Table 1.1.

Source: Data from NFIRS and NFPA Survey.

CPSC's 2004-2005 residential fire survey found that cooking equipment was involved in 4.7 million unreported home fires per year.

The 2004-2005 CPSC's Residential Fire Survey asked about all fires, including incidents that were not attended by the fire service.¹ They estimate that U.S. households experienced a total of 7.4 million fires per year, including 7.2 million that were not attended by the fire service. Cooking appliances were involved in 4.8 million home fires, including 4.7 million incidents that the fire department did not attend. One of every 22 occupied households had a cooking fire. Unreported cooking fires fell 63% from the 12.3 million such incidents in the 1984 survey of unreported residential fires done for the CPSC.

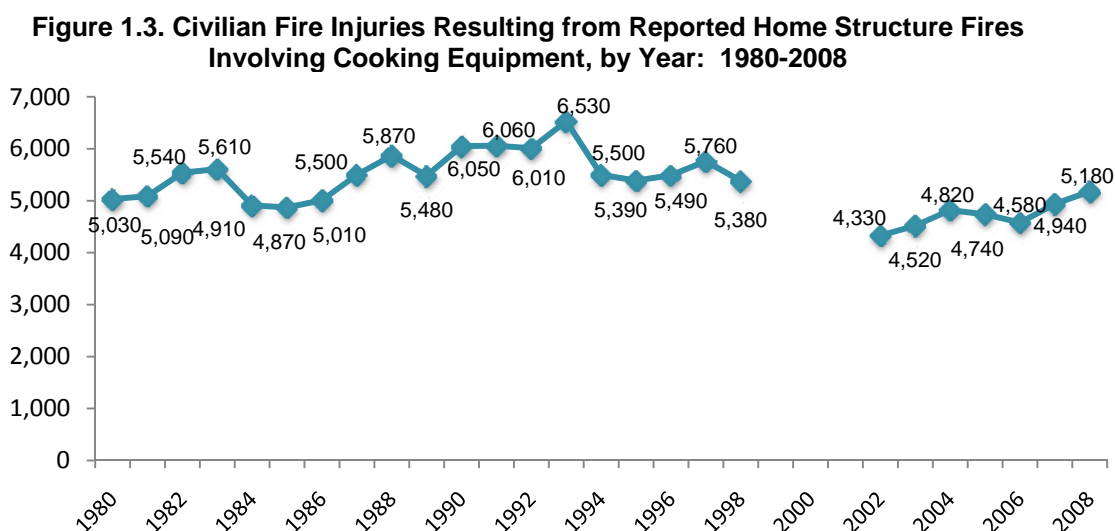
Cooking equipment was involved in roughly two-thirds of home fire incidents, including 64% of the total and 65% of fires that the fire department did not attend. The fire department responded to only one of every 50 home cooking fires.

The study also found that 102,000 injuries resulted from cooking equipment fires with no fire department presence. This is 21 times the average number of civilian injuries per year in reported fires during 2004-2008. 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.

When respondents with fires involving cooking equipment were asked if the equipment was operating properly at the time of the fire, 99% said it was. In 9,600 unreported home fires involving cooking equipment (0.2% of the total), the occupants had to leave the home for at least one night. All were able to return in less than a week.

¹ Michael A. Greene and Craig Andres. *2004-2005 National Sample Survey of Unreported Residential Fires*. U.S. Consumer Product Safety Commission, July 2009, pp. 20, 102, 127-133

Figure 1.3 shows that reported civilian injuries caused by these fires peaked in the early 1990s. Reported injuries were lower during the early years of NFIRS 5.0 but have been trending upward.



Note: See Notes on Table 1.1.

Source: Data from NFIRS and NFPA Survey.

The When and Where of Home Structure Fires Involving Cooking Equipment

Reported home cooking equipment fire deaths peak in January and February.

Table 1.2 shows that there was relatively little variation in frequency of reported home cooking equipment structure fires by month. July had the fewest structure fires involving cooking equipment overall, but July was the peak month for home fires, including both structure fires and outdoor fires, involving grills. Deaths from cooking equipment fires were most common in January (17%) and February (14%).

Sunday was the peak day of the week for home cooking equipment fires (15%) and associated deaths (23%). Saturday ranked second in both fires and deaths. (See Table 1.3.)

Thanksgiving was the peak day for home fires involving cooking equipment.

During 2008, all five dates with the largest numbers of estimated reported home fires involving cooking equipment were associated with holidays. Thanksgiving, perhaps the national holiday most strongly associated with a traditional meal, remains the leading day for cooking fires with three times as many cooking fires as an average day. Table B provides the details.

**Table B. Leading Dates for 2008 Home Fires Involving Cooking Equipment
Structure Fires Reported to U.S. Fire Departments**

Date	Fires	Percent Above Average Number of Fires per Day
November 27 (Thanksgiving)	1,300	201%
December 25 (Christmas Day)	730	68%
December 24 (Christmas Eve)	670	55%
November 26 (Day before Thanksgiving)	580	34%
March 23 (Easter)	490	14%

Source: Data from NFIRS 5.0 and NFPA survey.

Two-thirds of U.S. households cook at least one hot meal a day.

The Energy Information Administration reported that in 2005, 75 million U.S. households (68%) cooked at least one hot meal per day. Ninety-six percent of households cooked a meal at least once a week.² The American Time Use Survey (ATUS) found that in 2009, U.S. residents at least 15 years of age spent an average of 32 minutes per day on food preparation and clean up. The 55% of the population who actually engage in this activity averaged 59 minutes a day.³

Peak times for reported cooking fires, injuries, and property damage coincide with peak cooking times.

Table 1.4 and Figure 1.4 show that reported home fires and civilian injuries involving cooking equipment peaked between 4:00 p.m. and 8:00 p.m. This period is also the peak time for cooking-related activities of food preparation and clean-up. Data from the 2005-2009 American Time Use Survey on the percentage of the population engaged in household food preparation and clean-up activities at each hour of the day are shown by the dotted line.⁴ The dashed line shows the distribution of time spent cooking rather than the percentage of population cooking. Note that a sizeable minority of the adult population does not engage in food preparation or cleanup.

While 52% of overall home fire deaths resulted from fires reported between 11:00 p.m. and 7:00 a.m.,⁵ in 2003-2007, only 37% of the cooking equipment fire deaths resulted from fires reported during these hours. This is still slightly higher than the one-third (33%) of hours covered but 15 percentage points below the overall fire death percentage during this period.

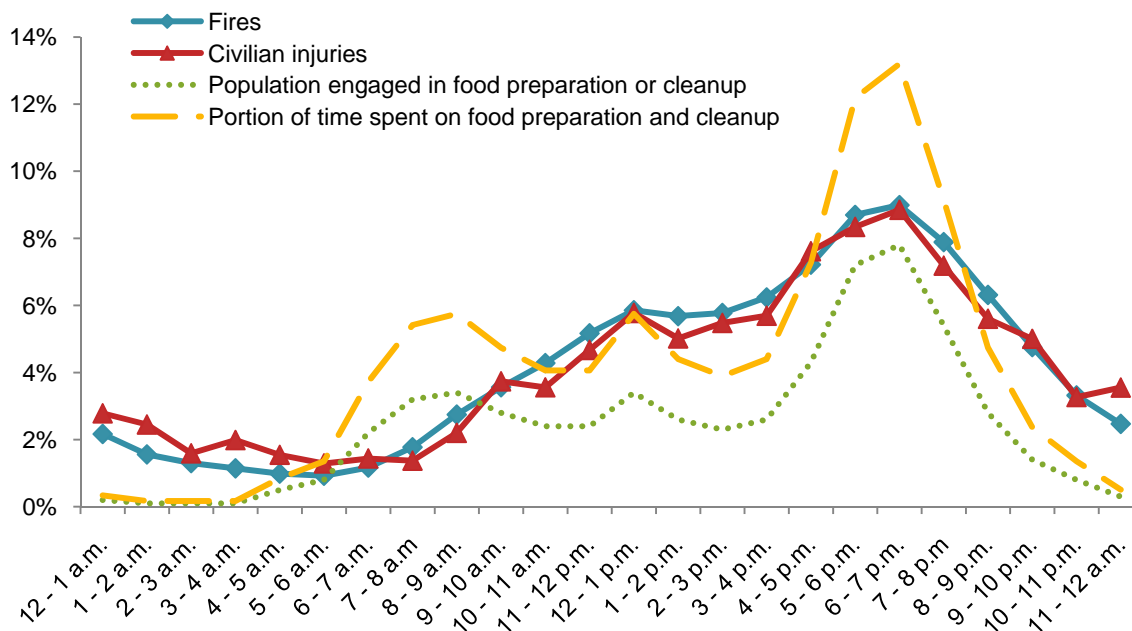
² Energy Information Administration. *2005 Residential Energy Consumption Survey: Preliminary Housing Characteristics Tables*, Table HC2.10 "Home Appliances Usage Indicators by Type of Housing Unit, 2005.

³ Bureau of Labor Statistics. *American Time Use Survey*, "Table A-1. Time Spent in Detailed Primary Activities and Percent of the Civilian Population Engaging in each Detailed Activity Category, Averages per Day by Sex, 2009 Annual Averages," accessed at http://www.bls.gov/tus/tables/a1_2009.pdf on November 16, 2010.

⁴ Bureau of Labor Statistics. *American Time Use Survey*, Table A-3. Percent of the Population Engaging in Activities by Time of Day, 2005-2009 accessed at http://www.bls.gov/tus/tables/a3_0509.pdf on November 16, 2010.

⁵ Marty Ahrens, *Home Structure Fires*, Quincy, MA: National Fire Protection Association, 2009, p. 6.

Figure 1.4. Reported Home Cooking Equipment Fires and Injuries and Percent of Population Cooking, by Time of Alarm: 2004-2008



Source: Fire and injury data from NFIRS 5.0 and NFPA survey; Population cooking data from the American Time Use Survey.

Almost all cooking equipment fires began in the kitchen.

Table 1.5 shows that 94% of all home cooking fires started in the kitchen. Most of the other leading areas of origin – courtyards, terraces or patios; exterior balconies or unenclosed porches; and unclassified outside areas; – primarily reflected locations of grill fires, and to a lesser extent, deep fryers.

Causal Factors

Ranges, with or without ovens, were involved in three out of five reported cooking fires.

Table A showed that ranges or cooktops were involved in 59% of the reported cooking fires. Their share of the losses was even greater. Ranges or cooktops were the heat sources in 89% of the civilian deaths, 77% of the civilian injuries, and 71% of the property damages associated with cooking equipment fires. Table C also shows that the risk of death per 1,000 reported range or cooktop fires was 4.5, 52% higher than the 3.0 deaths per 1,000 overall cooking equipment fires. Both are lower than the overall rate of 7.3 deaths per 1,000 reported home fires from all causes. The average dollar loss per fire was highest for cooking equipment that could be used in a variety of places. The loss per grill, hibachi, or barbecue fire was 4.6 times the average, while the loss from deep fryer fires was almost three times the average and the loss from fires involving portable cooking or warming units was almost twice the average loss. Loss rates from

fires involving ovens or rotisseries and from microwave ovens were lower than average on all three measures.

Table C. Reported Home Structure Fires Involving Cooking Equipment, by Type of Device, Risk of Death and Injury per 1,000 Fires and Average Loss per Fire 2004-2008 Annual Averages

Device	Fires	Civilian Deaths Per 1,000 Fires	Civilian Injuries Per 1,000 Fires	Average Loss Per Fire
Specific types of cooking equipment	133,300 (86%)	3.5	34	\$5,395
Range or cooktop	90,500 (59%)	4.5	41	\$5,700
Oven or rotisserie	24,100 (16%)	0.5	12	\$1,300
Microwave oven	7,000 (5%)	0.3	20	\$3,200
Portable cooking or warming unit	6,800 (4%)	3.7	34	\$9,200
Grill, hibachi or barbecue	3,200 (2%)	4.0	29	\$21,600
Deep fryer	900 (1%)	0.0	36	\$13,600
Grease hood or duct exhaust fan	700 (0%)	0.0	22	\$7,900
Confined cooking fire incident type but equipment involved was not cooking equipment	21,300 (14%)	0.0	14	\$203
Heating stove in confined cooking fire	10,600 (7%)	0.0	18	\$200
Other known non-cooking equipment in confined cooking fire	9,500 (6%)	0.0	11	\$200
No equipment involved in confined cooking fire	1,300 (1%)	0.0	9	\$200
All confined cooking fires identified by incident type	115,900 (75%)	0.1	13	\$200
Total cooking equipment fires including all fires with confined cooking fire incident type and non-confined fires with cooking equipment involved	154,700 (100%)	3.0	31	\$4,700

Note: Calculations were made with unrounded data. Sums may not equal totals due to rounding errors.
Source: Data from NFIRS Version 5.0 and NFPA survey.

Unattended equipment was the leading contributing factor in home cooking fires.

Table 1.6 shows that equipment that was left unattended was a factor contributing to ignition in one-third (34%) of reported home structure fires involving cooking equipment. Unattended equipment was also a factor in half (48%) of the civilian deaths and 45% of the civilian injuries. Abandoned or discarded material and an unclassified misuse of material were each factors in 10% of the incidents. Something that could catch fire was too close to the cooking equipment in 9% of the fires. In 8% of the incidents, the equipment was unintentionally turned on or not turned off.

The share of home structure fires involving cooking equipment that cited equipment unattended as a factor contributing to ignition (34% in 2004-2008) is much lower than the share of all home cooking fires with this factor before the introduction of NFIRS Version 5.0. Some explanations have been proposed, but these remain speculative. In the older system, the code choice simply

had the word “unattended.” In NFIRS 5.0, the code is “equipment unattended.” The wording may influence the likelihood of its use. It is also possible that some unattended-equipment fires are being coded instead as unattended-person fires under human factor contributing to ignition.

Falling asleep was a contributing factor in almost one-quarter of home cooking fire deaths.

Table 1.7 shows that in 22% of the deaths resulting from home fires involving cooking equipment, “asleep” was a human factor contributing to ignition. In 19% of the home cooking fires, an unattended or unsupervised person was a contributing human factor. The code choice “unattended or unsupervised person” is intended to describe a fire started by a person with unreliable judgment or a person with limited mobility, such as a young child or a person with a severe disability, whose access to or contact with a heat source leads to the fire. Almost three-quarters of the civilians injured in home cooking equipment fires coded with an unattended or unsupervised person were 18-64 years of age. It seems probable that many of these fires involved unattended cooking, not unattended individuals.

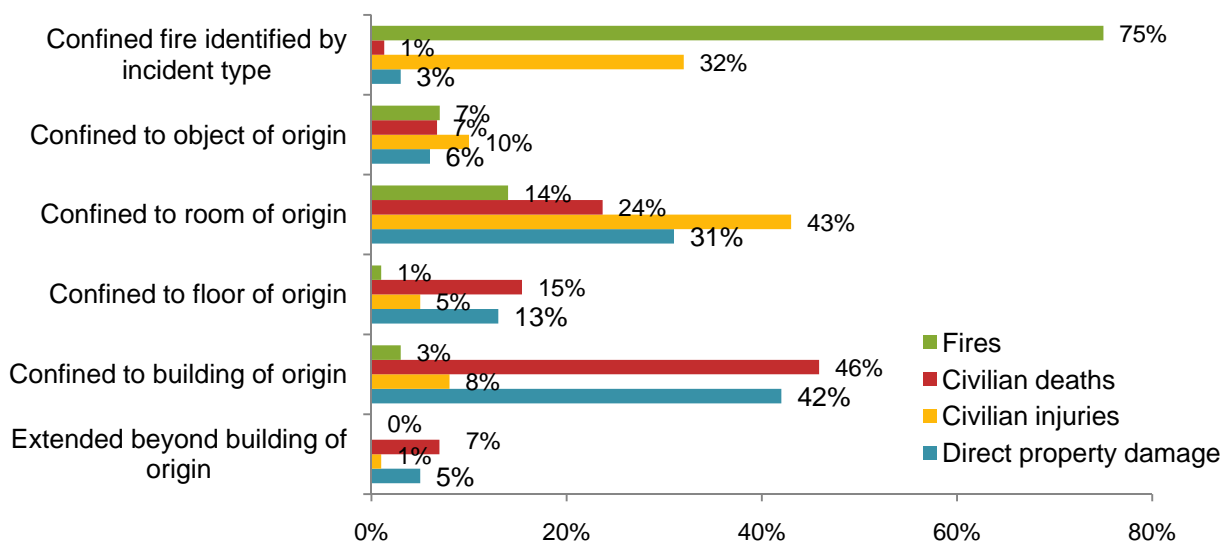
Two-thirds of home cooking equipment fires started with the ignition of food or other cooking materials.

Table 1.8 shows that in two-thirds (66%) of reported home structure fires involving cooking equipment, the item first ignited was some type of cooking material or food. Seven percent began with an unclassified item. Six percent began with household utensils. In 5%, appliance housings or casings were first ignited. Clothing ignitions accounted for less than 1% of the fires but these incidents caused 15% of the associated deaths.

96% of reported home cooking equipment fires were confined to the room of origin.

Figure 1.5 and Table 1.9 show that 8% of the deaths and 42% of the civilian injuries associated with reported home cooking equipment fires resulted from fires that were either:

Figure 1.5. Home Fires Involving Cooking Equipment by Extent of Flame Damage: 2004-2008



Source: Data from NFIRS Version 5.0 and NFPA survey.

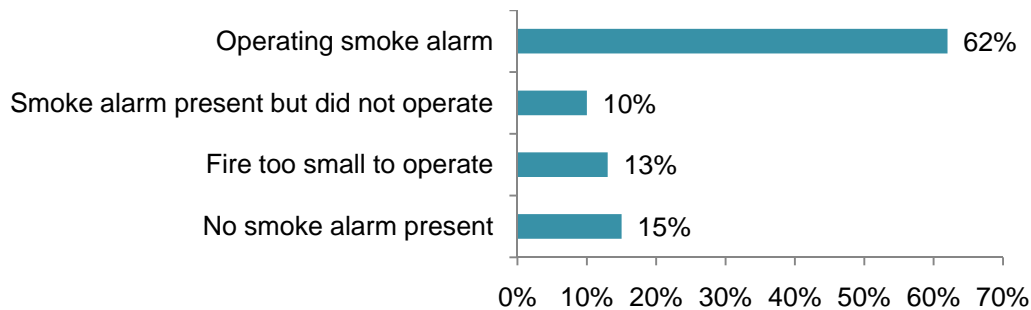
- a) coded with incident types indicating they were cooking fires involving the contents of a cooking vessel that did not extend beyond the vessel of origin (75% of the cooking equipment fires), or
- b) did not have a confined fire incident type but had flame damage confined to the object of origin (7% of the cooking equipment fires).

Combining the two, 82% of reported home cooking fires did not spread beyond the object of origin. One-third (32%) of home cooking equipment fire deaths and 86% of home cooking equipment fire injuries resulted from the 96% of fires that were confined to the room where the fire began.

Smoke alarms were more likely to be present in fires involving cooking equipment than in overall home fires.

Table 1.10 shows that alarms were present and operated in 62% of reported home fires involving cooking equipment and present, regardless of operating status, in 85% of reported home fires involving cooking equipment. In home fires of all causes reported in 2003-2006, smoke alarms were present in only 69% of the incidents and operated in 47%.⁶

Figure 1.6. Smoke Alarm Status in Reported Home Fires Involving Cooking Equipment 2004-2008



Source: Data from NFIRS 5.0 and NFPA survey.

In 1992, U.S. Consumer Product Safety Commission's (CPSC's) National Smoke Detector Project sent investigators into households in the general population. They found that nuisance alarms were the leading reason for disabling smoke alarms. They also looked at the reasons for nuisance activations. One-third of the smoke alarms had been placed in areas that made nuisance alarms more likely, often less than five feet from a potential source of smoke, steam, or moisture.⁷ An Alaskan study, published in 2000, found that 81% of the ionization cooking nuisance alarms were related to frying.⁸

A 2010 Harris Interactive poll done for the NFPA found that 52% of households reported having smoke alarms in the kitchen. Such placement is an invitation to frequent nuisance alarms. NFPA 72, *National Fire Alarm and Signaling Code* provides advice to help prevent nuisance

⁶ Marty Ahrens. *Smoke Alarms in U.S. Home Fires*, Quincy, MA: NFPA, 2009, p. 3.

⁷ Charles L. Smith, *Smoke Detector Operability Survey – Report on Findings*, Bethesda, MD: U.S. Consumer Product Safety Commission, November 1993.

⁸ Thomas M. Fazzini, Ron Perkins, and David Grossman. "Ionization and Photoelectric Smoke Alarms in Rural Alaskan Homes," *West J. Med*; 2000;173:89-92. online at <http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1071008&blobtype=pdf>.

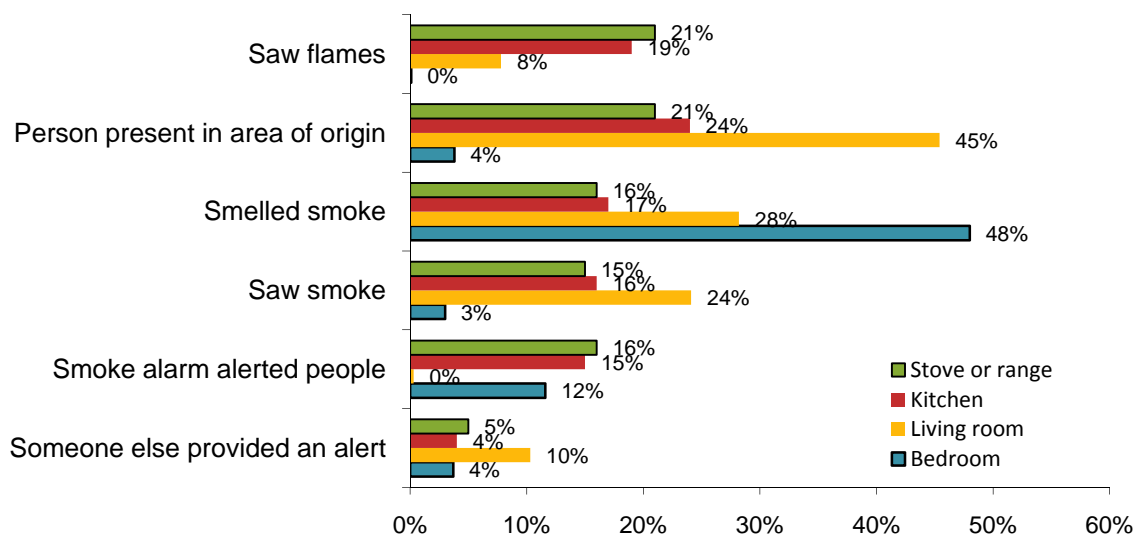
alarms. When possible, smoke alarms should be installed at least 20 feet away from the kitchen range. If that is not possible, any smoke alarm between 10 and 20 feet away from the stove should have a hush feature, which temporarily reduces the sensitivity of the alarm, or use a photoelectric sensor.

Smoke alarms alerted occupants in 16% of unreported home cooking fires.

In CPSC’s 2004-2005 Residential Fire Survey, smoke alarms sounded in 37% of kitchen fires, 41% of stove fires, and 30% of other cooking equipment fires that were handled without a fire department response. The sounding alarms alerted people in 16% of both stove and other cooking fires. The alarms provided the only alert in 13% of the stove fires and 11% of other cooking fires. The same report provided information on how fires were discovered.

Figure 1.7 shows that someone saw flames in 21% of the stove or range fires and 19% of all kitchen fires that were handled without fire department assistance. Someone was present in the area of origin when the fire started in 21% of stove or range fires and 24% of the kitchen fires.⁹ The method of discovery is also shown for living room and bedroom fires for contrast. Multiple answers were allowed to this question.

Figure 1.7. Method of Fire Discovery in CPSC 2004-2005 Sample Survey of Unreported Residential Fires



Source: Michael A. Greene and Craig Andres. pp. 162-168

According to the same study, in 44% of the unreported kitchen fires and 38% of the stove or range fires, not enough smoke reached the alarm to cause it to activate.

Automatic extinguishing systems were present in 8% of reported home cooking fires.

Table 1.11 shows that automatic extinguishing systems (AES) were present in 8% of reported home fires involving cooking equipment in 2004-2008, including 2% in which the system operated and 5% in which the fire was too small to activate the system. In contrast, automatic

⁹ Michael A. Greene and Craig D. Andres, *2004-2005 National Sample Survey of Unreported Residential Fires*, July 2009, pp. 162-168

extinguishing systems were present in 6% of reported home fires of all causes.¹⁰ Table 1.12 shows that sprinklers accounted for 96% of the AES present in reported home cooking fires, with wet pipe sprinklers accounting for 88%, dry pipe sprinklers for 7%, and 2% other sprinkler systems. In other words, the difference in AES presence is not because of non-water-based systems for range protection.

Technology could prevent many cooking fires.

The CPSC commissioned an Arthur D. Little, Inc. report on possible technologies that could address range or cooktop fires. The findings suggested that roughly two-thirds of these fires could be mitigated with technologies such as timers and motion sensors that would ensure someone was paying regular attention to the cooking.¹¹ Roughly three-quarters could be prevented with temperature sensors or related technologies to prevent cooking materials from igniting.

Today's ranges and cooktops come in a variety of configurations, including open or sealed gas burners and smooth and coil burners on electric stoves. Some stoves powered by electricity use induction for cooking. Some technologies may not be feasible for some configurations. Some technologies that use the suggested features are now available. Systematic studies of field reliability, costs vs. benefits, and consumer acceptance of these technologies are needed to determine which approaches will be most effective.

Victims of Home Structure Fires Involving Cooking Equipment

To prevent deaths and injuries from cooking equipment fires, it is helpful to know more about the victims of these fires. In the discussion that follows, the analyses were performed on victims of non-confined fires only.

Risk of cooking fire death is highest for young children and older adults but young children have a low rate of cooking fire injuries.

Table 1.13 and Figure 1.8 show that the relative risk of reported home cooking equipment fire deaths and injuries generally follows the same pattern as seen for home fire casualties overall.¹² During 2004-2008, an average of 80 (17%) of the home cooking fire fatalities per year were children under five. Compared to the general population, these young children were 2.5 times as likely to be killed by a cooking fire. Only people 85 and older had a

Relative Risk

Relative risk is calculated by dividing the rate of burns of each type in each age group by the rate for the general population. A risk of one means that people in that age group face the same risk as does the general population.

¹⁰ John R. Hall, Jr. *U.S. Experience with Sprinklers and Other Automatic Extinguishing Equipment*, Quincy, MA: NFPA, 2010, p. 8.

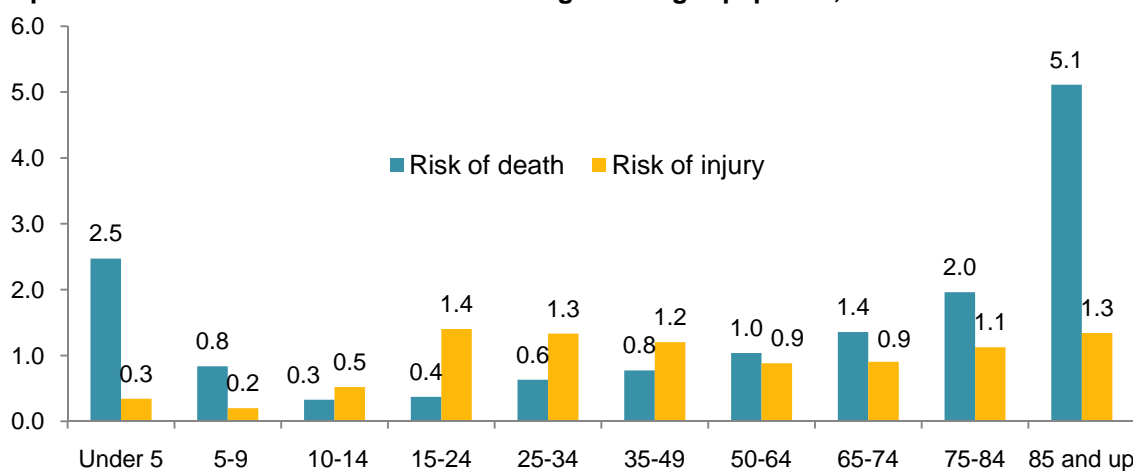
¹¹ Arthur D. Little, Inc. *Technical, Practical and Manufacturing Feasibility of Technologies to Address Surface Cooking Fires, Final Report to United States Consumer Product Safety Commission*, May 2001, online at <http://www.cpsc.gov/library/foia/foia01/brief/ranges.pt1.pdf>.

¹² Jennifer D. Flynn. *Characteristics of Home Fire Victims*, Quincy, MA: NFPA, 2010, pp. 11-12.

higher relative risk of death in these fires (5.1). Presumably most of these young children were not cooking themselves but died from fires started by an adult’s cooking activities. One-quarter of the fatalities (110 victims per year) were under 15 years of age. Only 2% of the reported non-fatal cooking fire injuries were children under five; 7% were under 15.

Older adults at least 65 years of age faced twice (2.1) the risk of dying in a cooking fire as the population at large. However, the overall cooking fire injury risk for that age group was the same as the general population. The highest non-fatal cooking fire injury rate was seen among people 15-24 (1.4), followed by the 15-24-year-olds and those 85 or older (1.3). Individuals between 35 and 49 also had a risk 1.2 times the general population.

Figure 1.8. Relative Risk of Civilian Death and Injury Resulting from Reported Non-Confined Home Fires Involving Cooking Equipment, 2004-2008 Annual Averages



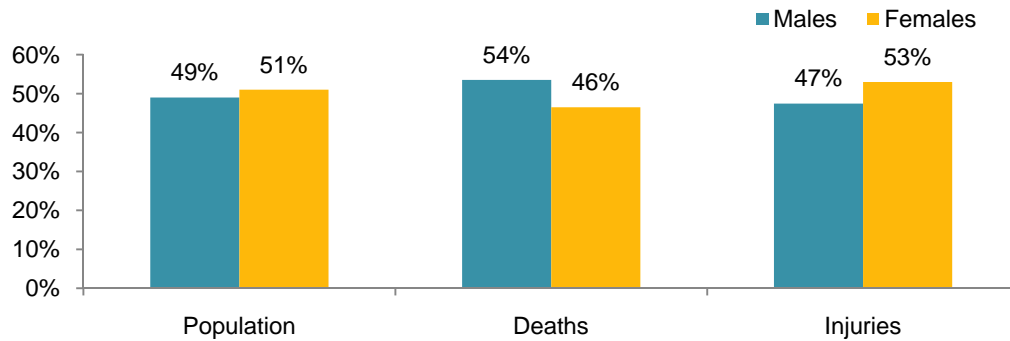
Source: Data from NFIRS Version 5.0, NFPA survey and U.S. Census.

Women have slightly higher shares of home cooking fire injuries relative to population but much lower numbers relative to time spent in food preparation and clean-up.

According to the American Time Use Survey (ATUS), U.S. women at least 15 years of age spent an average of 46 minutes a day on food preparation and clean-up in a typical day during 2009 while men spent an average of only 17 minutes a day on these same tasks. Limiting the discussion to the 40% of men and 68% of women who engage in these activities on a daily basis, male cooks spent an average of 44 minutes and female cooks spent 65 minutes daily.¹³

However, Figure 1.9 shows that in 2004-2008 males accounted for 54% of the home cooking fire deaths and 47% of cooking fire injuries. Considering that men spend much less time than women on food preparation and clean-up, the risk to males from these fires is substantially higher.

¹³ Bureau of Labor Statistics. *American Time Use Survey*, "Table A-1. Time Spent in Detailed Primary Activities and Percent of the Civilian Population Engaging in each Detailed Activity Category, Averages per Day by Sex, 2009 Annual Averages," accessed at http://www.bls.gov/tus/tables/a1_2009.pdf on November 16, 2010.

Figure 1.9. Cooking Equipment Fire Victims by Gender: 2004-2008

Sources: Statistical Abstract, data from NFIRS Version 5.0 and NFPA survey, ATUS.

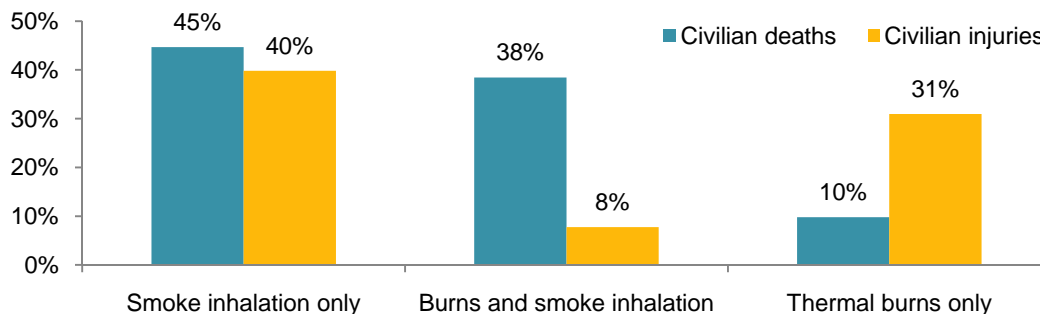
Victims in the area of origin accounted for almost half of home cooking equipment fatalities and two-thirds of the reported non-fatal injuries.

Table 1.14 shows that one-quarter (24%) of the victims of fatal home cooking fires and two of every five (40%) of the non-fatally injured were in the area of the origin when the fire started and involved in the ignition. People who were in the area of origin but not involved in the fire start accounted for one-fifth (20%) of the deaths and one-quarter (28%) of the injuries.

One-quarter (26%) of the fatal injuries and 10% of the non-fatal injuries were incurred by individuals who were not in the area of origin but were involved in the ignition. This could occur when someone had been cooking but had gone to another room in the home. Twenty-eight percent of the fatalities and 20% of the injuries were incurred by people who were not in the area of origin and not involved in the fire's start.

Smoke inhalation was the primary apparent symptom in almost half of home cooking equipment deaths.

According to fire department reports, smoke inhalation was the primary apparent symptom seen in 45% of the home cooking equipment fire deaths and 40% of the reported home cooking equipment fire injuries. Figure 1.10 shows that almost one-third (31%) of those injured exhibited signs of thermal burns only and 8% had both burns and smoke inhalation. In contrast, more than one-third (38%) of the fatalities suffered both burns and smoke inhalation while just 10% suffered only burns.

Figure 1.10. Civilian Casualties Incurred at Home Fires Involving Cooking Equipment by Primary Apparent Symptom as Identified by the Fire Department

Source: Data from NFIRS 5.0 and NFPA survey.

Roughly three of every five reported non-fatal civilian injuries in home cooking equipment fires occurred when the victim was trying to fight the fire.

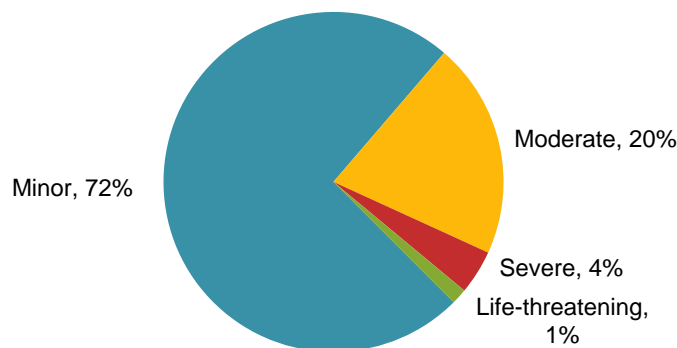
Table 1.15 shows that in 2004-2008, three of every five (59%) civilians injured in home fires involving cooking equipment were hurt while attempting to fight the fire themselves. This is 22 percentage points more than the 37% of overall home fire injuries incurred by civilians trying to control the fire in 2003-2007.¹⁴

One-third of the people killed by fires involving cooking equipment were asleep when fatally injured. Unless the cooking was started by a timer, the cook was awake when cooking began. A drowsy cook can fall asleep while waiting for the cooking finish.

Almost three-quarters of reported non-fatal cooking injuries were minor.

Figure 1.11 shows the severity of reported non-fatal non-confined home injuries involving cooking equipment. Seventy-two percent of the injuries were minor. Some individuals might believe that the benefit of potentially putting the fire out themselves is greater benefit than harm from a minor injury.

Figure 1.11. Severity of Reported Non-Fatal Home Fire Injuries Involving Cooking Equipment: 2004-2008



Source: Data from NFIRS 5.0 and NFPA survey.

Fire Control by Civilians

Vast majority of fires involving cooking equipment are put out by civilians and not reported to a fire department.

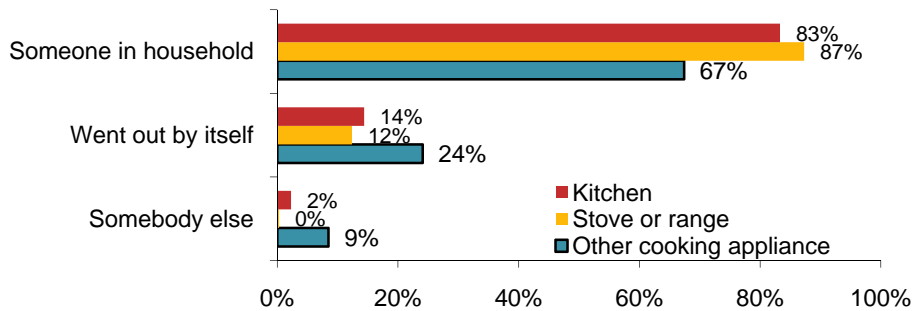
While firefighting is often a cause of injury in home cooking fires, it is even more often successful in quickly controlling the fire. The ratio of 50 unreported home cooking fires found by the CPSC in their 2004-2005 Residential Fire Survey for every reported home cooking fire is evidence of this success.¹⁵ The fire department was less likely to attend fires started by cooking equipment than most other types of fires.

¹⁴ Jennifer D. Flynn. *Characteristics of Home Fire Victims*, Quincy, MA: NFPA, 2010, p. 62.

¹⁵ Michael A. Greene and Craig Andres. *2004-2005 National Sample Survey of Unreported Residential Fires*. U.S. Consumer Product Safety Commission, July 2009, p. 58.

In the same study, the CPSC also asked who extinguished the unreported fire and how this was done. Because stoves and ranges are most often involved in kitchen and cooking fires, the patterns for kitchen fires are similar to those of stoves and ranges. Figure 1.12 shows that one of every four (24%) fires involving a cooking appliance other than a stove or range went out by itself. Only 12% of the stove or range fires self-extinguished. Someone in the household put out 87% of the stove or range fires and two-thirds (67%) of the fires involving other cooking appliances.¹⁶

Figure 1.12. Who Put Out Fire in CPSC's 2004-2005 Survey of Unreported Residential Fires?

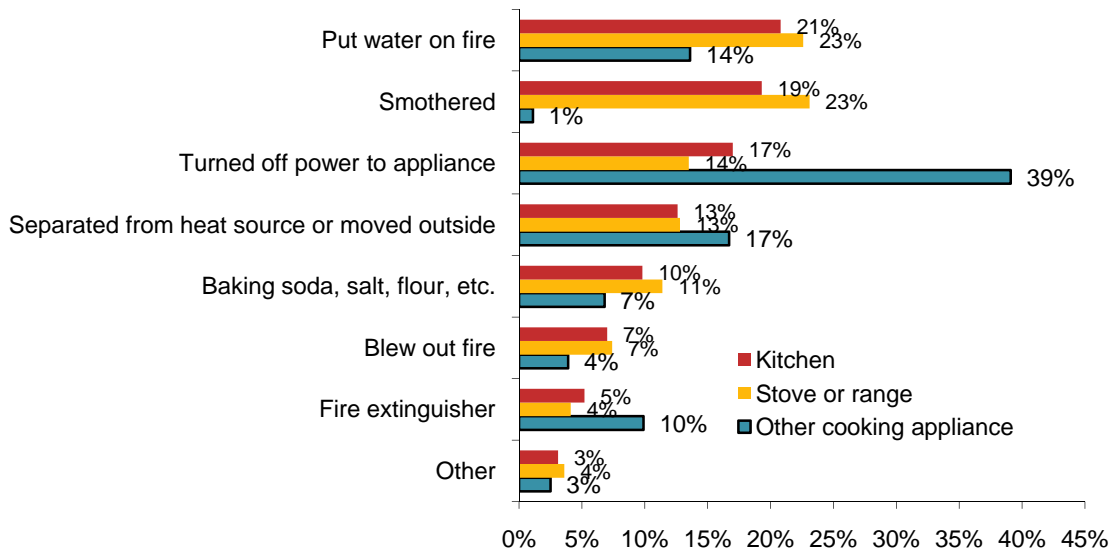


Source: Greene and Andres, 2009, pp. 166-172.

Civilians used a variety of techniques to put out cooking fires.

The CPSC asked their respondents how they put out the fire. Figure 1.13 shows that almost one-quarter (23%) put water on a stove or range fire. This approach was used with only 14% of the fires involving other cooking appliances. Twenty-three percent smothered stove or range fires. This was done in only 1% of the other cooking appliance fires.

Figure 1.13. Extinguishment Method Used in CPSC 2004-2005 Sample Survey of Unreported Fires



Source: Greene and Andres, 2009, pp. 166-172.

¹⁶ Michael A. Greene and Craig Andres. *2004-2005 National Sample Survey of Unreported Residential Fires*. U.S. Consumer Product Safety Commission, July 2009, pp. 166-172.

When a cooking appliance other than a stove or range was involved, 39% turned off the power to the appliance; 17% separated the appliance from the heat source or moved it outside; 10% used a fire extinguisher; 7% used baking soda, salt, flour, or some other substance; and 4% blew out the fire. Fourteen percent of the stove or range fires were extinguished by turning the power off; 13% were put out when the fire was separated from the heat source or moved outside; 11% were extinguished with baking soda, flour, or salt; 7% were blown out; and fire extinguishers put out 4%.

Each of these groups of methods can have problems or limitations:

- Putting water on the fire – Water can cause a grease fire to spread.
- Turned off power to appliance – An excellent first step but insufficient by itself unless the cooking equipment provides a fairly tight enclosure (e.g., oven, microwave oven) that will smother the fire without further action.
- Smothering the fire – Using a lid to smother a pan fire is the preferred safe, effective way to extinguish a stovetop pan fire. The lid must be kept on until the pan has cooled or the fire could flare up again. Some other objects, like blankets, may not fit tightly and so fail to smother the fire, may be awkward to maneuver and so risk moving the pan and spreading the fire, and may be combustible and so risk being ignited by the fire. Fire blankets are more commonly recommended in Europe and Australia.
- Separating the burning material from heat source or moving outside – Carrying burning material is clearly unsafe, and this action is even more dangerous if it involves carrying a pan with burning oil or grease or opening the door to an oven or microwave oven, which may result in a flare-up adding oxygen to the fire.
- Using flour, baking soda, salt, or other substances as an extinguishing agent – This approach can be ineffective because it is dangerous to get close enough to the fire to apply materials like this and it is difficult to achieve full coverage sufficient to smother the fire. Also, some of these substances, such as flour, can be ignited.
- Using a fire extinguisher – This approach can be effective but only if the right type of extinguisher (e.g., correct extinguishing agent, which would not be water for a grease fire; sufficient agent) is used under the right conditions (e.g., not when the pressure of the stream could dislodge the pan and spread the fire, not when the fire is growing rapidly or threatening to cut off escape paths). Using a lid is safer.
- Blowing out the fire – Very small fires may be blown out, but this practice brings a person's face (and possibly hair) close to flames.

In all cases, the risk remains that the fire will grow despite attempts to extinguish it. In the meantime, precious escape time has been lost. Before attempting to fight any fire, be sure that others have left the home and that a clear path to the exit is available.

Specific Uses of Cooking Equipment

Frying poses the greatest risk of fire.

The following bullet points on cooking methods are taken from Marty Ahrens et al., *Behavioral Mitigation of Cooking Fires through Strategies Based on Statistical Analysis*, EME-2005-CA-0343, project report to U.S. Fire Administration, NFPA, 2007. The CPSC study referenced in several bullets below conducted investigations of 289 range fires, including 218 fires that begin with ignition of food or other cooking materials.¹⁷ The study statistics cited here are based on these 218 cooking material range fires.

- **Frying.** Frying accounted for 63% of the CPSC range fire study incidents. Fire began in the first 15 minutes for 83% of the frying fires, while 12% began at least 30 minutes after cooking began. Frying inherently involves a combustible medium in addition to the food, namely the cooking oil or grease, and two-thirds of the CPSC range fire frying incidents began with ignition of the cooking oil. A frying pan provides no containment for fire if one begins. For all these reasons, there can be no exceptions to attendance at frying by the cook. Because frying is relatively quick, there should be no great hardship in attendance.

Deep fryers involve larger quantities of hot cooking oil than that involved in regular frying, and turkey fryers involve extremely large quantities of hot cooking oil. Because the frying process involves inserting the food into the heated medium, then later removing it and transferring it to a drying location, deep frying with these larger quantities of hot oil involve numerous opportunities for thermal burns and scalds, as well as fire ignitions.

Woks and other devices designed for stir-fry cooking also need to be considered within the frying cooking method and need to be closely attended.

- **Broiling and Grilling.** Broiling and grilling were part of the “other” category that accounted for 9% of the CPSC range fire study incidents. (Grilling is broiling on a gridiron.) In the “other” incidents, fire began in the first 15 minutes for 76% of the fires, while 24% began at least 30 minutes after cooking began. Broiling and grilling do not inherently involve a combustible medium in addition to the food. However, both types of cooking often involve a need for regular cook intervention, such as turning the food, in order to avoid overheating. Broiling is sometimes done in an oven, which provides some containment for fire if one begins. However, when broiling in an electric oven, the oven door is left ajar, limiting the containment. In addition, other broiling and all grilling are done on exposed cooking surfaces. For all these reasons, broiling and grilling can be regarded as only slightly less risky than frying and there should be no exceptions to attendance.

Barbecue grills are designed for use outside, and that location may reduce the risk, if fire occurs, of spread from grill to other valuable combustibles. In addition, fatal barbecue grill fires are rare. However, when fatal grill fires do occur, they nearly always involve

¹⁷ Linda Smith, Ron Monticone, and Brenda Gillum. *Range Fires, Characteristics Reported in National Fire Data and a CPSC Special Study*, U.S. Consumer Product Safety Commission, 1999, accessed at <http://www.cpsc.gov/LIBRARY/FOIA/Foia99/os/range.pdf>.

ignition of a part of a structure. Indoor use of charcoal grills, specifically, also introduces a significant risk of death due to carbon monoxide build-up.

- **Baking and Roasting.** Baking accounted for 10% of the CPSC range fire study incidents. Fire began in the first 15 minutes for 88% of the fires, while 12% ignited at least 30 minutes after cooking began. Baking and roasting do not inherently involve a combustible medium in addition to the food. Baking does not normally involve a need for regular cook intervention, but some roasting does require regular cook intervention, such as basting, in order to avoid overheating. Baking and roasting are typically done in an oven, which provides containment for fire if one begins. Primarily for this last reason, baking and roasting can be regarded as less risky than broiling and grilling. Brief absences during cooking that takes longer than frying, broiling or grilling, can be justified, provided a timer is used to remind the cook to check on the cooking.

Toaster ovens can be regarded as small baking devices, although they can be used for broiling as well. Hot plates and food warmers involve conducted heat rather than convective heat. Together with toasters and toaster ovens, they account for most of the fires and related deaths associated with portable cooking or warming devices. Hot plates and toasters should not be left unattended during their typically very short cooking periods.

