RESEARCH

Home Fires Involving Cooking Equipment

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Marty Ahrens

Abstract

Cooking has long been the leading cause of home structure fires and home fire injuries, as well as one of the leading causes of home fire deaths. National estimates of reported fires derived from the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS) and NFPA's annual fire department experience survey show that in 2009-2013, cooking was the leading cause of reported home structure fires and home structure fire injuries and the third leading cause of home fire deaths.

U.S. fire departments responded to an estimated average of 162,400 home structure fires involving cooking equipment per year. These fires caused an annual average of 430 civilian deaths, 5,400 civilian injuries, and $1.1 billion in direct property damage. Overall, cooking equipment was involved in 45% of reported home fires, 17% of home fire deaths and 42% of reported home fire injuries. Ranges, with or without ovens, account for the majority (61%) of reported home structure fires involving cooking equipment and even larger shares of associated civilian deaths (86%) and civilian injuries (78%). Unattended equipment is the leading cause of cooking fires. More than half (54%) of non-fatal civilian cooking fire injuries occurred when the victims tried to fight the fire themselves.

The findings show that cooking fires remain a serious problem. Efforts to prevent these fires through new technology and life safety education must continue.

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. To learn more about the One-Stop Data Shop go to www.nfpa.org/osds or call 617-984-7451.

Copies of this analysis are available from:
National Fire Protection Association
One-Stop Data Shop
1 Batterymarch Park
Quincy, MA 02169-7471
www.nfpa.org
e-mail: osds@nfpa.org
Phone: 617-984-7451
NFPA No. USS11

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Executive Summary

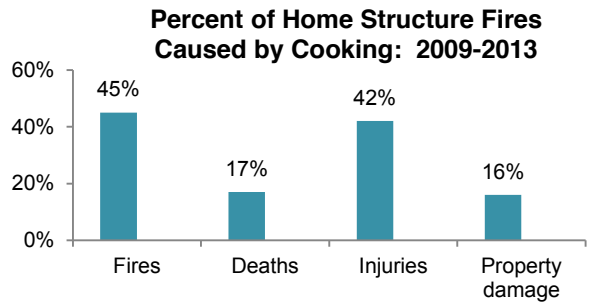
Cooking is, and has long been, the leading cause of home structure fires and home fire injuries. This is true for both fires reported to fire departments and those handled without fire department assistance.

The size of the problem

The 162,400 reported home structure fires caused by cooking claimed 430 lives per year. During the five-year period of 2009-2013, U.S. fire departments responded to an estimated average of 162,400 home[1] structure fires per year in which cooking equipment[2] 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. Together, these fires caused an average of 430 civilian deaths, 5,400 reported civilian fire injuries, and $1.1 billion in direct property damage per year.

U.S. fire departments responded to an average of 445 home cooking fires per day in 2009-2013.

Unless otherwise specified, the statistics presented here are estimates derived from the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS) and NFPA's annual fire department experience survey.



Cooking equipment was involved almost half of reported home fires and two of every five home fire injuries. Overall, these incidents accounted for 45% of reported home fires, 16% of home fire deaths, 42% of reported home fire injuries and 16% of the direct property damage resulting from home fires.

Home fires involving cooking peak on Thanksgiving, Christmas, and Christmas Eve. In 2013, Thanksgiving had more than three times the average daily number of reported home structure fires caused by cooking. All three dates have traditions associated with cooking.

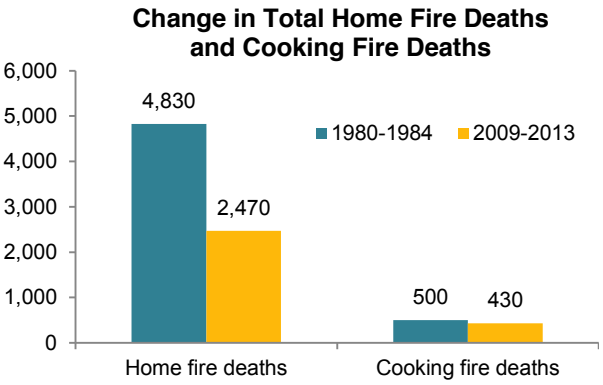
Trends in cooking fires and fire deaths

Less progress has been made in reducing deaths from home cooking fires than deaths from other fire causes. Reported fires involving cooking started to decline in 1981 and then

[1] Homes include one- or two-family homes and apartments or other multi-family housing.

[2] Cooking equipment includes equipment such as ranges, ovens, and other equipment designed to cook, heat, or warm food. In addition, cooking equipment is assumed to have been involved in any fire in NFIRS with an incident type indicating a "cooking fire involving the contents of a vessel without fire extension beyond the vessel." Other kitchen equipment associated with food storage and preparation such as refrigerators, food processors, and dishwashers is not considered cooking equipment and is examined in John Hall's NFPA report, *Home Structure Fires Involving Kitchen Equipment Other than Cooking Equipment*.

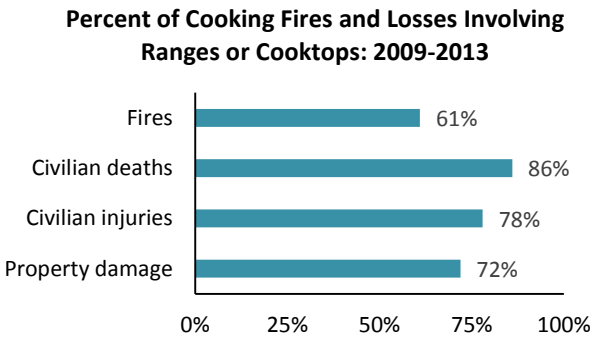
plateaued before falling again in the 1990s. NFIRS 5.0, first introduced in 1999, made it much easier to document minor cooking fires. Use of NFIRS 5.0 was accompanied by an increase in reported cooking fires. After leveling off for a few years, reported cooking fires hit new highs in 2012 and 2013. To obtain more complete data, in 2012, the USFA began requiring a valid entry for equipment involved in ignition when other data elements indicated that equipment was involved. 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 reflects true changes in fire experience.



However, it is clear that less progress has been made in reducing deaths from home cooking fires than deaths from other fire causes. The average of 430 deaths per year in 2009-2013 was only 14% lower than the 500 per year in 1980-1984. Total home fire deaths fell 49% from an annual average or 4,830 in 1980-1984 to 2,470 per year in 2009-2013.

Causes and circumstances of cooking fires

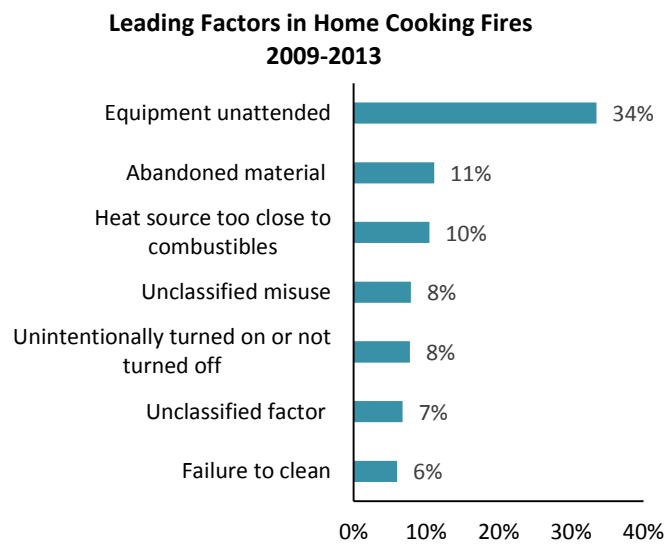
Ranges or cooktops were involved in the majority of cooking fires and losses. Ranges or cooktops were the equipment involved in three of every five (61%) reported home fires involving cooking equipment, 86% of the cooking fire deaths, three-quarters (78%) of the reported cooking fire civilian injuries, and 72% of the associated direct property damage.



Households that use electric ranges have a higher risk of cooking fires and associated losses than those using gas ranges. Although 60% of households cook with electricity, 80% of the ranges or cooktops involved in reported cooking fires were powered by electricity.

The rate of reported fires per million user households was 2.7 times higher for electric ranges than for gas, the death rate per million households was 1.7 times higher, and civilian injuries per million user households and average direct property loss were 4.1 times higher for households using electric ranges than for households using gas ranges.

Unattended cooking was the leading factor in cooking fires. Unattended equipment was a factor in one-third (34%) of reported home cooking fires and almost half (46%) of the associated deaths. Abandoned or discarded material, which may be related to unattended equipment, was a factor in 11%.



Something that could catch fire was too close to the cooking equipment in 10% of the cooking fires and injuries, and in 22% of the deaths. Wrappers, potholders, clothing and other materials on or near the stove can easily catch fire.

Eight percent were caused by an unclassified misuse of material. Another 8% occurred when the cooking equipment was unintentionally turned on or not turned off.

Fires beginning with cooking oil, grease or fat accounted for half of the fires and three-quarters of the losses from the cooking fires that began with cooking materials or food. Not surprisingly, two-thirds (66%) of home structure fires involving cooking equipment began with the ignition of cooking materials, including food. Fat, grease, cooking oil and related substances that could be associated with grease were first ignited in half (52%) of the home cooking fires that began with cooking materials. Roughly three-quarters (71%) of the civilian deaths, civilian injuries (77%), and direct property damage (76%) associated with cooking material or food ignitions resulted from these fat, grease or cooking oil fires.

Clothing was the item first ignited in less than 1% of these fires, but clothing ignitions led to 18% 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 catch fire if it comes in contact with a gas flame or electric burner.

The vast majority of reported cooking fires were small. Four out of five (79%) were confined to the object or vessel of origin. However, 11% of the cooking fire deaths and one-third (35%) of reported cooking fire injuries resulted from these small fires. Two out of five (40%) home cooking equipment fire deaths and 83% of home cooking equipment fire injuries resulted from the 96% of fires that were confined to the room where the fire began.

Frying dominates the cooking fire problem. Several studies, including the U.S. Consumer Product Safety Commission's (CPSC's) 1999 study of range fires,[3] and the 1998 New Zealand Fire Service Bay-Waikato Region Kitchen Fire Research[4] 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 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 frying, grilling, or broiling food. The range or cooktop

[3] Linda Smith, Ron Monticone, and Brenda Gillum. *Range Fires, Characteristics Reported in National Fire Data and a CPSC Special Study,* Washington, DC: U.S. Consumer Product Safety Commission, Division of Hazard Analysis, Directorate of Epidemiology. 1999.

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

should be shut off if the cook has to leave the kitchen even for a short time. 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. When simmering, baking, roasting, or boiling, the cook should remain in the home, check it regularly, and use a timer to ensure that it's not forgotten.

Victims of cooking fires

Women have slightly higher shares of home cooking fire injuries relative to the population but much lower numbers relative to time spent in food preparation and clean-up. Forty-six percent of the fatal cooking fire victims and 52% of the injured were female.

Compared to their share of the population, older adults faced the highest risk of death from cooking fires. People 65-74 years of age were 1.7 times as likely to die in a cooking fire as were members of the overall population. The risk of death increased to 2.7 the overall population adults 75-84, and to 8.4 times the overall population for those 85 or older. Children under five and adults age 50-64 had a risk 1.2 times that of the general population.

Young adults age 20-34 were at the highest risk of non-fatal cooking injury although much less variation in risk was seen in the injury age distribution. Young children were at much lower risk of a non-fatal fire injury from cooking equipment than the general population.

Civilian firefighting is a major factor in non-fatal cooking fire injuries. More than half (54%) of the civilians who were non-fatally injured in reported home structure fires involving cooking equipment were hurt while they were trying to fight the fire, compared to roughly one-third of injuries suffered in overall home structure fires. More than two-thirds (69%) of reported non-fatal home cooking fire injuries were minor.

Smoke alarms were more likely to have been present and sounded in cooking fires (70%) than in reported home fires overall (53%).

Cooking fires that were not reported to the fire department

CPSC's *2004-2005 National Sample Survey of Unreported Residential Fires*[5] **found that the overwhelming majority of home cooking fires were handled safely by individuals without fire department assistance.** The statistics on fires involving cooking equipment reported to local fire departments represent a tiny fraction of all home fires involving home cooking equipment. In their analysis of CPSC's 2004-2005 survey of residential fires, Michael Greene and Craig Andres found that U.S. households handled an average of 4.7 million home fires

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

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 19 times the average number of civilian injuries per year in reported home cooking structure fires during 2009-2013. However, almost all of these injuries were minor. In most cases, no medical attention was needed or sufficient first aid was provided at the scene. 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.

CPSC noted that unreported cooking equipment fires fell 63% from the 12.3 million such incidents in the 1984 survey of unreported residential fires. Smoke alarms were much loss common in the early 1980s. It is possible that smoke alarms are alerting people to situations that are close to developing into a fire, i.e., burned food, but have not actually progressed to something that most people would call a fire.

Non-fire cooking-related burns

Children under five face a higher risk of non-fire cooking-related burns. Many cooking burns are caused by contact with hot objects or scalds from hot liquids. Although children under five are not at high risk of cooking fire injuries, they face a much higher risk of non-fire burn injuries from cooking equipment, tableware, and cookware. Children under five years of age account for only 6% of the U.S. population, but according to 2014 data from the CPSC's National Electronic Injury Surveillance System (NEISS), these young children suffered an estimated:

- 5,200, or 60%, of the 8,700 scald burns associated with tableware such as coffee cups, drinking glasses, and soup bowls;
- 5,100, or 37%, of the 13,900 thermal non-fire burns associated with range or ovens, with most caused by contact with the equipment;
- 1,800, or 18%, of the 9,600 scald burns from cookware such as pots and pans;
- 1,600, or 33%, of the 4,900 thermal non-fire burns (*mostly* contact burns) associated with grills or barbecues;
- 1,500, or 30%, of the 5,000 scald burns associated with microwave ovens; and
- 1,000, or 12%, of the thermal 8,300 burns from contact with hot pots, pans or related cookware.

Safety Information

Go to http://www.nfpa.org/safety-information/ for the latest safety materials The Educational Messages Advisory Committee (EMAC) to NFPA's Public Education Division developed a collection of safety tips for a wide variety of activities, including fire-safe cooking. provided within that category. As a result, some messaging may be repeated throughout topic areas. Fire and life safety educators can download the Educational Messages Desk Reference - 2015 to find consistent safety messaging.

NFPA also has safety resources to help consumers protect themselves from cooking fires. These include videos, safety tip sheets, public service announcements, and illustrated handouts in several different languages.

