

# HOME FIRES INVOLVING COOKING EQUIPMENT

**Marty Ahrens**

**November 2009**



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

# **HOME FIRES INVOLVING COOKING EQUIPMENT**

**Marty Ahrens  
November 2009**



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

## **Abstract**

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

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

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

## **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](http://www.nfpa.org) or call 617-770-3000. To learn more about the One-Stop Data Shop go to [www.nfpa.org/osds](http://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](http://www.nfpa.org)  
e-mail: [osds@nfpa.org](mailto:osds@nfpa.org)  
phone: 617-984-7450

NFPA No. USS11  
Copyright © 2009, National Fire Protection Association, Quincy, MA



# Contents

	<b>Page</b>
Table of Contents	i
List of Numbered Tables and Figures	iii
Executive Summary	vii
Home Fires Involving Cooking Equipment Fact Sheet	xi
Home Fires Involving Grills Fact Sheet	xiii
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 Non-confined Home Structure Fires Involving Cooking Equipment	13
Fire Control Attempts by Civilians	17
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	43
Section 3. Ovens or Rotisseries	65
Section 4. Portable Cooking or Warming Devices	79
Section 5. Microwave Ovens	91
Section 6. Grills	99
Section 7. Deep Fryers	131
Section 8. Grease Hoods or Duct Exhaust Fans	139
Appendix A: How National Estimates Statistics Are Calculated	145
Appendix B. Selected Published Incidents	151



## List of Tables and Figures

	Page
<b>Section 1. Home Fires Involving Cooking Equipment Fires</b>	
Table A. Home Fires Involving Cooking Equipment: 2003-2006	1
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	5
Table B. Leading Dates for 2006 Home Fires Involving Cooking Equipment Structure Fires Reported to U.S. Fire Departments	
Figure 1.4. Reported Home Cooking Equipment Fires ,Injuries and Percent of Population Cooking, by Time of Alarm	7
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	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 Compared to Reported Home Fires Overall	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	16
Figure 1.11. Severity of Reported Non-Fatal Home Fire Injuries Involving Cooking Equipment Excluding Confined Fires	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	18
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	27
Table 1.2. Home Fires Involving Cooking Equipment by Month	28
Table 1.3. Home Fires Involving Cooking Equipment by Day of Week	28
Table 1.4. Home Fires Involving Cooking Equipment by Hour of Alarm	29
Table 1.5. Home Fires Involving Cooking Equipment by Area of Origin	30
Table 1.6. Home Fires Involving Cooking Equipment by Factor Contributing to Ignition	31
Table 1.7. Home Fires Involving Cooking Equipment, by Human Factor Contributing to Ignition	32

**List of Tables and Figures  
(Continued)**

	<b>Page</b>
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	39
Table 1.14. Home Fire Casualties Involving Cooking Equipment, by Victim’s Location at Time of Incident	39
Table 1.15. Home Fire Casualties Involving Cooking Equipment, by Victim’s Activity at Time of Injury	40
Table 1.16. 2008 Estimates of Emergency Room Visits for Burn Injuries Associated with Cooking Equipment and Related Products	40
Table 1.17. U.S. Non-Fire Carbon Monoxide Deaths Involving Cooking Equipment	41
 <b>Section 2. Ranges</b>	
Figure 2.1. Reported Home Structure Fires Involving Ranges or Cooktops, by Year	44
Figure 2.2. Percentage of Households Using Gas, Electricity and Other Fuel as a Primary Cooking Power Source over Time	45
Figure 2.3. Percentages of 2003-3006 Reported Home Structure Fires and Associated Losses Involving Cooking Equipment by Cooking Equipment Power Source	46
Figure 2.4. Injuries Involving Ranges or Ovens Seen at Hospital Emergency Rooms in 2008, by Diagnosis	49
Table 2.1. Ranges, by Year	52
Table 2.2. Gas-Fueled Ranges, by Year	53
Table 2.3. Electric-Powered Ranges, by Year	54
Table 2.4. Trends in U.S. Use of Primary Cooking Power Sources Percentage of Households	55
Table 2.5. Comparative Risks of Reported Fires and Associated Losses of Gas Versus Electric Stoves	56
Table 2.6. Ranges, by Factor Contributing to Ignition	57
Table 2.7. Gas-Fueled Ranges, by Factor Contributing to Ignition	58
Table 2.8. Electric-Powered Ranges, by Factor Contributing to Ignition	59
Table 2.9. Ranges, by Item First Ignited	60
Table 2.10. Gas-Fueled Ranges, by Item First Ignited	61
Table 2.11. Electric-Powered Ranges, by Item First Ignited	62
Table 2.12. Ranges, by Extent of Flame Damage	63
Table 2.13. Gas Ranges, by Extent of Flame Damage	63
Table 2.14. Electric-Powered Ranges, by Extent of Flame Damage	63
Table 2.15. Hospital Emergency Room Visits for Injuries Involving Ranges or Ovens During 2008 by Diagnosis	64

## List of Tables and Figures (Continued)

	<b>Page</b>
Table 2.16. Hospital Emergency Room Visits for Injuries Involving Ranges or Ovens During 2008 by Range Power Source	64
 <b>Section 3. Ovens or Rotisseries</b>	
Figure 3.1. Reported Home Structure Fires Involving Ovens or Rotisseries, by Year	67
Table 3.1. Ovens or Rotisseries, by Year	70
Table 3.2. Gas-Fueled Ovens or Rotisseries, by Year	71
Table 3.3. Electric-Powered Ovens or Rotisseries, by Year	72
Table 3.4. Ovens or Rotisseries, by Factor Contributing to Ignition	73
Table 3.5. Gas-Fueled Ovens or Rotisseries, by Factor Contributing to Ignition	74
Table 3.6. Electric-Powered Ovens or Rotisseries, by Factor Contributing to Ignition	75
Table 3.7. Ovens or Rotisseries, by Item First Ignited	76
Table 3.8. Gas-Fueled Ovens or Rotisseries, by Item First Ignited	76
Table 3.9. Electric-Powered Ovens or Rotisseries, by Item First Ignited	77
Table 3.10. Ovens or Rotisseries, by Extent of Flame Damage	77
 <b>Section 4 Portable Cooking or Warming Devices</b>	
Table 4.1. Portable Cooking or Warming Devices, by Type of Device	80
Figure 4.1. Reported Home Structure Fires Involving Portable Cooking or Warming Devices, by Year	81
Figure 4.2. Non-Confined Home Fires Involving Specific Portable Cooking or Warming Devices, by Leading Factors Contributing to Ignition	82
Figure 4.3. Non-Confined Home Fires Involving Specific Portable Cooking or Warming Devices by Leading Items First Ignited	83
Table 4.2. Portable Cooking or Warming Devices, by Year	86
Table 4.3. Portable Cooking or Warming Devices with Largest Shares of Fires, by Year	87
Table 4.4. Portable Cooking or Warming Devices, by Factor Contributing to Ignition	89
Table 4.5. Portable Cooking or Warming Devices, by Item First ignited	89
Table 4.6. Portable Cooking or Warming Devices, by Area of Origin	90
Table 4.7. Portable Cooking or Warming Devices, by Extent of Flame Damage	90
 <b>Section 5. Microwave Ovens</b>	
Figure 5.1. Amount of Food Cooked in Microwave Ovens by Households that Use Them According to DOE's 2005 Energy Survey	92
Table 5.1. Microwave Ovens, by Year	96
Table 5.2. Microwave Ovens, by Factor Contributing to Ignition	96
Table 5.3. Microwave Ovens, by Item First Ignited	97
Table 5.4. Microwave Ovens, by Extent of Flame Damage	97

## List of Tables and Figures (Continued)

	<b>Page</b>
<b>Section 6. Grills</b>	
Figure 6.1. Home Grill Fires, by Month	99
Figure 6.2. Home Grill Fires, by Power Source	101
Figure 6.3. Number of Barbecue Grills Shipped in North America, by Power Source	102
Figure 6.4. Home Fires Involving Grills, by Year	103
Figure 6.5. Percent of Home Grill Fires Involving Gas-Fueled Grills, by Year	103
Figure 6.6. Grill Fires, by Leading Areas of Origin	104
Table 6.1. Grill Fires, by Power Source	107
Table 6.2. Grill Fires, by Year	111
Table 6.3. Grills, by Area of Origin	120
Table 6.4. Grills, by Factor Contributing to Ignition	123
Table 6.5. Grills, by Item First Ignited	128
 <b>Section 7. Deep Fryers</b>	
Figure 7.1. Reported Home Structure Fires Involving Deep Fryers, by Year	132
Figure 7.2. Non-Confined Home Structure Fires Involving Deep Fryers, by Area of Origin	133
Table 7.1. Deep Fryers, by Year	136
Table 7.2. Deep Fryers, by Factor Contributing to Ignition	137
Table 7.3. Deep Fryers, by Item First Ignited	137
Table 7.4. Deep Fryers, by Area of Origin	138
Table 7.5. Deep Fryers, by Extent of Flame Damage	138
 <b>Section 8. Grease Hoods or Duct Exhaust Fans</b>	
Figure 8.1. Reported Home Structure Fires Involving Grease Hoods or Duct Fans, by Year	140
Table 8.1. Grease Hoods or Duct Fans, by Year	141
Table 8.2. Grease Hoods or Duct Fans, by Factor Contributing to Ignition	142
Table 8.3. Grease Hoods or Duct Fans, by Item First Ignited	142
Table 8.4. Grease Hoods or Duct Fans, by Extent of Flame Damage	143

## Executive Summary

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

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

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

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

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

---

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

---

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



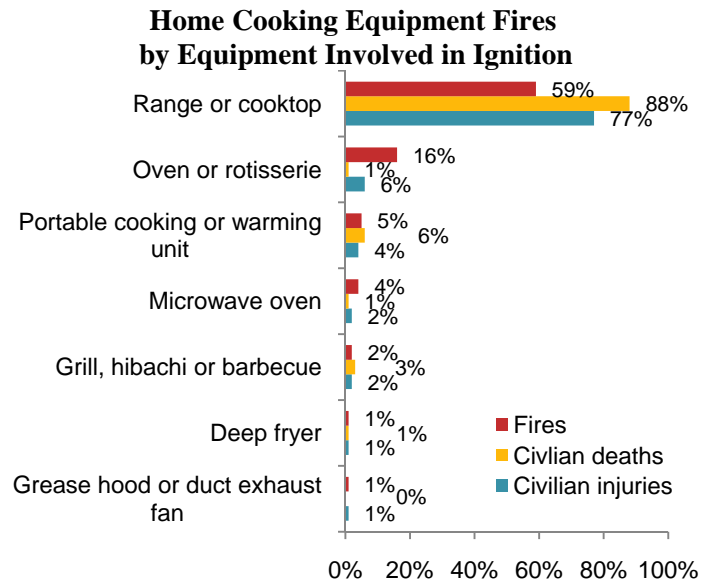


## Home Fires Involving Cooking Equipment

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

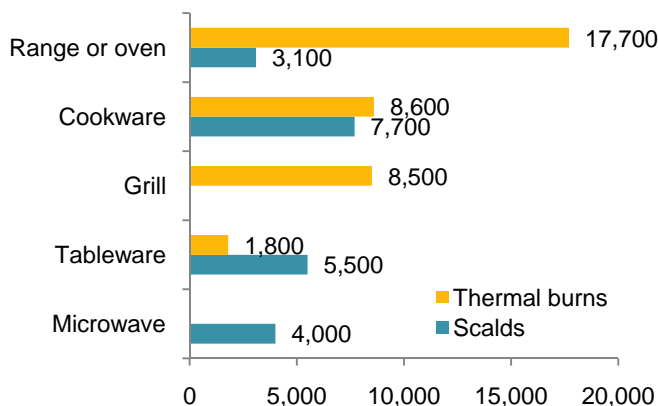
### During the four-year period of 2003-2006:

- U.S. fire departments responded to an average of **150,200** home<sup>1</sup> structure fires that involved cooking equipment per year. These fires caused an average of 500 civilian fire deaths, 4,660 civilian fire injuries, and \$756 million in direct property damage.
- Cooking equipment was involved in 40% of all reported home fires, 17% of home fire deaths, 36% of home civilian injuries, and 12% of the direct property damage resulting from home fires.
- Unattended cooking was by far the leading contributing factor in these fires. Something that could catch fire was too close to the equipment ranked second and unintentionally turned on or not turned off ranked third.
- Ranges accounted for the largest share (59%) of home cooking fire incidents. Ovens accounted for 16%.
- Three-fifths (57%) of reported home cooking fire injuries occurred when victims tried to fight the fire themselves.



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

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



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

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

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

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

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





## Home Fires Involving Grills

In 2003-2006, U.S. fire departments responded to an average of 7,900 home<sup>1</sup> fires involving grills, hibachis or barbecues per year, including an average of 2,900 structure fires and 5,000 outside fires. These 7,900 fires caused annual average of 10 civilian deaths (to the nearest ten), 120 reported injuries and \$80 million in direct property damage.

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

### Gas vs. Solid-Fueled Grills

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

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

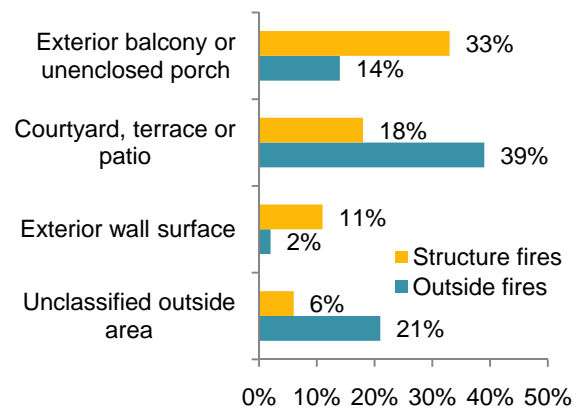
- Leak or break was the leading factor contributing to gas grill fires.

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

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

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

### Home Grill Fires by Leading Areas of Origin 2003-2006



One-third (33%) of the home structure fires<sup>2</sup> involving grills started on an exterior balcony or unenclosed porch, 18% started on a courtyard, terrace or patio, and 11% started on an exterior wall surface.

### Emergency Room Visits Due to Grills

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

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

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

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

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

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



## Home Fires Involving Cooking Equipment

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

During the four year-period of 2003-2006, cooking equipment was involved in an estimated annual average of 150,200 reported home<sup>1</sup> structure fires. Table A shows that these fires caused an average of 500 civilian deaths, 4,660 civilian injuries and \$756 million in direct property damage per year. Overall, these incidents accounted for 40% of all reported home fires, 17% of home fire deaths, 36% of home civilian injuries, and 12% of the direct property damage resulting from home fires.<sup>2</sup>

**Table A.**  
**Home Structure Fires Involving Cooking Equipment**  
**2003-2006 Annual Averages**

Equipment Type	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
<i>Identified cooking equipment</i>	129,700 (37,200)	490 (490)	4,310 (3,190)	\$753 (\$728)
Range or cooktop	88,000 (28,500)	440 (440)	3,540 (2,690)	\$523 (\$506)
Oven or rotisserie	23,300 (3,000)	0 (0)	280 (140)	\$32 (\$26)
Portable cooking or warming unit	7,000 (2,200)	30 (30)	200 (150)	\$76 (\$75)
Microwave oven	6,600 (1,300)	0 (0)	110 (80)	\$22 (\$21)
Grill, hibachi or barbecue	2,900 (1,300)	10 (10)	90 (70)	\$79 (\$79)
Deep fryer	1,000 (500)	0 (0)	60 (40)	\$15 (\$15)
Grease hood or duct exhaust fan	800 (400)	0 (0)	30 (30)	\$6 (\$6)
<i>Confined cooking fire incident type but equipment involved was not cooking equipment</i>				
Heating stove in confined cooking fire	9,400	0	180	\$4
Other known non-cooking equipment in confined cooking fire	1,500	0	10	\$0
No equipment involved in confined cooking fire	9,600	0	110	\$1
All confined cooking fires identified by confined cooking fire incident type	112,900	10	1,470	\$28
Total cooking equipment in non-confined fires plus confined cooking fires identified by incident type	150,200	500	4,660	\$756

Note: Numbers in parentheses exclude confined fires. Total line is the sum of the non-confined identified cooking equipment (in parentheses) and all confined cooking fires identified by confined cooking fire incident type. Confined fires are fires reported as confined to cooking vessel, chimney, flue, fuel burner, or boiler and involving heating equipment; they are analyzed separately from non-confined fires. Equipment involved in confined fires was derived from all confined fire incident types. Sums may not equal totals due to rounding errors.

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

<sup>1</sup> 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.

<sup>2</sup> Marty Ahrens, *Home Structure Fires*, Quincy, MA: National Fire Protection Association, 2009, p. 29.

## 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). Consequently, estimates of equipment involved in confined fires are based on the 4% of confined fire incident reports coded with known or no equipment involved in ignition.

Several types of cooking equipment are examined in this report:

Equipment Involved in Ignition	Equipment Involved in Ignition 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.

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 on the subject. 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.

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 that used in NFPA’s report, *Home Structure Fires*, counts all non-confined fires involving cooking equipment (shown in parentheses) 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 second section of Table A shows estimates of confined cooking fires, identified by incident type, in which the equipment involved was coded as something other than cooking equipment. From the data, it is impossible to tell if the code for heating stove was selected in error or if people are using wood stoves and related devices intended for heat for some cooking. (We have no way of statistically estimating the fires in which cooking equipment is inappropriately used for heat.) Fires coded as no equipment involved seem inconsistent and may reflect a reluctance to identify equipment in cases of human error. Roughly one-third of the other known non-cooking equipment in confined cooking fires were completely unclassified equipment, 11% were burners (a code in the torch category), and another 11% were unclassified personal or household equipment.

The estimates of identified cooking equipment are sums of cooking equipment in non-confined fires and in all confined fires, not just confined cooking fires, and include proportional shares of fires in which the equipment involved in ignition was unknown or not reported.

## Trends in Reported Home Structure Fires Involving Cooking Equipment

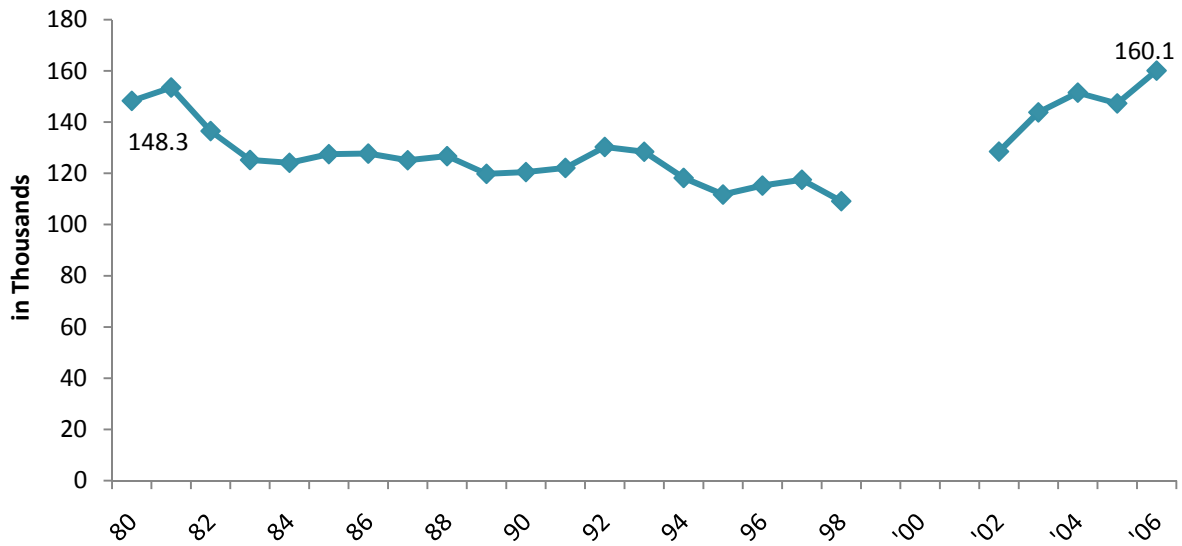
### **NFIRS 5.0 was accompanied by an increase in reported cooking equipment fires.**

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. They hit their lowest point in the late 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 160,100 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.

### **The average number of cooking fire deaths in 2003-2006 was the same as in 1980-1983.**

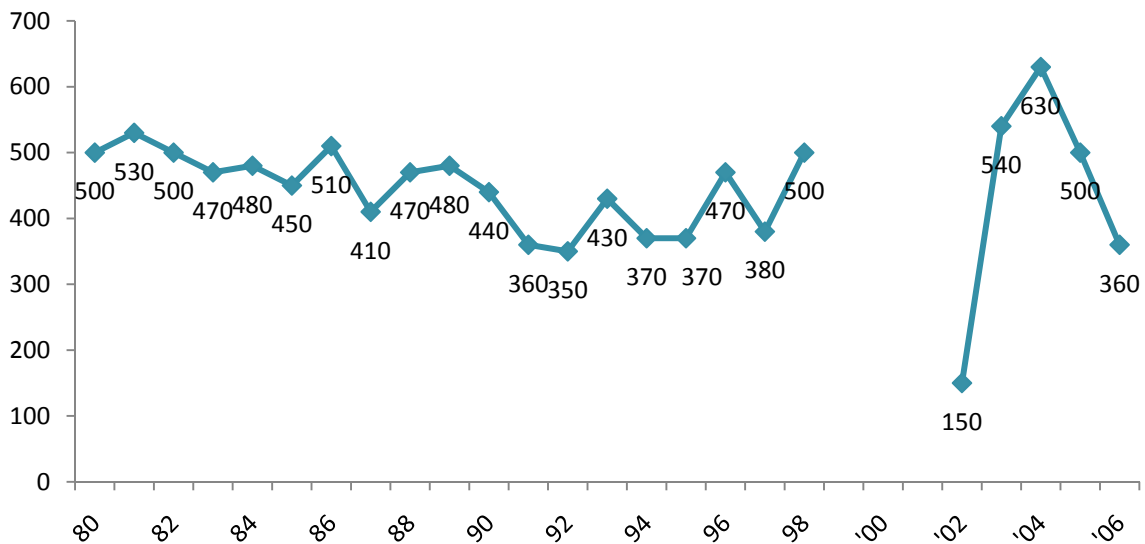
As Figure 1.2 shows, no clear trend can be seen in the deaths resulting from home fires involving cooking equipment. The 1980-1983 annual average for cooking fire deaths was 500, the same average seen in 2003-2006. Figure 1.3 shows that reported civilian injuries caused by these fires peaked in the early 1990s. Injuries during the recent NFIRS 5.0 years were lower than at any point during 1980-1998.

**Figure 1.1. Reported Home Structure Fires Involving Cooking Equipment by Year: 1980-2006**



Source: Data from NFIRS and NFPA Survey. Estimates for 1999-2006 are based on NFIRS 5.0 data and include all fires with the confined cooking fire incident type.  
 Note: See Notes on Table 1.1.

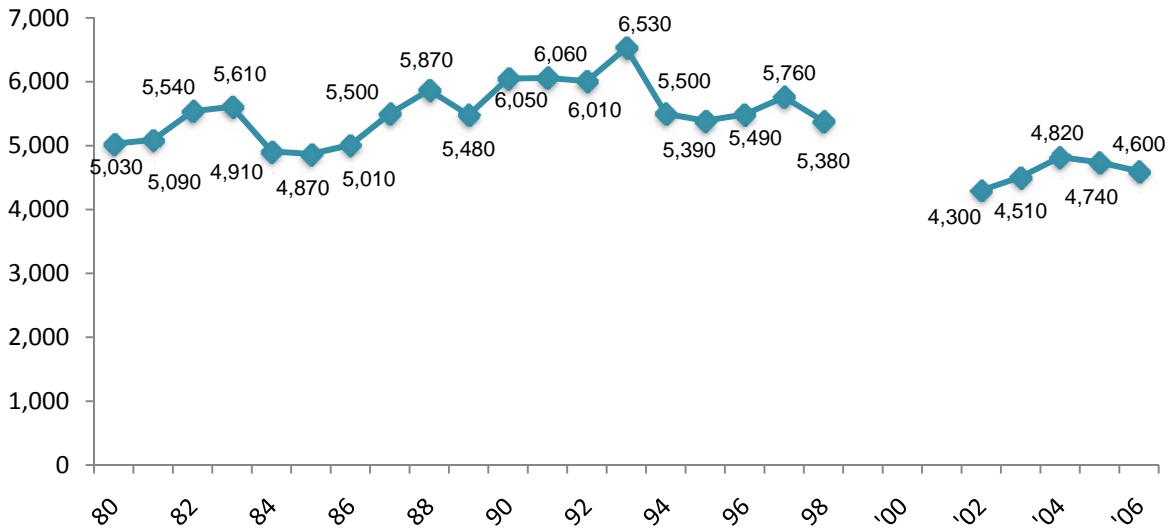
**Figure 1.2. Civilian Fire Deaths Resulting from Home Structure Fires Involving Cooking Equipment, by Year: 1980-2006**



Source: Data from NFIRS and NFPA Survey.

Note: See Notes on Table 1.1.

**Figure 1.3. Civilian Fire Injuries Resulting from Reported Home Structure Fires Involving Cooking Equipment, by Year: 1980-2006**



Source: Data from NFIRS and NFPA Survey.

Note: See Notes on Table 1.1.

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

The 2004-2005 CPSC's Residential Fire Survey asked about all fires, including incidents that were not attended by the fire service.<sup>3</sup> 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.

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 overwhelming majority of cooking equipment fires (50 to one) did not have the fire department in attendance. The study also found that 102,000 injuries resulted from cooking equipment fires with no fire department presence. This is 22 times the average number of civilian injuries per year in reported fires during 2003-2006. Total direct property damage from unreported home fires involving cooking equipment was estimated at \$328 million, with an average loss of \$70 dollars per fire. 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. Unreported cooking fires fell 63% from the 12.3 million such incidents in the 1984 survey of unreported residential fires done for the CPSC.

<sup>3</sup> 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.

## The When and Where of Home Structure Fires Involving Cooking Equipment

### Reported home cooking equipment fire deaths peak in December - 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 June and July were 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 (18%), February, (14%), and December (12%).

Sunday was the peak day of the week for home cooking equipment fires (16%) and associated deaths (22%). Saturday ranked second in fires, but Monday was second in deaths. (See Table 1.3.)

### Home fires involving cooking equipment are a holiday tradition, peaking on dates that are major U.S. holidays with traditions of cooking.

During 2006, four of the 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 2006 Home Fires Involving Cooking Equipment  
Structure Fires Reported to U.S. Fire Departments  
(Including Fires Reported as Confined Fires)**

Date	Fires	Percent Above Average Number of Fires per Day
November 23 (Thanksgiving)	1,310	198%
December 25 (Christmas Day)	720	64%
December 24 (Christmas Eve)	660	52%
October 22	640	47%
November 22 (Day before Thanksgiving)	590	36%
Average number of fires per day	440	0%

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.<sup>4</sup> The American Time Use Survey (ATUS) found that in 2008, U.S. residents at least 15 years of age spent an average of 31 minutes per day on food preparation and clean up, with the average man spending 18 minutes and the average woman 44 minutes. The 52% of the population (38% of men and 65% of women) who actually engage in this activity averaged 60 minutes a day, with men averaging 47 minutes and women 67.<sup>5</sup>

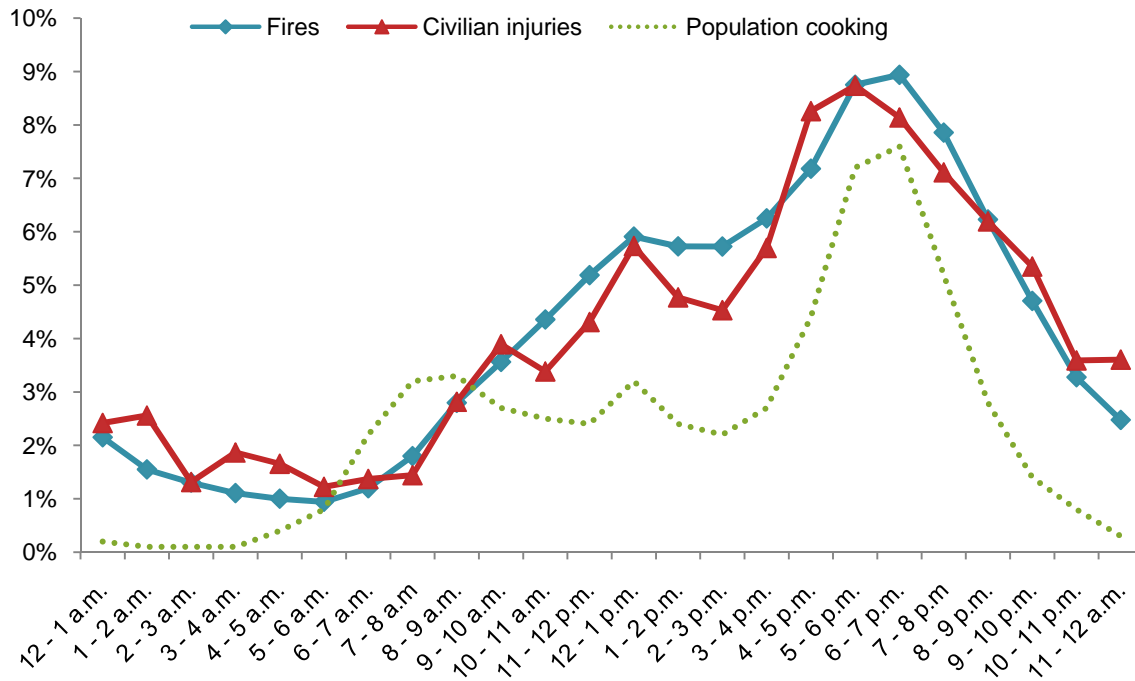
<sup>4</sup> Energy Information Administration. *2005 Residential Energy Consumption Survey: Preliminary Housing Characteristics Tables*, Table HC2.10 "Home Appliances Usage Indicators by Type of Housing Unit, 2005.

<sup>5</sup> 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, 2008 annual averages," online at [http://www.bls.gov/tus/tables/a1\\_2008.pdf](http://www.bls.gov/tus/tables/a1_2008.pdf)

**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 5:00 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 2008 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.<sup>6</sup>

**Figure 1.4. Reported Home Cooking Equipment Fires and Injuries and Percent of Population Cooking, by Time of Alarm.: 2003-2006**



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

While 52% of overall home fire deaths resulted from fires reported between 11:00 p.m. and 7:00 a.m.,<sup>7</sup> in 2003-2006, only 38% of the cooking equipment fire deaths resulted from fires reported during this period. This is still higher than the 33% of hours covered but 14 percentage points below the fire deaths overall.

**Cooking caused a larger share of reported fires in apartments than in one- or two-family homes.**

While the leading cause of fires in both one- and two-family homes and apartments was cooking, the percentage of reported cooking equipment fires in the two occupancies was quite different, particularly for confined cooking fires. In one- or two-family home fires reported during 2003-

<sup>6</sup> 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 primary activity category, averages per day by sex, 2008 annual averages.

<sup>7</sup> Marty Ahrens, *Home Structure Fires*, 2009, p. 7.

2006, 10% of the incidents involved cooking equipment in non-confined fires while 21% were confined cooking fires identified by incident type. Cooking equipment was involved, in total, in nearly one-third (31%) of the reported fires in these properties. In contrast, 52% of the reported apartment fires were confined cooking fires while 8% were non-confined fires with cooking equipment involved in ignition. In total, cooking equipment was involved in 60% of apartment fires, nearly twice the share of fires in one-or two-family homes.<sup>8</sup> In apartments, heating equipment and electrical distribution equipment are more likely to be centrally maintained. Apartment buildings have more cooking equipment in the structure that would be found in one-or-two family homes. It is also possible that small fires in apartments may be more likely to be reported than small fires in single-family homes.

**Almost all cooking equipment fires began in the kitchen.**

Table 1.5 shows that 93% of all non-confined home cooking fires started in the kitchen. The other leading areas of origin – exterior balcony or unenclosed porch; courtyard, terrace or patio; garage; and exterior wall surface – primarily reflected locations of grill fires, and to a lesser extent, deep fryers.

## Causal Factors

**Ranges, with or without ovens, were involved in the majority of reported cooking fires.**

Table C shows 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 88% of the civilian deaths, 77% of the civilian injuries, and 69% of the property damages associated with cooking equipment fires. Table C also shows that the risk of death per 1000 reported range or cooktop fires was 5.0, 50% higher than the 3.3 deaths per 1000 overall cooking equipment fires. The injury rate was highest for fires involving deep fryers. 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 4.5 times the average, while the loss from deep fryer fires was three times the average and the loss from fires involving portable cooking or warming units was more than twice the average loss. Loss rates from fires involving ovens or rotisseries and from microwave ovens were lower than average on all three measures.