- **Boiling.** Boiling accounted for 18% of the CPSC range fire study incidents. Fire began during the first 15 minutes in 6% of the fires, while 63% ignited at least 30 minutes after cooking began. Boiling does not inherently involve a combustible medium in addition to the food. In fact, the normal medium of water will typically prevent fire until or unless it boils away. Boiling does not normally involve a need for regular cook intervention. Boiling may be done in either an enclosed container (e.g., kettle, coffee maker) or an open container (e.g., pan). However, if the water boils away, the container may fail and deform, removing the containment. Primarily because few fires occur early in the boiling process, boiling can be treated as comparable to or less risky than baking and roasting. Brief absences during cooking can be justified, provided a timer is used to remind the cook to check on the cooking. Unlike other types of cooking, the periodic inspection can readily identify an impending hazard (i.e., the imminent loss of the water) with ample time to correct the problem.

Simmering is cooking done at or just below the boiling point. If the simmering temperature is well below the boiling point, simmering is like slow cooking (see below) or even food warming. “Stewing” is slow boiling. “Steaming” is cooking by exposure to steam, i.e., water in the form of heated vapor. Each of these presents a variation on boiling.

- **Slow cooking.** Slow cooking was not identified in the CPSC range study and represents a small share of the estimated home fires involving all types of portable cooking or warming equipment. Heat levels are typically low enough that other provisions for safety, including close attendance, are not necessary. If the cookware is placed where an unlikely minor overflow will not contact other combustibles, there will be added safety. If a crock pot or similar device is used, any ignition of food will also be contained, provided nothing has interfered with the equipment itself.

Roughly one-fourth of people receiving energy assistance have used a kitchen stove for heat in the previous year.

Earlier in the report, it was noted that 10,600 confined cooking fires per year are reported to involve a heating stove. This figure is an unknown combination of coding errors, use of equipment designed for both heating and cooking, and use of equipment designed only for heating for cooking. The counterpart to this fire problem is the use of equipment designed only for cooking for the purpose of heating. This practice increases the risk of fire, and for gas-fueled equipment, carbon monoxide poisoning.

In 2008, a survey of 1,256 Low Income Home Energy Association Program (LIHEAP) recipients in 12 states found that one-third used a kitchen stove or oven to provide heat in at least one month in the past year because of a lack of funds for the energy bill.¹⁸

Non-Fire Burn Injuries Associated with Cooking Equipment

Cooking equipment has long been the leading cause of reported fire injuries. More than one-third (39%) of the reported civilian cooking fire injuries were caused by either thermal burns alone or burns and smoke inhalation together. The reported injuries from all causes are but a fraction of the just the thermal burn injuries associated with cooking equipment or related products. However, data from the CPSC's National Electronic Injury Surveillance System (NEISS) show that the majority of emergency room visits for burn injuries associated with cooking equipment were not caused by fire or flame.

In 2009, ranges or ovens were involved in an estimated 17,300 thermal burn injuries seen in U.S. hospital emergency rooms. Table 1.16 shows that only 10% (1,810) were due to fire or flame. Ninety percent (15,490) of the thermal burns resulted from non-fire sources, chiefly contact with the hot equipment. Almost two-thirds (65%) of the 9,430 thermal burn injuries associated with grills were contact or non-fire burns.

In 2004-2008, children under five accounted for 7% of the U.S. population but they incurred only 2% of the non-fatal fire injuries associated with cooking equipment that were reported to the fire department. Figure 1.14 shows that these young children account for much larger shares of non-fire burn injuries from cooking equipment and tableware used with hot food or beverages.

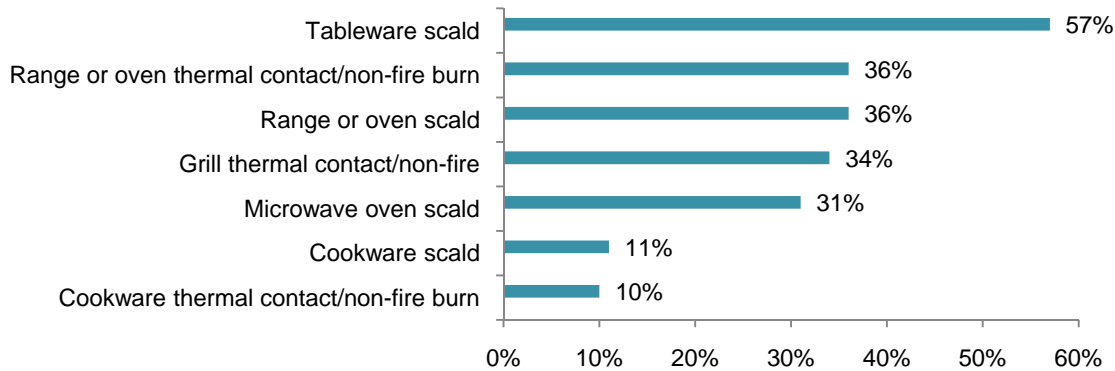
According to the NEISS data, children under five accounted for:

- 3,510, or 57%, of the scald burns associated with tableware such as coffee cups and soup bowls;
- 5,600, or 36%, of the thermal non-fire burns associated with range or ovens, with most caused by contact with the equipment;
- 1,040, or 36%, of the scald burns associated with ranges or ovens;
- 2,080, or 34%, of the thermal non-fire burns (mostly contact burns) associated with grills or barbecues;

¹⁸ National Energy Assistance Directors' Association. *2008 National Energy Assistance Survey*. 2009, p. 31.

- 1,230, or 31%, of the scald burns associated with microwave ovens;
- 1,000, or 11%, of the scald burns from cookware such as pots and pans; and
- 910, or 10%, of the burns from contact with hot cookware.

Figure 1.14. 2009 Non-Fire Burn Injury Emergency Room Visits Associated with Cooking Equipment and Products by Equipment and Burn Type and Percent of Patients under Five Years of Age



Source: CPSC's NEISS data, queried in October 2010.

CPSC's National Electronic Injury Surveillance System

The CPSC's National Electronic Injury Surveillance System (NEISS) collects information about all injuries seen in a weighted statistical sample of hospital emergency rooms. The database may be queried and results downloaded for further analysis. Information about the injury cause is obtained from the patient. Brief narratives are included. Fire involvement code zero is used when there is no fire, no unexpected flames or smoke, or no unexpected spread of flames or smoke. Thermal burns with code zero for fire involvement were considered contact burns. Fire involvement codes one to three indicate fire involvement or smoke inhalation with or without fire department attendance. Unless otherwise specified, no allocation of unknown data was done for the results presented here. No filters on location and occupancy were included in the queries.

Cooking Equipment and Non-Fire Carbon Monoxide Deaths

Table 1.17 shows that in 2001-2005, gas-fueled ranges, stoves, or ovens were involved in an average of five non-fire carbon monoxide deaths annually. During the same four years, charcoal grills or charcoal averaged 6.5 deaths per year. The combined category of gas grill, camp stoves, and lanterns averaged 5 per year in 2001-2005.¹⁹

Safety Tips

Choose the right cooking equipment. Install and use it properly.

- Always use cooking equipment tested and approved by a recognized testing facility.
- Follow manufacturer's instructions and code requirements when installing and operating cooking equipment.
- Plug microwave ovens or other cooking appliances directly into an outlet. Never use an extension cord for a cooking appliance as it can overload the circuit and cause a fire.

Watch what you heat!

- The leading cause of fires in the kitchen is unattended cooking.
- 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.
- 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.

Stay alert.

- To prevent cooking fires, you have to be alert. You won't be if you are sleepy, have taken medicine or drugs, or consumed alcohol.

Use equipment for intended purposes only.

- Cook only with equipment designed and intended for cooking, and heat your home only with equipment designed and intended for heating. There is additional danger of fire, injury, or death if equipment is used for a purpose for which it was not intended.

Keep things that can catch fire and heat sources apart.

- Keep anything that can catch fire – potholders, oven mitts, wooden utensils, paper or plastic bags, boxes, food packaging, towels or curtains – away from your stovetop.
- Keep the stovetop, burners, and oven clean.
- Keep pets off cooking surfaces and nearby countertops to prevent them from knocking things onto the burner.
- Wear short, close fitting or tightly rolled sleeves when cooking. Loose clothing can dangle onto stove burners and can catch fire if it comes in contact with a gas flame or electric burner.

¹⁹ Matthew V. Hnatov. *Non-Fire Carbon Monoxide Deaths Associated with the Use of Consumer Products*, U.S. Consumer Product Safety Commission, July 8, 2008, Table 1, <http://www.cpsc.gov>. Additional information was obtained from previous reports in this series.

Know what to do if your clothes catch fire.

- If your clothes catch fire, stop, drop, and roll. Stop immediately, drop to the ground, and cover face with hands. Roll over and over or back and forth to put out the fire. Immediately cool the burn with *cool* water for 3 to 5 minutes and seek emergency medical treatment.

Know what to do if you have a cooking fire.

- When in doubt, just get out! When you leave, close the door behind you to help contain the fire. Call 911 or the local emergency number after you leave.
- If you do try to fight the fire, be sure others are already getting out and you have a clear path to the exit.
- Always keep an oven mitt and a lid nearby when you're cooking. If a small grease fire starts in a pan, smother the flames by carefully sliding the lid over the pan (make sure you are wearing the oven mitt). 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 to prevent flames from burning you or your clothing.
- If you have a fire in your microwave oven, turn it off immediately and keep the door closed. Never open the door until the fire is completely out. Unplug the appliance if you can safely reach the outlet. After a fire, both ovens and microwaves should be checked and/or serviced before being used again.

Install and use microwave ovens safely.

- Place or install the microwave oven at a safe height, within easy reach of all users. The face of the person using the microwave oven should always be higher than the front of the microwave oven door. This is to prevent hot food or liquid from spilling onto a user's face or body from above and to prevent the microwave oven itself from falling onto a user.
- Never use aluminum foil or metal objects in a microwave oven. They can cause a fire and damage the oven.
- Heat food only in containers or dishes that are safe for microwave use.
- Open food containers slowly away from the face to avoid steam burns. Hot steam escaping from the container or food can cause burns.
- Foods heat unevenly in microwave ovens. Stir and test before eating.

Use barbecue grills safely.

- Position the grill well away from siding, deck railings and out from under eaves and overhanging branches.
- Place the grill a safe distance from lawn games, play areas, and foot traffic.
- Keep children and pets away from the grill area by declaring a three-foot "kid-free zone" around the grill.
- Put out several long-handled grilling tools to give the chef plenty of clearance from heat and flames when cooking food.
- Periodically remove grease or fat buildup in trays below grill so it cannot be ignited by a hot grill.

- Use only outdoors! If used indoors, or in any enclosed spaces, such as tents, barbecue grills pose both a fire hazard and the risk of exposing occupants to carbon monoxide.

Charcoal grills

- Purchase the proper starter fluid and store out of reach of children and away from heat sources.
- Never add charcoal starter fluid when coals or kindling have already been ignited, and never use any flammable or combustible liquid other than charcoal starter fluid to get the fire going.

Propane grills

- Check the propane cylinder hose for leaks before using it for the first time each year. A light soap and water solution applied to the hose will quickly reveal escaping propane by releasing bubbles.
- If you determined your grill has a gas leak by smell or the soapy bubbles test and there is no flame:
 - Turn off the propane tank and grill.
 - If the leak stops, get the grill serviced by a professional before using again.
 - If the leak does not stop, call the fire department.
- If you smell gas while cooking, immediately get away from the grill and call the fire department. Do not attempt to move the grill.
- All propane cylinders manufactured after April 2002 must have overfill protection devices (OPDs). OPDs shut off the flow of propane before capacity is reached, limiting the potential for release of propane gas if the cylinder heats up. OPDs are easily identified by their triangular-shaped hand wheel.
- Use only equipment bearing the mark of an independent test laboratory. Follow the manufacturers' instructions on how to set up the grill and maintain it.
- Never store propane cylinders in buildings or garages. If you store a gas grill inside during the winter, disconnect the cylinder and leave it outside.

Burns

- Teach children that hot things burn.
- Place objects 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.
- Keep hot foods and liquids away from table and counter edges.
- Use dry oven mitts or potholders. The heat from hot cookware or tableware could turn that moisture into a scald burn.
- If you have young children in the home cook on the stove back burners.
- When children are old enough, teach them to cook safely.

Treatment of burns

- Treat a burn right away, putting it in cool water. Cool the burn for three to five minutes. Cover with a clean, dry cloth. Do not apply creams, ointments, sprays or other home remedies.
- If the burn is bigger than the injured person's palm, or if there are questions, get medical help right away.

**Table 1.1. Home Fires Involving Cooking Equipment, by Year
Structure Fires Reported to U.S. Fire Departments**

Year	Fires	Civilian Deaths	Civilian Injuries	Direct Property as Reported	Damage (in Millions) In 2008 Dollars
1980	148,300	500	5,030	\$245	\$640
1981	153,500	530	5,090	\$766	\$1,809
1982	136,500	500	5,540	\$422	\$939
1983	125,200	470	5,610	\$343	\$740
1984	124,100	480	4,910	\$372	\$769
1985	127,500	450	4,870	\$350	\$698
1986	127,700	510	5,010	\$398	\$781
1987	125,100	410	5,500	\$397	\$751
1988	126,700	470	5,870	\$461	\$839
1989	119,800	480	5,480	\$451	\$783
1990	120,500	440	6,050	\$476	\$784
1991	122,100	360	6,060	\$621	\$980
1992	130,300	350	6,010	\$451	\$692
1993	128,400	430	6,530	\$548	\$816
1994	118,200	370	5,500	\$618	\$897
1995	111,700	370	5,390	\$446	\$629
1996	115,200	470	5,490	\$519	\$712
1997	117,500	380	5,760	\$565	\$757
1998	109,100	500	5,380	\$527	\$696
1999	85,800 (37,200)	300 (300)	2,620 (1,670)	\$497 (\$468)	\$642
2000	95,500 (34,500)	230 (230)	3,820 (2,540)	\$516 (\$474)	\$644
2001	120,600 (38,300)	500 (500)	4,470 (2,940)	\$521 (\$498)	\$633
2002	128,200 (37,700)	150 (150)	4,330 (2,930)	\$671 (\$642)	\$802
2003	143,400 (35,500)	530 (520)	4,520 (3,070)	\$768 (\$736)	\$898
2004	151,000 (35,900)	620 (610)	4,820 (3,290)	\$723 (\$697)	\$824
2005	146,800 (37,500)	500 (480)	4,740 (3,300)	\$874 (\$842)	\$962
2006	159,500 (40,100)	360 (360)	4,580 (3,120)	\$684 (\$662)	\$730
2007	158,000 (40,700)	420 (420)	4,940 (3,320)	\$541 (\$521)	\$561
2008	157,900 (39,600)	400 (400)	5,180 (3,490)	\$921 (\$897)	\$921

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

Table 1.2. Home Fires Involving Cooking Equipment, by Month
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	12,900	(8%)	80	(17%)	370	(8%)	\$65	(9%)
February	11,900	(8%)	60	(14%)	410	(9%)	\$72	(10%)
March	13,200	(9%)	40	(8%)	440	(9%)	\$63	(9%)
April	13,300	(9%)	40	(9%)	440	(9%)	\$67	(9%)
May	13,400	(9%)	50	(11%)	430	(9%)	\$72	(10%)
June	12,000	(8%)	30	(6%)	360	(7%)	\$52	(7%)
July	11,600	(8%)	30	(6%)	360	(8%)	\$53	(7%)
August	11,700	(8%)	20	(5%)	410	(8%)	\$56	(8%)
September	12,500	(8%)	10	(3%)	400	(8%)	\$44	(6%)
October	13,500	(9%)	20	(5%)	390	(8%)	\$60	(8%)
November	14,300	(9%)	40	(8%)	420	(9%)	\$52	(7%)
December	14,200	(9%)	40	(9%)	410	(8%)	\$66	(9%)
Total	154,700	(100%)	460	(100%)	4,850	(100%)	\$724	(100%)
Monthly average	12,900	(8%)	40	(8%)	400	(8%)	\$60	(8%)

Table 1.3. Home Fires Involving Cooking Equipment, by Day of Week
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	24,000	(15%)	110	(23%)	720	(15%)	\$103	(14%)
Monday	21,800	(14%)	60	(13%)	700	(14%)	\$106	(15%)
Tuesday	21,700	(14%)	50	(10%)	660	(14%)	\$107	(15%)
Wednesday	21,600	(14%)	70	(15%)	650	(13%)	\$92	(13%)
Thursday	22,100	(14%)	40	(9%)	750	(15%)	\$96	(13%)
Friday	20,800	(13%)	70	(14%)	670	(14%)	\$115	(16%)
Saturday	22,700	(15%)	70	(16%)	700	(15%)	\$104	(14%)
Total	154,700	(100%)	460	(100%)	4,850	(100%)	\$724	(100%)
Average per day	22,100	(14%)	70	(14%)	690	(14%)	\$103	(14%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 1.4. Home Fires Involving Cooking Equipment, by Hour of Alarm
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments

Alarm Time	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Midnight - 12:59 a.m.	3,400	(2%)	20	(4%)	140	(3%)	\$15	(2%)
1:00 - 1:59 a.m.	2,400	(2%)	30	(6%)	120	(2%)	\$18	(2%)
2:00 - 2:59 a.m.	2,000	(1%)	30	(6%)	80	(2%)	\$19	(3%)
3:00 - 3:59 a.m.	1,800	(1%)	40	(9%)	100	(2%)	\$17	(2%)
4:00 - 4:59 a.m.	1,500	(1%)	10	(3%)	80	(2%)	\$12	(2%)
5:00 - 5:59 a.m.	1,400	(1%)	20	(4%)	60	(1%)	\$10	(1%)
6:00 - 6:59 a.m.	1,800	(1%)	20	(4%)	70	(1%)	\$16	(2%)
7:00 - 7:59 a.m.	2,700	(2%)	20	(4%)	70	(1%)	\$15	(2%)
8:00 - 8:59 a.m.	4,200	(3%)	20	(4%)	110	(2%)	\$21	(3%)
9:00 - 9:59 a.m.	5,500	(4%)	40	(8%)	180	(4%)	\$27	(4%)
10:00 - 10:59 a.m.	6,600	(4%)	20	(5%)	170	(4%)	\$35	(5%)
11:00 - 11:59 a.m.	8,000	(5%)	30	(6%)	230	(5%)	\$36	(5%)
Noon - 12:59 p.m.	9,100	(6%)	10	(2%)	280	(6%)	\$43	(6%)
1:00 - 1:59 p.m.	8,800	(6%)	20	(4%)	240	(5%)	\$45	(6%)
2:00 - 2:59 p.m.	8,900	(6%)	10	(2%)	270	(5%)	\$41	(6%)
3:00 - 3:59 p.m.	9,700	(6%)	10	(2%)	280	(6%)	\$43	(6%)
4:00 - 4:59 p.m.	11,200	(7%)	20	(5%)	370	(8%)	\$50	(7%)
5:00 - 5:59 p.m.	13,500	(9%)	20	(3%)	400	(8%)	\$54	(7%)
6:00 - 6:59 p.m.	13,900	(9%)	10	(3%)	430	(9%)	\$55	(8%)
7:00 - 7:59 p.m.	12,200	(8%)	0	(1%)	350	(7%)	\$43	(6%)
8:00 - 8:59 p.m.	9,800	(6%)	20	(3%)	270	(6%)	\$40	(5%)
9:00 - 9:59 p.m.	7,400	(5%)	30	(6%)	240	(5%)	\$29	(4%)
10:00 - 10:59 p.m.	5,100	(3%)	30	(6%)	160	(3%)	\$23	(3%)
11:00 - 11:59 p.m.	3,800	(2%)	10	(2%)	170	(4%)	\$19	(3%)
Total	154,700	(100%)	460	(100%)	4,850	(100%)	\$724	(100%)
Average per hour	6,400	(4%)	20	(4%)	200	(4%)	\$30	(4%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 1.5. Home Fires Involving Cooking Equipment, by Area of Origin
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Kitchen or cooking area	145,600	(94%)	440	(95%)	4,620	(95%)	\$616	(85%)
<i>In non-confined fire</i>	36,200	(23%)	430	(94%)	3,120	(64%)	\$593	(82%)
<i>In confined fire</i>	109,400	(71%)	0	(1%)	1,500	(31%)	\$23	(3%)
Unclassified area of origin	2,000	(1%)	0	(0%)	10	(0%)	\$1	(0%)
<i>In non-confined fire</i>	100	(0%)	0	(0%)	0	(0%)	\$1	(0%)
<i>In confined fire</i>	1,900	(1%)	0	(0%)	10	(0%)	\$0	(0%)
Courtyard, terrace or patio	1,100	(1%)	0	(0%)	20	(0%)	\$16	(2%)
<i>In non-confined fire</i>	300	(0%)	0	(0%)	20	(0%)	\$16	(2%)
<i>In confined fire</i>	800	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Exterior balcony or unenclosed porch	1,000	(1%)	0	(1%)	40	(1%)	\$27	(4%)
<i>In non-confined fire</i>	600	(0%)	0	(1%)	30	(1%)	\$26	(4%)
<i>In confined fire</i>	400	(0%)	0	(0%)	10	(0%)	\$0	(0%)
Unclassified outside area	900	(1%)	0	(0%)	10	(0%)	\$4	(1%)
<i>In non-confined fire</i>	100	(0%)	0	(0%)	0	(0%)	\$4	(1%)
<i>In confined fire</i>	800	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known area of origin	4,100	(3%)	20	(5%)	150	(3%)	\$61	(8%)
<i>In non-confined fire</i>	1,500	(1%)	20	(5%)	130	(3%)	\$59	(8%)
<i>In confined fire</i>	2,600	(2%)	0	(0%)	30	(1%)	\$1	(0%)
Total	154,700	(100%)	460	(100%)	4,850	(100%)	\$724	(100%)
<i>In non-confined fire</i>	38,800	(25%)	450	(99%)	3,300	(68%)	\$699	(97%)
<i>In confined fire</i>	115,900	(75%)	10	(1%)	1,550	(32%)	\$25	(3%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 1.6. Home Fires Involving Cooking Equipment, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property	
							Damage (in Millions)	
Equipment unattended	52,600	(34%)	220	(48%)	2,200	(45%)	\$270	(37%)
<i>In non-confined fire</i>	14,800	(10%)	220	(48%)	1,600	(33%)	\$270	(37%)
<i>In confined fire</i>	37,800	(24%)	0	(0%)	600	(12%)	\$0	(0%)
Abandoned or discarded material or product	15,900	(10%)	40	(9%)	510	(11%)	\$67	(9%)
<i>In non-confined fire</i>	3,100	(2%)	40	(9%)	350	(7%)	\$67	(9%)
<i>In confined fire</i>	12,800	(8%)	0	(0%)	160	(3%)	\$0	(0%)
Unclassified misuse of material or product	14,700	(10%)	10	(3%)	470	(10%)	\$51	(7%)
<i>In non-confined fire</i>	2,600	(2%)	10	(3%)	270	(6%)	\$51	(7%)
<i>In confined fire</i>	12,200	(8%)	0	(0%)	200	(4%)	\$0	(0%)
Heat source too close to combustible	13,600	(9%)	90	(19%)	450	(9%)	\$85	(12%)
<i>In non-confined fire</i>	4,600	(3%)	80	(17%)	340	(7%)	\$85	(12%)
<i>In confined fire</i>	9,000	(6%)	10	(1%)	110	(2%)	\$0	(0%)
Unclassified factor contributed to ignition	12,100	(8%)	30	(6%)	310	(6%)	\$34	(5%)
<i>In non-confined fire</i>	1,800	(1%)	30	(6%)	150	(3%)	\$34	(5%)
<i>In confined fire</i>	10,300	(7%)	0	(0%)	160	(3%)	\$0	(0%)
Unintentionally turned on, not turned off	12,000	(8%)	40	(8%)	330	(7%)	\$92	(13%)
<i>In non-confined fire</i>	3,800	(2%)	40	(8%)	230	(5%)	\$92	(13%)
<i>In confined fire</i>	8,200	(5%)	0	(0%)	110	(2%)	\$0	(0%)
Failure to clean	9,300	(6%)	0	(1%)	80	(2%)	\$5	(1%)
<i>In non-confined fire</i>	1,200	(1%)	0	(1%)	60	(1%)	\$5	(1%)
<i>In confined fire</i>	8,100	(5%)	0	(0%)	20	(1%)	\$0	(0%)
Electrical failure or malfunction	6,800	(4%)	0	(1%)	120	(2%)	\$53	(7%)
<i>In non-confined fire</i>	2,900	(2%)	0	(1%)	110	(2%)	\$53	(7%)
<i>In confined fire</i>	3,900	(3%)	0	(0%)	10	(0%)	\$0	(0%)
Unclassified mechanical failure or malfunction	3,800	(2%)	10	(1%)	60	(1%)	\$19	(3%)
<i>In non-confined fire</i>	1,100	(1%)	10	(1%)	40	(1%)	\$19	(3%)
<i>In confined fire</i>	2,700	(2%)	0	(0%)	20	(0%)	\$0	(0%)
Unclassified operational deficiency	3,300	(2%)	20	(3%)	110	(2%)	\$27	(4%)
<i>In non-confined fire</i>	800	(0%)	20	(3%)	80	(2%)	\$27	(4%)
<i>In confined fire</i>	2,500	(2%)	0	(0%)	30	(1%)	\$0	(0%)

**Table 1.6. Home Fires Involving Cooking Equipment, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment not being operated properly	3,100	(2%)	20	(5%)	110	(2%)	\$13	(2%)
<i>In non-confined fire</i>	700	(0%)	20	(5%)	80	(2%)	\$13	(2%)
<i>In confined fire</i>	2,500	(2%)	0	(0%)	30	(1%)	\$0	(0%)
Improper container or storage	2,500	(2%)	0	(0%)	50	(1%)	\$4	(0%)
<i>In non-confined fire</i>	400	(0%)	0	(0%)	20	(0%)	\$4	(0%)
<i>In confined fire</i>	2,000	(1%)	0	(0%)	30	(1%)	\$0	(0%)
Other known factor	10,600	(7%)	40	(9%)	310	(6%)	\$58	(8%)
<i>In non-confined fire</i>	3,300	(2%)	40	(9%)	220	(4%)	\$58	(8%)
<i>In confined fire</i>	7,300	(5%)	0	(0%)	100	(2%)	\$0	(0%)
Total fires	154,700	(100%)	460	(100%)	4,850	(100%)	\$724	(100%)
<i>In non-confined fire</i>	38,800	(25%)	450	(99%)	3,300	(68%)	\$699	(97%)
<i>In confined fire</i>	115,900	(75%)	10	(1%)	1,550	(32%)	\$25	(3%)
Total entries	160,200	(104%)	520	(112%)	5,110	(105%)	\$779	(108%)
<i>In non-confined fire</i>	41,200	(27%)	510	(111%)	3,520	(73%)	\$779	(108%)
<i>In confined fire</i>	119,100	(77%)	10	(1%)	1,590	(33%)	\$0	(0%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 1.7. Home Fires Involving Cooking Equipment, by Human Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Human Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unattended or unsupervised person	29,900	(19%)	80	(17%)	860	(18%)	\$149	(21%)
<i>In non-confined fire</i>	6,900	(4%)	80	(17%)	560	(17%)	\$149	(21%)
<i>In confined fire</i>	23,000	(15%)	0	(21%)	300	(19%)	\$0	(23%)
Asleep	8,700	(6%)	100	(22%)	460	(9%)	\$61	(8%)
<i>In non-confined fire</i>	2,300	(2%)	100	(22%)	300	(9%)	\$61	(9%)
<i>In confined fire</i>	6,300	(4%)	0	(0%)	160	(10%)	\$0	(4%)
Age was a factor	3,500	(2%)	60	(14%)	210	(4%)	\$18	(3%)
<i>In non-confined fire</i>	900	(1%)	60	(13%)	140	(4%)	\$18	(3%)
<i>In confined fire</i>	2,600	(2%)	0	(54%)	70	(4%)	\$0	(3%)
Possibly impaired by alcohol or drugs	2,500	(2%)	70	(14%)	230	(5%)	\$18	(2%)
<i>In non-confined fire</i>	700	(0%)	70	(14%)	140	(4%)	\$18	(3%)
<i>In confined fire</i>	1,900	(1%)	0	(0%)	80	(5%)	\$0	(1%)
Possibly mentally disabled	1,100	(1%)	20	(3%)	70	(1%)	\$6	(1%)
<i>In non-confined fire</i>	300	(0%)	20	(4%)	50	(2%)	\$6	(1%)
<i>In confined fire</i>	700	(0%)	0	(0%)	20	(1%)	\$0	(0%)
Multiple persons involved	1,000	(1%)	10	(3%)	30	(1%)	\$8	(1%)
<i>In non-confined fire</i>	200	(0%)	10	(3%)	20	(1%)	\$8	(1%)
<i>In confined fire</i>	700	(0%)	0	(0%)	10	(1%)	\$0	(1%)
Physically disabled	800	(0%)	20	(3%)	70	(1%)	\$3	(0%)
<i>In non-confined fire</i>	200	(0%)	20	(4%)	40	(1%)	\$3	(0%)
<i>In confined fire</i>	600	(0%)	0	(0%)	30	(2%)	\$0	(1%)
No human factor involved	110,900	(72%)	170	(38%)	3,180	(66%)	\$466	(64%)
<i>In non-confined fire</i>	28,200	(18%)	170	(38%)	2,200	(67%)	\$466	(67%)
<i>In confined fire</i>	82,700	(53%)	0	(25%)	980	(63%)	\$0	(69%)
Total fires	154,700	(100%)	460	(100%)	4,850	(100%)	\$724	(100%)
<i>In non-confined fire</i>	38,800	(25%)	450	(99%)	3,300	(68%)	\$699	(97%)
<i>In confined fire</i>	115,900	(75%)	10	(1%)	1,550	(32%)	\$25	(3%)
Total entries	158,300	(102%)	530	(114%)	5,110	(105%)	\$728	(101%)
<i>In non-confined fire</i>	39,700	(26%)	520	(113%)	3,460	(71%)	\$728	(101%)
<i>In confined fire</i>	118,600	(77%)	10	(1%)	1,650	(34%)	\$0	(0%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 1.8. Home Fires Involving Cooking Equipment, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	101,400	(66%)	210	(45%)	3,350	(69%)	\$342	(47%)
<i>In non-confined fire</i>	21,400	(14%)	210	(45%)	2,190	(45%)	\$326	(45%)
<i>In confined fire</i>	80,000	(52%)	0	(0%)	1,170	(24%)	\$16	(2%)
Unclassified item	10,300	(7%)	10	(3%)	160	(3%)	\$22	(3%)
<i>In non-confined fire</i>	1,400	(1%)	10	(3%)	90	(2%)	\$21	(3%)
<i>In confined fire</i>	8,900	(6%)	0	(0%)	70	(1%)	\$2	(0%)
Household utensil	9,300	(6%)	20	(4%)	210	(4%)	\$32	(4%)
<i>In non-confined fire</i>	1,800	(1%)	20	(4%)	130	(3%)	\$30	(4%)
<i>In confined fire</i>	7,500	(5%)	0	(0%)	90	(2%)	\$1	(0%)
Appliance housing or casing	7,800	(5%)	20	(5%)	150	(3%)	\$39	(5%)
<i>In non-confined fire</i>	2,400	(2%)	20	(5%)	100	(2%)	\$38	(5%)
<i>In confined fire</i>	5,300	(3%)	0	(0%)	50	(1%)	\$1	(0%)
Flammable or combustible liquid or gas, piping or filter	5,400	(4%)	10	(3%)	240	(5%)	\$37	(5%)
<i>In non-confined fire</i>	2,100	(1%)	10	(3%)	170	(3%)	\$36	(5%)
<i>In confined fire</i>	3,300	(2%)	0	(0%)	70	(2%)	\$1	(0%)
Cabinetry	3,100	(2%)	30	(7%)	180	(4%)	\$67	(9%)
<i>In non-confined fire</i>	2,000	(1%)	30	(7%)	160	(3%)	\$66	(9%)
<i>In confined fire</i>	1,100	(1%)	0	(0%)	20	(0%)	\$1	(0%)
Other known item	17,500	(11%)	150	(33%)	560	(12%)	\$185	(26%)
<i>In non-confined fire</i>	7,600	(5%)	150	(32%)	470	(10%)	\$183	(25%)
<i>In confined fire</i>	9,800	(6%)	0	(1%)	90	(2%)	\$2	(0%)
Total	154,700	(100%)	460	(100%)	4,850	(100%)	\$724	(100%)
<i>In non-confined fire</i>	38,800	(25%)	450	(99%)	3,300	(68%)	\$699	(97%)
<i>In confined fire</i>	115,900	(75%)	10	(1%)	1,550	(32%)	\$25	(3%)
Clothing*	600	(0%)	70	(15%)	60	(1%)	\$4	(1%)

*Although the percentage of fires beginning with clothing was below the threshold for inclusion in the table, this line is shown because of the large percentage of deaths.

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 1.9. Home Fires Involving Cooking Equipment, by Extent of Flame Damage
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Extent of Flame Damage	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	115,900	(75%)	10	(1%)	1,550	(32%)	\$25	(3%)
Confined to object of origin	10,400	(7%)	30	(7%)	500	(10%)	\$42	(6%)
Confined to room of origin	21,900	(14%)	110	(24%)	2,110	(43%)	\$224	(31%)
Confined to floor of origin	2,000	(1%)	70	(15%)	250	(5%)	\$92	(13%)
Confined to building of origin	4,100	(3%)	210	(46%)	390	(8%)	\$302	(42%)
Beyond building of origin	300	(0%)	30	(7%)	50	(1%)	\$39	(5%)
Total	154,700	(100%)	460	(100%)	4,850	(100%)	\$724	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 1.10. Home Fires Involving Cooking Equipment, by Smoke Alarm Status
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Smoke Alarm Status	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Total	154,700	(100%)	460	(100%)	4,850	(100%)	\$724	(100%)
Smoke alarm present	131,400	(85%)	390	(84%)	4,150	(86%)	\$591	(82%)
<i>Fire too small to operate alarm</i>	<i>19,900</i>	<i>(13%)</i>	<i>20</i>	<i>(5%)</i>	<i>400</i>	<i>(8%)</i>	<i>\$15</i>	<i>(2%)</i>
In non-confined fire	2,700	(2%)	20	(5%)	210	(4%)	\$13	(2%)
In confined fire	17,200	(11%)	0	(0%)	190	(4%)	\$2	(0%)
<i>Smoke alarm present and fire large enough to operate alarm</i>	111,500	(72%)	360	(79%)	3,750	(77%)	\$576	(80%)
<i>Smoke alarm operated</i>	<i>95,800</i>	<i>(62%)</i>	<i>190</i>	<i>(41%)</i>	<i>2,900</i>	<i>(60%)</i>	<i>\$466</i>	<i>(64%)</i>
In non-confined fire	22,600	(15%)	180	(39%)	1,940	(40%)	\$449	(62%)
In confined fire	73,100	(47%)	10	(1%)	960	(20%)	\$17	(2%)
<i>Smoke alarm present but did not operate</i>	<i>15,700</i>	<i>(10%)</i>	<i>180</i>	<i>(38%)</i>	<i>850</i>	<i>(18%)</i>	<i>\$110</i>	<i>(15%)</i>
In non-confined fire	5,500	(4%)	180	(38%)	580	(12%)	\$108	(15%)
In confined fire	10,200	(7%)	0	(0%)	270	(6%)	\$3	(0%)
No smoke alarm	23,300	(15%)	70	(16%)	700	(14%)	\$132	(18%)
In non-confined fire	8,000	(5%)	70	(16%)	570	(12%)	\$129	(18%)
In confined fire	15,400	(10%)	0	(0%)	130	(3%)	\$3	(0%)
<i>No working smoke alarm (Sum of no smoke alarms and alarms that were present but did not operate)</i>	39,000	(25%)	250	(54%)	1,550	(32%)	\$243	(34%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 1.11. Home Fires Involving Cooking Equipment, by Automatic Extinguishing System (AES) Status
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

AES Status	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Total	154,700	(100%)	460	(100%)	4,850	(100%)	\$724	(100%)
AES present	11,800	(8%)	10	(1%)	250	(5%)	\$27	(4%)
<i>Fire too small to operate AES</i>	7,700	(5%)	0	(1%)	140	(3%)	\$2	(0%)
In non-confined fire	600	(0%)	0	(1%)	30	(1%)	\$2	(0%)
In confined fire	7,100	(5%)	0	(0%)	100	(2%)	\$0	(0%)
<i>AES present and fire large enough to operate</i>	3,900	(3%)	0	(1%)	120	(2%)	\$25	(3%)
<i>AES operated</i>	3,500	(2%)	0	(1%)	110	(2%)	\$23	(3%)
In non-confined fire	1,000	(1%)	0	(1%)	80	(2%)	\$21	(3%)
In confined fire	2,500	(2%)	0	(0%)	30	(1%)	\$2	(0%)
<i>AES present but did not operate</i>	400	(0%)	0	(0%)	10	(0%)	\$2	(0%)
In non-confined fire	0	(0%)	0	(0%)	0	(0%)	\$2	(0%)
In confined fire	400	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified AES operation	200	(0%)	0	(0%)	0	(0%)	\$0	(0%)
In non-confined fire	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
In confined fire	200	(0%)	0	(0%)	0	(0%)	\$0	(0%)
No AES	142,600	(92%)	460	(99%)	4,590	(95%)	\$696	(96%)
In non-confined fire	37,000	(24%)	450	(97%)	3,180	(66%)	\$674	(93%)
In confined fire	105,600	(68%)	10	(1%)	1,410	(29%)	\$22	(3%)
<i>No working AES (Sum of no AESs and AES that were present but did not operate)</i>	143,000	(92%)	460	(99%)	4,600	(95%)	\$699	(97%)
<i>AES in structure but not in fire area</i>	200	(0%)	0	(0%)	10	(0%)	\$0	(0%)
In non-confined fire	0	(0%)	0	(0%)	10	(0%)	\$0	(0%)
In confined fire	200	(0%)	0	(0%)	0	(0%)	\$0	(0%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 1.12. Home Fires Involving Cooking Equipment, by AES Type when Present
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

AES Type	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Wet pipe sprinkler	10,400	(88%)	10	(100%)	240	(94%)	\$26	(95%)
<i>In non-confined fire</i>	1,500	(13%)	10	(100%)	100	(86%)	\$24	(95%)
<i>In confined fire</i>	8,900	(75%)	0	(0%)	140	(100%)	\$2	(96%)
Dry pipe sprinkler	800	(7%)	0	(0%)	10	(4%)	\$1	(2%)
<i>In non-confined fire</i>	100	(1%)	0	(0%)	10	(8%)	\$1	(2%)
<i>In confined fire</i>	700	(6%)	0	(0%)	0	(0%)	\$0	(3%)
Other sprinkler system	200	(2%)	0	(0%)	0	(0%)	\$0	(1%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	0	(0%)	\$0	(1%)
<i>In confined fire</i>	200	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Dry chemical system	200	(2%)	0	(0%)	10	(3%)	\$0	(1%)
<i>In non-confined fire</i>	100	(1%)	0	(0%)	10	(6%)	\$0	(1%)
<i>In confined fire</i>	100	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified AES	200	(2%)	0	(0%)	0	(0%)	\$0	(2%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	0	(0%)	\$0	(2%)
<i>In confined fire</i>	200	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Total	11,800	(100%)	10	(100%)	250	(100%)	\$27	(100%)
<i>In non-confined fire</i>	1,700	(14%)	10	(100%)	110	(100%)	\$25	(100%)
<i>In confined fire</i>	10,200	(86%)	0	(0%)	140	(100%)	\$2	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 1.13. Casualties in Home Structure Fires Involving Cooking Equipment, by Age of Victim
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Age	Population (in Millions)		Civilian Deaths		Deaths Per Million	Relative Risk of Death	Civilian Injuries		Injuries per Million	Relative Risk of Injury
Under 5	20.5	(7%)	80	(17%)	3.8	2.5	110	(2%)	5.6	0.3
5-9	19.7	(7%)	30	(6%)	1.3	0.8	60	(1%)	3.2	0.2
10-14	20.6	(7%)	10	(2%)	0.5	0.3	170	(4%)	8.4	0.5
5-24	42.1	(14%)	20	(5%)	0.6	0.4	960	(20%)	22.8	1.4
25-34	40.2	(13%)	40	(8%)	1.0	0.6	870	(18%)	21.7	1.3
35-49	66.0	(22%)	80	(17%)	1.2	0.8	1,290	(27%)	19.6	1.2
50-64	52.0	(17%)	80	(18%)	1.6	1.0	740	(15%)	14.3	0.9
65-74	19.1	(6%)	40	(9%)	2.1	1.4	280	(6%)	14.7	0.9
75-84	13.0	(4%)	40	(9%)	3.0	2.0	240	(5%)	18.3	1.1
85 and up	5.3	(2%)	40	(9%)	7.9	5.1	120	(2%)	21.8	1.3
Total	298.4	(100%)	460	(100%)	1.5	1.0	4,850	(100%)	16.3	1.0
Under 15	60.8	(20%)	110	(25%)	1.9	1.2	350	(7%)	5.8	0.4
65 and up	37.4	(13%)	120	(26%)	3.2	2.1	630	(13%)	16.9	1.0

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey; *Statistical Abstract of the United States 2007*, U.S. Census Bureau, 2007.

**Table 1.14. Home Fire Casualties Involving Cooking Equipment by Victim's Location at Time of Incident
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Victim's Location at Time of Incident	Civilian Deaths		Civilian Injuries	
In area of origin and involved	110	(24%)	1,950	(40%)
In area of origin and not involved	90	(20%)	1,370	(28%)
Not in area of origin but involved	120	(26%)	510	(10%)
Not in area of origin and not involved	130	(28%)	980	(20%)
Unclassified	10	(2%)	40	(1%)
Total	460	(100%)	4,850	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 1.15. Home Fire Casualties Involving Cooking Equipment by Victim's Activity at Time of Injury
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Victim's Activity at Time of Injury	Civilian Deaths		Civilian Injuries	
	Count	Percentage	Count	Percentage
Sleeping	160	(35%)	370	(8%)
Escaping	160	(34%)	620	(13%)
Unable to act	50	(11%)	110	(2%)
Fire control	30	(7%)	2,860	(59%)
Unclassified activity	20	(5%)	370	(8%)
Returning to vicinity of fire before control	20	(5%)	240	(5%)
Irrational act	10	(3%)	80	(2%)
Rescue attempt	0	(0%)	150	(3%)
Returning to vicinity of fire after control	0	(0%)	30	(1%)
Total	460	(100%)	4,850	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 1.16. 2009 Estimates of Emergency Room Visits for Burn Injuries
Associated with Cooking Equipment and Related Products**

Injury type and data source	Range or Oven	Microwave Oven	Grill, Including Outdoor	Cookware	Tableware
NEISS estimates of 2009 emergency room visits for					
All thermal burns	17,300	-	9,430	10,200	-
<i>Victim under five</i>	<i>4,880</i>	<i>-</i>	<i>2,080</i>	<i>910</i>	<i>-</i>
Thermal fire, flame or flash burn	1,810	-	3,260	870	-
Thermal contact/non-fire burn	15,490	-	6,170	9,330	-
<i>Thermal contact/non-fire burn victim under five</i>	<i>5,600</i>	<i>-</i>	<i>2,080</i>	<i>910</i>	<i>-</i>
Scald burns	2,930	4,000	-	8,760	6,100
<i>Victim under 5</i>	<i>1,040</i>	<i>1,230</i>	<i>-</i>	<i>1,000</i>	<i>3,510</i>
Reported average civilian fire injuries 2004-2008	4,030	140	90	-	-

Note: Estimates of burns to victims under five are in italics.

Source: CPSC's NEISS, queried at <https://www.cpsc.gov/cgi-bin/NEISSQuery/Home.aspx> in October 2010.
Fire injury data from NFIRS Version 5.0 and NFPA survey 2004-2008 civilian fire injuries.

Table 1.17. U.S. Non-Fire Carbon Monoxide Deaths Involving Home Cooking Equipment

Year	Gas-fueled range, stove or oven	Charcoal grill or charcoal
1980	11	18
1985	31	49
1990	10	21
1991	14	25
1992	13	27
1993	6	27
1994	9	15
1995	5	14
1996	15	19
1997	5	23
1998	3	16
1999	6	17
2000	12	8
2001	9	10
2002	3	11
2003	3	8
2004	4	3
2005	6	4

Note: Gas-fueled grills had averaged less than one death a year through 1991 but are no longer listed separately. The combined category of gas grill, camp stoves, and lanterns averaged 5 per year in 2001-2005.

Source: Matthew V. Hnatov, *Non-Fire Carbon Monoxide Deaths Associated with the Use of Consumer Products*, U.S. Consumer Product Safety Commission, July 8, 2008, Table 1, <http://www.cpsc.gov>. Additional information from previous reports in this series.

Ranges

Ranges or cooktops were involved in the majority of home cooking equipment fires.

During 2004-2008, U.S. fire departments responded to an average of 90,500 home structure fires per year in which a range or cooktop was involved in ignition. These fires caused an annual average of 410 civilian deaths, 3,750 reported civilian injuries, and \$516 million in direct property damage. These incidents accounted for 59% of the reported home fires involving cooking equipment, 89% of the associated civilian deaths, 77% of the associated civilian injuries, and 71% of the direct property damage from cooking equipment fires.

Data Sources, Definitions and Conventions Used in this Report

The fire statistics 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 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 NFPA's annual fire department experience survey. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Fires are rounded to the nearest hundred, civilian deaths and civilian injuries are expressed to the nearest ten and property damage is rounded to the nearest million dollars.

NFIRS 5.0 equipment involved in ignition code 646 captures ranges or cooking surfaces and counter-mounted stoves, with or without ovens. NFIRS incident type codes in the range of 110-129 were used to identify structure fires. Unknown data were allocated proportionally in most fields analyzed except for incident type.

NFIRS incident type 113, a confined cooking fire, is used to capture structure fires involving the contents of cooking vessel with no fire extension beyond vessel. Causal information, including equipment involved in ignition, is not required for confined cooking fires or other structure fires with confined fire incident types (incident types 113-118). Equipment involved in ignition was reported in 23% of the non-confined fires and 5% of the confined fires. Confined and non-confined structure fires were analyzed separately and then summed to obtain estimates

The estimates reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined type. Fires reported as "no equipment" but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated.

Unless otherwise specified, property damage has not been adjusted for inflation. Additional details on the methodology used may be found in Appendix A. Our analysis methods are continually being refined and previous estimates updated.

NFIRS 5.0, first introduced in 1999, brought major changes to fire incident data, including changes in some definitions and coding rules. Because of these changes, caution should be used when comparing data before 1998 with data from 1999 on.

These fires are a major part of the overall home fire problem. Ranges or cooktops were also involved in one-quarter (24%) of reported home fires from all causes combined, 15% of home fire deaths, 29% of home fire injuries, and 8% of the direct property damage resulting from home fires.