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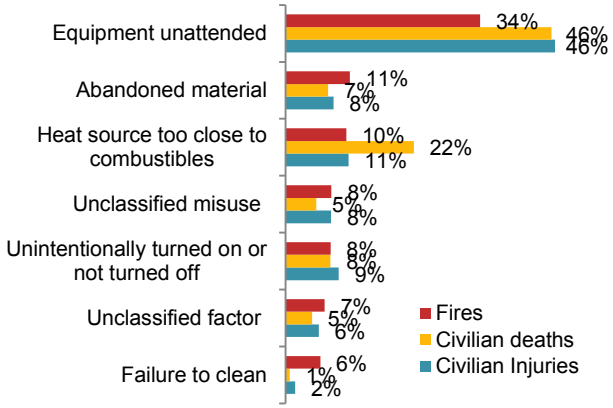
HOME FIRES INVOLVING COOKING EQUIPMENT FACT SHEET

In 2009-2013, U.S. fire departments responded to an average of 162,400 home[1] structure fires that involved cooking equipment per year. These fires caused an average of 430 civilian fire deaths, 5,400 civilian fire injuries, and $1.1 billion in direct property damage.

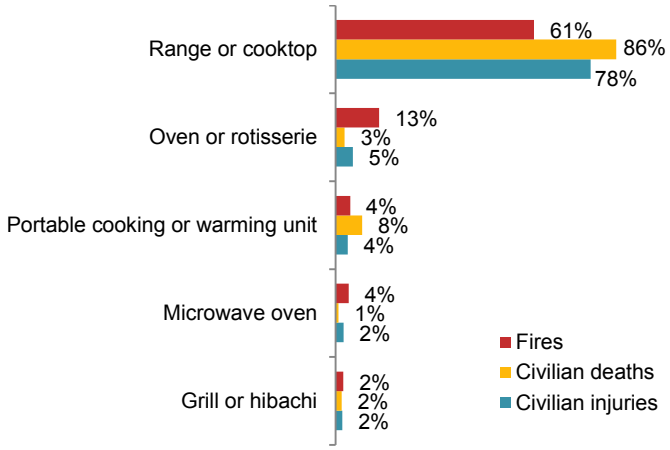
U.S. fire departments responded to an average of 445 home cooking fires per day in 2009-2013.

- Cooking equipment is the leading cause of home structure fires and associated civilian injuries and was the third leading cause of home fire deaths during this period.
- Cooking equipment was involved in
  - Almost half (45%) of all reported home fires,
  - One of every six (17%) home fire deaths,
  - Two of every five (42%) of reported home fire injuries, and
  - Sixteen percent of the direct property damage resulting from home fires.
- Unattended cooking was by far the leading contributing factor in these fires and fire deaths.
- Clothing was the item first ignited in less than 1% of these fires, but these incidents accounted for 18% of the cooking fire deaths.
- More than half (54%) of reported non-fatal home cooking fire injuries occurred when the 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.
- Ranges or cooktops, with or without ovens, accounted for the majority (61%) of home cooking fire incidents and even larger shares of civilian deaths (86%).
- Thanksgiving is the peak day for home cooking fires, followed by Christmas Day and Christmas Eve.
- 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.

Home Cooking Equipment Fires by Factor Contributing to Ignition: 2009-2013



Home Cooking Equipment Fires by Equipment Involved in Ignition: 2009-2013



[See NFPA's Cooking Safety Tips.]

[1]Homes include one- or two-family homes, and aparmtments or other multi-family housing.

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NON-FIRE COOKING BURNS FACT SHEET

Most burns associated with cooking equipment, cookware, and tableware in 2014 were caused by contact with a hot object or liquid rather than by fire or flame.

Ranges or ovens were the most common cooking equipment involved in non-fire cooking burns. Only 16% of thermal burns involving ranges or ovens were due to fire or flame.

Although tableware is not itself used for cooking, it often holds hot food or beverages even when not used for cooking.

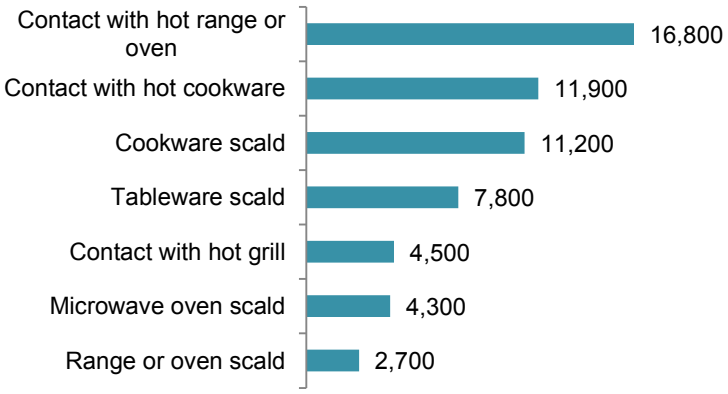
Keep hot foods and liquids away from table and counter edges.

Children under five face a higher risk of non-fire burns associated with cooking than of being burned in a cooking fire. These young children account for 6% of the population but much larger percentages of non-fire burn injuries from cooking equipment, tableware such as bowls and cups, and cookware such as pots and pans.

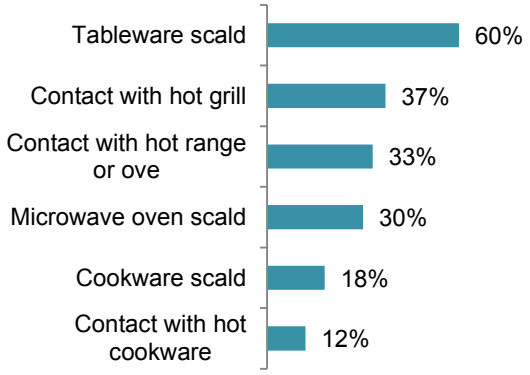
Have a "kid-free zone" of at least 3 feet (1 meter) around the stove and areas where hot food or drink is prepared or carried.

Never hold a child while you are cooking, drinking a hot liquid, or carrying hot foods or liquids.

Non-Fire Cooking Burns Seen at Emergency Rooms in 2014



Percent of Non-Fire Cooking-Related Burns Seen at Emergency Rooms in 2014 Incurred by Children under Five Years Old



Source: Data from the Consumer Product Safety Commission's National Electronic Injury Surveillance System, queried in October 2015.

See NFPA's Cooking Safety Tips.

Home Fires Involving Cooking Equipment

The leading cause of home fires and home fire injuries is cooking equipment. During the five-year-period of 2009-2013, cooking equipment was involved in an estimated annual average of 162,400 reported home[6] structure fires. Table A shows that these fires caused an average of 430 civilian deaths, 5,400 civilian injuries, and $1.1 billion in direct property damage per year. Overall, these incidents accounted for almost half (45%) reported home fires, 17% of home fire deaths, two of every five (42%) of reported home fire injuries, and 16% of the direct property damage resulting from home fires.

U.S. fire departments responded to an average of 445 home cooking fires per day in 2009-2013.

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 NFPA report, *Home Structure Fires Involving Kitchen Equipment Other than Cooking Equipment*. When any type of equipment is described as involved in ignition, it simply means that the equipment was the heat source that started the fire.

In Version 5.0 of the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS 5.0), six incident types are used to identify specific types of minor fires in or on structures that did not spread beyond a confined cooking vessel, a chimney or flue, a fuel burner or boiler, a compactor, an incinerator or beyond ignited trash to other contents or the structure itself. Incident type 113 identifies confined cooking fires. While additional causal information is not required, it is sometimes provided. Structure fires that do not have one of the six confined fire incident types are collectively referred to as non-confined fires regardless of their size.

Choices must be made in calculating the best estimate of the number of fires associated with cooking activities or cooking equipment. The simplest approach and the approach used here, counts all non-confined fires involving cooking equipment and all fires with an incident type indicating a cooking fire confined to the vessel origin as cooking fires, and ignores any cooking equipment in other confined fire incident types. *In this analysis, when the term "confined fires" is used, it refers to fires coded with incident type 113 to indicate a confined cooking fire*.

The first bolded category of Table A shows specific types of cooking equipment summed from both non-confined and confined cooking fires. The second bolded category shows estimates of confined cooking fires in which the equipment involved was coded as something other than cooking equipment. While some homes do have kitchen ranges that are also designed as heating equipment, the category "heating stove" may also include some wood stoves that were incidentally used for cooking and conventional kitchen ranges grouped here because of the word "stove." (We have no way of statistically estimating the fires in which cooking equipment is in appropriately used for heat.) Estimates of total home structure fires with the NFIRS incident type indicating a fire confined to a cooking vessel, regardless of the equipment involved, are shown below the third bolded category.

[6] The term "home" includes two broad categories of properties: 1) one- or two family homes, including manufactured homes; and 2) apartments and other multi-family housing, regardless of ownership.

Data Sources, Definitions and Conventions Used in this Report

The fire statistics in this analysis are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported only to Federal or state agencies or industrial fire brigades. These estimates are projections based on the detailed information collected in Version 5.0 of the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS 5.0) and the NFPA's annual fire department experience survey. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Fires are typically rounded to the nearest hundred, civilian deaths and civilian injuries are expressed to the nearest ten and property damage is rounded to the nearest million dollars.

NFIRS incident type codes in the range of 110-129 were used to identify structure fires. Unknown data were allocated proportionally in most fields analyzed except for incident type. NFIRS incident type 113, a confined cooking fire, is used to capture structure fires involving the contents of cooking vessel with no fire extension beyond vessel. Causal information, including equipment involved in ignition, is not required for confined cooking fires or other structure fires with confined fire incident types (incident types 113-118). Equipment involved in ignition was reported in 30% of the non-confined fires and 9% of the confined cooking fires. Confined and non-confined structure fires were analyzed separately and then summed to obtain estimates.

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 and allocated.

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

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

Table A.
Home Cooking Structure Fires, by Equipment Involved in Ignition
2009 – 2013 Annual Averages

Equipment Involved	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Specific types of cooking equipment	**139,700**	**(86%)**	**430**	**(100%)**	**5,030**	**(93%)**	**$1,098**	**(100%)**
Non-confined fire	41,000	(25%)	430	(100%)	3,810	(71%)	$1,073	(97%)
Confined fire	98,700	(61%)	0	(0%)	1,220	(23%)	$25	(2%)
Range or cooktop	99,000	(61%)	370	(86%)	4,230	(78%)	$794	(72%)
Non-confined fire	32,300	(20%)	370	(86%)	3,260	(60%)	$776	(70%)
Confined fire	66,700	(41%)	0	(0%)	970	(18%)	$19	(2%)
Oven or rotisserie	21,600	(13%)	10	(3%)	290	(5%)	$45	(4%)
Non-confined fire	2,800	(2%)	10	(3%)	160	(3%)	$42	(4%)
Confined fire	18,800	(12%)	0	(0%)	130	(2%)	$3	(0%)
Portable cooking or warming unit	7,300	(4%)	30	(8%)	200	(4%)	$79	(7%)
Non-confined fire	2,000	(1%)	30	(8%)	150	(3%)	$78	(7%)
Confined fire	5,300	(3%)	0	(0%)	50	(1%)	$1	(0%)
Microwave oven	6,500	(4%)	0	(1%)	130	(2%)	$36	(3%)
Non-confined fire	1,400	(1%)	0	(1%)	100	(2%)	$33	(3%)
Confined fire	5,100	(3%)	0	(0%)	40	(1%)	$3	(0%)
Grill or hibachi	3,900	(2%)	10	(2%)	110	(2%)	$116	(11%)
Non-confined fire	1,600	(1%)	10	(2%)	90	(2%)	$116	(11%)
Confined fire	2,200	(1%)	0	(0%)	20	(0%)	$0	(0%)
Deep fryer	700	(0%)	0	(0%)	40	(1%)	$19	(2%)
Non-confined fire	400	(0%)	0	(0%)	40	(1%)	$19	(2%)
Confined fire	300	(0%)	0	(0%)	0	(0%)	$0	(0%)
Grease hood or duct fan	600	(0%)	0	(0%)	20	(0%)	$9	(1%)
Non-confined fire	400	(0%)	0	(0%)	10	(0%)	$9	(1%)
Confined fire	200	(0%)	0	(0%)	10	(0%)	$0	(0%)
Steam table	0	(0%)	0	(0%)	0	(0%)	$0	(0%)
Non-confined fire	0	(0%)	0	(0%)	0	(0%)	$0	(0%)
Confined fire	0	(0%)	0	(0%)	0	(0%)	$0	(0%)
Confined cooking fire incident type but equipment involved was not cooking equipment*	22,700	(14%)	0	(0%)	380	(7%)	$4	(0%)
Heating stove	15,600	(10%)	0	(0%)	200	(4%)	$2	(0%)
Other known equipment involved in confined cooking fire	1,600	(1%)	0	(0%)	20	(0%)	$0	(0%)
Coded as no equipment involved in confined cooking fires	5,600	(3%)	0	(0%)	150	(3%)	$1	(0%)

Table A.
Home Structure Fires Involving Cooking Equipment
2009 – 2013 Annual Averages (continued)

Equipment Involved	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Total cooking equipment fires including all fires with confined cooking fire incident type and non-confined fires with cooking equipment involved	**162,400**	**(100%)**	**430**	**(100%)**	**5,400**	**(100%)**	**$1,101**	**(100%)**
All non-confined fires with cooking equipment involved	41,000	(25%)	430	(100%)	3,810	(71%)	$1,073	(97%)
All confined cooking fires identified by incident type	121,400	(75%)	0	(0%)	1,590	(29%)	$29	(3%)

Note: Total line is the sum of the non-confined fires in which cooking equipment was involved and all confined cooking fires identified by confined cooking fire incident type. Confined cooking fires are fires with NFIRS incident type 113 indicating the fire was a cooking fire involving the contents of a cooking vessel without fire extension beyond the vessel. All fires with this incident type were assumed to involve equipment used for cooking, regardless of what was coded for equipment involved in ignition. Sums may not equal totals due to rounding errors.

Source: NFIRS and NFPA fire department experience survey.