**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 the ignition of 38% of reported non-confined home structure fires involving cooking equipment. Unattended equipment was also a factor in 43% of the civilian deaths and 47% of the civilian injuries. Something that could catch fire was too close to the cooking equipment in 12% of the fires. The third and fourth ranked factors, unintentionally turned on or not turned off (10%) and abandoned or discarded material (8%) are like unattended equipment in that they all involve a failure of oversight.

---

<sup>8</sup> Marty Ahrens. *Home Structure Fires*, 2009, pp. 45, 55.

**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 2003-2006 Annual Averages (Including Confined Fires)**

Device	Fires	Civilian Deaths Per 1,000 Fires	Civilian Injuries Per 1,000 Fires	Average Loss Per Fire
Range or cooktop	88,000 (59%)	5.0	40	\$5,900
Oven or rotisserie	23,300 (16%)	0.2	12	\$1,400
Portable cooking or warming unit	7,000 (5%)	4.0	29	\$10,800
Microwave oven	6,600 (4%)	0.4	17	\$3,300
Grill, hibachi or barbecue	2,900 (2%)	4.5	31	\$27,300
Deep fryer	1,000 (1%)	4.6	57	\$14,500
Grease hood or duct exhaust fan	800 (1%)	0.0	37	\$8,300
Heating stove in confined cooking fire	9,400 (6%)	0.0	19	\$400
Other known non-cooking equipment in confined cooking fire	1,500 (1%)	0.0	7	\$100
No equipment involved in confined cooking fire	9,600 (6%)	0.5	11	\$100
Total cooking equipment in non-confined fires plus confined cooking fires identified by incident type	150,200 (100%)	3.3	31	\$5,000

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.

The share of non-confined home structure fires involving cooking equipment that cite equipment unattended as a factor contributing to ignition (38% in 2003-2006) is much lower than the share of all home cooking fires cited 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. Although causal factors are not required for confined fires, an analysis of confined fires with the cooking fire incident type and of confined fires that had specific cooking equipment coded showed that only 30% of fires with known contributing factor were coded as equipment unattended, an even lower share than was seen for non-confined fires.

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

Table 1.7 shows that in 23% of the deaths resulting from home fires involving cooking equipment, “asleep” was a human factor contributing to ignition. In 19% of the non-confined home cooking fires in 2003-2006, 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. Roughly 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.

**More than half of home cooking equipment fires started with the ignition of food or other cooking materials.**

Table 1.8 shows in 55% of reported non-confined home fires involving cooking ignition, the item first ignited was some type of cooking material or food. Six percent began with appliance housings or casing. A flammable or combustible liquid or gas, piping or filter was first ignited in an additional 6%. Five percent started when cabinetry ignited. Household utensils were first ignited in another 5%. Clothing ignitions account for only 1% of the fires but for 13% of the associated civilian deaths.

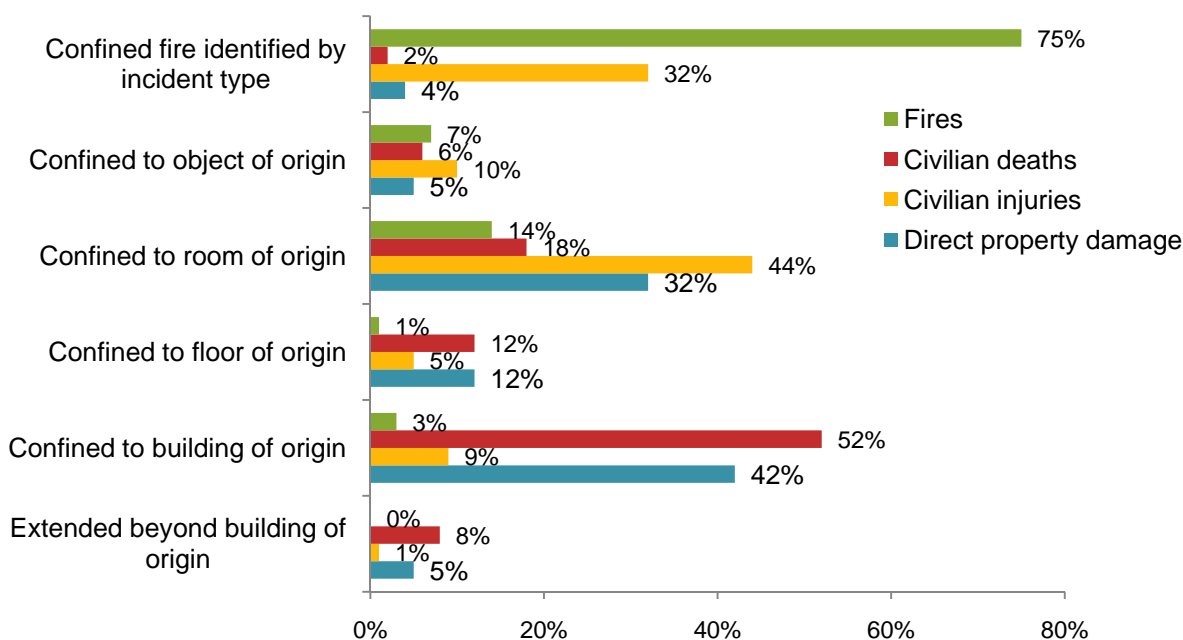
**96% of reported home cooking equipment fires were confined to the room of origin.**

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:

- 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. Twenty-six percent 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.

**Figure 1.5. Home Fires Involving Cooking Equipment by Extent of Flame Damage: 2003-2006**

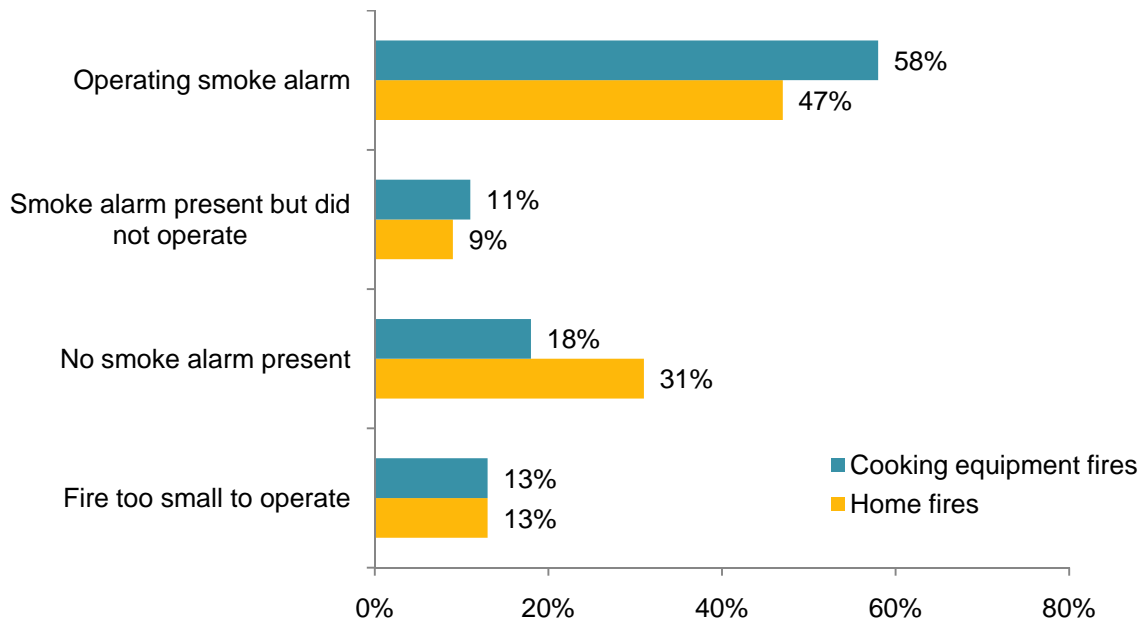


Source: Data from NFIRS Version 5.0 and NFPA survey.

**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 58% of reported home fires involving cooking equipment and present, regardless of operating status, in 82% of reported home fires involving cooking equipment. Figure 1.6 shows that compared to overall home fires, smoke alarm presence was 13 percentage points higher and the presence of operating smoke alarms was 11 percentage points higher in home cooking equipment fires.<sup>9</sup>

**Figure 1.6. Smoke Alarm Status in Reported Home Fires Involving Cooking Equipment Compared to Reported Home Fires Overall: 2003-2006**



Source: Data from NFIRS Version 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.<sup>10</sup> An Alaskan study, published in 2000, found that 81% of the ionization cooking nuisance alarms were related to frying.<sup>11</sup>

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

<sup>9</sup> Marty Ahrens. *Smoke Alarms in U.S. Home Fires*, Quincy, MA: NFPA, 2009, p. 3.

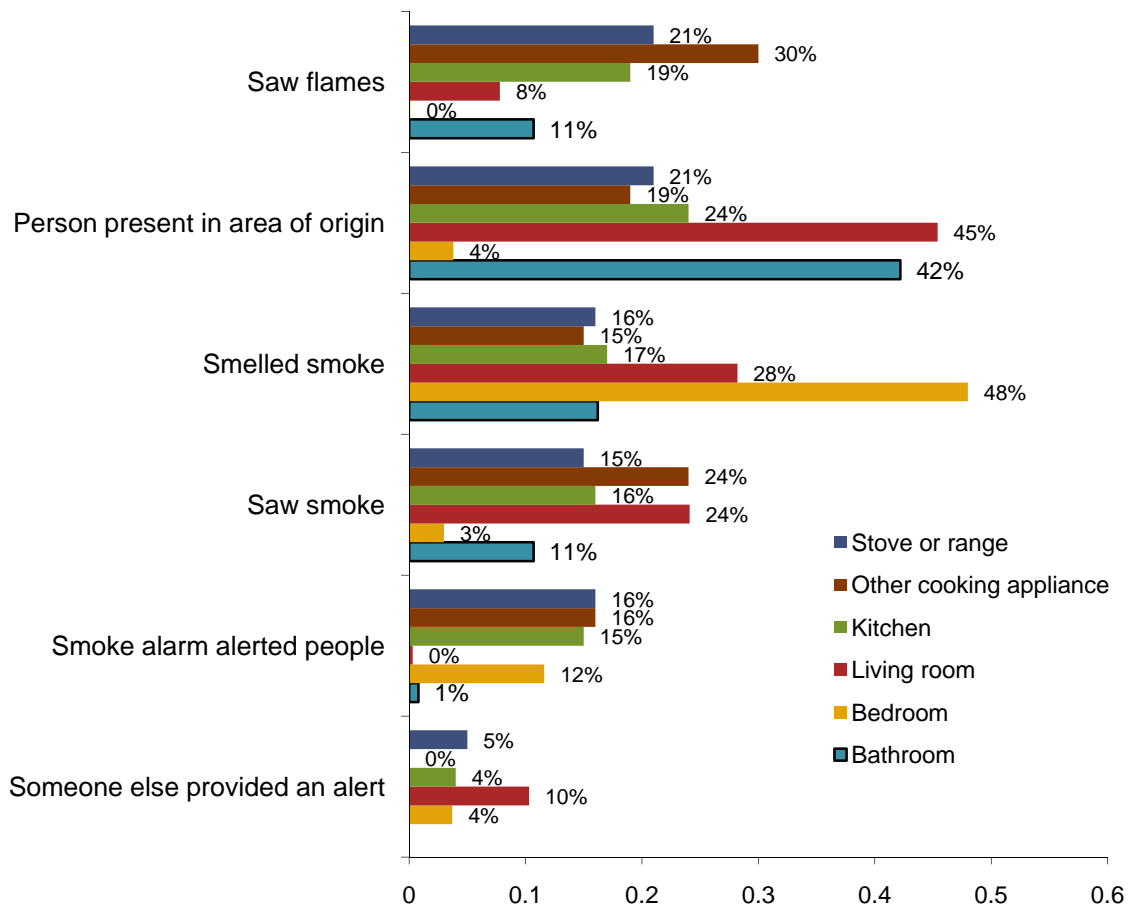
<sup>10</sup> Charles L. Smith, *Smoke Detector Operability Survey – Report on Findings*, Bethesda, MD: U.S. Consumer Product Safety Commission, November 1993.

<sup>11</sup> 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>.

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, 30% of the other cooking appliance 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, 19% of other cooking appliance fires, and 24% of the kitchen fires.<sup>12</sup> The method of discovery is also shown for living room, bedroom, and bathroom 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

<sup>12</sup> Michael A. Greene and Craig D. Andres, *2004-2005 National Sample Survey of Unreported Residential Fires*, July 2009, pp. 162-168

According to the same study, in 44% of the unreported kitchen fires, 38% of the stove or range fires, and 60% of the other cooking appliance fires, not enough smoke reached the alarm to cause it to activate.

**Automatic extinguishing systems were present in 7% of reported home cooking fires.**

Table 1.11 shows that automatic extinguishing systems (AES) were present in 7% of reported home fires involving cooking equipment in 2003-2006, including 3% in which the system operated and 4% in which the fire was too small to activate the system. In contrast, automatic extinguishing systems were present in 4% of reported home fires of all causes. Table 12 shows that sprinklers accounted for 94% of the AES present in reported home cooking fires, with wet pipe sprinklers accounting for 86%, dry pipe sprinklers for 6%, and 2% other sprinkler systems. Four percent were dry chemical systems and 2% were unclassified. In restaurants and other eating and drinking establishments, half of the automatic extinguishing systems found in reported structure fires were dry chemical systems.<sup>13</sup>

**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 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.<sup>14</sup> 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.

## **Victims of Non-Confined 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.<sup>15</sup> Relative risk is calculated by dividing the cooking fire death or injury rates per million population for each age group by the death or injury rate for the population overall.

<sup>13</sup> John R. Hall, Jr. *U.S. Experience with Sprinklers and Other Automatic Extinguishing Equipment*, Quincy, MA: NFPA, 2009, p. 12.

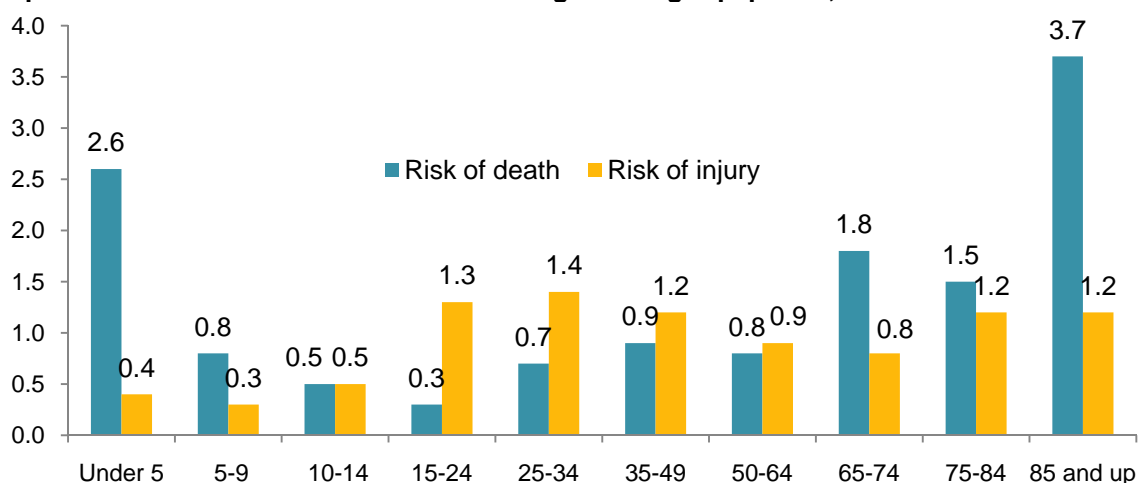
<sup>14</sup> Arthur D. Little, Inc. *Technical, Practical and Manufacturing Feasibility of Technologies to Address Surface Cooking Fires, Final Report to United States Consumer Product Safety Commission*, May 2001, online at <http://www.cpsc.gov/library/foia/foia01/brief/ranges.pt1.pdf>.

<sup>15</sup> Jennifer D. Flynn. *Characteristics of Home Fire Victims*, Quincy, MA: NFPA, 2008, pp. 8-9.

During 2003-2006, 90, or 18%, of the home cooking fire fatalities were children under five. With a relative risk of death of 2.6, only people 85 and older had a higher relative risk of death in these fires (3.7). Presumably most of these young children were not cooking themselves but died from fires started by an adult’s cooking activities. A total of 130 (27%) of the fatalities were under 15 years of age. Only 3% of the reported cooking fire injuries were children under five; 12% were under 15.

Older adults at least 65 years of age faced twice 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. Individuals who were at least 75 faced a risk of injury 1.2 times the average. The highest cooking fire injury rate was seen among people 25-34 (1.4), followed by the 15-24-year-olds (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, 2003-2006 Annual Averages**

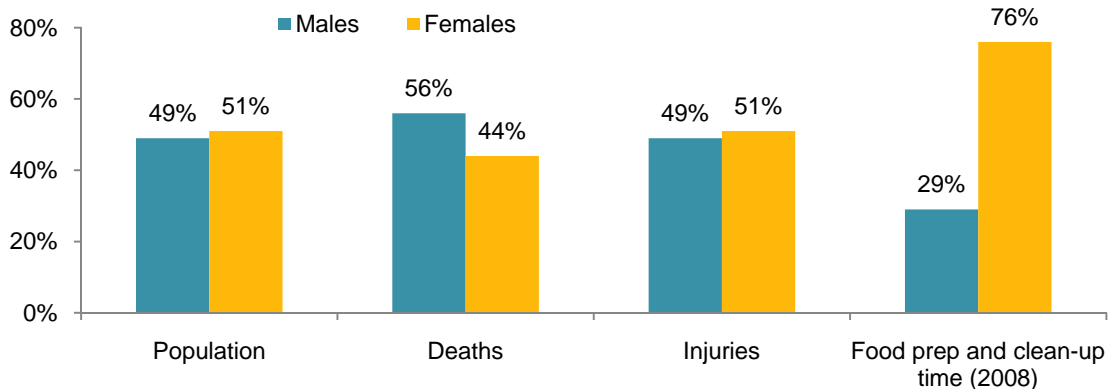


Source: Data from NFIRS Version 5.0, NFPA survey and U.S. Census.

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

During 2008, U.S. women at least 15 years of age spent an average of 44 minutes a day on food preparation and clean-up in a typical day. According to the American Time Use Survey, men, spent an average of only 18 minutes a day on these same tasks.<sup>16</sup> However, Figure 1.9 shows that in 2003-2006 males accounted for 58% of the home cooking fire deaths and 48% of cooking fire injuries. Considering that men spend less than half the time that women spend on food preparation and clean-up, the male risk from these fires is substantially higher.

<sup>16</sup> 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, 2008 Annual Averages,” online at [http://www.bls.gov/tus/tables/a1\\_2008.pdf](http://www.bls.gov/tus/tables/a1_2008.pdf).

**Figure 1.9. Cooking Equipment Fire Victims by Gender: 2003-2006**

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

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

Table 1.14 shows that 31% of the victims of fatal home cooking fires and 39% of those 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 (21%) of the deaths and one-quarter (26%) of the injuries.

Twenty-seven percent of the fatal injuries and 10% of the non-fatal injuries were incurred by individuals who were not in the area or origin but were involved in the ignition. This could be the case of someone who had been cooking but had gone to another room in the home. Twenty percent of the fatalities and 23% 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.**

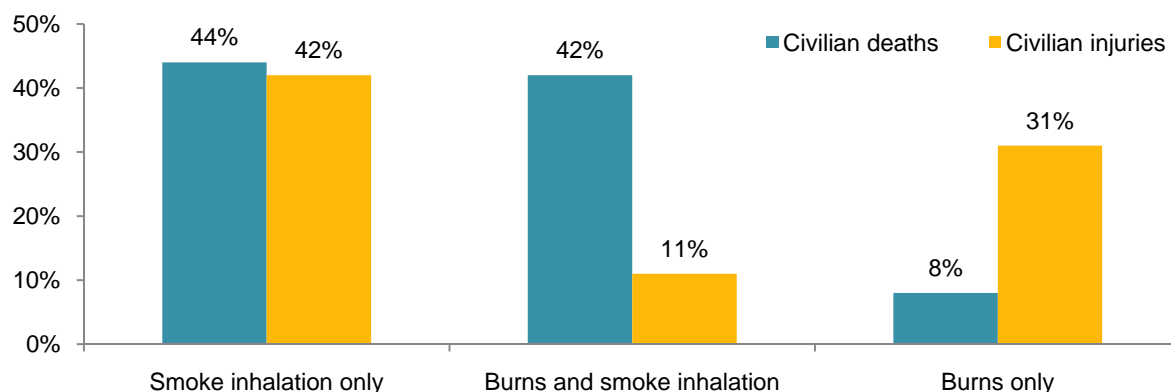
According to fire department reports, smoke inhalation was the primary apparent symptom seen in 44% of the home cooking equipment fire deaths and 42% of the reported non-confined home cooking equipment fire injuries. Figure 1.10 shows that almost one-third (31%) of those injured exhibited signs of burns only and 11% had both burns and smoke inhalation. In contrast, 42% of the fatalities suffered both burns and smoke inhalation while just 8% suffered only burns.

**More than one-third of the fatal home cooking fire injuries occurred while the victims were sleeping.**

Table 1.15 shows that in 2003-2006, 37% of the people killed in home fires involving cooking equipment were asleep when fatally injured. This is very close to the 39% of overall home fire victims in 2002-2005 who were sleeping.<sup>17</sup> Most other activities were also fairly similar. Notably, however, 6% were attempting to fight the fire themselves, twice the 3% seen among overall home fire deaths.

<sup>17</sup> Jennifer D. Flynn. *Characteristics of Home Fire Victims*, Quincy, MA: NFPA, 2008, pp. 55-60.

**Figure 1.10. Civilian Casualties Incurred at Home Fires Involving Cooking Equipment by Primary Apparent Symptom as Identified by the Fire Department (Excluding Confined Fires) 2003-2006**



Source: Data from NFIRS Version 5.0 and NFPA survey.

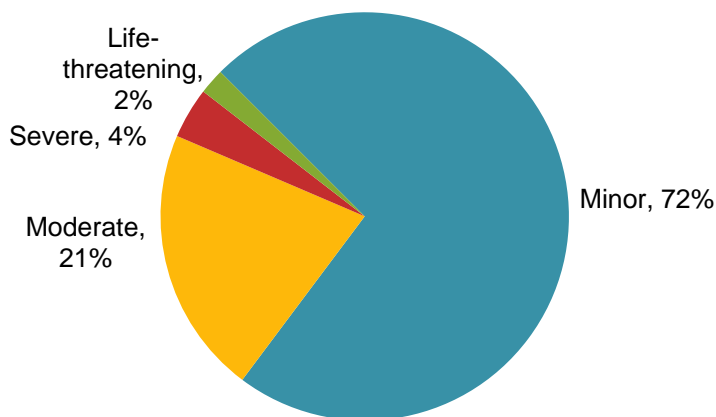
**Roughly three of every five reported non-fatal civilian injuries in home cooking equipment fires occurred when the victim was trying to fight the fire.**

Table 1.15 also shows that in 2003-2006, 57% of the people injured in non-confined home fires involving cooking equipment were hurt while attempting to fight the fire themselves. This is 20 percentage points more than the 37% of overall home fire injuries incurred by civilians trying to control the fire in 2002-2005.<sup>18</sup>

**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 perceive greater benefit from fighting a fire themselves than harm from a minor injury.

**Figure 1.11. Severity of Reported Non-Fatal Home Fire Injuries Involving Cooking Equipment (Excluding Confined Fires): 2003-2006**



Source: Data from NFIRS Version 5.0 and NFPA survey.

<sup>18</sup> Jennifer D. Flynn. *Characteristics of Home Fire Victims*, Quincy, MA: NFPA, 2008, p. 8.

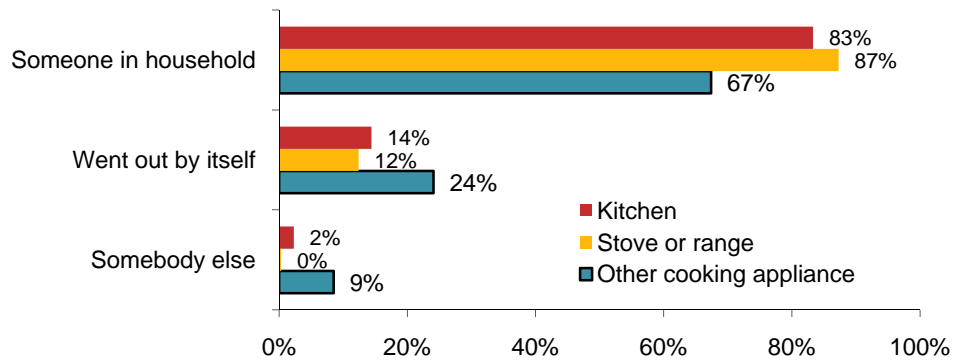
## Fire Control Attempts by Civilians

### Vast majority of fires involving cooking equipment are put out by civilians.

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.<sup>19</sup> The fire department was less likely to attend fires started by cooking equipment than most other types of fires.

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.<sup>20</sup>

**Figure 1.12. Who Put Out Fire in CPSC 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.

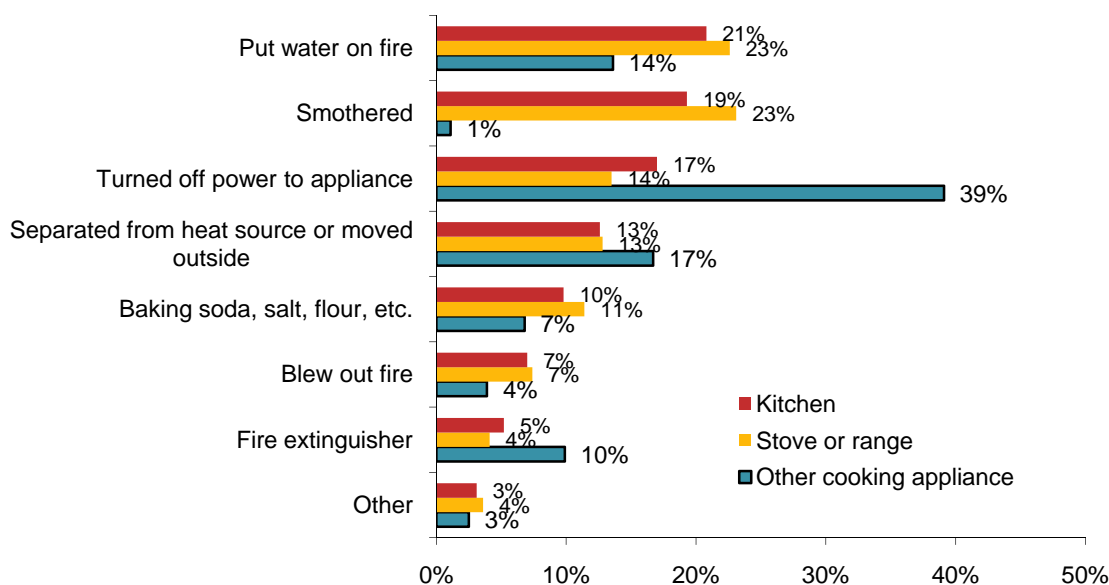
The CPSC asked their respondents how they put out the fire. Almost one-quarter (23%) put water on a stove or range fire. This approach was used with only 14% of the fires involving other cooking appliances. Twenty-three percent smothered stove or range fires. This was done in only 1% of the other cooking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

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%.

<sup>19</sup> 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.

<sup>20</sup> 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.

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



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

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.<sup>21</sup> 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

<sup>21</sup> 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>.

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 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, which tends to take 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 9,400 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.<sup>22</sup>

### **Non-Fire Burn Injuries Associated with Cooking Equipment**

Cooking equipment has long been the leading cause of reported fire injuries. Forty-four percent of the reported civilian 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, the majority of emergency room visits for burn injuries associated with cooking equipment were not caused by fire or flame.

In 2008, ranges or ovens were involved in an estimated 17,660 thermal burn injuries seen in U.S. hospital emergency rooms. Table 16 shows that only 8% (1,470) were due to fire or flame. Ninety-two percent (16,190) of the thermal burns resulted from non-fire sources, chiefly contact with the hot equipment. Almost two-thirds (62%) of the 8,530 thermal burn injuries associated with grills were contact or non-fire burns.

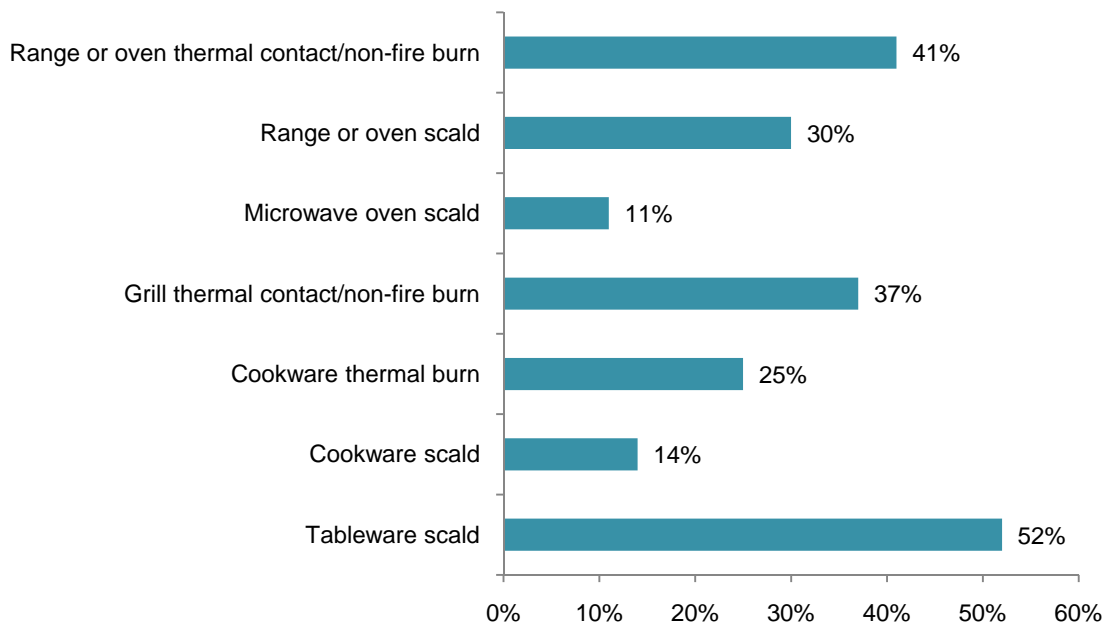
In 2003-2006, children under five accounted for 7% of the U.S. population but they incurred only 3% of the non-fatal fire injuries associated with cooking equipment. These young children account for much larger shares of non-fire burn injuries from cooking equipment and products associated with hot food.

<sup>22</sup> National Energy Assistance Directors’ Association. *2008 National Energy Assistance Survey*. 2009, p. 31.

### 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.

**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**



Source: CPSC's NEISS data, queried in August 2009.

Children under five accounted for:

- 41% of the 16,190 range or oven thermal *contact/non-fire* burns,
- 30% of the 3,060 scald burn injuries associated with ranges or ovens,
- 11% of the 4,020 scald burns associated with microwave ovens,

- 37% of the 5,270 thermal *contact/non-fire* burns associated with grills,
- 25% of the 8,610 thermal burn injuries associated with cookware;
- 14% of the 7,710 scald burns associated with cookware; and
- 52% of the 5,550 tableware scald burns.

## 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.<sup>23</sup>

## 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.

---

<sup>23</sup> 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.