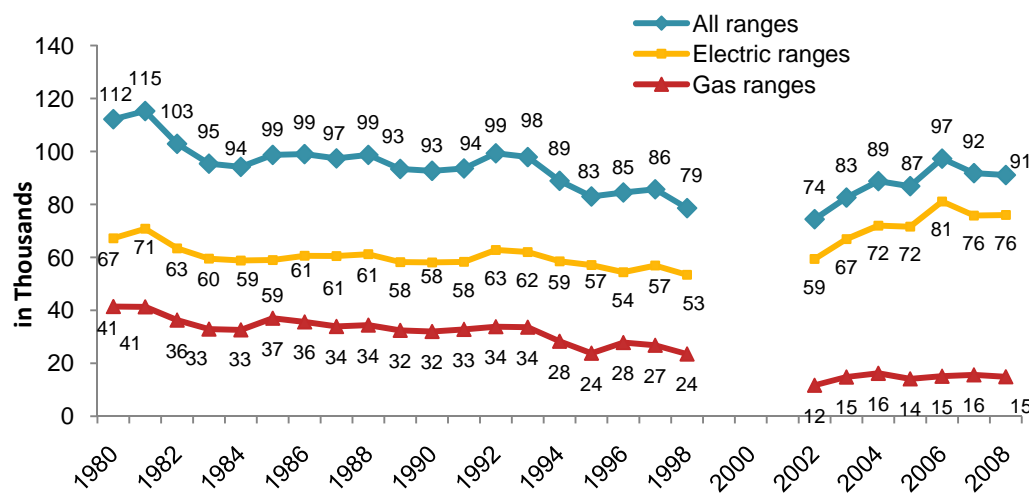
Ranges are found in almost every home. The American Housing Survey found that in 2007, cooking stoves or ranges were found in 98% of all occupied housing units.²⁰ NPD reported that the percentage of main meals prepared on a range or cooktop fell to 33% in 2009 from 52% in 1985. Despite the decrease, the stovetop remains the most popular piece of cooking equipment.²¹

Stoves or Ranges Were Involved in Millions of Unreported Fires

Stoves or ranges were also involved in an estimated annual average of 3.8 million home U.S. fires that the fire department did not attend, according to Michael Greene's and Craig Andres' CPSC 2009 report, *2004-2005 National Sample Survey of Unreported Residential Fires*.

Figure 2.1 and Table 2.1 show that the total number of reported fires involving ranges or cooktops was only 19% lower in 2008 than in 1980. Table 2.2 shows that fires involving gas ranges were 64% lower while Table 2.3 shows that electric range fires were actually up 13%. Because of the changes in data collection rules and definitions that accompanied the introduction of NFIRS 5.0 in 1999, caution must be used in interpreting these findings. NFIRS 5.0 made it much easier to document minor cooking fires.

Figure 2.1. Reported Home Structure Fires Involving Ranges or Cooktops, by Year: 1980-2008



Source: Data from NFIRS and NFPA survey.

²⁰ U.S. Census Bureau, Current Housing Reports, Series H150/07, *American Housing Survey for the United States: 2007*, Washington, DC, 2008. Table 1A-4.

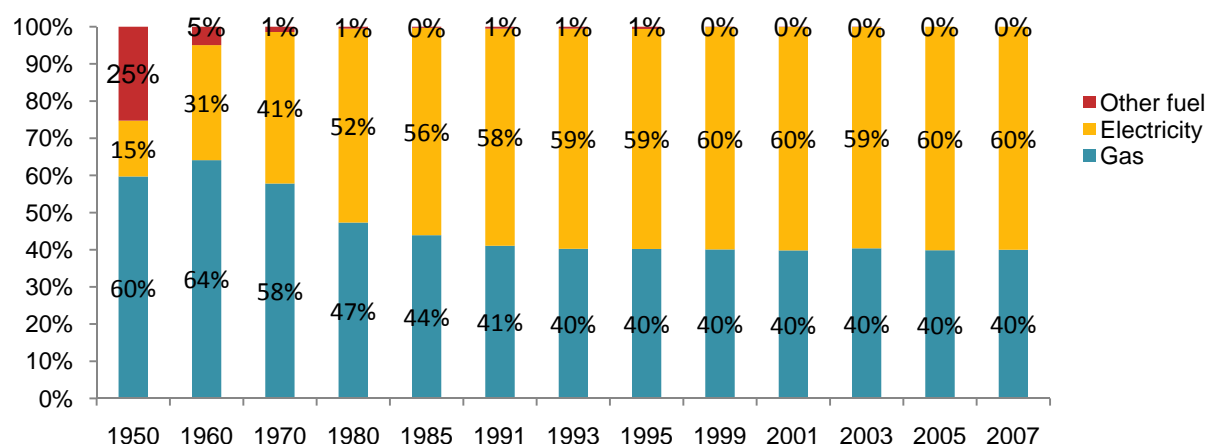
²¹ Kim McLynn. "Americans Are Eating at Home More; Microwave Usage Increased but Not Cooking," reports NPD. Port Washington, NY: The NPD Group, Inc. November 12, 2009, accessed at http://www.npd.com/press/releases/press_091112.html on October 28, 2010.

Range Power Sources

Electricity is favored over gas by 3-to-2 as the primary cooking equipment power source.

Table 2.4 and Figure 2.2 show how the use of electricity as the primary power source for cooking equipment increased from 15% of the households in 1950 to 60% in 2007. By 1970, the use of solid and liquid fuels as primary power source for cooking had fallen to 1%. By 1980, electricity had become the dominant power source. Since the early 1990s, 1.5 times as many households used electricity as gas.

Figure 2.2. Percentage of Households Using Gas, Electricity, and Other Fuel as Primary Cooking Power Source over Time



Note: Gas includes utility, bottled, tank and LP-gas.

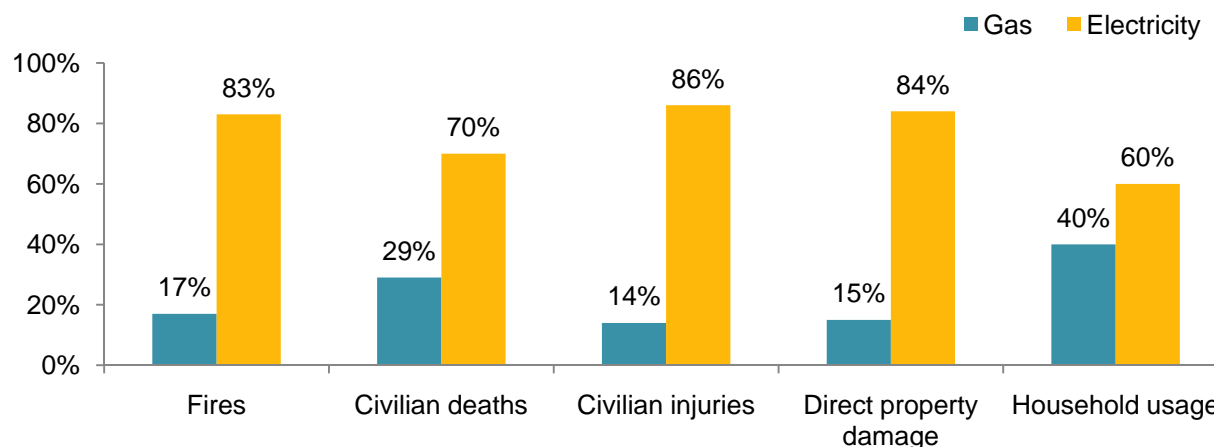
Source: U.S. Bureau of the Census, *Census of Housing, 1960*, Vol. 1; *1970 and 1980*, Vo. 1; Current Housing Reports, Series H-150-87, American Housing Survey; *1990 Census of Housing, Detailed Housing Characteristics*, Series CH-2; and *Statistical Abstract of the United States*, 1994-2010 editions.

Households that use electric ranges have a higher risk of fires and associated losses than those using gas ranges.

Although 60% of U.S. households used electricity as their primary cooking power source in 2005-2007, Figure 2.3 shows that 83% of the ranges or cooktops involved in home fires reported in 2004-2008 were powered by electricity. During this period, electric ranges or cooktops were involved in an average of 74,900 reported home structure fires per year. These fires caused an annual average of 290 civilian deaths, 3,210 reported civilian injuries, and \$436 million in direct property damage. Gas ranges or cooktops were involved in an average of 15,400 reported home structure fires annually during this period, resulting in an average of 120 civilian deaths, 530 civilian injuries, and \$79 million in direct property damage per year.

Rates of reported fires, civilian injuries, and average direct property damage per reported stove or range fire per million user households were three to four times higher for households using electric ranges than for households using gas ranges. (See Table 2.5.) The death rate from fires involving stoves, ranges, or cooktops in households using electricity for cooking was 1.6 times as high as it was in households using gas.

Figure 2.3. Percentages of 2004-2008 Reported Home Structure Fires and Associated Losses Involving Cooking Equipment, by Cooking Equipment Power Source



Source: Fire data from NFIRS Version 5.0 and NFPA survey. Household usage from *Statistical Abstract of the United States*.

Based on its 2004-2005 survey, the CPSC estimates that electric ranges were involved in 2.6 million home fires, including fires that were not attended by fire departments. When the unreported fires are included, the risk of fire involving an electric range rises to 3.8 such fires per 100 user households. Gas ranges were involved in an estimated 1.1 million fires, resulting in a rate of 2.6 fires per 100 user households.²² The risk of any fire was 47% higher in households using electric ranges.

Causal Factors

Unattended cooking was the leading factor contributing to home fires involving ranges.

During 2004-2008, unattended equipment was a factor contributing to ignition in more than one-third (39%) of reported home structure fires involving ranges or cooktops. Abandoned or discarded material (9%) might also refer to cooking that had been left unattended. Table 2.6 shows that 8% started after something that could catch fire was left too close to the heat source. Another 8% occurred when the range was unintentionally turned on or not turned off. An unclassified misuse of material also caused 8% and a failure to clean was a factor in 7%. Gas range fires were much less likely than electric range fires to cite equipment unattended (25% vs. 42% of fires) and much more likely to cite leak or break (6% vs. less than 1%). See Table 2.7 and 2.8 for more details.

Cooking materials were the leading items first ignited.

Two-thirds (68%) of the reported home structure fires involving ranges started with the ignition of cooking materials, including food. Six percent of the fires began with household utensils. An unclassified item was first ignited in 5%. Appliance housings or casings were also first ignited

²² Source: Michael A. Greene and Craig Andres. *2004-2005 National Sample Survey of Unreported Residential Fires*, U.S. Consumer Product Safety Commission, July 2009, pp. 127-128.

in 5% of these incidents. Less than 1% of these incidents began with the ignition of clothing, but these fires caused 17% of the associated deaths.

Gas range fires were less likely than electric range fires to begin with the ignition of cooking materials (55% vs. 70% of fires) and more likely to have started with flammable or combustible gases or liquids and related items (10% vs. 3% of fires). Additional details may be found in Tables 2.9, 2.10, and 2.11.

Flame damage was limited to the room of fire origin in 95% of range fires.

Table 2.12 shows that two-thirds (67%) of all range or cooktop fires reported in 2004-2008 were coded with an incident type that indicated the fire was confined to the vessel of origin. In an additional 8%, fire spread was coded as confined to the object of origin. Combined, the 75% of reported range fires with confined fire incident types or that were confined to object of origin caused 8% of the range fire deaths and 36% of the associated injuries. Flame damage spread beyond the room of origin in only 5% of reported range or cooktop fires. However, these incidents caused 71% of the associated deaths. Only 15% of the reported non-fatal range fire injuries resulted from the 5% of fires that spread beyond the room of origin. Table 2.13 shows comparable data for gas ranges while extent of flame damage for reported fires involving electric ranges is shown in Table 2.14.

Frying is the leading activity associated with cooking fires.

NFIRS provides considerable information, but it cannot provide the level of detail available from special studies. A 1999 CPSC study analyzed the results of 289 range fire investigations. Three-quarters (218) began with the ignition of food. Sixty-three percent of the food ignitions involved frying, 18% baking and 10% boiling. Eighty-three percent of the frying ignitions and 88% of the baking ignitions occurred during the first fifteen minutes of cooking. Only 6% of the ignitions while boiling occurred this early in the cooking process.²³

A 1998 study of kitchen fires in the Bay-Waikato region of New Zealand found that 35% of the cooks were shallow frying and 29% deep frying. The authors elaborated on the circumstances of different types of fires.²⁴ When oil or fat ignited:

- the cooks had forgotten to turn off the heat in 30% of the fires;
- distractions or other chores caused the cooking to be unattended in 23%;
- the stove or element's temperature was too high in 20% of the fires;
- 10% of the cooks were adding or removing food from the pan; and
- a build-up of grease under the element caught fire when the stove was turned on in 7% of the fires.

The same study noted several similar factors in the 16% of cooking fires involving boiling. When boiling was a factor, the fire started after the liquid evaporated.

²³ Linda Smith, Ron Monticone, and Brenda Gillum. *Range Fires, Characteristics Reported in National Fire Data and a CPSC Special Study*, Washington, DC: U.S. Consumer Product Safety Commission, Division of Hazard Analysis, Directorate of Epidemiology. 1999, online at <http://www.cpsc.gov/LIBRARY/FOIA/Foia99/os/range.pdf>

²⁴ Key Research and Marketing, Ltd. *New Zealand Fire Service Bay-Waikato Fire Region Kitchen Fire Research, Summary of Findings*, October 1998.

Frying inherently involves a combustible medium in addition to the food, namely the cooking oil or grease. A frying pan provides no containment for fire if one begins. For all these reasons, there can be no exceptions to attendance at frying by the cook. Because frying is relatively quick, there should be no great hardship in attendance.

Technology could prevent many range fires.

The CPSC commissioned an Arthur D. Little, Inc. report on possible technologies that could address range or cooktop fires.²⁵ The findings suggest that roughly two-thirds of these fires could be mitigated with technologies such as timers and motion sensors that would ensure someone was paying regular attention to the cooking. Roughly three-quarters could be mitigated with temperature sensors or related technologies to prevent cooking materials from igniting. Today's ranges and cooktops come in a variety of configurations, including open or sealed gas burners and smooth and coil burners on electric stoves. Some technologies may not be feasible for some configurations. Some of these technologies are currently available. Systematic studies of field reliability, costs vs. benefits, and consumer acceptance of these technologies would be helpful.

Visits to Hospital Emergency Rooms for Injuries Involving Ranges or Ovens

Fire injuries are only a fraction of the injuries involving ranges seen at hospital emergency rooms.

Almost half of the range- or oven-related injuries seen in hospital emergency rooms were contact burns.

Data collected by the CPSC's National Electronic Injury Surveillance System (NEISS) show that in 2009, an estimated 34,900 people with injuries involving ranges or ovens went to hospital emergency rooms.²⁶ Figure 2.4 and Table 2.15 show that half of these injuries were thermal burns, including 44% caused by contact with a hot object or other non-fire source (90% of the range or oven thermal burns). *Thirty-six percent (5,600) of the 15,500 contact/non-fire burns were incurred by children under five years of age.*

Five percent of the emergency room visits associated with a range or oven (10% of thermal burns) resulted from a fire or flame. Nine percent of the injuries were lacerations; 8% scald burns; 6% were strains or sprains; 6% were contusions; and 5% were due to anoxia. Anoxia can be caused by smoke inhalation from fires, non-fire carbon monoxide poisoning, or exposure to leaking gas;

²⁵ Arthur D. Little, Inc. *Technical, Practical and Manufacturing Feasibility of Technologies to Address Surface Cooking Fires, Final Report to United States Consumer Product Safety Commission*, May 2001, online at <http://www.cpsc.gov/library/foia/foia01/brief/ranges.pt1.pdf>.

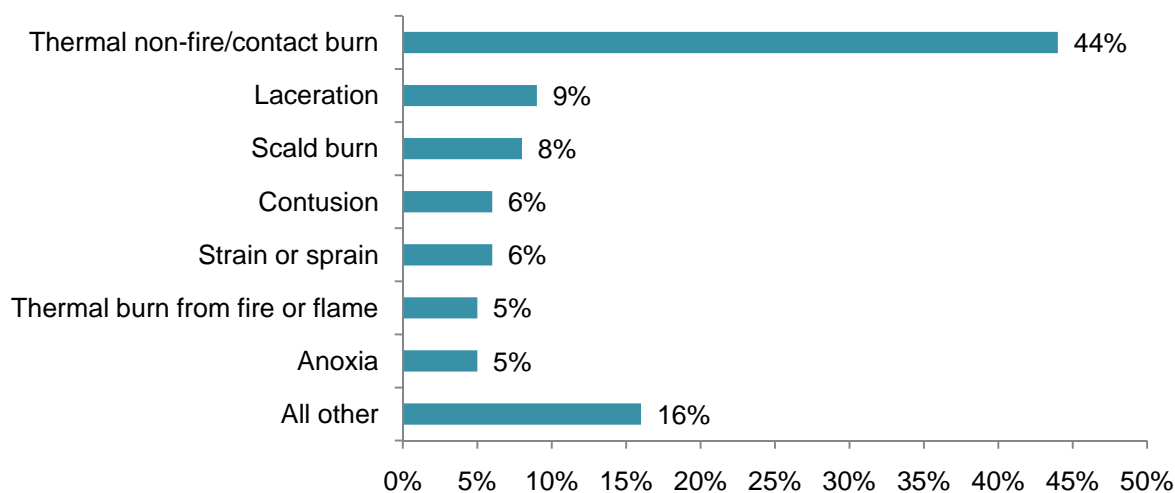
²⁶ All statistics are based on National Electronic Injury Surveillance System (NEISS) data obtained from the U.S. Consumer Product Safety Commission (CPSC) website, www.cpsc.gov, accessed in October 2010.

CPSC's National Electronic Injury Surveillance System

The CPSC's National Electronic Injury Surveillance System (NEISS) collects information about all injuries seen in a weighted statistical sample of hospital emergency rooms. The database may be queried and results downloaded for further analysis. Information about the injury cause is obtained from the patient. Fire involvement code zero is used when there is no fire, no unexpected flames or smoke, or no unexpected spread of flames or smoke. Thermal burns with code zero for fire involvement were considered contact or non-fire burns. Fire involvement codes one to three indicate fire involvement or smoke inhalation with or without fire department attendance. No filters on location and occupancy were included in the queries.

After proportional allocation of injuries involving ranges or ovens of unknown type, these injuries included 12,500 (36%) injuries involving gas-fueled ranges and ovens, 19,100 (55%) injuries involving electric-powered ranges and ovens, and 3,300 (9%) injuries involving other types of ranges and ovens. See Table 2.16.

Figure 2.4. Injuries Involving Ranges or Ovens Seen at Hospital Emergency Rooms in 2009 by Diagnosis



Source: CPSC's NEISS, queried in October 2010.

Safety Tips

Choose the right cooking equipment. Install and use it properly.

- Always use cooking equipment tested and approved by a recognized testing facility.
- Follow manufacturer's instructions and code requirements when installing and operating cooking equipment.
- Plug microwave ovens or other cooking appliances directly into an outlet. Never use an extension cord for a cooking appliance as it can overload the circuit and cause a fire.
- For gas-fueled ranges, be sure the range is installed in accordance with NFPA 54, *National Fuel Gas Code*, which addresses clearances, installation, and maintenance. Read and follow manufacturer's instructions, particularly with regard to installation, maintenance, and operation. Liquefied-petroleum (LP)-gas-fueled devices with self-contained fuel supplies are prohibited for home use by NFPA codes.
- For electric-powered ranges, be sure the range is installed in accordance with NFPA's *National Electrical Code*®. Read and follow manufacturer's instructions, particularly with regard to, installation, maintenance, and operation.

Watch what you heat!

- The leading cause of fires in the kitchen is unattended cooking.
- 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.
- 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.

Stay alert.

- To prevent cooking fires, you have to be alert. You won't be if you are sleepy, have taken medicine or drugs, or consumed alcohol.

Use equipment for intended purposes only.

- Cook only with equipment designed and intended for cooking, and heat your home only with equipment designed and intended for heating. There is additional danger of fire, injury, or death if equipment is used for a purpose for which it was not intended.

Keep things that can catch fire and heat sources apart.

- Keep anything that can catch fire – potholders, oven mitts, wooden utensils, paper or plastic bags, boxes, food packaging, towels or curtains – away from your stovetop.
- Keep the stovetop, burners, and oven clean.
- Keep pets off cooking surfaces and nearby countertops to prevent them from knocking things onto the burner.
- Wear short, close fitting or tightly rolled sleeves when cooking. Loose clothing can dangle onto stove burners and can catch fire if it comes in contact with a gas flame or electric burner.

Know what to do if your clothes catch fire.

- If your clothes catch fire, stop, drop, and roll. Stop immediately, drop to the ground, and cover face with hands. Roll over and over or back and forth to put out the fire. Immediately cool the burn with *cool* water for 3 to 5 minutes and seek emergency medical treatment.

Know what to do if you have a cooking fire.

- When in doubt, just get out! When you leave, close the door behind you to help contain the fire. Call 911 or the local emergency number after you leave.
- If you do try to fight the fire, be sure others are already getting out and you have a clear path to the exit.
- Always keep an oven mitt and a lid nearby when you're cooking. If a small grease fire starts in a pan, smother the flames by carefully sliding the lid over the pan (make sure you are wearing the oven mitt). 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 to prevent flames from burning you or your clothing. After a fire, the oven should be checked and/or serviced before being used again.

**Table 2.1. Home Fires Involving Ranges, by Year
Structure Fires Reported to U.S. Fire Departments**

Year	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)	
				As Reported	In 2008 Dollars
1980	112,200	380	4,210	\$181	\$473
1981	115,300	420	4,230	\$701	\$1,655
1982	102,900	370	4,600	\$219	\$487
1983	95,400	400	4,820	\$267	\$576
1984	94,200	420	4,150	\$282	\$583
1985	98,700	360	4,050	\$267	\$533
1986	99,000	390	4,210	\$303	\$595
1987	97,400	380	4,750	\$304	\$575
1988	98,700	390	4,940	\$332	\$604
1989	93,400	360	4,710	\$335	\$581
1990	92,700	380	5,050	\$355	\$585
1991	93,600	310	5,130	\$465	\$734
1992	99,300	290	4,960	\$321	\$492
1993	97,900	340	5,490	\$417	\$621
1994	88,900	270	4,480	\$321	\$466
1995	83,000	280	4,300	\$309	\$436
1996	84,500	360	4,350	\$366	\$502
1997	85,700	330	4,610	\$382	\$512
1998	78,600	410	4,280	\$863	\$1,140
1999	31,600 (17,100)	300 (300)	1,420 (900)	\$239 (\$228)	\$308
2000	55,500 (23,700)	110 (110)	2,880 (1,850)	\$265 (\$244)	\$331
2001	67,700 (28,500)	380 (380)	3,560 (2,400)	\$355 (\$344)	\$431
2002	73,900 (28,000)	120 (120)	3,600 (2,480)	\$475 (\$459)	\$567
2003	81,900 (26,400)	410 (410)	3,350 (2,490)	\$520 (\$502)	\$609
2004	87,700 (28,000)	590 (580)	3,860 (2,810)	\$542 (\$525)	\$618
2005	85,900 (28,900)	410 (410)	3,690 (2,890)	\$552 (\$538)	\$607
2006	96,300 (31,000)	350 (350)	3,440 (2,590)	\$488 (\$474)	\$521
2007	91,800 (31,800)	300 (300)	3,860 (2,820)	\$400 (\$388)	\$414
2008	91,100 (30,400)	370 (370)	3,930 (2,920)	\$682 (\$668)	\$682

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 2.2. Home Fires Involving Gas-Fueled Ranges, by Year
Structure Fires Reported to U.S. Fire Departments**

Year	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)	
				As Reported	In 2008
1980	41,400	270	1,410	\$53	\$138
1981	41,300	210	1,390	\$590	\$1,393
1982	36,300	230	1,580	\$79	\$176
1983	32,900	250	1,570	\$83	\$179
1984	32,600	220	1,390	\$79	\$163
1985	37,000	140	1,380	\$81	\$162
1986	35,600	190	1,240	\$90	\$177
1987	33,900	170	1,410	\$97	\$184
1988	34,400	220	1,500	\$118	\$215
1989	32,400	230	1,410	\$89	\$154
1990	32,000	180	1,450	\$100	\$165
1991	32,800	160	1,540	\$137	\$216
1992	33,800	140	1,410	\$96	\$147
1993	33,600	120	1,400	\$99	\$147
1994	28,300	170	1,140	\$86	\$125
1995	23,800	170	1,020	\$75	\$106
1996	27,800	210	1,110	\$103	\$141
1997	26,800	180	1,060	\$92	\$123
1998	23,500	220	900	\$84	\$111
1999	11,000 (6,200)	80 (80)	650 (380)	\$85 (\$83)	\$110
2000	11,900 (5,800)	110 (110)	580 (580)	\$90 (\$86)	\$113
2001	13,100 (5,500)	190 (190)	570 (350)	\$69 (\$68)	\$84
2002	11,900 (4,600)	20 (20)	430 (370)	\$75 (\$74)	\$90
2003	15,100 (4,800)	200 (200)	570 (410)	\$85 (\$83)	\$100
2004	16,200 (5,100)	220 (220)	690 (480)	\$86 (\$83)	\$98
2005	14,600 (5,100)	60 (60)	430 (260)	\$67 (\$65)	\$74
2006	15,700 (5,500)	100 (100)	550 (440)	\$73 (\$71)	\$77
2007	15,600 (5,400)	120 (120)	560 (390)	\$73 (\$72)	\$76
2008	14,900 (4,300)	100 (100)	450 (330)	\$102 (\$100)	\$102

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 2.3. Home Fires Involving Electric-Powered Ranges, by Year
Structure Fires Reported to U.S. Fire Departments**

Year	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)		
							As Reported	In 2008 Dollars	
1980	67,200		100		2,690		\$119	\$311	
1981	70,800		190		2,750		\$106	\$250	
1982	63,400		110		2,910		\$130	\$289	
1983	59,500		140		3,130		\$174	\$375	
1984	58,800		170		2,660		\$197	\$407	
1985	59,000		200		2,590		\$175	\$349	
1986	60,600		200		2,870		\$205	\$403	
1987	60,500		170		3,210		\$191	\$361	
1988	61,200		140		3,290		\$204	\$371	
1989	58,200		110		3,220		\$235	\$408	
1990	58,100		190		3,480		\$245	\$404	
1991	58,300		150		3,450		\$316*	\$499*	
1992	62,800		150		3,420		\$217	\$333	
1993	62,000		220		3,950		\$307	\$457	
1994	58,500		100		3,270		\$224	\$325	
1995	57,100		110		3,210		\$222	\$313	
1996	54,400		140		3,110		\$248	\$340	
1997	56,900		140		3,470		\$281	\$376	
1998	53,400		170		3,320		\$269	\$355	
1999	20,400	(10,800)	230	(230)	650	(380)	\$153	(\$144)	\$197
2000	34,100	(16,600)	0	(0)	1,930	(1,160)	\$157	(\$146)	\$196
2001	53,700	(22,200)	190	(190)	2,880	(1,940)	\$282	(\$271)	\$342
2002	59,200	(22,800)	100	(100)	3,090	(2,070)	\$387	(\$374)	\$463
2003	66,500	(21,500)	200	(200)	2,780	(2,080)	\$435	(\$418)	\$509
2004	71,500	(22,800)	360	(350)	3,170	(2,330)	\$454	(\$439)	\$517
2005	70,900	(23,700)	350	(350)	3,210	(2,600)	\$483	(\$473)	\$532
2006	80,400	(25,400)	240	(240)	2,880	(2,140)	\$413	(\$400)	\$440
2007	75,800	(26,300)	180	(180)	3,300	(2,430)	\$326	(\$316)	\$338
2008	76,000	(26,000)	260	(260)	3,470	(2,590)	\$579	(\$566)	\$579

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 2.4. Trends in U.S. Use of Primary Cooking Power Sources
(Percentage of Households)**

Year	Gas	Electricity	Other Fuel	None
1950	59.6%	15.0%	25.2%	0.3%
1960	63.7%	30.8%	4.9%	0.5%
1970	57.6%	40.6%	1.4%	0.3%
1980	47.2%	52.1%	0.5%	0.2%
1985	43.7%	55.5%	0.3%	0.5%
1991	40.9%	58.2%	0.5%	0.4%
1993	40.1%	59.0%	0.5%	0.4%
1995	40.1%	59.0%	0.6%	0.3%
1999	39.9%	59.6%	0.1%	0.4%
2001	39.7%	59.9%	0.1%	0.3%
2003	40.3%	59.4%	0.1%	0.3%
2005	39.8%	60.0%	--	--
2007	39.9%	59.9%	--	--

Note: Gas includes utility, bottled, tank and LP-gas.

Source: U.S. Bureau of the Census, *Census of Housing, 1960*, Vol. 1; *1970 and 1980*, Vo. 1; Current Housing Reports, Series H-150-87, *American Housing Survey*; *1990 Census of Housing, Detailed Housing Characteristics*, Series CH-2; and *Statistical Abstract of the United States*, 1994-2010 editions.

Table 2.5. Comparative Risks of Reported Fires and Associated Losses of Gas Versus Electric Stoves

A. Input Data

	Average U.S. Households U.S. Households Using a Range With This Power Power (in Millions)	Fires	Annual Average of 2004-2008 U.S. Home Structure Fires <u>Involving Range or Stove With This Power</u>		
			Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
Gas	43.8	15,400	120	530	\$79
Electricity	65.8	74,900	290	3,210	\$436
All ranges	109.7	90,500	410	3,750	\$516

Note: Usage statistics are published only for odd-numbered years. Therefore, in this analysis, usage is estimated as the average of 2005 and 2007 usage and assumes that households using these power sources for cooking have a range or stove.

Source: Data from NFIRS 5.0 and NFPA survey; *Statistical Abstract of the United States 2010*, Table 966.

B. Comparative U.S. Risk Relative to Usage

	Fires per Million Households	Civilian Deaths per Million Households	Civilian Injuries per Million Households	Direct Property Damage per Household
Gas	351	2.7	12.1	\$1.80
Electricity	1,138	4.3	48.8	\$6.62
All ranges	825	3.7	34.2	\$4.71

**Table 2.6. Home Fires Involving Ranges, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment unattended	35,700	(39%)	210	(52%)	1,910	(51%)	\$242	(47%)
<i>Non-confined fire</i>	13,100	(14%)	210	(52%)	1,470	(39%)	\$237	(46%)
<i>Confined fire</i>	22,600	(25%)	0	(0%)	440	(12%)	\$5	(1%)
Abandoned or discarded material or product	8,300	(9%)	30	(8%)	400	(11%)	\$55	(11%)
<i>Non-confined fire</i>	2,600	(3%)	30	(8%)	330	(9%)	\$54	(10%)
<i>Confined fire</i>	5,700	(6%)	0	(0%)	80	(2%)	\$1	(0%)
Heat source too close to combustible	7,400	(8%)	80	(18%)	340	(9%)	\$50	(10%)
<i>Non-confined fire</i>	3,400	(4%)	70	(17%)	260	(7%)	\$49	(10%)
<i>Confined fire</i>	4,100	(4%)	10	(1%)	70	(2%)	\$1	(0%)
Unintentionally turned on or not turned off	7,100	(8%)	30	(8%)	260	(7%)	\$77	(15%)
<i>Non-confined fire</i>	3,300	(4%)	30	(8%)	200	(5%)	\$76	(15%)
<i>Confined fire</i>	3,800	(4%)	0	(0%)	60	(2%)	\$1	(0%)
Unclassified misuse of material	7,000	(8%)	10	(3%)	320	(9%)	\$29	(6%)
<i>Non-confined fire</i>	2,000	(2%)	10	(3%)	220	(6%)	\$27	(5%)
<i>Confined fire</i>	5,000	(6%)	0	(0%)	100	(3%)	\$2	(0%)
Failure to clean	6,700	(7%)	0	(1%)	70	(2%)	\$4	(1%)
<i>Non-confined fire</i>	900	(1%)	0	(1%)	40	(1%)	\$3	(1%)
<i>Confined fire</i>	5,800	(6%)	0	(0%)	30	(1%)	\$0	(0%)
Unclassified factor contributed to ignition	5,300	(6%)	20	(4%)	200	(5%)	\$28	(5%)
<i>Non-confined fire</i>	1,400	(2%)	20	(4%)	130	(4%)	\$27	(5%)
<i>Confined fire</i>	3,800	(4%)	0	(0%)	70	(2%)	\$1	(0%)
Electrical failure or malfunction	4,300	(5%)	0	(1%)	50	(1%)	\$20	(4%)
<i>Non-confined fire</i>	1,400	(2%)	0	(1%)	40	(1%)	\$19	(4%)
<i>Confined fire</i>	2,900	(3%)	0	(0%)	10	(0%)	\$0	(0%)
Unclassified mechanical failure or malfunction	2,300	(2%)	0	(1%)	50	(1%)	\$6	(1%)
<i>Non-confined fire</i>	500	(1%)	0	(1%)	20	(1%)	\$5	(1%)
<i>Confined fire</i>	1,700	(2%)	0	(0%)	30	(1%)	\$0	(0%)
Equipment not being operated properly	1,700	(2%)	20	(4%)	90	(2%)	\$7	(1%)
<i>Non-confined fire</i>	500	(1%)	20	(4%)	60	(2%)	\$7	(1%)
<i>Confined fire</i>	1,300	(1%)	0	(0%)	20	(1%)	\$0	(0%)
Unclassified operational deficiency	1,700	(2%)	10	(3%)	80	(2%)	\$11	(2%)
<i>Non-confined fire</i>	500	(1%)	10	(3%)	70	(2%)	\$11	(2%)
<i>Confined fire</i>	1,200	(1%)	0	(0%)	10	(0%)	\$1	(0%)
Improper container or storage	1,500	(2%)	0	(0%)	10	(0%)	\$2	(0%)
<i>Non-confined fire</i>	300	(0%)	0	(0%)	10	(0%)	\$2	(0%)
<i>Confined fire</i>	1,200	(1%)	0	(0%)	0	(0%)	\$0	(0%)

Table 2.6. Home Fires Involving Ranges, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments
(Continued)

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Other known factor	6,000	(7%)	30	(6%)	220	(6%)	\$32	(6%)
<i>Other known non-confined fire</i>	2,300	(2%)	30	(6%)	160	(4%)	\$31	(6%)
<i>Other known confined fire</i>	3,700	(4%)	0	(0%)	70	(2%)	\$1	(0%)
Total fires	90,500	(100%)	410	(100%)	3,750	(100%)	\$516	(100%)
<i>Non-confined fire</i>	30,000	(33%)	400	(99%)	2,810	(75%)	\$502	(97%)
<i>Confined fire</i>	60,500	(67%)	10	(1%)	950	(25%)	\$14	(3%)
Total entries	94,800	(105%)	450	(110%)	4,010	(107%)	\$564	(109%)
<i>Non-confined fire</i>	32,100	(35%)	440	(109%)	3,020	(80%)	\$548	(106%)
<i>Confined fire</i>	62,800	(69%)	10	(1%)	990	(26%)	\$15	(3%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 2.7. Home Fires Involving Gas-Fueled Ranges, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Equipment unattended	3,900	(25%)	40	(33%)	210	(39%)	\$29	(37%)
<i>Non-confined fire</i>	1,400	(9%)	40	(33%)	160	(31%)	\$29	(37%)
<i>Confined fire</i>	2,500	(16%)	0	(0%)	40	(8%)	\$0	(1%)
Heat source too close to combustible	1,700	(11%)	30	(26%)	70	(13%)	\$7	(9%)
<i>Non-confined fire</i>	800	(5%)	30	(26%)	60	(11%)	\$7	(9%)
<i>Confined fire</i>	900	(6%)	0	(0%)	10	(2%)	\$0	(0%)
Failure to clean	1,600	(10%)	0	(0%)	10	(2%)	\$1	(1%)
<i>Non-confined fire</i>	200	(2%)	0	(0%)	10	(2%)	\$0	(0%)
<i>Confined fire</i>	1,400	(9%)	0	(0%)	0	(1%)	\$0	(0%)
Unclassified misuse of material	1,300	(9%)	0	(4%)	50	(9%)	\$5	(7%)
<i>Non-confined fire</i>	400	(3%)	0	(4%)	40	(8%)	\$5	(7%)
<i>Confined fire</i>	900	(6%)	0	(0%)	0	(1%)	\$0	(0%)
Abandoned or discarded material or product	1,100	(7%)	30	(22%)	30	(6%)	\$7	(9%)
<i>Non-confined fire</i>	300	(2%)	30	(22%)	20	(4%)	\$7	(9%)
<i>Confined fire</i>	800	(5%)	0	(0%)	10	(2%)	\$0	(0%)
Unintentionally turned on or not turned off	1,000	(6%)	0	(4%)	20	(3%)	\$8	(10%)
<i>Non-confined fire</i>	400	(3%)	0	(4%)	10	(1%)	\$8	(10%)
<i>Confined fire</i>	600	(4%)	0	(0%)	10	(2%)	\$0	(0%)
Leak or break	1,000	(6%)	0	(0%)	40	(7%)	\$5	(7%)
<i>Non-confined fire</i>	500	(4%)	0	(0%)	20	(5%)	\$5	(7%)
<i>Confined fire</i>	400	(3%)	0	(0%)	10	(2%)	\$0	(0%)
Unclassified factor contributed to ignition	900	(6%)	10	(10%)	30	(5%)	\$5	(7%)
<i>Non-confined fire</i>	200	(2%)	10	(10%)	10	(2%)	\$5	(6%)
<i>Confined fire</i>	600	(4%)	0	(0%)	10	(3%)	\$0	(0%)
Unclassified mechanical failure or malfunction	600	(4%)	0	(3%)	30	(5%)	\$2	(3%)
<i>Non-confined fire</i>	200	(1%)	0	(3%)	10	(1%)	\$2	(3%)
<i>Confined fire</i>	400	(3%)	0	(0%)	20	(4%)	\$0	(0%)
Unclassified improper container or storage	600	(4%)	0	(0%)	0	(1%)	\$1	(1%)
<i>Non-confined fire</i>	100	(1%)	0	(0%)	0	(1%)	\$0	(1%)
<i>Confined fire</i>	500	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Equipment not being operated properly	400	(3%)	0	(3%)	20	(4%)	\$1	(1%)
<i>Non-confined fire</i>	100	(1%)	0	(3%)	10	(1%)	\$1	(1%)
<i>Confined fire</i>	300	(2%)	0	(0%)	10	(3%)	\$0	(0%)
Unclassified operational deficiency	400	(2%)	0	(0%)	20	(3%)	\$4	(4%)
<i>Non-confined fire</i>	100	(1%)	0	(0%)	10	(2%)	\$3	(4%)
<i>Confined fire</i>	300	(2%)	0	(0%)	10	(1%)	\$0	(0%)

**Table 2.7. Home Fires Involving Gas-Fueled Ranges, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments
(Continued)**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Other known factor	1,500	(10%)	0	(3%)	60	(12%)	\$9	(12%)
<i>Non-confined fire</i>	700	(4%)	0	(3%)	40	(8%)	\$9	(11%)
<i>Confined fire</i>	800	(5%)	0	(0%)	20	(4%)	\$1	(1%)
Total fires	15,400	(100%)	120	(100%)	530	(100%)	\$79	(100%)
<i>Non-confined fire</i>	5,100	(33%)	120	(100%)	380	(71%)	\$77	(97%)
<i>Confined fire</i>	10,300	(67%)	0	(0%)	150	(29%)	\$2	(3%)
Total entries	16,000	(104%)	130	(106%)	580	(109%)	\$85	(108%)
<i>Non-confined fire</i>	5,400	(35%)	130	(106%)	410	(77%)	\$83	(105%)
<i>Confined fire</i>	10,500	(68%)	0	(0%)	170	(31%)	\$2	(3%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 2.8. Home Fires Involving Electric-Powered Ranges, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property	
							Damage (in Millions)	
Equipment unattended	31,200	(42%)	170	(59%)	1,690	(53%)	\$209	(48%)
<i>Non-confined fire</i>	11,500	(15%)	170	(59%)	1,290	(40%)	\$204	(47%)
<i>Confined fire</i>	19,800	(26%)	0	(0%)	390	(12%)	\$5	(1%)
Abandoned or discarded material or product	7,100	(10%)	10	(4%)	360	(11%)	\$50	(11%)
<i>Non-confined fire</i>	2,300	(3%)	10	(4%)	300	(9%)	\$49	(11%)
<i>Confined fire</i>	4,800	(6%)	0	(0%)	60	(2%)	\$1	(0%)
Unintentionally turned on or not turned off	6,100	(8%)	30	(9%)	260	(8%)	\$69	(16%)
<i>Non-confined fire</i>	2,900	(4%)	30	(9%)	200	(6%)	\$68	(16%)
<i>Confined fire</i>	3,100	(4%)	0	(0%)	60	(2%)	\$1	(0%)
Heat source too close to combustible	5,700	(8%)	50	(16%)	270	(8%)	\$43	(10%)
<i>Non-confined fire</i>	2,600	(3%)	40	(14%)	210	(7%)	\$42	(10%)
<i>Confined fire</i>	3,100	(4%)	10	(2%)	60	(2%)	\$1	(0%)
Unclassified misuse of material or product	5,700	(8%)	0	(1%)	270	(8%)	\$24	(5%)
<i>Non-confined fire</i>	1,600	(2%)	0	(1%)	170	(5%)	\$22	(5%)
<i>Confined fire</i>	4,100	(5%)	0	(0%)	100	(3%)	\$1	(0%)
Failure to clean	5,200	(7%)	0	(2%)	60	(2%)	\$3	(1%)
<i>Non-confined fire</i>	600	(1%)	0	(2%)	30	(1%)	\$3	(1%)
<i>Confined fire</i>	4,600	(6%)	0	(0%)	30	(1%)	\$0	(0%)
Unclassified factor contributed to ignition	4,300	(6%)	10	(3%)	170	(5%)	\$22	(5%)
<i>Non-confined fire</i>	1,200	(2%)	10	(3%)	110	(4%)	\$22	(5%)
<i>Confined fire</i>	3,100	(4%)	0	(0%)	50	(2%)	\$1	(0%)
Electrical failure or malfunction	4,300	(6%)	0	(2%)	50	(1%)	\$20	(5%)
<i>Non-confined fire</i>	1,400	(2%)	0	(2%)	30	(1%)	\$20	(5%)
<i>Confined fire</i>	2,900	(4%)	0	(0%)	10	(0%)	\$0	(0%)
Equipment not being operated properly	1,400	(2%)	20	(6%)	60	(2%)	\$6	(1%)
<i>Non-confined fire</i>	400	(1%)	20	(6%)	50	(2%)	\$5	(1%)
<i>Confined fire</i>	1,000	(1%)	0	(0%)	10	(0%)	\$0	(0%)
Unclassified mechanical failure or malfunction	1,700	(2%)	0	(0%)	30	(1%)	\$4	(1%)
<i>Non-confined fire</i>	300	(0%)	0	(0%)	20	(1%)	\$3	(1%)
<i>Confined fire</i>	1,300	(2%)	0	(0%)	10	(0%)	\$0	(0%)
Unclassified operational deficiency	1,300	(2%)	10	(5%)	70	(2%)	\$8	(2%)
<i>Non-confined fire</i>	400	(1%)	10	(5%)	60	(2%)	\$7	(2%)
<i>Confined fire</i>	900	(1%)	0	(0%)	10	(0%)	\$1	(0%)
Other known factor	4,700	(6%)	10	(5%)	140	(4%)	\$20	(5%)
<i>Non-confined fire</i>	1,400	(2%)	10	(5%)	110	(3%)	\$20	(4%)
<i>Confined fire</i>	3,300	(4%)	0	(0%)	30	(1%)	\$1	(0%)

**Table 2.8. Home Fires Involving Electric-Powered Ranges, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments
(Continued)**

Factor	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
Total fires	74,900 (100%)	290 (100%)	3,210 (100%)	\$436 (100%)
<i>Non-confined fire</i>	24,900 (33%)	280 (98%)	2,420 (75%)	\$424 (97%)
<i>Confined fire</i>	50,000 (67%)	10 (2%)	790 (25%)	\$12 (3%)
Total entries	78,700 (105%)	310 (110%)	3,420 (107%)	\$479 (110%)
<i>Non-confined fire</i>	26,600 (36%)	310 (108%)	2,600 (81%)	\$466 (107%)
<i>Confined fire</i>	52,100 (70%)	10 (2%)	830 (26%)	\$13 (3%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS 5.0 and NFPA survey.

Table 2.9. Home Fires Involving Ranges, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking material, including food	61,400	(68%)	200	(48%)	2,730	(73%)	\$302	(58%)
<i>Non-confined fire</i>	18,600	(21%)	200	(48%)	2,010	(54%)	\$292	(57%)
<i>Confined fire</i>	42,800	(47%)	0	(0%)	720	(19%)	\$9	(2%)
Household utensil	5,300	(6%)	10	(3%)	170	(4%)	\$23	(4%)
<i>Non-confined fire</i>	1,400	(2%)	10	(3%)	110	(3%)	\$22	(4%)
<i>Confined fire</i>	3,800	(4%)	0	(0%)	60	(2%)	\$1	(0%)
Unclassified item first ignited	4,600	(5%)	10	(3%)	100	(3%)	\$13	(2%)
<i>Non-confined fire</i>	900	(1%)	10	(3%)	60	(2%)	\$12	(2%)
<i>Confined fire</i>	3,700	(4%)	0	(0%)	30	(1%)	\$1	(0%)
Appliance housing or casing	4,400	(5%)	20	(5%)	70	(2%)	\$21	(4%)
<i>Non-confined fire</i>	1,300	(1%)	20	(5%)	50	(1%)	\$21	(4%)
<i>Confined fire</i>	3,100	(3%)	0	(0%)	20	(0%)	\$1	(0%)
Flammable or combustible liquid or gas, piping or filter	3,400	(4%)	10	(2%)	180	(5%)	\$20	(4%)
<i>Non-confined fire</i>	1,600	(2%)	10	(2%)	140	(4%)	\$19	(4%)
<i>Confined fire</i>	1,900	(2%)	0	(0%)	40	(1%)	\$1	(0%)
Cabinetry	1,800	(2%)	30	(7%)	140	(4%)	\$47	(9%)
<i>Non-confined fire</i>	1,400	(2%)	30	(7%)	130	(3%)	\$47	(9%)
<i>Confined fire</i>	400	(0%)	0	(0%)	10	(0%)	\$0	(0%)
Electrical wire or cable insulation	1,500	(2%)	0	(0%)	20	(0%)	\$7	(1%)
<i>Non-confined fire</i>	600	(1%)	0	(0%)	10	(0%)	\$7	(1%)
<i>Confined fire</i>	900	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known item	8,000	(9%)	130	(31%)	350	(9%)	\$83	(16%)
<i>Non-confined fire</i>	4,100	(5%)	120	(30%)	290	(8%)	\$82	(16%)
<i>Confined fire</i>	3,900	(4%)	10	(1%)	60	(2%)	\$1	(0%)
Total fires	90,500	(100%)	410	(100%)	3,750	(100%)	\$516	(100%)
<i>Non-confined fire</i>	30,000	(33%)	400	(99%)	2,810	(75%)	\$502	(97%)
<i>Confined fire</i>	60,500	(67%)	10	(1%)	950	(25%)	\$14	(3%)
Clothing*	400	(0%)	70	(17%)	40	(1%)	\$3	(1%)

*Although the percentage of fires beginning with clothing was below the threshold for inclusion in the table, this line is shown because of the large percentage of deaths.