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

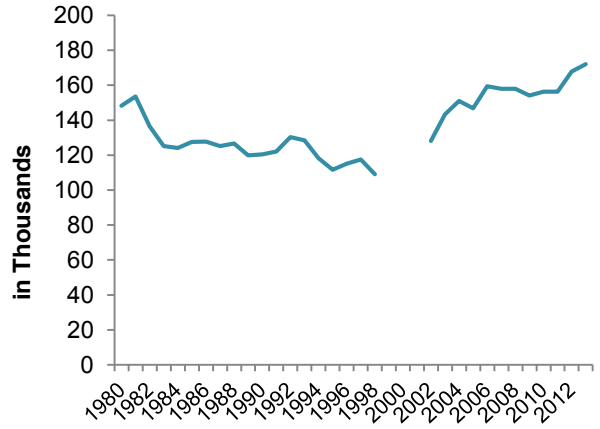
Trends in Reported Home Cooking Structure Fires

Reported cooking fires have been going up.
Figure 1.1A and Table 1.1 show that reported fires involving cooking started to decline in 1981 and then plateaued before falling again in the 1990s. NFIRS 5.0, first introduced in 1999, made it much easier to document minor cooking fires. Use of NFIRS 5.0 was accompanied by an increase in reported cooking fires. After leveling off for a few years, reported cooking fires hit new highs in 2012 and 2013. To obtain more complete data, in 2012, the USFA began requiring a valid entry for equipment involved in ignition when other data elements indicated that equipment was involved. 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 reflects true changes in fire experience.

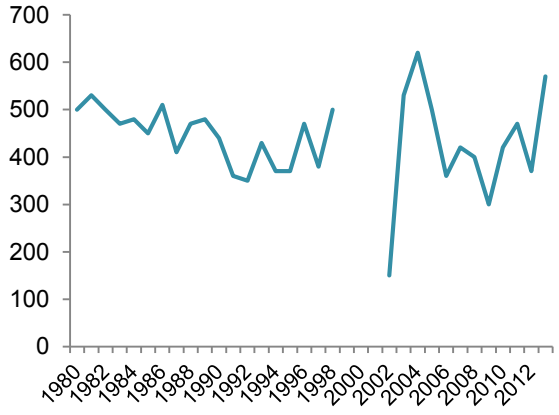
The average number of cooking fire deaths in 2009-2013 was only 14% lower than the 1980-1984 average. In 2013, 570 civilian deaths resulted from home cooking fires. However, Figure 1.1Bshows that no clear long-term trend can be seen in these deaths. The average of 430 deaths per year in 2009-2013 was 14% lower than the average of 500 deaths per year in 1980-1984. Total home fire deaths fell 49% from an annual average of 4,830 in 1980-1984 down to 2,470 per year in 2009-2013.

Figure 1.1. Reported Home Cooking Fires, by Year: 1980-2013

A. Reported Fires



B. Civilian Fire Deaths



C. Civilian Fire Injuries

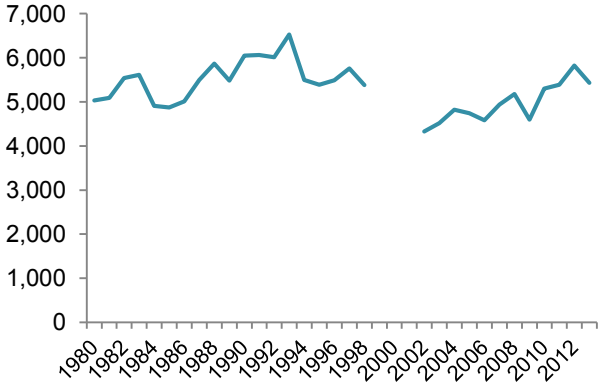


Figure 1.1C shows that reported civilian injuries caused by these fires peaked in the early 1990s. Reported injuries were lower during the early years of NFIRS 5.0 but have been trending upward in recent years.

Note: See Notes on Table 1.1.

The When and Where of Home Cooking Structure Fires

Reported home cooking equipment fire deaths peak in January. Table 1.2 shows that there was relatively little variation in frequency of reported home cooking equipment structure fires by month. Deaths from cooking equipment fires were most common in January (14%).

Sunday was the peak day of the week for home cooking equipment fires (16%) while deaths peaked on Saturday (18%). Saturday ranked second in fires. (See Table 1.3.)

Thanksgiving was the peak day for home fires involving cooking equipment. During 2013, the dates with the largest numbers of estimated reported home fires involving cooking equipment were almost all associated with holidays. Thanksgiving, perhaps the national holiday most strongly associated with a traditional meal, remains the leading day for cooking fires, with more than three times as many cooking fires as an average day. Table B provides the details.

Table B. Leading Dates for 2013 Home Cooking Fires
Structure Fires Reported to U.S. Fire Departments

Date	Fires	Percent above Average Number of Fires per Day
November 28 (Thanksgiving)	1,550	(230%)
December 25 (Christmas)	740	(58%)
December 24 (Christmas Eve)	720	(54%)
November 27 (Day before Thanksgiving)	700	(48%)
May 26 (Sunday of Memorial Day weekend)	590	(26%)
February 3 (Super Bowl Sunday)	590	(25%)
May 27 (Memorial Day)	590	(25%)
Daily average in 2013	470	

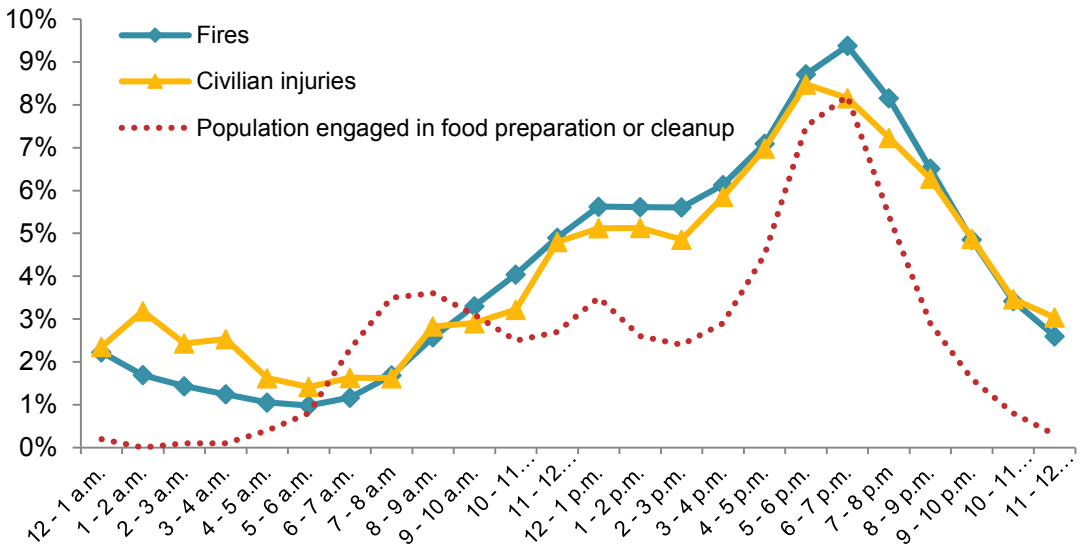
Source: Data from NFIRS 5.0 and NFPA fire department experience survey.

Two-thirds of U.S. households cook at least one hot meal a day.
The Energy Information Administration reported that in 2009, 78 million U.S. households (68%) cooked at least one hot meal per day. Ninety-five percent of households cooked a meal at least once a week.[7] The American Time Use Survey (ATUS) found that in 2011, U.S. residents at least 15 years of age spent an average of 34 minutes per day on food preparation and clean up. The 53% of the population who actually engage in this activity averaged 62 minutes a day.[8]

[7] Energy Information Administration. *2009 Residential Energy Consumption Survey*, Table HC3.1 "Appliances in U.S. Homes, by Housing Unit Type, 2009, accessed on October 26, 2015.
[8] 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, 2011 Annual Averages," accessed on October 26, 2015.

Peak times for reported cooking fires, injuries, and property damage coincide with peak cooking times. Table 1.4 and Figure 1.2 show that reported home fires and civilian injuries involving cooking equipment peaked between 5:00 p.m. and 7:00 p.m. This period is also the peak time for cooking-related activities of food preparation and clean-up. Data from the 2009-2013 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.[9] Note that a sizeable minority of the adult population does not engage in these activities.

Figure 1.2. Reported Home Cooking Fires and Injuries and Percent of Population Cooking, by Time of Day: 2009-2013



Sources: Fire and injury data from 2009-2013 NFIRS 5.0.and NFPA fire department experience survey; food preparation and clean-up data from American Time Use Survey: 2009-2013.

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

Equipment Type and Other Causal Factors

Ranges, with or without ovens, were involved in three out of five reported cooking fires. Table A showed that ranges or cooktops were involved in 61% of the reported cooking fires. Their share of the losses was even greater. Ranges or cooktops were the equipment involved in 86% of the cooking fire deaths, 78% of the civilian injuries, and 72% of the property damages associated with cooking equipment fires. Table C shows that the risk of death per 1,000 reported range or cooktop fires was 3.7, or 41% higher than the 2.6 deaths per 1,000 overall cooking

[9] Bureau of Labor Statistics. *American Time Use Survey, Table A-3. Percent of the Population Engaging in Activities by Time of Day, 2009-2013* accessed on October 26, 2013.

equipment fires. Both are substantially lower than the overall rate of 6.9 deaths per 1,000 reported home fires from all causes.

Table C. Reported Home Cooking Fires, by Equipment Involved in Ignition, Risk of Death and Injury per 1,000 Fires and Average Loss per Fire 2009-2013 Annual Averages

Equipment Involved	Fires	Civilian Deaths Per 1,000 Fires	Civilian Injuries Per 1,000 Fires	Average Loss Per Fire
Specific types of cooking equipment	**139,700**	**3.1**	**36.0**	**$7,900**
Range or cooktop	99,000	3.7	42.7	$8,000
Oven or rotisserie	21,600	0.6	13.3	$2,100
Portable cooking or warming unit	7,300	4.7	27.5	$10,700
Microwave oven	6,500	0.6	20.4	$5,500
Grill or hibachi	3,900	2.1	29.3	$30,000
Deep fryer	700	0.0	59.3	$26,200
Grease hood or duct fan	600	0.0	31.3	$14,000
Steam table	0	0.0	0.0	$2,900
Confined cooking fire incident type but equipment involved was not cooking equipment*	**22,700**	**0.0**	**16.5**	**$200**
Heating stove	15,600	0.0	13.0	$100
Other known equipment involved in confined cooking fire	1,600	0.0	14.6	$200
Coded as no equipment involved in confined cooking fires	5,600	0.0	27.0	$200
All confined cooking fires identified by incident type	**121,400**	**0.0**	**13.1**	**$200**
Total cooking equipment fires including all fires with confined cooking fire incident type and non-confined fires with cooking equipment involved	**162,400**	**2.6**	**33.3**	**$6,800**

* Because NFIRS incident type 113 specifically identified fires cooking fires involving the contents of a cooking vessel without fire extension, all fires with this incident type were assumed to involve equipment used for cooking, regardless of what was coded for equipment involved in ignition.
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 fire department experience survey.

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 4.4 times the average, while the average loss from deep fryer fires was almost four times the overall average. The loss from fires involving portable cooking or warming units was 1.6 times the average loss. The average loss per grease hood or duct exhaust fire was twice as high as the average cooking equipment fire. However, these incidents are much less common than range or oven fires. 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 one-third (34%) of reported home structure fires involving cooking equipment. Unattended equipment was also a factor in almost half the civilian deaths (46%) and civilian injuries (46%). Abandoned or discarded material, which may be related to unattended equipment, was a factor in 11% of the incidents. Something that could catch fire was too close to the cooking equipment in 10% of the fires and 22% of the deaths. An unclassified misuse of material was a factor in 8%. In another 8% of the incidents, the equipment was unintentionally turned on or not turned off.[10]

Alcohol or drug impairment and falling asleep contributed to cooking fire deaths. Table 1.7 shows that a possible impairment by alcohol or drugs was mentioned as a human factor contributing to ignition in 15% of the cooking fire deaths while "asleep" was mentioned in 14% of the deaths.

In 18% of the home cooking fires, an unattended or unsupervised person was a contributing human factor. The code choice "unattended or unsupervised person" is intended to describe a fire started by a person with unreliable judgment or a person with limited mobility, such as a young child or a person with a severe disability, whose access to or contact with a heat source leads to the fire. It seems probable that many of these fires involved unattended cooking, not unattended or unsupervised individuals.

Two-thirds of home cooking equipment fires started with the ignition of food or other cooking materials. Table 1.8 shows that in two-thirds (66%) of reported home structure fires involving cooking equipment, the item first ignited was some type of cooking material or food. Six percent began with an unclassified item. Another 6% began with household utensils. In 5%, appliance housings or casings were first ignited.

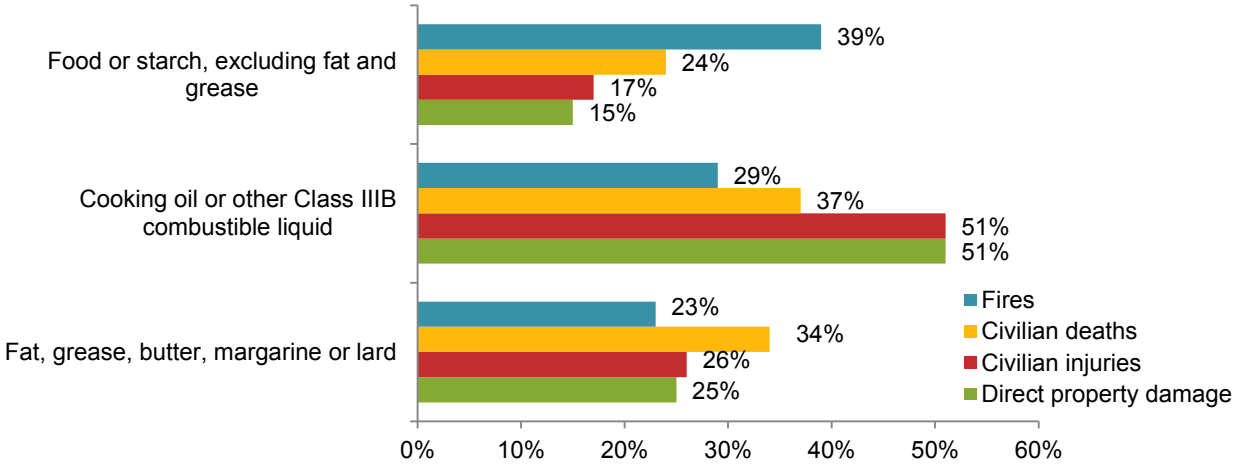
Clothing ignitions accounted for less than 1% of the fires, but these incidents caused 18% of the cooking deaths.