**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.
- 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 2006 Dollars
1980	148,300	500	5,030	\$245	\$600
1981	153,500	530	5,090	\$766	\$1,696
1982	136,500	500	5,540	\$422	\$881
1983	125,200	470	5,610	\$343	\$694
1984	124,100	480	4,910	\$372	\$721
1985	127,500	450	4,870	\$350	\$655
1986	127,700	510	5,010	\$398	\$733
1987	125,100	410	5,500	\$397	\$704
1988	126,700	470	5,870	\$461	\$786
1989	119,800	480	5,480	\$451	\$734
1990	120,500	440	6,050	\$476	\$735
1991	122,100	360	6,060	\$621*	\$919*
1992	130,300	350	6,010	\$451	\$648
1993	128,400	430	6,530	\$548	\$765
1994	118,200	370	5,500	\$618	\$841
1995	111,700	370	5,390	\$446	\$590
1996	115,200	470	5,490	\$519	\$668
1997	117,500	380	5,760	\$565	\$710
1998	109,100	500	5,380	\$527	\$652
1999	85,800 (37,200)	310 (310)	2,620 (1,670)	\$504 (\$475)	\$610
2000	95,700 (34,600)	240 (240)	3,750 (2,470)	\$517 (\$475)	\$606
2001	120,900 (38,600)	510 (510)	4,490 (2,960)	\$534 (\$511)	\$608
2002	128,500 (38,000)	150 (150)	4,300 (2,910)	\$673 (\$645)	\$754
2003	143,800 (35,900)	540 (530)	4,510 (3,060)	\$771 (\$739)	\$846
2004	151,500 (36,500)	630 (620)	4,820 (3,290)	\$732 (\$706)	\$782
2005	147,300 (38,000)	500 (480)	4,740 (3,300)	\$869 (\$836)	\$897
2006	160,100 (40,700)	360 (360)	4,600 (3,150)	\$698 (\$676)	\$698

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 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 (1999-2006) and from NFPA survey.

**Table 1.2. Home Fires Involving Cooking Equipment, by Month**  
**Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Includes Confined Fires)**

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	12,500	(8%)	90	(18%)	400	(9%)	\$67	(9%)
February	11,400	(8%)	70	(14%)	370	(8%)	\$62	(8%)
March	12,800	(9%)	40	(8%)	400	(9%)	\$60	(8%)
April	12,700	(8%)	50	(10%)	430	(9%)	\$80	(11%)
May	12,800	(9%)	50	(10%)	410	(9%)	\$79	(10%)
June	11,700	(8%)	30	(6%)	340	(7%)	\$55	(7%)
July	11,100	(7%)	20	(5%)	310	(7%)	\$51	(7%)
August	11,400	(8%)	20	(5%)	390	(8%)	\$53	(7%)
September	12,100	(8%)	0	(1%)	380	(8%)	\$44	(6%)
October	13,600	(9%)	40	(7%)	410	(9%)	\$66	(9%)
November	13,900	(9%)	30	(5%)	410	(9%)	\$61	(8%)
December	14,100	(9%)	60	(12%)	420	(9%)	\$76	(10%)
Total	150,200	(100%)	500	(100%)	4,660	(100%)	\$756	(100%)
Average	12,500	(8%)	40	(8%)	390	(8%)	\$63	(8%)

**Table 1.3. Home Fires Involving Cooking Equipment, by Day of Week**  
**Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Includes Confined Fires)**

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	23,400	(16%)	110	(22%)	670	(14%)	\$112	(15%)
Monday	21,200	(14%)	80	(17%)	690	(15%)	\$101	(13%)
Tuesday	21,000	(14%)	50	(11%)	610	(13%)	\$117	(15%)
Wednesday	20,800	(14%)	80	(16%)	640	(14%)	\$91	(12%)
Thursday	21,600	(14%)	60	(11%)	740	(16%)	\$99	(13%)
Friday	20,200	(13%)	60	(12%)	630	(13%)	\$119	(16%)
Saturday	22,100	(15%)	60	(12%)	690	(15%)	\$117	(16%)
Total	150,200	(100%)	500	(100%)	4,660	(100%)	\$756	(100%)
Average	21,500	(14%)	70	(14%)	670	(14%)	\$108	(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 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Includes Confined Fires)**

Alarm Time	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Midnight - 12:59 a.m.	3,200	(2%)	20	(3%)	110	(2%)	\$14	(2%)
1:00 - 1:59 a.m.	2,300	(2%)	40	(7%)	120	(3%)	\$19	(3%)
2:00 - 2:59 a.m.	2,000	(1%)	20	(5%)	60	(1%)	\$22	(3%)
3:00 - 3:59 a.m.	1,700	(1%)	40	(7%)	90	(2%)	\$17	(2%)
4:00 - 4:59 a.m.	1,500	(1%)	10	(2%)	80	(2%)	\$12	(2%)
5:00 - 5:59 a.m.	1,400	(1%)	20	(3%)	60	(1%)	\$11	(1%)
6:00 - 6:59 a.m.	1,800	(1%)	10	(2%)	60	(1%)	\$16	(2%)
7:00 - 7:59 a.m.	2,700	(2%)	20	(3%)	70	(1%)	\$14	(2%)
8:00 - 8:59 a.m.	4,200	(3%)	20	(4%)	130	(3%)	\$22	(3%)
9:00 - 9:59 a.m.	5,300	(4%)	40	(8%)	180	(4%)	\$30	(4%)
10:00 - 10:59 a.m.	6,500	(4%)	30	(6%)	160	(3%)	\$42	(6%)
11:00 - 11:59 a.m.	7,800	(5%)	20	(5%)	200	(4%)	\$34	(5%)
Noon - 12:59 p.m.	8,900	(6%)	10	(1%)	270	(6%)	\$46	(6%)
1:00 - 1:59 p.m.	8,600	(6%)	20	(3%)	220	(5%)	\$42	(6%)
2:00 - 2:59 p.m.	8,600	(6%)	10	(1%)	210	(5%)	\$41	(5%)
3:00 - 3:59 p.m.	9,400	(6%)	0	(0%)	270	(6%)	\$42	(6%)
4:00 - 4:59 p.m.	10,800	(7%)	20	(3%)	390	(8%)	\$45	(6%)
5:00 - 5:59 p.m.	13,100	(9%)	30	(6%)	410	(9%)	\$57	(7%)
6:00 - 6:59 p.m.	13,400	(9%)	30	(7%)	380	(8%)	\$56	(7%)
7:00 - 7:59 p.m.	11,800	(8%)	0	(0%)	330	(7%)	\$45	(6%)
8:00 - 8:59 p.m.	9,400	(6%)	20	(3%)	290	(6%)	\$35	(5%)
9:00 - 9:59 p.m.	7,100	(5%)	20	(5%)	250	(5%)	\$29	(4%)
10:00 - 10:59 p.m.	4,900	(3%)	20	(5%)	170	(4%)	\$37	(5%)
11:00 - 11:59 p.m.	3,700	(2%)	50	(9%)	170	(4%)	\$28	(4%)
Total	150,200	(100%)	500	(100%)	4,660	(100%)	\$756	(100%)
Average	6,300	(4%)	20	(4%)	190	(4%)	\$31	(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 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Kitchen	34,700	(93%)	410	(85%)	3,010	(94%)	\$599	(82%)
Exterior balcony or unenclosed porch	500	(1%)	0	(0%)	50	(2%)	\$39	(5%)
Courtyard, terrace or patio	300	(1%)	0	(0%)	20	(1%)	\$18	(2%)
Garage or vehicle storage area*	200	(1%)	0	(1%)	20	(1%)	\$10	(1%)
Exterior wall surface	200	(1%)	0	(0%)	10	(0%)	\$6	(1%)
Other known area**	1,300	(4%)	70	(14%)	90	(3%)	\$55	(8%)
<b>Total</b>	<b>37,200</b>	<b>(100%)</b>	<b>490</b>	<b>(100%)</b>	<b>3,190</b>	<b>(100%)</b>	<b>\$728</b>	<b>(100%)</b>

\* Does not include garage coded as separate property.

\*\* "Other known" includes unclassified function area (7% 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 1.6. Home Fires Involving Cooking Equipment, by Factor Contributing to Ignition  
Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

<b>Factor</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Equipment unattended	14,100	(38%)	210	(43%)	1,500	(47%)	\$268	(37%)
Heat source too close to combustible	4,400	(12%)	80	(15%)	350	(11%)	\$82	(11%)
Unintentionally turned on or not turned off	3,700	(10%)	40	(9%)	250	(8%)	\$130	(18%)
Abandoned or discarded material	2,900	(8%)	30	(7%)	320	(10%)	\$69	(10%)
Electrical failure or malfunction	2,800	(8%)	10	(2%)	90	(3%)	\$52	(7%)
Unclassified misuse of material	2,500	(7%)	10	(2%)	260	(8%)	\$63	(9%)
Unclassified factor contributed to ignition	1,700	(5%)	10	(2%)	130	(4%)	\$34	(5%)
Failure to clean	1,200	(3%)	0	(1%)	50	(1%)	\$6	(1%)
Unclassified mechanical failure, malfunction, other	1,100	(3%)	10	(3%)	30	(1%)	\$18	(3%)
Leak or break	900	(2%)	10	(3%)	60	(2%)	\$26	(4%)
Unclassified operational deficiency	700	(2%)	20	(3%)	90	(3%)	\$28	(4%)
Equipment not being operated properly	600	(2%)	20	(4%)	80	(3%)	\$17	(2%)
Flammable liquid or gas spilled	400	(1%)	0	(0%)	70	(2%)	\$8	(1%)
Improper container or storage	400	(1%)	0	(0%)	10	(0%)	\$3	(0%)
Equipment used for unintended purpose	300	(1%)	40	(9%)	20	(1%)	\$4	(1%)
Worn out	300	(1%)	0	(0%)	10	(0%)	\$1	(0%)
Other known factor*	1,900	(5%)	50	(10%)	110	(4%)	\$40	(5%)
<b>Total</b>	<b>37,200</b>	<b>(100%)</b>	<b>490</b>	<b>(100%)</b>	<b>3,190</b>	<b>(100%)</b>	<b>\$728</b>	<b>(100%)</b>
<b>Total entries</b>	<b>40,000</b>	<b>(108%)</b>	<b>560</b>	<b>(114%)</b>	<b>3,440</b>	<b>(108%)</b>	<b>\$850</b>	<b>(117%)</b>

\* "Other known" includes playing with fire (9% of deaths).

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 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

<b>Human Factor</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Unattended or unsupervised person	7,000	(19%)	100	(21%)	650	(20%)	\$164	(23%)
Asleep	2,300	(6%)	110	(23%)	290	(9%)	\$61	(8%)
Age was a factor	900	(2%)	90	(19%)	140	(4%)	\$23	(3%)
Possibly impaired by alcohol or drugs	600	(2%)	60	(13%)	140	(4%)	\$21	(3%)
Possibly mentally disabled	300	(1%)	20	(4%)	50	(2%)	\$6	(1%)
Multiple persons involved	200	(1%)	20	(4%)	20	(1%)	\$9	(1%)
Physically disabled	200	(0%)	20	(4%)	30	(1%)	\$3	(0%)
None	26,600	(71%)	170	(34%)	2,030	(64%)	\$474	(65%)
<b>Total</b>	<b>37,200</b>	<b>(100%)</b>	<b>490</b>	<b>(100%)</b>	<b>3,190</b>	<b>(100%)</b>	<b>\$728</b>	<b>(100%)</b>
<b>Total entries</b>	<b>38,200</b>	<b>(102%)</b>	<b>590</b>	<b>(121%)</b>	<b>3,350</b>	<b>(105%)</b>	<b>\$761</b>	<b>(105%)</b>

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 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

<b>Item First Ignited</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Cooking materials, including food	20,400	(55%)	200	(41%)	2,130	(67%)	\$328	(45%)
Appliance housing or casing	2,300	(6%)	40	(8%)	90	(3%)	\$35	(5%)
Flammable or combustible liquid or gas, piping or filter	2,100	(6%)	10	(1%)	170	(5%)	\$43	(6%)
Cabinetry	1,800	(5%)	40	(8%)	130	(4%)	\$75	(10%)
Household utensil	1,700	(5%)	10	(2%)	120	(4%)	\$34	(5%)
Unclassified item first ignited	1,500	(4%)	20	(5%)	90	(3%)	\$19	(3%)
Electrical wire or cable insulation	1,200	(3%)	10	(1%)	30	(1%)	\$11	(1%)
Interior wall covering, excluding drapes	1,000	(3%)	40	(7%)	80	(3%)	\$36	(5%)
Box, carton, bag, basket or barrel	700	(2%)	10	(2%)	40	(1%)	\$15	(2%)
Unclassified furniture or utensil	400	(1%)	0	(1%)	20	(0%)	\$6	(1%)
Exterior wall covering or finish	400	(1%)	10	(3%)	30	(1%)	\$15	(2%)
Structural member or framing	400	(1%)	10	(1%)	10	(0%)	\$37	(5%)
Unclassified structural component or finish	400	(1%)	0	(0%)	20	(1%)	\$21	(3%)
Magazine, newspaper or writing paper	300	(1%)	0	(1%)	20	(1%)	\$7	(1%)
Linen other than bedding	300	(1%)	0	(0%)	30	(1%)	\$2	(0%)
Clothing	300	(1%)	60	(13%)	50	(1%)	\$5	(1%)
Multiple items first ignited	300	(1%)	10	(3%)	10	(0%)	\$7	(1%)
Rubbish, trash or waste	200	(1%)	0	(0%)	10	(0%)	\$3	(0%)
Unclassified soft goods or wearing apparel	200	(1%)	0	(0%)	20	(1%)	\$2	(0%)
Other known item	1,400	(4%)	10	(3%)	100	(3%)	\$28	(4%)
<b>Total</b>	<b>37,200</b>	<b>(100%)</b>	<b>490</b>	<b>(100%)</b>	<b>3,190</b>	<b>(100%)</b>	<b>\$728</b>	<b>(100%)</b>

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 2003-2006 Structure Fires Reported to U.S. Fire Departments**

<b>Extent of Flame Damage</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Confined fire identified by incident type	112,900	(75%)	10	(2%)	1,470	(32%)	\$28	(4%)
Confined to object of origin	10,300	(7%)	30	(6%)	480	(10%)	\$41	(5%)
Confined to room of origin	20,900	(14%)	90	(18%)	2,030	(44%)	\$239	(32%)
Confined to floor of origin	1,900	(1%)	60	(12%)	230	(5%)	\$92	(12%)
Confined to building of origin	3,800	(3%)	260	(52%)	410	(9%)	\$319	(42%)
Extended beyond building of origin	400	(0%)	40	(8%)	50	(1%)	\$36	(5%)
<b>Total</b>	<b>150,200</b>	<b>(100%)</b>	<b>500</b>	<b>(100%)</b>	<b>4,660</b>	<b>(100%)</b>	<b>\$756</b>	<b>(100%)</b>

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 2003-2006 Structure Fires Reported to U.S. Fire Departments**

Smoke Alarm Status	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Smoke alarm operated in non-confined fire	21,200	(14%)	170	(34%)	1,900	(41%)	\$469	(62%)
Smoke alarm operated in confined fire	66,500	(44%)	10	(2%)	920	(20%)	\$19	(3%)
<i>Subtotal – Operating smoke alarm</i>	<i>87,800</i>	<i>(58%)</i>	<i>180</i>	<i>(36%)</i>	<i>2,820</i>	<i>(60%)</i>	<i>\$489</i>	<i>(65%)</i>
Smoke alarm present but did not operate in non-confined fire	5,300	(4%)	230	(45%)	580	(12%)	\$108	(14%)
Smoke alarm present but did not operate in confined fire	10,600	(7%)	0	(0%)	280	(6%)	\$3	(0%)
<i>Subtotal – Smoke alarm present but did not operate</i>	<i>15,900</i>	<i>(11%)</i>	<i>230</i>	<i>(45%)</i>	<i>860</i>	<i>(18%)</i>	<i>\$112</i>	<i>(15%)</i>
Fire too small to operate in non-confined fire	2,500	(2%)	20	(5%)	190	(4%)	\$15	(2%)
Fire too small to operate in confined fire	17,100	(11%)	0	(0%)	150	(3%)	\$2	(0%)
<i>Subtotal – Fire too small to operate alarm</i>	<i>19,600</i>	<i>(13%)</i>	<i>20</i>	<i>(5%)</i>	<i>340</i>	<i>(7%)</i>	<i>\$17</i>	<i>(2%)</i>
<i>Subtotal – Smoke alarm present</i>	<i>123,300</i>	<i>(82%)</i>	<i>430</i>	<i>(86%)</i>	<i>4,020</i>	<i>(86%)</i>	<i>\$617</i>	<i>(82%)</i>
No smoke alarm present in non-confined fire	8,200	(5%)	70	(14%)	520	(11%)	\$135	(18%)
No smoke alarm present in confined fire	18,700	(12%)	0	(0%)	120	(3%)	\$3	(0%)
<i>Subtotal – No smoke alarm</i>	<i>26,900</i>	<i>(18%)</i>	<i>70</i>	<i>(14%)</i>	<i>650</i>	<i>(14%)</i>	<i>\$139</i>	<i>(18%)</i>
<i>Subtotal – No working smoke alarm present</i>	<i>42,800</i>	<i>(29%)</i>	<i>300</i>	<i>(59%)</i>	<i>1,510</i>	<i>(32%)</i>	<i>\$250</i>	<i>(33%)</i>
Total	150,200	(100%)	500	(100%)	4,660	(100%)	\$756	(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 1.11. Home Fires Involving Cooking Equipment, by Automatic Extinguishing System (AES) Status  
Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments**

AES Status	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
AES operated in non-confined fire	800	(1%)	10	(2%)	70	(2%)	\$16	(2%)
AES operated in confined fire	3,200	(2%)	0	(0%)	40	(1%)	\$4	(1%)
<i>Subtotal – Operating AES</i>	<i>4,000</i>	<i>(3%)</i>	<i>10</i>	<i>(2%)</i>	<i>110</i>	<i>(2%)</i>	<i>\$20</i>	<i>(3%)</i>
AES present but did not operate in non-confined fire	0	(0%)	0	(0%)	0	(0%)	\$3	(0%)
AES present but did not operate in confined fire	200	(0%)	0	(0%)	0	(0%)	\$0	(0%)
<i>Subtotal – AES present but did not operate</i>	<i>200</i>	<i>(0%)</i>	<i>0</i>	<i>(0%)</i>	<i>0</i>	<i>(0%)</i>	<i>\$3</i>	<i>(0%)</i>
Fire too small to operate in non-confined fire	500	(0%)	0	(0%)	40	(1%)	\$5	(1%)
Fire too small to operate in confined fire	5,000	(3%)	0	(0%)	70	(2%)	\$0	(0%)
<i>Subtotal – Fire too small to operate alarm</i>	<i>5,500</i>	<i>(4%)</i>	<i>0</i>	<i>(0%)</i>	<i>110</i>	<i>(2%)</i>	<i>\$5</i>	<i>(1%)</i>
<i>Subtotal – AES present</i>	<i>9,800</i>	<i>(7%)</i>	<i>10</i>	<i>(2%)</i>	<i>220</i>	<i>(5%)</i>	<i>\$28</i>	<i>(4%)</i>
Unclassified AES operation unclassified in non-confined fire	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified AES operation unclassified in confined fire	100	(0%)	0	(0%)	0	(0%)	\$0	(0%)
<i>Subtotal - Unclassified AES operation</i>	<i>100</i>	<i>(0%)</i>	<i>0</i>	<i>(0%)</i>	<i>0</i>	<i>(0%)</i>	<i>\$0</i>	<i>(0%)</i>
No AES present in non-confined fire	35,800	(24%)	480	(96%)	3,080	(66%)	\$704	(93%)
No AES present in confined fire	104,200	(69%)	10	(2%)	1,360	(29%)	\$24	(3%)
<i>Subtotal – No AES present</i>	<i>140,000</i>	<i>(93%)</i>	<i>490</i>	<i>(98%)</i>	<i>4,440</i>	<i>(95%)</i>	<i>\$728</i>	<i>(96%)</i>
<i>Subtotal – No working AES present</i>	<i>140,200</i>	<i>(93%)</i>	<i>490</i>	<i>(98%)</i>	<i>4,440</i>	<i>(95%)</i>	<i>\$731</i>	<i>(97%)</i>
AES in structure but not in fire area in non-confined fire	0	(0%)	0	(0%)	10	(0%)	\$0	(0%)
AES in structure but not in fire area in confined fire	200	(0%)	0	(0%)	0	(0%)	\$0	(0%)
<i>Subtotal - AES in structure but not in fire area</i>	<i>300</i>	<i>(0%)</i>	<i>0</i>	<i>(0%)</i>	<i>10</i>	<i>(0%)</i>	<i>\$0</i>	<i>(0%)</i>
<b>Total</b>	<b>150,200</b>	<b>(100%)</b>	<b>500</b>	<b>(100%)</b>	<b>4,660</b>	<b>(100%)</b>	<b>\$756</b>	<b>(100%)</b>

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 2003-2006 Structure Fires Reported to U.S. Fire Departments**

**A. Non-confined fires involving cooking equipment plus fires with confined cooking fire incident type**

AES Type	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Wet pipe sprinkler	8,500	(86%)	10	(100%)	200	(92%)	\$23	(81%)
Dry pipe sprinkler	600	(6%)	0	(0%)	10	(5%)	\$4	(14%)
Other sprinkler system	200	(2%)	0	(0%)	0	(0%)	\$0	(0%)
<i>Subtotal - Sprinkler</i>	<i>9,200</i>	<i>(94%)</i>	<i>10</i>	<i>(100%)</i>	<i>210</i>	<i>(97%)</i>	<i>\$27</i>	<i>(95%)</i>
Dry chemical system	400	(4%)	0	(0%)	10	(3%)	\$1	(3%)
Unclassified AES	200	(2%)	0	(0%)	0	(0%)	\$1	(2%)
Total	9,800	(100%)	10	(100%)	220	(100%)	\$28	(100%)

**B. Non-confined fires involving cooking equipment**

AES Type	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Wet pipe sprinkler	1,200	(89%)	10	(100%)	90	(83%)	\$19	(77%)
Dry pipe sprinkler	100	(4%)	0	(0%)	10	(10%)	\$4	(16%)
Other sprinkler system	0	(1%)	0	(0%)	0	(0%)	\$0	(0%)
<i>Subtotal - Sprinkler</i>	<i>1,300</i>	<i>(95%)</i>	<i>10</i>	<i>(100%)</i>	<i>100</i>	<i>(94%)</i>	<i>\$23</i>	<i>(94%)</i>
Dry chemical system	100	(5%)	0	(0%)	10	(6%)	\$1	(4%)
Unclassified AES	0	(1%)	0	(0%)	0	(0%)	\$1	(2%)
Total	1,400	(100%)	10	(100%)	110	(100%)	\$24	(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 1.12. Home Fires Involving Cooking Equipment, by AES Type when Present  
Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Continued)**

**C. Fires with confined cooking fire incident type**

AES Type	Fires		Civilian Deaths		Civilian Injuries		Direct Property	
							Damage (in Millions)	
Wet pipe sprinkler	7,300	(86%)	0	(NA)	110	(100%)	\$4	(99%)
Dry pipe sprinkler	500	(6%)	0	(NA)	0	(0%)	\$0	(0%)
Other sprinkler system	100	(2%)	0	(NA)	0	(0%)	\$0	(0%)
<i>Subtotal - Sprinkler</i>	<i>7,900</i>	<i>(94%)</i>	<i>0</i>	<i>(NA)</i>	<i>110</i>	<i>(100%)</i>	<i>\$4</i>	<i>(99%)</i>
Dry chemical system	400	(4%)	0	(NA)	0	(0%)	\$0	(1%)
Unclassified AES	200	(2%)	0	(NA)	0	(0%)	\$0	(0%)
Total	8,500	(100%)	0	(NA)	110	(100%)	\$4	(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 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Excluding Confined Fires)**

Age	Population (in Millions)		Civilian Deaths		Deaths Per Million	Relative Risk of Death	Civilian Injuries		Injuries per Million	Relative Risk of Injury
Under 5	20.1	(7%)	90	(18%)	4.4	2.6	80	(3%)	4.1	0.4
5-9	19.7	(7%)	30	(5%)	1.3	0.8	60	(2%)	3.1	0.3
10-14	21.0	(7%)	20	(3%)	0.8	0.5	100	(3%)	5.0	0.5
15-24	41.9	(14%)	20	(4%)	0.5	0.3	590	(19%)	14.2	1.3
25-34	40.1	(14%)	50	(10%)	1.2	0.7	610	(19%)	15.3	1.4
35-49	66.3	(22%)	100	(21%)	1.5	0.9	840	(26%)	12.7	1.2
50-64	49.5	(17%)	70	(14%)	1.4	0.8	500	(16%)	10.0	0.9
65-74	18.6	(6%)	60	(12%)	3.1	1.8	170	(5%)	8.9	0.8
75-84	13.0	(4%)	30	(7%)	2.5	1.5	170	(5%)	13.0	1.2
85 and up	5.0	(2%)	30	(6%)	6.2	3.7	60	(2%)	12.5	1.2
Total	295.1	(100%)	490	(100%)	1.7	1.0	3,190	(100%)	10.8	1.0
Under 15	60.8	(21%)	130	(27%)	2.1	1.3	250	(8%)	4.1	0.4
Over 65	36.6	(12%)	120	(25%)	3.3	2.0	400	(12%)	10.9	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 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Excluding Confined Fires)**

Victim's Location at Time of Incident	Civilian Deaths		Civilian Injuries	
In area of origin and involved	150	(31%)	1,250	(39%)
In area of origin and not involved	100	(21%)	840	(26%)
Not in area of origin but involved	130	(27%)	330	(10%)
Not in area of origin and not involved	100	(20%)	740	(23%)
Unclassified	10	(2%)	20	(1%)
Total	490	(100%)	3,190	(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 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Confined Fires)**

Victim's Activity at Time of Injury	Civilian Deaths		Civilian Injuries	
	Count	Percentage	Count	Percentage
Sleeping	180	(37%)	190	(6%)
Escaping	170	(34%)	480	(15%)
Unclassified activity	40	(8%)	220	(7%)
Unable to act	40	(8%)	70	(2%)
Fire control	30	(6%)	1,830	(57%)
Returning to vicinity of fire before control	10	(3%)	180	(6%)
Rescue attempt	10	(2%)	130	(4%)
Irrational act	10	(2%)	60	(2%)
Returning to vicinity of fire after control	0	(0%)	20	(1%)
<b>Total</b>	<b>490</b>	<b>(100%)</b>	<b>3,190</b>	<b>(100%)</b>

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. 2008 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
<b>NEISS estimates of 2008 emergency room visits for</b>					
Thermal burns	17,660	--	8,530	8,610	1,770
Victim under five	6,690	--	2,040	2,190	290
Thermal fire, flame or flash burn	1,470		3,270	780	
Thermal contact/non-fire burn	16,190		5,270	7,830	1,690
Thermal contact/non-fire burn victim under five	6,680		1,970	990	290
Scald burns	3,060	4,020	--	7,710	5,550
Victim under 5	910	450	--	1,100	2,900
<b>Reported civilian fire injuries 2003-2006</b>	<b>3,820</b>	<b>110</b>	<b>120</b>	<b>--</b>	<b>--</b>

Source: CPSC's NEISS, queried at <https://www.cpsc.gov/cgibin/NEISSQuery/Home.aspx> in August 2009, Data from NFIRS Version 5.0 and NFPA survey 2003-2006 civilian fire injuries.

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

<b>Year</b>	<b>Gas-fueled range, stove or oven</b>	<b>Charcoal grill or charcoal</b>
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 2003-2006, U.S. fire departments responded to an average of 88,000 home structure fires per year in which a range or cooktop was involved in ignition. These fires caused an annual average of 440 civilian deaths, 3,540 civilian injuries, and \$523 million in direct property damage. These incidents accounted for 59% of the reported home fires involving cooking equipment, 88% of the associated civilian deaths, 77% of the associated civilian injuries, and 69% 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). Consequently, estimates of equipment involved in confined fires are based on the 4% of confined fire incident reports coded with known or no equipment involved in ignition.

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 23% of reported home fires from all causes combined, 15% of home fire deaths, 27% of home fire injuries, and 9% 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.<sup>24</sup>

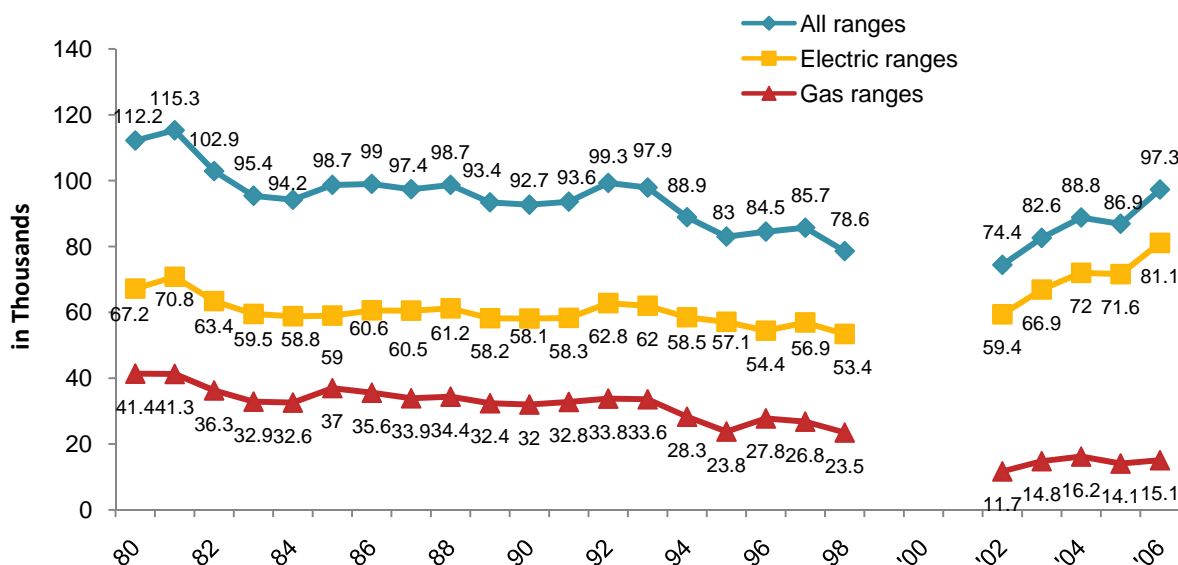
Figure 2.1 and Table 2.1 show that the total number of reported fires involving ranges or cooktops was only 13% lower in 2006 than in 1980. Table 2.2 shows that fires involving gas ranges were 63% lower while Table 2.3 shows that electric range fires were actually up 21%.

### 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*.

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: 1980-2006**



Source: Data from NFIRS and NFPA survey.

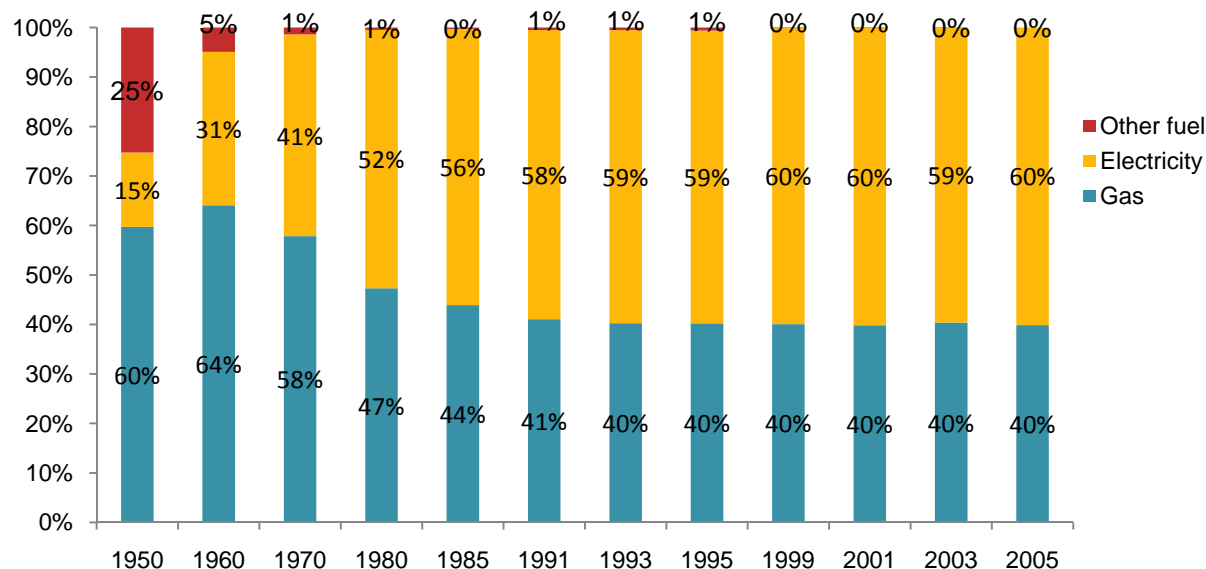
<sup>24</sup> U.S. Census Bureau, Current Housing Reports, Series H150/07, *American Housing Survey for the United States: 2007*, Washington, DC, 2008. Table 1A-4.

## 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 2005. 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 have used electricity as gas.