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 2.10. Home Fires Involving Gas-Fueled Ranges, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	8,400	(55%)	50	(38%)	300	(56%)	\$35	(44%)
<i>Non-confined fire</i>	2,200	(14%)	50	(38%)	200	(37%)	\$33	(42%)
<i>Confined fire</i>	6,200	(40%)	0	(0%)	100	(19%)	\$1	(2%)
Flammable or combustible liquid or gas, piping or filter	1,500	(10%)	10	(6%)	70	(14%)	\$7	(9%)
<i>Non-confined fire</i>	700	(5%)	10	(6%)	50	(10%)	\$7	(9%)
<i>Confined fire</i>	700	(5%)	0	(0%)	20	(4%)	\$0	(0%)
Household utensil	1,200	(8%)	0	(2%)	20	(3%)	\$5	(6%)
<i>Non-confined fire</i>	300	(2%)	0	(2%)	10	(1%)	\$5	(6%)
<i>Confined fire</i>	800	(5%)	0	(0%)	10	(2%)	\$0	(0%)
Unclassified item first ignited	1,000	(6%)	0	(2%)	10	(2%)	\$2	(3%)
<i>Non-confined fire</i>	200	(1%)	0	(2%)	0	(1%)	\$2	(3%)
<i>Confined fire</i>	800	(5%)	0	(0%)	0	(1%)	\$0	(0%)
Appliance housing or casing	1,000	(6%)	0	(0%)	10	(3%)	\$2	(3%)
<i>Non-confined fire</i>	300	(2%)	0	(0%)	10	(3%)	\$2	(3%)
<i>Confined fire</i>	700	(4%)	0	(0%)	0	(0%)	\$0	(0%)
Cabinetry	300	(2%)	0	(3%)	20	(3%)	\$9	(11%)
<i>Non-confined fire</i>	300	(2%)	0	(3%)	20	(3%)	\$9	(11%)
<i>Confined fire</i>	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Box, carton, bag or barrel	200	(2%)	0	(0%)	10	(1%)	\$1	(1%)
<i>Non-confined fire</i>	100	(1%)	0	(0%)	0	(0%)	\$1	(1%)
<i>Confined fire</i>	200	(1%)	0	(0%)	10	(1%)	\$0	(0%)
Other known item	1,800	(12%)	60	(48%)	90	(17%)	\$18	(22%)
<i>Non-confined fire</i>	1,000	(6%)	60	(48%)	80	(16%)	\$18	(22%)
<i>Confined fire</i>	900	(6%)	0	(0%)	10	(1%)	\$0	(0%)
Total fires	15,400	(100%)	120	(100%)	530	(100%)	\$79	(100%)
<i>Non-confined fire</i>	5,100	(33%)	120	(100%)	380	(71%)	\$77	(97%)
<i>Confined fire</i>	10,300	(67%)	0	(0%)	150	(29%)	\$2	(3%)
Clothing*	100	(1%)	40	(31%)	30	(5%)	\$1	(1%)

*Although the percentage of fires beginning with clothing was below the threshold for inclusion in the table, this line is shown because of the large percentage of deaths.

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS 5.0 and NFPA survey.

**Table 2.11. Home Fires Involving Electric-Powered Ranges, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property	
							Damage (in Millions)	
Cooking materials, including food	52,300	(70%)	150	(51%)	2,410	(75%)	\$262	(60%)
<i>Non-confined fire</i>	16,100	(22%)	150	(51%)	1,800	(56%)	\$255	(58%)
<i>Confined fire</i>	36,200	(48%)	0	(0%)	610	(19%)	\$8	(2%)
Household utensil	4,200	(6%)	10	(4%)	140	(4%)	\$19	(4%)
<i>Non-confined fire</i>	1,100	(2%)	10	(4%)	90	(3%)	\$19	(4%)
<i>Confined fire</i>	3,100	(4%)	0	(0%)	50	(2%)	\$1	(0%)
Unclassified item first ignited	3,600	(5%)	10	(4%)	80	(3%)	\$10	(2%)
<i>Non-confined fire</i>	700	(1%)	10	(4%)	60	(2%)	\$10	(2%)
<i>Confined fire</i>	2,900	(4%)	0	(0%)	30	(1%)	\$1	(0%)
Appliance housing or casing	3,600	(5%)	20	(8%)	60	(2%)	\$19	(4%)
<i>Non-confined fire</i>	1,100	(1%)	20	(8%)	40	(1%)	\$18	(4%)
<i>Confined fire</i>	2,500	(3%)	0	(0%)	20	(0%)	\$1	(0%)
Flammable or combustible liquid or gas, piping or filter	2,000	(3%)	0	(0%)	110	(3%)	\$13	(3%)
<i>Non-confined fire</i>	900	(1%)	0	(0%)	90	(3%)	\$13	(3%)
<i>Confined fire</i>	1,200	(2%)	0	(0%)	20	(1%)	\$1	(0%)
Cabinetry	1,500	(2%)	30	(9%)	120	(4%)	\$39	(9%)
<i>Non-confined fire</i>	1,200	(2%)	30	(9%)	110	(3%)	\$39	(9%)
<i>Confined fire</i>	300	(0%)	0	(0%)	10	(0%)	\$0	(0%)
Electrical wire or cable insulation	1,500	(2%)	0	(0%)	20	(1%)	\$7	(2%)
<i>Non-confined fire</i>	600	(1%)	0	(0%)	10	(0%)	\$7	(2%)
<i>Confined fire</i>	900	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known item	6,200	(8%)	70	(24%)	270	(8%)	\$65	(15%)
<i>Non-confined fire</i>	3,200	(4%)	60	(22%)	220	(7%)	\$64	(15%)
<i>Confined fire</i>	3,000	(4%)	10	(2%)	50	(1%)	\$1	(0%)
Total fires	74,900	(100%)	290	(100%)	3,210	(100%)	\$436	(100%)
<i>Non-confined fire</i>	24,900	(33%)	280	(98%)	2,420	(75%)	\$424	(97%)
<i>Confined fire</i>	50,000	(67%)	10	(2%)	790	(25%)	\$12	(3%)
Clothing*	200	(0%)	30	(12%)	20	(1%)	\$3	(1%)

*Although the percentage of fires beginning with clothing was below the threshold for inclusion in the table, this line is shown because of the large percentage of deaths.

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS 5.0 and NFPA survey.

**Table 2.12. Home Fires Involving Ranges, by Extent of Flame Damage
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Extent of Flame Damage	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	60,500	(67%)	10	(1%)	950	(25%)	\$14	(3%)
Confined to object of origin	7,200	(8%)	30	(6%)	390	(10%)	\$29	(6%)
Confined to room of origin	18,200	(20%)	90	(22%)	1,860	(50%)	\$180	(35%)
Confined to floor of origin	1,500	(2%)	60	(16%)	220	(6%)	\$68	(13%)
Confined to building of origin	2,900	(3%)	200	(49%)	300	(8%)	\$203	(39%)
Extended beyond building of origin	200	(0%)	20	(6%)	40	(1%)	\$23	(4%)
Total	90,500	(100%)	410	(100%)	3,750	(100%)	\$516	(100%)

**Table 2.13. Home Fires Involving Gas Ranges, by Extent of Flame Damage
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Extent of Flame Damage	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	50,000	(67%)	10	(2%)	790	(25%)	\$12	(3%)
Confined to object of origin	5,400	(7%)	10	(4%)	310	(10%)	\$24	(6%)
Confined to room of origin	15,900	(21%)	60	(21%)	1,660	(52%)	\$161	(37%)
Confined to floor of origin	1,300	(2%)	50	(17%)	180	(6%)	\$59	(14%)
Confined to building of origin	2,200	(3%)	150	(52%)	230	(7%)	\$163	(37%)
Extended beyond building of origin	200	(0%)	10	(4%)	30	(1%)	\$17	(4%)
Total	74,900	(100%)	290	(100%)	3,210	(100%)	\$436	(100%)

**Table 2.14. Home Fires Involving Electric Ranges, by Extent of Flame Damage
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Extent of Flame Damage	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	10,300	(67%)	0	(0%)	150	(29%)	\$2	(3%)
Confined to object of origin	1,700	(11%)	20	(13%)	70	(14%)	\$3	(3%)
Confined to room of origin	2,500	(16%)	30	(22%)	190	(37%)	\$23	(29%)
Confined to floor of origin	300	(2%)	10	(12%)	40	(8%)	\$9	(11%)
Confined to building of origin	600	(4%)	50	(39%)	70	(13%)	\$38	(48%)
Extended beyond building of origin	0	(0%)	20	(13%)	0	(0%)	\$5	(6%)
Total	15,400	(100%)	120	(100%)	530	(100%)	\$79	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS 5.0 and NFPA survey.

2.15. Hospital Emergency Room Visits for Injuries Involving Ranges or Ovens During 2009, by Leading Diagnoses

Diagnosis	Injuries	
Thermal burn	17,300	(50%)
Thermal contact/non-fire burn	15,500	(44%)
<i>Victim under 5</i>	5,600	(16%)
Thermal fire, flame or flash burn	1,800	(5%)
Laceration	3,200	(9%)
Scald burns	2,900	(8%)
<i>Victim under 5</i>	1,000	(3%)
Strain or sprain	2,100	(6%)
Contusion or abrasion	2,100	(6%)
Anoxia	1,800	(5%)

Note: Estimates of victims under 5 years of age are shown in italics.

Table 2.16. Hospital Emergency Room Visits for Injuries Involving Ranges or Ovens During 2009, by Range Power Source

Power Source	Injuries	
Electric range or oven	19,100	55%
Gas range or oven	12,500	36%
Other range or oven	3,300	9%
Total	34,900	100%

Note: Unspecified types of ranges or ovens were allocated proportionally among the specified types of ranges or ovens.

Source: CPSC's National Electronic Injury Surveillance System (NEISS) queried in October 2010.

Ovens or Rotisseries

Ovens or rotisseries were involved in 16% of reported home cooking equipment fires.

During 2004-2008, U.S. fire departments responded to an average of 24,100 home structure fires per year in which an oven or rotisserie was involved in ignition. These fires caused an annual average of 12 civilian deaths, 280 civilian injuries, and \$32 million in direct property damage. These incidents accounted for 16% of the reported home fires involving cooking equipment, 3% of the associated civilian deaths, 6% of the associated civilian injuries, and 4% of the direct property damage from cooking equipment fires. Note that fires in ovens that are part of ranges may be coded as range fires. Therefore, these statistics probably understate the oven share of home cooking fires.

Data Sources, Definitions and Conventions Used in this Report

The fire statistics 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 NFPA's annual fire department experience survey. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Fires are rounded to the nearest hundred, civilian deaths are rounded to the nearest one, civilian injuries are expressed to the nearest ten and property damage is rounded to the nearest million dollars. Property damage has not been adjusted for inflation unless so indicated.

NFIRS 5.0 equipment involved in ignition code 645 identifies ovens or rotisseries. Code 646 captures ranges with or without an oven, so some oven fires may be counted with the ranges. NFIRS 5.0 incident type codes in the range of 110-129 were used to identify structure fires. Unknown data were allocated proportionally in most fields analyzed except for incident type. NFIRS 5.0, first introduced in 1999, brought major changes to fire incident data, including changes in some definitions and coding rules. Because of these changes, caution should be used when

comparing data before 1998 with data from 1999 on.

The estimates reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined type. Fires reported as "no equipment" but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated.

Certain types of fires collectively referred to as "confined fires," including confined cooking fires, chimney fires, trash fires, and fuel burner or boiler fires (incident types 113-118) can be documented more easily in NFIRS 5.0. Causal data, including equipment involved in ignition, is generally not required for these incidents although it is provided in some cases. Equipment involved in ignition was reported in 23% of the non-confined fires and 5% of the confined fires. Confined and non-confined structure fires were analyzed separately and then summed to obtain estimates of all fires involving ranges. Detailed analyses on causal factors were done of non-confined fires only. Additional details on the methodology used may be found in Appendix A.

One-quarter of U.S. households use a conventional oven at least once a day.

The Energy Information Administration reported that in 2005, 28 million U.S. households (25%) used a conventional oven at least once a day. Seventy-two percent of the households used the oven at least once a week.²⁷

The risk of casualty or loss per 1,000 reported oven fires is lower than from reported cooking equipment fires in general.

During 2004-2008, the death rate per 1,000 reported home fires involving ovens or rotisseries was 0.5, a small fraction of the 3.0 deaths per 1,000 overall reported fires involving any type of cooking equipment and of the 4.5 deaths per 1,000 reported range or cooktop fires. The reported civilian injury rate for fires involving ovens or rotisseries was 12 per 1,000 fires, a little more than one-third the overall home cooking equipment rate of 31 injuries per 1000 fires, and less than one-third the rate of 41 injuries per 1,000 range or cooktop fires. The \$1,300 average direct property loss in oven or rotisserie fires was roughly one-quarter the average loss in all reported home cooking equipment fires (\$4,700) and in reported home range or cooktop fires (\$5,700).

Households that use electric ovens have a higher risk of fires and associated losses than those using gas ovens.

Although 60% of U.S. households used electricity as their primary cooking power source in 2003-2007, in 74% of the oven or rotisserie fires reported in 2004-2008, the equipment involved was powered by electricity. During this period, electric ovens or rotisseries were involved in an average of 17,900 reported home structure fires per year. These fires caused an annual average of eight civilian deaths, 230 reported civilian injuries, and \$26 million in direct property damage. Gas ovens or rotisseries were involved in an average of 6,200 reported home structure fires annually during this period, resulting in an average of five civilian deaths, 45 civilian injuries, and \$6 million in direct property damage per year.

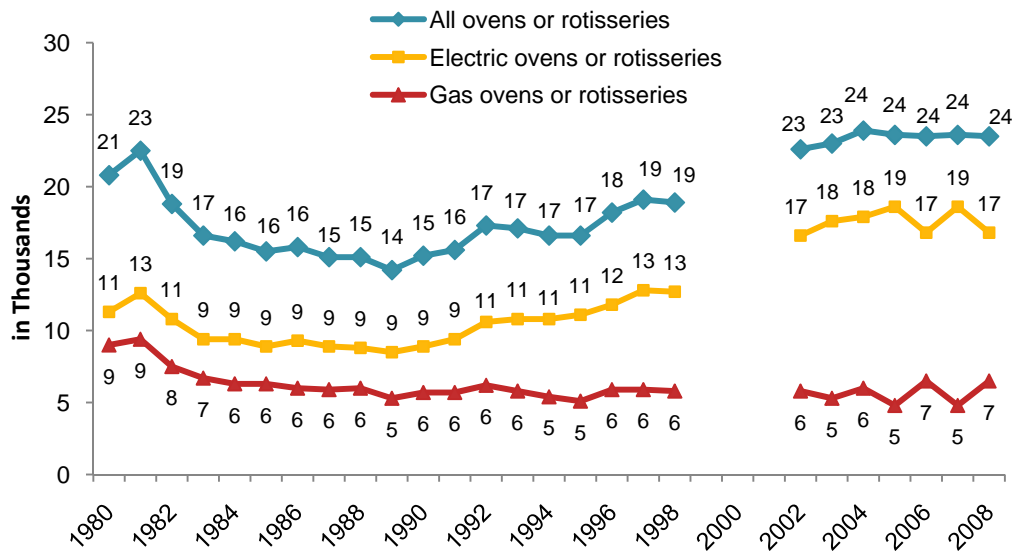
More oven or rotisserie fires were reported in recent years than in the early 1980s.

Table 3.1 and Figure 3.1 show that the total number of reported fires involving ovens or rotisseries was 18% higher in 2008 than in 1980. Fires involving gas ovens or rotisseries were 29% lower in 2008 while electric range fires climbed 61% since 1980. (See Tables 3.2 and 3.3.) The percentage of households using electricity as their primary power source for cooking increased from 52% in 1980 to 60% in 2007. Over the same period, the percentage of households using primarily gas for cooking dropped to 40% in 2007 from 47% in 1980.

Because of the changes in data collection rules and definitions that accompanied the introduction of NFIRS 5.0 in 1999, caution must be used in interpreting these findings. NFIRS 5.0 made it much easier to document minor cooking fires.

²⁷ Energy Information Administration. *2005 Residential Energy Consumption Survey: Preliminary Housing Characteristics Tables*, Table HC2.10 "Home Appliances Usage Indicators by Type of Housing Unit, 2005.

Figure 3.1. Reported Home Structure Fires Involving Ovens or Rotisseries, by Year



A failure to clean was the leading factor contributing to home fires involving ovens or rotisseries.

During 2004-2008, a failure to clean was a factor contributing to ignition in 17% of reported home structure fires involving ovens or rotisseries. This is a much larger share than for ranges, the other primary type of cooking equipment. Spills and splatters may be more visible on the stovetop and hence cleaned more frequently. Unlike the stovetop, the whole oven is heated when it is in use. This increases the odds of something being heated to ignition temperature.

Unattended cooking, the leading factor for ranges, was a factor in 15% of oven or rotisserie fires, or less than half the percentage of range fires. This probably reflects the fact that the oven is a more complete enclosure and that roasting does not require continuous, uninterrupted attention. Other leading factors in oven or rotisserie fires were: electrical failures or malfunctions (11%); heat source too close to combustibles (9%); unclassified misuse of material (also 9%); wholly unclassified factors (6%); improper container or storage (6%); abandoned or discarded material (6%); and unintentionally turned on or not turned off (also 6%). (See Tables 3.4, 3.5, and 3.6.)

Leaks or breaks were also seen more commonly in gas ovens or rotisseries (4%) than in those powered by electricity (1%). Electrical failures or malfunctions were factors in 15% of the electric oven or rotisserie fires but roughly 1% of the equipment powered by gas.

Cooking materials were first ignited in more than half of the reported oven or rotisserie fires.

Table 3.7 shows that in 2004-2008, cooking materials, including food, were the first items ignited in three of every five (57%) reported home structure fires involving ovens or rotisseries. Other leading items first ignited included unclassified items (9%), appliance housings or casings (8%), and household utensils (also 8% of fires). Flammable or combustible gas or liquid or piping ranked higher (5%) for gas-fueled equipment than for electric-powered equipment (2%). Predictably, electrical wire or cable insulation was first ignited in a larger percentage (5%) of

fires involving electric ovens or rotisseries than in those fueled by gas (less than 1%). See Table 3.8 and 3.9 for more details.

A 1998 study of kitchen fires in the Bay-Waikato region of New Zealand noted that in some of the 10% of cooking fires started by ovens in their study, baking products fell or dripped onto the heating element. In some cases, non-food items had been left in the oven.²⁸

Flame damage was limited to the room of fire origin in 99% of reported oven or rotisserie fires.

Table 3.10 shows that 88% of all home fires involving ovens or rotisseries reported in 2004-2008 were coded with an incident type that indicated the fire was confined to the vessel of origin. In an additional 7%, fire spread was coded as confined to the object of origin. Combined, the 95% of reported fires with confined fire incident types or non-confined fires with flame damage coded as confined to object of origin caused 88% of the injuries associated with oven or rotisserie fires. Flame damage spread beyond the room of origin in only 1% of these fires. Eight percent of the injuries resulted from fires that spread beyond the room of origin.

Safety Tips

Choose the right cooking equipment. Install and use it properly.

- Always use cooking equipment tested and approved by a recognized testing facility.
- Follow manufacturer's instructions and code requirements when installing and operating cooking equipment.
- Plug microwave ovens or other cooking appliances directly into an outlet. Never use an extension cord for a cooking appliance as it can overload the circuit and cause a fire.
- For gas-fueled ovens, be sure the oven is installed in accordance with NFPA 54, *National Fuel Gas Code*, which addresses clearances, installation, and maintenance. Read and follow manufacturer's instructions, particularly with regard to installation, maintenance, and operation. Liquefied-petroleum (LP)-gas-fueled ovens with self-contained fuel supplies are prohibited for home use by NFPA codes.
- For electric-powered ovens, be sure the oven is installed in accordance with NFPA's *National Electrical Code*®. Read and follow manufacturer's instructions, particularly with regard to, installation, maintenance, and operation.

Watch what you heat!

- The leading cause of fires in the kitchen is unattended cooking.
- 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.
- 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.
-

²⁸ Key Research and Marketing, Ltd. *New Zealand Fire Service Bay-Waikato Fire Region Kitchen Fire Research, Summary of Findings*, October 1998.

Stay alert.

- To prevent cooking fires, you have to be alert. You won't be if you are sleepy, have taken medicine or drugs, or consumed alcohol.
- **Use equipment for intended purposes only.**
- Cook only with equipment designed and intended for cooking, and heat your home only with equipment designed and intended for heating. There is additional danger of fire, injury, or death if equipment is used for a purpose for which it was not intended.

Keep things that can catch fire and heat sources apart.

- Keep anything that can catch fire – potholders, oven mitts, wooden utensils, paper or plastic bags, boxes, food packaging, towels or curtains – away from your oven.
- Keep the oven clean.
- Wear short, close fitting or tightly rolled sleeves when cooking. Loose clothing can dangle onto an oven's cooking elements and can catch fire if it comes in contact with a gas flame or electric burner.

Know what to do if your clothes catch fire.

- If your clothes catch fire, stop, drop, and roll. Stop immediately, drop to the ground, and cover face with hands. Roll over and over or back and forth to put out the fire. Immediately cool the burn with *cool* water for 3 to 5 minutes and seek emergency medical treatment.

Know what to do if you have a cooking fire.

- When in doubt, just get out! When you leave, close the door behind you to help contain the fire. Call 911 or the local emergency number after you leave.
- If you do try to fight the fire, be sure others are already getting out and you have a clear path to the exit.
- In case of an oven fire, turn off the heat and keep the door closed to prevent flames from burning you or your clothing. After a fire, the oven should be checked and/or serviced before being used again.

**Table 3.1. Home Fires Involving Ovens or Rotisseries, by Year
Structure Fires Reported to U.S. Fire Departments**

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
					As Reported	In 2008 Dollars
1980	20,800		260		\$14	\$37
1981	22,500		320		\$13	\$31
1982	18,800		410		\$16	\$36
1983	16,600		280		\$14	\$30
1984	16,200		310		\$21	\$43
1985	15,500		370		\$19	\$38
1986	15,800		320		\$24	\$47
1987	15,100		280		\$26	\$49
1988	15,100		390		\$28	\$51
1989	14,200		310		\$26	\$45
1990	15,200		490		\$22	\$36
1991	15,600		400		\$32	\$51
1992	17,300		480		\$39	\$60
1993	17,100		530		\$42	\$63
1994	16,600		520		\$213	\$309
1995	16,600		520		\$40	\$56
1996	18,200		610		\$44	\$60
1997	19,100		580		\$49	\$66
1998	18,900		570		\$45	\$59
1999	30,300	(10,300)	520	(260)	\$71 (\$65)	\$91
2000	16,300	(3,700)	260	(260)	\$32 (\$20)	\$39
2001	23,300	(3,200)	210	(160)	\$22 (\$20)	\$27
2002	22,300	(3,000)	120	(90)	\$26 (\$24)	\$31
2003	23,000	(3,300)	280	(180)	\$21 (\$19)	\$24
2004	23,900	(2,500)	270	(110)	\$27 (\$25)	\$30
2005	23,300	(3,100)	320	(110)	\$49 (\$38)	\$54
2006	23,500	(3,000)	270	(150)	\$27 (\$25)	\$29
2007	25,100	(2,900)	300	(140)	\$24 (\$22)	\$25
2008	24,600	(3,000)	240	(80)	\$34 (\$32)	\$34

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving equipment; they are analyzed separately. These are national estimates of fires reported to U.S. estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Because of their small numbers, annual estimates of fire deaths involving this equipment are unreliable and not shown. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 3.2. Home Fires Involving Gas-Fueled Ovens or Rotisseries, by Year
Structure Fires Reported to U.S. Fire Departments**

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2008 Dollars	
1980	9,000		180		\$8		\$21
1981	9,400		150		\$5		\$12
1982	7,500		140		\$7		\$16
1983	6,700		120		\$7		\$15
1984	6,300		160		\$8		\$17
1985	6,300		170		\$7		\$14
1986	6,000		120		\$7		\$14
1987	5,900		90		\$11		\$21
1988	6,000		160		\$6		\$11
1989	5,300		110		\$9		\$16
1990	5,700		170		\$9		\$15
1991	5,700		130		\$12*		\$19*
1992	6,200		180		\$17		\$26
1993	5,800		200		\$16		\$24
1994	5,400		220		\$8		\$12
1995	5,100		150		\$10		\$14
1996	5,900		190		\$13		\$18
1997	5,900		180		\$16		\$21
1998	5,800		180		\$8		\$11
1999	3,800	(1,400)	0	(0)	\$8	(\$6)	\$10
2000	2,700	(600)	0	(0)	\$8	(\$3)	\$10
2001	5,500	(800)	90	(40)	\$4	(\$4)	\$5
2002	5,800	(600)	20	(20)	\$9	(\$9)	\$11
2003	5,300	(1,300)	70	(50)	\$6	(\$6)	\$7
2004	6,000	(800)	10	(10)	\$3	(\$2)	\$3
2005	4,800	(800)	20	(20)	\$3	(\$3)	\$4
2006	6,500	(1,000)	40	(40)	\$8	(\$7)	\$8
2007	6,700	(800)	100	(30)	\$4	(\$4)	\$5
2008	6,400	(900)	50	(20)	\$9	(\$8)	\$9

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Because of their small numbers, annual estimates of fire deaths involving this equipment are unreliable and not shown. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 3.3. Home Fires Involving Electric-Powered Ovens or Rotisseries, by Year
Structure Fires Reported to U.S. Fire Departments**

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2008 Dollars	
1980	11,300		70		\$6		\$16
1981	12,600		170		\$7		\$17
1982	10,800		250		\$8		\$18
1983	9,400		150		\$5		\$11
1984	9,400		150		\$13		\$27
1985	8,900		190		\$11		\$22
1986	9,300		190		\$15		\$29
1987	8,900		190		\$15		\$28
1988	8,800		210		\$21		\$38
1989	8,500		190		\$16		\$28
1990	8,900		310		\$13		\$21
1991	9,400		270		\$18*		\$28*
1992	10,600		290		\$19		\$29
1993	10,800		320		\$24		\$36
1994	10,800		290		\$18		\$26
1995	11,100		360		\$29		\$41
1996	11,800		420		\$31		\$43
1997	12,800		380		\$32		\$43
1998	12,700		400		\$43		\$57
1999	25,600	(8,500)	520	(260)	\$62	(\$58)	\$80
2000	13,200	(3,000)	260	(260)	\$23	(\$17)	\$29
2001	17,400	(2,300)	120	(120)	\$18	(\$17)	\$22
2002	16,300	(2,300)	100	(70)	\$16	(\$15)	\$19
2003	17,600	(1,900)	210	(130)	\$14	(\$13)	\$17
2004	17,900	(1,700)	260	(100)	\$24	(\$23)	\$27
2005	18,400	(2,400)	290	(80)	\$46	(\$36)	\$51
2006	16,700	(2,000)	220	(100)	\$19	(\$17)	\$20
2007	18,300	(2,100)	200	(110)	\$20	(\$18)	\$21
2008	18,200	(2,200)	190	(60)	\$25	(\$23)	\$25

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Because of their small numbers, annual estimates of fire deaths involving this equipment are unreliable and not shown. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 3.4. Home Fires Involving Ovens or Rotisseries, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported**

Factor	Fires		Civilian Injuries		Direct Property	
					Damage (in Millions)	
Failure to clean	4,100	(17%)	10	(5%)	\$1	(2%)
<i>In non-confined fire</i>	300	(1%)	10	(5%)	\$0	(1%)
<i>In confined fire</i>	3,800	(16%)	0	(0%)	\$0	(0%)
Equipment unattended	3,600	(15%)	80	(29%)	\$6	(19%)
<i>In non-confined fire</i>	600	(2%)	30	(9%)	\$6	(18%)
<i>In confined fire</i>	3,000	(13%)	60	(20%)	\$0	(1%)
Electrical failure or malfunction	2,600	(11%)	0	(1%)	\$5	(17%)
<i>In non-confined fire</i>	400	(1%)	0	(1%)	\$3	(10%)
<i>In confined fire</i>	2,300	(9%)	0	(0%)	\$2	(6%)
Heat source too close to combustible	2,200	(9%)	10	(2%)	\$4	(13%)
<i>In non-confined fire</i>	300	(1%)	10	(2%)	\$4	(12%)
<i>In confined fire</i>	1,900	(8%)	0	(0%)	\$0	(1%)
Unclassified misuse of material	2,200	(9%)	10	(4%)	\$3	(9%)
<i>In non-confined fire</i>	200	(1%)	10	(4%)	\$3	(9%)
<i>In confined fire</i>	2,000	(8%)	0	(0%)	\$0	(0%)
Unclassified factor contributed to ignition	1,500	(6%)	30	(12%)	\$2	(6%)
<i>In non-confined fire</i>	100	(1%)	0	(1%)	\$2	(5%)
<i>In confined fire</i>	1,400	(6%)	30	(11%)	\$0	(1%)
Improper container or storage	1,500	(6%)	30	(10%)	\$1	(3%)
<i>In non-confined fire</i>	200	(1%)	10	(2%)	\$1	(3%)
<i>In confined fire</i>	1,400	(6%)	20	(8%)	\$0	(0%)
Abandoned or discarded material or product	1,400	(6%)	30	(12%)	\$3	(9%)
<i>In non-confined fire</i>	200	(1%)	20	(6%)	\$2	(6%)
<i>In confined fire</i>	1,200	(5%)	20	(6%)	\$1	(2%)
Unintentionally turned on or not turned off	1,400	(6%)	50	(18%)	\$3	(10%)
<i>In non-confined fire</i>	200	(1%)	20	(8%)	\$3	(9%)
<i>In confined fire</i>	1,200	(5%)	30	(11%)	\$0	(1%)
Unclassified mechanical failure or malfunction	1,200	(5%)	0	(1%)	\$1	(5%)
<i>In non-confined fire</i>	100	(1%)	0	(1%)	\$1	(4%)
<i>In confined fire</i>	1,000	(4%)	0	(0%)	\$0	(0%)
Unclassified operational deficiency	600	(3%)	0	(0%)	\$1	(5%)
<i>In non-confined fire</i>	100	(0%)	0	(0%)	\$1	(4%)
<i>In confined fire</i>	500	(2%)	0	(0%)	\$0	(0%)

**Table 3.4. Home Fires Involving Ovens or Rotisseries, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported
(Continued)**

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment not being operated properly	600	(3%)	10	(2%)	\$1	(3%)
<i>In non-confined fire</i>	100	(0%)	0	(0%)	\$1	(3%)
<i>In confined fire</i>	600	(2%)	10	(2%)	\$0	(0%)
Worn out	500	(2%)	0	(0%)	\$0	(1%)
<i>In non-confined fire</i>	100	(0%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	400	(2%)	0	(0%)	\$0	(0%)
Leak or break	400	(2%)	10	(4%)	\$1	(3%)
<i>In non-confined fire</i>	100	(0%)	10	(4%)	\$1	(3%)
<i>In confined fire</i>	300	(1%)	0	(0%)	\$0	(0%)
Other known factor	1,500	(6%)	10	(3%)	\$2	(6%)
<i>Non-confined fire</i>	200	(1%)	0	(1%)	\$2	(5%)
<i>Confined fire</i>	1,200	(5%)	10	(2%)	\$0	(1%)
Total fires	24,100	(100%)	280	(100%)	\$32	(100%)
<i>Non-confined fire</i>	2,900	(12%)	120	(42%)	\$27	(86%)
<i>Confined fire</i>	21,200	(88%)	160	(58%)	\$4	(14%)
Total entries	25,300	(105%)	290	(103%)	\$34	(108%)
<i>Non-confined fire</i>	3,100	(13%)	120	(43%)	\$30	(94%)
<i>Confined fire</i>	22,200	(92%)	170	(60%)	\$4	(14%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 3.5. Home Fires Involving Gas-Fueled Ovens or Rotisseries, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Failure to clean	1,200	(20%)	0	(0%)	\$0	(4%)
<i>Non-confined fire</i>	100	(2%)	0	(0%)	\$0	(3%)
<i>Confined fire</i>	1,100	(18%)	0	(0%)	\$0	(2%)
Equipment unattended	900	(15%)	0	(0%)	\$0	(8%)
<i>Non-confined fire</i>	100	(2%)	0	(0%)	\$0	(7%)
<i>Confined fire</i>	800	(13%)	0	(0%)	\$0	(2%)
Heat source too close to combustible	600	(11%)	0	(5%)	\$1	(17%)
<i>Non-confined fire</i>	100	(2%)	0	(5%)	\$1	(15%)
<i>Confined fire</i>	600	(9%)	0	(0%)	\$0	(2%)
Unclassified misuse of material	600	(9%)	0	(0%)	\$1	(20%)
<i>Non-confined fire</i>	100	(1%)	0	(0%)	\$1	(19%)
<i>Confined fire</i>	500	(8%)	0	(0%)	\$0	(1%)
Improper container or storage	500	(9%)	20	(39%)	\$0	(2%)
<i>Non-confined fire</i>	100	(1%)	0	(9%)	\$0	(1%)
<i>Confined fire</i>	500	(8%)	10	(30%)	\$0	(1%)
Unintentionally turned on or not turned off	400	(6%)	0	(9%)	\$0	(2%)
<i>Non-confined fire</i>	0	(1%)	0	(9%)	\$0	(1%)
<i>Confined fire</i>	300	(6%)	0	(0%)	\$0	(1%)
Unclassified factor contributed to ignition	400	(6%)	10	(16%)	\$0	(7%)
<i>Non-confined fire</i>	0	(1%)	0	(0%)	\$0	(6%)
<i>Confined fire</i>	300	(6%)	10	(16%)	\$0	(1%)
Abandoned or discarded material or product	300	(5%)	0	(5%)	\$0	(3%)
<i>Non-confined fire</i>	0	(1%)	0	(5%)	\$0	(2%)
<i>Confined fire</i>	300	(4%)	0	(0%)	\$0	(1%)
Unclassified mechanical failure or malfunction	300	(4%)	0	(0%)	\$0	(7%)
<i>Non-confined fire</i>	0	(1%)	0	(0%)	\$0	(6%)
<i>Confined fire</i>	200	(4%)	0	(0%)	\$0	(0%)
Leak or break	200	(4%)	10	(22%)	\$1	(16%)
<i>Non-confined fire</i>	100	(1%)	10	(22%)	\$1	(15%)
<i>Confined fire</i>	200	(3%)	0	(0%)	\$0	(1%)
Equipment not being operated properly	200	(3%)	0	(0%)	\$0	(1%)
<i>Non-confined fire</i>	0	(0%)	0	(0%)	\$0	(1%)
<i>Confined fire</i>	100	(2%)	0	(0%)	\$0	(0%)

**Table 3.5. Home Fires Involving Gas-Fueled Ovens or Rotisseries, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments
(Continued)**

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified operational deficiency	100	(2%)	0	(0%)	\$1	(16%)
<i>Non-confined fire</i>	0	(1%)	0	(0%)	\$1	(16%)
<i>Confined fire</i>	100	(1%)	0	(0%)	\$0	(0%)
Equipment used for unintended purpose	100	(2%)	0	(0%)	\$0	(4%)
<i>Non-confined fire</i>	0	(0%)	0	(0%)	\$0	(3%)
<i>Confined fire</i>	100	(1%)	0	(0%)	\$0	(0%)
Other known factor	500	(9%)	0	(5%)	\$1	(14%)
<i>Non-confined fire</i>	100	(2%)	0	(5%)	\$1	(12%)
<i>Confined fire</i>	400	(7%)	0	(0%)	\$0	(2%)
Total fires	6,200	(100%)	40	(100%)	\$6	(100%)
<i>Non-confined fire</i>	800	(14%)	20	(54%)	\$5	(87%)
<i>Confined fire</i>	5,300	(86%)	20	(46%)	\$1	(13%)
Total entries	6,400	(103%)	40	(100%)	\$7	(121%)
<i>Non-confined fire</i>	900	(15%)	20	(55%)	\$6	(107%)
<i>Confined fire</i>	5,500	(89%)	20	(46%)	\$1	(14%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 3.6. Home Fires Involving Electric-Powered Ovens or Rotisseries, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor	Fires		Civilian Injuries		Direct Property	
					Damage (in Millions)	
Failure to clean	2,900	(16%)	10	(6%)	\$0	(1%)
<i>In non-confined fire</i>	200	(1%)	10	(6%)	\$0	(1%)
<i>In confined fire</i>	2,700	(15%)	0	(0%)	\$0	(0%)
Electrical failure or malfunction	2,600	(15%)	0	(1%)	\$6	(22%)
<i>In non-confined fire</i>	400	(2%)	0	(1%)	\$4	(13%)
<i>In confined fire</i>	2,300	(13%)	0	(0%)	\$2	(9%)
Equipment unattended	2,700	(15%)	80	(33%)	\$6	(21%)
<i>In non-confined fire</i>	400	(3%)	30	(12%)	\$5	(20%)
<i>In confined fire</i>	2,200	(12%)	50	(22%)	\$0	(1%)
Unclassified misuse of material	1,700	(9%)	10	(5%)	\$2	(6%)
<i>In non-confined fire</i>	100	(1%)	10	(5%)	\$2	(6%)
<i>In confined fire</i>	1,500	(9%)	0	(0%)	\$0	(0%)
Heat source too close to combustible	1,500	(8%)	0	(2%)	\$3	(11%)
<i>In non-confined fire</i>	200	(1%)	0	(2%)	\$3	(11%)
<i>In confined fire</i>	1,300	(7%)	0	(0%)	\$0	(1%)
Unclassified factor contributed to ignition	1,100	(6%)	20	(11%)	\$1	(5%)
<i>In non-confined fire</i>	100	(0%)	0	(0%)	\$1	(5%)
<i>In confined fire</i>	1,100	(6%)	20	(11%)	\$0	(1%)
Abandoned or discarded material or product	1,000	(6%)	30	(13%)	\$2	(8%)
<i>In non-confined fire</i>	100	(1%)	10	(5%)	\$2	(8%)
<i>In confined fire</i>	900	(5%)	20	(8%)	\$0	(0%)
Unintentionally turned on or not turned off	1,000	(6%)	50	(19%)	\$3	(12%)
<i>In non-confined fire</i>	100	(1%)	20	(6%)	\$3	(12%)
<i>In confined fire</i>	800	(5%)	30	(13%)	\$0	(1%)
Improper container or storage	1,000	(5%)	10	(6%)	\$1	(3%)
<i>In non-confined fire</i>	100	(1%)	0	(1%)	\$1	(3%)
<i>In confined fire</i>	900	(5%)	10	(5%)	\$0	(0%)
Unclassified mechanical failure or malfunction	900	(5%)	0	(1%)	\$1	(4%)
<i>In non-confined fire</i>	100	(0%)	0	(1%)	\$1	(4%)
<i>In confined fire</i>	800	(4%)	0	(0%)	\$0	(0%)
Unclassified operational deficiency	500	(3%)	0	(0%)	\$0	(1%)
<i>In non-confined fire</i>	100	(0%)	0	(0%)	\$0	(1%)
<i>In confined fire</i>	400	(2%)	0	(0%)	\$0	(0%)
Worn out	500	(3%)	0	(0%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	400	(2%)	0	(0%)	\$0	(0%)

**Table 3.6. Home Fires Involving Electric-Powered Ovens or Rotisseries, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments
(Continued)**

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment not being operated properly	500	(3%)	10	(2%)	\$1	(4%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	\$1	(3%)
<i>In confined fire</i>	400	(2%)	10	(2%)	\$0	(0%)
Other known factor	1,100	(6%)	10	(2%)	\$1	(3%)
<i>Non-confined fire</i>	200	(1%)	0	(0%)	\$1	(3%)
<i>Confined fire</i>	1,000	(5%)	10	(2%)	\$0	(0%)
Total fires	17,900	(100%)	230	(100%)	\$26	(100%)
<i>Non-confined fire</i>	2,000	(11%)	90	(39%)	\$22	(86%)
<i>Confined fire</i>	15,900	(89%)	140	(61%)	\$4	(14%)
Total entries	18,900	(106%)	240	(103%)	\$27	(104%)
<i>Non-confined fire</i>	2,200	(12%)	90	(39%)	\$24	(90%)
<i>Confined fire</i>	16,700	(93%)	150	(63%)	\$4	(14%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 3.7. Home Fires Involving Ovens or Rotisseries, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported by U.S. Fire Departments**

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	13,800	(57%)	170	(60%)	\$12	(37%)
<i>Non-confined fire</i>	1,400	(6%)	60	(20%)	\$9	(30%)
<i>Confined fire</i>	12,400	(52%)	110	(40%)	\$3	(8%)
Unclassified item first ignited	2,100	(9%)	20	(8%)	\$3	(9%)
<i>Non-confined fire</i>	200	(1%)	10	(3%)	\$3	(9%)
<i>Confined fire</i>	1,900	(8%)	10	(5%)	\$0	(1%)
Appliance housing or casing	1,900	(8%)	20	(8%)	\$3	(8%)
<i>Non-confined fire</i>	200	(1%)	10	(2%)	\$2	(7%)
<i>Confined fire</i>	1,700	(7%)	20	(5%)	\$0	(1%)
Household utensil	1,800	(8%)	20	(8%)	\$1	(4%)
<i>Non-confined fire</i>	200	(1%)	10	(3%)	\$1	(3%)
<i>Confined fire</i>	1,700	(7%)	10	(5%)	\$0	(1%)
Electrical wire or cable insulation	900	(4%)	0	(0%)	\$0	(1%)
<i>Non-confined fire</i>	200	(1%)	0	(0%)	\$0	(1%)
<i>Confined fire</i>	700	(3%)	0	(0%)	\$0	(0%)
Box, carton, bag, basket or barrel	800	(3%)	10	(3%)	\$0	(1%)
<i>Non-confined fire</i>	100	(0%)	10	(2%)	\$0	(1%)
<i>Confined fire</i>	700	(3%)	0	(1%)	\$0	(0%)
Flammable or combustible liquid or gas or piping	600	(2%)	10	(3%)	\$2	(7%)
<i>Non-confined fire</i>	100	(0%)	10	(3%)	\$1	(5%)
<i>Confined fire</i>	500	(2%)	0	(0%)	\$1	(2%)
Other known item first ignited	2,200	(9%)	30	(11%)	\$10	(32%)
<i>Non-confined fire</i>	500	(2%)	30	(10%)	\$10	(32%)
<i>Confined fire</i>	1,700	(7%)	0	(2%)	\$0	(1%)
Total fires	24,100	(100%)	280	(100%)	\$32	(100%)
<i>Non-confined fire</i>	2,900	(12%)	120	(42%)	\$27	(86%)
<i>Confined fire</i>	21,200	(88%)	160	(58%)	\$4	(14%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 3.8. Home Fires Involving Gas-Fueled Ovens or Rotisseries, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported by U.S. Fire Departments**

Item First Ignited	Fires		Civilian Injuries		Direct Property	
					Damage (in Millions)	
Cooking materials, including food	3,500	(57%)	20	(40%)	\$2	(30%)
<i>Non-confined fire</i>	400	(6%)	0	(3%)	\$1	(24%)
<i>Confined fire</i>	3,100	(51%)	20	(36%)	\$0	(6%)
Household utensil	600	(9%)	0	(6%)	\$0	(6%)
<i>Non-confined fire</i>	100	(1%)	0	(6%)	\$0	(4%)
<i>Confined fire</i>	500	(8%)	0	(0%)	\$0	(2%)
Unclassified item first ignited	500	(8%)	0	(7%)	\$1	(14%)
<i>Non-confined fire</i>	100	(1%)	0	(7%)	\$1	(13%)
<i>Confined fire</i>	400	(7%)	0	(0%)	\$0	(1%)
Appliance housing or casing	400	(6%)	10	(13%)	\$0	(9%)
<i>Non-confined fire</i>	100	(1%)	0	(3%)	\$0	(7%)
<i>Confined fire</i>	300	(5%)	0	(9%)	\$0	(1%)
Flammable or combustible liquid or gas or piping	300	(5%)	10	(15%)	\$1	(21%)
<i>Non-confined fire</i>	100	(1%)	10	(15%)	\$1	(21%)
<i>Confined fire</i>	200	(4%)	0	(0%)	\$0	(0%)
Box, carton, bag, basket or barrel	200	(3%)	0	(7%)	\$0	(1%)
<i>Non-confined fire</i>	0	(0%)	0	(7%)	\$0	(0%)
<i>Confined fire</i>	100	(2%)	0	(0%)	\$0	(1%)
Other known item first ignited	700	(10%)	10	(2%)	\$1	(5%)
<i>Non-confined fire</i>	100	(1%)	10	(2%)	\$1	(2%)
<i>Confined fire</i>	600	(10%)	0	(0%)	\$0	(2%)
Total fires	6,200	(100%)	40	(100%)	\$6	(100%)
<i>Non-confined fire</i>	800	(14%)	20	(54%)	\$5	(87%)
<i>Confined fire</i>	5,300	(86%)	20	(46%)	\$1	(13%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 3.9. Home Fires Involving Electric-Powered Ovens or Rotisseries, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported by U.S. Fire Departments**

Item First Ignited	Fires		Civilian Injuries		Direct Property	
					Damage (in Millions)	
Cooking materials, including food	10,100	(57%)	150	(64%)	\$10	(40%)
<i>Non-confined fire</i>	1,000	(6%)	60	(24%)	\$8	(30%)
<i>Confined fire</i>	9,100	(51%)	90	(41%)	\$3	(10%)
Unclassified item first ignited	1,700	(10%)	20	(8%)	\$2	(9%)
<i>Non-confined fire</i>	100	(1%)	10	(2%)	\$2	(8%)
<i>Confined fire</i>	1,600	(9%)	10	(6%)	\$0	(1%)
Appliance housing or casing	1,600	(9%)	20	(6%)	\$2	(8%)
<i>Non-confined fire</i>	200	(1%)	0	(1%)	\$2	(7%)
<i>Confined fire</i>	1,400	(8%)	10	(5%)	\$0	(1%)
Household utensil	1,300	(7%)	20	(8%)	\$1	(3%)
<i>Non-confined fire</i>	100	(1%)	10	(2%)	\$1	(2%)
<i>Confined fire</i>	1,200	(7%)	10	(6%)	\$0	(1%)
Electrical wire or cable insulation	800	(5%)	0	(0%)	\$0	(2%)
<i>Non-confined fire</i>	200	(1%)	0	(0%)	\$0	(1%)
<i>Confined fire</i>	700	(4%)	0	(0%)	\$0	(1%)
Box, carton, bag, basket or barrel	600	(3%)	10	(2%)	\$0	(1%)
<i>Non-confined fire</i>	0	(0%)	0	(1%)	\$0	(1%)
<i>Confined fire</i>	500	(3%)	0	(1%)	\$0	(0%)
Flammable or combustible liquid or gas or piping	300	(2%)	0	(0%)	\$0	(1%)
<i>Non-confined fire</i>	0	(0%)	0	(0%)	\$0	(1%)
<i>Confined fire</i>	200	(1%)	0	(0%)	\$0	(0%)
Other known item first ignited	1,500	(8%)	20	(11%)	\$9	(36%)
<i>Non-confined fire</i>	400	(2%)	20	(9%)	\$9	(35%)
<i>Confined fire</i>	1,100	(6%)	0	(2%)	\$0	(1%)
Total fires	17,900	(100%)	230	(100%)	\$26	(100%)
<i>Non-confined fire</i>	2,000	(11%)	90	(39%)	\$22	(86%)
<i>Confined fire</i>	15,900	(89%)	140	(61%)	\$4	(14%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 3.10. Home Fires Involving Ovens or Rotisseries, by Extent of Flame Damage
Annual Average of 2004-2008 Structure Fires Reported by U.S. Fire Departments**

Extent of Flame Damage	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Confined fire identified by incident type	21,200	(88%)	160	(58%)	\$4	(14%)
Confined to object of origin	1,700	(7%)	80	(30%)	\$2	(8%)
Confined to room of origin	1,000	(4%)	10	(5%)	\$8	(26%)
Confined to floor of origin	100	(0%)	10	(5%)	\$5	(16%)
Confined to building of origin	100	(0%)	10	(3%)	\$12	(37%)
Extended beyond building of origin	0	(0%)	0	(0%)	\$0	(0%)
Total	24,100	(100%)	280	(100%)	\$32	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Microwave Ovens

Microwave ovens were involved in 5% of reported home cooking equipment fires.

During 2004-2008, U.S. fire departments responded to an average of 7,000 home structure fires per year in which a microwave oven was involved in ignition. These fires caused an annual average of two civilian deaths, 140 civilian injuries, and \$22 million in direct property damage. These incidents accounted for 5% of the reported home fires involving cooking equipment, 1% of the associated civilian deaths, 3% of the civilian injuries, and 3% of the direct property damage from cooking equipment fires.

Fifty-nine percent of the microwaves were stationary and 41% were portable. Nearly all (96%) of these fires began in the kitchen.