Fats, cooking oil, or related substances were the type of material first ignited in more than half of the losses resulting from the ignition of cooking materials, including food. In NFIRS the type of material first ignited provides additional detail about the item first ignited. Figure 1.3 and Table 1.9 show that when cooking materials, including food, were the item first ignited in home fires involving cooking equipment, two types of materials that could be associated with grease fires accounted for half (52%) of the ignitions:

1) Cooking oil or other Class IIIB combustible liquids (29%), and
2) Fat, grease, butter, margarine, or lard (23%).

[10] Multiple entries are allowed in factors contributing to ignition and in human factors contributing to ignition, resulting in some fires having more than one factor for each data element.

Figure 1.3. Home Cooking FiresThat Began with Cooking Materials, Including Food by Type of Material First Ignited: 2009-2013

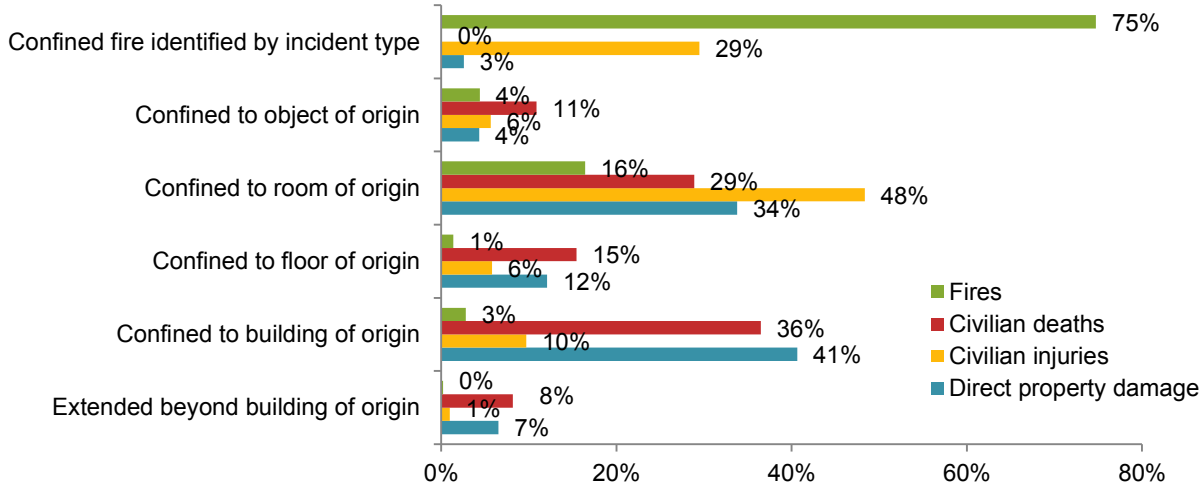


Together, these substances were first ignited in roughly three-quarters of the losses: 71% of the cooking material or food fire deaths, 77% of the injuries, and 76% of the direct property damage. Food or starch, excluding fat and grease, was first ignited in two of every five (39%) cooking material fires, one-quarter (24%) of the associated deaths, and 17% of the injuries.

Ninety-six percent of reported home cooking fires were confined to the room of origin. Figure 1.4 and Table 1.10 show that 11% of the deaths and 35% of the civilian injuries associated with reported home cooking equipment fires resulted from fires that were either:

a) coded with an incident type 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 (4% of the cooking equipment fires).

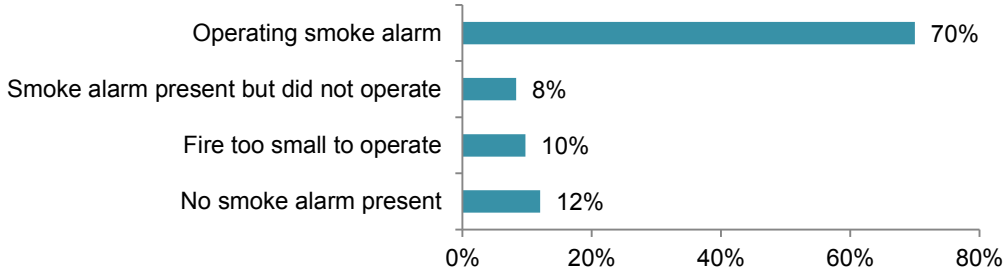
Figure 1.4. Home Cooking Fires, by Extent of Flame Damage 2009-2013



Combining the two, 79% of reported home cooking fires did not spread beyond the object of origin. Two out of five (40%) home cooking fire deaths and 83% of home cooking fire injuries resulted from the 96% of fires that were confined to the room where the fire began.

Smoke alarms were more likely to be present in fires involving cooking equipment than in overall home fires. Table 1.11 and Figure 1.5 show that smoke alarms were present in 88% of reported home fires involving cooking equipment. In more than two-thirds (70%) of the home cooking fires, they were present and operated. In home fires of all causes reported in this period, smoke alarms were present in only 73% of the incidents and operated in 53%.[11]

Figure 1.5. Smoke Alarm Status in Reported Home Cooking Fires 2009-2013



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.[12] An Alaskan study, published in 2000, found that 81% of the ionization cooking nuisance alarms were related to frying.[13]

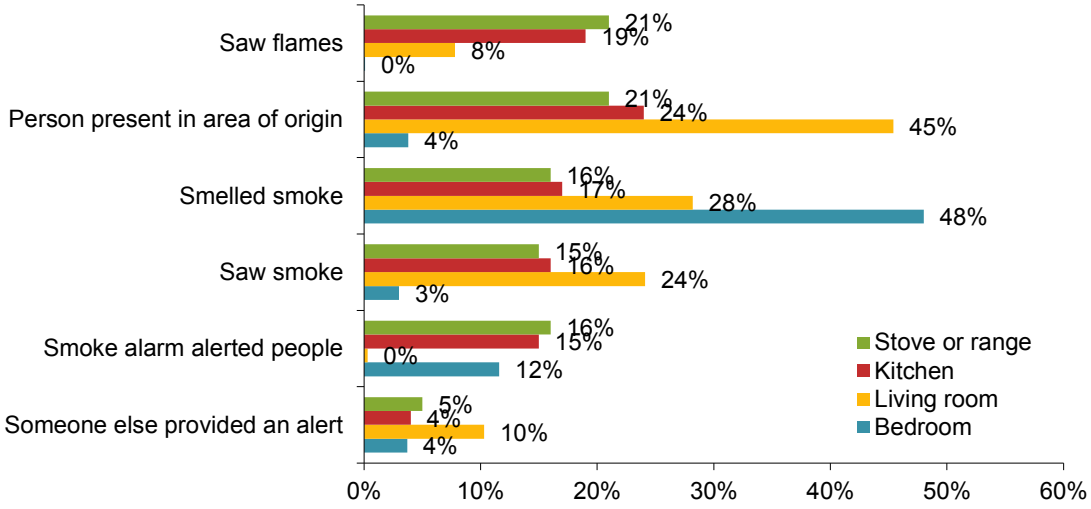
A 2010 Harris Interactive poll done for the NFPA found that half (52%) of households reported having smoke alarms in the kitchen. Such placement is an invitation to frequent nuisance alarms. NFPA 72, *National Fire Alarm and Signaling Code*, provides requirements to help prevent nuisance alarms. When possible, smoke alarms should be installed at least 20 feet away from the kitchen range. If that is not possible, any smoke alarm between 10 and 20 feet away from the stove should have a hush feature, which temporarily reduces the sensitivity of the alarm, or use a photoelectric sensor. Smoke alarms should not be installed within 10 feet of a cooking appliance. Additional details can be found in NFPA 72.

[11] Marty Ahrens. *Smoke Alarms in U.S. Home Fires*, Quincy, MA: NFPA, 2015, pp. 3-4.
[12] Charles L. Smith, *Smoke Detector Operability Survey – Report on Findings*, Bethesda, MD: U.S. Consumer Product Safety Commission, November 1993.
[13] Thomas M. Fazzini, Ron Perkins, and David Grossman, "Ionization and Photoelectric Smoke Alarms in Rural Alaskan Homes," *West J. Med;* 2000; 173:89-92.

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

Figure 1.6 shows that someone saw flames in 21% of the stove or range fires and 19% of all kitchen fires that were handled without fire department assistance. Someone was present in the area of origin when the fire started in 21% of stove or range fires and 24% of the kitchen fires.[14] The method of discovery is also shown for living room and bedroom fires for contrast. Multiple answers were allowed to this question.

Figure 1.6. Method of Fire Discovery in CPSC 2004-2005 Sample Survey of Unreported Residential Fires



Source: CPSC's *2004-2005 Residential Fire Survey*, pp. 162-168

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

New UL 858 requirement will require electric coil ranges to prevent the ignition of cooking oil. In April of 2015, a proposal for an oil ignition test submitted to Underwriters Laboratories (UL) 858, *Standard for Houshold Electric Ranges* by the American Home Appliance Association (AHAM) was ratified. This test will require open coil electric range tops to prevent the ignition of a think layer of canola oil in an aluminum pan for 30 minutes on the maximum heat setting. Listing organizations will set the effective date. Efforts to develop tests for other cooktop or range technologies are underway.[15]

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

[15] Marty Ahrens, Josh Dinaburg, and Judy Comoletti, *What's Cooking with Range-Top Fire Safety??*, presentation given at NFPA's Conference and Expo in Chicago, IL, June 22, 2015

The Fire Protection Research Foundation conducted several projects to develop an appropriate test. The proposal to UL grew out of this work. See two 2014 reports Analytical Modeling of Pan and Oil Heating on an Electric Coil Cooktop and Development of Standardized Cooking Fires for Evaluation of Prevention Technologies: Data Analysis for more details.

Victims of Home Structure Fires Involving Cooking Equipment

To prevent deaths and injuries from cooking equipment fires, it is helpful to know more about the victims of these fires.

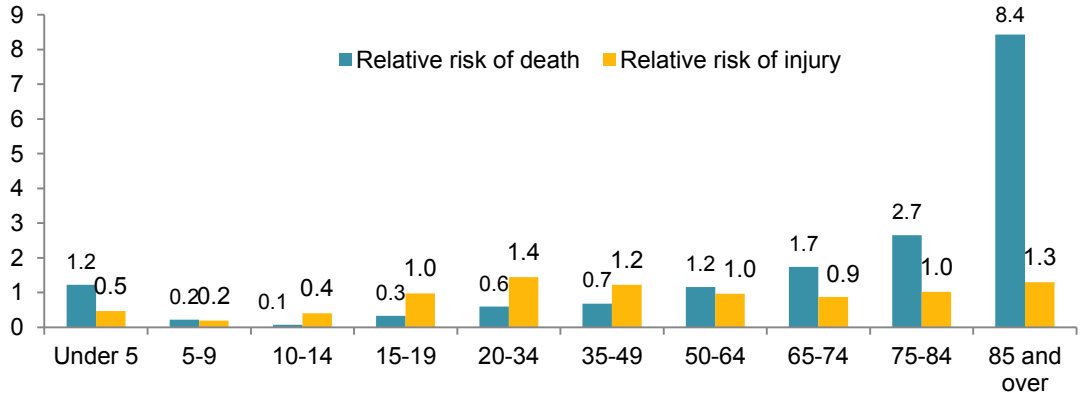
Older adults had a higher risk of cooking fire death than other age groups. Table 1.12 and Figure 1.7 show people 65 and older had the highest risk of cooking fire deaths. This is consistent with home fire deaths overall. [16]. During 2009-2013, adults 85 and older were 8.4 times as likely as the population at large to have died as a result of a cooking fire. People 75-84 had a relative risk that was 2.7 times that of the general population, and those 65-74 had risk 1.7 times that of the population as a whole.

The relative risk to children under five was 1.2 times the overall population, about the same as those in the 50 to 64 year-old age group. Presumably most of these young children were not themselves cooking but died from fires started by an adult's cooking activities. During this period, cooking fires killed an estimated average of 30 children under five (8% of the deaths), and an average of 40 children under fifteen (10%) per year.

Relative Risk

Relative risk is calculated by dividing the rate of death or injury incurred in each age group by the rate for the general population. A relative risk of one means that people in that age group face the same risk as does the general population.

Figure 1.7. Relative Risk of Civilian Death and Injury Resulting from Reported Home Cooking Fires: 2009-2013 Annual Averages



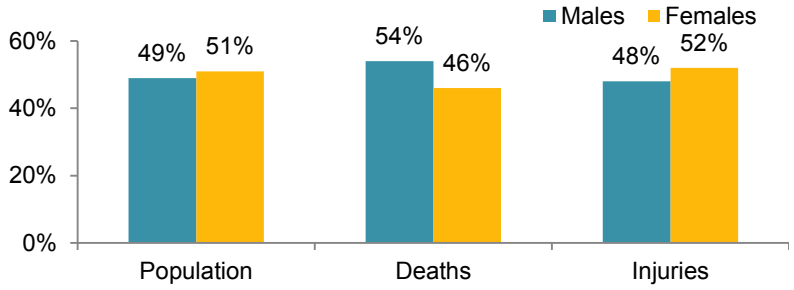
Sources: NFIRS 5.0 and NFPA fire department experience survey; U.S. Census estimates of resident population.

[16] Marty Ahrens. *Home Structure Fires*, Quincy, MA: NFPA, 2015, p. 9

Only 3% of the reported non-fatal cooking fire injuries were incurred by children under five; 7% of the injured were under 15. The highest relative risk of non-fatal cooking fire injury rate was seen among people ages 20-34 (1.4).

Women have slightly higher shares of home cooking fire injuries relative to population but much lower numbers relative to time spent in food preparation and clean-up. According to the American Time Use Survey (ATUS), U.S. women at least 15 years of age spent an average of 47 minutes a day on "food preparation and clean-up" in a typical day during 2011while men spent an average of only 19 minutes a day on these same tasks. Limiting the discussion to the 40% of men and 66% of women who engaged in these activities on a daily basis, men spent an average of 46 minutes and women spent 68 minutes daily.[17] However, Figure 1.8 shows that in 2009-2013 males accounted for 54% of the home cooking fire deaths and 48% of cooking fire injuries. Considering that men spend much less time than women on food preparation and clean-up, the risk to males from these fires is notably higher.

Figure 1.8. Home Cooking Fire Victims, by Gender: 2009-2013



Sources: U.S. Census, data from NFIRS and NFPA fire department experience survey.

Victims in the area of origin accounted for 42% of home cooking equipment fatalities and half of the reported non-fatal injuries. Table 1.13 shows that 12% of the victims of fatal home cooking fires and 29% of the non-fatally injured were in the area of 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 30% of the deaths and one-fifth (21%) of the injuries.