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



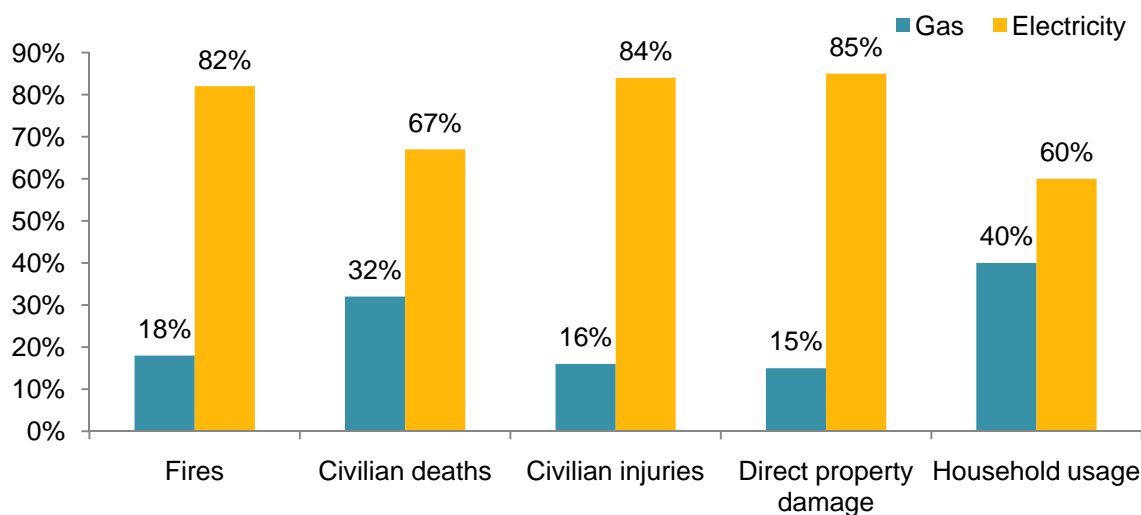
Note: Gas includes utility, bottled, tank and LP-gas.

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*, 1994-2008 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 2003-2005, Figure 2.3 shows that 82% of the range or cooktop fires reported in 2003-2006 were powered by electricity. During 2003-2006, electric ranges or cooktops were involved in an average of 72,200 reported home structure fires per year. These fires caused an annual average of 290 civilian deaths, 2,980 reported civilian injuries, and \$444 million in direct property damage. Gas ranges or cooktops were involved in an average of 15,600 reported home structure fires annually during this period, resulting in an average of 140 civilian deaths, 550 civilian injuries, and \$78 million in direct property damage per year.

**Figure 2.3. Percentages of 2003-2006 Reported Home Structure Fires and Associated Losses Involving Cooking Equipment by Cooking Equipment Power Source**



Source: Data from NFIRS Version 5.0 and NFPA survey.

Rates per million user households of reported fires and civilian injuries and average direct property damage per reported stove or range fire were three to four times higher for households using electric ranges than in 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 1.4 times as high as it was in households using gas. The rate of 41.2 injuries per 1,000 reported electric range or cooktop fires and average loss per fire of \$6,100 were also higher for than the 35.5 injuries per 1,000 reported gas range fires and \$5,000 in average direct property damage. However, the death rate of 9.1 deaths per reported 1,000 gas range fires was more than twice as high as the electric range rate of 4.1.

Including fires that were not attended by fire departments, based on its 2004-2005 survey, the CPSC estimates that electric ranges were involved in 2.6 million home fires, resulting in a risk of 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.<sup>25</sup> The risk of fire was 47% higher in households using electric ranges.

## Causal Factors

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

During 2003-2006, unattended equipment was a factor contributing to ignition in 43% of reported non-confined home structure fires involving ranges or cooktops. Table 2.6 shows that other leading factors were unintentionally turned on or not turned off (11% of fires), heat source

<sup>25</sup> 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.

too close to combustibles (11% of fires), abandoned or discarded material (9% of fires), and playing with fire (less than 1% of fires but 10% of the deaths).

Gas range fires were much less likely than electric range fires to cite equipment unattended (26% vs. 45% of fires) and much more likely to cite leak or break (12% vs. 0%). See Table 2.7 and 2.8 for more details.

### **Cooking materials were the leading items first ignited.**

During the same four-year period, 61% of the reported non-confined home fires involving ranges started with the ignition of cooking materials, including food. Other leading items first ignited for one or more losses were flammable or combustible gases or liquids or associated piping (5% of fires), household utensils (also 5% of fires), cabinetry (another 5% of fires), appliance housing or casing (4% of fires), and clothing (only 1% of fires but 15% of deaths).

Gas range fires were much less likely than electric range fires to cite cooking materials (43% vs. 65% of fires) and more likely to cite flammable or combustible gases or liquids and related items (16% 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 (68%) of all range or cooktop fires reported in 2003-2006 were coded with an incident type that indicated the fire was confined to the vessel or object or origin. In an additional 8%, fire spread was coded as confined to the object of origin. Combined, the 76% of reported range fires with confined fire incident types or that were confined to object of origin caused 6% of the range fire deaths and 35% 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 76% of the associated deaths. Only 16% 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 specials 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.<sup>26</sup>

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.<sup>27</sup> When oil or fat ignited:

<sup>26</sup> Smith, Linda, Monticone, Ron, and Gillum, Brenda. *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>

<sup>27</sup> Key Research and Marketing, Ltd. *New Zealand Fire Service Bay-Waikato Fire Region Kitchen Fire Research, Summary of Findings*, October 1998.

- 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.

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.<sup>28</sup> 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 2008, an estimated 36,000 people with injuries involving ranges or ovens went to hospital emergency rooms.<sup>29</sup> Figure 2.4 and Table 2.15 show that 49% of these injuries were thermal burns, including 45% caused by contact with a hot object or other non-fire source (92% of the

---

<sup>28</sup> 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>.

<sup>29</sup> 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](http://www.cpsc.gov), accessed in August 2009.

range or oven thermal burns). *Forty-one percent (6,700) of these contact/non-fire burns were incurred by children under five years of age.*

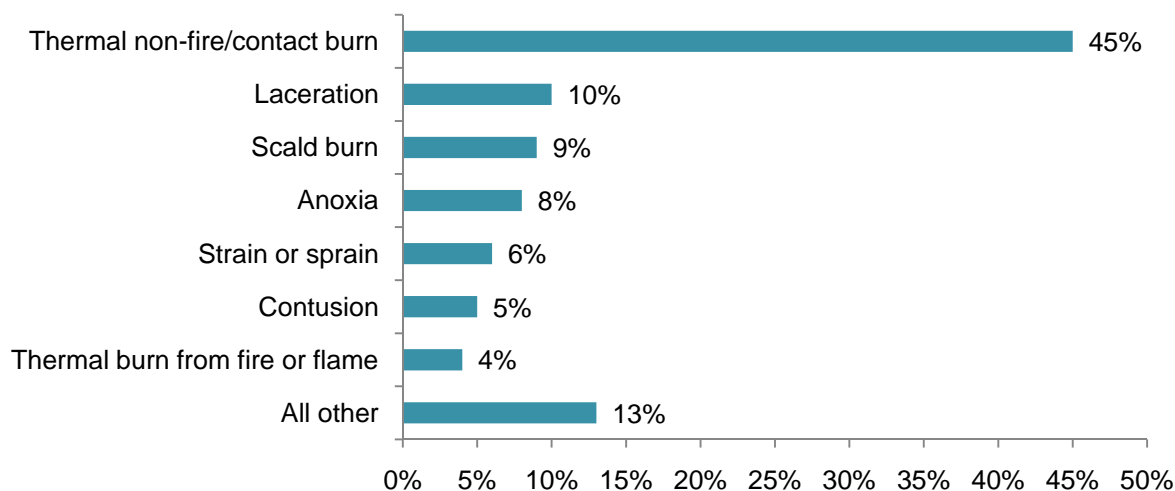
Four percent of the ER visits associated with a range or oven (8% of thermal burns) resulted from a fire or flame. Ten percent of the injuries were lacerations; 9% scald burns; 8% were due to anoxia, including both smoke inhalation from fires, non-fire carbon monoxide poisoning, and exposure to leaking gas; 6% were strains or sprains; and 5% were contusions.

After proportional allocation of injuries involving ranges or ovens of unknown type, these injuries included 11,600 injuries involving gas-fueled ranges and ovens, 19,800 injuries involving electric-powered ranges and ovens, and 4,600 injuries involving other types of ranges and ovens. See Table 16.

### 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.

**Figure 2.4. Injuries Involving Ranges or Ovens Seen at Hospital Emergency Rooms in 2008, by Diagnosis**



Source: CPSC's NEISS, queried in August 2009.

## 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 2006 Dollars	
1980	112,200		380		4,210		\$181		\$443
1981	115,300		420		4,230		\$701		\$1,552
1982	102,900		370		4,600		\$219		\$457
1983	95,400		400		4,820		\$267		\$540
1984	94,200		420		4,150		\$282		\$546
1985	98,700		360		4,050		\$267		\$500
1986	99,000		390		4,210		\$303		\$558
1987	97,400		380		4,750		\$304		\$539
1988	98,700		390		4,940		\$332		\$566
1989	93,400		360		4,710		\$335		\$545
1990	92,700		380		5,050		\$355		\$548
1991	93,600		310		5,130		\$465*		\$688*
1992	99,300		290		4,960		\$321		\$461
1993	97,900		340		5,490		\$417		\$582
1994	88,900		270		4,480		\$321		\$437
1995	83,000		280		4,300		\$309		\$409
1996	84,500		360		4,350		\$366		\$471
1997	85,700		330		4,610		\$382		\$480
1998	78,600		410		4,280		\$863		\$1,068
1999	31,900	(17,100)	310	(310)	1,420	(900)	\$242	(\$231)	\$293
2000	55,700	(23,800)	120	(120)	2,830	(1,800)	\$266	(\$244)	\$312
2001	68,200	(28,800)	390	(390)	3,580	(2,420)	\$364	(\$353)	\$414
2002	74,400	(28,200)	120	(120)	3,570	(2,450)	\$476	(\$460)	\$534
2003	82,600	(26,700)	420	(420)	3,350	(2,490)	\$523	(\$505)	\$574
2004	88,800	(28,400)	600	(590)	3,860	(2,810)	\$549	(\$531)	\$587
2005	86,900	(29,200)	410	(410)	3,690	(2,890)	\$548	(\$535)	\$566
2006	97,300	(31,400)	350	(350)	3,460	(2,610)	\$498	(\$484)	\$498

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 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 (1999-2006) 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 2006
1980	41,400	270	1,410	\$53	\$130
1981	41,300	210	1,390	\$590	\$1,306
1982	36,300	230	1,580	\$79	\$165
1983	32,900	250	1,570	\$83	\$168
1984	32,600	220	1,390	\$79	\$153
1985	37,000	140	1,380	\$81	\$152
1986	35,600	190	1,240	\$90	\$166
1987	33,900	170	1,410	\$97	\$172
1988	34,400	220	1,500	\$118	\$201
1989	32,400	230	1,410	\$89	\$145
1990	32,000	180	1,450	\$100	\$154
1991	32,800	160	1,540	\$137*	\$203*
1992	33,800	140	1,410	\$96	\$138
1993	33,600	120	1,400	\$99	\$138
1994	28,300	170	1,140	\$86	\$117
1995	23,800	170	1,020	\$75	\$99
1996	27,800	210	1,110	\$103	\$132
1997	26,800	180	1,060	\$92	\$116
1998	23,500	220	900	\$84	\$104
1999	11,400 (6,200)	80 (80)	650 (380)	\$86 (\$84)	\$104
2000	11,500 (5,800)	120 (120)	570 (570)	\$90 (\$86)	\$105
2001	12,900 (5,600)	190 (190)	560 (350)	\$71 (\$70)	\$81
2002	11,700 (4,600)	20 (20)	430 (370)	\$76 (\$74)	\$85
2003	14,800 (4,900)	210 (210)	570 (410)	\$86 (\$84)	\$94
2004	16,200 (5,200)	220 (220)	670 (480)	\$87 (\$84)	\$93
2005	14,100 (5,200)	60 (60)	400 (260)	\$67 (\$64)	\$69
2006	15,100 (5,600)	100 (100)	540 (440)	\$74 (\$72)	\$74

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 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 (1999-2006) 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 2006 Dollars	
1980	67,200		100		2,690		\$119		\$292
1981	70,800		190		2,750		\$106		\$235
1982	63,400		110		2,910		\$130		\$271
1983	59,500		140		3,130		\$174		\$352
1984	58,800		170		2,660		\$197		\$382
1985	59,000		200		2,590		\$175		\$327
1986	60,600		200		2,870		\$205		\$377
1987	60,500		170		3,210		\$191		\$339
1988	61,200		140		3,290		\$204		\$348
1989	58,200		110		3,220		\$235		\$382
1990	58,100		190		3,480		\$245		\$378
1991	58,300		150		3,450		\$316*		\$468*
1992	62,800		150		3,420		\$217		\$312
1993	62,000		220		3,950		\$307		\$428
1994	58,500		100		3,270		\$224		\$305
1995	57,100		110		3,210		\$222		\$294
1996	54,400		140		3,110		\$248		\$319
1997	56,900		140		3,470		\$281		\$353
1998	53,400		170		3,320		\$269		\$333
1999	20,400	(10,800)	230	(230)	650	(380)	\$155	(\$146)	\$187
2000	34,300	(16,600)	0	(0)	1,900	(1,130)	\$157	(\$146)	\$184
2001	54,000	(22,400)	190	(190)	2,890	(1,960)	\$288	(\$278)	\$328
2002	59,400	(23,000)	100	(100)	3,080	(2,050)	\$388	(\$375)	\$435
2003	66,900	(21,800)	210	(210)	2,780	(2,080)	\$437	(\$421)	\$479
2004	72,000	(23,100)	360	(350)	3,170	(2,330)	\$459	(\$444)	\$491
2005	71,600	(24,000)	350	(350)	3,210	(2,600)	\$480	(\$470)	\$496
2006	81,100	(25,700)	240	(240)	2,900	(2,160)	\$421	(\$408)	\$421

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 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 (1999-2006) and from NFPA survey.

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

<b>Year</b>	<b>Gas</b>	<b>Electricity</b>	<b>Other Fuel</b>	<b>None</b>
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%	0.0%	0.2%

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*, 1994-2008 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)	Annual Average of 2003-2006 U.S. Home Structure Fires (Non-Confined or Confined) Involving Range or Stove With This Power			
		Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
Gas	43.0	15,600	140	550	\$78
Electricity	64.1	72,200	290	2,980	\$444
All ranges	107.1	88,000	440	3,540	\$528

Note: Usage statistics are published only for odd-numbered years. Therefore, in this analysis, usage is estimated as the average of 2003 and 2005 usage and assumes that households using these power sources for cooking have a range or stove.

Source: Data from NFIRS Version 5.0 and NFPA survey; *Statistical Abstract of the United States 2008* Table 963, Washington: U.S. Department of Commerce, 2007.

**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 Households
Gas	363	3.3	12.9	\$1.81
Electricity	1,126	4.6	46.4	\$6.92
All ranges	822	4.1	33.1	\$4.88

**Table 2.6. Home Fires Involving Ranges, by Factor Contributing to Ignition  
Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Equipment unattended	12,200	(43%)	200	(46%)	1,380	(51%)	\$233	(46%)
Unintentionally turned on or not turned off	3,200	(11%)	40	(9%)	230	(9%)	\$95	(19%)
Heat source too close to combustible	3,100	(11%)	60	(13%)	270	(10%)	\$49	(10%)
Abandoned or discarded material	2,500	(9%)	30	(7%)	290	(11%)	\$56	(11%)
Unclassified misuse of material or product	1,900	(7%)	10	(2%)	220	(8%)	\$33	(7%)
Electrical failure or malfunction	1,400	(5%)	10	(3%)	20	(1%)	\$18	(4%)
Unclassified factor contributed to ignition	1,400	(5%)	10	(2%)	110	(4%)	\$26	(5%)
Failure to clean	800	(3%)	10	(1%)	30	(1%)	\$3	(1%)
Leak or break	600	(2%)	0	(0%)	20	(1%)	\$4	(1%)
Unclassified mechanical failure or malfunction	600	(2%)	0	(0%)	10	(1%)	\$4	(1%)
Unclassified operational deficiency	500	(2%)	20	(3%)	80	(3%)	\$7	(1%)
Equipment not being operated properly	400	(2%)	10	(3%)	60	(2%)	\$7	(1%)
Flammable liquid or gas spilled	300	(1%)	0	(0%)	60	(2%)	\$5	(1%)
Improper container or storage	200	(1%)	0	(0%)	10	(0%)	\$2	(0%)
Worn out	200	(1%)	0	(0%)	10	(0%)	\$0	(0%)
Equipment used for unintended purpose	100	(1%)	30	(6%)	20	(1%)	\$1	(0%)
Other known factor*	1,000	(3%)	50	(12%)	70	(2%)	\$17	(3%)
<b>Total</b>	<b>28,500</b>	<b>(100%)</b>	<b>440</b>	<b>(100%)</b>	<b>2,690</b>	<b>(100%)</b>	<b>\$506</b>	<b>(100%)</b>
<b>Total entries</b>	<b>30,600</b>	<b>(107%)</b>	<b>470</b>	<b>(109%)</b>	<b>2,880</b>	<b>(107%)</b>	<b>\$560</b>	<b>(111%)</b>

\* Other known factor includes playing with heat source with 10% of the deaths. and an unclassified design deficiency, manufacturing or installation deficiency, a factor in 1% of the deaths..

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 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Equipment unattended	1,400	(26%)	20	(16%)	170	(42%)	\$33	(44%)
Heat source too close to combustible	800	(16%)	20	(15%)	70	(16%)	\$7	(10%)
Leak or break	600	(12%)	0	(0%)	20	(6%)	\$5	(6%)
Unintentionally turned on or not turned off	400	(8%)	10	(4%)	20	(4%)	\$11	(15%)
Unclassified misuse of material	400	(7%)	10	(4%)	50	(13%)	\$9	(12%)
Abandoned or discarded material	300	(6%)	20	(16%)	20	(5%)	\$5	(7%)
Unclassified factor contributed to ignition	300	(5%)	10	(4%)	20	(5%)	\$3	(4%)
Unclassified mechanical failure or malfunction	200	(5%)	0	(0%)	0	(0%)	\$3	(4%)
Failure to clean	200	(4%)	0	(0%)	10	(1%)	\$0	(0%)
Electrical failure or malfunction	100	(2%)	0	(0%)	0	(0%)	\$1	(1%)
Unclassified operational deficiency	100	(2%)	0	(0%)	10	(2%)	\$0	(1%)
Worn out	100	(2%)	0	(0%)	0	(1%)	\$0	(0%)
Equipment not being operated properly	100	(2%)	0	(3%)	10	(2%)	\$1	(1%)
Improper container or storage	100	(2%)	0	(0%)	10	(1%)	\$0	(0%)
Playing with heat source	100	(1%)	50	(34%)	10	(1%)	\$1	(1%)
Flammable liquid or gas spilled	100	(1%)	0	(0%)	10	(2%)	\$1	(2%)
Equipment used for unintended purpose	100	(1%)	0	(3%)	10	(3%)	\$1	(1%)
Other known factor	300	(5%)	0	(0%)	20	(5%)	\$3	(4%)
Total	5,200	(100%)	140	(100%)	400	(100%)	\$75	(100%)
Total entries	5,500	(107%)	140	(100%)	440	(110%)	\$84	(112%)

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 2002-2005 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Equipment unattended Unintentionally turned on or not turned off	10,600	(45%)	170	(60%)	1,200	(53%)	\$196	(46%)
Heat source too close to combustible	2,900	(12%)	30	(11%)	230	(10%)	\$84	(20%)
Abandoned or discarded material	2,300	(10%)	30	(12%)	200	(9%)	\$42	(10%)
Unclassified misuse of material	2,200	(9%)	10	(3%)	270	(12%)	\$52	(12%)
Electrical failure or malfunction	1,500	(6%)	0	(0%)	160	(7%)	\$24	(6%)
Unclassified factor contributed to ignition	1,400	(6%)	10	(4%)	20	(1%)	\$18	(4%)
Failure to clean	1,200	(5%)	10	(2%)	100	(4%)	\$24	(6%)
Unclassified operational deficiency	600	(3%)	10	(2%)	20	(1%)	\$3	(1%)
Unclassified mechanical failure or malfunction	400	(2%)	20	(6%)	70	(3%)	\$7	(2%)
Equipment not being operated properly	400	(2%)	0	(0%)	20	(1%)	\$2	(0%)
Flammable liquid or gas spilled	400	(2%)	10	(4%)	40	(2%)	\$5	(1%)
Improper container or storage	300	(1%)	0	(0%)	50	(2%)	\$4	(1%)
Other known factor*	100	(1%)	0	(0%)	0	(0%)	\$2	(0%)
	900	(4%)	20	(6%)	50	(2%)	\$14	(3%)
<b>Total</b>	<b>23,300</b>	<b>(100%)</b>	<b>290</b>	<b>(100%)</b>	<b>2,290</b>	<b>(100%)</b>	<b>\$429</b>	<b>(100%)</b>
<b>Total entries</b>	<b>25,000</b>	<b>(107%)</b>	<b>320</b>	<b>(110%)</b>	<b>2,440</b>	<b>(106%)</b>	<b>\$476</b>	<b>(111%)</b>

\* Other known factor includes equipment used for unintended purpose, a factor in 4% of the deaths and an unclassified design deficiency, manufacturing or installation deficiency, a factor in 2% of the deaths.

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 2.9. Home Fires Involving Ranges, by Item First Ignited**  
**Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Fires)**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Cooking materials, including food flammable or combustible liquid or gas, pipe, hose or duct	17,500	(61%)	190	(44%)	1,940	(72%)	\$287	(57%)
Household utensil	1,500	(5%)	10	(1%)	130	(5%)	\$19	(4%)
Cabinetry	1,400	(5%)	10	(1%)	110	(4%)	\$23	(5%)
Appliance housing or casing	1,300	(5%)	40	(9%)	110	(4%)	\$53	(10%)
Unclassified item first ignited	1,200	(4%)	40	(8%)	40	(2%)	\$16	(3%)
Interior wall covering, excluding drapes	1,000	(3%)	20	(5%)	80	(3%)	\$12	(2%)
Electrical wire or cable insulation	800	(3%)	30	(7%)	50	(2%)	\$29	(6%)
Box, carton, bag, basket or barrel	600	(2%)	0	(0%)	10	(0%)	\$5	(1%)
Unclassified furniture or utensil	500	(2%)	10	(2%)	30	(1%)	\$13	(3%)
Magazine, newspaper or writing paper	300	(1%)	0	(0%)	10	(0%)	\$4	(1%)
Linen other than bedding	300	(1%)	0	(0%)	10	(0%)	\$4	(1%)
Clothing	200	(1%)	0	(0%)	30	(1%)	\$2	(0%)
Multiple items first ignited	200	(1%)	60	(15%)	40	(2%)	\$3	(1%)
Unclassified structural component or finish	200	(1%)	10	(3%)	10	(0%)	\$5	(1%)
Rubbish, trash or waste	200	(1%)	0	(0%)	10	(0%)	\$7	(1%)
Unclassified soft goods or wearing apparel	200	(1%)	0	(0%)	10	(0%)	\$2	(0%)
Other known item*	200	(1%)	0	(0%)	10	(1%)	\$1	(0%)
Other known item*	1,000	(3%)	10	(2%)	60	(2%)	\$19	(4%)
<b>Total</b>	<b>28,500</b>	<b>(100%)</b>	<b>440</b>	<b>(100%)</b>	<b>2,690</b>	<b>(100%)</b>	<b>\$506</b>	<b>(100%)</b>

\* "Other known" includes ignition of a person (1% of deaths) and floor covering, rug or mat (1% of the 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 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Fires)**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Cooking materials, including food flammable or combustible liquid or gas, piping or filter	2,200	(43%)	50	(36%)	200	(50%)	\$31	(41%)
Household utensil	300	(6%)	0	(0%)	10	(3%)	\$4	(6%)
Appliance housing or casing	300	(5%)	0	(0%)	10	(4%)	\$2	(3%)
Cabinetry	200	(5%)	10	(10%)	10	(3%)	\$8	(11%)
Unclassified item first ignited	200	(4%)	0	(3%)	20	(5%)	\$3	(4%)
Interior wall covering, excluding drapes	200	(4%)	20	(13%)	0	(1%)	\$8	(11%)
Linen other than bedding	100	(2%)	0	(0%)	10	(1%)	\$0	(0%)
Box, carton, bag, basket or barrel	100	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Clothing	100	(2%)	40	(25%)	30	(6%)	\$1	(1%)
Unclassified furniture or utensil	100	(1%)	0	(0%)	0	(1%)	\$1	(2%)
Electrical wire or cable insulation	100	(1%)	0	(0%)	0	(1%)	\$0	(0%)
Magazine, newspaper or writing paper	100	(1%)	0	(0%)	0	(1%)	\$2	(2%)
Other known item*	400	(8%)	10	(8%)	40	(10%)	\$7	(9%)
<b>Total</b>	<b>5,200</b>	<b>(100%)</b>	<b>140</b>	<b>(100%)</b>	<b>400</b>	<b>(100%)</b>	<b>\$75</b>	<b>(100%)</b>

\* "Other known" includes ignition of a person (4% of deaths) and multiple items first ignited (3% of the 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 2.11. Home Fires Involving Electric-Powered Ranges, by Item First Ignited  
Annual Average of 2002-2005 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Cooking materials, including food	15,100	(65%)	140	(47%)	1,730	(76%)	\$253	(59%)
Household utensil	1,100	(5%)	0	(2%)	90	(4%)	\$20	(5%)
Cabinetry	1,100	(5%)	30	(9%)	90	(4%)	\$45	(10%)
Appliance housing or casing	1,000	(4%)	30	(12%)	30	(1%)	\$13	(3%)
Flammable or combustible liquid or gas, piping, filter or duct	800	(3%)	0	(0%)	80	(3%)	\$12	(3%)
Unclassified item first ignited	800	(3%)	20	(7%)	60	(3%)	\$8	(2%)
Interior wall covering, excluding drapes	600	(2%)	20	(5%)	40	(2%)	\$21	(5%)
Electrical wire or cable insulation	500	(2%)	0	(0%)	10	(0%)	\$5	(1%)
Box, carton, bag, basket or barrel	400	(2%)	0	(2%)	30	(1%)	\$13	(3%)
Unclassified furniture or utensil	200	(1%)	0	(0%)	10	(0%)	\$3	(1%)
Magazine, newspaper or writing paper	200	(1%)	0	(2%)	10	(0%)	\$3	(1%)
Multiple items first ignited	200	(1%)	10	(3%)	10	(0%)	\$5	(1%)
Linen other than bedding	200	(1%)	0	(0%)	30	(1%)	\$1	(0%)
Clothing	100	(1%)	30	(10%)	20	(1%)	\$3	(1%)
Unclassified structural component or finish	100	(1%)	0	(0%)	10	(0%)	\$5	(1%)
Rubbish, trash or waste	100	(1%)	0	(0%)	10	(0%)	\$2	(0%)
Other known item*	900	(4%)	0	(2%)	40	(2%)	\$17	(4%)
<b>Total</b>	<b>23,300</b>	<b>(100%)</b>	<b>290</b>	<b>(100%)</b>	<b>2,290</b>	<b>(100%)</b>	<b>\$429</b>	<b>(100%)</b>

\* "Other known" includes floor covering, rug or mat (2% of the 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 2.12. Home Fires Involving Ranges, by Extent of Flame Damage  
Annual Average of 2003-2006 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	59,500	(68%)	0	(1%)	850	(24%)	\$17	(3%)
Confined to object of origin	7,000	(8%)	20	(5%)	380	(11%)	\$25	(5%)
Confined to room of origin	17,200	(20%)	80	(18%)	1,760	(50%)	\$188	(36%)
Confined to floor of origin	1,400	(2%)	60	(15%)	210	(6%)	\$70	(13%)
Confined to building of origin	2,700	(3%)	230	(53%)	310	(9%)	\$203	(39%)
Extended beyond building of origin	200	(0%)	40	(8%)	30	(1%)	\$20	(4%)
Total	88,000	(100%)	440	(100%)	3,540	(100%)	\$523	(100%)

**Table 2.13. Home Fires Involving Gas Ranges, by Extent of Flame Damage  
Annual Average of 2003-2006 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	10,400	(67%)	0	(0%)	160	(28%)	\$2	(3%)
Confined to object of origin	1,700	(11%)	10	(7%)	70	(13%)	\$3	(3%)
Confined to room of origin	2,600	(17%)	30	(18%)	210	(39%)	\$28	(36%)
Confined to floor of origin	200	(2%)	10	(9%)	30	(6%)	\$7	(9%)
Confined to building of origin	600	(4%)	80	(54%)	80	(14%)	\$35	(44%)
Extended beyond building of origin	0	(0%)	20	(11%)	10	(1%)	\$3	(4%)
Total	15,600	(100%)	140	(100%)	550	(100%)	\$78	(100%)

**Table 2.14. Home Fires Involving Electric Ranges, by Extent of Flame Damage  
Annual Average of 2003-2006 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	48,800	(68%)	0	(1%)	690	(23%)	\$15	(3%)
Confined to object of origin	5,300	(7%)	10	(4%)	300	(10%)	\$22	(5%)
Confined to room of origin	14,600	(20%)	60	(20%)	1,540	(52%)	\$162	(36%)
Confined to floor of origin	1,200	(2%)	50	(16%)	180	(6%)	\$63	(14%)
Confined to building of origin	2,100	(3%)	150	(51%)	240	(8%)	\$166	(38%)
Extended beyond building of origin	100	(0%)	20	(8%)	30	(1%)	\$16	(3%)
Total	72,200	(100%)	290	(100%)	2,980	(100%)	\$444	(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.

### 2.15. Hospital Emergency Room Visits for Injuries Involving Ranges or Ovens During 2008 by Diagnosis

<b>Diagnosis</b>	<b>Injuries</b>	
Thermal burn	17,700	(49%)
Contact/non-fire burn	16,200	(45%)
Contact/non-fire burn victim under 5	6,700	(19%)
Thermal burn from fire or flame	1,500	(4%)
Laceration	3,800	(10%)
Scald burn	3,100	(9%)
Scalds under 5	900	(3%)
Anoxia	2,800	(8%)
Strain or sprain	2,000	(6%)
Contusion	1,900	(5%)
All other	4,800	(13%)
Total	36,000	(100%)

**Table 2.16. Hospital Emergency Room Visits for Injuries Involving Ranges or Ovens During 2008, by Range Power Source**

<b>Power Source</b>	<b>Injuries</b>	
Electric range or oven	19,800	(55%)
Gas range or oven	11,600	(32%)
Other range or oven	4,600	(13%)
Total	36,000	(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 August 2009.

## Ovens or Rotisseries

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

During 2003-2006, U.S. fire departments responded to an average of 23,300 home structure fires per year in which an oven or rotisserie was involved in ignition. These fires caused an annual average of four 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, 1% 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 22% of the non-confined fires and 4% 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.<sup>30</sup>

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

During 2003-2006, the death rate per 1,000 reported home fires involving ovens or rotisseries was 0.2, a tiny fraction of the 3.3 deaths per 1,000 overall reported fires involving any type of cooking equipment and of the 5.0 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 fire injury rate of 31 injuries per 1,000 fires, and less than one-third the rate of 40 injuries per 1,000 range or cooktop fires. The \$1,400 average direct property loss in oven or rotisserie fires was roughly one-quarter the average loss in all reported home cooking equipment fires (\$5,000) and in reported home range or cooktop fires (\$5,900).

**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 2003-2005, in 75% of the oven or rotisserie fires reported in 2003-2006, the equipment involved was powered by electricity. During 2003-2006, electric ovens or rotisseries were involved in an average of 17,600 reported home structure fires per year. These fires caused an annual average of four civilian deaths, 240 reported civilian injuries, and \$26 million in direct property damage. Gas ovens or rotisseries were involved in an average of 5,600 reported home structure fires annually during this period, resulting in an average of 40 civilian injuries, and \$5 million in direct property damage per year. No deaths involving gas-fueled ovens were reported during this time period.