Data Sources, Definitions and Conventions Used in this Report

The fire statistics 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 NFPA's annual fire department experience survey. Fires are rounded to the nearest hundred, civilian deaths to the nearest one, civilian injuries to the nearest ten, and direct property damage is rounded to the nearest million dollars. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Property damage has not been adjusted for inflation unless so indicated.

NFIRS 5.0 equipment involved in ignition code 644 captures fires involving microwave ovens. NFIRS 5.0 incident type codes in the range of 110-129 were used to identify structure fires. Unknown data were allocated proportionally in most fields analyzed except for incident type. NFIRS 5.0, first introduced in 1999, brought major changes to fire incident data, including the code that specifically identifies microwave ovens. The estimates reflect a proportional share of home

fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined type. Fires reported as "no equipment" but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated.

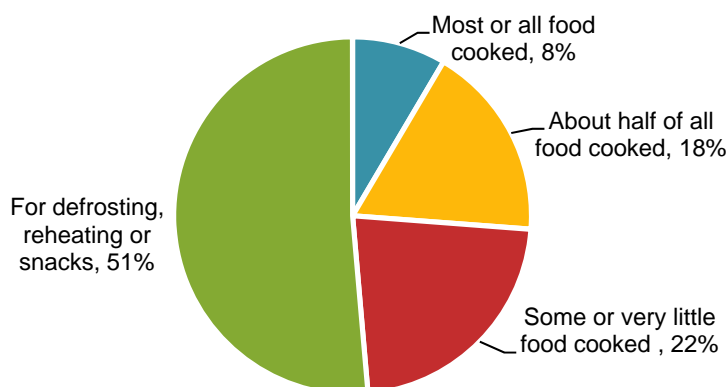
Certain types of fires collectively referred to as "confined fires," including confined cooking fires, chimney fires, trash fires, and fuel burner or boiler fires (incident types 113-118) can be documented more easily in NFIRS 5.0. Causal data, including equipment involved in ignition, is generally not required for these incidents although it is provided in some cases. Equipment involved in ignition was reported in 23% of the non-confined fires and 5% of the confined fires. Confined and non-confined structure fires were analyzed separately and then summed to obtain estimates of all fires involving ranges. Detailed analyses on causal factors were done of non-confined fires only. Additional details on the methodology used may be found in Appendix A.

Microwave ovens have only been identified in NFIRS since 1999, and the level of participation in NFIRS has only been sufficient to produce reasonably stable estimates since 2002. Table 4.1 shows that home structure fires involving microwave ovens hit their highest point in 2006 with 7,700 fires. Direct property damage from these fires hit a new peak in 2008 at \$31 million.

98 million households use a microwave oven.

The Energy Information Administration's *2005 Residential Energy Survey* found that microwave ovens were used in 98 million housing units, or 88% of all households.²⁹ Respondents were asked to select the description that best described how much of their food was cooked in the microwave.³⁰ Figure 4.1 shows that roughly half (51%) of the households that used microwave ovens used them only for defrosting, reheating or snacks; 22% cooked some or a little of their food in microwaves; 18% used microwaves for almost half of their cooked food; and 8% used microwaves for most or all of their cooking. The NPD Group, Inc. found that in recent years, microwaves were used in the preparation of one of every five main meals.³¹

Figure 4.1. Amount of Food Cooked in Microwave Ovens by Households that Use Them According to DOE's 2005 Residential Energy Survey



Source: Energy Information Administration's *2005 Residential Energy Survey*

Microwaves were unattended in one-quarter of these fires.

During 2004-2008, unattended equipment was a factor in 25% of reported home structure fires involving microwave ovens. An electrical failure or malfunction was a factor contributing to ignition in one of every five (19%) of these incidents. An unclassified misuse of material contributed to 16% of the incidents. In 7%, the microwave was not being operated properly. An unclassified mechanical failure or malfunction was a factor in another 7% of these fires. (See Table 4.2.)

²⁹ Energy Information Administration. *2005 Residential Energy Consumption Survey*, Table HC2.10, "Home Appliance Usage Indicators by Type of Housing Unit", accessed at http://www.eia.doe.gov/emeu/recs/recs2005/hc2005_tables/hc10homeapplianceindicators/pdf/alltables.pdf on October 22, 2010.

³⁰ Energy Information Administration. "2005 Residential Energy Consumption Survey Form EIA-457A (2005) Household Questionnaire, Question B-5a, accessed at http://www.eia.doe.gov/emeu/recs/recs2005/hc2005_tables/2005recshouseholdquex.pdf on October 22, 2010.

³¹ Kim McLynn. "Americans Are Eating at Home More; Microwave Usage Increased but Not Cooking," reports NPD. Port Washington, NY: The NPD Group, Inc. November 12, 2009, accessed at http://www.npd.com/press/releases/press_091112.html on October 28, 2010.

Half of these fires began with the cooking materials or food.

Table 43 shows that in 50% of home structure fires involving microwave ovens, cooking materials, including food, were the item first ignited. In one of every five incidents (19%), an appliance housing or casing ignited first. An unclassified item caught fire initially in 8%. Electrical wire or cable insulation was first ignited in 5% of the fires.

Flame damage was limited to the room of fire origin in 97% of reported microwave oven fires.

Table 4.4 shows that four of every five (79%) home structure fires involving microwave ovens reported in 2004-2008 were coded with an incident type that indicated the fire was confined to the vessel of origin. In an additional 8%, fire spread was coded as confined to the object of origin fires. Flame damage spread beyond the room of origin in only 3% of these fires.

CPSC estimates U.S. homes have an average of 332,000 unreported microwave fires per year.

Based on their 2004-2005 survey, the Consumer Product Safety Commission estimates that U.S. homes experienced an annual average of 332,000 fires involving microwave ovens to which the fire department did not respond.³²

Nearly half of microwave oven-related emergency room visits were for scald burns.

The CPSC's National Electronic Injury Surveillance System (NEISS) estimates that 8,860 people visited hospital emergency rooms because of microwave-oven related injuries during 2009.³³ Forty-five percent (4,000) of these injuries were scald burns. Thirty-one percent of the scald burns and 14% of all microwave oven related injuries were scald burns incurred by children under five years of age. In some cases, the children were taking food or liquids out of the microwave oven themselves when it spilled. In others, an older relative or caregiver spilled or splashed the hot food.

Safety tips**Choose the right cooking equipment. Install and use it properly.**

- Always use cooking equipment tested and approved by a recognized testing facility.
- Follow manufacturer's instructions and code requirements when installing and operating cooking equipment.
- Plug microwave ovens directly into an outlet. Never use an extension cord for a cooking appliance as it can overload the circuit and cause a fire.

Keep things that can catch fire and heat sources apart.

- Keep anything that can catch fire – potholders, oven mitts, wooden utensils, paper or plastic bags, boxes, food packaging, towels or curtains – away from your microwave oven.
- Keep the microwave oven clean.

³² Michael A. Greene and Craig Andres. *2004-2005 National Sample Survey of Unreported Residential Fires*. U.S. Consumer Product Safety Commission, July 2009, p. 127.

³³ All statistics are based on National Electronic Injury Surveillance System (NEISS) data obtained from the U.S. Consumer Product Safety Commission (CPSC) website, www.cpsc.gov, accessed in October 2010.

- Keep pets off cooking equipment and nearby countertops to prevent them from knocking things over.

Know what to do if your clothes catch fire.

- If your clothes catch fire, stop, drop, and roll. Stop immediately, drop to the ground, and cover face with hands. Roll over and over or back and forth to put out the fire. Immediately cool the burn with *cool* water for 3 to 5 minutes and seek emergency medical treatment.

Know what to do if you have a cooking fire.

- When in doubt, just get out! When you leave, close the door behind you to help contain the fire. Call 911 or the local emergency number after you leave.
- 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 you have a fire in your microwave oven, turn it off immediately and keep the door closed. Never open the door until the fire is completely out. Unplug the appliance if you can safely reach the outlet. After a fire, the microwave oven should be checked and/or serviced before being used again.

Install and use microwave ovens safely.

- Place or install the microwave oven at a safe height, within easy reach of all users. The face of the person using the microwave oven should always be higher than the front of the microwave oven door. This is to prevent hot food or liquid from spilling onto a user's face or body from above and to prevent the microwave oven itself from falling onto a user.
- Never use aluminum foil or metal objects in a microwave oven. They can cause a fire and damage the oven.
- Heat food only in containers or dishes that are safe for microwave use.
- Open food containers slowly away from the face to avoid steam burns. Hot steam escaping from the container or food can cause burns.
- Foods heat unevenly in microwave ovens. Stir and test before eating or giving to children.

**Table 4.1. Home Fires Involving Microwave Ovens, by Year
Structure Fires Reported to U.S. Fire Departments**

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2008 Dollars	
2002	5,400	(1,000)	90	(60)	\$9	(\$8)	\$11
2003	6,300	(1,100)	100	(60)	\$21	(\$20)	\$25
2004	6,100	(1,300)	130	(90)	\$21	(\$20)	\$24
2005	6,300	(1,400)	80	(40)	\$18	(\$17)	\$20
2006	7,700	(1,500)	130	(110)	\$26	(\$26)	\$28
2007	7,500	(1,600)	190	(120)	\$17	(\$16)	\$17
2008	7,300	(1,600)	160	(130)	\$31	(\$31)	\$31

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Because of their small numbers, annual estimates of fire deaths involving this equipment are unreliable and not shown. Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: NFIRS 5.0 and NFPA survey.

**Table 4.2. Home Fires Involving Microwave Ovens, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor Contributing to Ignition	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment unattended	1,700	(25%)	40	(29%)	\$2	(8%)
<i>In non-confined fire</i>	200	(3%)	20	(16%)	\$2	(8%)
<i>In confined fire</i>	1,600	(22%)	20	(13%)	\$0	(0%)
Electrical failure or malfunction	1,300	(19%)	40	(32%)	\$12	(55%)
<i>In non-confined fire</i>	600	(9%)	40	(32%)	\$12	(54%)
<i>In confined fire</i>	700	(10%)	0	(0%)	\$0	(1%)
Unclassified misuse of material	1,100	(16%)	20	(13%)	\$1	(5%)
<i>In non-confined fire</i>	100	(2%)	10	(10%)	\$1	(5%)
<i>In confined fire</i>	1,000	(14%)	10	(4%)	\$0	(0%)
Equipment not being operated properly	500	(7%)	20	(11%)	\$1	(3%)
<i>In non-confined fire</i>	0	(1%)	10	(5%)	\$1	(3%)
<i>In confined fire</i>	500	(7%)	10	(6%)	\$0	(0%)
Unclassified mechanical failure or malfunction	500	(7%)	0	(2%)	\$4	(19%)
<i>In non-confined fire</i>	200	(3%)	0	(2%)	\$4	(19%)
<i>In confined fire</i>	300	(4%)	0	(0%)	\$0	(0%)
Unclassified factor contributed to ignition	400	(5%)	10	(6%)	\$0	(2%)
<i>In non-confined fire</i>	100	(1%)	0	(0%)	\$0	(1%)
<i>In confined fire</i>	300	(4%)	10	(6%)	\$0	(1%)
Abandoned or discarded material or product	300	(4%)	0	(0%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	300	(4%)	0	(0%)	\$0	(0%)
Unintentionally turned on or not turned off	300	(4%)	0	(0%)	\$1	(6%)
<i>In non-confined fire</i>	100	(1%)	0	(0%)	\$1	(5%)
<i>In confined fire</i>	200	(4%)	0	(0%)	\$0	(0%)
Unclassified operational deficiency	300	(4%)	0	(2%)	\$0	(2%)
<i>In non-confined fire</i>	0	(1%)	0	(2%)	\$0	(2%)
<i>In confined fire</i>	200	(3%)	0	(0%)	\$0	(0%)
Equipment used for unintended purpose	200	(4%)	0	(0%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	200	(3%)	0	(0%)	\$0	(0%)
Improper container or storage	100	(2%)	0	(0%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	100	(2%)	0	(0%)	\$0	(0%)
Other known factor	600	(8%)	20	(12%)	\$2	(8%)
<i>In non-confined fire</i>	200	(2%)	20	(12%)	\$2	(7%)
<i>In confined fire</i>	400	(5%)	0	(0%)	\$0	(0%)
Total fires	7,000	(100%)	140	(100%)	\$22	(100%)
<i>In non-confined fire</i>	1,500	(21%)	100	(71%)	\$22	(97%)
<i>In confined fire</i>	5,600	(79%)	40	(29%)	\$1	(3%)
Total entries	7,400	(105%)	150	(107%)	\$24	(107%)
<i>In non-confined fire</i>	1,600	(22%)	110	(78%)	\$23	(105%)
<i>In confined fire</i>	5,800	(82%)	40	(29%)	\$1	(3%)

**Table 4.2. Home Fires Involving Microwave Ovens, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments
(Continued)**

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 4.3. Home Fires Involving Microwave Ovens, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	3,500	(50%)	60	(43%)	\$4	(16%)
<i>In non-confined fire</i>	300	(4%)	20	(18%)	\$3	(15%)
<i>In confined fire</i>	3,200	(46%)	40	(25%)	\$0	(1%)
Appliance housing or casing	1,300	(19%)	30	(24%)	\$7	(31%)
<i>In non-confined fire</i>	500	(6%)	30	(20%)	\$7	(30%)
<i>In confined fire</i>	900	(12%)	10	(4%)	\$0	(1%)
Unclassified item	500	(8%)	10	(4%)	\$1	(4%)
<i>In non-confined fire</i>	100	(1%)	10	(4%)	\$1	(4%)
<i>In confined fire</i>	500	(6%)	0	(0%)	\$0	(0%)
Electrical wire or cable insulation	400	(5%)	10	(9%)	\$5	(21%)
<i>In non-confined fire</i>	200	(3%)	10	(9%)	\$5	(21%)
<i>In confined fire</i>	200	(2%)	0	(0%)	\$0	(0%)
Cabinetry	200	(3%)	10	(6%)	\$2	(7%)
<i>In non-confined fire</i>	100	(2%)	10	(6%)	\$2	(7%)
<i>In confined fire</i>	100	(1%)	0	(0%)	\$0	(0%)
Household utensil	200	(2%)	0	(0%)	\$0	(1%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	\$0	(1%)
<i>In confined fire</i>	100	(2%)	0	(0%)	\$0	(0%)
Other known item	900	(13%)	20	(14%)	\$4	(20%)
<i>In non-confined fire</i>	300	(4%)	20	(14%)	\$4	(19%)
<i>In confined fire</i>	600	(9%)	0	(0%)	\$0	(1%)
Total	7,000	(100%)	140	(100%)	\$22	(100%)
<i>In non-confined fire</i>	1,500	(21%)	100	(71%)	\$22	(97%)
<i>In confined fire</i>	5,600	(79%)	40	(29%)	\$1	(3%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 4.4. Home Fires Involving Microwave Ovens, by Extent of Flame Damage
Annual Average of 2004-2008 Structure Fires Reported by U.S. Fire Departments**

Extent of Flame Damage	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	5,600	(79%)	40	(29%)	\$1	(3%)
Confined to object of origin	500	(8%)	20	(11%)	\$1	(4%)
Confined to room of origin	700	(11%)	60	(40%)	\$9	(43%)
Confined to floor of origin	100	(1%)	10	(4%)	\$3	(12%)
Confined to building of origin	100	(2%)	20	(11%)	\$8	(36%)
Beyond building of origin	0	(0%)	10	(4%)	\$1	(3%)
Total	7,000	(100%)	140	(100%)	\$22	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Portable Cooking or Warming Devices

Portable cooking or warming devices were involved in 4% of reported home cooking equipment fires.

During 2004-2008, U.S. fire departments responded to an average of 6,800 home structure fires per year in which a portable cooking or warming device (other than a deep fryer, grill, or microwave oven) was involved in ignition. These fires caused an annual average of 25 civilian deaths, 230 civilian injuries, and \$62 million in direct property damage. These incidents accounted for 4% of the reported home fires involving cooking equipment, 5% of the associated civilian deaths and injuries, and 9% of the direct property damage from cooking equipment fires.

Data Sources, Definitions and Conventions Used in this Report

The fire statistics 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 NFPA's annual fire department experience survey. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Fires are rounded to the nearest hundred, civilian deaths to the nearest one, civilian injuries to the nearest ten and direct property damage to the nearest million dollars. Property damage has not been adjusted for inflation unless so indicated.

NFIRS 5.0 equipment involved in ignition codes 631-641 are used identify the different types of portable cooking or warming devices shown above. NFIRS 5.0 incident type codes in the range of 110-129 were used to identify structure fires. Unknown data were allocated proportionally in most fields analyzed except for incident type. NFIRS 5.0, first introduced in 1999, brought major changes to fire incident data, including changes in some definitions and coding rules. Because of these changes, caution should be used when

comparing data before 1998 with data from 1999 on.

The estimates reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined type. Fires reported as "no equipment" but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated.

Certain types of fires collectively referred to as "confined fires," including confined cooking fires, chimney fires, trash fires, and fuel burner or boiler fires (incident types 113-118) can be documented more easily in NFIRS 5.0. Causal data, including equipment involved in ignition, is generally not required for these incidents although it is provided in some cases. Equipment involved in ignition was reported in 23% of the non-confined fires and 5% of the confined fires. Confined and non-confined structure fires were analyzed separately and then summed to obtain estimates of all fires involving ranges. Detailed analyses on causal factors were done of non-confined fires only. Additional details on the methodology used may be found in Appendix A.

Toasters or toaster ovens were involved in half of the reported portable cooking or warming device structure fires.

NFIRS 5.0 made it possible to identify these specific types of portable cooking and warming devices. Details are shown in the table below. Each of these groups presumably refers to powered equipment. The many unpowered frying pans and teapots, for example, presumably would not be included here as equipment.

**Table 5.1. Home Fires Involving Portable Cooking or Warming Devices, by Type of Device
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Device	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
Toaster or toaster oven	3,300 (49%)	9 (37%)	80 (33%)	\$24 (39%)
<i>Non-confined fire</i>	1,000 (14%)	9 (37%)	60 (24%)	\$24 (38%)
<i>Confined fire</i>	2,400 (35%)	0 (0%)	20 (9%)	\$0 (0%)
Wok, frying pan or skillet	2,200 (32%)	2 (10%)	110 (47%)	\$14 (23%)
<i>Non-confined fire</i>	600 (8%)	2 (10%)	70 (28%)	\$13 (22%)
<i>Confined fire</i>	1,600 (24%)	0 (0%)	40 (18%)	\$1 (1%)
Coffee maker or teapot	400 (6%)	5 (22%)	10 (4%)	\$15 (24%)
<i>Non-confined fire</i>	300 (4%)	5 (22%)	10 (4%)	\$15 (24%)
<i>Confined fire</i>	200 (3%)	0 (0%)	0 (0%)	\$0 (0%)
Hot plate or food warmer	400 (5%)	5 (19%)	20 (10%)	\$5 (8%)
<i>Non-confined fire</i>	200 (3%)	5 (19%)	20 (10%)	\$5 (8%)
<i>Confined fire</i>	200 (2%)	0 (0%)	0 (0%)	\$0 (0%)
Kettle	200 (3%)	3 (13%)	10 (3%)	\$0 (1%)
<i>Non-confined fire</i>	0 (1%)	3 (13%)	10 (3%)	\$0 (1%)
<i>Confined fire</i>	200 (2%)	0 (0%)	0 (0%)	\$0 (0%)
Slow cooker	100 (2%)	0 (0%)	10 (2%)	\$3 (5%)
<i>Non-confined fire</i>	100 (1%)	0 (0%)	10 (2%)	\$3 (5%)
<i>Confined fire</i>	100 (1%)	0 (0%)	0 (0%)	\$0 (0%)
Pressure cooker or canner	100 (1%)	0 (0%)	0 (1%)	\$0 (0%)
<i>Non-confined fire</i>	0 (0%)	0 (0%)	0 (1%)	\$0 (0%)
<i>Confined fire</i>	0 (1%)	0 (0%)	0 (0%)	\$0 (0%)
Other known device	100 (2%)	0 (0%)	0 (1%)	\$0 (1%)
<i>Non-confined fire</i>	0 (1%)	0 (0%)	0 (1%)	\$0 (1%)
<i>Confined fire</i>	100 (1%)	0 (0%)	0 (0%)	\$0 (0%)
Total	6,800 (100%)	25 (100%)	230 (100%)	\$62 (100%)
<i>Non-confined fire</i>	2,200 (32%)	25 (100%)	170 (73%)	\$62 (99%)
<i>Confined fire</i>	4,600 (68%)	0 (0%)	60 (27%)	\$1 (1%)

Note: Sums may not equal totals due to rounding errors.

Source: Data from NFIRS Version 5.0 and NFPA survey.

During the five-year period of 2004-2008, toasters or toaster ovens were involved in an estimated average of 3,300 reported home structure fires, or 49%, of the incidents in which portable cooking or warming devices were involved. These fires caused an average of nine civilian deaths, 80 civilian

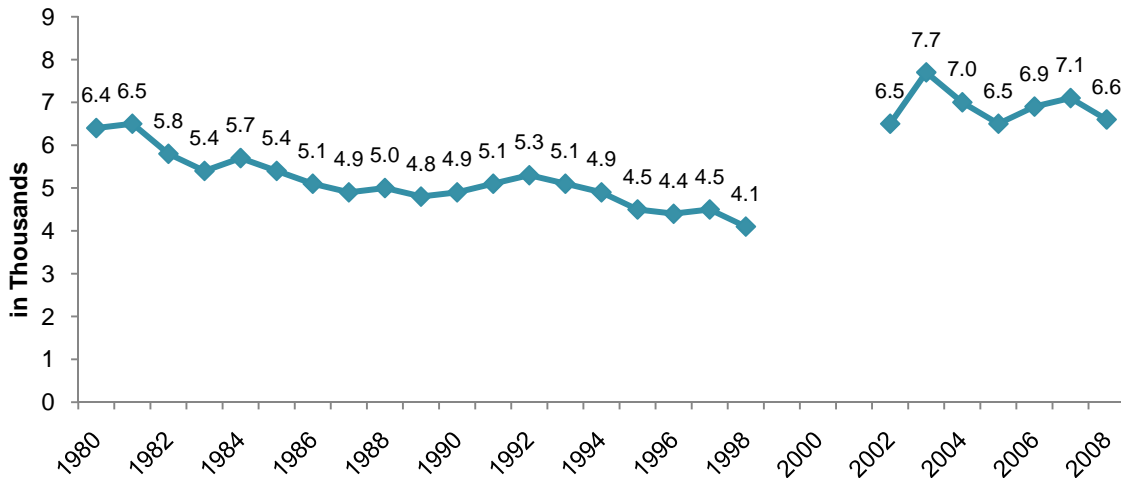
injuries, and \$24 million in direct property damage. Woks, frying pans or skillets accounted for one-third (32%) of the fires involving portable cooking or warming equipment. Coffee makers or teapots accounted for 6% and hot plates or food warmers were involved in 5%.

Fires involving portable cooking or warming devices had been falling until NFIRS 5.0.

Figure 5.1 and Table 5.2 show that the total number of reported home structure fires involving portable cooking or warming devices other than grills or deep fryers was 3% higher in 2008 than in 1980. Because of the changes in data collection rules and definitions that accompanied the introduction of NFIRS 5.0 in 1999, caution must be used in interpreting these findings. NFIRS 5.0 made it much easier to document minor cooking fires. Prior to NFIRS 5.0, all types of portable cooking or warming equipment were grouped together in one category. As mentioned, NFIRS 5.0 now provides separate identifying codes for the equipment shown above. It is also possible that the NFIRS 5.0 data may include some non-powered equipment, such as skillets or kettles, which was actually used on a range or with other powered cooking equipment. Reported home structure fires involving portable cooking or warming equipment trended downward in the early 1980s, hovered between 4,800 and 5,400 from the mid 1980s to the early 1990s, and then resumed a downward trend until they hit their lowest point, 4,100, in 1998.

No clear trend is seen in the NFIRS 5.0 years. Table 5.3 shows trend data from 1999-2008 for portable cooking and warming devices with the largest number of fires. Even so, the numbers are relatively small and should be viewed with caution.

Figure 5.1. Reported Home Structure Fires Involving Portable Cooking or Warming Devices, by Year: 1980-2008



Source: Data from NFIRS and NFPA survey.

Note: See Notes in year table.

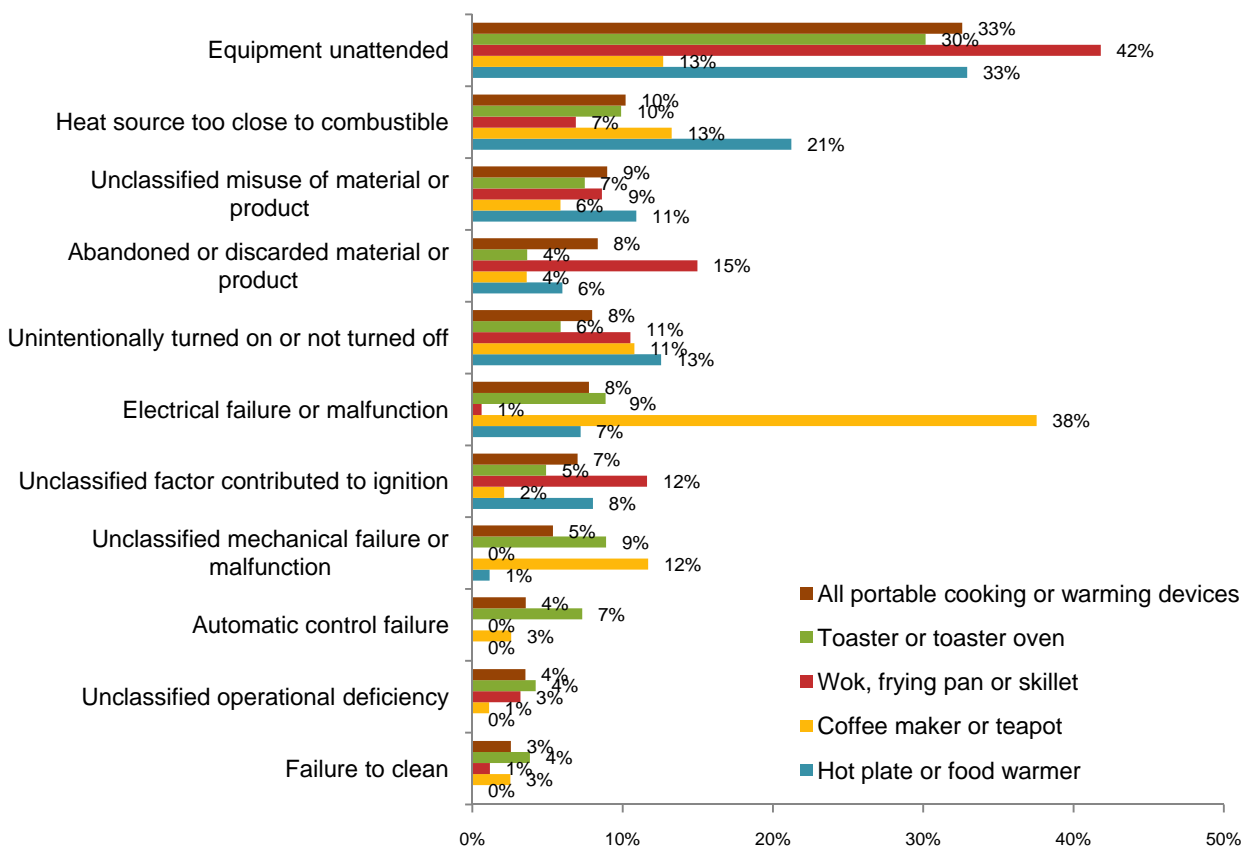
Unattended equipment was a factor in one-third of fires involving portable cooking or warming devices.

During 2004-2008, unattended equipment was a factor contributing to ignition in 33% of reported home structure fires involving portable cooking or warming devices. Table 5.4 shows that the equipment was too close to something that could catch fire in 10% of the incidents. Nine

percent resulted from an unclassified misuse of material. Abandoned or discarded material was a factor in 8% of the fires, as was unintentionally turned on or not turned off. An electrical failure or malfunction played a role in another 8% of these fires.

Figure 5.2 shows that the leading contributing factors vary among the different types of portable cooking or warming devices. Electrical failures or malfunctions were the leading factor in more than one-third (38%) of the fires involving coffee makers or teapots. Unattended equipment was the leading factor in fires involving toaster ovens or toasters (30%); in fires involving woks, frying pans, or skillets (42%); and in fires involving hot plates or skilletts (42%); and in fires involving hot plates or food warmers (33%). One in five (21%) fires involving hot plates or food warmers occurred when the equipment was too close to something that could catch fire.

Figure 5.2. Home Structure Fires Involving Specific Portable Cooking or Warming Devices by Leading Factors Contributing to Ignition: 2004-2008

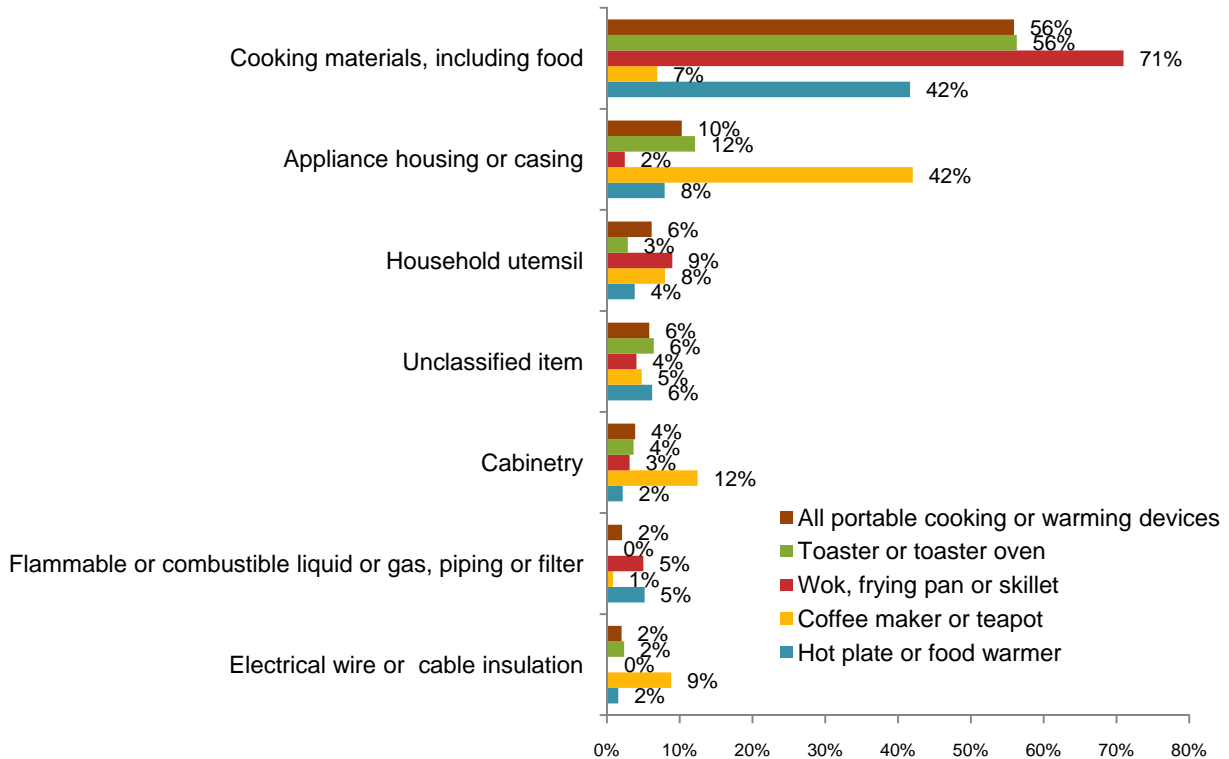


More than half of the fires involving portable cooking or warming devices began with the ignition of cooking materials.

Cooking materials, including food, were first ignited in more than half (56%) of reported home structure fires involving portable cooking or warming devices compared to two-thirds (66%) of home structure fires involving all types of cooking equipment. Fires involving portable cooking or warming devices were more likely to have begun with appliance housings or casings (10% vs. 5%). (See Table 5.5.)

Figure 5.3 shows that the items first ignited also vary among the different types of portable cooking or warming devices. Cooking materials, including food, were ignited first in more than half (56%) of the fires involving toasters or toaster ovens; almost three-quarters (71%) of the fires involving woks, frying pans, two of every five (42%) fires involving hot plates or food warmers, but only 7% of the fires involving coffee makers or teapots. Fires involving coffee makers or teapots were more likely to have started with the ignition of appliance housings or casings (42%), cabinetry (12%), or electrical wire or cable insulation (9%).

Figure 5.3. Home Structure Fires Involving Specific Portable Cooking or Warming Devices by Leading Items First Ignited: 2004-2008



Almost all home structure fires involving portable cooking or warming devices began in the kitchen.

Table 5.6 shows that during 2004-2008, 93% of these fires started in the kitchen. One percent began in an unclassified area of origin and one percent began in a bedroom.

Flame damage was limited to the room of fire origin in 93% of reported portable cooking or warming device fires.

Table 5.7 shows that two-thirds (68%) of all home structure fires involving portable cooking or warming devices reported in 2004-2008 were coded with an incident type that indicated the fire was confined to the vessel of origin. In an additional 7%, fire spread was coded as confined to the object of origin. Flame damage spread beyond the room of origin in only 7% of these fires.

CPSC estimates U.S. homes have an average of 208,000 unreported toaster or toaster oven fires per year.

Based on their 2004-2005 survey, the Consumer Product Safety Commission estimates that U.S. homes experienced an annual average of 208,000 fires involving toaster ovens or toasters and 68,000 involving coffeemakers or teapots to which the fire department did not respond.³⁴ The Energy Information Administration's 2005 survey found that 67 million households use electric coffeemakers and that in 13 million, or 20%, of these households, the coffeemaker is left on for more than one hour.³⁵

Safety Tips

Choose the right cooking equipment. Install and use it properly.

- Always use cooking equipment tested and approved by a recognized testing facility.
- Follow manufacturer's instructions and code requirements when installing and operating cooking equipment.
- Plug microwave ovens or other cooking appliances directly into an outlet. Never use an extension cord for a cooking appliance as it can overload the circuit and cause a fire.

Watch what you heat!

- The leading cause of fires in the kitchen is unattended cooking.
- 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.
- 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.

Stay alert.

- To prevent cooking fires, you have to be alert. You won't be if you are sleepy, have taken medicine or drugs, or consumed alcohol.

Use equipment for intended purposes only.

- Cook only with equipment designed and intended for cooking, and heat your home only with equipment designed and intended for heating. There is additional danger of fire, injury, or death if equipment is used for a purpose for which it was not intended.

Keep things that can catch fire and heat sources apart.

- Keep anything that can catch fire – potholders, oven mitts, wooden utensils, paper or plastic bags, boxes, food packaging, towels or curtains – away from your cooking equipment.

³⁴ Michael A. Greene and Craig Andres. *2004-2005 National Sample Survey of Unreported Residential Fires*. U.S. Consumer Product Safety Commission, July 2009, p. 127.

³⁵ Energy Information Administration. *2005 Residential Energy Consumption Survey*, Table HC2.10, "Home Appliance Usage Indicators by Type of Housing Unit", accessed at http://www.eia.doe.gov/emeu/recs/recs2005/hc2005_tables/hc10homeapplianceindicators/pdf/alltables.pdf on October 23, 2009.

- Keep the equipment clean.
- Keep pets off cooking surfaces and nearby countertops to prevent them from knocking things onto the burner.
- Wear short, close fitting or tightly rolled sleeves when cooking. Loose clothing can dangle onto cooking elements or hot surfaces or food and can catch fire if it comes in contact with a gas flame or electric burner.
-

Know what to do if your clothes catch fire.

- If your clothes catch fire, stop, drop, and roll. Stop immediately, drop to the ground, and cover face with hands. Roll over and over or back and forth to put out the fire. Immediately cool the burn with *cool* water for 3 to 5 minutes and seek emergency medical treatment.

Know what to do if you have a cooking fire.

- When in doubt, just get out! When you leave, close the door behind you to help contain the fire. Call 911 or the local emergency number after you leave.
- If you do try to fight the fire, be sure others are already getting out and you have a clear path to the exit.
- Always keep an oven mitt and a lid nearby when you're cooking. If a small grease fire starts in a pan, smother the flames by carefully sliding the lid over the pan (make sure you are wearing the oven mitt). 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 a toaster oven fire, turn off the heat and keep the door closed to prevent flames from burning you or your clothing.
- After a fire, the affected device should be checked and/or serviced before being used again.

**Table 5.2. Home Fires Involving Portable Cooking or Warming Devices, by Year
Structure Fires Reported to U.S. Fire Department**

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2008 Dollars	
1980	6,400		150		\$18	\$47	
1981	6,500		170		\$17	\$40	
1982	5,800		170		\$22	\$49	
1983	5,400		170		\$22	\$47	
1984	5,700		170		\$26	\$54	
1985	5,400		220		\$22	\$44	
1986	5,100		170		\$26	\$51	
1987	4,900		160		\$27	\$51	
1988	5,000		170		\$28	\$51	
1989	4,800		160		\$37	\$64	
1990	4,900		160		\$38	\$63	
1991	5,100		200		\$42	\$66	
1992	5,300		200		\$23	\$35	
1993	5,100		140		\$28	\$42	
1994	4,900		180		\$28	\$41	
1995	4,500		190		\$32	\$45	
1996	4,400		160		\$44	\$60	
1997	4,500		190		\$45	\$60	
1998	4,100		210		\$31	\$41	
1999	6,800	(4,400)	260	(260)	\$62	(\$62)	\$80
2000	8,300	(3,800)	190	(110)	\$87	(\$83)	\$108
2001	7,200	(2,600)	190	(140)	\$60	(\$55)	\$73
2002	6,500	(2,900)	220	(190)	\$71	(\$70)	\$84
2003	7,700	(2,500)	210	(150)	\$82	(\$81)	\$95
2004	7,000	(2,200)	170	(120)	\$68	(\$67)	\$78
2005	6,500	(2,100)	240	(170)	\$88	(\$87)	\$97
2006	6,900	(2,200)	210	(160)	\$69	(\$68)	\$73
2007	7,100	(2,200)	210	(140)	\$43	(\$42)	\$44
2008	6,600	(2,200)	340	(260)	\$58	(\$57)	\$58

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Because of their small numbers, annual estimates of fire deaths involving this equipment are unreliable and not shown. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 5.3. Home Fires Involving Portable Cooking or Warming Devices with Largest Shares of Fires, by Year
Structure Fires Reported to U.S. Fire Department**

A. Toaster or toaster oven

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2008 Dollars	
2002	4,000	(1,600)	70	(70)	\$40	(\$40)	\$48
2003	4,200	(1,100)	50	(50)	\$31	(\$31)	\$36
2004	3,600	(1,000)	80	(60)	\$37	(\$37)	\$42
2005	3,100	(900)	80	(60)	\$28	(\$28)	\$31
2006	3,500	(1,000)	70	(40)	\$26	(\$26)	\$28
2007	3,500	(800)	80	(60)	\$15	(\$15)	\$15
2008	3,000	(1,000)	80	(60)	\$21	(\$21)	\$21

B. Wok, frying pan, or skillet

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2008 Dollars	
2002	1,200	(500)	60	(20)	\$6	(\$6)	\$8
2003	1,700	(500)	120	(60)	\$17	(\$16)	\$19
2004	1,800	(600)	60	(40)	\$10	(\$9)	\$12
2005	2,100	(600)	110	(60)	\$7	(\$6)	\$7
2006	2,100	(500)	70	(60)	\$23	(\$22)	\$24
2007	2,300	(700)	120	(70)	\$14	(\$14)	\$15
2008	2,300	(500)	170	(110)	\$15	(\$14)	\$15

C. Coffee maker or teapot

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2008 Dollars	
2002	500	(400)	40	(40)	\$13	(\$13)	\$16
2003	600	(400)	20	(20)	\$16	(\$16)	\$19
2004	800	(300)	0	(0)	\$16	(\$16)	\$18
2005	400	(200)	10	(10)	\$35	(\$35)	\$39
2006	400	(300)	10	(10)	\$12	(\$12)	\$13
2007	300	(300)	0	(0)	\$7	(\$7)	\$8
2008	400	(300)	30	(30)	\$11	(\$11)	\$11

Note: Numbers in parentheses exclude confined fires.

**Table 5.3. Home Fires Involving Portable Cooking or Warming Devices with Largest Shares of Fires, by Year
Structure Fires Reported to U.S. Fire Department**

D. Hot plate or food warmer

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2008 Dollars	
2002	400	(300)	0	(0)	\$7	(\$7)	\$8
2003	500	(300)	20	(20)	\$8	(\$8)	\$9
2004	300	(100)	10	(10)	\$3	(\$3)	\$3
2005	400	(200)	30	(30)	\$10	(\$10)	\$11
2006	300	(200)	40	(40)	\$6	(\$6)	\$6
2007	600	(200)	0	(0)	\$4	(\$4)	\$5
2008	300	(200)	30	(30)	\$3	(\$3)	\$3

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Because of their small numbers, annual estimates of fire deaths involving this equipment are unreliable and not shown. Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Version 5.0 (1999-2008) and from NFPA survey.

**Table 5.4. Home Fires Involving Portable Cooking or Warming Devices, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property	
							Damage (in Millions)	
Equipment unattended	2,200	(33%)	5	(20%)	60	(28%)	\$13	(21%)
<i>In non-confined fire</i>	600	(8%)	5	(20%)	50	(21%)	\$13	(21%)
<i>In confined fire</i>	1,700	(24%)	0	(0%)	10	(6%)	\$0	(1%)
Heat source too close to combustible	700	(10%)	7	(28%)	50	(20%)	\$8	(13%)
In non-confined fire	400	(5%)	7	(28%)	40	(18%)	\$8	(12%)
In confined fire	300	(5%)	0	(0%)	0	(2%)	\$0	(0%)
Unclassified misuse of material or product	600	(9%)	0	(0%)	20	(10%)	\$2	(4%)
<i>In non-confined fire</i>	100	(2%)	0	(0%)	20	(8%)	\$2	(3%)
<i>In confined fire</i>	500	(7%)	0	(0%)	0	(2%)	\$0	(0%)
Abandoned or discarded material or product	600	(8%)	5	(18%)	10	(5%)	\$7	(12%)
<i>In non-confined fire</i>	100	(2%)	5	(18%)	0	(1%)	\$7	(11%)
<i>In confined fire</i>	500	(7%)	0	(0%)	10	(4%)	\$0	(0%)
Unintentionally turned on or not turned off	500	(8%)	5	(18%)	20	(8%)	\$11	(17%)
<i>In non-confined fire</i>	200	(3%)	5	(18%)	0	(2%)	\$10	(17%)
<i>In confined fire</i>	400	(5%)	0	(0%)	10	(6%)	\$0	(0%)
Electrical failure or malfunction	500	(8%)	0	(0%)	30	(11%)	\$16	(26%)
<i>In non-confined fire</i>	400	(6%)	0	(0%)	30	(11%)	\$16	(25%)
<i>In confined fire</i>	200	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified factor contributed to ignition	500	(7%)	7	(28%)	20	(7%)	\$3	(4%)
<i>In non-confined fire</i>	100	(2%)	7	(28%)	10	(3%)	\$2	(4%)
<i>In confined fire</i>	300	(5%)	0	(0%)	10	(5%)	\$0	(0%)
Unclassified mechanical failure or malfunction	400	(5%)	4	(15%)	10	(3%)	\$4	(7%)
<i>In non-confined fire</i>	100	(2%)	4	(15%)	10	(3%)	\$4	(7%)
<i>In confined fire</i>	200	(4%)	0	(0%)	0	(0%)	\$0	(0%)
Automatic control failure	200	(4%)	0	(0%)	0	(1%)	\$2	(3%)
<i>In non-confined fire</i>	100	(1%)	0	(0%)	0	(1%)	\$2	(3%)
<i>In confined fire</i>	200	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified operational deficiency	200	(4%)	0	(0%)	0	(2%)	\$1	(1%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	0	(2%)	\$1	(1%)
<i>In confined fire</i>	200	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Failure to clean	200	(3%)	0	(0%)	0	(2%)	\$1	(1%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	0	(2%)	\$1	(1%)
<i>In confined fire</i>	200	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Other known factor	600	(8%)	5	(18%)	30	(11%)	\$10	(17%)
<i>Non-confined fire</i>	200	(3%)	5	(18%)	20	(9%)	\$10	(17%)
<i>Confined fire</i>	400	(5%)	0	(0%)	0	(2%)	\$0	(0%)
Total fires	6,800	(100%)	25	(100%)	230	(100%)	\$62	(100%)
<i>Non-confined fire</i>	2,200	(32%)	25	(100%)	170	(73%)	\$62	(99%)
<i>Confined fire</i>	4,600	(68%)	0	(0%)	60	(27%)	\$1	(1%)
Total entries	7,200	(106%)	37	(147%)	250	(107%)	\$78	(124%)
<i>Non-confined fire</i>	2,300	(34%)	37	(147%)	190	(80%)	\$77	(123%)
<i>Confined fire</i>	4,900	(71%)	0	(0%)	60	(27%)	\$1	(2%)

**Table 5.4. Home Fires Involving Portable Cooking or Warming Devices, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments
(Continued)**

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 5.5. Home Fires Involving Portable Cooking or Warming Devices, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	3,800	(56%)	5	(20%)	120	(50%)	\$15	(24%)
<i>In non-confined fire</i>	700	(11%)	5	(20%)	70	(28%)	\$15	(23%)
<i>In confined fire</i>	3,100	(45%)	0	(0%)	50	(22%)	\$0	(1%)
Appliance housing or casing	700	(10%)	0	(0%)	10	(5%)	\$7	(11%)
<i>In non-confined fire</i>	300	(5%)	0	(0%)	10	(4%)	\$7	(11%)
<i>In confined fire</i>	400	(6%)	0	(0%)	0	(1%)	\$0	(0%)
Household utensil	400	(6%)	5	(20%)	20	(8%)	\$7	(11%)
<i>In non-confined fire</i>	100	(2%)	5	(20%)	10	(6%)	\$7	(11%)
<i>In confined fire</i>	300	(5%)	0	(0%)	10	(3%)	\$0	(0%)
Unclassified item	400	(6%)	0	(0%)	10	(3%)	\$2	(3%)
<i>In non-confined fire</i>	100	(2%)	0	(0%)	10	(3%)	\$2	(3%)
<i>In confined fire</i>	300	(4%)	0	(0%)	0	(0%)	\$0	(0%)
Cabinetry	300	(4%)	4	(16%)	10	(6%)	\$10	(17%)
<i>In non-confined fire</i>	200	(3%)	4	(16%)	10	(6%)	\$10	(17%)
<i>In confined fire</i>	0	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Flammable or combustible liquid or gas, piping or filter	100	(2%)	0	(0%)	10	(2%)	\$3	(4%)
<i>In non-confined fire</i>	100	(1%)	0	(0%)	10	(2%)	\$3	(4%)
<i>In confined fire</i>	100	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Electrical wire or cable insulation	100	(2%)	5	(22%)	0	(1%)	\$2	(3%)
<i>In non-confined fire</i>	100	(1%)	5	(22%)	0	(1%)	\$2	(3%)
<i>In confined fire</i>	0	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known item	900	(14%)	5	(22%)	60	(24%)	\$17	(27%)
<i>In non-confined fire</i>	500	(8%)	5	(22%)	50	(23%)	\$17	(27%)
<i>In confined fire</i>	400	(6%)	0	(0%)	0	(2%)	\$0	(0%)
Total	6,800	(100%)	25	(100%)	230	(100%)	\$62	(100%)
<i>In non-confined fire</i>	2,200	(32%)	25	(100%)	170	(73%)	\$62	(99%)
<i>In confined fire</i>	4,600	(68%)	0	(0%)	60	(27%)	\$1	(1%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 5.6. Home Fires Involving Portable Cooking or Warming Devices, by Area of Origin
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Kitchen or cooking area	6,300	(93%)	22	(87%)	200	(87%)	\$51	(81%)
<i>In non-confined fire</i>	1,900	(28%)	22	(87%)	140	(60%)	\$50	(80%)
<i>In confined fire</i>	4,400	(65%)	0	(0%)	60	(27%)	\$1	(1%)
Unclassified area of origin	100	(1%)	0	(0%)	0	(0%)	\$0	(1%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	0	(0%)	\$0	(1%)
<i>In confined fire</i>	100	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Bedroom	100	(1%)	0	(0%)	10	(4%)	\$3	(4%)
<i>In non-confined fire</i>	100	(1%)	0	(0%)	10	(4%)	\$3	(4%)
<i>In confined fire</i>	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Other known item	300	(5%)	3	(13%)	20	(9%)	\$9	(14%)
<i>In non-confined fire</i>	200	(3%)	3	(13%)	20	(9%)	\$9	(14%)
<i>In confined fire</i>	100	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Total	6,800	(100%)	25	(100%)	230	(100%)	\$62	(100%)
<i>In non-confined fire</i>	2,200	(32%)	25	(100%)	170	(73%)	\$62	(99%)
<i>In confined fire</i>	4,600	(68%)	0	(0%)	60	(27%)	\$1	(1%)

Table 5.7. Home Fires Involving Portable Cooking or Warming Devices, by Extent of Flame Damage
Annual Average of 2004-2008 Structure Fires Reported by U.S. Fire Departments

Extent of Flame Damage	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	4,600	(68%)	0	(0%)	60	(27%)	\$1	(1%)
Confined to object of origin	500	(7%)	3	(13%)	30	(16%)	\$3	(5%)
Confined to room of origin	1,200	(18%)	10	(40%)	110	(64%)	\$19	(31%)
Confined to floor of origin	100	(2%)	0	(0%)	10	(4%)	\$11	(18%)
Confined to building of origin	300	(4%)	9	(35%)	30	(17%)	\$23	(38%)
Beyond building of origin	0	(0%)	3	(12%)	0	(0%)	\$5	(9%)
Total	6,800	(100%)	25	(100%)	230	(100%)	\$62	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Grills

U.S. fire departments responded to an average of 7,700 home structure and outdoor fires involving grills per year during 2004-2008.