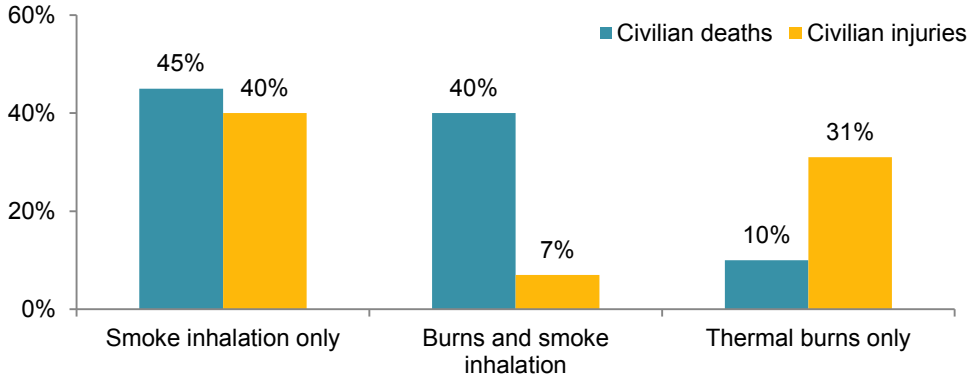
One-fifth (22%) of the fatal injuries and 11% of the non-fatal injuries were incurred by individuals who were not in the area of origin but were involved in the ignition. This could occur when someone had been cooking but had gone to another room in the home before the fire started. More than one-third (36%) of the fatalities and injuries (38%) 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 fire deaths. According to fire department reports, smoke inhalation was the primary apparent symptom seen in almost half (45%) of the home cooking fire deaths and two out of five (40%) reported home cooking fire injuries. Figure 1.9 shows that almost one-third (31%) of the non-fatally injured exhibited signs of thermal burns only and 7% had both burns and smoke

[17] 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, 2011 Annual Averages,"

inhalation. In contrast, two-fifths (40%) of the fatalities suffered both burns and smoke inhalation while just 10% suffered only thermal burns.

Figure 1.9. Civilian Casualties Incurred at Home Fires Involving Cooking Equipment by Primary Apparent Symptom as Identified by the Fire Department: 2009-2013

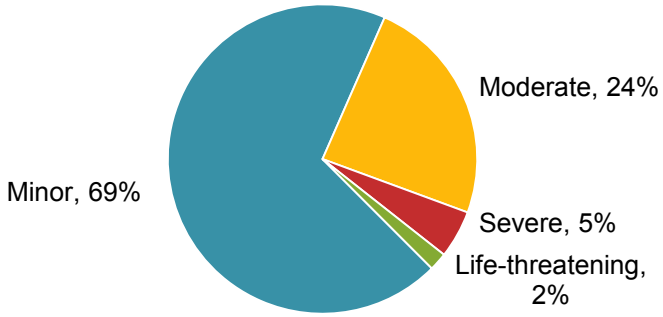


More than half of the non-fatal civilian injuries in home cooking equipment fires occurred when the victim was trying to fight the fire. Table 1.14 shows that 54% of civilians injured in home fires involving cooking equipment were hurt while attempting to fight the fire themselves. This is 19 percentage points more than the 35% of fire injuries incurred by civilians trying to control home fires of all causes in 2007-2011.[18]

One-quarter (26%) of the people killed by home cooking fires were asleep when fatally injured. Unless the cooking was started by a timer or someone else in the household, the cook was awake when cooking began. A drowsy cook can fall asleep while waiting for the cooking to finish.

More than two-thirds of reported non-fatal cooking injuries were minor. Figure 1.10 shows the severity of reported non-fatal home fire injuries involving cooking equipment. Two-thirds (69%) percent of the injuries were minor. Some individuals might believe that the benefit of putting the fire out themselves is worth more than the potential harm from a minor injury.

Figure 1.10. Severity of Reported Non-Fatal Home Cooking Fire Injuries 2009-2013



[18] Marty Ahrens. *Characteristics of Home Fire Victims*, Quincy, MA: NFPA, 2014, p. 47.

Cooking Fires that Were NOT Reported to Fire Departments

CPSC's 2004-2005 residential fire survey found that cooking equipment was involved in 4.7 million unreported home fires per year. The *2004-2005 CPSC's Residential Fire Survey* asked about all fires, including incidents that were not attended by the fire service.[19] They estimated that U.S. households experienced a total of 7.4 million fires per year, including 7.2 million that were not attended by the fire service. Cooking appliances were involved in 4.8 million home fires, including 4.7 million incidents that the fire department did not attend. One of every 22 occupied households had a cooking fire. Unreported cooking fires fell 63% from the 12.3 million such incidents in the 1984 survey of unreported residential fires done for the CPSC.

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

The study also found that 102,000 injuries resulted from cooking equipment fires with no fire department presence. This is 20 times the average of 5,080 civilian injuries per year in reported home cooking structure fires during 2007-2011. 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.

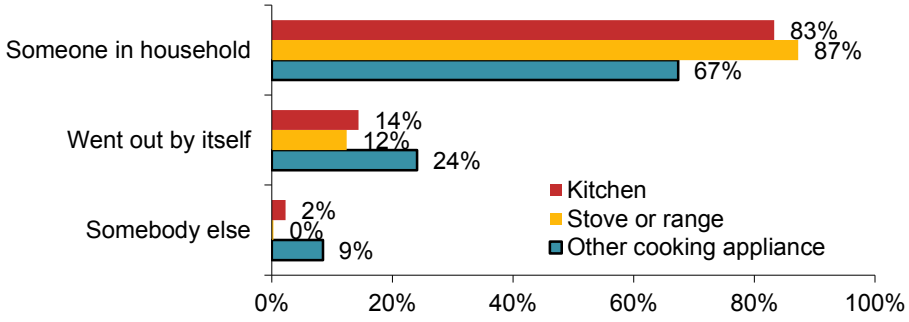
When respondents with fires involving cooking equipment were asked if the equipment was operating properly at the time of the fire, 99% said it was. In 9,600 unreported home fires involving cooking equipment (0.2% of the total), the occupants had to leave the home for at least one night. All were able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

Fire Control by Civilians

The vast majority of fires involving cooking equipment are put out by civilians and not reported to a fire department. While firefighting is often a cause of injury in home cooking fires, it is even more often successful in quickly controlling the fire. The ratio of 50 unreported home cooking fires found by the CPSC in their 2004-2005 Residential Fire Survey for every reported home cooking fire is evidence of this success. 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 1.11 shows that one of every four (24%) fires involving a cooking appliance other than a stove or range went out by itself.

[19] Michael A. Greene and Craig Andres. *2004-2005 National Sample Survey of Unreported Residential Fires*. U.S. Consumer Product Safety Commission, July 2009, p. 102

Figure 1.11. Who Put Out Kitchen and Cooking Equipment Fires in CPSC's 2004-2005 Survey of Unreported Residential Fires?

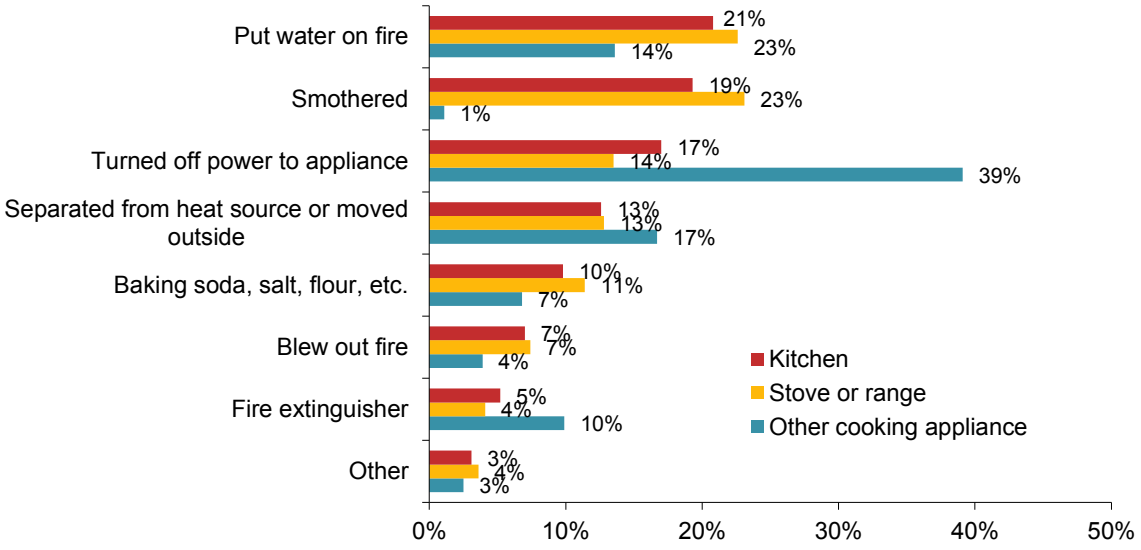


Source: Greene and Andres, 2009, pp. 166-172.

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.[20]

Civilians used a variety of techniques to put out cooking fires.
The CPSC asked their respondents how they put out the fire. Figure 1.12 shows that almost one-quarter (23%) put water on a stove or range fire. This approach was used with only 14% of the fires involving other cooking appliances. Twenty-three percent smothered stove or range fires. This was done in only 1% of the other cooking appliance fires.

Figure 1.12 Extinguishment Method Used in Kitchen and Cooking Equipment Fires in CPSC 2004-2005 Survey of Unreported Residential Fires



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

When a cooking appliance other than a 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 other substance; and 4% blew out the fire. Fourteen percent of the range fires were extinguished by turning the power off; 13% were put out

[20]Greene and Andres. pp. 166-172.

when the fire was separated from the heat source or moved outside; 11% were extinguished with baking soda, flour, or salt; 7% were blown out; and fire extinguishers put out 4%.

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

- Putting water on the fire – Water can cause a grease fire to spread.
- Turning 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 fire 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 than in the U.S.
- 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 way out is available.

Some examples of home cooking fires are included in Appendix B to illustrate how these fires can happen. These incidents, taken from NFPA's Fire Incident Data Organization (FIDO) anecdotal database, were previously published in either *NFPA Journal's* "Firewatch" column, or NFPA's studies of catastrophic fires.

Specific Uses of Cooking Equipment

Frying is the leading activity associated with cooking fires.
NFIRS provides considerable information, but it cannot provide the level of detail available from special studies. 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.[21] 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 regular frying, and turkey fryers involve extremely large quantities of hot cooking oil. Because the frying process involves inserting the food into the heated medium, then later removing it and transferring it to a drying location, deep frying with these larger quantities of hot oil involve numerous opportunities for thermal burns and scalds, as well as fire ignitions.

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

- Broiling and Grilling. Broiling and grilling were part of the "other" category that accounted for 9% of the CPSC range fire study incidents. (Grilling is broiling on a gridiron.) In the "other" incidents, fire began in the first 15 minutes for 76% of the fires, while 24% began at least 30 minutes after cooking began. Broiling and grilling do not inherently involve a combustible medium in addition to the food. However, both types of cooking often involve a need for regular cook intervention, such as turning the food, in order to avoid overheating. Broiling is sometimes done in an oven, which provides some containment for fire if one begins. However, when broiling in an electric oven, the oven door may be 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 that fire could spread from the grill to other valuable combustibles. In addition, fatal barbecue grill fires are rare. However, when fatal grill fires do occur, they nearly always

[21] 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.

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. A brief absence during cooking that takes longer than frying, broiling or grilling can be justified, provided a timer is used to remind the cook to check on the cooking.

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

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

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

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

One-third of people receiving energy assistance have used a kitchen stove for heat in the previous year. Earlier in the report, it was noted that an estimated average of 15,600 confined cooking fires per year are reported to involve a heating stove. This figure is an unknown combination of coding errors, use of equipment designed for both heating and cooking, and use of equipment designed only for heating for cooking. The counterpart to this fire problem is the use of equipment designed only for cooking for the purpose of heating. This practice increases the risk of fire, and, in the case of gas-fueled equipment, carbon monoxide poisoning.

In 2011, a survey of Low Income Home Energy Association Program (LIHEAP) recipients found that one-third used a kitchen stove or oven to provide heat in the past year because of a lack of funds for the energy bill.[22]

Non-Fire Burn Injuries Associated with Cooking Equipment

Cooking fires have long been the leading cause of reported fire injuries. Roughly two out of five (38%) reported civilian cooking fire injuries were caused by either thermal burns alone or burns and smoke inhalation together. The reported injuries from all causes are but a fraction of the thermal burn injuries associated with cooking equipment or related products. However, data from the CPSC's National Electronic Injury Surveillance System (NEISS) show that the majority of emergency room visits for burn injuries associated with cooking equipment were not caused by fire or flame.

[22] National Energy Assistance Directors' Association. *2011 National Energy Assistance Survey*. 2011, Table III.

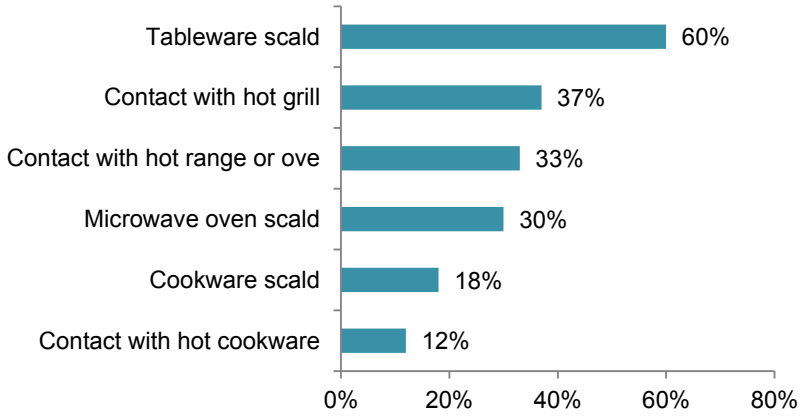
In 2014, ranges or ovens were involved in an estimated 16,400 thermal burn injuries seen in U.S. hospital emergency rooms. Table 1.15 shows that only 16% (2,600) were due to fire or flame. Eighty-four percent (13,900) of the thermal burns resulted from non-fire sources, chiefly contact with the hot equipment. Three-fifths (59%) of the 8,400 thermal burn injuries associated with grills were contact or non-fire burns.

In 2009-2013, children under five accounted for 6% of the U.S. population but they incurred only 3% of the non-fatal cooking fire injuries reported to fire departments. Figure 1.13 shows that these young children account for much larger shares of non-fire burn injuries from cooking equipment and tableware used with hot food or beverages.