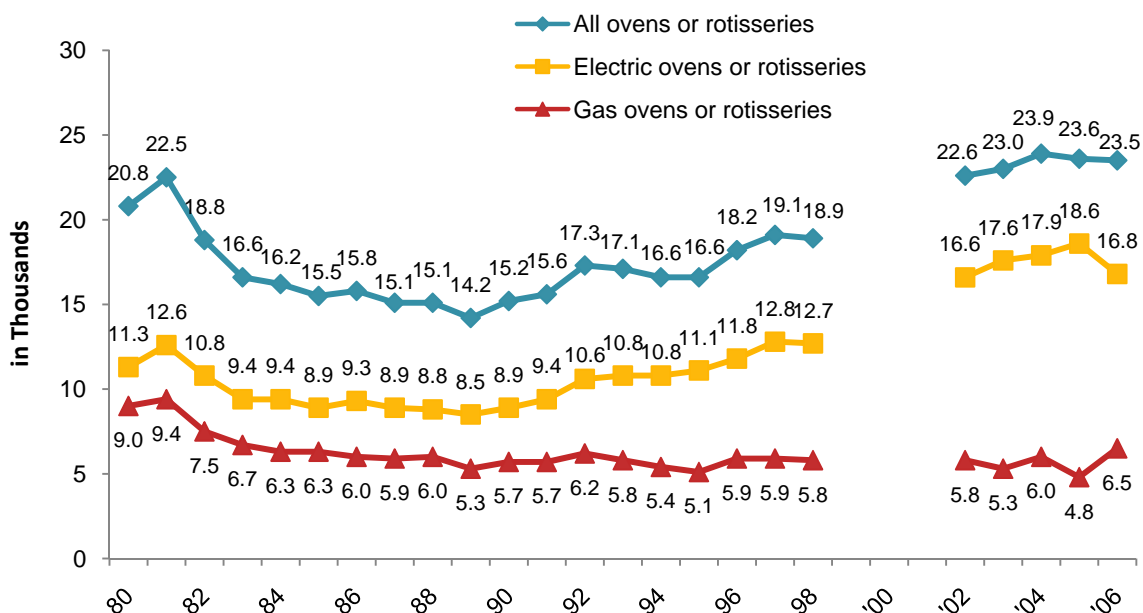
**More oven or rotisserie fires were reported in 2006 than in 1980.**

Table 3.1 and Figure 3.1 show that the total number of reported fires involving ovens or rotisseries was 13% higher in 2006 than in 1980. Fires involving gas ovens or rotisseries were 27% lower in 2006 while electric range fires were actually up 49% from 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 2005. Over the same period, the percentage of households using primarily gas for cooking dropped to 40% in 2005 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.

---

<sup>30</sup> 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**


### Unattended cooking was the leading factor contributing to home fires involving ovens or rotisseries.

During 2003-2006, unattended equipment was a factor contributing to ignition in 23% of reported non-confined home structure fires involving ovens or rotisseries. This is a much smaller share than for ranges, the other primary type of cooking equipment, which probably reflects the fact that the oven is a more complete enclosure and that roasting does not require continuous, uninterrupted attention. Other leading factors were: electrical failures or malfunctions (12% of total fires); heat source too close to combustibles (10% of fires); failure to clean (also 10%); unclassified misuse of material (7%); abandoned or discarded material (6%); improper container or storage (6%); and unintentionally turned on or not turned off (also 6%). (See Tables 3.4, 3.5, and 3.6.)

Unattended equipment was a more common factor in reported non-confined gas oven fires than in electric oven fires (32% vs. 18%). Leaks or breaks were also seen more commonly in gas ovens or rotisseries (7%) than in those powered by electricity (1%). Electrical failures or malfunctions were factors in 17% of the electric oven or rotisserie fires but roughly 1% of the equipment powered by gas.

### Cooking materials were first ignited in almost half of the reported oven or rotisserie fires.

Table 3.7 shows that in 2003-2006, cooking materials, include food, were the first items ignited in 45% of the reported non-confined home fires involving ovens or rotisseries. Other leading items first ignited included unclassified items (8%), appliance housings or casings (also 8%), household utensils (7% of fires), and wire or cable insulation (6%). Flammable or combustible gas or liquid or piping ranked higher (12%) for gas-fueled equipment, as might be expected, while electrical wire or cable insulation predictably was first ignited in a larger percentage (8%) of fires involving electric ovens or rotisseries. 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.<sup>31</sup>

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

Table 3.10 shows that 87% of all home fires involving ovens or rotisseries reported in 2003-2006 were coded with an incident type that indicated the fire was confined to the vessel or object or origin. In an additional 8%, 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 70% of the injuries associated with oven or rotisserie fires. Flame damage spread beyond the room of origin in only 1% of these fires. Only 9% 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.

---

<sup>31</sup> 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 2006 Dollars	
1980	20,800		260		\$14	\$34	
1981	22,500		320		\$13	\$29	
1982	18,800		410		\$16	\$33	
1983	16,600		280		\$14	\$28	
1984	16,200		310		\$21	\$41	
1985	15,500		370		\$19	\$36	
1986	15,800		320		\$24	\$44	
1987	15,100		280		\$26	\$46	
1988	15,100		390		\$28	\$48	
1989	14,200		310		\$26	\$42	
1990	15,200		490		\$22	\$34	
1991	15,600		400		\$32*	\$47*	
1992	17,300		480		\$39	\$56	
1993	17,100		530		\$42	\$59	
1994	16,600		520		\$213	\$290	
1995	16,600		520		\$40	\$53	
1996	18,200		610		\$44	\$57	
1997	19,100		580		\$49	\$62	
1998	18,900		570		\$45	\$56	
1999	32,000	(10,300)	520	(260)	\$72	(\$66)	\$87
2000	16,500	(3,700)	260	(260)	\$32	(\$20)	\$37
2001	24,000	(3,200)	210	(160)	\$23	(\$21)	\$26
2002	22,600	(3,000)	120	(90)	\$26	(\$24)	\$29
2003	23,000	(3,300)	280	(180)	\$21	(\$19)	\$23
2004	23,900	(2,600)	270	(110)	\$27	(\$25)	\$29
2005	23,600	(3,200)	320	(110)	\$49	(\$38)	\$51
2006	23,500	(3,000)	270	(150)	\$28	(\$25)	\$28

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm. One 1994 fire with an implausibly high dollar loss accounted for the larger loss that year.

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 2006 dollars is done using the consumer price index.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2006) 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 2006 Dollars	
1980	9,000		180		\$8		\$20
1981	9,400		150		\$5		\$11
1982	7,500		140		\$7		\$15
1983	6,700		120		\$7		\$14
1984	6,300		160		\$8		\$16
1985	6,300		170		\$7		\$13
1986	6,000		120		\$7		\$13
1987	5,900		90		\$11		\$20
1988	6,000		160		\$6		\$10
1989	5,300		110		\$9		\$15
1990	5,700		170		\$9		\$14
1991	5,700		130		\$12*		\$18*
1992	6,200		180		\$17		\$24
1993	5,800		200		\$16		\$22
1994	5,400		220		\$8		\$11
1995	5,100		150		\$10		\$13
1996	5,900		190		\$13		\$17
1997	5,900		180		\$16		\$20
1998	5,800		180		\$8		\$10
1999	3,700	(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)	\$10
2003	5,300	(1,400)	70	(50)	\$6	(\$6)	\$7
2004	6,000	(800)	10	(10)	\$3	(\$2)	\$3
2005	4,800	(800)	20	(20)	\$3	(\$3)	\$3
2006	6,500	(1,000)	40	(40)	\$8	(\$7)	\$8

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 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 (1999-2006) 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 2006 Dollars	
1980	11,300		70		\$6		\$15
1981	12,600		170		\$7		\$15
1982	10,800		250		\$8		\$17
1983	9,400		150		\$5		\$10
1984	9,400		150		\$13		\$25
1985	8,900		190		\$11		\$21
1986	9,300		190		\$15		\$28
1987	8,900		190		\$15		\$27
1988	8,800		210		\$21		\$36
1989	8,500		190		\$16		\$26
1990	8,900		310		\$13		\$20
1991	9,400		270		\$18*		\$27*
1992	10,600		290		\$19		\$27
1993	10,800		320		\$24		\$33
1994	10,800		290		\$18		\$24
1995	11,100		360		\$29		\$38
1996	11,800		420		\$31		\$40
1997	12,800		380		\$32		\$40
1998	12,700		400		\$43		\$53
1999	26,900	(8,500)	520	(260)	\$63	(\$59)	\$76
2000	13,400	(3,000)	260	(260)	\$23	(\$17)	\$27
2001	18,000	(2,300)	120	(120)	\$19	(\$17)	\$21
2002	16,600	(2,400)	100	(70)	\$16	(\$15)	\$18
2003	17,600	(2,000)	210	(130)	\$14	(\$13)	\$16
2004	17,900	(1,700)	260	(100)	\$24	(\$23)	\$26
2005	18,600	(2,400)	290	(80)	\$46	(\$35)	\$47
2006	16,800	(2,000)	220	(100)	\$19	(\$18)	\$19

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 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 (1999-2006) and from NFPA survey.

**Table 3.4. Home Fires Involving Ovens or Rotisseries, by Factor Contributing to Ignition  
Annual Average of 2003-2006 Structure Fires Reported  
(Excluding Fires Reported as Confined Fires)**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property	
							Damage (in Millions)	
Equipment unattended	700	(23%)	*	(*)	30	(24%)	\$6	(23%)
Electrical failure or malfunction	300	(12%)	*	(*)	10	(6%)	\$3	(13%)
Heat source too close to combustible	300	(10%)	*	(*)	10	(4%)	\$2	(9%)
Failure to clean	300	(10%)	*	(*)	20	(13%)	\$0	(1%)
Unclassified misuse of material	200	(7%)	*	(*)	10	(5%)	\$3	(10%)
Abandoned or discarded material	200	(6%)	*	(*)	30	(19%)	\$2	(7%)
Improper container or storage	200	(6%)	*	(*)	10	(5%)	\$1	(5%)
Unintentionally turned on or not turned off	200	(6%)	*	(*)	10	(9%)	\$1	(5%)
Unclassified mechanical failure or malfunction	100	(4%)	*	(*)	0	(0%)	\$2	(6%)
Unclassified factor contributed to ignition	100	(4%)	*	(*)	0	(2%)	\$3	(10%)
Leak or break	100	(3%)	*	(*)	10	(9%)	\$1	(4%)
Unclassified operational deficiency	100	(3%)	*	(*)	0	(0%)	\$0	(1%)
Equipment used for unintended purpose	100	(2%)	*	(*)	0	(0%)	\$0	(1%)
Equipment not being operated properly	100	(2%)	*	(*)	0	(0%)	\$1	(4%)
Other known factor	200	(8%)	*	(*)	10	(8%)	\$1	(5%)
<b>Total</b>	<b>3,000</b>	<b>(100%)</b>	<b>4</b>	<b>(100%)</b>	<b>140</b>	<b>(100%)</b>	<b>\$26</b>	<b>(100%)</b>
<b>Total entries</b>	<b>3,200</b>	<b>(107%)</b>	<b>*</b>	<b>(*)</b>	<b>140</b>	<b>(105%)</b>	<b>\$28</b>	<b>(105%)</b>

\* Not available because all fires with deaths were coded as Factor Contributing to Ignition unknown or not reported.

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 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

<b>Factor</b>	<b>Fires</b>	<b>Civilian Deaths</b>	<b>Civilian Injuries</b>	<b>Direct Property Damage (in Millions)</b>
Equipment unattended	300 (32%)	0 (NA)	0 (0%)	\$0 (8%)
Failure to clean	100 (11%)	0 (NA)	0 (0%)	\$0 (4%)
Heat source too close to combustible	100 (10%)	0 (NA)	0 (0%)	\$0 (2%)
Leak or break	100 (7%)	0 (NA)	10 (42%)	\$1 (24%)
Unclassified misuse of material	100 (6%)	0 (NA)	0 (0%)	\$1 (24%)
Improper container or storage	100 (6%)	0 (NA)	0 (10%)	\$0 (1%)
Other known factor	300 (34%)	0 (NA)	20 (63%)	\$2 (42%)
<b>Total</b>	<b>1,000 (100%)</b>	<b>0 (NA)</b>	<b>30 (100%)</b>	<b>\$5 (100%)</b>
<b>Total entries</b>	<b>1,000 (105%)</b>	<b>0 (NA)</b>	<b>30 (115%)</b>	<b>\$5 (105%)</b>

NA – Not applicable because estimated total was zero.

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 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property	
							Damage (in Millions)	
Equipment unattended	400	(18%)	*	(*%)	30	(33%)	\$6	(26%)
Electrical failure or malfunction	300	(17%)	*	(*%)	10	(8%)	\$3	(15%)
Heat source too close to combustible	200	(11%)	*	(*%)	10	(6%)	\$2	(11%)
Failure to clean	200	(9%)	*	(*%)	20	(17%)	\$0	(1%)
Abandoned or discarded material	100	(7%)	*	(*%)	20	(22%)	\$2	(8%)
Unintentionally turned on or not turned off	100	(7%)	*	(*%)	0	(3%)	\$1	(6%)
Unclassified misuse of material	100	(7%)	*	(*%)	10	(7%)	\$1	(6%)
Improper container or storage	100	(6%)	*	(*%)	0	(4%)	\$1	(5%)
Unclassified mechanical failure or malfunction	100	(5%)	*	(*%)	0	(0%)	\$1	(6%)
Unclassified factor contributed to ignition	100	(4%)	*	(*%)	0	(0%)	\$2	(10%)
Unclassified operational deficiency	100	(3%)	*	(*%)	0	(0%)	\$0	(1%)
Other known factor	300	(14%)	*	(*%)	0	(0%)	\$2	(10%)
Total	2,000	(100%)	4	(100%)	100	(100%)	\$22	(100%)
Total entries	2,100	(107%)	*	(*%)	100	(100%)	\$23	(105%)

\* Not available because all fires with deaths were coded as Factor Contributing to Ignition unknown or not reported.

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 2003-2006 Structure Fires Reported by U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Fires)**

<b>Item First Ignited</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Cooking materials, including food	1,400	(45%)	*	(*%)	70	(50%)	\$11	(41%)
Unclassified item first ignited	200	(8%)	*	(*%)	0	(3%)	\$1	(4%)
Appliance housing or casing	200	(8%)	*	(*%)	10	(7%)	\$1	(5%)
Household utensil	200	(7%)	*	(*%)	10	(5%)	\$1	(4%)
Electrical wire or cable insulation	200	(6%)	*	(*%)	0	(2%)	\$0	(1%)
Flammable or combustible liquid or gas, piping or filter	100	(4%)	*	(*%)	0	(4%)	\$1	(2%)
Cabinetry	100	(4%)	*	(*%)	0	(3%)	\$4	(13%)
Box, carton, bag, basket or barrel	100	(3%)	*	(*%)	10	(7%)	\$0	(1%)
Interior wall covering, excluding drapes	100	(2%)	*	(*%)	10	(10%)	\$1	(4%)
Other known item	300	(12%)	*	(*%)	10	(9%)	\$6	(24%)
<b>Total</b>	<b>3,000</b>	<b>(100%)</b>	<b>4</b>	<b>(100%)</b>	<b>140</b>	<b>(100%)</b>	<b>\$26</b>	<b>(100%)</b>

\* Not available because all fires with deaths were coded as Item First Ignited unknown.

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 2003-2006 Structure Fires Reported by U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Fires)**

<b>Item First Ignited</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Cooking materials, including food	400	(41%)	0	(NA)	0	(0%)	\$2	(50%)
Household utensil	100	(12%)	0	(NA)	0	(7%)	\$0	(3%)
Flammable or combustible liquid or gas or piping	100	(12%)	0	(NA)	0	(16%)	\$1	(11%)
Appliance housing or casing	100	(8%)	0	(NA)	0	(16%)	\$0	(6%)
Unclassified item first ignited	100	(8%)	0	(NA)	0	(0%)	\$0	(10%)
Other known factor	200	(20%)	0	(NA)	20	(62%)	\$1	(19%)
<b>Total</b>	<b>1,000</b>	<b>(100%)</b>	<b>0</b>	<b>(NA)</b>	<b>30</b>	<b>(100%)</b>	<b>\$5</b>	<b>(100%)</b>

NA -- Not applicable because estimated total was zero.

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 2003-2006 Structure Fires Reported by U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Fires)**

<b>Item First Ignited</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Cooking materials	1,100	(44%)	*	(*)	70	(69%)	\$7	(34%)
Unclassified item first ignited	200	(9%)	*	(*)	0	(0%)	\$1	(6%)
Household utensil	200	(9%)	*	(*)	10	(6%)	\$1	(5%)
Electrical wire or cable insulation	200	(8%)	*	(*)	0	(3%)	\$0	(1%)
Appliance housing or casing	200	(8%)	*	(*)	0	(0%)	\$1	(5%)
Cabinetry	100	(4%)	*	(*)	0	(0%)	\$2	(9%)
Box or bag	100	(3%)	*	(*)	10	(6%)	\$0	(1%)
Interior wall covering	100	(3%)	*	(*)	0	(3%)	\$1	(6%)
Other known item first ignited	300	(13%)	*	(*)	10	(15%)	\$7	(33%)
<b>Total fires</b>	<b>2,500</b>	<b>(100%)</b>	<b>4</b>	<b>(100%)</b>	<b>100</b>	<b>(100%)</b>	<b>\$22</b>	<b>(100%)</b>

\* Not available because all fires with deaths were coded as Item First Ignited unknown.

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 2003-2006 Structure Fires Reported by U.S. Fire Departments**

<b>Extent of Flame Damage</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Confined fire identified by incident type	20,300	(87%)	0	(0%)	140	(50%)	\$5	(17%)
Confined to object of origin	1,800	(8%)	0	(0%)	50	(20%)	\$2	(7%)
Confined to room of origin	1,000	(4%)	4	(100%)	60	(21%)	\$10	(31%)
Confined to floor of origin	100	(0%)	0	(0%)	10	(2%)	\$3	(9%)
Confined to building of origin	100	(1%)	0	(0%)	10	(5%)	\$11	(35%)
Extended beyond building of origin	0	(0%)	0	(0%)	0	(1%)	\$0	(1%)
<b>Total</b>	<b>23,300</b>	<b>(100%)</b>	<b>4</b>	<b>(100%)</b>	<b>280</b>	<b>(100%)</b>	<b>\$32</b>	<b>(100%)</b>

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 5% of reported home cooking equipment fires.

During 2003-2006, U.S. fire departments responded to an average of 7,000 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 28 civilian deaths, 200 civilian injuries, and \$76 million in direct property damage. These incidents accounted for 5% of the reported home fires involving cooking equipment, 6% of the associated civilian deaths, 4% of the associated civilian injuries, and 10% 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 22% of the non-confined fires and 4% 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 4.1. Home Fires Involving Portable Cooking or Warming Devices, by Type of Device  
Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Including Confined Fires)**

Device	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Toaster or toaster oven	3,600	(51%)	11	(40%)	67	(33%)	\$30	(40%)
Wok, frying pan or skillet	1,900	(28%)	0	(0%)	92	(45%)	\$15	(19%)
Coffee maker or teapot	500	(7%)	4	(13%)	9	(4%)	\$19	(25%)
Food warmer or hot plate	400	(5%)	9	(33%)	26	(13%)	\$7	(9%)
Kettle	300	(4%)	4	(14%)	6	(3%)	\$1	(1%)
Slow cooker	200	(3%)	0	(0%)	2	(1%)	\$4	(6%)
Other known device	100	(2%)	0	(0%)	2	(1%)	\$1	(1%)
Total	7,000	(100%)	28	(100%)	205	(100%)	\$76	(100%)

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

Source: Data from NFIRS Version 5.0 and NFPA survey.

During the four-year period of 2003-2006, toasters or toaster ovens were involved in 3,600 reported home structure fires, or 51% of the incidents in which portable cooking or warming devices were involved. These fires caused an average of 11 civilian deaths, 67 civilian injuries, and \$30 million in direct property damage. Woks, frying pans or skillets ranked second, and coffee makers or teapots ranked third. One-third of the deaths associated with this group of equipment resulted from fires involving food warmer or hot plates.

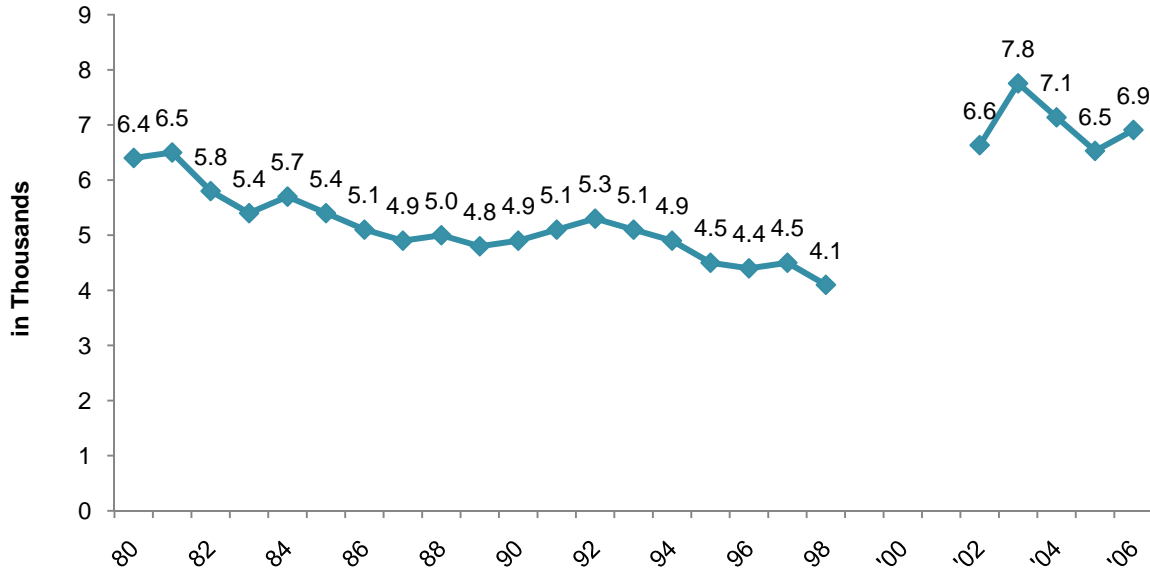
**Fires involving portable cooking or warming devices had been falling until NFIRS 5.0.**

Figure 4.1 and Table 4.2 show that the total number of reported home structure fires involving portable cooking or warming devices other than grills or deep fryers was 8% higher in 2006 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 4.3 shows trend data from 1999-2006 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 4.1. Reported Home Structure Fires Involving Portable Cooking or Warming Devices, by Year: 1980-2006**



Source: Data from NFIRS and NFPA survey.

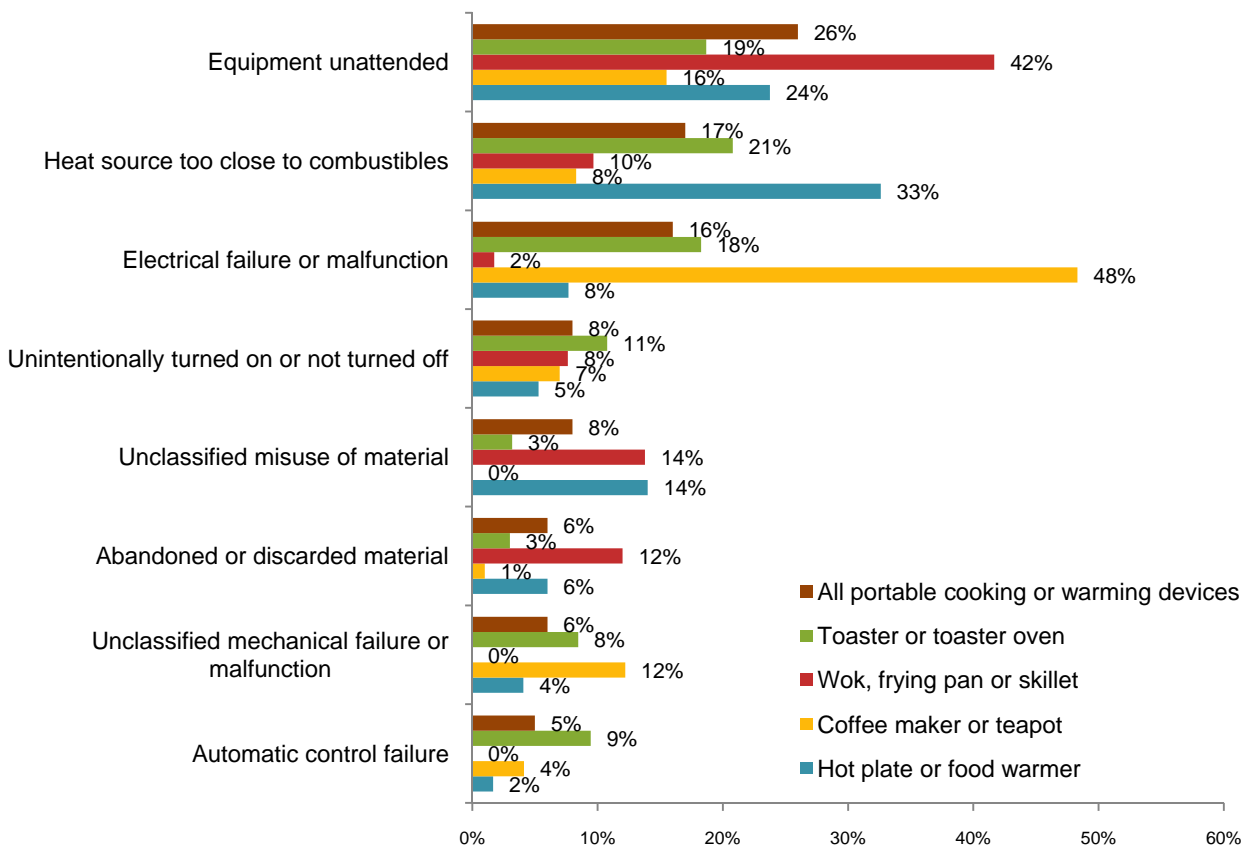
Note: See Notes in year table.

**Unattended equipment was a factor in one of every four fires involving portable cooking or warming devices.**

During 2003-2006, unattended equipment was a factor contributing to ignition in 26% of reported non-confined home structure fires portable cooking or warming devices. Table 4.4 shows that the equipment was too close to something that could catch fire in 17% of the incidents. An electrical failure or malfunction played a role in 16% of these fires. Almost two-thirds of the deaths from these fires resulted from incidents in which the equipment was used for unintended purposes.

Figure 4.2 shows that the leading contributing factors vary considerably among the different types of portable cooking or warming devices. For toaster ovens or toaster ovens and for hot plates or food warmers, the leading factor was the equipment (heat source) too close to combustibles. Unattended equipment was the leading factor for fires involving woks, frying pans, or skillets. An electrical failure or malfunction was a factor in almost half of the fires involving coffee makers or teapots.

**Figure 4.2. Non-Confined Home Fires Involving Specific Portable Cooking or Warming Devices by Leading Factors Contributing to Ignition: 2003-2006**

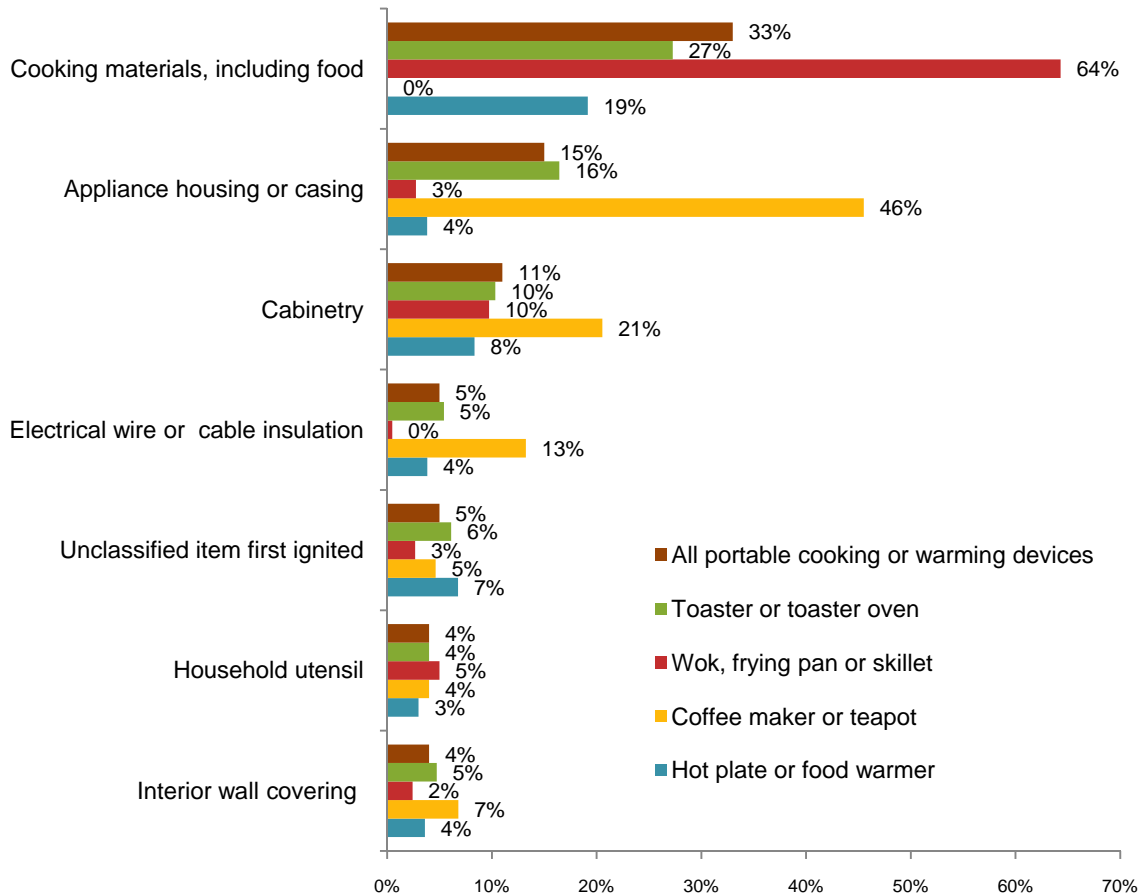


**One-third of the non-confined fires involving portable cooking or warming devices began with the ignition of cooking materials.**

Cooking materials, including food, were first ignited in only 33% of non-confined home fires involving portable cooking or warming devices compared to 55% of all reported non-confined home structure fires involving cooking equipment. Fires involving portable cooking or warming devices were more likely to have begun with appliance housings or casings (15% vs. 6%) and cabinetry (11% vs. 5%) than were fires involving cooking equipment in general. (See Table 4.5.)

Figure 4.3 shows that the items first ignited also vary among the different types of portable cooking or warming devices. For works, frying pans, or skillets, for toaster ovens or toaster ovens, and for hot plates or food warmers, cooking materials, including food, were ignited first. None of the fires involving coffee makers or teapots began with cooking materials but almost half (46% ) began with the ignition of the appliance housing or casing.

**Figure 4.3. Non-Confined Home Fires Involving Specific Portable Cooking or Warming Devices by Leading Items First Ignited: 2003-2006**



**The majority of non-confined home structure fires involving portable cooking or warming devices began in the kitchen.**

Table 4.6 shows that during 2003-2006, 89% of these fires started in the bedroom. The only other area with enough fires to be listed was bedroom, which accounted for 3% of these fires but one-third of the associated deaths.

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

Table 4.7 shows that two-thirds (68%) of all home structure fires involving portable cooking or warming devices reported in 2003-2006 were coded with an incident type that indicated the fire was confined to the vessel or object 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 332,000 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.<sup>32</sup> 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.<sup>33</sup>

## 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.

---

<sup>32</sup> 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.

<sup>33</sup> 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](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 4.2. 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 2006 Dollars	
1980	6,400		150		\$18		\$44
1981	6,500		170		\$17		\$38
1982	5,800		170		\$22		\$46
1983	5,400		170		\$22		\$44
1984	5,700		170		\$26		\$50
1985	5,400		220		\$22		\$41
1986	5,100		170		\$26		\$48
1987	4,900		160		\$27		\$48
1988	5,000		170		\$28		\$48
1989	4,800		160		\$37		\$60
1990	4,900		160		\$38		\$59
1991	5,100		200		\$42*		\$62*
1992	5,300		200		\$23		\$33
1993	5,100		140		\$28		\$39
1994	4,900		180		\$28		\$38
1995	4,500		190		\$32		\$42
1996	4,400		160		\$44		\$57
1997	4,500		190		\$45		\$57
1998	4,100		210		\$31		\$38
1999	6,800	(4,400)	260	(260)	\$63	(\$62)	\$76
2000	8,300	(3,800)	190	(100)	\$87	(\$83)	\$102
2001	7,500	(2,700)	200	(140)	\$61	(\$56)	\$70
2002	6,600	(3,000)	210	(180)	\$71	(\$70)	\$79
2003	7,800	(2,500)	210	(150)	\$82	(\$81)	\$90
2004	7,100	(2,200)	170	(120)	\$69	(\$67)	\$74
2005	6,500	(2,100)	240	(170)	\$87	(\$87)	\$90
2006	6,900	(2,300)	210	(160)	\$70	(\$70)	\$70

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 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 (1999-2006) and from NFPA survey.