During the five-year period of 2004-2008, grills, hibachis or barbecues were involved in the ignition of an estimated 7,700 reported home structure and outdoor fires per year. These fires caused an average of 13 civilian deaths, 120 civilian injuries, and \$70 million in direct property damage annually.

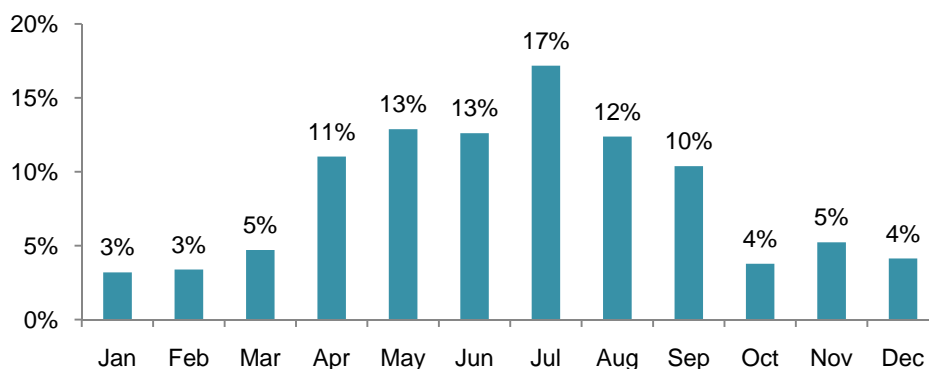
The 7,700 home grill fires reported annually included 3,200 (41%) fires per year in or on structures. All of the grill fire deaths, 90 (75%) of the associated fire injuries, and \$69 million in direct property damage (98%) per year resulted from fires involving structures. The 3,200 home structure fires involving grills accounted for 2% of the reported home cooking equipment fires, 3% of associated civilian deaths, and 2% of associated civilian injuries, but 10% of the associated property damage.

On average, 4,500 (59%) outside and unclassified grill fires were reported annually during this period. These fires caused an annual average of 30 civilian injuries and \$1 million in direct property damage.

Grill fires are more common in the warmer months.

Figure 6.1 shows that July, with 17% of the incidents, was the peak month for grill fires. May and June followed with 13% each. Although the smallest share of fires occurred in the winter months, grill fires do occur throughout the year.

Figure 6.1. Home Grill Fires by Month: 2004-2008



More people are grilling year round.

The market research company NPD Group, Inc. reported that in 2007, more than one-third (38%) of American households had at least one meal cooked on an outdoor grill in an average two-week period during the year.³⁶ In the summer months of June, July and August, half (49%) had a grilled meal. Even in the winter months of December, January, and February, one-quarter (27%)

³⁶ The NPD Group, Inc. "NPD Reports Year Round Grilling at All Time High," Port Washington, New York, May 2008 15, 2008, accessed at http://www.npd.com/press/releases/press_080515a.html on October 28, 2010.

Data Sources, Definitions and Conventions Used in this Report

The fire statistics 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. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire.

NFIRS equipment involved in ignition code 643 identifies grills, hibachis, and barbecues. The data classification system does not distinguish between equipment intended for outdoor vs. indoor use (or both). Nor does it distinguish based on size and price. Anything from a discount store hibachi to high end outdoor cooking equipment for the serious cook may be called a grill.

NFIRS incident type codes in the range of 110-129 were used to identify structure fires. Unknown data were allocated proportionally in most fields analyzed except for incident type. NFIRS 5.0, first introduced in 1999, brought major changes to fire incident data, including changes in some definitions and coding rules. Because of these changes, caution should be used when comparing data before 1998 with data from 1999 on.

The estimates reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as heating or air conditioning equipment of undetermined type. Fires reported as "no equipment" but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated. Certain types of fires collectively referred to as "confined fires," including confined cooking fires, chimney fires, trash fires, and fuel burner or boiler fires (incident types 113-118) can be documented more easily in NFIRS 5.0. Causal data, including equipment involved in ignition, is generally not required for these incidents although it is provided in some cases. Equipment involved in ignition was reported in 23% of the non-confined fires and 5% of the confined cooking fires (incident type 113). Confined cooking fires and non-confined structure fires were analyzed separately and then summed.

Causal data is not required for outside rubbish fires (incident type 150-159) either. Outside rubbish fires were analyzed separately from the remaining non-structure, non-vehicle fires. These two groups (1- outside rubbish, and 2- outside non rubbish and unclassified) were also analyzed separately and then summed. Because the number of outdoor trash fires involving grills was small, only the sums are shown in the tables.

Except where otherwise indicated, property damage has not been adjusted for inflation. Vehicle fires were excluded from this analysis. Additional details on the methodology used may be found in Appendix A.

Our analysis methods are continually being refined and previous estimates updated.

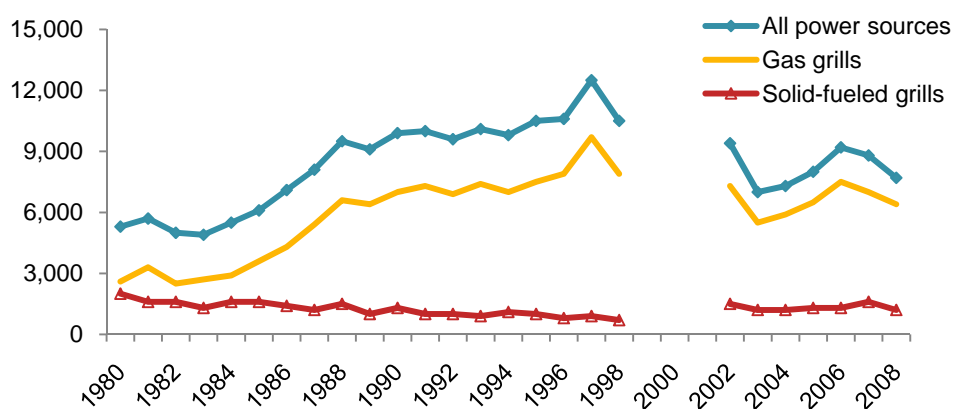
had eaten at least one grilled item in a 14-day period. Year-round grilling more than doubled from 17% in 1985 to 38% in 2007. Two of every five male grillers (41%) report that they do all the grilling. Only 17% of women grillers say that they are the only grillers in the household.

Gas grill fires climbed while solid-fueled grill fires declined.

Figure 6.2 and Table 6.1 show that the 7,700 grill fires reported in 2008 was 45% higher than the 5,300 reported in 1980 but still below the peak years of 1995-1998, when fires ranged between 10,500 and 12,500. These statistics include both structure and outdoor fires. Because of issues related to the gradual introduction of NFIRS 5.0, data from 1990-2001 are not depicted graphically but are included in the tables.

Gas grill fires were 2.5 times as frequent in 2008 (6,400 fires) as in 1980 (2,600). In contrast, 1,200 charcoal or solid-fueled grill fires were reported in 2006, a drop of 40% from the 2,000 reported in 1980.

**Figure 6.2. Home Structure and Outdoor Fires Involving Grills, by Year
Fires Reported to U.S. Fire Departments: 1980-2008**



Source: Data from NFIRS and NFPA survey. Note: See Note in year table.

71% of grills involved in home outdoor and structure fires in 2004-2008 used LP-gas.

Table 6.2 and Figure 6.3 show the power source for all grills involved in reported home fires. Gas grills were involved in 81% of reported home grill fires. More than two-thirds (71%) of the home grill fires involved grills fueled by liquid propane gas (LP-gas) or similar gas that is heavier than air. Eight percent were fueled by natural gas or other lighter than air gas, and 2% were fueled by an unclassified gas.

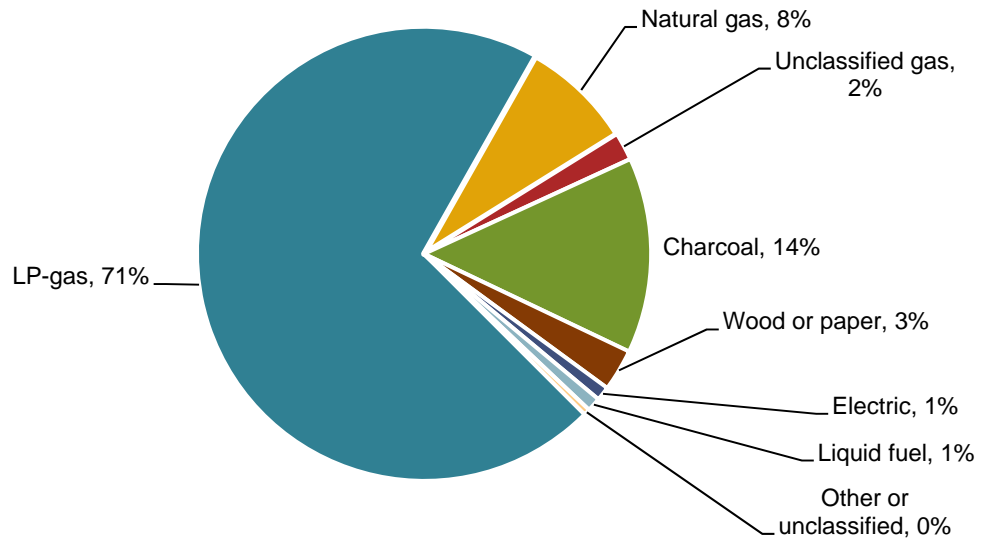
Seventeen percent of the grills involved in fires were solid-fueled, including 14% that used charcoal or coal and 3% that used wood or paper. One percent of the grills were powered by electricity, 1% by a liquid fuel, and less than 1% by another known or unclassified power source.

In 2008, the NPD Group also noted that 76% of American households own an outdoor grill and 75% of the owners have a gas grill.³⁷ That means that more than half (57%) of American

³⁷ The NPD Group, Inc., 2008.

households have a gas grill. The Weber GrillWatch™ Survey, reported that one-third of U.S. grill owners have at least two different grills with one in five owning both a charcoal grill and one fueled by gas. Grill accessories are becoming more common³⁸

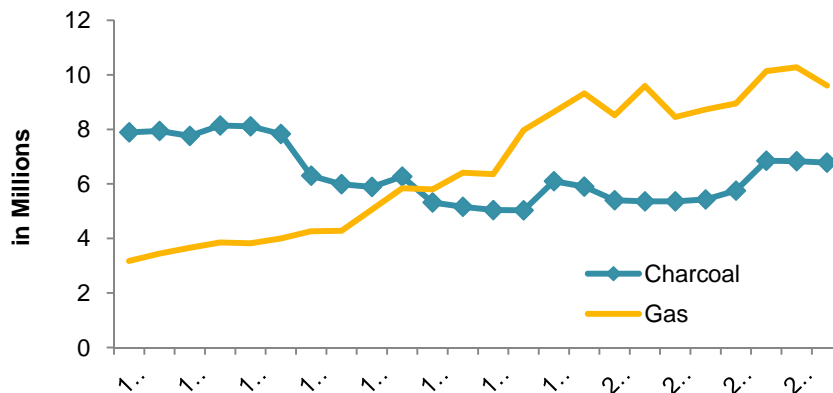
Figure 6.3. Home Grill Fires by Power Source: 2004-2008



Shipments of gas grills overtook charcoal in 1995.

According to the Hearth, Patio and Barbecue Association, more than twice as many charcoal grills were shipped in North America during 1985 as gas grills. Figure 6.4 shows that as of 1995, more gas grills were shipped for sale than charcoal grills.

Figure 6.4. Barbecue Grills Shipped in North America, by Power Source: 1985-2008

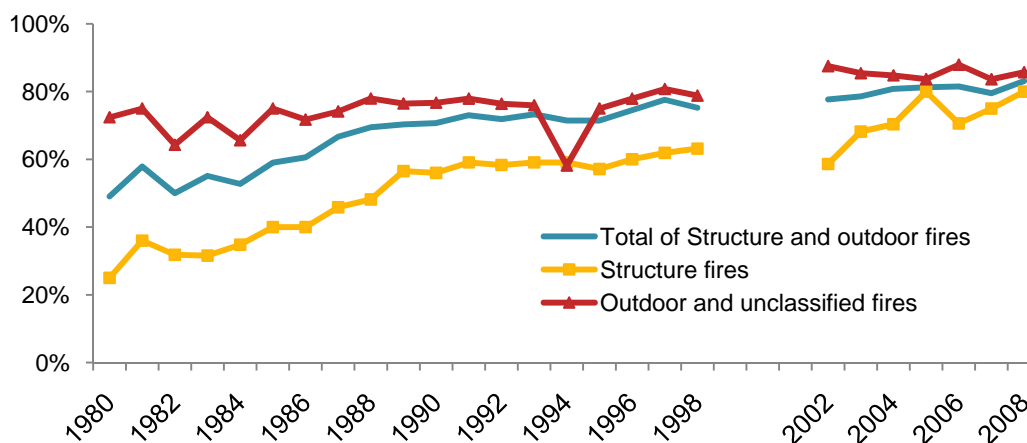


Source: Hearth, Patio and Barbecue Association, “BBQ Grill Shipments- North America: 1985-2009,” accessed at <http://www.hpba.org/statistics/barbecue-statistics/bbq-grill-shipments> on October 28, 2010.

³⁸ Weber. “While Outdoor Grill Purchased Are Down, Nationwide Study Shows Consumers Are Investing in Higher Quality Barbecues. 21st Annual Grillwatch Survey™.” March 30, 2010. Accessed at <http://weber.mediaroom.com/index.php?s=41&cat=1> on October 28, 2010.

Figure 6.5 shows that gas grills accounted for roughly two-thirds to three-quarters of the outdoor and unclassified grill fires from 1980 through 1998. Since 2004, 70-80% of the outdoor grill fires involved gas-fueled equipment. Gas-fueled equipment accounted for roughly one-quarter to one-third of the structure fires involving grills in the early 1980s. In the most recent years of data, gas-fired equipment was involved in two-thirds to four-fifths of the grill structure fires.

**Figure 6.5. Percent of Home Grill Fires Involving Gas-Fueled Grills, by Year
Fires Reported to U.S. Fire Departments: 1980-2008**



Source: Data from NFIRS and NFPA survey.

Note: See Note in year table.

Circumstances of Grill Fires

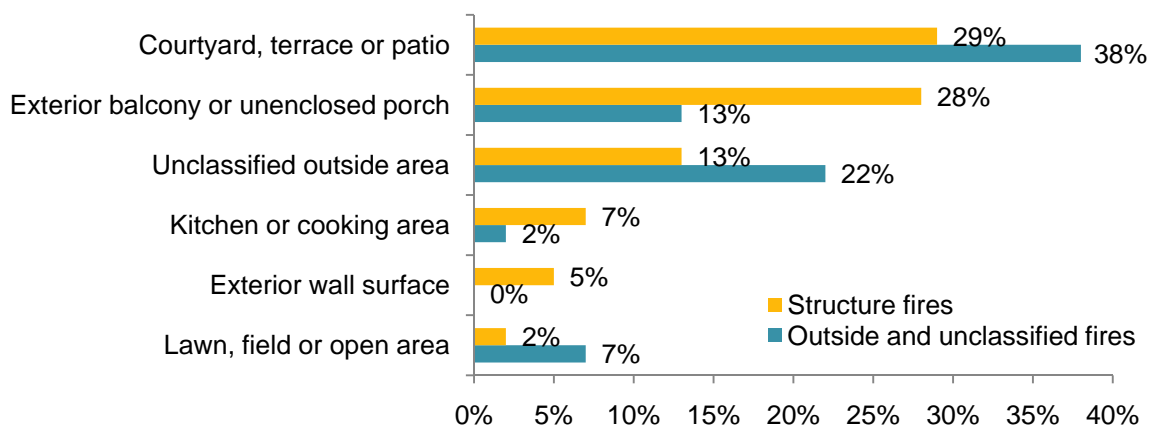
The leading area of origin was a courtyard, terrace, or patio.

Figure 6.6 and Table 6.5 show that in 2004-2008, more than one-quarter (29%) of the home structure fires involving grills and more than one-third (38%) of the outdoor or unclassified grill fires started on courtyards, terraces or patios. Other leading areas of origin for grill structure fires were exterior balconies or open porches (28%), unclassified outside areas (13%); kitchens or cooking areas (7%); and exterior wall surfaces (5%).

Other leading areas of origin for outdoor or unclassified fires involving grills were unclassified outside areas (22%); exterior balconies or open porches (13%); and lawns, fields or open areas (7%).

Tables 6.6 and 6.7 show there is little difference in the leading areas of origin between gas- and solid-fueled grills.

**Figure 6.6. Home Grill Fires by Leading Areas of Origin
2004-2008**



Leaks or breaks were the leading cause of home fires involving grills.

In 2004-2008, a leak or break was a factor in one of every five (20%) home structure fires in which grills were involved in ignition. Other leading causes were something that could catch fire too close to the grill, a failure to clean, and unattended equipment. For outdoor and unclassified grill fires, the top three leading factors were the same, although the order varied.

Tables 6.9 and 6.10 show that the leading factors contributing to ignition varied by power source. Heat source too close was a factor in 40% of solid-fueled grill structure fires but only 12% of gas grill structure fires.

Although leaks or breaks were the leading contributing factors in all outdoor grill fires (30%) and in grill structure fires (20%), this is due largely to gas grill fires. Leaks or breaks were factors in 28% of the gas grill structure fires and 37% of the gas grill outside fires but were not a notable factor in solid-fueled grill fires.

Flammable or combustible gas or liquid was the item first ignited in half of home outdoor grill fires.

In 49% of the home outdoor fires and 30% of the home structure fires in which grills were involved, 56% of the outside gas grills, and 39% of the gas grill structure fires, the fire started when a flammable or combustible gas or liquid caught fire. Table 6.11 shows that cooking materials were the second leading item ignited in both structure and outdoor grills overall. Exterior wall coverings were first ignited in 10% of these structure fires.

So far, the analysis has focused on fires that were reported to fire departments. These injuries are a tiny fraction of the grill-related injuries seen in the country's emergency rooms.

In 2009, 17,700 patients went to emergency rooms because of injuries involving grills.

The U.S. Consumer Product Safety Commission (CPSC) maintains the National Electronic Injury Surveillance System (NEISS). A weighted sample of hospital emergency rooms provides information about the patients and injuries seen and allows projections to be made about injuries involving specific products. Gas grills accounted for an estimated 3,600 injuries and charcoal or

wood-burning grills for 1,400 injuries. Unspecified other grills accounted for 11,300 injuries. The number of electric-powered grill injuries was too small to produce reliable estimates.³⁹

- The 9,400 thermal burns accounted for roughly two-thirds (2,300) of the injuries involving gas grills, almost three-quarters (1,000) of the injuries involving charcoal or wood-burning grills and almost half (5,300) of the injuries involving unspecified grills. Children under five accounted for 2,100, or 22%, of total thermal grill burns. Most of these were contact burns rather than flame burns.
- Roughly one-third of the gas grill injuries were thermal 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.
- Although the number of cases was too small for reliable estimates, more people were seen for carbon monoxide exposure after using a charcoal grill inside the home compared to gas grills.

CPSC estimates that grills were involved in an average of 7 fatal CO poisonings a year in 2003-2005.

In a study of non-fire deaths resulting from carbon monoxide (CO) poisoning, Matthew Hnatov of the CPSC reported that charcoal or charcoal grills were involved in an average of six such deaths a year in 2003-2005.⁴⁰ Gas-fueled grills or camp stoves were involved in an average of one CO death per year in the same period.

³⁹ Queries on the entire category of grills including charcoal or wood burning grills (code 3218), gas or LP-Grills or Stoves (for outdoor use) (code 3248, and grills, not specified (3249), as well as electric grills, (3229) kerosene grills or stoves (3230) and other grills or stoves (3233) were done at <http://www.cpsc.gov/library/neiss.html> in October 2010.

⁴⁰ Matthew Hnatov Non-Fire Carbon Monoxide Deaths Associated with the Use of Consumer Products,” U.S. Consumer Product Safety Commission, 2008, Table 1, p. 6 accessed at <http://www.cpsc.gov/LIBRARY/co08.pdf> on April 20, 2009.

**Table 6.1 Home Fires Involving Grills, by Year
Fires Reported to U.S. Fire Departments**

A. Structure Fires: All Power Sources

Year	Fires		Civilian Injuries	Direct Property Damage (in Millions)			
				As Reported	In 2008 Dollars		
1980	2,400		90	\$9		\$24	
1981	2,500		100	\$12		\$28	
1982	2,200		80	\$15		\$33	
1983	1,900		120	\$15		\$32	
1984	2,300		70	\$16		\$33	
1985	2,500		80	\$17		\$34	
1986	2,500		90	\$18		\$35	
1987	2,400		70	\$19		\$36	
1988	2,700		130	\$37		\$67	
1989	2,300		60	\$20		\$35	
1990	2,500		120	\$24		\$40	
1991	2,200		110	\$36		\$57	
1992	2,400		100	\$41		\$63	
1993	2,200		80	\$22		\$33	
1994	2,200		90	\$21		\$30	
1995	2,100		70	\$30		\$42	
1996	2,000		110	\$29		\$40	
1997	2,100		80	\$44		\$59	
1998	1,900		90	\$53		\$70	
1999	3,600	(2,900)	0	(0)	\$81	(\$81)	\$105
2000	2,300	(1,500)	110	(110)	\$61	(\$61)	\$76
2001	2,300	(1,400)	50	(50)	\$40	(\$40)	\$48
2002	2,900	(1,600)	90	(90)	\$56	(\$55)	\$66
2003	2,200	(1,100)	90	(70)	\$92	(\$92)	\$108
2004	2,700	(1,200)	110	(110)	\$47	(\$47)	\$53
2005	3,000	(1,300)	80	(60)	\$136	(\$136)	\$150
2006	3,400	(1,400)	90	(60)	\$48	(\$48)	\$51
2007	3,200	(1,500)	90	(70)	\$43	(\$42)	\$45
2008	3,500	(1,700)	100	(70)	\$90	(\$90)	\$90

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. Fires are rounded to the nearest hundred, civilian injuries are expressed to the nearest ten and direct property damage is rounded to the nearest million dollars. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or reported as cooking or kitchen equipment of undetermined or unclassified type. Fires reported as “no equipment” but lacking a confirming specific heat source (codes (40-99) are also treated as unknown equipment and allocated. Because of their small numbers, annual estimates of fire deaths involving this equipment are unreliable and not shown. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 6.1. Home Fires Involving Grills, by Year
Fires Reported to U.S. Fire Departments (Continued)**

B. Outdoor Fires: All Power Sources

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2008 Dollars
1980	2,900	30	\$0	\$0
1981	3,200	10	\$0	\$0
1982	2,800	40	\$0	\$0
1983	2,900	30	\$0	\$0
1984	3,200	30	\$0	\$0
1985	3,600	20	\$0	\$0
1986	4,600	30	\$0	\$0
1987	5,800	30	\$0	\$0
1988	6,800	30	\$0	\$0
1989	6,800	30	\$1	\$2
1990	7,300	20	\$0	\$0
1991	7,700	40	\$0	\$0
1992	7,200	40	\$1	\$2
1993	7,900	20	\$0	\$0
1994	9,800	120	\$21	\$30
1995	8,400	50	\$1	\$1
1996	8,600	30	\$0	\$0
1997	10,400	40	\$0	\$0
1998	8,500	40	\$1	\$1
1999	5,600	90	\$0	\$1
2000	4,000	20	\$0	\$0
2001	5,400	70	\$0	\$0
2002	6,400	30	\$1	\$1
2003	4,800	20	\$0	\$1
2004	4,600	20	\$0	\$0
2005	4,900	30	\$0	\$1
2006	5,800	60	\$1	\$1
2007	5,500	20	\$7	\$7
2008	4,200	30	\$1	\$1

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 6.1. Home Fires Involving Grills, by Year
Fires Reported to U.S. Fire Departments (Continued)**

C. Structure and Outdoor Fires Combined: All Power Sources

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2008 Dollars
1980	5,300	120	\$9	\$24
1981	5,700	110	\$12	\$28
1982	5,000	120	\$15	\$33
1983	4,900	150	\$15	\$32
1984	5,500	110	\$16	\$33
1985	6,100	110	\$18	\$36
1986	7,100	120	\$18	\$35
1987	8,100	110	\$19	\$36
1988	9,500	150	\$37	\$67
1989	9,100	100	\$21	\$36
1990	9,900	140	\$25	\$41
1991	10,000	150	\$36	\$57
1992	9,600	140	\$42	\$64
1993	10,100	100	\$23	\$34
1994	9,800	120	\$21	\$30
1995	10,500	130	\$31	\$44
1996	10,600	150	\$30	\$41
1997	12,500	110	\$45	\$60
1998	10,500	140	\$54	\$71
1999	9,100	90	\$81	\$105
2000	6,200	130	\$61	\$76
2001	7,700	120	\$40	\$48
2002	9,400	110	\$56	\$67
2003	7,000	110	\$92	\$108
2004	7,300	130	\$47	\$54
2005	8,000	100	\$137	\$151
2006	9,200	160	\$49	\$52
2007	8,800	110	\$50	\$51
2008	7,700	130	\$91	\$91

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 6.2. Home Fires Involving Grills, by Year
Fires Reported to U.S. Fire Departments (Continued)**

A. Structure Fires: Gas-Fueled Grills

Year	Fires		Civilian Injuries	Direct Property Damage (in Millions)		
				As Reported	In 2008 Dollars	
1980	600		40		\$2	\$5
1981	900		70		\$3	\$7
1982	700		20		\$2	\$4
1983	600		50		\$6	\$13
1984	800		40		\$5	\$10
1985	1,000		50		\$7	\$14
1986	1,000		50		\$6	\$12
1987	1,100		40		\$7	\$13
1988	1,300		80		\$21	\$38
1989	1,300		40		\$9	\$16
1990	1,400		70		\$15	\$25
1991	1,300		100		\$19	\$30
1992	1,400		80		\$31	\$48
1993	1,300		60		\$15	\$22
1994	1,300		60		\$11	\$16
1995	1,200		40		\$11	\$16
1996	1,200		70		\$15	\$21
1997	1,300		60		\$24	\$32
1998	1,200		40		\$32	\$42
1999	1,300	(600)	0	(0)	\$1	(\$1)
2000	1,400	(500)	110	(110)	\$26	(\$26)
2001	1,400	(700)	0	(0)	\$17	(\$17)
2002	1,700	(900)	50	(50)	\$28	(\$27)
2003	1,500	(600)	80	(60)	\$76	(\$76)
2004	1,900	(700)	80	(80)	\$20	(\$20)
2005	2,400	(800)	60	(40)	\$119	(\$119)
2006	2,400	(800)	60	(20)	\$21	(\$21)
2007	2,400	(900)	40	(30)	\$26	(\$25)
2008	2,800	(1,100)	70	(50)	\$59	(\$59)

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 6.2. Home Fires Involving Grills, by Year
Fires Reported to U.S. Fire Departments (Continued)**

B. Outdoor Fires: Gas-Fueled Grills

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2008 Dollars
1980	2,100	0	\$0	\$0
1981	2,400	10	\$0	\$0
1982	1,800	40	\$0	\$0
1983	2,100	20	\$0	\$0
1984	2,100	20	\$0	\$0
1985	2,700	10	\$0	\$0
1986	3,300	30	\$0	\$0
1987	4,300	20	\$0	\$0
1988	5,300	20	\$0	\$0
1989	5,200	20	\$1	\$2
1990	5,600	10	\$0	\$0
1991	6,000	30	\$0	\$0
1992	5,500	30	\$1	\$2
1993	6,000	10	\$0	\$0
1994	5,700	20	\$0	\$0
1995	6,300	50	\$1	\$1
1996	6,700	20	\$0	\$0
1997	8,400	40	\$0	\$0
1998	6,700	40	\$1	\$1
1999	3,800	40	\$0	\$0
2000	3,200	20	\$0	\$0
2001	4,800	60	\$0	\$0
2002	5,600	30	\$1	\$1
2003	4,100	20	\$0	\$0
2004	3,900	10	\$0	\$0
2005	4,100	10	\$0	\$1
2006	5,100	40	\$1	\$1
2007	4,600	10	\$5	\$6
2008	3,600	30	\$1	\$1

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 6.2. Home Fires Involving Grills, by Year
Fires Reported to U.S. Fire Departments (Continued)**

C. Structure and Outdoor Fires Combined: Gas-Fueled Grills

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2008 Dollars
1980	2,600	60	\$2	\$5
1981	3,300	70	\$3	\$7
1982	2,500	60	\$2	\$4
1983	2,700	70	\$6	\$13
1984	2,900	60	\$5	\$10
1985	3,600	60	\$7	\$14
1986	4,300	80	\$6	\$12
1987	5,400	60	\$7	\$13
1988	6,600	90	\$21	\$38
1989	6,400	60	\$10	\$17
1990	7,000	80	\$15	\$25
1991	7,300	130	\$19	\$30
1992	6,900	110	\$32	\$49
1993	7,400	80	\$15	\$22
1994	7,000	80	\$11	\$16
1995	7,500	80	\$12	\$17
1996	7,900	90	\$15	\$21
1997	9,700	100	\$24	\$32
1998	7,900	80	\$33	\$44
1999	5,100	40	\$1	\$1
2000	4,600	130	\$26	\$33
2001	6,200	60	\$17	\$21
2002	7,300	80	\$28	\$34
2003	5,500	100	\$76	\$89
2004	5,900	90	\$20	\$23
2005	6,500	70	\$120	\$132
2006	7,500	90	\$22	\$23
2007	7,000	60	\$31	\$32
2008	6,400	100	\$60	\$60

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 6.3. Home Fires Involving Grills, by Year
Fires Reported to U.S. Fire Departments (Continued)**

A. Structure Fires: Solid-Fueled Grills

Year	Fires		Civilian Injuries	Direct Property Damage (in Millions)		
				As Reported	In 2008 Dollars	
1980	1,500		40	\$4	\$10	
1981	1,300		20	\$7	\$17	
1982	1,100		50	\$6	\$13	
1983	900		50	\$8	\$17	
1984	1,100		20	\$10	\$21	
1985	1,100		20	\$5	\$10	
1986	1,100		30	\$9	\$18	
1987	900		10	\$6	\$11	
1988	1,000		30	\$13	\$24	
1989	700		20	\$9	\$16	
1990	800		20	\$6	\$10	
1991	600		10	\$12	\$19	
1992	600		0	\$7	\$11	
1993	500		0	\$3	\$4	
1994	600		30	\$7	\$10	
1995	500		0	\$14	\$20	
1996	400		40	\$4	\$5	
1997	400		10	\$5	\$7	
1998	300		10	\$5	\$7	
1999	1,200	(1,200)	0	(0)	\$11 (\$11)	\$15
2000	700	(700)	0	(0)	\$5 (\$5)	\$6
2001	700	(600)	50	(50)	\$15 (\$15)	\$18
2002	700	(500)	0	(0)	\$27 (\$27)	\$33
2003	600	(400)	10	(10)	\$13 (\$13)	\$15
2004	600	(400)	30	(30)	\$19 (\$19)	\$22
2005	600	(400)	20	(20)	\$17 (\$17)	\$19
2006	800	(500)	40	(40)	\$26 (\$26)	\$28
2007	700	(500)	40	(40)	\$17 (\$17)	\$17
2008	600	(500)	10	(10)	\$29 (\$29)	\$29

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 6.3. Home Fires Involving Grills, by Year
Fires Reported to U.S. Fire Departments (Continued)**

B. Outdoor Fires: Solid-Fueled Grills

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2008 Dollars
1980	500	10	\$0	\$0
1981	400	10	\$0	\$0
1982	500	0	\$0	\$0
1983	400	0	\$0	\$0
1984	500	0	\$0	\$0
1985	400	0	\$0	\$0
1986	400	0	\$0	\$0
1987	400	0	\$0	\$0
1988	500	0	\$0	\$0
1989	300	0	\$0	\$0
1990	500	0	\$0	\$0
1991	400	0	\$0	\$0
1992	400	0	\$0	\$0
1993	400	0	\$0	\$0
1994	400	0	\$0	\$0
1995	400	0	\$0	\$0
1996	400	0	\$0	\$0
1997	500	0	\$0	\$0
1998	400	0	\$0	\$0
1999	200	0	\$0	\$0
2000	100	0	\$0	\$0
2001	500	0	\$0	\$0
2002	800	0	\$0	\$0
2003	600	0	\$0	\$0
2004	600	10	\$0	\$0
2005	800	10	\$0	\$0
2006	600	20	\$0	\$0
2007	900	0	\$1	\$1
2008	500	10	\$0	\$0

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 6.3. Home Fires Involving Solid-Fueled Grills, by Year
Fires Reported to U.S. Fire Departments (Continued)**

C. Structure and Outdoor Fires Combined: Solid-Fueled Grills

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2008 Dollars
1980	2,000	50	\$4	\$10
1981	1,600	20	\$7	\$17
1982	1,600	50	\$6	\$13
1983	1,300	50	\$8	\$17
1984	1,600	20	\$10	\$21
1985	1,600	20	\$5	\$10
1986	1,400	30	\$9	\$18
1987	1,200	10	\$6	\$11
1988	1,500	30	\$13	\$24
1989	1,000	30	\$9	\$16
1990	1,300	30	\$6	\$10
1991	1,000	20	\$12	\$19
1992	1,000	0	\$7	\$11
1993	900	0	\$3	\$4
1994	1,100	30	\$7	\$10
1995	1,000	0	\$14	\$20
1996	800	40	\$4	\$5
1997	900	10	\$5	\$7
1998	700	10	\$5	\$7
1999	1,400	0	\$11	\$15
2000	800	0	\$5	\$6
2001	1,200	50	\$15	\$18
2002	1,500	0	\$27	\$33
2003	1,200	10	\$13	\$15
2004	1,200	40	\$19	\$22
2005	1,300	30	\$17	\$19
2006	1,300	60	\$26	\$28
2007	1,600	40	\$18	\$18
2008	1,200	20	\$29	\$29

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

Table 6.4. Home Grill Fires by Power Source
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments

A. Structures: All Power Sources

Power Source	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
LP-gas or other heavier than air gas	2,100	(65%)	60	(67%)	\$31	(46%)
<i>In non-confined fire</i>	700	(23%)	40	(46%)	\$31	(46%)
<i>In confined fire</i>	1,300	(42%)	20	(21%)	0	(0%)
Natural gas or other lighter than air gas	300	(9%)	0	(2%)	\$13	(19%)
<i>In non-confined fire</i>	100	(4%)	0	(2%)	\$13	(19%)
<i>In confined fire</i>	200	(5%)	0	(0%)	\$0	(0%)
Unclassified gas	100	(2%)	0	(0%)	\$1	(1%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	1	(1%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
All gas-fueled	2,400	(76%)	60	(69%)	\$45	(66%)
<i>In non-confined fire</i>	900	(27%)	40	(48%)	\$45	(66%)
<i>In confined fire</i>	1,500	(48%)	20	(21%)	\$0	(1%)
Charcoal or coal	600	(19%)	30	(29%)	\$21	(31%)
<i>In non-confined fire</i>	500	(14%)	30	(29%)	\$21	(31%)
<i>In confined fire</i>	100	(5%)	0	(0%)	\$0	(0%)
Wood or paper	0	(1%)	0	(0%)	\$0	(0%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
Unclassified solid fuel	0	(0%)	0	(0%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
All solid-fueled	700	(21%)	30	(29%)	\$22	(32%)
<i>In non-confined fire</i>	500	(15%)	30	(29%)	\$22	(31%)
<i>In confined fire</i>	200	(5%)	0	(0%)	\$0	(0%)
Electric	100	(2%)	0	(0%)	\$1	(2%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	\$1	(2%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Other known or unclassified power source	100	(2%)	0	(2%)	\$0	(1%)
<i>In non-confined fire</i>	0	(1%)	0	(2%)	\$0	(1%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Total	3,200	(100%)	90	(100%)	\$69	(100%)
<i>In non-confined fire</i>	1,400	(44%)	70	(79%)	\$68	(99%)
<i>In confined fire</i>	1,800	(56%)	20	(21%)	\$0	(1%)

Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.4. Home Grill Fires by Power Source
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments
(Continued)

B. Outside and Unclassified Grill Fires: All Power Sources

Power Source	Fires		Civilian Injuries		Direct Property	
					Damage (in Millions)	
LP-gas or other heavier than air gas	3,400	(75%)	20	(61%)	\$1	(73%)
Natural gas or other lighter than air gas	400	(8%)	0	(3%)	\$0	(9%)
Unclassified gas	100	(2%)	0	(0%)	\$0	(0%)
All gas-fueled	3,800	(84%)	20	(64%)	\$1	(82%)
Charcoal or coal	500	(10%)	10	(32%)	\$0	(13%)
Wood or paper	200	(4%)	0	(0%)	\$0	(4%)
All solid-fueled	600	(14%)	10	(32%)	\$0	(17%)
Liquid-fueled	100	(1%)	0	(0%)	\$0	(0%)
Other known or unclassified power source	0	(1%)	0	(4%)	\$0	(1%)
Total	4,500	(100%)	30	(100%)	\$1	(100%)

C. Structure and Outdoor Fires Combined: All Power Sources

Power Source	Fires		Civilian Injuries		Direct Property	
					Damage (in Millions)	
LP-gas or other heavier than air gas	5,400	(71%)	80	(66%)	\$32	(46%)
Natural gas or other lighter than air gas	600	(8%)	0	(2%)	\$13	(19%)
Unclassified gas	100	(2%)	0	(0%)	\$1	(1%)
All gas-fueled	6,200	(81%)	80	(68%)	\$47	(66%)
Charcoal or coal	1,100	(14%)	40	(30%)	\$22	(31%)
Wood or paper	200	(3%)	0	(0%)	\$0	(0%)
Unclassified solid fuel	0	(0%)	0	(0%)	\$0	(0%)
All solid-fueled	1,300	(17%)	40	(30%)	\$22	(31%)
Electric	100	(1%)	0	(0%)	\$1	(2%)
Liquid-fueled	100	(1%)	0	(1%)	\$0	(1%)
Other known or unclassified power source	0	(0%)	0	(1%)	\$0	(0%)
Total	7,700	(100%)	120	(100%)	\$70	(100%)

Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.5. Home Fires Involving Grills, by Area of Origin
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments

A. Structure Fires: All Power Sources

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Courtyard, terrace or patio	900	(29%)	20	(22%)	\$13	(19%)
<i>In non-confined fire</i>	300	(8%)	10	(15%)	\$13	(19%)
<i>In confined fire</i>	700	(21%)	10	(7%)	\$0	(0%)
Exterior balcony or unenclosed porch	900	(28%)	40	(43%)	\$23	(34%)
<i>In non-confined fire</i>	500	(16%)	30	(29%)	\$23	(34%)
<i>In confined fire</i>	400	(12%)	10	(14%)	\$0	(0%)
Unclassified outside area	400	(13%)	0	(2%)	\$4	(6%)
<i>In non-confined fire</i>	100	(3%)	0	(2%)	\$4	(5%)
<i>In confined fire</i>	300	(10%)	0	(0%)	\$0	(0%)
Kitchen or cooking area	200	(7%)	0	(3%)	\$1	(2%)
<i>In non-confined fire</i>	100	(2%)	0	(3%)	\$1	(2%)
<i>In confined fire</i>	200	(5%)	0	(0%)	\$0	(0%)
Exterior wall surface	200	(5%)	10	(14%)	\$5	(8%)
<i>In non-confined fire</i>	200	(5%)	10	(14%)	\$5	(8%)
<i>In confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
Unclassified area of origin	100	(3%)	0	(2%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(2%)	\$0	(0%)
<i>In confined fire</i>	100	(3%)	0	(0%)	\$0	(0%)
Garage or vehicle storage area*	100	(3%)	0	(5%)	\$3	(5%)
<i>In non-confined fire</i>	100	(2%)	0	(5%)	\$3	(5%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Lawn, field or open area	100	(2%)	0	(2%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(2%)	\$0	(0%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Exterior stairway, ramp, or fire escape	100	(2%)	0	(0%)	\$2	(2%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	\$2	(2%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Other known area	300	(9%)	10	(8%)	\$17	(25%)
<i>In non-confined fire</i>	200	(6%)	10	(8%)	\$17	(25%)
<i>In confined fire</i>	100	(3%)	0	(0%)	\$0	(0%)
Total	3,200	(100%)	90	(100%)	\$69	(100%)
<i>In non-confined fire</i>	1,400	(44%)	70	(79%)	\$68	(99%)
<i>In confined fire</i>	1,800	(56%)	20	(21%)	\$0	(1%)

* Does not include garage coded as separate property.

Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.5. Home Fires Involving Grills, by Area of Origin
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments
(Continued)

B. Outdoor Fires: All Power Sources

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Courtyard, terrace or patio	1,700	(38%)	10	(19%)	\$0	(13%)
Unclassified outside area	1,000	(22%)	0	(5%)	\$1	(20%)
Exterior balcony or unenclosed porch	600	(13%)	0	(8%)	\$0	(5%)
Lawn, field or open area	300	(7%)	0	(5%)	\$0	(1%)
Unclassified area of origin	200	(4%)	0	(2%)	\$0	(1%)
Vegetation area (from the wildland module)	100	(2%)	0	(2%)	\$0	(0%)
Kitchen or cooking area	100	(2%)	0	(1%)	\$0	(1%)
Unclassified function area	100	(2%)	0	(1%)	\$0	(0%)
Unclassified equipment or service area	100	(2%)	0	(1%)	\$0	(0%)
Other known area of origin	400	(8%)	0	(7%)	\$0	(12%)
Total	4,500	(100%)	30	(100%)	\$1	(100%)

Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.6. Home Fires Involving Grills, by Area of Origin
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments

A. Structure Fires: Gas-Fueled Grills

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Courtyard, terrace or patio	800	(34%)	10	(20%)	\$7	(15%)
<i>In non-confined fire</i>	200	(8%)	10	(11%)	\$7	(15%)
<i>In confined fire</i>	600	(26%)	10	(10%)	\$0	(0%)
Exterior balcony or unenclosed porch	600	(27%)	30	(42%)	\$9	(21%)
<i>In non-confined fire</i>	300	(12%)	10	(21%)	\$9	(20%)
<i>In confined fire</i>	400	(15%)	10	(21%)	\$0	(0%)
Unclassified outside area	300	(12%)	0	(2%)	\$4	(8%)
<i>In non-confined fire</i>	100	(3%)	0	(2%)	\$4	(8%)
<i>In confined fire</i>	200	(10%)	0	(0%)	\$0	(0%)
Kitchen or cooking area	100	(6%)	0	(2%)	\$1	(2%)
<i>In non-confined fire</i>	0	(2%)	0	(2%)	\$1	(2%)
<i>In confined fire</i>	100	(4%)	0	(0%)	\$0	(0%)
Exterior wall surface	100	(4%)	10	(15%)	\$4	(8%)
<i>In non-confined fire</i>	100	(4%)	10	(15%)	\$4	(8%)
<i>In confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
Garage or vehicle storage area*	100	(3%)	0	(7%)	\$3	(6%)
<i>In non-confined fire</i>	0	(2%)	0	(7%)	\$3	(6%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Unclassified area of origin	100	(4%)	0	(2%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(2%)	\$0	(0%)
<i>In confined fire</i>	100	(3%)	0	(0%)	\$0	(0%)
Other known area	200	(10%)	10	(8%)	\$18	(40%)
<i>In non-confined fire</i>	100	(5%)	10	(8%)	\$18	(40%)
<i>In confined fire</i>	100	(5%)	0	(0%)	\$0	(0%)
Total	2,400	(100%)	60	(100%)	\$45	(100%)
<i>In non-confined fire</i>	900	(36%)	40	(70%)	\$45	(99%)
<i>In confined fire</i>	1,500	(64%)	20	(30%)	\$0	(1%)

* Does not include garage coded as separate property.

Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.6. Home Fires Involving Grills, by Area of Origin
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments

B. Outdoor Fires: Gas-Fueled Grills

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
					\$	(%)
Courtyard, terrace or patio	1,600	(43%)	10	(44%)	\$0	(27%)
Unclassified outside area	800	(21%)	0	(4%)	\$1	(48%)
Unclassified area of origin	200	(5%)	0	(6%)	\$0	(2%)
Lawn, field or open area	200	(4%)	0	(6%)	\$0	(1%)
Unclassified function area	100	(2%)	0	(5%)	\$0	(0%)
Unclassified equipment or service area	100	(2%)	0	(5%)	\$0	(1%)
Kitchen or cooking area	100	(2%)	0	(5%)	\$0	(3%)
Other known area of origin	800	(21%)	10	(26%)	\$0	(17%)
Total	3,800	(100%)	20	(100%)	\$1	(100%)

Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.7. Home Fires Involving Grills, by Area of Origin
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments

A. Structure Fires: Solid-Fueled Grills

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Exterior balcony or unenclosed porch	200	(35%)	10	(45%)	\$13	(62%)
<i>In non-confined fire</i>	200	(33%)	10	(45%)	\$13	(62%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Courtyard, terrace or patio	100	(15%)	10	(27%)	\$4	(21%)
<i>In non-confined fire</i>	100	(12%)	10	(27%)	\$4	(21%)
<i>In confined fire</i>	0	(4%)	0	(0%)	\$0	(0%)
Unclassified outside area	100	(11%)	0	(0%)	\$0	(1%)
<i>In non-confined fire</i>	0	(5%)	0	(0%)	\$0	(1%)
<i>In confined fire</i>	0	(6%)	0	(0%)	\$0	(0%)
Other known area	300	(39%)	10	(28%)	\$3	(16%)
<i>In non-confined fire</i>	200	(25%)	10	(28%)	\$3	(16%)
<i>In confined fire</i>	100	(14%)	0	(0%)	\$0	(0%)
Total	700	(100%)	30	(100%)	\$22	(100%)
<i>In non-confined fire</i>	500	(75%)	30	(100%)	\$22	(100%)
<i>In confined fire</i>	200	(25%)	0	(0%)	\$0	(0%)

B. Outdoor Fires: Solid-Fueled Grills

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified outside area	200	(30%)	0	(12%)	\$0	(91%)
Courtyard, terrace or patio	100	(21%)	0	(41%)	\$0	(32%)
Lawn, field or open area	100	(21%)	0	(25%)	\$0	(27%)
Other known area	200	(27%)	0	(22%)	\$0	(50%)
Total	600	(100%)	10	(100%)	\$0	(100%)

Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 6.8. Home Fires Involving Grills, by Factor Contributing to Ignition
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments**

A. Structure Fires: All Power Sources

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Leak or break	600	(20%)	30	(28%)	\$6	(9%)
<i>In non-confined fire</i>	200	(6%)	20	(24%)	\$6	(9%)
<i>In confined fire</i>	500	(15%)	0	(4%)	\$0	(0%)
Heat source too close to combustible	600	(18%)	20	(20%)	\$20	(29%)
<i>In non-confined fire</i>	400	(14%)	20	(20%)	\$20	(29%)
<i>In confined fire</i>	100	(4%)	0	(0%)	\$0	(0%)
Failure to clean	400	(13%)	0	(3%)	\$0	(0%)
<i>In non-confined fire</i>	0	(1%)	0	(3%)	\$0	(0%)
<i>In confined fire</i>	400	(12%)	0	(0%)	\$0	(0%)
Equipment unattended	300	(11%)	10	(6%)	\$9	(13%)
<i>In non-confined fire</i>	200	(6%)	10	(6%)	\$9	(13%)
<i>In confined fire</i>	100	(4%)	0	(0%)	\$0	(0%)
Outside/open fire for warming or cooking	200	(7%)	10	(11%)	\$5	(8%)
<i>In non-confined fire</i>	100	(4%)	10	(11%)	\$5	(8%)
<i>In confined fire</i>	100	(3%)	0	(0%)	\$0	(0%)
Abandoned or discarded material	200	(5%)	0	(4%)	\$3	(4%)
<i>In non-confined fire</i>	100	(3%)	0	(4%)	\$3	(4%)
<i>In confined fire</i>	100	(2%)	0	(0%)	\$0	(0%)
Unclassified factor contributed	100	(4%)	0	(2%)	\$3	(5%)
<i>In non-confined fire</i>	0	(2%)	0	(2%)	\$3	(5%)
<i>In confined fire</i>	100	(3%)	0	(0%)	\$0	(0%)
Unclassified mechanical failure or malfunction	100	(4%)	10	(6%)	\$3	(4%)
<i>In non-confined fire</i>	100	(2%)	0	(2%)	\$3	(4%)
<i>In confined fire</i>	100	(2%)	0	(4%)	\$0	(0%)
Worn out	100	(4%)	10	(8%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	100	(3%)	10	(8%)	\$0	(0%)
Unclassified misuse of material	100	(4%)	0	(5%)	\$17	(25%)
<i>In non-confined fire</i>	100	(2%)	0	(5%)	\$17	(25%)
<i>In confined fire</i>	100	(2%)	0	(0%)	\$0	(0%)
Equipment not being operated properly	100	(2%)	0	(4%)	\$3	(4%)
<i>In non-confined fire</i>	0	(1%)	0	(4%)	\$3	(4%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Installation deficiency	100	(2%)	0	(0%)	\$0	(1%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	\$0	(1%)
<i>In confined fire</i>	0	(2%)	0	(0%)	\$0	(0%)
Unintentionally turned on or not turned off	100	(2%)	0	(0%)	\$2	(2%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	\$2	(2%)
<i>In confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)

Table 6.8. Home Fires Involving Grills, by Factor Contributing to Ignition
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments
(Continued)

A. Structure Fires: All Power Sources

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Other known factor	400	(14%)	10	(16%)	\$19	(27%)
<i>In non-confined fire</i>	200	(8%)	10	(11%)	\$19	(27%)
<i>In confined fire</i>	200	(6%)	0	(5%)	\$0	(0%)
Total fires	3,200	(100%)	90	(100%)	\$69	(100%)
<i>In non-confined fire</i>	1,400	(44%)	70	(79%)	\$68	(99%)
<i>In confined fire</i>	1,800	(56%)	20	(21%)	\$0	(1%)
Total entries	3,500	(110%)	100	(113%)	\$90	(130%)
<i>In non-confined fire</i>	1,600	(51%)	80	(92%)	\$89	(130%)
<i>In confined fire</i>	1,900	(59%)	20	(21%)	\$0	(1%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.8. Home Fires Involving Grills, by Factor Contributing to Ignition
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments
(Continued)

B. Outdoor Fires: All Power Sources

Factor	Fires		Civilian Injuries		Direct Property	
					Damage (in Millions)	
Leak or break	1,400	(30%)	10	(26%)	\$1	(55%)
Failure to clean	600	(12%)	0	(0%)	\$0	(3%)
Heat source too close to combustible	400	(8%)	0	(6%)	\$0	(9%)
Unclassified mechanical failure or malfunction	400	(8%)	0	(9%)	\$0	(4%)
Outside or open fire for warming or cooking	300	(7%)	0	(14%)	\$0	(6%)
Equipment unattended	200	(5%)	0	(0%)	\$0	(7%)
Unclassified misuse of material or product	200	(4%)	0	(9%)	\$0	(1%)
Worn out	200	(4%)	0	(0%)	\$0	(0%)
Abandoned or discarded material	200	(4%)	0	(0%)	\$0	(5%)
Unclassified factor contributed to ignition	100	(3%)	0	(0%)	\$0	(0%)
Equipment not being operated properly	100	(3%)	0	(11%)	\$0	(1%)
Outside or open fire for debris or waste disposal	100	(2%)	0	(0%)	\$0	(0%)
Unclassified operational deficiency	100	(2%)	0	(0%)	\$0	(1%)
Installation deficiency	100	(2%)	0	(0%)	\$0	(0%)
Other known factor	600	(13%)	10	(34%)	\$0	(24%)
Total fires	4,500	(100%)	30	(100%)	\$1	(100%)
Total entries	4,800	(107%)	30	(109%)	\$2	(118%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 6.9. Home Fires Involving Grills, by Factor Contributing to Ignition
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments**

A. Structure Fires: Gas-Fueled Grills

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Leak or break	700	(28%)	30	(42%)	\$6	(14%)
<i>In non-confined fire</i>	200	(8%)	20	(36%)	\$6	(14%)
<i>In confined fire</i>	500	(20%)	0	(6%)	\$0	(0%)
Failure to clean	400	(16%)	0	(4%)	\$0	(0%)
<i>In non-confined fire</i>	0	(1%)	0	(4%)	\$0	(0%)
<i>In confined fire</i>	400	(15%)	0	(0%)	\$0	(0%)
Heat source too close to combustible	300	(12%)	10	(17%)	\$11	(24%)
<i>In non-confined fire</i>	200	(9%)	10	(17%)	\$11	(24%)
<i>In confined fire</i>	100	(3%)	0	(0%)	\$0	(0%)
Equipment unattended	200	(8%)	0	(6%)	\$5	(10%)
<i>In non-confined fire</i>	100	(5%)	0	(6%)	\$5	(10%)
<i>In confined fire</i>	100	(3%)	0	(0%)	\$0	(0%)
Unclassified mechanical failure or malfunction	100	(6%)	10	(9%)	\$2	(5%)
<i>In non-confined fire</i>	100	(3%)	0	(3%)	\$2	(5%)
<i>In confined fire</i>	100	(3%)	0	(6%)	\$0	(0%)
Outside or open fire for warming or cooking	100	(5%)	0	(7%)	\$2	(5%)
<i>In non-confined fire</i>	100	(2%)	0	(7%)	\$2	(5%)
<i>In confined fire</i>	100	(3%)	0	(0%)	\$0	(0%)
Unclassified factor contributed	100	(5%)	0	(3%)	\$2	(4%)
<i>In non-confined fire</i>	0	(1%)	0	(3%)	\$2	(4%)
<i>In confined fire</i>	100	(4%)	0	(0%)	\$0	(0%)
Worn out	100	(5%)	10	(12%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	100	(4%)	10	(12%)	\$0	(0%)
Abandoned or discarded material	100	(3%)	0	(0%)	\$1	(1%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	\$1	(1%)
<i>In confined fire</i>	0	(2%)	0	(0%)	\$0	(0%)
Installation deficiency	100	(3%)	0	(0%)	\$0	(1%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	\$0	(1%)
<i>In confined fire</i>	0	(2%)	0	(0%)	\$0	(0%)
Unclassified misuse of material	100	(3%)	0	(3%)	\$15	(34%)
<i>In non-confined fire</i>	0	(1%)	0	(3%)	\$15	(34%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Equipment not being operated properly	100	(2%)	0	(0%)	\$1	(2%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	\$1	(2%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Unintentionally turned on or not turned off	100	(2%)	0	(0%)	\$2	(3%)
<i>In non-confined fire</i>	0	(2%)	0	(0%)	\$2	(3%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)

Table 6.9. Home Fires Involving Grills, by Factor Contributing to Ignition
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments
(Continued)

A. Structure Fires: Gas-Fueled Grills

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Other known factor	300	(12%)	10	(10%)	\$16	(36%)
<i>In non-confined fire</i>	100	(6%)	0	(3%)	\$16	(36%)
<i>In confined fire</i>	100	(6%)	0	(7%)	\$0	(0%)
Total fires	2,400	(100%)	60	(100%)	\$45	(100%)
<i>In non-confined fire</i>	900	(36%)	40	(70%)	\$45	(99%)
<i>In confined fire</i>	1,500	(64%)	20	(30%)	\$0	(1%)
Total entries	2,600	(109%)	70	(113%)	\$64	(140%)
<i>In non-confined fire</i>	1,000	(41%)	50	(83%)	\$63	(140%)
<i>In confined fire</i>	1,600	(67%)	20	(30%)	\$0	(1%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 6.9. Home Fires Involving Grills, by Factor Contributing to Ignition
Annual Average 2004-2008 Fires Reported to U.S. Fire Department
(Continued)**

B. Outdoor Fires: Gas-Fueled Grills

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Leak or break	1,400	(37%)	10	(47%)	\$1	(69%)
Failure to clean	500	(14%)	0	(0%)	\$0	(4%)
Unclassified mechanical failure or malfunction	400	(10%)	0	(17%)	\$0	(5%)
Heat source too close to combustible	200	(5%)	0	(0%)	\$0	(8%)
Worn out	200	(5%)	0	(0%)	\$0	(1%)
Outside or open fire for warming or cooking	200	(4%)	0	(8%)	\$0	(1%)
Equipment unattended	200	(4%)	0	(0%)	\$0	(3%)
Equipment not being operated properly	100	(3%)	0	(20%)	\$0	(1%)
Unclassified factor contributed	100	(3%)	0	(0%)	\$0	(0%)
Unintentionally turned on or not turned off	100	(3%)	0	(0%)	\$0	(2%)
Unclassified misuse of material	100	(3%)	0	(9%)	\$0	(1%)
Unclassified operational deficiency	100	(2%)	0	(0%)	\$0	(1%)
Installation deficiency	100	(2%)	0	(0%)	\$0	(0%)
Other known factor	400	(10%)	0	(8%)	\$0	(11%)
Total fires	3,800	(100%)	20	(100%)	\$1	(100%)
Total entries	4,000	(105%)	20	(109%)	\$1	(105%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 6.10. Home Fires Involving Grills, by Factor Contributing to Ignition
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments**

A. Structure Fires: Solid-Fueled Grills

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Heat source too close to combustible	300	(40%)	10	(32%)	\$8	(39%)
<i>In non-confined fire</i>	200	(33%)	10	(32%)	\$8	(39%)
<i>In confined fire</i>	0	(7%)	0	(0%)	\$0	(0%)
Outside or open fire for warming or cooking	100	(15%)	10	(22%)	\$3	(15%)
<i>In non-confined fire</i>	100	(12%)	10	(22%)	\$3	(15%)
<i>In confined fire</i>	0	(3%)	0	(0%)	\$0	(0%)
Equipment unattended	100	(14%)	0	(0%)	\$4	(20%)
<i>In non-confined fire</i>	100	(8%)	0	(0%)	\$4	(20%)
<i>In confined fire</i>	0	(5%)	0	(0%)	\$0	(0%)
Abandoned or discarded material	100	(14%)	0	(15%)	\$2	(10%)
<i>In non-confined fire</i>	100	(9%)	0	(15%)	\$2	(10%)
<i>In confined fire</i>	0	(5%)	0	(0%)	\$0	(0%)
Other known factor	200	(30%)	10	(47%)	\$6	(29%)
<i>In non-confined fire</i>	200	(23%)	10	(47%)	\$6	(29%)
<i>In confined fire</i>	0	(6%)	0	(0%)	\$0	(0%)
Total fires	700	(100%)	30	(100%)	\$22	(100%)
<i>In non-confined fire</i>	500	(75%)	30	(100%)	\$22	(100%)
<i>In confined fire</i>	200	(25%)	0	(0%)	\$0	(0%)
Total entries	700	(112%)	30	(116%)	\$24	(113%)
<i>In non-confined fire</i>	600	(85%)	30	(116%)	\$24	(112%)
<i>In confined fire</i>	200	(27%)	0	(0%)	\$0	(0%)

B. Outdoor Fires: Solid-Fueled Grills

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Outside or open fire for warming or cooking	100	(23%)	0	(26%)	\$0	(30%)
Heat source too close to combustible	100	(18%)	0	(0%)	\$0	(16%)
Abandoned or discarded material	100	(17%)	0	(0%)	\$0	(23%)
Outside or open fire for debris or waste disposal	100	(10%)	0	(0%)	\$0	(0%)
Equipment unattended	100	(9%)	0	(0%)	\$0	(26%)
Other known factor	200	(38%)	10	(84%)	\$0	(75%)
Total fires	600	(100%)	10	(100%)	\$0	(100%)
Total entries	700	(116%)	10	(110%)	\$0	(170%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.11. Home Fires Involving Grills, by Item First Ignited
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments

A. Structure Fires: All Power Sources

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Flammable or combustible liquid or gas, piping or filter	900	(30%)	30	(33%)	\$11	(16%)
<i>In non-confined fire</i>	300	(9%)	10	(20%)	\$11	(16%)
<i>In confined fire</i>	700	(21%)	20	(83%)	\$0	(47%)
Cooking materials, including food	800	(25%)	10	(11%)	\$3	(4%)
<i>In non-confined fire</i>	100	(3%)	10	(9%)	\$2	(4%)
<i>In confined fire</i>	700	(22%)	0	(17%)	\$0	(32%)
Exterior wall covering or finish	300	(10%)	20	(20%)	\$12	(17%)
<i>In non-confined fire</i>	300	(10%)	20	(25%)	\$12	(17%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(2%)
Unclassified item first ignited	200	(7%)	0	(2%)	\$3	(4%)
<i>In non-confined fire</i>	100	(2%)	0	(2%)	\$3	(4%)
<i>In confined fire</i>	200	(5%)	0	(0%)	\$0	(4%)
Structural member or framing	200	(6%)	0	(4%)	\$17	(25%)
<i>In non-confined fire</i>	200	(6%)	0	(6%)	\$17	(25%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(5%)
Unclassified structural component or finish	200	(6%)	0	(5%)	\$11	(15%)
<i>In non-confined fire</i>	100	(4%)	0	(7%)	\$10	(15%)
<i>In confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
Appliance housing or casing	100	(2%)	0	(0%)	\$0	(0%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	100	(2%)	0	(0%)	\$0	(2%)
Exterior trim, including doors	100	(2%)	10	(8%)	\$2	(2%)
<i>In non-confined fire</i>	100	(2%)	10	(10%)	\$2	(2%)
<i>In confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
Other known item	400	(13%)	20	(16%)	\$11	(16%)
<i>In non-confined fire</i>	300	(9%)	20	(16%)	\$11	(16%)
<i>In confined fire</i>	100	(4%)	0	(0%)	\$0	(0%)
Total	3,200	(100%)	90	(100%)	\$69	(100%)
<i>In non-confined fire</i>	1,400	(44%)	70	(79%)	\$68	(99%)
<i>In confined fire</i>	1,800	(56%)	20	(21%)	\$0	(1%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 6.11. Home Fires Involving Grills, by Item First Ignited
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments**

B. Outdoor Fires: All Power Sources

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Flammable or combustible liquid or gas, piping or filter	2,200	(49%)	30	(92%)	\$0	(25%)
Cooking materials, including food	900	(20%)	0	(0%)	\$0	(7%)
Unclassified item first ignited	500	(12%)	0	(3%)	\$1	(45%)
Rubbish, trash, or waste	200	(4%)	0	(0%)	\$0	(3%)
Light vegetation, including grass	200	(4%)	0	(0%)	\$0	(2%)
Appliance housing or casing	100	(2%)	0	(0%)	\$0	(1%)
Other known item	400	(10%)	0	(5%)	\$0	(16%)
Total	4,500	(100%)	30	(100%)	\$1	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.12. Home Fires Involving Grills, by Item First Ignited
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments

A. Structure Fires: Gas-Fueled Grills

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Flammable or combustible liquid or gas, piping or filter	900	(39%)	30	(44%)	\$11	(25%)
<i>In non-confined fire</i>	300	(11%)	10	(18%)	\$11	(24%)
<i>In confined fire</i>	700	(28%)	20	(25%)	\$0	(0%)
Cooking materials, including food	700	(27%)	10	(14%)	\$1	(2%)
<i>In non-confined fire</i>	100	(3%)	10	(9%)	\$1	(1%)
<i>In confined fire</i>	600	(24%)	0	(5%)	\$0	(0%)
Exterior wall covering or finish	200	(9%)	10	(17%)	\$9	(20%)
<i>In non-confined fire</i>	200	(8%)	10	(17%)	\$9	(20%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Unclassified item first ignited	200	(7%)	0	(0%)	\$1	(3%)
<i>In non-confined fire</i>	0	(1%)	0	(0%)	\$1	(3%)
<i>In confined fire</i>	100	(6%)	0	(0%)	\$0	(0%)
Structural member or framing	100	(4%)	0	(3%)	\$14	(30%)
<i>In non-confined fire</i>	100	(4%)	0	(3%)	\$14	(30%)
<i>In confined fire</i>	0	(1%)	0	(0%)	\$0	(0%)
Appliance housing or casing	100	(2%)	0	(0%)	\$0	(0%)
<i>In non-confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
<i>In confined fire</i>	100	(2%)	0	(0%)	\$0	(0%)
Other known item	300	(12%)	10	(22%)	\$10	(21%)
<i>In non-confined fire</i>	200	(9%)	10	(22%)	\$10	(21%)
<i>In confined fire</i>	100	(3%)	0	(0%)	\$0	(0%)
Total	2,400	(100%)	60	(100%)	\$45	(100%)
<i>In non-confined fire</i>	900	(36%)	40	(70%)	\$45	(99%)
<i>In confined fire</i>	1,500	(64%)	20	(30%)	\$0	(1%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.12. Home Fires Involving Grills, by Item First Ignited
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments

B. Outdoor Fires: Gas-Fueled Grills

Item First Ignited	Fires		Civilian Injuries		Direct Property	
					Damage (in Millions)	
Flammable or combustible liquid or gas, piping or filter	2,100	(56%)	20	(96%)	\$0	(31%)
Cooking materials, including food	800	(22%)	0	(0%)	\$0	(5%)
Unclassified item first ignited	500	(12%)	0	(4%)	\$1	(55%)
Appliance housing or casing	100	(3%)	0	(0%)	\$0	(1%)
Other known item	300	(8%)	0	(0%)	\$0	(8%)
Total	3,800	(100%)	20	(100%)	\$1	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 6.13. Home Fires Involving Grills, by Item First Ignited
Annual Average of 2004-2008 Fires Reported to U.S. Fire Departments

A. Structure Fires: Solid-Fueled Grills

Item First Ignited	Fires		Civilian Injuries		Direct Property	
					Damage (in Millions)	
Exterior wall covering or finish	100	(16%)	10	(29%)	\$3	(14%)
<i>In non-confined fire</i>	100	(16%)	10	(29%)	\$3	(14%)
<i>In confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
Structural member or framing	100	(16%)	0	(7%)	\$5	(22%)
In non-confined fire	100	(16%)	0	(7%)	\$5	(22%)
In confined fire	0	(0%)	0	(0%)	\$0	(0%)
Cooking materials, including food	100	(14%)	0	(0%)	\$1	(3%)
<i>In non-confined fire</i>	0	(2%)	0	(6%)	\$1	(3%)
<i>In confined fire</i>	100	(12%)	0	(0%)	\$0	(0%)
Unclassified structural component or finish	100	(11%)	0	(11%)	\$7	(30%)
<i>In non-confined fire</i>	100	(11%)	0	(11%)	\$7	(30%)
<i>In confined fire</i>	0	(0%)	0	(0%)	\$0	(0%)
Unclassified item first ignited	100	(8%)	0	(0%)	\$1	(6%)
<i>In non-confined fire</i>	0	(4%)	0	(6%)	\$1	(6%)
<i>In confined fire</i>	0	(4%)	0	(0%)	\$0	(0%)
Other known item	200	(34%)	10	(40%)	\$6	(26%)
<i>In non-confined fire</i>	200	(26%)	10	(40%)	\$6	(26%)
<i>In confined fire</i>	100	(8%)	0	(0%)	\$0	(0%)
Total	700	(100%)	30	(100%)	\$22	(100%)
<i>In non-confined fire</i>	500	(75%)	30	(100%)	\$22	(100%)
<i>In confined fires</i>	200	(25%)	0	(0%)	\$0	(0%)

B. Outdoor Fires: Solid-Fueled Grills

Item First Ignited	Fires		Civilian Injuries		Direct Property	
					Damage (in Millions)	
Rubbish, trash, or waste	100	(22%)	0	(0%)	\$0	(13%)
Light vegetation, including grass	100	(21%)	0	(0%)	\$0	(7%)
Flammable or combustible liquid or gas	100	(11%)	10	(81%)	\$0	(0%)
Other known item	300	(46%)	0	(19%)	\$0	(79%)
Total	600	(100%)	10	(100%)	\$0	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Deep Fryers

Deep fryers were involved in 1% of reported home cooking equipment fires.

During 2004-2008, U.S. fire departments responded to an average of 900 home structure fires per year in which a deep fryer was involved in ignition. These fires caused an annual average of 30 civilian injuries, and \$12 million in direct property damage per year. During the same period, these incidents accounted for 1% of the reported home fires involving cooking equipment, 1% of the associated civilian injuries, and 2% of the direct property damage from cooking equipment fires. No deaths associated with fires involving deep fryers were reported to NFIRS 5.0 during this period.

Data Sources, Definitions and Conventions Used in this Report

The fire statistics 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 NFPA's annual fire department experience survey. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Fires are rounded to the nearest hundred, civilian deaths to the nearest one, civilian injuries to the nearest ten, and direct property damage to the nearest million dollars. Property damage has not been adjusted for inflation unless so indicated.

NFIRS 5.0 equipment involved in ignition code 642 captures fires involving deep fryers. NFIRS 5.0 incident type codes in the range of 110-129 were used to identify structure fires. Unknown data were allocated proportionally in most fields analyzed except for incident type. NFIRS 5.0, first introduced in 1999, brought major changes to fire incident data, including changes in some definitions and coding rules. Because of these changes,

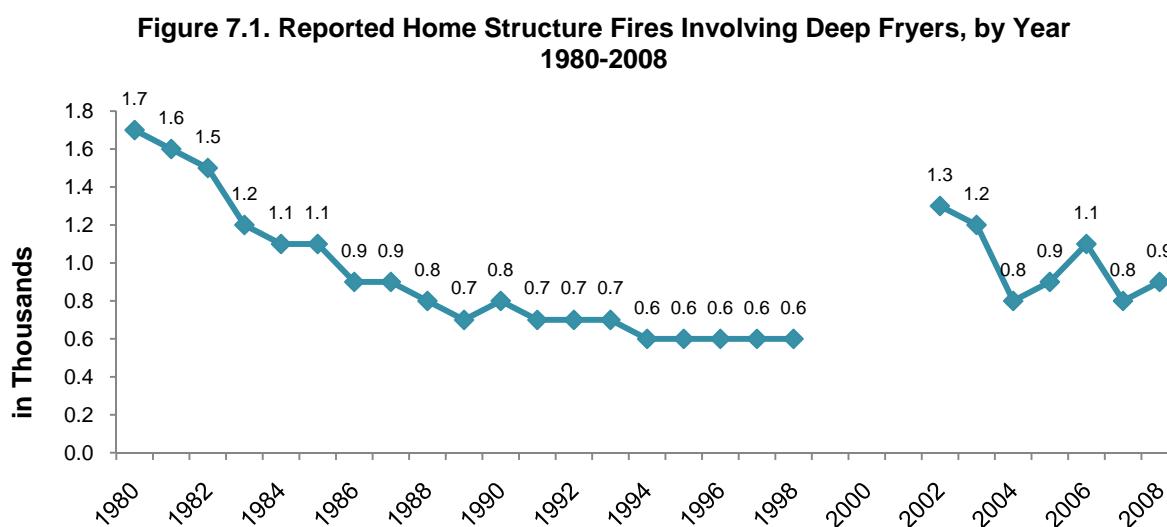
caution should be used when comparing data before 1998 with data from 1999 on. The estimates reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined type. Fires reported as "no equipment" but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated.

Certain types of fires collectively referred to as "confined fires," including confined cooking fires, chimney fires, trash fires, and fuel burner or boiler fires (incident types 113-118) can be documented more easily in NFIRS 5.0. Causal data, including equipment involved in ignition, is generally not required for these incidents although it is provided in some cases. Equipment involved in ignition was reported in 23% of the non-confined fires and 5% of the confined fires. Confined and non-confined structure fires were analyzed separately and then summed to obtain estimates of all fires involving ranges. Detailed analyses on causal factors were done of non-confined fires only. Additional details on the methodology used may be found in Appendix A.

Fires involving deep fryers fell during the 1980s.

Figure 7.1 and Table 7.1 show that the total number of reported home structure fires involving deep fryers was in 2008 was roughly half the number reported in 1980. Because of the changes in data collection rules and definitions that accompanied the introduction of NFIRS 5.0 in 1999, caution must be used in interpreting these findings. NFIRS 5.0 made it much easier to document minor cooking fires. Reported home structure fires involving deep fryers trended downward throughout much of the 1980s and then leveled off, hitting a low of an estimated average of 600 fires per year from 1994 through 1998, 65% lower than the 1,700 such incidents reported in 1980. These fires were more common in recent years, but no clear trend is apparent.

No clear trend is seen in the NFIRS 5.0 years.



Source: Data from NFIRS and NFPA survey.

Note: See Notes in year table.

Unattended equipment was a factor in more than one-third of the home fires involving deep fryers.

Table 7.2 shows that unattended equipment was a factor contributing to ignition in more than one-third (37%) of reported home structure fires involving deep fryers during 2004-2008. An unclassified misuse of material was a factor in 15%. The equipment was too close to something that could catch fire in 14% of the incidents. In 7%, the equipment was not being operated properly. Abandoned or discarded material was a factor in 6% of the fires.

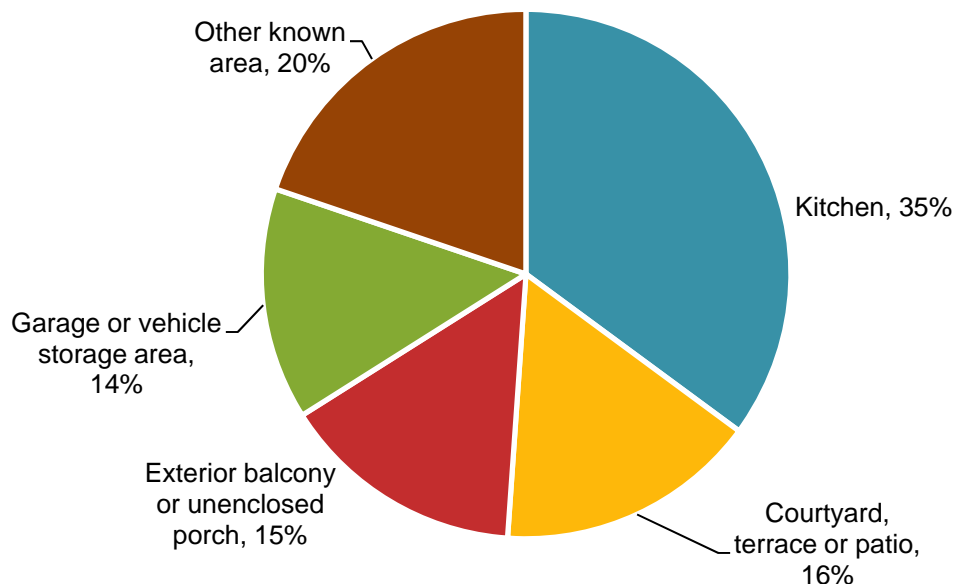
Three of every five home structure fires involving deep fryers began with the ignition of cooking materials.

Table 7.3 shows that cooking materials, including food, were first ignited in 61% of reported home structure fires involving deep fryers. Eighteen percent began with the ignition of flammable or combustible liquids or gases or associated piping. In contrast, only 4% of all reported home structure fires involving cooking equipment began with the ignition of these liquids, gases, or related materials.

Roughly one-third of home structure fires involving deep fryers began in the kitchen.

While 94% of home structure fires involving cooking equipment of all types started in the kitchen, this was true for only 35% of the incidents involving deep fryers. Figure 7.2 and Table 7.4 show that 16% began on or in a courtyard, terrace or patio; 15% started on an exterior balcony or open porch; and 14% started in a garage or vehicle storage area.

**Figure 7.2. Home Structure Fires Involving Deep Fryers, by Area of Origin
2004-2008**



Flame damage was limited to the room of fire origin in 84% of reported deep fryer fires.

Three of every five home structure fires involving deep fryers reported in 2004-2008 were coded with an incident type that indicated the fire was confined to the vessel of origin. In an additional 6%, fire spread was coded as confined to the object of origin fires. Flame damage spread beyond the room of origin in 16% of these fires.

Frying is more dangerous than many other types of cooking.

Frying inherently involves a combustible medium in addition to the food, namely the cooking oil or grease.

Turkey fryers involve extremely large quantities of hot cooking oil. Because the frying process involves inserting the food into the heated medium, then later removing it and transferring it to a drying location, deep frying with these larger quantities of hot oil involve numerous opportunities for thermal burns and scalds, as well as fire ignitions.

Safety Tips

Choose the right cooking equipment. Install and use it properly.

- Always use cooking equipment tested and approved by a recognized testing facility.
- Follow manufacturer's instructions and code requirements when installing and operating cooking equipment.
- Plug cooking appliances directly into an outlet. Never use an extension cord for a cooking appliance as it can overload the circuit and cause a fire.

Watch what you heat!

- The leading cause of fires in the kitchen is unattended cooking.
- Stay in the kitchen when you are frying food. If you leave the kitchen for even a short period of time, turn off the deep fryer.

Stay alert.

- To prevent cooking fires, you have to be alert. You won't be if you are sleepy, have taken medicine or drugs, or consumed alcohol.

Use equipment for intended purposes only.

- Cook only with equipment designed and intended for cooking, and heat your home only with equipment designed and intended for heating. There is additional danger of fire, injury, or death if equipment is used for a purpose for which it was not intended.

Keep things that can catch fire and heat sources apart.

- Keep anything that can catch fire – potholders, oven mitts, wooden utensils, paper or plastic bags, boxes, food packaging, towels or curtains – away from your deep fryer.
- Keep the deep fryer clean.
- Keep pets away to prevent them from knocking over the deep fryer or knocking something onto or into the deep fryer.
- Wear short, close fitting or tightly rolled sleeves when cooking. Loose clothing can dangle into the deep fryer and can catch fire if it comes in contact with a gas flame or electric burner.

Know what to do if your clothes catch fire.

- If your clothes catch fire, stop, drop, and roll. Stop immediately, drop to the ground, and cover face with hands. Roll over and over or back and forth to put out the fire. Immediately cool the burn with *cool* water for 3 to 5 minutes and seek emergency medical treatment.

Know what to do if you have a cooking fire.

- When in doubt, just get out! When you leave, close the door behind you to help contain the fire. Call 911 or the local emergency number after you leave.
- If you try to fight the fire, be sure others are already getting out and you have a clear path to the exit.

Turkey fryers

- NFPA discourages the use of outdoor gas-fueled turkey fryers that immerse the turkey in hot oil. These turkey fryers use a substantial quantity of cooking oil at high temperatures, and units currently available for home use pose a significant danger that hot oil will be released at some point during the cooking process. The use of turkey fryers by consumers can lead to devastating burns, or other injuries and the destruction of property.

**Table 7.1. Home Fires Involving Deep Fryers, by Year
Structure Fires Reported to U.S. Fire Departments**

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2008 Dollars
1980	1,700	160	\$6	\$16
1981	1,600	120	\$6	\$14
1982	1,500	150	\$8	\$18
1983	1,200	90	\$6	\$13
1984	1,100	50	\$5	\$10
1985	1,100	50	\$7	\$14
1986	900	70	\$6	\$12
1987	900	70	\$5	\$9
1988	800	80	\$10	\$18
1989	700	50	\$7	\$12
1990	800	60	\$8	\$13
1991	700	40	\$8	\$13
1992	700	60	\$4	\$6
1993	700	70	\$8	\$12
1994	600	40	\$6	\$9
1995	600	40	\$6	\$8
1996	600	40	\$5	\$7
1997	600	50	\$6	\$8
1998	600	40	\$7	\$9
1999	1,100 (800)	260 (260)	\$26 (\$26)	\$34
2000	1,300 (600)	50 (50)	\$43 (\$43)	\$54
2001	1,200 (800)	140 (140)	\$27 (\$27)	\$32
2002	1,300 (700)	100 (40)	\$25 (\$25)	\$30
2003	1,200 (700)	100 (60)	\$17 (\$17)	\$20
2004	800 (400)	20 (20)	\$9 (\$9)	\$10
2005	900 (300)	40 (20)	\$17 (\$17)	\$18
2006	1,100 (400)	70 (50)	\$16 (\$16)	\$17
2007	800 (400)	10 (10)	\$7 (\$7)	\$8
2008	900 (300)	30 (30)	\$14 (\$14)	\$14

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Because of their small numbers, annual estimates of fire deaths involving this equipment are unreliable and not shown. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 7.2. Home Fires Involving Deep Fryers, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment unattended	300	(37%)	10	(30%)	\$4	(36%)
<i>In non-confined fire</i>	100	(15%)	10	(30%)	\$4	(36%)
<i>In confined fire</i>	200	(22%)	0	(0%)	\$0	(0%)
Unclassified misuse of material or product	100	(15%)	0	(7%)	\$1	(7%)
<i>In non-confined fire</i>	0	(4%)	0	(7%)	\$1	(7%)
<i>In confined fire</i>	100	(11%)	0	(0%)	\$0	(0%)
Heat source too close to combustible	100	(14%)	10	(29%)	\$3	(26%)
<i>In non-confined fire</i>	100	(9%)	10	(29%)	\$3	(26%)
<i>In confined fire</i>	0	(5%)	0	(0%)	\$0	(0%)
Equipment not being operated properly	100	(7%)	0	(0%)	\$1	(5%)
<i>In non-confined fire</i>	0	(3%)	0	(0%)	\$1	(5%)
<i>In confined fire</i>	0	(4%)	0	(0%)	\$0	(0%)
Abandoned or discarded material or product	100	(6%)	10	(21%)	\$1	(10%)
<i>In non-confined fire</i>	0	(2%)	0	(0%)	\$1	(10%)
<i>In confined fire</i>	0	(4%)	10	(21%)	\$0	(0%)
Other known factor	300	(29%)	10	(30%)	\$4	(30%)
<i>In non-confined fire</i>	100	(14%)	10	(30%)	\$4	(29%)
<i>In confined fire</i>	100	(15%)	0	(0%)	\$0	(0%)
Total fires	900	(100%)	30	(100%)	\$12	(100%)
<i>In non-confined fire</i>	400	(41%)	30	(80%)	\$12	(99%)
<i>In confined fire</i>	500	(59%)	10	(20%)	\$0	(1%)
Total entries	1,000	(108%)	40	(116%)	\$14	(114%)
<i>In non-confined fire</i>	400	(47%)	30	(95%)	\$14	(113%)
<i>In confined fire</i>	500	(61%)	10	(21%)	\$0	(1%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding errors.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 7.3. Home Fires Involving Deep Fryers, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	500	(61%)	20	(67%)	\$5	(45%)
<i>In non-confined fire</i>	200	(21%)	20	(47%)	\$5	(44%)
<i>In confined fire</i>	400	(40%)	10	(20%)	\$0	(1%)
Flammable or combustible liquid or gas, piping or filter	200	(18%)	0	(10%)	\$1	(6%)
<i>In non-confined fire</i>	0	(5%)	0	(10%)	\$1	(6%)
<i>In confined fire</i>	100	(13%)	0	(0%)	\$0	(0%)
Other known item	200	(20%)	10	(22%)	\$6	(49%)
<i>In non-confined fire</i>	100	(15%)	10	(22%)	\$6	(49%)
<i>In confined fire</i>	0	(5%)	0	(0%)	\$0	(0%)
Total	900	(100%)	30	(100%)	\$12	(100%)
<i>In non-confined fire</i>	400	(41%)	30	(80%)	\$12	(99%)
<i>In confined fire</i>	500	(59%)	10	(20%)	\$0	(1%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 7.4. Home Fires Involving Deep Fryers, by Area of Origin
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Kitchen	300	(35%)	20	(51%)	\$5	(38%)
<i>In non-confined fire</i>	200	(20%)	10	(31%)	\$5	(38%)
<i>In confined fire</i>	100	(16%)	10	(20%)	\$0	(0%)
Courtyard, terrace or patio	100	(16%)	10	(16%)	\$2	(18%)
<i>In non-confined fire</i>	0	(4%)	10	(16%)	\$2	(18%)
<i>In confined fire</i>	100	(12%)	0	(0%)	\$0	(0%)
Exterior balcony or unenclosed porch	100	(15%)	0	(5%)	\$2	(16%)
<i>In non-confined fire</i>	0	(5%)	0	(5%)	\$2	(16%)
<i>In confined fire</i>	100	(10%)	0	(0%)	\$0	(0%)
Garage or vehicle storage area*	100	(14%)	10	(22%)	\$2	(15%)
<i>In non-confined fire</i>	100	(7%)	10	(22%)	\$2	(15%)
<i>In confined fire</i>	100	(8%)	0	(0%)	\$0	(0%)
Other known area	200	(20%)	0	(6%)	\$2	(13%)
<i>In non-confined fire</i>	100	(6%)	0	(6%)	\$2	(12%)
<i>In confined fire</i>	100	(14%)	0	(0%)	\$0	(0%)
Total	900	(100%)	30	(100%)	\$12	(100%)
<i>In non-confined fire</i>	400	(41%)	30	(80%)	\$12	(99%)
<i>In confined fire</i>	500	(59%)	10	(20%)	\$0	(1%)

*Does not include garage coded as separate property.

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Table 7.5. Home Fires Involving Deep Fryers, by Extent of Flame Damage
Annual Average of 2004-2008 Structure Fires Reported by U.S. Fire Departments

Extent of Flame Damage	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	500	(59%)	10	(20%)	\$0	(1%)
Confined to object of origin	100	(6%)	0	(4%)	\$1	(5%)
Confined to room of origin	200	(20%)	10	(46%)	\$3	(27%)
Confined to floor of origin	0	(4%)	0	(0%)	\$1	(6%)
Confined to building of origin	100	(11%)	10	(30%)	\$7	(55%)
Beyond building of origin	0	(1%)	0	(0%)	\$1	(8%)
Total	900	(100%)	30	(100%)	\$12	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Grease Hoods or Duct Exhaust Fans

Grease hood or duct exhaust fans were involved in less than 1% of reported home cooking equipment fires.

During 2004-2008, U.S. fire departments responded to an average of 700 home structure fires per year in which a grease hood or duct exhaust fan was involved in ignition. These fires caused an annual average of 20 civilian injuries, and \$6 million in direct property damage. These incidents accounted for less than 1% of the reported home fires and associated injuries involving cooking equipment and 1% of the direct property damage from cooking equipment fires. No civilian deaths were reported in these incidents.

Data Sources, Definitions and Conventions Used in this Report

The fire statistics 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 NFPA's annual fire department experience survey. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Fires were rounded to the nearest hundred, civilian injuries to the nearest 10, and direct property damage was rounded to the nearest million dollars. Property damage has not been adjusted for inflation unless so indicated.

NFIRS 5.0 equipment involved in ignition code 654 captures fires involving grease hoods or duct exhaust fans. NFIRS 5.0 incident type codes in the range of 110-129 were used to identify structure fires. Unknown data were allocated proportionally in most fields analyzed except for incident type. NFIRS 5.0, first introduced in 1999, brought major changes to fire incident data, including changes in some definitions and coding rules. Because of these changes, caution should be

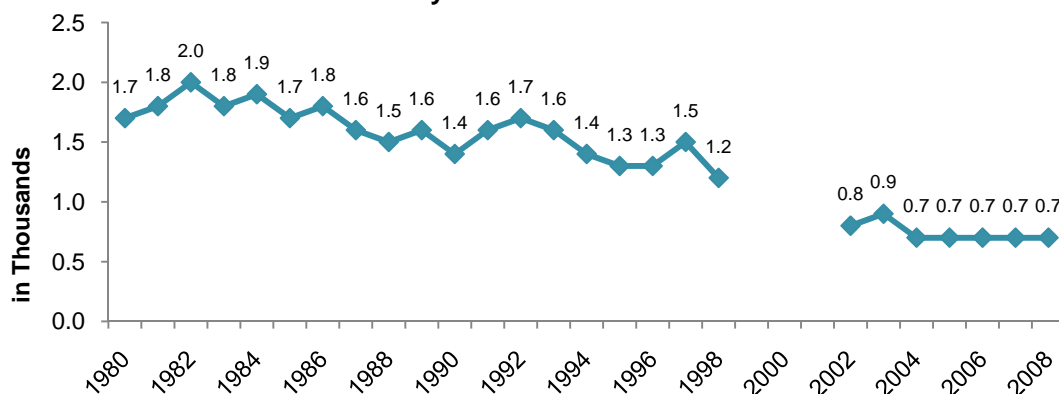
used when comparing data before 1998 with data from 1999 on. The estimates reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined type. Fires reported as "no equipment" but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated.

Certain types of fires collectively referred to as "confined fires," including confined cooking fires, chimney fires, trash fires, and fuel burner or boiler fires (incident types 113-118) can be documented more easily in NFIRS 5.0. Causal data, including equipment involved in ignition, is generally not required for these incidents although it is provided in some cases. Equipment involved in ignition was reported in 23% of the non-confined fires and 5% of the confined fires. Confined and non-confined structure fires were analyzed separately and then summed to obtain estimates of all fires involving ranges. Detailed analyses on causal factors were done of non-confined fires only. Additional details on the methodology used may be found in Appendix A.

Fires involving grease hoods and duct exhaust fans have been stable since 2004.

Figure 8.1 and Table 8.1 show that the total number of reported home structure fires involving grease hoods or duct exhaust fans was less than half as high in recent years as in the 1980s. Because of the changes in data collection rules and definitions that accompanied the introduction of NFIRS 5.0 in 1999, caution must be used in interpreting these findings.

Figure 8.1. Reported Home Structure Fires Involving Grease Hoods or Duct Exhaust Fans by Year: 1980-2008



Source: Data from NFIRS and NFPA survey.

Note: See Notes in year table.

Electrical failures or malfunctions were factors in one-third of the home fires involving grease hoods or duct exhaust fans.

Table 8.2 shows that an electrical failure or malfunction was a factor contributing to ignition in 33% of home structure fires involving grease hoods or duct exhaust fans reported during 2004-2008. The equipment was unattended in 17% of the fires. An unclassified mechanical failure or malfunction was a factor in 12% and a failure to clean was a factor in 9%.

More than one-third of the home structure fires involving grease hoods or duct exhaust fans began with the ignition of cooking materials or food.

Table 8.3 shows that cooking materials, including food, were the item first ignited in 37% of reported home structure fires involving grease hoods or duct exhaust fans. Seventeen percent started with electrical wire or cable insulation while 13% began with the ignition of an appliance housing or casing.

Flame damage was limited to the room of fire origin in 88% of reported grease hood or duct exhaust fan fires.

Table 8.4 shows that 42% of all home structure fires involving grease hoods or duct exhaust fans reported in 2004-2008 were coded with an incident type that indicated the fire was confined to the vessel of origin. In an additional 19%, fire spread was coded as confined to the object of origin. Flame damage spread beyond the room of origin in 12% of these fires.

Safety Tip

- Follow manufacturer's instructions regarding installation, operation, and especially regular maintenance, including cleaning.

**Table 8.1. Home Fires Involving Grease Hoods or Duct Fans, by Year
Structure Fires Reported to U.S. Fire Departments**

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2008 Dollars
1980	1,700	30	\$5	\$13
1981	1,800	30	\$6	\$14
1982	2,000	20	\$5	\$11
1983	1,800	20	\$7	\$15
1984	1,900	30	\$6	\$12
1985	1,700	20	\$6	\$12
1986	1,800	20	\$7	\$14
1987	1,600	50	\$3	\$6
1988	1,500	60	\$11	\$20
1989	1,600	50	\$5	\$9
1990	1,400	30	\$7	\$12
1991	1,600	60	\$11	\$17
1992	1,700	40	\$6	\$9
1993	1,600	50	\$9	\$13
1994	1,400	40	\$9	\$13
1995	1,300	50	\$6	\$8
1996	1,300	30	\$5	\$7
1997	1,500	40	\$11	\$15
1998	1,200	30	\$6	\$8
1999	1,000 (700)	0 (0)	\$3 (\$2)	\$4
2000	500 (400)	50 (50)	\$13 (\$13)	\$17
2001	1,100 (700)	0 (0)	\$6 (\$6)	\$7
2002	800 (500)	30 (0)	\$2 (\$2)	\$3
2003	900 (500)	70 (70)	\$5 (\$5)	\$6
2004	700 (400)	30 (30)	\$6 (\$6)	\$7
2005	700 (400)	10 (10)	\$8 (\$8)	\$8
2006	700 (500)	10 (10)	\$7 (\$7)	\$7
2007	700 (400)	20 (20)	\$4 (\$4)	\$4
2008	700 (400)	10 (0)	\$6 (\$6)	\$6

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Because of their small numbers, annual estimates of fire deaths involving this equipment are unreliable and not shown. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution.* Inflation adjustment to 2008 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2008) and from NFPA survey.