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 1.13. Percent of Non-Fire Cooking-Related Burns Seen at Emergency Rooms in 2014 that Were Incurred by Children under Five Years Old



Source: CPSC's NEISS data, queried in October 2015.

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

- 5,200, or 60%, of the 8,700 scald burns associated with tableware such as coffee cups, drinking glasses, and soup bowls;
- 5,100, or 37%, of the 13,900 thermal non-fire burns associated with range or ovens, with most caused by contact with the equipment;
- 1,800, or 18%, of the 9,600 scald burns from cookware such as pots and pans;
- 1,600, or 33%, of the 4,900 thermal non-fire burns (mostly contact burns) associated with grills or barbecues;
- 1,500, or 30%, of the 5,000 scald burns associated with microwave ovens; and
- 1,000, or 12%, of the thermal 8,300 burns from contact with hot pots, pans or related cookware.

In a 2009 article on cooking related pediatric burns, Sharmila Dissanaike and colleagues examined data about 123 children between one and six years of age who had been admitted to a Level 1 burn center with cooking-related injuries. The three most common substances involved were soup (27%), grease (26%) and coffee (18%). The mean age was 2.7 years. In the most common scenario, a child pulled the item down.[23]

[23] Sharmila Dissanaike, Kimberly Boshart, Alan Coleman, JennaWishnew, and Cynthia Hester. "Cooking-Related Pediatric Burns: Risk Factors and the Role of Differential Cooling Rates Among Commonly Implicated Substances," *Journal of Burn Care and Research* 30.4 (2009): 593-598.

Cooking Equipment and Non-Fire Carbon Monoxide Deaths

Table 1.16 shows that in 2007-2011, gas-fueled ranges, stoves, or ovens were involved in an average of three non-fire carbon monoxide deaths annually. During the same five years, charcoal grills or burning charcoal averaged nine deaths per year.[24]

Safety Information

The Educational Messages Advisory Committee (EMAC) to NFPA's Public Education Division developed a collection of safety tips for a wide variety of activities, including fire-safe cooking. provided within that category. As a result, some messaging may be repeated throughout topic areas. Fire and life safety educators can download the Educational Messages Desk Reference - 2015 to find consistent safety messaging.

NFPA also has safety resoures to help consumers protect themselves from cooking fires. These include videos, safety tip sheets, public service announcements, and illustrated handouts in several different languages.

[24] Matthew V. Hnatov, *Non-Fire Carbon Monoxide Deaths Associated with the Use of Consumer Products*, U.S. Consumer Product Safety Commission, December 2011, Table 1. Online at http://www.cpsc.gov/library/foia/foia12/os/co11.pdf. Additional information from previous reports in this series.

Table 1.1. Home Cookng Structure Fires, by Year

Year	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions) As Reported		In 2013 Dollars
1980	148,300		500		5030		$245		$694
1981	153,500		530		5090		$766		$1,961
1982	136,500		500		5540		$422		$1,018
1983	125,200		470		5610		$343		$802
1984	124,100		480		4910		$372		$833
1985	127,500		450		4870		$350		$757
1986	127,700		510		5010		$398		$847
1987	125,100		410		5500		$397		$814
1988	126,700		470		5870		$461		$909
1989	119,800		480		5480		$451		$848
1990	120,500		440		6050		$476		$850
1991	122,100		360		6060		$621		$1,063
1992	130,300		350		6010		$451		$750
1993	128,400		430		6530		$548		$884
1994	118,200		370		5500		$618		$972
1995	111,700		370		5390		$446		$682
1996	115,200		470		5490		$519		$772
1997	117,500		380		5760		$565		$821
1998	109,100		500		5380		$527		$754
1999	85,800	(37,200)	300	(300)	2620	(1,670)	$497	(468)	$695
2000	95,500	(34,500)	230	(230)	3820	(2,540)	$516	(474)	$699
2001	120,600	(38,300)	500	(500)	4470	(2,940)	$521	(498)	$686
2002	128,200	(37,700)	150	(150)	4330	(2,930)	$671	(642)	$870
2003	143,400	(35,500)	530	(520)	4520	(3,070)	$768	(736)	$974
2004	151,000	(35,900)	620	(610)	4820	(3,290)	$723	(697)	$893
2005	146,800	(37,500)	500	(480)	4740	(3,300)	$874	(842)	$1,043
2006	159,500	(40,100)	360	(360)	4580	(3,120)	$684	(662)	$791
2007	158,000	(40,700)	420	(420)	4940	(3,320)	$541	(521)	$608
2008	157,900	(39,600)	400	(400)	5180	(3,490)	$921	(897)	$998
2009	154,200	(35,700)	300	(300)	4600	(3,020)	$965	(929)	$1,048
2010	156,300	(37,400)	420	(420)	5300	(3,560)	$993	(967)	$1,062
2011	156,300	(38,300)	470	(470)	5390	(3,840)	$1,002	(977)	$1,039

Table 1.1. Home Cookng Structure Fires, by Year (Continued)

Year	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions) As Reported		In 2013 Dollars
2012	167,800	(44,700)	370	(370)	5,820	(4,200)	$1,299	(1,274)	$4,269
2013	172,000	(43,600)	570	(570)	5,430	(3,960)	$1,115	(1,085)	$3,960

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution*. Inflation adjustment to 2011 dollars is done using the consumer price index. Unknowns have been allocated proportionally.
Source: NFIRS and NFPA fire department experience survey.

Table 1.2. Home Cookng Structure Fires, by Month
2009-2013 Annual Averages

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	14,000	(9%)	60	(14%)	410	(8%)	$110	(10%)
February	12,500	(8%)	40	(10%)	470	(9%)	$98	(9%)
March	14,200	(9%)	40	(9%)	480	(9%)	$94	(9%)
April	13,700	(8%)	40	(8%)	440	(8%)	$92	(8%)
May	14,100	(9%)	40	(10%)	450	(8%)	$108	(10%)
June	12,600	(8%)	20	(4%)	470	(9%)	$82	(7%)
July	12,500	(8%)	20	(4%)	440	(8%)	$101	(9%)
August	12,800	(8%)	30	(8%)	420	(8%)	$81	(7%)
September	13,300	(8%)	20	(5%)	480	(9%)	$83	(7%)
October	14,000	(9%)	40	(10%)	490	(9%)	$81	(7%)
November	14,600	(9%)	40	(10%)	420	(8%)	$95	(9%)
December	14,200	(9%)	40	(8%)	420	(8%)	$79	(7%)
Total	162,400	(100%)	430	(100%)	5,400	(100%)	$1,101	(100%)
Monthly average	13,500	(8%)	40	(8%)	450	(8%)	$92	(8%)

Table 1.3. Home Cookng Structure Fires, by Day of Week
2009-2013 Annual Averages

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	25,400	(16%)	60	(14%)	790	(15%)	$150	(14%)
Monday	22,700	(14%)	60	(14%)	790	(15%)	$156	(14%)
Tuesday	22,600	(14%)	60	(14%)	800	(15%)	$154	(14%)
Wednesday	22,400	(14%)	60	(14%)	740	(14%)	$147	(13%)
Thursday	23,100	(14%)	60	(13%)	740	(14%)	$181	(16%)
Friday	22,000	(14%)	60	(13%)	720	(13%)	$155	(14%)
Saturday	24,200	(15%)	70	(18%)	830	(15%)	$159	(14%)
Total	162,400	(100%)	430	(100%)	5,400	(100%)	$1,101	(100%)
Daily average	23,200	(14%)	60	(14%)	770	(14%)	$157	(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 fire department experience survey.

Table 1.4. Home Cookng Structure Fires, by Alarm Time
2009-2013 Annual Averages

Alarm Time	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight- 12:59 a.m.	3,600	(2%)	20	(5%)	130	(2%)	$33	(3%)
1:00-1:59 a.m.	2,700	(2%)	20	(4%)	170	(3%)	$25	(2%)
2:00-2:59 a.m.	2,300	(1%)	20	(4%)	130	(2%)	$26	(2%)
3:00-3:59 a.m.	2,000	(1%)	50	(11%)	140	(3%)	$20	(2%)
4:00-4:59 a.m.	1,700	(1%)	20	(6%)	90	(2%)	$20	(2%)
5:00-5:59 a.m.	1,600	(1%)	10	(3%)	80	(1%)	$15	(1%)
6:00-6:59 a.m.	1,900	(1%)	20	(5%)	90	(2%)	$16	(1%)
7:00-7:59 a.m.	2,700	(2%)	20	(5%)	90	(2%)	$18	(2%)
8:00-8:59 a.m.	4,200	(3%)	20	(5%)	150	(3%)	$29	(3%)
9:00-9:59 a.m.	5,400	(3%)	10	(3%)	160	(3%)	$32	(3%)
10:00-10:59 a.m.	6,600	(4%)	10	(3%)	170	(3%)	$34	(3%)
11:00-11:59 a.m.	8,000	(5%)	10	(2%)	260	(5%)	$53	(5%)
12:00-12:59 p.m.	9,100	(6%)	10	(2%)	280	(5%)	$65	(6%)
1:00-1:59 p.m.	9,100	(6%)	20	(4%)	280	(5%)	$65	(6%)
2:00-2:59 p.m.	9,100	(6%)	20	(4%)	260	(5%)	$66	(6%)
3:00-3:59 p.m.	10,000	(6%)	20	(5%)	320	(6%)	$64	(6%)
4:00-4:59 p.m.	11,500	(7%)	10	(3%)	380	(7%)	$88	(8%)
5:00-5:59 p.m.	14,200	(9%)	30	(7%)	460	(8%)	$88	(8%)
6:00-6:59 p.m.	15,200	(9%)	10	(3%)	440	(8%)	$88	(8%)
7:00-7:59 p.m.	13,200	(8%)	20	(6%)	390	(7%)	$73	(7%)
8:00-8:59 p.m.	10,600	(7%)	20	(4%)	340	(6%)	$62	(6%)
9:00-9:59 p.m.	7,900	(5%)	10	(3%)	260	(5%)	$51	(5%)
10:00-10:59 p.m.	5,600	(3%)	10	(3%)	190	(3%)	$37	(3%)
11:00-11:59 p.m.	4,200	(3%)	20	(4%)	160	(3%)	$33	(3%)
Total	162,400	(100%)	430	(100%)	5,400	(100%)	$1,101	(100%)
Hourly average	6,800	(4%)	20	(4%)	230	(4%)	$46	(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 fire department experience survey.

Table 1.5. Home Cookng Structure Fires, by Area of Origin
2009-2013 Annual Averages

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Kitchen or cooking area	152,600	(94%)	390	(92%)	5,170	(96%)	$941	(85%)
Non-confined	38,300	(24%)	390	(92%)	3,620	(67%)	$914	(83%)
Confined	114,300	(70%)	0	(0%)	1,550	(29%)	$27	(2%)
Unclassified area of origin	2,100	(1%)	0	(0%)	10	(0%)	$3	(0%)
Non-confined	100	(0%)	0	(0%)	10	(0%)	$2	(0%)
Confined	2,000	(1%)	0	(0%)	10	(0%)	$0	(0%)
Courtyard, terrace, or patio	1,300	(1%)	0	(0%)	30	(1%)	$31	(3%)
Non-confined	400	(0%)	0	(0%)	20	(0%)	$31	(3%)
Confined	900	(1%)	0	(0%)	10	(0%)	$0	(0%)
Unclassified outside area	1,100	(1%)	0	(0%)	10	(0%)	$7	(1%)
Non-confined	100	(0%)	0	(0%)	0	(0%)	$7	(1%)
Confined	1,000	(1%)	0	(0%)	0	(0%)	$0	(0%)
Exterior balcony or unenclosed porch	1,100	(1%)	0	(0%)	40	(1%)	$51	(5%)
Non-confined	600	(0%)	0	(0%)	30	(1%)	$51	(5%)
Confined	500	(0%)	0	(0%)	10	(0%)	$0	(0%)
Other known area of origin	4,100	(3%)	30	(8%)	150	(3%)	$69	(6%)
Non-confined	1,500	(1%)	30	(8%)	130	(2%)	$68	(6%)
Confined	2,600	(2%)	0	(0%)	20	(0%)	$1	(0%)
Total	162,400	(100%)	430	(100%)	5,400	(100%)	$1,101	(100%)
Non-confined	41,000	(25%)	430	(100%)	3,810	(71%)	$1,073	(97%)
Confined	121,400	(75%)	0	(0%)	1,590	(29%)	$29	(3%)

Less than 2% of the fires but at least 2% of the deaths resulted from fires in the following "other known" area:		
Bedroom	10	(3%)
Living room, family room or den	10	(2%)

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

Source: Data from NFIRS Version 5.0 and NFPA fire department experience survey.