**Table 4.3. Home Fires Involving Portable Cooking or Warming Devices with Largest Shares of Fires, by Year**  
**Structure Fires Reported to U.S. Fire Department**  
**(Including Fires Reported as Confined Fires)**

**A. Toaster or toaster oven**

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2006 Dollars	
1999	3,900	(2,200)	0	(0)	\$23	(\$22)	\$27
2000	4,600	(1,900)	90	(0)	\$34	(\$32)	\$40
2001	3,700	(1,300)	20	(20)	\$29	(\$26)	\$33
2002	4,000	(1,600)	70	(70)	\$40	(\$40)	\$45
2003	4,200	(1,100)	50	(50)	\$31	(\$31)	\$34
2004	3,700	(1,000)	80	(60)	\$38	(\$38)	\$40
2005	3,100	(900)	80	(60)	\$28	(\$28)	\$29
2006	3,500	(1,100)	70	(40)	\$26	(\$26)	\$26

**B. Wok, frying pan, or skillet**

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2006 Dollars	
1999	1,000	(300)	0	(0)	\$3	(\$3)	\$4
2000	1,000	(500)	50	(50)	\$8	(\$7)	\$9
2001	1,600	(500)	110	(50)	\$11	(\$9)	\$12
2002	1,200	(500)	50	(20)	\$6	(\$6)	\$7
2003	1,700	(500)	120	(60)	\$17	(\$16)	\$18
2004	1,800	(600)	60	(40)	\$10	(\$9)	\$11
2005	2,200	(600)	110	(60)	\$7	(\$6)	\$7
2006	2,100	(500)	70	(60)	\$23	(\$23)	\$23

**C. Coffee maker or teapot**

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2006 Dollars	
1999	600	(600)	130	(130)	\$12	(\$12)	\$14
2000	1,000	(700)	50	(50)	\$15	(\$15)	\$18
2001	800	(500)	40	(40)	\$16	(\$16)	\$18
2002	500	(400)	40	(40)	\$14	(\$14)	\$15
2003	600	(400)	20	(20)	\$16	(\$16)	\$18
2004	800	(300)	0	(0)	\$16	(\$16)	\$17
2005	400	(200)	10	(10)	\$35	(\$35)	\$36
2006	400	(300)	10	(10)	\$12	(\$12)	\$12

Note: Numbers in parentheses exclude confined fires.

**Table 4.3. Home Fires Involving Portable Cooking or Warming Devices with Largest Shares of Fires, by Year**  
**Structure Fires Reported to U.S. Fire Department**  
**(Including Fires Reported as Confined Fires) (Continued)**

**D. Hot plate or food warmer**

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported	In 2006 Dollars	
1999	800	(800)	130	(130)	\$23	(\$23)	\$28
2000	500	(300)	0	(0)	\$10	(\$10)	\$12
2001	400	(200)	20	(20)	\$3	(\$3)	\$3
2002	400	(300)	0	(0)	\$7	(\$7)	\$7
2003	500	(300)	20	(20)	\$8	(\$8)	\$9
2004	300	(100)	10	(10)	\$3	(\$3)	\$3
2005	400	(200)	30	(30)	\$10	(\$10)	\$10
2006	300	(200)	40	(40)	\$6	(\$6)	\$6

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Version 5.0 (1999-2006) and from NFPA survey.

**Table 4.4. Home Fires Involving Portable Cooking or Warming Devices, by Factor Contributing to Ignition**  
**Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Fires)**

<b>Factor</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Equipment unattended	600	(26%)	5	(19%)	40	(26%)	\$16	(22%)
Heat source too close to combustible	400	(17%)	13	(45%)	40	(28%)	\$8	(11%)
Electrical failure or malfunction	400	(16%)	0	(0%)	20	(17%)	\$18	(24%)
Unintentionally turned on or not turned off	200	(8%)	5	(18%)	0	(0%)	\$16	(21%)
Unclassified misuse of material	200	(8%)	0	(0%)	10	(9%)	\$2	(3%)
Abandoned or discarded material	100	(6%)	5	(18%)	0	(2%)	\$10	(13%)
Unclassified mechanical failure or malfunction	100	(6%)	0	(0%)	10	(7%)	\$5	(7%)
Unclassified factor contributed to ignition	100	(5%)	0	(0%)	10	(4%)	\$2	(3%)
Automatic control failure	100	(5%)	0	(0%)	10	(4%)	\$2	(3%)
Other known factor	300	(13%)	18	(63%)	20	(11%)	\$14	(19%)
<b>Total</b>	<b>2,200</b>	<b>(100%)</b>	<b>28</b>	<b>(100%)</b>	<b>150</b>	<b>(100%)</b>	<b>\$75</b>	<b>(100%)</b>
<b>Total entries</b>	<b>2,400</b>	<b>(109%)</b>	<b>46</b>	<b>(162%)</b>	<b>160</b>	<b>(108%)</b>	<b>\$95</b>	<b>(126%)</b>

“Other known” includes equipment used for unintended purpose (63% of deaths).

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 4.5. Home Fires Involving Portable Cooking or Warming Devices, by Item First Ignited**  
**Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Fires)**

<b>Item First Ignited</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Cooking materials, including food	700	(33%)	7	(24%)	60	(42%)	\$17	(23%)
Appliance housing or casing	300	(15%)	0	(0%)	10	(6%)	\$10	(14%)
Cabinetry	200	(11%)	0	(0%)	0	(3%)	\$13	(18%)
Electrical wire or cable insulation	100	(5%)	7	(26%)	10	(9%)	\$1	(2%)
Unclassified item first ignited	100	(5%)	0	(0%)	0	(3%)	\$3	(4%)
Household utensil	100	(4%)	7	(24%)	0	(3%)	\$8	(10%)
Interior wall covering, excluding drapes	100	(4%)	7	(26%)	10	(9%)	\$4	(6%)
Flammable or combustible liquid or gas or piping	100	(3%)	0	(0%)	10	(5%)	\$2	(2%)
Other known item	400	(20%)	0	(0%)	30	(20%)	\$16	(22%)
<b>Total</b>	<b>2,200</b>	<b>(100%)</b>	<b>28</b>	<b>(100%)</b>	<b>150</b>	<b>(100%)</b>	<b>\$75</b>	<b>(100%)</b>

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 4.6. Home Fires Involving Portable Cooking or Warming Devices, by Area of Origin**  
**Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Fires)**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Kitchen or cooking area	2,000	(89%)	15	(53%)	120	(84%)	\$62	(82%)
Bedroom	100	(3%)	9	(33%)	10	(6%)	\$3	(4%)
Other known area of origin	200	(9%)	4	(14%)	10	(9%)	\$11	(14%)
Total	2,200	(100%)	28	(100%)	150	(100%)	\$75	(100%)

**Table 4.7. Home Fires Involving Portable Cooking or Warming Devices, by Extent of Flame Damage**  
**Annual Average of 2003-2006 Structure Fires Reported by U.S. Fire Departments**

Extent of Flame Damage	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Confined fire identified by incident type	4,800	(68%)	0	(0%)	60	(27%)	\$1	(1%)
Confined to object of origin	500	(7%)	4	(14%)	20	(9%)	\$3	(4%)
Confined to room of origin	1,300	(18%)	4	(13%)	90	(46%)	\$21	(28%)
Confined to floor of origin	200	(2%)	0	(0%)	10	(3%)	\$12	(16%)
Confined to building of origin	300	(4%)	17	(60%)	30	(13%)	\$31	(41%)
Extended beyond building of origin	0	(1%)	4	(13%)	0	(1%)	\$8	(11%)
Total	7,000	(100%)	28	(100%)	200	(100%)	\$76	(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 4% of reported home cooking equipment fires.**

During 2003-2006, U.S. fire departments responded to an average of 6,600 home structure fires per year in which a microwave oven was involved in ignition. These fires caused an annual average of three civilian deaths, 110 civilian injuries, and \$22 million in direct property damage. These incidents accounted for 4% of the reported home fires involving cooking equipment, 1% of the associated civilian deaths, 2% of the civilian injuries, and 3% of the direct property damage from cooking equipment fires.

Fifty-six percent of the microwaves were stationary and 44% were portable. Nearly all (96%) of 2003-2006 non-confined home structure fires involving microwave ovens 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 22% of the non-confined fires and 4% 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.

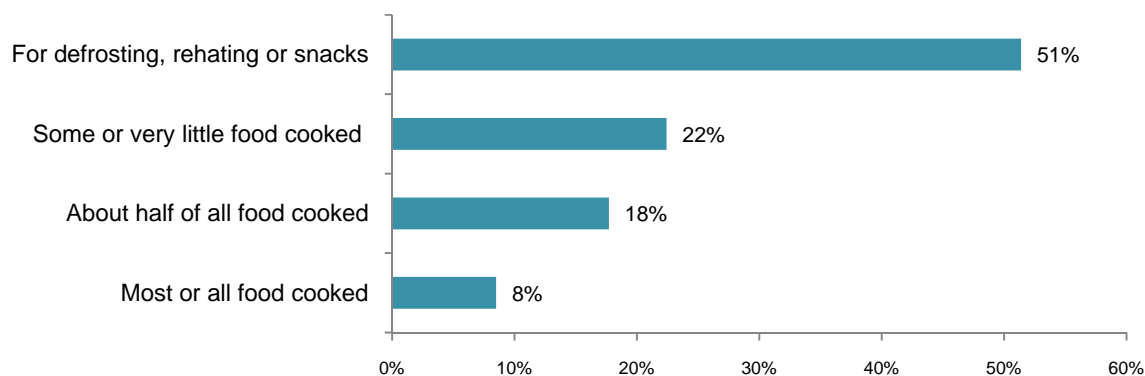
Microwave ovens have only been identified in NFIRS since 1999, and the level of participation in NFIRS has only been sufficient to produce reasonably stable estimates since 2002. Table 5-1 shows that home structure fires involving microwave ovens hit their highest point in 2006 with 7,800 fires, as did direct property damage from these fires with a new peak of \$27 million. The estimated number of civilian injuries tied the previous high in 2004 with 130 reported non-fatal injuries. Because of the very small numbers, estimates of deaths by year are unreliable.

These fires divide as about 4-to-1 confined fires to non-confined fires. This compares to a roughly 2 to-1 ratio for ranges and portable cooking or warming devices, and a ratio of 7-to-1 for ovens or rotisseries, which most closely resemble microwave ovens in providing a complete enclosure in which fire can be effectively contained.

### **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.<sup>34</sup> Respondents were asked to select the description that best described how much of their food was cooked in the microwave.<sup>35</sup> Figure 5.1 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.

**Figure 5.1. Amount of Food Cooked in Microwave Ovens by Households that Use Them According to DOE's 2005 Residential Energy Survey**



### **Electrical failure or malfunction was a factor in two-fifths of the non-confined home fires involving microwave ovens.**

During 2003-2006, an electrical failure or malfunction was a factor contributing to ignition in 41% of reported non-confined home structure fires involving microwave ovens. In 14% of the

<sup>34</sup> 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](http://www.eia.doe.gov/emeu/recs/recs2005/hc2005_tables/hc10homeapplianceindicators/pdf/alltables.pdf) on October 23, 2009.

<sup>35</sup> 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](http://www.eia.doe.gov/emeu/recs/recs2005/hc2005_tables/2005recshouseholdquex.pdf) on October 23, 2009.

fires, the equipment was unattended. An unclassified mechanical failure or malfunction contributed to 12% of the incidents. (See Table 5.2.)

**Almost one-third of the non-confined microwave oven fires began with the appliance housing or casing.**

Table 5.3 shows that in 31% of the non-confined home structure fires involving microwave ovens, an appliance housing or casing was the item first ignited. Cooking materials, including food, were first ignited in 21%. Electrical wire or cable insulation was first ignited in 14% while 7% started with the ignition of cabinetry.

**Flame damage was limited to the room of fire origin in 98% of reported microwave oven fires.**

Table 5.4 shows that four of every five (80%) home structure fires involving microwave ovens reported in 2003-2006 were coded with an incident type that indicated the fire was confined to the vessel or object or origin. In an additional 7%, fire spread was coded as confined to the object of origin fires. Flame damage spread beyond the room of origin in 2% 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.<sup>36</sup>

**Microwave ovens were involved in more electrocution deaths than all other types of cooking equipment combined.**

In 1995-2002 excluding 1999 (when there was no report), microwave ovens were involved in an average of seven electrocution deaths a year.<sup>37</sup> All other cooking devices combined averaged two a year in the same period. In recent years, electrocution death statistics for microwave ovens have been combined with those for other appliances, which prevent updating of the statistics. A special study by the CPSC found that four electrocution deaths per year, or about half the total, involved victims who were trying to repair their own microwave ovens.<sup>38</sup>

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

The CPSC's National Electronic Injury Surveillance System (NEISS) estimates that 8,500 people visited hospital emergency rooms because of microwave-oven related injuries during 2008.<sup>39</sup> Forty-seven percent (4,000) of these injuries were scald burns. Eleven percent of the scald burns and 5% 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

<sup>36</sup> 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.

<sup>37</sup> Risana T. Chowdhury, 2003 Electrocutions Associated With Consumer Products, U.S. Consumer Product Safety Commission, December 2006, <http://www.cpsc.gov>, Table 2, and earlier reports in series.

<sup>38</sup> Consumer Product Safety Commission, *Electrocution Hazard with Do-It-Yourself Repairs of Ovens*, CPSC document #5061, undated, accessed at <http://www.cpsc.gov/cpsc/pub/pubs/5061.html>.

<sup>39</sup> 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](http://www.cpsc.gov), accessed in August, 2009.

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.
- 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 5.1. 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 2006 Dollars	
1999	4,500	(1,000)	0	(0)	\$4	(\$4)	\$5
2000	3,400	(800)	100	(100)	\$12	(\$11)	\$14
2001	4,200	(1,000)	40	(40)	\$8	(\$7)	\$10
2002	5,600	(1,000)	90	(60)	\$9	(\$8)	\$10
2003	6,300	(1,100)	100	(60)	\$21	(\$20)	\$23
2004	6,200	(1,300)	130	(90)	\$21	(\$20)	\$22
2005	6,300	(1,400)	80	(40)	\$18	(\$17)	\$18
2006	7,800	(1,500)	130	(110)	\$27	(\$26)	\$27

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: Version 5.0 (1999-2006) and from NFPA survey.

**Table 5.2. Home Fires Involving Microwave Ovens, by Factor Contributing to Ignition  
Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

Factor Contributing to Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Electrical failure or malfunction	500	(41%)	0	(0%)	40	(48%)	\$11	(50%)
Equipment unattended	200	(14%)	0	(0%)	10	(11%)	\$2	(7%)
Unclassified mechanical failure or malfunction	200	(12%)	0	(0%)	0	(7%)	\$2	(10%)
Unclassified misuse of material or product	100	(9%)	0	(0%)	20	(21%)	\$1	(6%)
Unintentionally turned on or not turned off	100	(4%)	0	(0%)	0	(0%)	\$1	(4%)
Other known factor*	300	(25%)	3	(100%)	20	(29%)	\$6	(31%)
Total	1,300	(100%)	3	(100%)	80	(100%)	\$21	(100%)
Total entries	1,400	(106%)	3	(100%)	90	(117%)	\$23	(109%)

\* "Other known" includes equipment not being operated properly (100% of deaths).

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 5.3. Home Fires Involving Microwave Ovens, by Item First Ignited**  
**Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Fires)**

<b>Item First Ignited</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Appliance housing or casing	400	(31%)	0	(0%)	20	(25%)	\$6	(29%)
Cooking materials, including food	300	(21%)	0	(0%)	10	(14%)	\$3	(14%)
Electrical wire or cable insulation	200	(14%)	0	(0%)	0	(3%)	\$4	(17%)
Cabinetry	100	(7%)	0	(0%)	10	(12%)	\$2	(11%)
Unclassified item first ignited	100	(5%)	0	(0%)	0	(5%)	\$1	(6%)
Interior wall covering	100	(4%)	0	(0%)	10	(9%)	\$2	(9%)
Other known item*	200	(17%)	3	(100%)	20	(30%)	\$3	(14%)
<b>Total</b>	<b>1,300</b>	<b>(100%)</b>	<b>3</b>	<b>(100%)</b>	<b>80</b>	<b>(100%)</b>	<b>\$21</b>	<b>(100%)</b>

\* “Other known” includes unclassified furniture or utensil (100% 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 5.4. Home Fires Involving Microwave Ovens, by Extent of Flame Damage**  
**Annual Average of 2003-2006 Structure Fires Reported by U.S. Fire Departments**

<b>Extent of Flame Damage</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Confined fire identified by incident type	5,300	(80%)	0	(0%)	30	(31%)	\$1	(3%)
Confined to object of origin	500	(7%)	0	(0%)	10	(10%)	\$1	(3%)
Confined to room of origin	700	(10%)	3	(100%)	50	(49%)	\$10	(45%)
Confined to floor of origin	0	(1%)	0	(0%)	0	(2%)	\$2	(10%)
Confined to building of origin	100	(1%)	0	(0%)	0	(3%)	\$6	(27%)
Extended beyond building of origin	0	(0%)	0	(0%)	10	(5%)	\$3	(13%)
<b>Total</b>	<b>6,600</b>	<b>(100%)</b>	<b>3</b>	<b>(100%)</b>	<b>110</b>	<b>(100%)</b>	<b>\$22</b>	<b>(100%)</b>

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 7,900 home structure and outdoor fires involving grills per year during 2003-2006.

During the four-year period of 2003-2006, grills, hibachis or barbecues were involved in the ignition of an estimated 7,900 reported home<sup>40</sup> structure and outdoor fires per year. These fires caused an average of 10 civilian deaths, 120 civilian injuries, and \$80 million in direct property damage annually. When a grill was involved in ignition, it provided the heat source that started the fire.

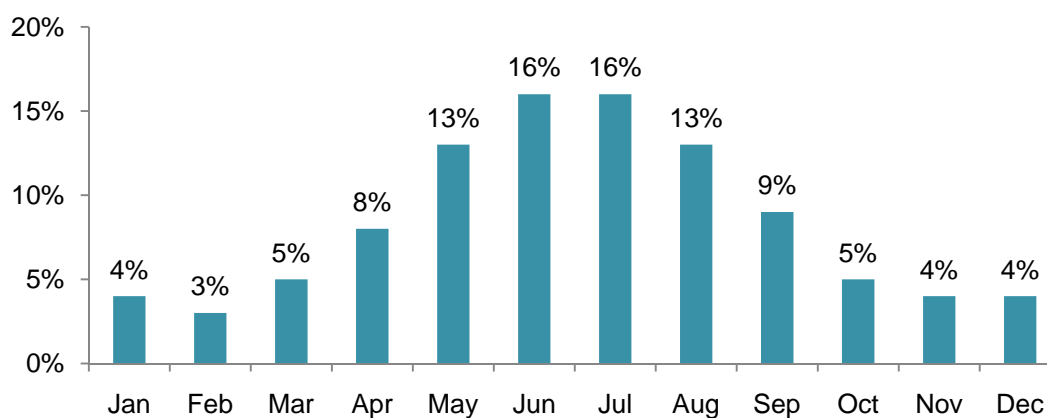
The 7,900 home grill fires reported annually included 2,900 (37%) fires per year in or on structures. All of the grill fire deaths, 90 (73%) of the associated fire injuries, and \$79 million in direct property damage (99%) per year resulted from fires involving structures. The 2,900 home structure fires 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, 5,000 (63%) outside and unclassified grill fires were reported annually during this period. These fires caused an annual average of 30 civilian injuries (27%) and less than \$1 million in direct property damage.

### Grill fires peak in the summer.

Figure 6.1 shows that June and July were the peak months for grill fires, with 16% of the incidents each. May and August followed with 13% each. Although the smallest share of fires occurred in the winter months, these incidents occurred throughout the year.

Figure 6.1. Home Grill Fires by Month: 2003-2006



<sup>40</sup> Homes include one- and two-family dwellings, apartments (regardless of ownership), and manufactured housing. Fires are rounded to the nearest hundred, casualties to the nearest ten, and direct property damage to the nearest million.

### **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.

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.

### **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.<sup>41</sup> In the summer months of June, July and August, half (49%) had a grilled meal. But even in the winter months of December, January, and February, one-quarter (27%) 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.

More than one-third of people who cooked from scratch prepared at least one meal per week on an outdoor grill, according to A.E. Sloan's article that referenced 2005 findings from Multi-

---

<sup>41</sup> 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](http://www.npd.com/press/releases/press_080515a.html) on April 17, 2009.

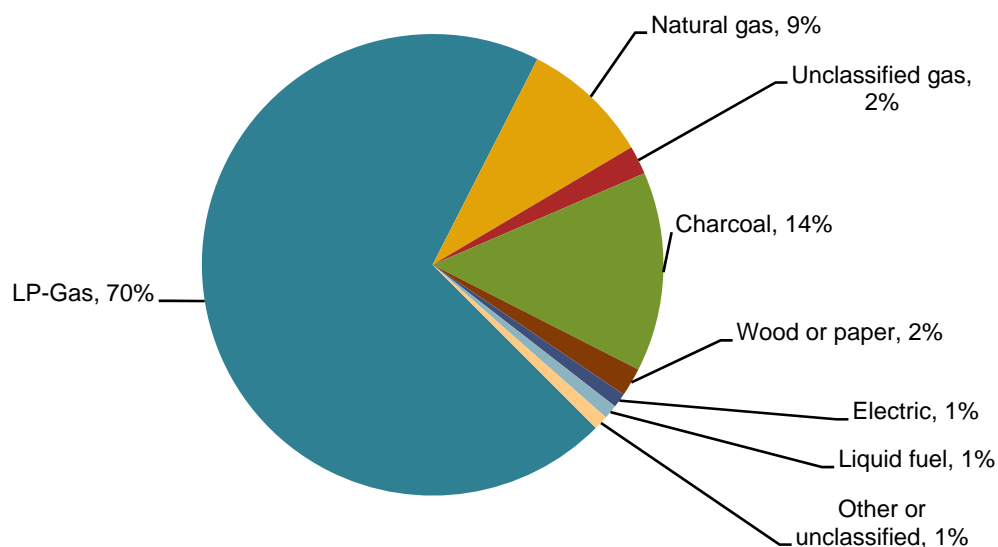
Sponsor Surveys, Inc.<sup>42</sup> Twenty percent used an indoor grill at least once a week. One-quarter (27%) of convenience cooks used an outdoor grill for at least one meal a week and 19% used indoor grills every week.

**70% of grills involved in home outdoor and structure fires in 2003-2006 used LP-gas.**

Table 6.1 and Figure 6.2 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 (70%) of the home grill fires involved grills fueled by liquid propane gas (LP-gas) or similar gas that is heavier than air. Nine percent were fueled by natural gas or other lighter than air gas, and 2% were fueled by an unclassified gas.

Sixteen percent of the grills involved in fires were solid-fueled, including 14% that used charcoal or coal and 2% that used wood or paper. One percent of the grills were powered by electricity, 1% by a liquid fuel, and 1% by another known or unclassified power source.

**Figure 6.2. Home Grill Fires by Power Source: 2003-2006**



The NPD Group also noted that 76% of American households own an outdoor grill and 75% of the owners have a gas grill.<sup>43</sup> That means that more than half (57%) of American households have a gas grill. In a 2007 press release, NPD reported that in 2005, 30% of households had a charcoal grill and 56% a gas grill.

In 2008, the Weber GrillWatch™ Survey, conducted by Greenfield Online, reported that 53% of all grill owners have a charcoal grill, and 63% have a gas grill.<sup>44</sup> Fifty-six percent use gas grills more often, while 38% use charcoal grills more. Almost one-quarter (23%) use both equally.

<sup>42</sup> A.E. Sloan. "What, When and Where America Eats," *Food Technology*, January 2006, p. 26, accessed <http://members.ift.org/NR/rdonlyres/65A7B82E-0AFF-4639-95B2-733B8225D93A/0/0106americaeats.pdf> on April 20, 2009.

<sup>43</sup> The NPD Group, Inc., 2008.

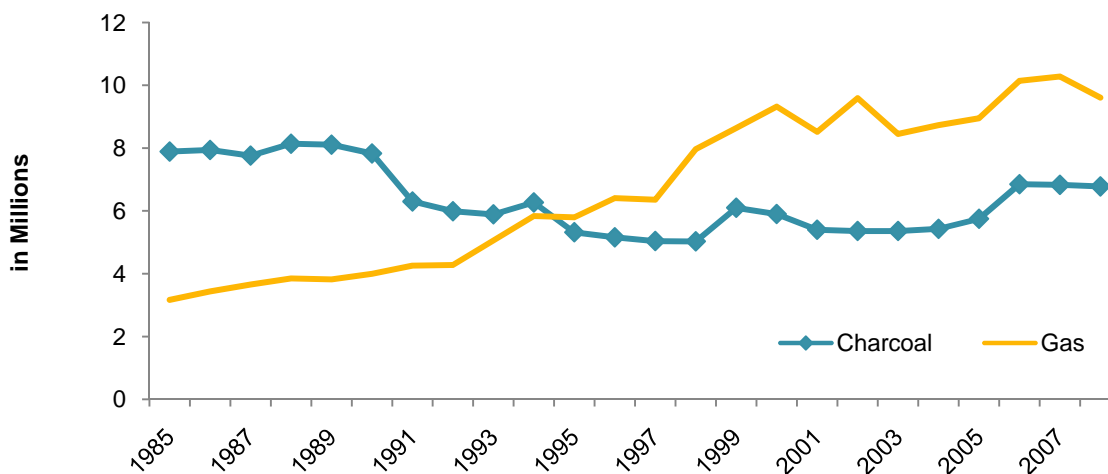
<sup>44</sup> Weber. "Outdoor Grillers Are Turning to Healthier Choices, Grilling More Often According to the 19<sup>th</sup> Annual Grillwatch™ Survey." March 24, 2008. Accessed at <http://weber.mediaroom.com/index.php?s=41&cat=1>.

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

### 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 6.3 shows that as of 1995, more gas grills were shipped for sale than charcoal grills.

**Figure 6.3. Number of Barbecue Grills Shipped in North America, by Power Source:1985-2007**



Source: Hearth, Patio and Barbecue Association, "BBQ Grill Shipments- North America: 1985-2008," accessed at <http://www.hpba.org/index.php?id=255> on April 17, 2009.

### Gas grill fires climbed since the early 80s while solid-fueled grill fires decreased.

In 2005, gas grill user households outnumbered charcoal grill user households by roughly 2-to-1 (56% of U.S. households vs. 30% of U.S. households).<sup>45</sup> Figure 6.4 and Table 6.2 show that the 9,200 grill fires in 2006 was almost twice 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 nearly three times as frequent in 2006 (7,500 fires) as in 1980 (2,600). In contrast, 1,400 charcoal or solid-fueled grill fires were reported in 2006, a drop of 30% from the 2,000 reported in 1980.

<sup>45</sup> The NPD Group, Inc., "NPD reveals outdoor grill usage at a 20-year high," news release, May 22, 2006, accessed at [www.npd.com](http://www.npd.com).

**Figure 6.4. Home Fires Involving Grills, by Year**  
**Fires Reported to U.S. Fire Departments: 1980-2006**

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

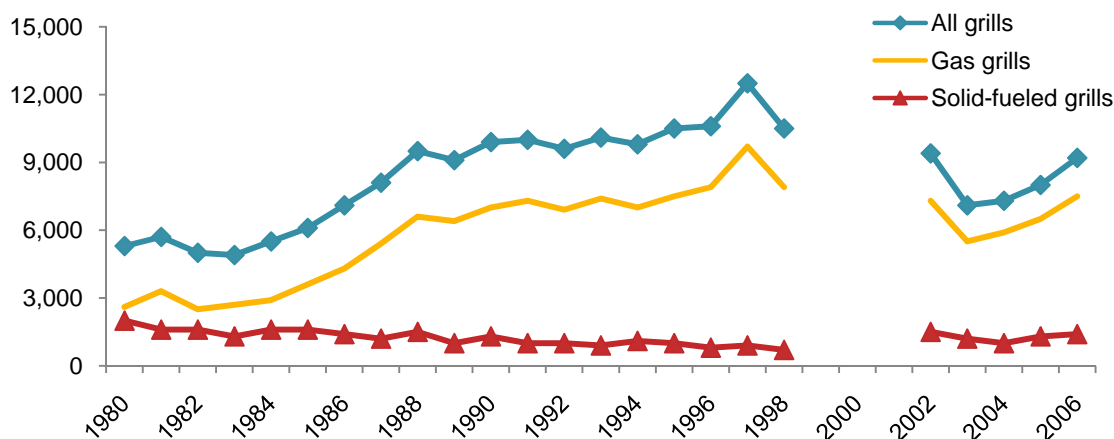
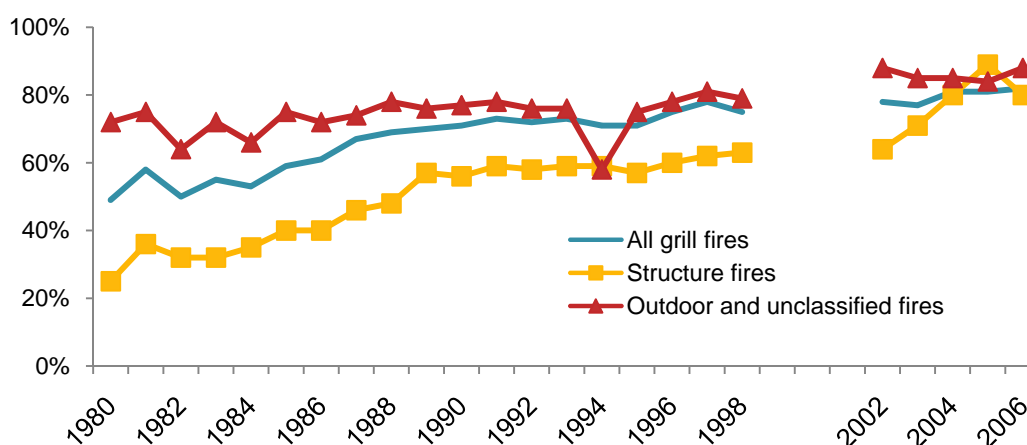


Figure 6.5 shows that gas grills accounted for roughly two-thirds to three-quarters of the outdoor and unclassified grill fires from 1980 through 1998. Since 2002, 84-89% of the outdoor grill fires involved gas-fueled equipment. Gas-fueled equipment accounted for roughly one-quarter to one-third of the structure fires involving grills in the early 1980s. In the most recent three years of data, gas-fired equipment was involved in 80-89% 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: 1980-2006**



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

**One-third of home grill structure fires started on an exterior balcony or open porch.**

Figure 6.6 and Table 6.3 show that in 2003-2006, 33% of the non-confined home grill structure fires started on an exterior balcony or unenclosed porch; 18% began on a courtyard, terrace, or patio; and 11% started along an exterior wall surface. Unlike typical cooking equipment, most grills are

intended for outdoor use. Consequently, few grill fires start in kitchens (5% of non-confined home structure grill fires). The rank order of where fires start is the same for both gas grills and solid-fueled grills. It appears that grills are too often used too close to the structure.

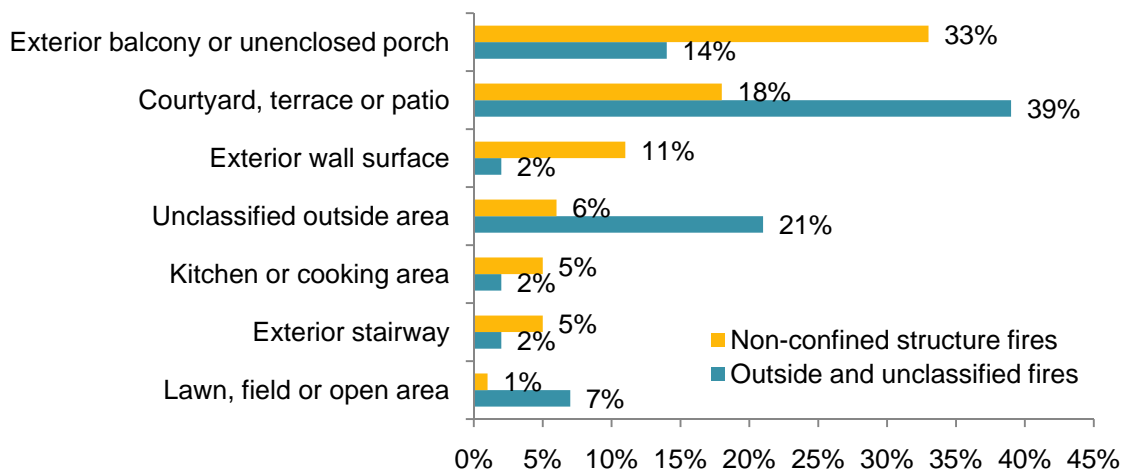
For outdoor and unclassified grill fires (excluding outdoor rubbish fires), the leading areas of origin were courtyards, terraces, or patios (39%); unclassified outside areas (21%); exterior balconies or unenclosed porch (14%), and lawns, fields, or open areas (7%). Although the order varied slightly, these were the leading areas of origin for outdoor fires involving both gas and solid-fueled grills.