**Table 8.2. Home Fires Involving Grease Hood or Duct Fan Fires, by Factor Contributing to Ignition
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Factor	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Electrical failure or malfunction	200	(33%)	10	(64%)	\$2	(39%)
<i>In non-confined fire</i>	200	(27%)	10	(64%)	\$2	(39%)
<i>In confined fire</i>	0	(5%)	0	(0%)	\$0	(0%)
Equipment unattended	100	(17%)	0	(17%)	\$0	(4%)
<i>In non-confined fire</i>	0	(6%)	0	(17%)	\$0	(4%)
<i>In confined fire</i>	100	(11%)	0	(0%)	\$0	(0%)
Unclassified mechanical failure or malfunction	100	(12%)	0	(0%)	\$1	(24%)
<i>In non-confined fire</i>	100	(8%)	0	(0%)	\$1	(24%)
<i>In confined fire</i>	0	(3%)	0	(0%)	\$0	(0%)
Failure to clean	100	(9%)	0	(0%)	\$0	(4%)
<i>In non-confined fire</i>	0	(5%)	0	(0%)	\$0	(4%)
<i>In confined fire</i>	0	(4%)	0	(0%)	\$0	(0%)
Other known factor	300	(36%)	0	(0%)	\$2	(30%)
<i>In non-confined fire</i>	100	(16%)	0	(0%)	\$2	(29%)
<i>In confined fire</i>	100	(21%)	0	(0%)	\$0	(1%)
Total fires	700	(100%)	20	(100%)	\$6	(100%)
<i>In non-confined fire</i>	400	(58%)	10	(81%)	\$6	(98%)
<i>In confined fire</i>	300	(42%)	0	(19%)	\$0	(2%)
Total entries	800	(106%)	20	(81%)	\$6	(102%)
<i>In non-confined fire</i>	400	(62%)	10	(81%)	\$6	(100%)
<i>In confined fire*</i>	300	(44%)	0	*	\$0	(2%)

*The factor contributing to ignition was coded as “none” in the injuries (19%) resulting from confined fires involving grease hoods or duct fans.

Note: Multiple entries are allowed, resulting in more factor entries than fires. Home cooking fires involving cooking equipment and factor contributing to ignition listed as unknown, unreported, none, or blank have also been allocated proportionally. Totals may not equal sums because of rounding error.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 8.3. Home Fires Involving Grease Hoods or Duct Fans, by Item First Ignited
Annual Average of 2004-2008 Structure Fires Reported to U.S. Fire Departments**

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	300	(37%)	10	(70%)	\$1	(10%)
<i>In non-confined fire</i>	100	(13%)	10	(51%)	\$1	(9%)
<i>In confined fire</i>	200	(24%)	0	(19%)	\$0	(1%)
Electrical wire or cable insulation	100	(17%)	0	(0%)	\$1	(21%)
<i>In non-confined fire</i>	100	(14%)	0	(0%)	\$1	(21%)
<i>In confined fire</i>	0	(3%)	0	(0%)	\$0	(0%)
Appliance housing or casing	100	(13%)	0	(16%)	\$1	(17%)
<i>In non-confined fire</i>	100	(9%)	0	(16%)	\$1	(17%)
<i>In confined fire</i>	0	(3%)	0	(0%)	\$0	(0%)
Unclassified item	100	(8%)	0	(0%)	\$0	(5%)
<i>In non-confined fire</i>	0	(2%)	0	(0%)	\$0	(5%)
<i>In confined fire</i>	0	(6%)	0	(0%)	\$0	(1%)
Other known item	200	(24%)	0	(14%)	\$3	(46%)
<i>In non-confined fire</i>	100	(19%)	0	(14%)	\$3	(46%)
<i>In confined fire</i>	0	(5%)	0	(0%)	\$0	(0%)
Total	700	(100%)	20	(100%)	\$6	(100%)
<i>In non-confined fire</i>	400	(58%)	10	(81%)	\$6	(98%)
<i>In confined fire</i>	300	(42%)	0	(19%)	\$0	(2%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 8.4. Home Fires Involving Grease Hoods or Duct Exhaust Fan, by Extent of Flame Damage
Annual Average of 2004-2008 Structure Fires Reported by U.S. Fire Departments**

Extent of Flame Damage	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	300	(42%)	0	(19%)	\$0	(2%)
Confined to object of origin	100	(19%)	0	(19%)	\$0	(6%)
Confined to room of origin	200	(27%)	10	(51%)	\$1	(25%)
Confined to floor of origin	0	(2%)	0	(0%)	\$1	(20%)
Confined to building of origin	100	(10%)	0	(11%)	\$3	(46%)
Beyond building of origin	0	(0%)	0	(0%)	\$0	(1%)
Total	700	(100%)	20	(100%)	\$6	(100%)

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.

Source: Data from NFIRS Version 5.0 and NFPA survey.

Appendix A. How National Estimates Statistics Are Calculated

The statistics in this analysis are estimates derived 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 survey of U.S. fire departments. NFIRS is a voluntary system by which participating fire departments report detailed factors about the fires to which they respond. Roughly two-thirds of U.S. fire departments participate, although not all of these departments provide data every year. Fires reported to federal or state fire departments or industrial fire brigades are not included in these estimates.

NFIRS provides the most detailed incident information of any national database not limited to large fires. NFIRS is the only database capable of addressing national patterns for fires of all sizes by specific property use and specific fire cause. NFIRS also captures information on the extent of flame spread, and automatic detection and suppression equipment. For more information about NFIRS visit <http://www.nfirs.fema.gov/>. Copies of the paper forms may be downloaded from http://www.nfirs.fema.gov/documentation/design/NFIRS_Paper_Forms_2008.pdf.

NFIRS has a wide variety of data elements and code choices. The NFIRS database contains coded information. Many code choices describe several conditions. These cannot be broken down further. For example, area of origin code 83 captures fires starting in vehicle engine areas, running gear areas or wheel areas. It is impossible to tell the portion of each from the coded data.

Methodology may change slightly from year to year.

NFPA is continually examining its methodology to provide the best possible answers to specific questions, methodological and definitional changes can occur. *Earlier editions of the same report may have used different methodologies to produce the same analysis, meaning that the estimates are not directly comparable from year to year.*

NFPA's fire department experience survey provides estimates of the big picture.

Each year, NFPA conducts an annual survey of fire departments which enables us to capture a summary of fire department experience on a larger scale. Surveys are sent to all municipal departments protecting populations of 50,000 or more and a random sample, stratified by community size, of the smaller departments. Typically, a total of roughly 3,000 surveys are returned, representing about one of every ten U.S. municipal fire departments and about one third of the U.S. population.

The survey is stratified by size of population protected to reduce the uncertainty of the final estimate. Small rural communities have fewer people protected per department and are less likely to respond to the survey. A larger number must be surveyed to obtain an adequate sample of those departments. (NFPA also makes follow-up calls to a sample of the smaller fire departments that do not respond, to confirm that those that did respond are truly representative of fire departments their size.) On the other hand, large city

departments are so few in number and protect such a large proportion of the total U.S. population that it makes sense to survey all of them. Most respond, resulting in excellent precision for their part of the final estimate.

The survey includes the following information: (1) the total number of fire incidents, civilian deaths, and civilian injuries, and the total estimated property damage (in dollars), for each of the major property use classes defined in NFIRS; (2) the number of on-duty firefighter injuries, by type of duty and nature of illness; 3) the number and nature of non-fire incidents; and (4) information on the type of community protected (e.g., county versus township versus city) and the size of the population protected, which is used in the statistical formula for projecting national totals from sample results. The results of the survey are published in the annual report *Fire Loss in the United States*. To download a free copy of the report, visit <http://www.nfpa.org/assets/files/PDF/OS.fireloss.pdf>.

Projecting NFIRS to National Estimates

As noted, NFIRS is a voluntary system. Different states and jurisdictions have different reporting requirements and practices. Participation rates in NFIRS are not necessarily uniform across regions and community sizes, both factors correlated with frequency and severity of fires. This means NFIRS may be susceptible to systematic biases. No one at present can quantify the size of these deviations from the ideal, representative sample, so no one can say with confidence that they are or are not serious problems. But there is enough reason for concern so that a second database -- the NFPA survey -- is needed to project NFIRS to national estimates and to project different parts of NFIRS separately. This multiple calibration approach makes use of the annual NFPA survey where its statistical design advantages are strongest.

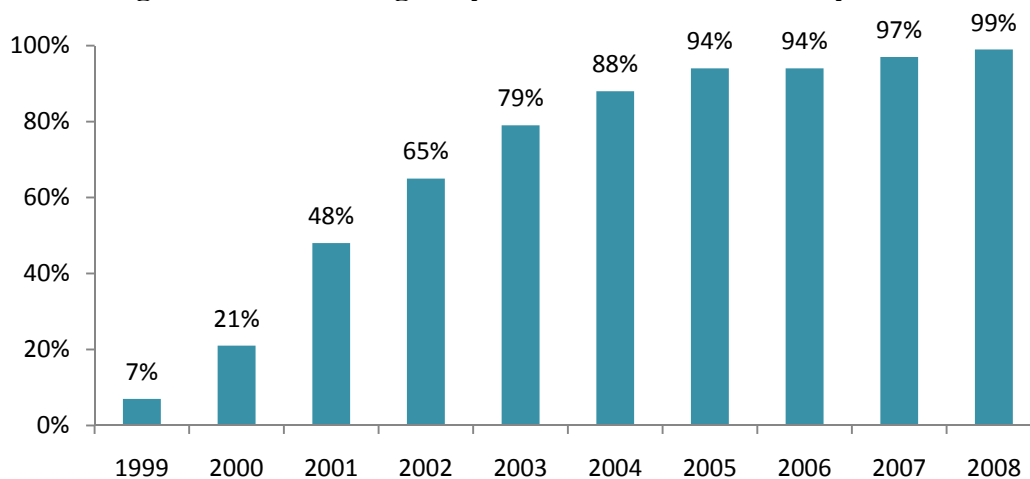
Scaling ratios are obtained by comparing NFPA's projected totals of residential structure fires, non-residential structure fires, vehicle fires, and outside and other fires, and associated civilian deaths, civilian injuries, and direct property damage with comparable totals in NFIRS. Estimates of specific fire problems and circumstances are obtained by multiplying the NFIRS data by the scaling ratios. Reports for incidents in which mutual aid was given are excluded from NFPA's analyses.

Analysts at the NFPA, the USFA, and the Consumer Product Safety Commission developed the specific basic analytical rules used for this procedure. "The National Estimates Approach to U.S. Fire Statistics," by John R. Hall, Jr. and Beatrice Harwood, provides a more detailed explanation of national estimates. A copy of the article is available online at <http://www.nfpa.org/osds> or through NFPA's One-Stop Data Shop.

Version 5.0 of NFIRS, first introduced in 1999, used a different coding structure for many data elements, added some property use codes, and dropped others. The essentials of the approach described by Hall and Harwood are still used, but some modifications have been necessary to accommodate the changes in NFIRS 5.0.

Figure A.1 shows the percentage of fires originally collected in the NFIRS 5.0 system. Each year's release version of NFIRS data also includes data collected in older versions of NFIRS that were converted to NFIRS 5.0 codes.

Figure A.1. Fires Originally Collected in NFIRS 5.0 by Year



From 1999 data on, analyses are based on scaling ratios using only data originally collected in NFIRS 5.0:

$$\frac{\text{NFPA survey projections}}{\text{NFIRS totals (Version 5.0)}}$$

For 1999 to 2001, the same rules may be applied, but estimates for these years in this form will be less reliable due to the smaller amount of data originally collected in NFIRS 5.0; they should be viewed with extreme caution.

NFIRS 5.0 introduced six categories of confined structure fires, including:

- cooking fires confined to the cooking vessel,
- confined chimney or flue fires,
- confined incinerator fire,
- confined fuel burner or boiler fire or delayed ignition,
- confined commercial compactor fire, and
- trash or rubbish fires in a structure with no flame damage to the structure or its contents.

Although causal and other detailed information is typically not required for these incidents, it is provided in some cases. Some analyses, particularly those that examine cooking equipment, heating equipment, fires caused by smoking materials, and fires started by playing with fire, may examine the confined fires in greater detail. Because the confined fire incident types describe certain scenarios, the distribution of unknown data differs from that of all fires. Consequently, allocation of unknowns must be done separately.

Some analyses of structure fires show only non-confined fires. In these tables, percentages shown are of non-confined structure fires rather than all structure fires. This approach has the advantage of showing the frequency of specific factors in fire causes, but the disadvantage of possibly overstating the percentage of factors that are seldom seen in the confined fire incident types and of understating the factors specifically associated with the confined fire incident types.

Other analyses include entries for confined fire incident types in the causal tables and show percentages based on total structure fires. In these cases, the confined fire incident type is treated as a general causal factor.

For most fields other than Property Use and Incident Type, NFPA allocates unknown data proportionally among known data. This approach assumes that if the missing data were known, it would be distributed in the same manner as the known data. NFPA makes additional adjustments to several fields. *Casualty and loss projections can be heavily influenced by the inclusion or exclusion of unusually serious fire.*

In the formulas that follow, the term “all fires” refers to all fires in NFIRS on the dimension studied. The percentages of fires with known or unknown data are provided for non-confined fires and associated losses, and for confined fires only.

Cause of Ignition: This field is used chiefly to identify intentional fires. “Unintentional” in this field is a specific entry and does not include other fires that were not intentionally set: failure of equipment or heat source, act of nature, or “other” (unclassified).” The last should be used for exposures but has been used for other situations as well. Fires that were coded as under investigation and those that were coded as undetermined after investigation were treated as unknown.

Factor Contributing to Ignition: In this field, the code “none” is treated as an unknown and allocated proportionally. For Human Factor Contributing to Ignition, NFPA enters a code for “not reported” when no factors are recorded. “Not reported” is treated as an unknown, but the code “none” is treated as a known code and not allocated. Multiple entries are allowed in both of these fields. Percentages are calculated on the total number of fires, not entries, resulting in sums greater than 100%. Although Factor Contributing to Ignition is only required when the cause of ignition was coded as: 2) unintentional, 3) failure of equipment or heat source; or 4) act of nature, data is often present when not required. Consequently, any fire in which no factor contributing to ignition was entered was treated as unknown.

In some analyses, all entries in the category of mechanical failure, malfunction (factor contributing to ignition 20-29) are combined and shown as one entry, “mechanical failure or malfunction.” This category includes:

21. Automatic control failure;
22. Manual control failure;
23. Leak or break. Includes leaks or breaks from containers or pipes. Excludes operational deficiencies and spill mishaps;
25. Worn out;

- 26. Backfire. Excludes fires originating as a result of hot catalytic converters;
- 27. Improper fuel used; Includes the use of gasoline in a kerosene heater and the like; and
- 20. Mechanical failure or malfunction, other.

Entries in “electrical failure, malfunction” (factor contributing to ignition 30-39) may also be combined into one entry, “electrical failure or malfunction.” This category includes:

- 31. Water-caused short circuit arc;
- 32. Short-circuit arc from mechanical damage;
- 33. Short-circuit arc from defective or worn insulation;
- 34. Unspecified short circuit arc;
- 35. Arc from faulty contact or broken connector, including broken power lines and loose connections;
- 36. Arc or spark from operating equipment, switch, or electric fence;
- 37. Fluorescent light ballast; and
- 30. Electrical failure or malfunction, other.

Heat Source. In NFIRS 5.0, one grouping of codes encompasses various types of open flames and smoking materials. In the past, these had been two separate groupings. A new code was added to NFIRS 5.0, which is code 60: “Heat from open flame or smoking material, other.” NFPA treats this code as a partial unknown and allocates it proportionally across the codes in the 61-69 range, shown below.

- 61. Cigarette;
- 62. Pipe or cigar;
- 63. Heat from undetermined smoking material;
- 64. Match;
- 65. Lighter: cigarette lighter, cigar lighter;
- 66. Candle;
- 67. Warning or road flare, fuse;
- 68. Backfire from internal combustion engine. Excludes flames and sparks from an exhaust system, (11); and
- 69. Flame/torch used for lighting. Includes gas light and gas-/liquid-fueled lantern.

In addition to the conventional allocation of missing and undetermined fires, NFPA multiplies fires with codes in the 61-69 range by

$$\frac{\text{All fires in range 60-69}}{\text{All fires in range 61-69}}$$

The downside of this approach is that heat sources that are truly a different type of open flame or smoking material are erroneously assigned to other categories. The grouping “smoking materials” includes codes 61-63 (cigarettes, pipes or cigars, and heat from undetermined smoking material, with a proportional share of the code 60s and true unknown data.

Equipment Involved in Ignition (EII). NFIRS 5.0 originally defined EII as the piece of equipment that provided the principal heat source to cause ignition if the equipment malfunctioned or was used improperly. In 2006, the definition was modified to “the piece of equipment that provided the principal heat source to cause ignition.” However, much of the data predates the change. Individuals who have already been trained with the older definition may not change their practices. To compensate, NFPA treats fires in which EII = NNN and heat source is not in the range of 40-99 as an additional unknown.

To allocate unknown data for EII, the known data is multiplied by

All fires

(All fires – blank – undetermined – [fires in which EII =NNN and heat source <>40-99])

In addition, the partially unclassified codes for broad equipment groupings (i.e., code 100 - heating, ventilation, and air conditioning, other; code 200 - electrical distribution, lighting and power transfer, other; etc.) were allocated proportionally across the individual code choices in their respective broad groupings (heating, ventilation, and air conditioning; electrical distribution, lighting and power transfer, other; etc.). Equipment that is totally unclassified is not allocated further. This approach has the same downside as the allocation of heat source 60 described above. Equipment that is truly different is erroneously assigned to other categories.

In some analyses, various types of equipment are grouped together.

Code Grouping	EII Code	NFIRS definitions
Central heat	132	Furnace or central heating unit
	133	Boiler (power, process or heating)
Fixed or portable space heater	131	Furnace, local heating unit, built-in
	123	Fireplace with insert or stove
	124	Heating stove
	141	Heater, excluding catalytic and oil-filled
	142	Catalytic heater
	143	Oil-filled heater
Fireplace or chimney	120	Fireplace or chimney
	121	Fireplace, masonry
	122	Fireplace, factory-built
	125	Chimney connector or vent connector
	126	Chimney – brick, stone or masonry
	127	Chimney-metal, including stovepipe or flue
Wiring, switch or outlet	210	Unclassified electrical wiring
	211	Electrical power or utility line
	212	Electrical service supply wires from utility
	214	Wiring from meter box to circuit breaker
	216	Electrical branch circuit
	217	Outlet, receptacle

	218	Wall switch
Power switch gear or overcurrent protection device	215	Panel board, switch board, circuit breaker board
	219	Ground fault interrupter
	222	Overcurrent, disconnect equipment
	227	Surge protector
Lamp, bulb or lighting	230	Unclassified lamp or lighting
	231	Lamp-tabletop, floor or desk
	232	Lantern or flashlight
	233	Incandescent lighting fixture
	234	Fluorescent light fixture or ballast
	235	Halogen light fixture or lamp
	236	Sodium or mercury vapor light fixture or lamp
	237	Work or trouble light
	238	Light bulb
	241	Nightlight
	242	Decorative lights – line voltage
	243	Decorative or landscape lighting – low voltage
	244	Sign
Cord or plug	260	Unclassified cord or plug
	261	Power cord or plug, detachable from appliance
	262	Power cord or plug- permanently attached
	263	Extension cord
Torch, burner or soldering iron	331	Welding torch
	332	Cutting torch
	333	Burner, including Bunsen burners
	334	Soldering equipment
Portable cooking or warming equipment	631	Coffee maker or teapot
	632	Food warmer or hot plate
	633	Kettle
	634	Popcorn popper
	635	Pressure cooker or canner
	636	Slow cooker
	637	Toaster, toaster oven, counter-top broiler
	638	Waffle iron, griddle
	639	Wok, frying pan, skillet
	641	Breadmaking machine

The equipment involved in ignition was undetermined, not reported, or coded as no equipment with a heat source code outside the range of 40-99 (non-equipment related heat sources) in 77% of the non-confined home cooking fires, 82% of the civilian deaths, 71% of the injuries, and 78% of the direct property damage. Equipment was not analyzed separately for confined fires. Instead, each confined fire incident type was listed with the equipment or as other known equipment. In the raw data, some type of cooking equipment was listed as the equipment involved in ignition in a total of 23,508 non-confined fires that resulted in 170 civilian deaths, 2,139 civilian injuries, and \$331 million over the five-year period of 2004-2008. Over the same period, some type of cooking equipment was entered in a total of 12,334 confined cooking fires that resulted in one civilian death, 374 civilian injuries and \$7 million in direct property damage.

Item First Ignited. In most analyses, mattress and pillows (item first ignited 31) and bedding, blankets, sheets, and comforters (item first ignited 32) are combined and shown as “mattresses and bedding.” In many analyses, wearing apparel not on a person (code 34) and wearing apparel on a person (code 35) are combined and shown as “clothing.” In some analyses, flammable and combustible liquids and gases, piping and filters (item first ignited 60-69) are combined and shown together.

Area of Origin. Two areas of origin: bedroom for more than five people (code 21) and bedroom for less than five people (code 22) are combined and shown as simply “bedroom.” Chimney is no longer a valid area of origin code for non-confined fires.

Rounding and percentages. The data shown are estimates and generally rounded. An entry of zero may be a true zero or it may mean that the value rounds to zero. Percentages are calculated from unrounded values. It is quite possible to have a percentage entry of up to 100% even if the rounded number entry is zero. The same rounded value may account for a slightly different percentage share. Because percentages are expressed in integers and not carried out to several decimal places, percentages that appear identical may be associated with slightly different values.

Inflation. Property damage estimates are not adjusted for inflation unless so indicated. In this analysis, inflation adjusted damage estimates are provided in Table 1, 1A and 1B.

Appendix B Selected Published Incidents

The following are selected published incidents involving home cooking equipment. Included are short articles from the “Firewatch” or “Bi-monthly” columns in *NFPA Journal* or its predecessor *Fire Journal* and incidents from either the large-loss fires report or catastrophic fires report. If available, investigation reports or NFPA Alert Bulletins are included and provide detailed information about the fires.

It is important to remember that this is anecdotal information. Anecdotes show what can happen; they are not a source to learn about what typically occurs.

NFPA’s Fire Incident Data Organization (FIDO) identifies significant fires through a clipping service, the Internet, and other sources. Additional information is obtained from the fire service and federal and state agencies. FIDO is the source for articles published in the “Firewatch” column of the *NFPA Journal* and many of the articles in this report.

Stove fire kills one, North Dakota

A 27-year-old died trying to extinguish a stovetop fire in a top-floor apartment of a three-story apartment building.

The unsprinklered wood-frame, 18-unit apartment building, which covered approximately 16,000 square feet (1,500 square meters), had a fire detection system that covered the common spaces and the apartments.

The fire activated the detection system at 11:10 p.m., alerting the resident of the unit next door. When the neighbor looked out his door, however, he saw nothing in the hallway and went back into his apartment. Minutes later, he heard water running and movement in the apartment next door and looked out again to find the adjacent apartment door open and smoke and heat filling the hallway. Crawling low, he left the building and called 911.

Arriving firefighters found the victim in his apartment. Investigators determined that he had turned two burners on to cook some food and suspect that either cooking oil spilled under the burners or food spilled on them and ignited. The resulting fire spread to the kitchen cabinets.

The fire damaged the building’s third-floor hallway, and the unit of origin, while heavy smoke spread to other units on the floor. The building and its contents, valued at \$1.5 million, sustained losses of \$215,000.

Kenneth J. Tremblay, 2010, “Firewatch”, *NFPA Journal*, November/December, 24.

Unattended cooking leads to fire death, Alabama

A 54-year-old man died of smoke inhalation in a fire that started when he fell asleep after turning on the stove in his single-story, wood-frame home. The house, which covered approximately 1,300 square feet (396 square meters), had no smoke alarms or sprinklers.

Firefighters were called to the neighborhood at 9:23 p.m., and arrived about five minutes later to discover that the fire had nearly burned itself out. When they forced entry, they found a red-hot

pan on the operating stove burner and shut the heat off. They discovered the victim on the floor roughly 50 feet (15 meters) from the kitchen, dead of smoke inhalation.

Investigators determined that the fire ignited the area above the stovetop and that smoke spread from the kitchen throughout the house.

The house, valued at \$62,500, sustained \$10,000 in damage. Its contents, valued at \$10,000, sustained an \$8,000 loss.

Kenneth J. Tremblay, 2010, "Firewatch", *NFPA Journal*, November/December, 23.

Oven used for storage leads to fatal fire, Massachusetts

A 71-year-old woman and her 72-year-old husband died of smoke inhalation injuries they sustained while trying to extinguish a fire in an oven used for storage.

The 1 ½-story, single-family, wood-frame house was 35 feet (11 meters) long and 30 feet (9 meters) wide. It had a single-station smoke alarm, but there were no sprinklers.

Investigators determined that the couple used the oven to store combustibles and inadvertently turned it on. After the heat ignited the stored goods, the pair tried to control the fire and called 911. They became disoriented, and succumbed to smoke inhalation. The woman died at the scene, and her husband died later in the hospital.

Fire damage to the house was limited to the area around the range, although heavy smoke spread throughout the dwelling. Property damage to the house, which was valued at \$81,000, and its contents, valued at \$75,000, was estimated at \$10,000.

Kenneth J. Tremblay, 2010, "Firewatch", *NFPA Journal*, November/December, 23.

Sprinkler extinguishes apartment fire, Wisconsin

A single sprinkler extinguished a fire that began when the occupant of an apartment turned on the wrong stove burner and unintentionally overheated a pan of grease that had been left on the burner.

The three-story, 24-unit apartment building, which was 210 feet (64 meters) long and 67 feet (20 meters) wide, had exterior walls of brick and an asphalt roof. It had a wet-pipe sprinkler system, which was monitored by a central station fire alarm company, and hardwired smoke detection equipment, which operated and alerted the building occupants.

The sprinkler in the kitchen activated and extinguished the fire before firefighters arrived. There were no injuries, and damage was not reported.

Kenneth J. Tremblay, 2010, "Firewatch", *NFPA Journal*, November/December, 22-23.

Unattended cooking starts fatal fire, Michigan

A 36-year-old man died when he was overcome by smoke in a fire that began when he left food cooking unattended on the stove in his single-family home.

Two families lived in the single-story, manufactured home, which was 58 feet (18 meters) long and 25 feet (8 meters) wide and had several additions. It had no sprinklers, and investigators could not determine whether smoke alarms were present.

A neighbor called 911 at 8:31 p.m. to report the fire, and the fire department arrived nine minutes later to find the home fully involved. Fire crews found the victim lying face down on the side of the house opposite the kitchen. A witness reported that the man had been very intoxicated before the fire started.

The fire destroyed the house, valued at \$80,000, and its contents, which were valued at \$45,000.

Ken Tremblay, 2010, "Firewatch", *NFPA Journal*, September/October, 33.

Malfunctioning microwave starts fire, Connecticut

A single sprinkler extinguished a fire that began when a microwave oven malfunctioned and ignited crackers stored inside it and wooden cabinets above it.

The three-story, 54-unit, wood-frame apartment building, which was 255 feet (78 meters) long and 56 feet (17 meters) wide, had brick walls and a wooden roof covered with asphalt shingles. In addition to the wet-pipe sprinkler system, the building had a smoke and heat detection system.

A woman was using the stove in her first-floor unit when she smelled something burning. Unable to find the source of the smell in the kitchen, she went into the bedroom to see if anything was amiss. Seeing nothing out of the ordinary, she returned to the kitchen, where she saw smoke. At about the same time, the smoke detectors began to sound.

A floor monitor who came to investigate opened a window and told the woman and her husband, who had been watching television in the living room, to evacuate. The monitor also pulled the building's manual fire alarm and asked a neighbor to call 911. When the couple left the apartment, they did not know where the smoke was coming from.

A fuse problem in the fire alarm control panel prevented the alarm from reaching the monitoring company, so the fire department only learned of the fire through the 911 call. Fortunately, one 155°F (68°C) sprinkler operated and extinguished the fire in the unit.

Investigators determined that the fire started in the internal control panel of the kitchen's microwave, which was plugged in but not in use at the time of the fire.

The building, valued at \$2.8 million, sustained \$22,000 in damage. There were no injuries.

Ken Tremblay, 2010, "Firewatch", *NFPA Journal*, September/October, 32.

Residential sprinkler douses apartment fire, Oklahoma

By the time firefighters responded to a 911 call reporting a kitchen fire at a wood-frame apartment building, a residential fire sprinkler had extinguished the blaze.

The 24-unit, three-story apartment building, which measured 116 feet (35 meters) by 63 feet (19 meters), was covered with brick and wood siding. Its wooden roof was covered with asphalt shingles. The building was protected by monitored, hardwired, interconnected smoke alarms installed in the bedrooms and hallways and a wet-pipe sprinkler system designed in accordance with NFPA 13R, *Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height*.

Investigators determined that the fire began when oil left heating unattended in a pan on the stove in a third-floor apartment ignited. The smoke alarm alerted the apartment's occupant, who tried to extinguish the flames with water. When this caused the fire to intensify, he called 911 at 7:18 p.m.

Estimates placed the damage to the building at \$5,000, while damage to the apartment's contents was estimated at \$1,500. There were no injuries.

Ken Tremblay, 2010, "Firewatch", *NFPA Journal*, September/October, 31.

Unattended Cooking Ignites Deadly Fire, Texas

A 22-year-old woman died in a fire that began when the contents of a pan she left unattended on the stove in her two-story, wood-frame duplex ignited.

Investigators determined that aluminum-like metal on and around the burner melted and ignited nearby combustibles. The fire spread from the kitchen to the dining room, most of the walls of which did not have sheetrock. Three of the seven joists above the dining room were severely damaged, causing the floor in the bedroom above to collapse.

The duplex, valued at \$68,000, sustained \$50,000 in damage. Damage to its contents was estimated at \$10,000. The duplex had neither smoke alarms nor sprinklers.

Ken Tremblay, 2010, "Firewatch", *NFPA Journal*, May/June, 34.

Sprinkler Extinguishes Fatal Apartment Fire, Minnesota

A single sprinkler extinguished a fire in a three-story apartment building, but not before it fatally burned an 86-year-old woman, who died 12 hours later.

The three-story wood-frame apartment building was part of a large complex protected by a monitored wet-pipe sprinkler system. The system also provided smoke detector coverage in the apartments and common spaces. The water flow alarm activated the fire alarm, which notified the fire department at 8:30 a.m.

The victim was cooking gelatin on the front burner of her kitchen stove when her robe ignited. The robe burned quickly until the sprinkler activated and extinguished the fire.

Damage estimates for the building and its contents were not reported.

Kenneth J. Tremblay, 2010, "Firewatch", *NFPA Journal*, March/April 24.

Disabled Woman Dies in Cooking Fire, Pennsylvania

A 73-year-old woman who was blind and used a wheelchair died of burns she suffered when she dropped a foil-and-paper-wrapped sandwich that had caught fire in her microwave onto her lap.

The four-story, steel-frame masonry apartment building, which was 100 feet (30 meters) long and 75 feet (23 meters) wide, had a fire suppression system and a fire detection system that alerted the occupants and the fire department at 5:52 p.m. Responding firefighters discovered that the fire was so small it had extinguished itself before the sprinklers could operate.

Investigators believe that the woman put the sandwich in the microwave, not realizing that it was wrapped in aluminum foil under the paper. When she turned the microwave on, the foil arced and ignited the paper covering the sandwich. After retrieving the burning sandwich from the microwave, the woman dropped it in her lap, where it ignited her clothing. The fire enveloped the victim, but did not spread any further.

Damage to the building and its contents was estimated at \$25,000. Two other building occupants, ages 86 and 63, suffered smoke inhalation.

Kenneth J. Tremblay, 2010, "Firewatch," *NFPA Journal*, January/February, 24-25.

Stove Ignites Fatal Fire, Connecticut

An 85-year-old man died of smoke inhalation after a gas stove ignited combustibles in the kitchen of his single-family home.

The two-story, wood-frame house was 48 feet (15 meters) wide and 24 feet (7 meters) long. Single-station, battery-operated smoke alarms on the first and second floors operated as designed. There were no sprinklers.

Firefighters arriving at the house at 1:52 p.m. found heavy fire coming from the open front door and the rear of the home. They tried to enter the structure from the front, but a limited water supply and the volume of the fire forced them to wait for other resources to arrive. Once a water supply had been established, crews used hose lines to knock the fire down and began searching for the occupant.

They found his body on the second floor, where he had died of smoke inhalation. Investigators determined that he had tried unsuccessfully to extinguish the fire with a portable fire extinguisher. When that failed, he opened the front door, then walked upstairs to a bedroom to

call the fire department on the home's only working telephone. This delay allowed the fire to spread up the stairwell and trap the man on the second floor.

Investigators were told that the victim used on stove burner for his cooking and used the rest of the stovetop for storage. They also learned that he had difficulty walking up and down stairs.

The home, valued at \$776,750, and its contents sustained significant damage. Four firefighters were injured during extinguishment operations.

Ken Tremblay, 2009, "Firewatch," *NFPA Journal*, November/December, 23-24.

Cooking Fire Leads to Death, South Carolina

A woman with impaired mobility died of burns caused by a cooking fire in her single-family home.

The one-story, wood-frame house was 60 feet (18 meters) long and 30 feet (9 meters) wide. A smoke alarm in the living room operated during the fire. There were no sprinklers.

The fire began when a pan of food ignited. The cook, a man suffering from Alzheimer's disease, tried unsuccessfully to control the flames, but the fire continued to spread. He was able to leave the house, but the woman, who used a wheelchair, couldn't get out in time. A neighbor eventually rescued her, but not before she was fatally burned.

The home, valued at \$50,000, sustained \$35,000 in damage. Its contents, valued at \$15,000, were destroyed.

Ken Tremblay, 2009, "Firewatch," *NFPA Journal*, November/December, 23.

Kitchen Fire Kills Man, Indiana

A 74-year-old man died of smoke inhalation when a pan of grease he had left heating unattended on the stove ignited. The fire spread through the first-floor apartment's kitchen, across the ceiling, and into the dining room before firefighters brought it under control.

The unsprinklered, wood-frame apartment building, which covered 5,000 square feet (465 square meters), had a roof covered with asphalt shingles. Firefighters found a smoke alarm on a night stand in the victim's bedroom, but it was below the smoke line. The fire was detected by a second-floor occupant who called 911.

After the blaze was extinguished, investigators found three cast-iron skillets on the apartment's electric stove; one with grease in it had been placed on a burner whose control knob was in the 'on' position. After the grease in it ignited, flames spread into a vent hood and to other areas of the kitchen. The fire then spread across the ceiling to other rooms in the apartment.

The building, which was valued at \$500,000, and its contents, valued at \$200,000, sustained property damage estimated at \$50,000 and \$10,000, respectively.

Kenneth J. Tremblay, 2009, "Firewatch," *NFPA Journal*, July/August, 19-20.

Clothing Fire in Apartment Complex Kills One, Ohio

A 57-year-old woman who lived alone died when the sleeve of her robe ignited as she prepared dinner in her fifth-floor apartment.

The six-story, 60-unit apartment building for low-income families was constructed of steel framing with concrete block walls and a brick exterior. It was protected by a dry-pipe sprinkler system and a fire alarm system that included smoke detectors and pull stations.

Although heat from the fire was insufficient to activate the sprinklers, smoke set off the smoke alarm in the apartment, and neighbors responded. One of them used a portable extinguisher to knock down the blaze.

Once they had controlled the flames in the kitchen, they found the occupant, who was mentally ill, sitting on the living room couch. She had tried unsuccessfully to put the fire out at the kitchen sink before moving to the bathroom, where she filled the tub with water and extinguished the fire on her robe.

By that time, however, she had suffered burns, many of them third-degree burns, over 90 percent of her body. She died two days later of her injuries.

Firefighters responding to the alarm completed extinguishment.

Damage to the apartment and the building were not reported.

Kenneth J. Tremblay, 2009, "Firewatch," *NFPA Journal*, May/June, 35.

Unattended Child Dies in Cooking Fire, Louisiana

An off-duty police officer investigating a glow in the sky discovered flames shooting from the roof of a two-story apartment building and notified the fire department at 12:06 a.m. As he began walking around the house, the officer found a 7-year-old boy who had jumped from a second-floor window and who told him that his 6-year-old sister was trapped in their second-floor apartment. The police officer took the boy to the front of the building and told arriving firefighters about the missing girl.

In an attempt to rescue the child, responding firefighters took a hose line up the stairs to the second floor, where they found that smoke had banked down to the floor, seriously obscuring visibility. After they searched the first room without success, the roof collapsed into the apartment's living room, and they retreated to the stairs.

When the smoke cleared after the collapse, the fire fighters quickly made their way to the second room down the hall, where they found the girl behind a closed door. She was not breathing, and her heart had stopped. They immediately removed her from the building and turned her over to the medical crew, who took her to the hospital.

The children were alone in the apartment, and investigators determined that one of them had left a pot of grease cooking unattended on the electric stove. At some point, the grease ignited and activated a hardwired smoke alarm in the hallway, which alerted the two children. The boy, who was watching television in the living room, heard the alarm ran to the kitchen to find the fire on the stove. He then went to a bedroom, climbed out a window, and fell to the ground. The girl went to an opposite room and stayed there until she was overcome by smoke.

The fire destroyed the unsprinklered, wood-frame house, valued at \$200,000, and its contents, valued at \$100,000. The little girl died.

Kenneth J. Tremblay, 2009, "Firewatch," *NFPA Journal*, March/April, 22-23.

Unattended Cooking Fire Kills Woman, Wisconsin

A 40-year-old woman was fatally injured when food left cooking unattended on a stove ignited and the fire spread to other combustibles in her single-family house.

The one-story, wood-frame house had smoke alarms outside the kitchen and in the hallway near the bedrooms, but they were inoperable because their batteries had been placed improperly. The house was not sprinklered.

The woman, who had a broken leg, had put potatoes and oil in a pan on the electric stove and gone into another room to talk on the phone. Apparently, she forgot about the food, and the oil and potatoes ignited, starting a fire that spread to other combustibles, including the kitchen cabinets. When she discovered the fire, she tried unsuccessfully to put it out herself. A relative of the victim who had come to visit found the remains of the blaze, which had self-extinguished by that time, and called 911.

Firefighters found most of the fire damaged confined to the kitchen, although heat had damaged some nearby rooms and smoke had spread throughout the house. The victim's exact location was not reported.

The house, valued at \$94,000, sustained structural damage of \$45,000. Its contents, valued at \$20,000, sustained \$12,000 worth of damage. The woman died of smoke inhalation.

Kenneth J. Tremblay, 2009, "Firewatch," *NFPA Journal*, March/April, 23-24.

Unattended Cooking Fire Damages Home, Massachusetts

A three-family apartment house was damaged during a midday fire that started when the two occupants of the first-floor unit left cooking oil heating on the stove unattended.

The wood-frame house was 60 feet (18 meters) long and 40 feet (12 meters) wide. Hardwired smoke alarms had been installed in the common hallways, and there were battery-operated smoke alarms in each apartment near the bedrooms. All the smoke alarms and detectors worked as designed during the fire. The structure was unsprinklered.

One of the apartment's occupants who was on the way to the bathroom saw the flames in the kitchen and warned the other occupant. They both escaped unharmed as the fire spread to other parts of the house and vented out a window.

Firefighters arrived three minutes after a 11:51 a.m. call to 911, and the incident commander sounded a second and third alarm when he saw how intense the smoke and fire were. Fire crews placed the first hose line in the front door, while other crews established a water supply and vented the rear-facing windows on the first floor. Additional crews were sent to upper floors to conduct a primary search and attack the flames that had spread to the two upper floors and the attic.

Firefighters managed to control the blaze within 40 minutes, although they had to overhaul the scene for several more hours.

All of the occupants escaped unharmed, but two cats died in the fire. Structural damage to the house was estimated at \$200,000.

Kenneth J. Tremblay, 2009, "Firewatch," *NFPA Journal*, January/February, 19-20.

Unattended Cooking Fire Damages Apartment Building, Washington

An apartment fire that began when a burner was unintentionally left on under a pan of French fries and cooking oil caused considerable damage to the rest of the building.

Each apartment in the 32-unit, wood-frame building, which measured 180 feet (55 meters) by 35 feet (11 meters), had single-station, battery-operated smoke alarms in the bedrooms and hallways. There were no sprinklers.

The fire department received a 911 call from a passerby reporting a fire in the building, and arriving firefighters found smoke and flames coming from a first-floor apartment balcony. They initially thought that the fire was simply a balcony fire, and delayed calling for additional resources. The blaze eventually spread to every floor of the building and burned the roof off in places before firefighters could control it.

Investigators determined that the blaze began in the apartment's kitchen and spread to the living room, where an open sliding door provided fresh air and a place to vent. Flames then traveled along the exterior of the building throughout the upper floors.

The building's local smoke alarms did not work, but someone used a manual pull station to alert the occupants, all of whom managed to evacuate the building.

Valued at \$1.9 million, the property and its contents sustained losses estimated at \$1.1 million. There were no injuries.

Kenneth J. Tremblay, 2008, "Firewatch," *NFPA Journal*, November/December, 19-20.

Man Dies in Cooking Fire, Pennsylvania

A 28-year-old man died in an early-morning fire that began when food he left cooking unattended ignited, filling his single-family house with smoke.

The unsprinklered, one-story, wood-frame house had two smoke alarms. The alarm in a bedroom operated, but the alarm in the living room had been removed from the ceiling and had no batteries.

Police officers on their rounds smelled smoke just after 2:00 a.m. and searched the streets until they found its source. The home's front door was locked, so they went around the back and through unlocked sliding porch doors, then forced the rear door open.

Despite heavy smoke, the officers found the victim kneeling on the living room floor and dragged him to the front lawn, where the ambulance crew pronounced him dead.

Firefighters, who received the alarm at 2:25 a.m., arrived minutes later to find the fire nearly out.

The house, valued at \$175,000, sustained \$60,000 in property damage, and its contents, valued at \$30,000, sustained \$15,000 worth of damage. The victim was intoxicated at the time of his death.

Kenneth J. Tremblay, 2008, "Firewatch," *NFPA Journal*, September/October, 24.

Child Dies in Unattended Cooking Fire, North Carolina

A 5-year-old girl died when she and two siblings became trapped on the second floor of a two-story apartment during a fire that began when her babysitter fell asleep, leaving a pan of oil heating unattended in the first-floor kitchen. The babysitter awoke when the smoke alarm sounded but fled the apartment without the three children in her charge. The two other children managed to escape on their own before firefighters arrived.

The 12-unit apartment building, which was 194 feet (59 meters) long and 30 feet (9 meters) wide, had a brick veneer over ordinary construction and a wood-truss roof covered with asphalt shingles. The only battery-operated smoke alarm was located between the kitchen and living area. The apartment had no sprinklers.

The babysitter had put the children to bed and was doing her homework on the first floor when she decided to cook some French fries. She put a pan of oil on the stove, and fell asleep while the oil heated. The unattended oil eventually ignited, starting a fire that triggered the smoke alarm, which woke the girl, who left the apartment. Firefighter response was delayed when the neighbors tried to extinguish the fire with a bucket of water before calling the fire department, which was only two blocks from the building.

A four-person crew responded to the 12:07 a.m. alarm and quickly deployed two hose lines in an attempt to rescue the 5-year-old. However, the heat and smoke prevented them from reaching her in time.

The building and its contents, which had a combined value of \$507,600, sustained damages estimated at \$169,300.

Kenneth J. Tremblay, 2006, "Firewatch," *NFPA Journal*, November/December, 22.

Residential Sprinkler Extinguishes Cooking Fire, California

A single sprinkler extinguished a fire in the kitchen of a single-family home that began when food left cooking unattended ignited. The single-story, wood-frame house, which covered 2,100 square feet (195 square meters), had both smoke alarms and a wet-pipe sprinkler system.

A water flow alarm alerted the home's occupant, who was outside that the sprinkler had activated. By the time he reentered the house, the sprinkler had already extinguished the fire, so he turned off the electric stove and shut the water off at the street before calling the fire department business number at 6:39 p.m.

Firefighters arrived within five minutes to find water throughout the kitchen and a melted microwave oven above the burned stove. Before leaving, they removed the water with water vacuums, replaced the sprinkler, and put the sprinkler system back in service after advising the owner to have the system inspected.

The occupant said he began heating a pan of oil on the stove, then went outside and forgot about the pan.

The house, valued at \$635,000, sustained \$63,000 in damages. There were no injuries.

Kenneth J. Tremblay, 2006, "Firewatch," *NFPA Journal*, September/ October, 34.

Sprinkler Extinguishes Cooking Fire, Washington

One residential sprinkler successfully extinguished a fire in an apartment in a 12-unit apartment building.

The three-story, wood-frame building was 130 feet (39 meters) long and 50 feet (15 Meters) wide. It was protected by a residential sprinkler system, and smoke alarms were located in all the apartments, including sleeping rooms. A central station alarm company monitored the fire protection systems, which were operational at the time of the fire.

The fire started when the liquid in a pan of potatoes left cooking unattended on the stove evaporated. Single-station smoke alarms activated around 5:30 p.m., and alerted to the blaze, the apartment's occupant left the unit.

Shortly afterward, a sprinkler 5 feet (1.5 meters) from the stove activated and extinguished the fire, limiting fire and smoke damage to the stovetop and surrounding area.

Damage to the building, valued at \$1.2 million, was estimated at \$15,000, and damage to its contents, valued at \$50,000, was estimated at \$2,000. The fire department credited the building's emergency evacuation plan for the rapid evacuation of its occupants.

Kenneth J. Tremblay, 2005, "Firewatch," *NFPA Journal*, November/December, 18.

Five Die in Fire Started by Stove Turned on by Child, Michigan

At 4:29 a.m., firefighters were called to a fire in a one-story, single-family dwelling of unprotected wood-frame construction. The home had no smoke alarms or sprinklers.

A four-year-old turned on a gas stove and went back to bed. Cooking materials ignited and the fire spread throughout the house. Due to the early hour, family members were asleep, and the child was unsupervised. Security bars prevented the family's escape. All the victims were found in bedrooms. Four of the five victims were under six years of age.

Adapted from Stephen G. Badger's 2005 article, "Catastrophic Fires of 2004." *NFPA Journal*, September/October 57.

Three Children Die in Cooking Fire, Texas

Firefighters responding to a fire at a single-family home discovered flames shooting from window and the front door. When told that several people might be trapped in the house, they advanced two lines through the front door. Inside, they found the bodies of three children, all of whom had succumbed to smoke inhalation.

The one-story, wood-frame house was 30 feet (9 meters) long and 40 feet (12 meters) wide. There were no smoke alarms or sprinklers.

Investigators determined that food left cooking unattended on a gas stove ignited and that the resulting fire spread to combustibles in the kitchen and other areas of the house. One resident discovered the fire and called 911 about six minutes later at 3:47 a.m. Firefighters brought the fire under control within an hour.

Fire crews found the bodies of a one-year-old and a one-year-old girl in the remains of a crib and the body of a two-year-old on a bed.

Property loss estimates weren't reported. One firefighter was injured.

Kenneth J. Tremblay, 2005, "Firewatch", *NFPA Journal*, May/June, 28.

Fire Sprinkler Extinguishes Cooking Fire, Washington

A single fire sprinkler limited fire losses when an occupant of an apartment in a three-story building inadvertently turned the burner on under a pot of cooking oil and left the apartment. The building's monitored water-flow detector system activated the building's fire alarm and notified the fire department.

The wood-frame building, which measured 130 feet (40 meters) by 50 feet (15 meters), contained 12 two- and three-bedroom units. Manual pull stations and smoke alarms had been installed in compliance with a local ordinance, and emergency plans had been distributed to residents. Although he wasn't required to, the building's owner had also installed a residential wet-pipe fire-sprinkler system that provided full coverage. A central station alarm company monitored the alarms and fire sprinklers.

The fire started when the unattended oil heated to its ignition temperature and ignited, and spread from the stove to the area immediately above it.

The central station alarm company notified the fire department at 2:03 p.m., but by the time firefighters arrived, the apartment's fire sprinkler had extinguished the blaze.

Damage to the building, valued at \$1.25 million, and its contents, valued at \$50,000, were approximately \$15,000 and \$2,000, respectively. Much of the damage was attributed to water damage.

Kenneth J. Tremblay, 2004, "Firewatch," *NFPA Journal*, January/February 15.