Table 1.6. Home Cookng Structure Fires, by Factor Contributing to Ignition
2009-2013 Annual Averages

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment unattended	54,400	(34%)	200	(46%)	2,510	(46%)	$452	(41%)
Non-confined	16,800	(10%)	190	(46%)	1,910	(35%)	$445	(40%)
Confined	37,600	(23%)	0	(0%)	590	(11%)	$7	(1%)
Abandoned or discarded material or product	18,000	(11%)	30	(7%)	450	(8%)	$89	(8%)
Non-confined	3,500	(2%)	30	(7%)	270	(5%)	$87	(8%)
Confined	14,600	(9%)	0	(0%)	180	(3%)	$2	(0%)
Heat source too close to combustibles	17,000	(10%)	90	(22%)	590	(11%)	$160	(15%)
Non-confined	4,900	(3%)	90	(22%)	460	(8%)	$155	(14%)
Confined	12,100	(7%)	0	(0%)	130	(2%)	$5	(0%)
Unclassified misuse of material or product	12,800	(8%)	20	(5%)	420	(8%)	$59	(5%)
Non-confined	2,400	(1%)	20	(5%)	240	(4%)	$55	(5%)
Confined	10,500	(6%)	0	(0%)	180	(3%)	$4	(0%)
Unintentionally turned on or not turned off	12,600	(8%)	30	(8%)	500	(9%)	$139	(13%)
Non-confined	4,200	(3%)	30	(8%)	380	(7%)	$137	(12%)
Confined	8,400	(5%)	0	(0%)	120	(2%)	$2	(0%)
Unclassified factor contributed to ignition	11,000	(7%)	20	(5%)	310	(6%)	$39	(4%)
Non-confined	1,700	(1%)	20	(5%)	150	(3%)	$35	(3%)
Confined	9,300	(6%)	0	(0%)	160	(3%)	$3	(0%)
Failure to clean	9,700	(6%)	0	(1%)	90	(2%)	$16	(1%)
Non-confined	1,100	(1%)	0	(1%)	40	(1%)	$15	(1%)
Confined	8,600	(5%)	0	(0%)	50	(1%)	$1	(0%)
Mechanical failure or malfunction	7,300	(4%)	10	(1%)	120	(2%)	$71	(6%)
Non-confined	2,100	(1%)	10	(1%)	90	(2%)	$70	(6%)
Confined	5,200	(3%)	0	(0%)	30	(1%)	$1	(0%)
Electrical failure or malfunction	6,700	(4%)	20	(4%)	100	(2%)	$61	(6%)
Non-confined	2,700	(2%)	20	(4%)	90	(2%)	$60	(5%)
Confined	4,100	(2%)	0	(0%)	10	(0%)	$1	(0%)

Table 1.6. Home Cookng Structure Fires, by Factor Contributing to Ignition
2009-2013 Annual Averages (Continued)

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment not being operated properly	3,600	(2%)	10	(3%)	120	(2%)	$16	(1%)
Non-confined	800	(0%)	10	(3%)	80	(1%)	$15	(1%)
Confined	2,800	(2%)	0	(0%)	40	(1%)	$0	(0%)
Unclassified operational deficiency	3,300	(2%)	0	(1%)	100	(2%)	$15	(1%)
Non-confined	600	(0%)	0	(1%)	60	(1%)	$15	(1%)
Confined	2,700	(2%)	0	(0%)	40	(1%)	$0	(0%)
Improper container or storage	2,800	(2%)	10	(2%)	50	(1%)	$9	(1%)
Non-confined	400	(0%)	10	(2%)	30	(1%)	$9	(1%)
Confined	2,400	(1%)	0	(0%)	20	(0%)	$1	(0%)
Other known factor contributing to ignition	7,900	(5%)	20	(5%)	360	(7%)	$97	(9%)
Non-confined	2,500	(2%)	20	(5%)	270	(5%)	$95	(9%)
Confined	5,400	(3%)	0	(0%)	90	(2%)	$1	(0%)
Total fires	162,400	(100%)	430	(100%)	5,400	(100%)	$1,101	(100%)
Non-confined	41,000	(25%)	430	(100%)	3,810	(71%)	$1,073	(97%)
Confined	121,400	(75%)	0	(0%)	1,590	(29%)	$29	(3%)
Total entries	167,300	(103%)	470	(110%)	5,700	(105%)	$1,224	(111%)
Non-confined	43,600	(27%)	470	(110%)	4,060	(75%)	$1,195	(108%)
Confined	123,700	(76%)	0	(0%)	1,640	(30%)	$29	(3%)

The following other known factors contributed to less than 2% of the fires but at least 2% or the deaths:		
Improper container or storage	10	(2%)
Unclassified fire spread or control	10	(2%)

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 fire department experience survey.

Table 1.7. Home Cookng Structure Fires, by Human Factor Contributing to Ignition
2009-2013 Annual Averages

Human Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unattended or unsupervised person	28,800	(18%)	30	(6%)	960	(18%)	$200	(18%)
Non-confined	7,200	(4%)	30	(6%)	670	(12%)	$194	(18%)
Confined	21,500	(13%)	0	(0%)	290	(5%)	$6	(1%)
Asleep	9,800	(6%)	60	(14%)	620	(11%)	$85	(8%)
Non-confined	2,400	(1%)	60	(14%)	460	(9%)	$84	(8%)
Confined	7,400	(5%)	0	(0%)	150	(3%)	$1	(0%)
Possibly impaired by alcohol or drugs	3,000	(2%)	60	(15%)	270	(5%)	$29	(3%)
Non-confined	700	(0%)	60	(15%)	180	(3%)	$29	(3%)
Confined	2,300	(1%)	0	(0%)	90	(2%)	$0	(0%)
Age was a factor	2,800	(2%)	50	(11%)	180	(3%)	$21	(2%)
Non-confined	800	(0%)	50	(11%)	110	(2%)	$21	(2%)
Confined	2,100	(1%)	0	(0%)	70	(1%)	$0	(0%)
Multiple persons involved	700	(0%)	0	(0%)	40	(1%)	$6	(1%)
Non-confined	200	(0%)	0	(0%)	30	(0%)	$5	(0%)
Confined	500	(0%)	0	(0%)	10	(0%)	$0	(0%)
Possibly mentally disabled	1,100	(1%)	10	(2%)	70	(1%)	$10	(1%)
Non-confined	300	(0%)	10	(2%)	40	(1%)	$10	(1%)
Confined	800	(0%)	0	(0%)	30	(1%)	$0	(0%)
Physically disabled	700	(0%)	40	(9%)	70	(1%)	$5	(0%)
Non-confined	200	(0%)	40	(9%)	40	(1%)	$4	(0%)
Confined	600	(0%)	0	(0%)	30	(0%)	$0	(0%)
No human factor involved	118,100	(73%)	230	(53%)	3,470	(64%)	$772	(70%)
Non-confined	29,800	(18%)	230	(53%)	2,460	(46%)	$752	(68%)
Confined	88,300	(54%)	0	(0%)	1,010	(19%)	$20	(2%)
Total fires	162,400	(100%)	430	(100%)	5,400	(100%)	$1,101	(100%)
Non-confined	41,000	(25%)	430	(100%)	3,810	(71%)	$1,073	(97%)
Confined	121,400	(75%)	0	(0%)	1,590	(29%)	$29	(3%)
Total entries	165,100	(102%)	470	(111%)	5,670	(105%)	$1,128	(102%)
Non-confined	41,700	(26%)	470	(111%)	3,980	(74%)	$1,099	(100%)
Confined	123,400	(76%)	0	(0%)	1,690	(31%)	$29	(3%)

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 fire department experience survey.

Table 1.8. Home Cookng Structure Fires, by Item First Ignited
2009-2013 Annual Average

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	107,900	(66%)	190	(45%)	3,730	(69%)	$546	(50%)
Non-confined	23,500	(14%)	190	(45%)	2,570	(48%)	$527	(48%)
Confined	84,500	(52%)	0	(0%)	1,160	(21%)	$19	(2%)
Unclassified item first ignited	9,500	(6%)	10	(2%)	180	(3%)	$41	(4%)
Non-confined	1,400	(1%)	10	(2%)	110	(2%)	$40	(4%)
Confined	8,200	(5%)	0	(0%)	80	(1%)	$1	(0%)
Household utensil	9,400	(6%)	30	(8%)	210	(4%)	$37	(3%)
Non-confined	1,600	(1%)	30	(8%)	120	(2%)	$36	(3%)
Confined	7,700	(5%)	0	(0%)	90	(2%)	$2	(0%)
Appliance housing or casing	8,800	(5%)	10	(3%)	190	(3%)	$58	(5%)
Non-confined	2,600	(2%)	10	(3%)	140	(3%)	$56	(5%)
Confined	6,300	(4%)	0	(0%)	50	(1%)	$2	(0%)
Flammable or combustible liquids or gases, piping or filter	5,300	(3%)	10	(2%)	360	(7%)	$59	(5%)
Non-confined	2,100	(1%)	10	(2%)	270	(5%)	$58	(5%)
Confined	3,300	(2%)	0	(0%)	90	(2%)	$1	(0%)
Cabinetry	3,400	(2%)	20	(5%)	170	(3%)	$95	(9%)
Non-confined	2,300	(1%)	20	(5%)	150	(3%)	$94	(9%)
Confined	1,100	(1%)	0	(0%)	20	(0%)	$1	(0%)
Other known item first ignited	18,000	(11%)	150	(35%)	560	(10%)	$265	(24%)
Non-confined	7,600	(5%)	150	(35%)	450	(8%)	$263	(24%)
Confined	10,400	(6%)	0	(0%)	110	(2%)	$2	(0%)
Total	162,400	(100%)	430	(100%)	5,400	(100%)	$1,101	(100%)
Non-confined	41,000	(25%)	430	(100%)	3,810	(71%)	$1,073	(97%)
Confined	121,400	(75%)	0	(0%)	1,590	(29%)	$29	(3%)

The following other known items were first ignited in less than 2% of the fires but at least 10, or 2%, of the deaths:		
Clothing	80	(18%)
Interior wall covering	10	(3%)
Multiple items first ignited	10	(3%)
Unclassified furniture or utensil	10	(2%)
Flammable or combustible liquids or gases, piping or filter	10	(2%)

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

Source: Data from NFIRS Version 5.0 and NFPA fire department experience survey.

Table 1.9. Home Cooking Structure Fires that Began with Cooking Materials, Including Food by Type of Material First Ignited, 2009-2013 Annual Averages

Material First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Food or starch, excluding fat and grease	41,900	(39%)	50	(24%)	650	(17%)	$81	(15%)
Non-confined	4,200	(4%)	50	(24%)	360	(10%)	$79	(14%)
Confined	37,700	(35%)	0	(0%)	290	(8%)	$2	(0%)
Cooking oil or other Class IIIB cpmbustible liquid	30,800	(29%)	70	(37%)	1,900	(51%)	$276	(51%)
Non-confined	11,100	(10%)	70	(37%)	1,380	(37%)	$271	(50%)
Confined	19,700	(18%)	0	(0%)	520	(14%)	$5	(1%)
Fat, grease, butter, margarine or lard	25,000	(23%)	70	(34%)	990	(26%)	$139	(25%)
Non-confined	6,600	(6%)	70	(34%)	710	(19%)	$133	(24%)
Confined	18,400	(17%)	0	(0%)	270	(7%)	$6	(1%)
Unclassified type of material first ignited	3,200	(3%)	0	(2%)	30	(1%)	$5	(1%)
Non-confined	200	(0%)	0	(2%)	10	(0%)	$4	(1%)
Confined	3,100	(3%)	0	(0%)	20	(0%)	$1	(0%)
Plastic	1,900	(2%)	0	(0%)	40	(1%)	$4	(1%)
Non-confined	300	(0%)	0	(0%)	20	(1%)	$4	(1%)
Confined	1,600	(1%)	0	(0%)	20	(1%)	$0	(0%)
Other known	5,100	(5%)	0	(2%)	120	(3%)	$41	(7%)
Non-confined	1,100	(1%)	0	(2%)	90	(2%)	$36	(7%)
Confined	4,000	(4%)	0	(0%)	40	(1%)	$4	(1%)
Total	107,900	(100%)	190	(100%)	3,730	(100%)	$546	(100%)
Non-confined	23,500	(22%)	190	(100%)	2,570	(69%)	$527	(96%)
Confined	84,500	(78%)	0	(0%)	1,160	(31%)	$19	(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 fire department experience survey.

Table 1.10. Home Cookng Structure Fires, by Extent of Flame Damage
2009-2013 Annual Averages

Extent of Flame Damage	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	121,400	(75%)	0	(0%)	1,590	(29%)	$29	(3%)
Confined to object of origin	7,200	(4%)	50	(11%)	310	(6%)	$48	(4%)
Confined to room of origin	26,700	(16%)	120	(29%)	2,610	(48%)	$372	(34%)
Confined to floor of origin	2,300	(1%)	70	(15%)	310	(6%)	$133	(12%)
Confined to building of origin	4,500	(3%)	160	(36%)	520	(10%)	$448	(41%)
Extended beyond building of origin	400	(0%)	30	(8%)	50	(1%)	$72	(7%)
Total	162,400	(100%)	430	(100%)	5,400	(100%)	$1,101	(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 fire department experience survey.

Table 1.11. Home Cookng Structure Fires, by Smoke Alarm Status
2009-2013 Annual Averages

Smoke Alarm Status	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Total	**162,400**	**(100%)**	**430**	**(100%)**	**5,400**	**(100%)**	**$1,101**	**(100%)**
Non-confined	41,000	(25%)	430	(100%)	3,810	(71%)	$1,073	(97%)
Confined	121,400	(75%)	0	(0%)	1,590	(29%)	$29	(3%)
Smoke alarm present	142,200	(88%)	290	(69%)	4,480	(83%)	$921	(84%)
Non-confined	33,000	(20%)	290	(69%)	3,060	(57%)	$896	(81%)
Confined	109,200	(67%)	0	(0%)	1,420	(26%)	$26	(2%)
Fire too small to operate alarm	15,800	(10%)	20	(4%)	340	(6%)	$15	(1%)
Non-confined	2,400	(1%)	20	(4%)	150	(3%)	$14	(1%)
Confined	13,400	(8%)	0	(0%)	190	(3%)	$2	(0%)
Smoke alarm present and fire large enough to operate alarm	126,400	(78%)	280	(65%)	4,140	(77%)	$906	(82%)
Non-confined	30,600	(19%)	280	(65%)	2,910	(54%)	$882	(80%)
Confined	95,800	(59%)	0	(0%)	1,230	(23%)	$24	(2%)
Smoke alarm operated	114,200	(70%)	200	(47%)	3,360	(62%)	$759	(69%)
Non-confined	25,600	(16%)	200	(47%)	2,300	(43%)	$737	(67%)
Confined	88,600	(55%)	0	(0%)	1,060	(20%)	$22	(2%)
Smoke alarm present but did not operate	12,200	(8%)	80	(18%)	780	(14%)	$147	(13%)
Non-confined	5,000	(3%)	80	(18%)	610	(11%)	$145	(13%)
Confined	7,200	(4%)	0	(0%)	180	(3%)	$2	(0%)
No smoke alarm	20,300	(12%)	130	(31%)	920	(17%)	$180	(16%)
Non-confined	8,000	(5%)	130	(31%)	750	(14%)	$177	(16%)
Confined	12,300	(8%)	0	(0%)	170	(3%)	$3	(0%)
No working smoke alarm (Sum of no smoke alarms and alarms that were present but did not operate)	32,500	(20%)	210	(49%)	1,700	(31%)	$327	(30%)
Non-confined	13,100	(8%)	210	(49%)	1,360	(25%)	$322	(29%)
Confined	19,400	(12%)	0	(0%)	350	(6%)	$5	(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 fire department experience survey.