### About Confined, Non-Confined, and Outside Rubbish Fires

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 22% of the non-confined fires and 4% of the confined fires. Confined and non-confined structure fires were analyzed separately and then summed to obtain estimates of grill structure fires with different power sources.

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 summed for estimates of grill trends, power sources and months.

**Figure 6.6. Home Grill Fires by Leading Areas of Origin  
2003-2006**



### **The grill was too close to something combustible in one-third of non-confined home grill structure fires.**

In 2003-2006, a heat source (the grill) was too close to something that could catch fire in 32% of all non-confined structure fires in which grills were involved in ignition. Table 6.4 shows that the leading factors contributing to ignition varied by power source. Heat source too close was a factor in almost half (46%) of solid-fueled grill structure fires and almost one-quarter (23%) of gas grill structure fires. Unattended equipment was a factor in 15% of all grill structure fires, 16% of gas grill structure fires, 12% of solid-fueled grill structure fires, 15% of outdoor solid-fueled grill fires, but only 2% of outdoor gas grill fires.

Although leaks or breaks were the leading contributing factors in all outdoor grill fires (34%) and the third leading factor in grill structure fires (13%), this is due largely to gas grill fires. Leaks or breaks were the leading contributing factors in gas grill structure fires (24%), and outdoor gas grill fires (39%). A failure to clean was a factor in 14% of all outdoor grill fires and 16% of outdoor gas grill fires.

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

In 51% of the home outdoor fires in which grills were involved, 56% of the outside gas grills, and 29% of the non-confined gas grill structure fires, the fire started when a flammable or combustible gas or liquid caught fire. Table 6.5 shows that exterior wall coverings and structural members or framing were in the top three items first ignited for all non-confined grill structure fires, as well as those involving solid-fueled and gas grills.

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 2007, 18,600 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 2,900 injuries and charcoal or wood-burning grills for 2,100 injuries. Unspecified other grills accounted for 13,300 injuries. The number of electric-powered grill injuries was too small to produce reliable estimates.<sup>46</sup>

- The 9,600 thermal burns accounted for roughly two-thirds (2,000) of the injuries involving gas grills and charcoal or wood-burning grills (1,400) and almost half (6,100) of the injuries involving unspecified grills. Children under five accounted for 2,200, or roughly one-quarter, 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.

<sup>46</sup> Queries on charcoal or wood burning grills (code 3218), gas or LP-Grills or Stoves (for outdoor use) (code 3248, and grills, not specified (3249) were done at <http://www.cpsc.gov/library/neiss.html> in n April 2009.

- 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.<sup>47</sup> Gas-fueled grills or camp stoves were involved in an average of one CO death per year in the same period.

---

<sup>47</sup> 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 Grill Fires by Power Source**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments**

**A. Grill Fires Summarized: All Incident Types**

Power Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
All gas	6,390	(81%)	9	(73%)	67	(55%)	\$58	(73%)
All solid-fueled	1,260	(16%)	4	(27%)	23	(18%)	\$19	(24%)
Electric	110	(1%)	0	(0%)	0	(0%)	\$3	(3%)
Other known power source	160	(2%)	0	(0%)	2	(1%)	\$0	(0%)
Total	7,920	(100%)	13	(100%)	122	(100%)	\$80	(100%)

**B. Grill Fires in Detail: All Incident Types**

Power Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
LP-gas or other heavier than air gas	5,550	(70%)	9	(73%)	85	(70%)	\$40	(50%)
Natural gas or other lighter than air gas	690	(9%)	0	(0%)	2	(1%)	\$17	(21%)
Unclassified gas	150	(2%)	0	(0%)	0	(0%)	\$1	(1%)
<i>All gas-fueled</i>	<i>6,390</i>	<i>(81%)</i>	<i>9</i>	<i>(73%)</i>	<i>87</i>	<i>(71%)</i>	<i>\$58</i>	<i>(73%)</i>
Charcoal or coal	1,100	(14%)	4	(27%)	34	(27%)	\$19	(23%)
Wood or paper	150	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified solid fuel	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
<i>All solid-fueled</i>	<i>1,260</i>	<i>(16%)</i>	<i>4</i>	<i>(27%)</i>	<i>34</i>	<i>(27%)</i>	<i>\$19</i>	<i>(24%)</i>
Electric	110	(1%)	0	(0%)	0	(0%)	\$3	(3%)
Liquid-fueled	90	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known or unclassified power source	70	(1%)	0	(0%)	2	(1%)	\$0	(0%)
Total	7,920	(100%)	13	(100%)	122	(100%)	\$80	(100%)

Note: Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined or unclassified type, as well as a proportional share of grill fires in which the equipment power source was unknown. Fires reported as “no equipment” but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated. Home cooking fires with this equipment and power source unknown 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 6.1. Home Grill Fires by Power Source**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments (Continued)**

**C. Structure Fires**

Power Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
LP-gas or other heavier than air gas	1,750	(60%)	9	(73%)	65	(73%)	\$40	(50%)
Natural gas or other lighter than air gas	260	(9%)	0	(0%)	2	(2%)	\$17	(21%)
Unclassified gas	70	(2%)	0	(0%)	0	(0%)	\$1	(1%)
<i>All gas-fueled</i>	<i>2,080</i>	<i>(72%)</i>	<i>9</i>	<i>(73%)</i>	<i>67</i>	<i>(75%)</i>	<i>\$58</i>	<i>(73%)</i>
Charcoal or coal	590	(21%)	4	(27%)	23	(25%)	\$19	(24%)
Wood or paper	40	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified solid fuel	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
<i>All solid-fueled</i>	<i>630</i>	<i>(22%)</i>	<i>4</i>	<i>(27%)</i>	<i>23</i>	<i>(25%)</i>	<i>\$19</i>	<i>(24%)</i>
Electric	80	(3%)	0	(0%)	0	(0%)	\$3	(3%)
Liquid-fueled	40	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known or unclassified power source	60	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Total	2,900	(100%)	13	(100%)	90	(100%)	\$79	(100%)

**D. Non-Confined Structure Fires**

Power Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
LP-gas or other heavier than air gas	620	(50%)	9	(73%)	48	(66%)	\$40	(50%)
Natural gas or other lighter than air gas	100	(8%)	0	(0%)	2	(2%)	\$17	(21%)
Unclassified gas	10	(1%)	0	(0%)	0	(0%)	\$1	(1%)
<i>All gas-fueled</i>	<i>730</i>	<i>(59%)</i>	<i>9</i>	<i>(73%)</i>	<i>49</i>	<i>(69%)</i>	<i>\$57</i>	<i>(73%)</i>
Charcoal or coal	430	(34%)	4	(27%)	23	(31%)	\$19	(24%)
Wood or paper	20	(2%)	0	(0%)	0	(0%)	\$0	(0%)
<i>All solid-fueled</i>	<i>450</i>	<i>(36%)</i>	<i>4</i>	<i>(27%)</i>	<i>23</i>	<i>(31%)</i>	<i>\$19</i>	<i>(24%)</i>
Electric	40	(3%)	0	(0%)	0	(0%)	\$3	(4%)
Liquid-fueled	10	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known or unclassified power source	10	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Total	1,250	(100%)	13	(100%)	72	(100%)	\$79	(100%)

Note: Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined or unclassified type, as well as a proportional share of grill fires in which the equipment power source was unknown. Fires reported as “no equipment” but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated. Home cooking fires with this equipment and area of origin unknown 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 6.1. Home Grill Fires by Power Source**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments (Continued)**

**E. Confined Structure Fires**

Power Source	Fires		Civilian		Civilian		Direct Property	
			Deaths		Injuries		Damage (in Millions)	
LP-gas or other heavier than air gas	1,130	(69%)	0	(NA)	18	(100%)	\$0	(45%)
Natural gas or other lighter than air gas	160	(10%)	0	(NA)	0	(0%)	\$0	(6%)
Unclassified gas	60	(3%)	0	(NA)	0	(0%)	\$0	(48%)
<i>All gas-fueled</i>	<i>1,350</i>	<i>(82%)</i>	<i>0</i>	<i>(NA)</i>	<i>18</i>	<i>(100%)</i>	<i>\$0</i>	<i>(99%)</i>
Charcoal or coal	170	(10%)	0	(NA)	0	(0%)	\$0	(1%)
Wood or paper	10	(1%)	0	(NA)	0	(0%)	\$0	(0%)
<i>All solid-fueled</i>	<i>180</i>	<i>(11%)</i>	<i>0</i>	<i>(NA)</i>	<i>0</i>	<i>(0%)</i>	<i>\$0</i>	<i>(1%)</i>
Electric	40	(2%)	0	(NA)	0	(0%)	\$0	(1%)
Liquid-fueled	30	(2%)	0	(NA)	0	(0%)	\$0	(0%)
Other known or unclassified fuel or power source	50	(3%)	0	(NA)	0	(0%)	\$0	(0%)
Total	1,640	(100%)	0	(NA)	18	(100%)	\$0	(100%)

**F. Outside and Unclassified Grill Fires**

Power Source	Fires		Civilian		Civilian		Direct Property	
			Deaths		Injuries		Damage (in Millions)	
LP-gas or other heavier than air gas	3,800	(76%)	0	(NA)	20	(61%)	\$0	(74%)
Natural gas or other lighter than air gas	430	(8%)	0	(NA)	0	(0%)	\$0	(9%)
Unclassified gas	80	(2%)	0	(NA)	0	(0%)	\$0	(2%)
<i>All gas-fueled</i>	<i>4,310</i>	<i>(86%)</i>	<i>0</i>	<i>(NA)</i>	<i>20</i>	<i>(61%)</i>	<i>\$0</i>	<i>(85%)</i>
Charcoal or coal	510	(10%)	0	(NA)	11	(34%)	\$0	(14%)
Wood or paper	120	(2%)	0	(NA)	0	(0%)	\$0	(0%)
Unclassified solid fuel	0	(0%)	0	(NA)	0	(0%)	\$0	(0%)
<i>All solid-fueled</i>	<i>620</i>	<i>(12%)</i>	<i>0</i>	<i>(NA)</i>	<i>11</i>	<i>(34%)</i>	<i>\$0</i>	<i>(14%)</i>
Electric	30	(1%)	0	(NA)	0	(0%)	\$0	(0%)
Liquid-fueled	60	(1%)	0	(NA)	0	(0%)	\$0	(0%)
Other known or unclassified fuel or power source	0	(0%)	0	(NA)	2	(5%)	\$0	(1%)
Total	5,030	(100%)	0	(NA)	33	(100%)	\$0	(100%)

NA – not applicable because estimated total is zero.

Note: Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined or unclassified type, as well as a proportional share of grill fires in which the equipment power source was unknown. Fires reported as “no equipment” but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated. Home cooking fires with this equipment and area of origin unknown 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 6.1. Home Grill Fires by Power Source**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments (Continued)**

**G. Outside and Unclassified Fires, Excluding Trash Fires**

<b>Power Source</b>	<b>Fires</b>		<b>Civilian Deaths</b>	<b>Civilian Injuries</b>	<b>Direct Property Damage (in Millions)</b>	
LP-gas or other heavier than air gas	3,750	(78%)	0 (NA)	20 (61%)	\$0	(74%)
Natural gas or other lighter than air gas	400	(8%)	0 (NA)	0 (0%)	\$0	(9%)
Unclassified gas	80	(2%)	0 (NA)	0 (0%)	\$0	(2%)
<i>All gas-fueled</i>	<i>4,230</i>	<i>(88%)</i>	<i>0 (NA)</i>	<i>20 (61%)</i>	<i>\$0</i>	<i>(85%)</i>
Charcoal or coal	410	(9%)	0 (NA)	11 (34%)	\$0	(14%)
Wood or paper	60	(1%)	0 (NA)	0 (0%)	\$0	(0%)
<i>All solid-fueled</i>	<i>470</i>	<i>(10%)</i>	<i>0 (NA)</i>	<i>11 (34%)</i>	<i>\$0</i>	<i>(14%)</i>
Electric	30	(1%)	0 (NA)	0 (0%)	\$0	(0%)
Liquid-fueled	60	(1%)	0 (NA)	0 (0%)	\$0	(0%)
Other known or unclassified fuel or power source	0	(0%)	0 (NA)	2 (5%)	\$0	(1%)
<b>Total</b>	<b>4,790</b>	<b>(100%)</b>	<b>0 (NA)</b>	<b>33 (100%)</b>	<b>\$0</b>	<b>(100%)</b>

**H. Outside Trash Fires**

<b>Power Source</b>	<b>Fires</b>		<b>Civilian Deaths</b>	<b>Civilian Injuries</b>	<b>Direct Property Damage (in Millions)</b>	
LP-gas or other heavier than air gas	50	(23%)	0 (NA)	0 (NA)	\$0	(24%)
Natural gas or other lighter than air gas	30	(11%)	0 (NA)	0 (NA)	\$0	(43%)
<i>All gas-fueled</i>	<i>80</i>	<i>(0%)</i>	<i>0 (NA)</i>	<i>0 (NA)</i>	<i>\$0</i>	<i>(67%)</i>
Charcoal or coal	100	(42%)	0 (NA)	0 (NA)	\$0	(33%)
Wood or paper	60	(24%)	0 (NA)	0 (NA)	\$0	(0%)
<i>All solid-fueled</i>	<i>160</i>	<i>(66%)</i>	<i>0 (NA)</i>	<i>0 (NA)</i>	<i>\$0</i>	<i>(33%)</i>
<b>Total</b>	<b>240</b>	<b>(100%)</b>	<b>0 (NA)</b>	<b>0 (NA)</b>	<b>\$0</b>	<b>(100%)</b>

NA – not applicable because estimated total is zero.

Note: These 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. National estimates are projections. 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, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as heating or air conditioning equipment of undetermined type, as well as a proportional share of grill fires in which the equipment power source was unknown. Fires reported as “no equipment” but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated. Home heating fires with this equipment and area of origin unknown 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 6.2. 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 2006 Dollars		
1980	2,400		90	\$9		\$22	
1981	2,500		100	\$12		\$27	
1982	2,200		80	\$15		\$31	
1983	1,900		120	\$15		\$30	
1984	2,300		70	\$16		\$31	
1985	2,500		80	\$17		\$32	
1986	2,500		90	\$18		\$33	
1987	2,400		70	\$19		\$34	
1988	2,700		130	\$37		\$63	
1989	2,300		60	\$20		\$33	
1990	2,500		120	\$24		\$37	
1991	2,200		110	\$36*		\$53*	
1992	2,400		100	\$41		\$59	
1993	2,200		80	\$22		\$31	
1994	2,200		90	\$21		\$29	
1995	2,100		70	\$30		\$40	
1996	2,000		110	\$29		\$37	
1997	2,100		80	\$44		\$55	
1998	1,900		90	\$53		\$66	
1999	3,500	(2,900)	0	(0)	\$82	(\$84)	\$99
2000	2,200	(900)	100	(100)	\$61	(\$61)	\$71
2001	2,200	(1,400)	50	(50)	\$41	(\$41)	\$47
2002	2,800	(2,600)	90	(90)	\$56	(\$55)	\$63
2003	2,100	(1,100)	90	(70)	\$92	(\$92)	\$101
2004	2,500	(1,200)	110	(110)	\$47	(\$47)	\$50
2005	2,700	(1,300)	70	(60)	\$135	(\$135)	\$139
2006	3,000	(1,400)	90	(60)	\$49	(\$49)	\$49

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

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 deaths and 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 2006 dollars is done using the consumer price index.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2006) and from NFPA survey.

**Table 6.2. 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 2006 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	\$1
1993	7,900	20	\$0	\$0
1994	9,800	120	\$21	\$29
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	\$0
2000	4,000	20	\$0	\$0
2001	5,400	70	\$0	\$0
2002	6,400	30	\$1	\$1
2003	4,800	20	\$0	\$0
2004	4,600	20	\$0	\$0
2005	4,900	30	\$0	\$0
2006	5,800	60	\$1	\$1

Note: Fires are rounded to the nearest hundred, civilian deaths and 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 2006 dollars is done using the consumer price index. For outdoor fires, details such as cause are not required for trash fires, and so trash fires are analyzed separately from other outdoor fires.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2006) 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: All Power Sources**

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2006 Dollars
1980	5,300	120	\$9	\$22
1981	5,700	110	\$12	\$27
1982	5,000	120	\$15	\$31
1983	4,900	150	\$15	\$30
1984	5,500	110	\$16	\$31
1985	6,100	110	\$18	\$34
1986	7,100	120	\$18	\$33
1987	8,100	110	\$19	\$34
1988	9,500	150	\$37	\$63
1989	9,100	100	\$21	\$34
1990	9,900	140	\$25	\$39
1991	10,000	150	\$36*	\$53*
1992	9,600	140	\$42	\$60
1993	10,100	100	\$23	\$32
1994	9,800	120	\$21	\$29
1995	10,500	130	\$31	\$41
1996	10,600	150	\$30	\$39
1997	12,500	110	\$45	\$57
1998	10,500	140	\$54	\$67
1999	9,100	90	\$83	\$100
2000	6,200	130	\$61	\$71
2001	7,700	120	\$41	\$47
2002	9,400	110	\$56	\$63
2003	7,100	110	\$93	\$102
2004	7,300	130	\$48	\$51
2005	8,000	110	\$136	\$140
2006	9,200	110	\$50	\$50

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Fires are rounded to the nearest hundred, civilian deaths and 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 2006 dollars is done using the consumer price index. For outdoor fires, details such as cause are not required for trash fires, and so trash fires are analyzed separately from other outdoor fires.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2006) and from NFPA survey.

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

**D. Structure Fires: Gas-Fueled Grills**

Year	Fires		Civilian Injuries		Direct Property Damage (in Millions)		
					As Reported		In 2006 Dollars
1980	600		40		\$2		\$5
1981	900		70		\$3		\$7
1982	700		20		\$2		\$4
1983	600		50		\$6		\$12
1984	800		40		\$5		\$10
1985	1,000		50		\$7		\$13
1986	1,000		50		\$6		\$11
1987	1,100		40		\$7		\$12
1988	1,300		80		\$21		\$36
1989	1,300		40		\$9		\$15
1990	1,400		70		\$15		\$23
1991	1,300		100		\$19*		\$28*
1992	1,400		80		\$31		\$45
1993	1,300		60		\$15		\$21
1994	1,300		60		\$11		\$15
1995	1,200		40		\$11		\$15
1996	1,200		70		\$15		\$19
1997	1,300		60		\$24		\$30
1998	1,200		40		\$32		\$40
1999	1,300	(600)	0	(0)	\$1	(\$1)	\$1
2000	1,400	(500)	100	(100)	\$26	(\$26)	\$30
2001	1,400	(700)	0	(0)	\$18	(\$18)	\$21
2002	1,800	(900)	50	(50)	\$28	(\$27)	\$31
2003	1,500	(600)	80	(60)	\$76	(\$76)	\$83
2004	2,000	(700)	80	(80)	\$20	(\$20)	\$21
2005	2,400	(800)	60	(40)	\$118	(\$118)	\$122
2006	2,400	(800)	60	(20)	\$22	(\$22)	\$22

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

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 deaths and 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, as well as grill fires with unknown power source. 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 2006 dollars is done using the consumer price index.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2006) and from NFPA survey.

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

**E. Outdoor Fires: Gas-Fueled Grills**

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2006 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	\$1
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	0	\$0	\$1
2003	4,100	20	\$0	\$0
2004	3,900	10	\$0	\$0
2005	4,100	10	\$0	\$0
2006	5,100	0	\$1	\$1

Note: Fires are rounded to the nearest hundred, civilian deaths and 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, as well as grill fires with unknown power source. 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 2006 dollars is done using the consumer price index. For outdoor fires, details such as cause are not required for trash fires, and so trash fires are analyzed separately from other outdoor fires. Outside rubbish fires were analyzed separately from all other outside and unclassified fires and the results summed. Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2006) and from NFPA survey.

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

**F. Structure and Outdoor Fires Combined: Gas-Fueled Grills**

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2006 Dollars
1980	2,600	60	\$2	\$5
1981	3,300	70	\$3	\$7
1982	2,500	60	\$2	\$4
1983	2,700	70	\$6	\$12
1984	2,900	60	\$5	\$10
1985	3,600	60	\$7	\$13
1986	4,300	80	\$6	\$11
1987	5,400	60	\$7	\$12
1988	6,600	90	\$21	\$36
1989	6,400	60	\$10	\$16
1990	7,000	80	\$15	\$23
1991	7,300	130	\$19*	\$28*
1992	6,900	110	\$32	\$46
1993	7,400	80	\$15	\$21
1994	7,000	80	\$11	\$15
1995	7,500	80	\$12	\$16
1996	7,900	90	\$15	\$19
1997	9,700	100	\$24	\$30
1998	7,900	80	\$33	\$41
1999	5,100	40	\$1	\$1
2000	4,600	130	\$26	\$30
2001	6,200	60	\$18	\$21
2002	7,300	50	\$28	\$31
2003	5,500	100	\$76	\$83
2004	5,900	90	\$21	\$21
2005	6,500	70	\$119	\$123
2006	7,500	60	\$22	\$22

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Fires are rounded to the nearest hundred, civilian deaths and 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, as well as grill fires with unknown power source. 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 2006 dollars is done using the consumer price index. For outdoor fires, details such as cause are not required for trash fires, and so trash fires are analyzed separately from other outdoor fires.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2006) and from NFPA survey.

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

**G. Structure Fires: Solid-Fueled Grills**

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

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as continued to a cooking vessel and involving cooking equipment; they are analyzed separately. Fires are rounded to the nearest hundred, civilian deaths and 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 involving in ignition unknown or reported as cooking or kitchen equipment of undetermined type, as well as grill fires with unknown power source. 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 2006 dollars is done using the consumer price index.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2006) and from NFPA survey.

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

**H. Outdoor Fires: Solid-Fueled Grills**

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2006 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	4002	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	400	10	\$0	\$0
2005	800	10	\$0	\$0
2006	600	0	\$0	\$0

Note: Fires are rounded to the nearest hundred, civilian deaths and 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, as well as grill fires with unknown power source. 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 2006 dollars is done using the consumer price index. For outdoor fires, details such as cause are not required for trash fires, and so trash fires are analyzed separately from other outdoor fires.

Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2006) and from NFPA survey.

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

**I. Structure and Outdoor Fires Combined: Solid-Fueled Grills**

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

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parenthesis exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. These 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. 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 2006 dollars is done using the consumer price index. For outdoor fires, details such as cause are not required for trash fires, and so trash fires are analyzed separately from other outdoor fires. Source: Data from NFIRS Version 4.1 (1980-1998) and Version 5.0 (1999-2006) and from NFPA survey.

**Table 6.3. Home Fires Involving Grills, by Area of Origin**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)**

**A. Structure Fires: All Power Sources**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Exterior balcony or unenclosed porch	400	(33%)	0	(0%)	33	(45%)	\$32	(40%)
Courtyard, terrace or patio	200	(18%)	0	(0%)	15	(21%)	\$11	(14%)
Exterior wall surface	100	(11%)	0	(0%)	6	(9%)	\$5	(6%)
Unclassified outside area	100	(6%)	0	(0%)	0	(0%)	\$1	(1%)
Garage or vehicle storage area*	100	(5%)	0	(0%)	7	(10%)	\$4	(6%)
Exterior stairway, ramp, or fire escape	100	(5%)	0	(0%)	3	(3%)	\$1	(1%)
Kitchen or cooking area	100	(5%)	0	(0%)	2	(2%)	\$1	(2%)
Other known area	200	(17%)	13	(100%)	6	(9%)	\$23	(29%)
<b>Total</b>	<b>1,300</b>	<b>(100%)</b>	<b>13</b>	<b>(100%)</b>	<b>72</b>	<b>(100%)</b>	<b>\$79</b>	<b>(100%)</b>

\* Does not include garage coded as separate property.

**B. Outdoor Fires: All Power Sources**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Courtyard, terrace or patio	1,900	(39%)	0	(NA)	13	(39%)	\$0	(47%)
Unclassified outside area	1,000	(21%)	0	(NA)	3	(10%)	\$0	(10%)
Exterior balcony or unenclosed porch	700	(14%)	0	(NA)	6	(18%)	\$0	(15%)
Lawn, field or open area	300	(7%)	0	(NA)	5	(16%)	\$0	(4%)
Unclassified area	200	(4%)	0	(NA)	2	(5%)	\$0	(4%)
Vegetation area	200	(3%)	0	(NA)	2	(6%)	\$0	(1%)
Kitchen or cooking area	100	(2%)	0	(NA)	0	(0%)	\$0	(1%)
Unclassified equipment or service area	100	(2%)	0	(NA)	0	(0%)	\$0	(2%)
Unclassified function area	100	(2%)	0	(NA)	0	(0%)	\$0	(2%)
Fuel tank or fuel line of vehicle	100	(1%)	0	(NA)	0	(0%)	\$0	(5%)
Other known area	200	(4%)	0	(NA)	2	(5%)	\$0	(0%)
<b>Total</b>	<b>4,800</b>	<b>(100%)</b>	<b>0</b>	<b>(NA)</b>	<b>33</b>	<b>(100%)</b>	<b>\$0</b>	<b>(0%)</b>

NA – Not applicable because estimated total is zero.

Note: Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking 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. Home kitchen and cooking fires with this equipment and area of origin unknown 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 6.3. Home Fires Involving Grills, by Area of Origin**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)**  
**(Continued)**

**C. Structure Fires: Gas-Fueled Grills**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Exterior balcony or unenclosed porch	200	(32%)	0	(0%)	20	(40%)	\$20	(35%)
Courtyard, terrace or patio	100	(20%)	0	(0%)	7	(15%)	\$5	(9%)
Exterior wall surface	100	(12%)	0	(0%)	6	(13%)	\$3	(5%)
Other known area	300	(36%)	9	(100%)	16	(32%)	\$0	(0%)
Total	700	(100%)	9	(100%)	49	(100%)	\$0	(0%)

**D. Outdoor Fires: Gas-Fueled Grills**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Courtyard, terrace or patio	1,800	(43%)	0	(NA)	10	(51%)	\$0	(52%)
Unclassified outside area	900	(21%)	0	(NA)	0	(0%)	\$0	(8%)
Exterior balcony or unenclosed porch	600	(15%)	0	(NA)	6	(32%)	\$0	(16%)
Lawn, field or open area	300	(6%)	0	(NA)	2	(9%)	\$0	(3%)
Unclassified area	200	(5%)	0	(NA)	2	(9%)	\$0	(5%)
Unclassified equipment or service area	100	(2%)	0	(NA)	0	(0%)	\$0	(3%)
Kitchen or cooking area	100	(2%)	0	(NA)	0	(0%)	\$0	(1%)
Unclassified function area	100	(2%)	0	(NA)	0	(0%)	\$0	(1%)
Fuel tank or fuel line of vehicle	100	(2%)	0	(NA)	0	(0%)	\$0	(6%)
Other known area	100	(3%)	0	(NA)	0	(0%)	\$0	(0%)
Total	4,200	(100%)	0	(NA)	20	(100%)	\$0	(0%)

NA – Not applicable because estimated total is zero.

Note: Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking 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. Home kitchen and cooking fires with this equipment and area of origin unknown 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 6.3. Home Fires Involving Grills, by Area of Origin**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)**  
**(Continued)**

**E. Structure Fires: Solid-Fueled Grills**

<b>Area of Origin</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Exterior balcony or unenclosed porch	200	(42%)	0	(0%)	13	(57%)	\$11	(60%)
Courtyard, terrace or patio	100	(17%)	0	(0%)	8	(35%)	\$4	(19%)
Other known area	200	(41%)	4	(100%)	2	(8%)	\$4	(21%)
<b>Total</b>	<b>500</b>	<b>(100%)</b>	<b>4</b>	<b>(100%)</b>	<b>23</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>

**F. Outdoor Fires: Solid-Fueled Grills**

<b>Area of Origin</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Unclassified outside area	100	(29%)	0	(NA)	2	(17%)	\$0	(15%)
Courtyard, terrace or patio	100	(24%)	0	(NA)	3	(31%)	\$0	(20%)
Lawn, field or open area	100	(15%)	0	(NA)	4	(35%)	\$0	(11%)
Exterior balcony, unenclosed porch	100	(15%)	0	(NA)	0	(0%)	\$0	(15%)
Other known item	100	(17%)	0	(NA)	2	(17%)	\$0	(38%)
<b>Total</b>	<b>500</b>	<b>(100%)</b>	<b>0</b>	<b>(NA)</b>	<b>11</b>	<b>(100%)</b>	<b>\$0</b>	<b>(100%)</b>

NA – Not applicable because estimated total is zero.

Note: Fires are rounded to the nearest hundred, civilian deaths to the nearest one, civilian injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking 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. Home kitchen and cooking fires with this equipment and area of origin unknown 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 6.4. Home Fires Involving Grills, by Factor Contributing to Ignition  
Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)**

**A. Structure Fires: All Power Sources**

Factor	Fires		Civilian		Civilian		Direct Property	
			Deaths	Injuries	Injuries	Damage (in Millions)		
Heat source too close to combustible	400	(32%)	4	(27%)	26	(36%)	\$17	(22%)
Equipment unattended	200	(15%)	0	(0%)	3	(5%)	\$7	(9%)
Leak or break	200	(13%)	9	(73%)	24	(34%)	\$19	(24%)
Outside or open fire for warming or cooking	100	(8%)	0	(0%)	5	(8%)	\$4	(5%)
Unclassified misuse of material or product,	100	(6%)	0	(0%)	6	(9%)	\$24	(30%)
Unclassified mechanical failure or malfunction	100	(5%)	9	(73%)	3	(4%)	\$2	(3%)
Abandoned or discarded material	100	(4%)	0	(0%)	0	(0%)	\$2	(3%)
Other known factor	400	(33%)	0	(0%)	20	(27%)	\$45	(57%)
Total fires	1,300	(100%)	13	(100%)	72	(100%)	\$79	(100%)
Total entries	1,400	(115%)	22	(173%)	87	(121%)	\$120	(152%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fire with equipment involved in ignition unknown or recorded cooking or kitchen 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. Home cooking fires with this 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 6.4. Home Fires Involving Grills, by Factor Contributing to Ignition  
Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)  
(Continued)**

**B. Outdoor Fires: All Power Sources**

<b>Factor</b>	<b>Fires</b>		<b>Civilian Deaths</b>	<b>Civilian Injuries</b>	<b>Direct Property Damage (in Millions)</b>	
Leak or break	1,600	(34%)	0 (NA)	2 (7%)	\$0	(24%)
Failure to clean	700	(14%)	0 (NA)	0 (0%)	\$0	(10%)
Unclassified mechanical failure or malfunction	400	(9%)	0 (NA)	6 (18%)	\$0	(18%)
Heat source too close to combustible	300	(6%)	0 (NA)	3 (9%)	\$0	(18%)
Unclassified misuse of product	300	(5%)	0 (NA)	6 (18%)	\$0	(4%)
Worn out	200	(5%)	0 (NA)	0 (0%)	\$0	(3%)
Equipment unattended	200	(4%)	0 (NA)	0 (0%)	\$0	(4%)
Outside or open fire for warming or cooking	200	(4%)	0 (NA)	5 (15%)	\$0	(8%)
Equipment not being operated properly	200	(3%)	0 (NA)	5 (16%)	\$0	(3%)
Unclassified factor contributed to ignition	100	(3%)	0 (NA)	0 (0%)	\$0	(0%)
Unclassified operational deficiency	100	(3%)	0 (NA)	0 (0%)	\$0	(1%)
Flammable liquid used to kindle fire	100	(1%)	0 (NA)	5 (16%)	\$0	(1%)
Installation deficiency	100	(1%)	0 (NA)	0 (0%)	\$0	(0%)
High wind	100	(1%)	0 (NA)	0 (0%)	\$0	(1%)
Abandoned or discarded materials or products	100	(1%)	0 (NA)	0 (0%)	\$0	(0%)
Other known factor	500	(10%)	0 (NA)	3 (8%)	\$0	(18%)
<b>Total fires</b>	<b>4,800</b>	<b>(100%)</b>	<b>0 (NA)</b>	<b>33 (100%)</b>	<b>\$0</b>	<b>(100%)</b>
<b>Total entries</b>	<b>5,000</b>	<b>(105%)</b>	<b>0 (NA)</b>	<b>35 (107%)</b>	<b>\$1</b>	<b>(113%)</b>

NA – Not applicable because estimated total is zero.

Note: Multiple entries are allowed, resulting in more factor entries than fires. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fire with equipment involved in ignition unknown or recorded cooking or kitchen 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. Home cooking fires with this 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 6.4. Home Fires Involving Grills, by Factor Contributing to Ignition**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)**  
**(Continued)**

**C. Structure Fires: Gas-Fueled Grills**

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Leak or break	200	(24%)	9	(100%)	27	(54%)	\$20	(35%)
Heat source too close to combustible	200	(23%)	0	(0%)	13	(26%)	\$6	(11%)
Equipment unattended	100	(16%)	0	(0%)	4	(7%)	\$5	(9%)
Unclassified mechanical failure or malfunction	100	(8%)	9	(100%)	3	(6%)	\$2	(4%)
Other known factor	300	(46%)	0	(0%)	10	(21%)	\$64	(112%)
Total fires	700	(100%)	9	(100%)	49	(100%)	\$57	(100%)
Total entries	900	(117%)	19	(200%)	56	(114%)	\$98	(171%)

Note: Multiple entries are allowed, resulting in more factor entries than fires. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fire with equipment involved in ignition unknown or recorded cooking or kitchen 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. Home cooking fires with this 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 6.4. Home Fires Involving Grills, by Factor Contributing to Ignition  
Annual Average 2003-2006 Fires Reported to U.S. Fire Department  
(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)  
(Continued)**

**D. Outdoor Fires: Gas-Fueled Grills**

<b>Factor</b>	<b>Fires</b>		<b>Civilian Deaths</b>	<b>Civilian Injuries</b>	<b>Direct Property Damage (in Millions)</b>	
Leak or break	1,600	(39%)	0 (NA)	3 (14%)	\$0	(28%)
Failure to clean	700	(16%)	0 (NA)	0 (0%)	\$0	(12%)
Unclassified mechanical failure or malfunction	400	(11%)	0 (NA)	7 (35%)	\$0	(22%)
Worn out	200	(5%)	0 (NA)	0 (0%)	\$0	(1%)
Unclassified misuse of material	200	(4%)	0 (NA)	7 (35%)	\$0	(2%)
Heat source too close to combustible	200	(4%)	0 (NA)	0 (0%)	\$0	(20%)
Equipment not being operated properly	200	(4%)	0 (NA)	6 (30%)	\$0	(3%)
Unclassified factor contributed to ignition	100	(3%)	0 (NA)	0 (0%)	\$0	(0%)
Unclassified operational deficiency	100	(3%)	0 (NA)	0 (0%)	\$0	(1%)
Outside or open fire for warming or cooking	100	(3%)	0 (NA)	0 (0%)	\$0	(1%)
Equipment unattended	100	(2%)	0 (NA)	0 (0%)	\$0	(3%)
Installation deficiency	100	(2%)	0 (NA)	0 (0%)	\$0	(0%)
Unclassified design, manufacturing or installation deficiency	100	(1%)	0 (NA)	0 (0%)	\$0	(1%)
Other known factor	400	(9%)	0 (NA)	0 (0%)	\$0	(21%)
<b>Total fires</b>	<b>4,200</b>	<b>(100%)</b>	<b>0 (NA)</b>	<b>20 (100%)</b>	<b>\$0</b>	<b>(100%)</b>
<b>Total entries</b>	<b>4,400</b>	<b>(105%)</b>	<b>0 (NA)</b>	<b>22 (114%)</b>	<b>\$0</b>	<b>(114%)</b>

NA – Not applicable because estimated total is zero.

Note: Multiple entries are allowed, resulting in more factor entries than fires. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fire with equipment involved in ignition unknown or recorded cooking or kitchen 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. Home cooking fires with this 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 6.4. Home Fires Involving Grills, by Factor Contributing to Ignition**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)**  
**(Continued)**

**E. Structure Fires: Solid-Fueled Grills**

<b>Factor</b>	<b>Fires</b>	<b>Civilian Deaths</b>	<b>Civilian Injuries</b>	<b>Direct Property Damage (in Millions)</b>
Heat source too close to combustible	200 (46%)	4 (100%)	12 (52%)	\$9 (47%)
Outside or open fire for warming or cooking	100 (15%)	0 (0%)	2 (9%)	\$3 (17%)
Equipment unattended	100 (12%)	0 (0%)	0 (0%)	\$1 (8%)
Other known factor	200 (40%)	0 (0%)	16 (72%)	\$8 (40%)
<b>Total fires</b>	<b>500 (100%)</b>	<b>4 (100%)</b>	<b>23 (100%)</b>	<b>\$19 (100%)</b>
<b>Total entries</b>	<b>500 (113%)</b>	<b>4 (100%)</b>	<b>30 (132%)</b>	<b>\$21 (112%)</b>

**F. Outdoor Fires: Solid-Fueled Grills**

<b>Factor</b>	<b>Fires</b>	<b>Civilian Deaths</b>	<b>Civilian Injuries</b>	<b>Direct Property Damage (in Millions)</b>
Heat source too close to combustible	100 (17%)	0 (NA)	0 (0%)	\$0 (8%)
Equipment unattended	100 (15%)	0 (NA)	0 (0%)	\$0 (8%)
Unclassified misuse of material	100 (13%)	0 (NA)	0 (0%)	\$0 (14%)
Outside or open fire for warming or cooking	100 (12%)	0 (NA)	4 (38%)	\$0 (43%)
Other known factor	200 (53%)	0 (NA)	7 (62%)	\$0 (0%)
<b>Total fires</b>	<b>500 (111%)</b>	<b>0 (NA)</b>	<b>11 (100%)</b>	<b>\$0 (0%)</b>
<b>Total entries</b>	<b>500 (100%)</b>	<b>0 (NA)</b>	<b>11 (100%)</b>	<b>\$0 (0%)</b>

NA – Not applicable because estimated total is zero.

Note: Multiple entries are allowed, resulting in more factor entries than fires. Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fire with equipment involved in ignition unknown or recorded cooking or kitchen 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. Home cooking fires with this 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 6.5. Home Fires Involving Grills, by Item First Ignited**

**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)**

**A. Structure Fires: All Power Sources**

Item First Ignited	Fires		Civilian		Civilian		Direct Property	
			Deaths	Injuries	Injuries	Damage (in Millions)		
Exterior wall covering or finish	300	(22%)	9 (73%)	24 (33%)	\$10	(13%)		
Flammable or combustible liquid or gas	200	(17%)	0 (0%)	15 (21%)	\$20	(25%)		
Structural member or framing	200	(14%)	0 (0%)	5 (7%)	\$25	(31%)		
Cooking materials, including food	100	(7%)	0 (0%)	9 (13%)	\$3	(4%)		
Unclassified structural component or finish	100	(6%)	0 (0%)	0 (0%)	\$7	(9%)		
Unclassified item first ignited	100	(4%)	0 (0%)	0 (0%)	\$2	(3%)		
Exterior trim, including door	100	(4%)	0 (0%)	9 (13%)	\$2	(3%)		
Other known item	300	(24%)	4 (27%)	10 (14%)	\$11	(13%)		
<b>Total</b>	<b>1,300</b>	<b>(100%)</b>	<b>13 (100%)</b>	<b>72 (100%)</b>	<b>\$79</b>	<b>(100%)</b>		

**B. Outdoor Fires: All Power Sources**

Item First Ignited	Fires		Civilian		Civilian		Direct Property	
			Deaths	Injuries	Injuries	Damage (in Millions)		
Flammable or combustible liquid or gas	2,400	(51%)	0 (NA)	30 (93%)	\$0	(45%)		
Cooking materials, including food	900	(19%)	0 (NA)	0 (0%)	\$0	(10%)		
Unclassified item	700	(14%)	0 (NA)	0 (0%)	\$0	(22%)		
Pipe, duct, conduit, hose or covering	200	(4%)	0 (NA)	0 (0%)	\$0	(3%)		
Light vegetation including grass	100	(3%)	0 (NA)	0 (0%)	\$0	(5%)		
Appliance housing or casing	100	(2%)	0 (NA)	0 (0%)	\$0	(3%)		
Unclassified organic material	100	(1%)	0 (NA)	0 (0%)	\$0	(1%)		
Other known item	300	(6%)	0 (NA)	2 (7%)	\$0	(11%)		
<b>Total</b>	<b>4,800</b>	<b>(100%)</b>	<b>0 (NA)</b>	<b>33 (100%)</b>	<b>\$0</b>	<b>(100%)</b>		

NA – Not applicable because estimated total is zero.

Note: Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking 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. Home heating fires with this equipment and item first ignited unknown have also been allocated proportionally. Totals may not equal sums because of rounding.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 6.5. Home Fires Involving Grills, by Item First Ignited**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)**  
**(Continued)**

**C. Structure Fires: Gas-Fueled Grills**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Flammable or combustible liquid or gas	200	(29%)	0	(0%)	12	(25%)	\$21	(36%)
Exterior wall covering or finish	200	(24%)	9	(100%)	15	(31%)	\$8	(14%)
Structural member or framing	100	(10%)	0	(0%)	3	(5%)	\$19	(33%)
Cooking materials, including food	100	(8%)	0	(0%)	7	(15%)	\$1	(2%)
Other known item	200	(29%)	0	(0%)	12	(24%)	\$9	(16%)
Total	700	(100%)	9	(100%)	49	(100%)	\$57	(100%)

**D. Outdoor Fires: Gas-Fueled Grills**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Flammable or combustible liquid or gas	2,400	(56%)	0	(NA)	20	(100%)	\$0	(51%)
Cooking materials, including food	800	(19%)	0	(NA)	0	(0%)	\$0	(10%)
Unclassified item	600	(13%)	0	(NA)	0	(0%)	\$0	(19%)
Pipe, duct, conduit hose or covering	200	(5%)	0	(NA)	0	(0%)	\$0	(3%)
Appliance housing or casing	100	(2%)	0	(NA)	0	(0%)	\$0	(4%)
Other known item	200	(6%)	0	(NA)	0	(0%)	\$0	(13%)
Total	4,200	(100%)	0	(NA)	20	(100%)	\$0	(100%)

Note: Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking 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. Home heating fires with this equipment and item first ignited unknown have also been allocated proportionally. Totals may not equal sums because of rounding.

Source: Data from NFIRS Version 5.0 and NFPA survey.

**Table 6.5. Home Fires Involving Grills, by Item First Ignited**  
**Annual Average of 2003-2006 Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Structure Fires and Outside Trash Fires)**  
**(Continued)**

**E. Structure Fires: Solid-Fueled Grills**

<b>Item First Ignited</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Structural member or framing	100	(21%)	0	(0%)	3	(11%)	\$7	(37%)
Exterior wall covering or finish	100	(20%)	0	(0%)	8	(38%)	\$3	(16%)
Unclassified structural component or finish	100	(12%)	0	(0%)	0	(0%)	\$3	(15%)
Other known item	200	(46%)	4	(100%)	11	(51%)	\$6	(33%)
<b>Total</b>	<b>500</b>	<b>(100%)</b>	<b>4</b>	<b>(100%)</b>	<b>23</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>

**F. Outdoor Fires: Solid-Fueled Grills**

<b>Item First Ignited</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Unclassified item first ignited	100	(23%)	0	(NA)	0	(0%)	\$0	(42%)
Light vegetation, including grass	100	(21%)	0	(NA)	0	(0%)	\$0	(1%)
Cooking materials, including food	100	(19%)	0	(NA)	0	(0%)	\$0	(10%)
Other known item	200	(37%)	0	(NA)	11	(100%)	\$0	(47%)
<b>Total</b>	<b>500</b>	<b>(100%)</b>	<b>0</b>	<b>(NA)</b>	<b>11</b>	<b>(100%)</b>	<b>\$0</b>	<b>(100%)</b>

NA – Not applicable because estimated total is zero.

Note: Fires are rounded to the nearest hundred, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million dollars. Damage has not been adjusted for inflation. Figures reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking 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. Home heating fires with this equipment and item first ignited unknown have also been allocated proportionally. Totals may not equal sums because of rounding.

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 2003-2006, U.S. fire departments responded to an average of 1,000 home structure fires per year in which a deep fryer was involved in ignition. These fires caused an annual average of five civilian deaths, 60 civilian injuries, and \$15 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 deaths and civilian injuries, and 2% 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 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.

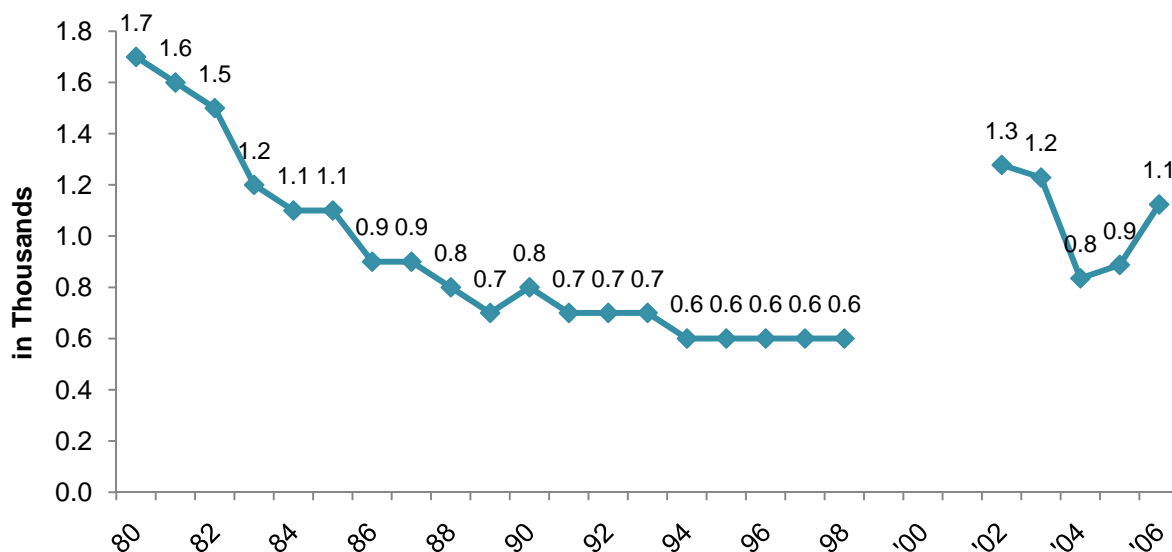
Certain types of fires collectively referred to as "confined fires," including confined cooking fires, chimney fires, trash fires, and fuel burner or boiler fires (incident types 113-118) can be documented more easily in NFIRS 5.0. Causal data, including equipment involved in ignition, is generally not required for these incidents although it is provided in some cases. Equipment involved in ignition was reported in 22% of the non-confined fires and 4% 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 34% lower in 2006 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. 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.

No clear trend is seen in the NFIRS 5.0 years.

**Figure 7.1. Reported Home Structure Fires Involving Deep Fryers, by Year 1980-2006**



Source: Data from NFIRS and NFPA survey.

Note: See Notes in year table.

### Unattended equipment was a factor in almost half the non-confined home fires involving deep fryers.

Table 7.2 shows that unattended equipment was a factor contributing to ignition in 44% of non-confined home structure fires involving deep fryers that were reported during 2003-2006. The equipment was too close to something that could catch fire in 19% of the incidents.

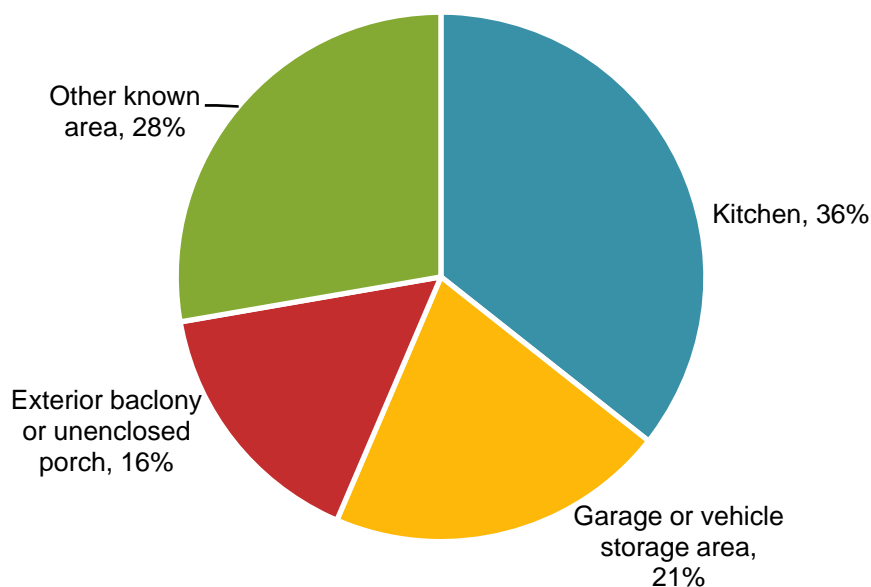
### One-half of the non-confined fires involving deep fryers began with the ignition of cooking materials.

Table 7.3 shows that cooking materials, including food, were first ignited in 51% of non-confined home fires involving deep fryers. Fourteen percent began with the ignition of flammable or combustible liquids or gases or associated piping. In contrast, only 6% of all reported non-confined fires involving cooking equipment began with the ignition of these liquids, gases, or related material.

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

While 93% of non-confined fires involving cooking equipment of all types started in the kitchen, this was true for only 36% of the incidents involving deep fryers. Figure 7.2 and Table 7.4 show that 21% started in a garage or vehicle storage area while 16% began on an exterior balcony or open porch.

**Figure 7.2. Non-Confined Home Structure Fires Involving Deep Fryers, by Area of Origin 2003-2006**



**Flame damage was limited to the room of fire origin in 76% of reported deep fryer fires.**

Slightly more than half (53%) of all home structure fires involving deep fryers reported in 2003-2006 were coded with an incident type that indicated the fire was confined to the vessel or object or origin. In an additional 10%, fire spread was coded as confined to the object of origin fires. Flame damage spread beyond the room of origin in 24% 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. Deep fryers involve larger quantities of hot cooking oil than are involved in regular frying and so involve higher risk of injury or loss. The 57 civilian injuries per 1,000 reported home fires involving deep fryers during 2003-2006 was almost twice the rate of 31 injuries per 1,000 homes fires involving all types of cooking equipment combined. The average direct property loss of \$14,500 per reported deep fryer fires was almost three times the average of \$5,000 seen for cooking fires in general.

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 2006 Dollars	
1980	1,700	160	\$6		\$15
1981	1,600	120	\$6		\$13
1982	1,500	150	\$8		\$17
1983	1,200	90	\$6		\$12
1984	1,100	50	\$5		\$10
1985	1,100	50	\$7		\$13
1986	900	70	\$6		\$11
1987	900	70	\$5		\$9
1988	800	80	\$10		\$17
1989	700	50	\$7		\$11
1990	800	60	\$8		\$12
1991	700	40	\$8*		\$12*
1992	700	60	\$4		\$6
1993	700	70	\$8		\$11
1994	600	40	\$6		\$8
1995	600	40	\$6		\$8
1996	600	40	\$5		\$6
1997	600	50	\$6		\$8
1998	600	40	\$7		\$9
1999	1,100 (800)	260 (260)	\$27 (\$27)		\$32
2000	1,300 (600)	50 (50)	\$43 (\$43)		\$51
2001	1,300 (800)	140 (140)	\$27 (\$27)		\$31
2002	1,300 (700)	100 (40)	\$25 (\$25)		\$28
2003	1,200 (700)	100 (60)	\$17 (\$17)		\$19
2004	800 (400)	20 (20)	\$9 (\$9)		\$10
2005	900 (300)	40 (20)	\$17 (\$17)		\$17
2006	1,100 (500)	70 (50)	\$16 (\$16)		\$16

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 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 (1999-2006) and from NFPA survey.

**Table 7.2. Home Fires Involving Deep Fryers, by Factor Contributing to Ignition  
Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

<b>Factor</b>	<b>Fires</b>	<b>Civilian Deaths</b>	<b>Civilian Injuries</b>	<b>Direct Property Damage (in Millions)</b>
Equipment unattended	200 (44%)	5 (100%)	10 (28%)	\$6 (40%)
Heat source too close to combustible	100 (19%)	0 (0%)	10 (19%)	\$4 (27%)
Other known factor	200 (49%)	0 (0%)	30 (67%)	\$6 (42%)
<b>Total</b>	<b>500 (100%)</b>	<b>5 (100%)</b>	<b>40 (100%)</b>	<b>\$15 (100%)</b>
Total entries	500 (111%)	5 (100%)	40 (113%)	\$16 (109%)

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 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

<b>Item First Ignited</b>	<b>Fires</b>	<b>Civilian Deaths</b>	<b>Civilian Injuries</b>	<b>Direct Property Damage (in Millions)</b>
Cooking materials, including food	200 (51%)	0 (0%)	20 (46%)	\$6 (40%)
Flammable or combustible liquid, gas or piping	100 (14%)	0 (0%)	10 (17%)	\$1 (9%)
Other known item*	200 (35%)	5 (100%)	10 (36%)	\$7 (51%)
<b>Total</b>	<b>500 (100%)</b>	<b>5 (100%)</b>	<b>40 (100%)</b>	<b>\$15 (100%)</b>

\* "Other known" includes structural member or framing (100% 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 7.4. Home Fires Involving Deep Fryers, by Area of Origin**  
**Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments**  
**(Excluding Fires Reported as Confined Fires)**

Area of Origin	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
Kitchen or cooking area	200 (36%)	0 (0%)	10 (19%)	\$4 (24%)
Garage or vehicle storage area*	100 (21%)	5 (100%)	10 (27%)	\$3 (22%)
Exterior balcony or unenclosed porch	100 (16%)	0 (0%)	10 (32%)	\$3 (24%)
Other known area	100 (28%)	0 (0%)	10 (23%)	\$4 (30%)
Total	500 (100%)	5 (100%)	40 (100%)	\$15 (100%)

\*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 2003-2006 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	500 (53%)	0 (0%)	20 (33%)	\$0 (1%)
Confined to object of origin	100 (10%)	0 (0%)	10 (9%)	\$2 (11%)
Confined to room of origin	100 (13%)	1 (28%)	10 (21%)	\$1 (5%)
Confined to floor of origin	100 (6%)	0 (0%)	0 (4%)	\$1 (4%)
Confined to building of origin	100 (15%)	3 (72%)	20 (29%)	\$11 (72%)
Extended beyond building of origin	0 (3%)	0 (0%)	0 (5%)	\$1 (6%)
Total	1,000 (100%)	5 (100%)	60 (100%)	\$15 (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 1% of reported home cooking equipment fires.

During 2003-2006, U.S. fire departments responded to an average of 800 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 30 civilian injuries, and \$6 million in direct property damage. These incidents accounted for 1% of the reported home fires involving cooking equipment, 1% of the associated civilian injuries, 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

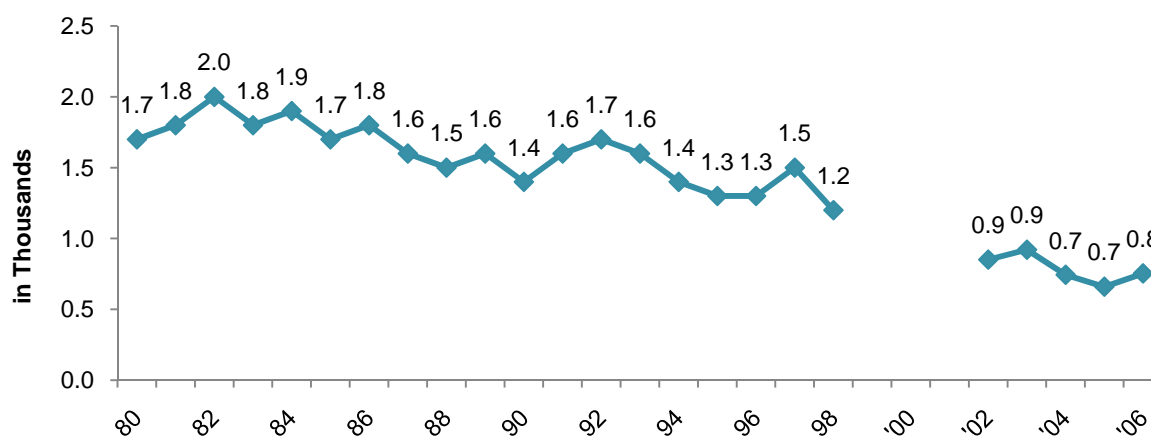
used when comparing data before 1998 with data from 1999 on. The estimates reflect a proportional share of home fires with equipment involved in ignition unknown or recorded as kitchen or cooking equipment of undetermined type. Fires reported as "no equipment" but lacking a confirming specific heat source (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 22% of the non-confined fires and 4% 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 falling.

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 56% lower in 2006 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.

**Figure 8.1. Reported Home Structure Fires Involving Grease Hoods or Duct Exhaust Fans by Year: 1980-2006**



Source: Data from NFIRS and NFPA survey.

Note: See Notes in year table.

### Electrical failures or malfunctions were factors in half of the non-confined 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 48% of non-confined home structure fires involving grease hoods or duct exhaust fans reported during 2003-2006. An unclassified mechanical failure or malfunction was a factor in 15% and a failure to clean was a factor in 12%.

### One-quarter of the non-confined home structure fires involving grease hoods or duct exhaust fans began with the ignition of electrical wire or cable insulation.

Electrical wire or cable insulation was the time first ignited in 27% of these incidents. Table 8.3 shows that cooking materials, including food, were first ignited in 23% of these fires. Sixteen percent began with an appliance housing or casing.

### Flame damage was limited to the room of fire origin in 89% of reported grease hood or duct exhaust fan fires.

Table 8.4 shows that 42% of all home structure fires involving deep fryers reported in 2003-2006 were coded with an incident type that indicated the fire was confined to the vessel or object or origin. In an additional 20%, fire spread was coded as confined to the object of origin fires. Flame damage spread beyond the room of origin in 11% 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 2006 Dollars	
1980	1,700		30		\$5		\$12
1981	1,800		30		\$6		\$13
1982	2,000		20		\$5		\$10
1983	1,800		20		\$7		\$14
1984	1,900		30		\$6		\$12
1985	1,700		20		\$6		\$11
1986	1,800		20		\$7		\$13
1987	1,600		50		\$3		\$5
1988	1,500		60		\$11		\$19
1989	1,600		50		\$5		\$8
1990	1,400		30		\$7		\$11
1991	1,600		60		\$11*		\$16*
1992	1,700		40		\$6		\$9
1993	1,600		50		\$9		\$13
1994	1,400		40		\$9		\$12
1995	1,300		50		\$6		\$8
1996	1,300		30		\$5		\$6
1997	1,500		40		\$11		\$14
1998	1,200		30		\$6		\$7
1999	1,000	(700)	0	(0)	\$3	(\$2)	\$4
2000	500	(400)	50	(50)	\$13	(\$13)	\$16
2001	1,100	(700)	0	(0)	\$6	(\$6)	\$7
2002	900	(500)	30	(0)	\$2	(\$2)	\$2
2003	900	(500)	70	(70)	\$5	(\$5)	\$6
2004	700	(400)	30	(30)	\$6	(\$6)	\$6
2005	700	(400)	10	(10)	\$8	(\$8)	\$8
2006	800	(500)	10	(10)	\$7	(\$7)	\$7

\* All 1991 home fire property damage figures are inflated by estimation problems related to the handling of the Oakland fire storm.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to chimney, flue, fuel burner, or boiler and involving heating 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 2006 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 (1999-2006) and from NFPA survey.

**Table 8.2. Home Fires Involving Grease Hood or Duct Fan Fires, by Factor Contributing to Ignition  
Annual Average of 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

<b>Factor</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Electrical failure or malfunction	200	(48%)	0	(NA)	10	(44%)	\$3	(43%)
Unclassified mechanical failure or malfunction	100	(15%)	0	(NA)	0	(0%)	\$2	(34%)
Failure to clean	100	(12%)	0	(NA)	0	(12%)	\$1	(12%)
Other known factor	100	(34%)	0	(NA)	20	(56%)	\$1	(20%)
Total entries	500	(108%)	0	(NA)	30	(112%)	\$7	(109%)
Total	400	(100%)	0	(NA)	30	(100%)	\$6	(100%)

NA – Not applicable because estimated total is zero.

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 2003-2006 Structure Fires Reported to U.S. Fire Departments  
(Excluding Fires Reported as Confined Fires)**

<b>Item First Ignited</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Electrical wire or cable insulation	100	(27%)	0	(NA)	0	(0%)	\$1	(18%)
Cooking materials, including food	100	(23%)	0	(NA)	20	(71%)	\$1	(17%)
Appliance housing or casing	100	(16%)	0	(NA)	10	(20%)	\$0	(8%)
Other known item	100	(34%)	0	(NA)	0	(8%)	\$4	(57%)
Total	400	(100%)	0	(NA)	30	(100%)	\$6	(100%)

NA – Not applicable because estimated total is zero.

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 2003-2006 Structure Fires Reported by U.S. Fire Departments**

<b>Extent of Flame Damage</b>	<b>Fires</b>		<b>Civilian Deaths</b>	<b>Civilian Injuries</b>	<b>Direct Property Damage (in Millions)</b>
Confined fire identified by incident type	300	(42%)	0 (NA)	0 (0%)	\$0 (2%)
Confined to object of origin	200	(20%)	0 (NA)	10 (18%)	\$1 (8%)
Confined to room of origin	200	(27%)	0 (NA)	20 (65%)	\$2 (30%)
Confined to floor of origin	0	(3%)	0 (NA)	0 (0%)	\$2 (26%)
Confined to building of origin	100	(8%)	0 (NA)	0 (17%)	\$2 (34%)
Extended beyond building of origin	0	(0%)	0 (NA)	0 (0%)	\$0 (1%)
<b>Total</b>	<b>800</b>	<b>(100%)</b>	<b>0 (NA)</b>	<b>30 (100%)</b>	<b>\$6 (100%)</b>

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.

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/\\_download/nfirpaperforms2007.pdf](http://www.nfirs.fema.gov/_download/nfirpaperforms2007.pdf).

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; and (3) 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.

Analysts at the NFPA, the USFA and the Consumer Product Safety Commission have developed the specific 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.

**Figure 1.**

**Fires Originally Collected in NFIRS 5.0 by Year**



Figure 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.

For 2002 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.

A second option is to omit year estimates for 1999-2001 from year tables.

NFIRS 5.0 has 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. In order for that limited detail to be used to characterize the confined fires, they must be analyzed separately from non-confined fires. Otherwise, the patterns in a factor for the more numerous non-confined fires with factor known will dominate the allocation of the unknown factor fires for both non-confined and confined fires. If the pattern is different for confined fires, which is often the case, that fact will be lost unless analysis is done separately.

For most fields other than Property Use, 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.

For Factor Contributing to Ignition, 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%. Groupings for this field show all category headings and specific factors if they account for a rounded value of at least 1%.

**Type of Material First Ignited (TMI).** This field is required only if the Item First Ignited falls within the code range of 00-69. NFPA has created a new code “not required” for this field that is applied when Item First Ignited is in code 70-99 (organic materials, including cooking materials and vegetation, and general materials, such as electrical wire, cable insulation, transformers, tires, books, newspaper, dust, rubbish, etc..) and TMI is blank. The ratio for allocation of unknown data is:

$$\frac{\text{(All fires – TMI Not required)}}{\text{(All fires – TMI Not Required – Undetermined – Blank)}}$$

**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, fusee,
68. Backfire from internal combustion engine. Excludes flames and sparks from an exhaust system, (11)
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, the 2006 data is not yet available and a large portion of the fires coded as no equipment involved (NNN) have heat sources in the operating equipment category. 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])

Additional allocations may be used in specific analyses. For example, NFPA’s report about home heating fires treats Equipment Involved in Ignition Code 120, fireplace, chimney, other” as a partial unknown (like Heat Source 60) and allocates it over its related decade of 121-127, which includes codes for fireplaces (121-122) and chimneys (126-127) but also includes codes for fireplace insert or stove, heating stove, and chimney or vent connector. More general analyses of specific occupancies may not perform as many allocations of partial allocations. Notes at the end of each table describe what was allocated.

**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. Values that appear identical may be associated with different percentages, and identical percentages may be associated with slightly different values.



---

## 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.

### **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.