Table 1.12. Casualties in Home Cooking Structure Fires, by Age of Victim
2009-2013 Annual Averages

Age	Population (in Millions)		Civilian Deaths		Deaths Per Million	Relative Risk of Death	Civilian Injuries		Injuries per Million	Relative Risk of Injury
Under 5	20.2	(6%)	30	(8%)	1.7	1.2	160	(3%)	8.1	0.5
5-9	20.3	(7%)	10	(1%)	0.3	0.2	70	(1%)	3.4	0.2
10-14	20.7	(7%)	0	(0%)	0.1	0.1	150	(3%)	7.0	0.4
15-19	21.6	(7%)	10	(2%)	0.5	0.3	370	(7%)	17.0	1.0
20-34	63.9	(21%)	50	(12%)	0.8	0.6	1,610	(30%)	25.1	1.4
35-49	62.8	(20%)	60	(14%)	0.9	0.7	1,330	(25%)	21.3	1.2
50-64	60.6	(19%)	100	(23%)	1.6	1.2	1,010	(19%)	16.7	1.0
65-74	22.5	(7%)	50	(13%)	2.4	1.7	340	(6%)	15.2	0.9
75-84	13.2	(4%)	50	(11%)	3.6	2.7	230	(4%)	17.8	1.0
85 and over	5.7	(2%)	70	(16%)	11.6	8.4	130	(2%)	22.5	1.3
Total	311.6	(100%)	430	(100%)	1.4	1.0	5,400	(100%)	17.3	1.0
Selected Age Groups										
14 and under	61.2	(20%)	40	(10%)	0.7	0.5	380	(7%)	6.2	0.4
65 and over	41.4	(13%)	170	(39%)	4.0	3.0	710	(13%)	17.0	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 fire department experience survey and Table 1. Annual Estimates of the Resident Population by Sex and Five-Year Age Group for the United States: April 1, 2010 to July 1, 2011 (NC-EST2011-01).

Table 1.13. Home Cooking Structure Fires Casualties by Victim's Location at Time of Incident 2009-2013 Annual Averages

Victim's Location at Time of Incident	Civilian Deaths		Civilian Injuries	
In area of origin and involved	50	(12%)	1,570	(29%)
In area of origin and not involved	130	(30%)	1,140	(21%)
Not in area of origin but involved	90	(22%)	590	(11%)
Not in area of origin and not involved	150	(36%)	2,060	(38%)
Unclassified	0	(0%)	50	(1%)
Total	430	(100%)	5,400	(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 fire department experience survey.

Table 1.14. Home Cooking Structure Fires Casualties by Victim's Activity at Time of Injury 2009-2013 Annual Averages

Activity at Time of Injury	Civilian Deaths		Civilian Injuries	
Sleeping	110	(26%)	470	(9%)
Escaping	90	(21%)	770	(14%)
Unable to act	70	(16%)	150	(3%)
Unclassified activity	60	(13%)	430	(8%)
Fire control	40	(10%)	2,930	(54%)
Irrational act	30	(7%)	90	(2%)
Returning to vicinity of fire before control	20	(5%)	340	(6%)
Returning to vicinity of fire after control	10	(2%)	30	(1%)
Rescue attempt	0	(0%)	200	(4%)
Total	430	(100%)	5,400	(100%)

Table 1.15. 2014 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	Grills	ts, Pans, and Related Cookware	Drinking Glasses and Tableware
NEISS estimates of 2014 emergency room visits for					
All thermal burns	16,400		8,400	9,600	
Victim under 5	*5,300*		*1,700*	*1,100*	
Thermal fire, flame or flash burn	2,600		3,500	1,300	
Thermal contact/non-fire burn	13,900		4,900	8,300	
Thermal contact/non-fire burn victim under 5	5,100		1,600	1,000	
Scald burns	4,400	5,000		9,600	8,700
Victim under 5		*1,500*		*1,800*	*5,200*
Reported civilian fire injuries in home fires: 2009-2013 annual averages	4,230	130	110*		

*Estimates of grill fire injuries exclude injuries incurred at outside and unclassified grill fires.

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

Source: CPSC's NEISS, queried at https://www.cpsc.gov/cgibin/NEISSQuery/Home.aspx in October 2015.
Fire injury data from NFIRS and NFPA fire department experience survey 2009-2013 civilian fire injuries

Table 1.16. U.S. Non-Fire Carbon Monoxide Deaths Involving Home Cooking Equipment

Year	Gas-Fueled Range, Stove or Oven	Charcoal Grill or Charcoal
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	6
2006	0	10
2007	6	8
2008	0	7
2009	4	7
2010	5	16
2011	8	8
2007-2011 Annual average	3	9

Source: Matthew V. Hnatov, *Non-Fire Carbon Monoxide Deaths Associated with the Use of Consumer Products*, U.S. Consumer Product Safety Commission, January 2015, Table 1, pp. 11-12. Additional information was extracted from previous reports in this series.

Ranges

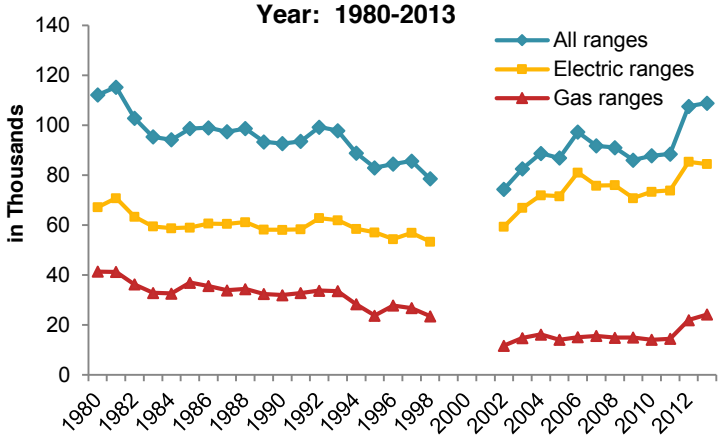
Ranges or cooktops were involved in the majority of home cooking equipment fires. During 2009-2013, U.S. fire departments responded to an estimated average of 99,000 home structure fires per year in which a range or cooktop was involved in ignition. These fires caused an annual average of 370 civilian deaths, 4,230 reported civilian injuries, and $794 million in direct property damage. These incidents accounted for three of every five (61%) reported home fires involving cooking equipment, 86% of the associated civilian deaths, and roughly three-quarters of the associated civilian injuries (78%) and of the direct property damage (72%) from cooking equipment fires.

These fires are a major part of the overall home fire problem. Ranges or cooktops were involved in more than one-quarter (28%) of reported home fires from all causes combined, 15% of home fire deaths, one-third (33%) of reported home fire injuries, and 12% of the direct property damage resulting from home fires.[25] According to the CPSC 2009 report, *2004-2005 National Sample Survey of Unreported Residential Fires, s*toves 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.[26]

Ranges are found in almost every home. The American Housing Survey found that in 2011, cooking stoves or ranges were found in 99% of all occupied housing units.[27]

Figure 2.1 and Table 2.1 show that the total number of reported fires involving ranges or cooktops was 3% lower in 2013 than in 1980. Table 2.2 shows that over the same period, reported fires involving gas ranges were 42% lower, while Table 2.3 shows that electric range fires were 26% higher.

Figure 2.1.
Reported Home Range or Cooktop Fires, by Year: 1980-2013



Changes in data collection rules and definitions that accompanied the introduction of NFIRS 5.0 in 1999 made it much easier to document minor cooking fires. To obtain more complete data, in 2012, the USFA began requiring a valid entry for equipment involved in ignition when other data elements indicated that equipment was involved. *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 reflects true changes in fire experience*.

[25] Marty Ahrens. *Home Structure Fires*, Quincy, MA: NFPA. 2015, p. 37.

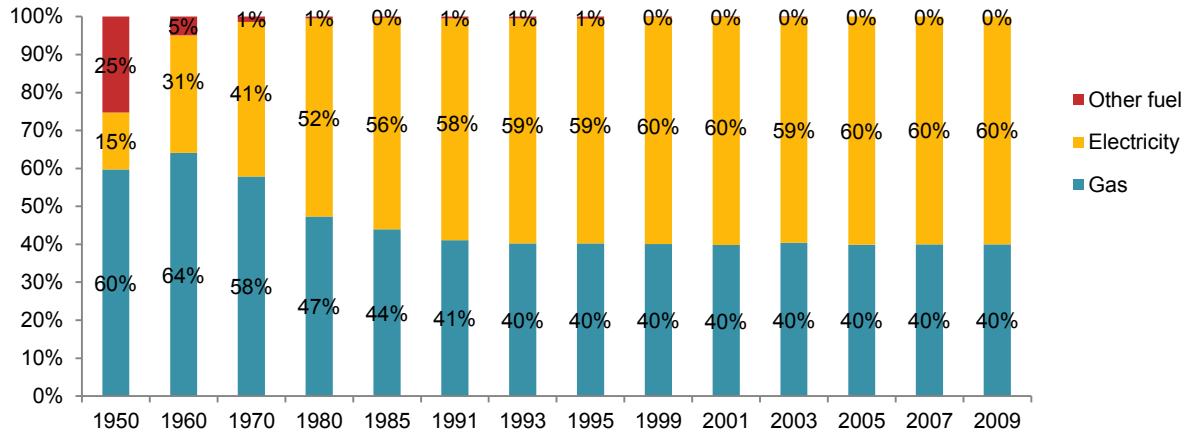
[26] Michael A. Greene and Craig D. Andres. *2004-2005 National Sample Survey of Unreported Residential Fires*, July 2009, p. 127.

[27] U.S. Census Bureau. Current Housing Reports, Series H150/11 *American Housing Survey for the United States: 2011*, Washington, DC, 2013. Table C-03-AO.

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 recent years. By 1970, the use of solid and liquid fuels as primary power source for cooking had fallen to 1%. By 1980, electricity had become the dominant power source. Since the early 1990s, 1.5 times as many households used electricity as gas.

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



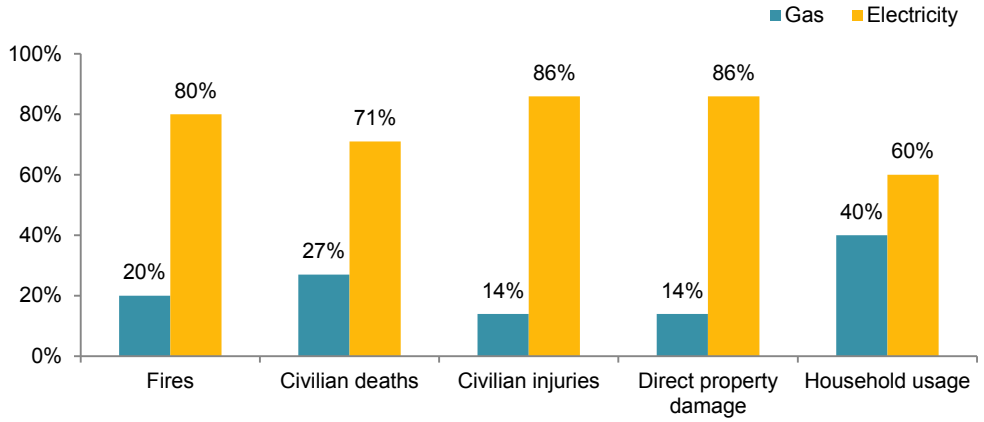
Note: Gas includes utility, bottled, tank and LP-Gas.

Source: U.S. Bureau of the Census, *Census of Housing, 1960*, Vol. 1; *1970 and 1980*, Vo. 1; Current Housing Reports, Series H-150-87, American Housing Survey; *1990 Census of Housing, Detailed Housing Characteristics*, Series CH-2; and *Statistical Abstract of the United States*, 1994-2012 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 recent years, Figure 2.3 shows that 80% of the ranges or cooktops involved in reported home fires were powered by electricity. During this period, electric ranges or cooktops were involved in an average of 79,300 reported home structure fires per year. These fires caused an annual average of 260 civilian deaths, 3,630 reported civilian injuries, and $681 million in direct property damage. Gas ranges or cooktops were involved in an average of 19,500 reported home structure fires annually during this period, resulting in an average of 100 civilian deaths, 590 civilian injuries, and $111 million in direct property damage per year.

The rate of reported fires per million user households was 2.7 times as high for electric ranges as for gas; the death rate per million households was 1.7 times as high, while civilian injuries per million user households and average direct propertyloss were 4.1 times higher for households using electric ranges than for households using gas ranges. (See Table 2.5.)

Figure 2.3.
Percentages of Reported Home Range or Cooktop Fires and AssociatedLosses by Power Source: 2009-2013



Source: Fire data from NFIRS Version 5.0 and NFPA fire department experience survey. Household usage through 2009 from *Statistical Abstract of the United States*.

Based on its 2004-2005 survey, the CPSC estimates that electric ranges were involved in 2.6 million home fires, including fires that were not attended by fire departments. When the unreported fires are included, the risk of fire involving an electric range rises to 3.8 such fires per 100 user households. Gas ranges were involved in an estimated 1.1 million fires, resulting in a rate of 2.6 fires per 100 user households.[28]

Causal Factors

Unattended cooking was the leading factor contributing to home fires involving ranges. During 2009-2013, unattended equipment was a factor contributing to two out of five (40%) reported home structure fires involving ranges or cooktops. Abandoned or discarded material (10%) might also refer to cooking that had been left unattended. Table 2.6 shows that 9% occurred when the range was unintentionally turned on or not turned off and 8% started when something that could catch fire was left or came too close to the range. A failure to clean was a factor in 7% of these fires.[29]

Gas range fires were less likely than electric range fires to be involved in fires in which the equipment was unattended (32% vs. 42% of fires) and more likely have had a mechanical failure or malfunction (7% vs. 3%). See Table 2.7 and 2.8 for more details.

[28] 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.
[29] Multiple entries are allowed in this field, resulting in some fires having more than one contributing factor.

Cooking materials were the leading items first ignited. Seventy percent of the reported home structure fires involving ranges started with the ignition of cooking materials, including food. Six percent of the fires began with household utensils. Appliance housings or casings were first ignited in 5% of these incidents. Less than 1% of these incidents began with the ignition of clothing, but these fires caused 20% of the range fire deaths.

Gas range fires were less likely than electric range fires to begin with the ignition of cooking materials (64% vs. 71% of fires). Additional details may be found in Tables 2.9, 2.10, and 2.11.

Fats, cooking oil, or related substances were first ignited in roughly three-quarters of the losses resulting from the range or cooktop ignition of cooking materials, including food. When cooking materials, including food, were first ignited in home range or cooktop fires, two types of materials accounted for 57% of the ignitions:

2) Cooking oil or other Class IIIB combustible liquids (33%), and
3) Fat, grease, butter, margarine, or lard (24%).

Together, these substances were first ignited in roughly three-quarters of the losses from range or cooktop ignition of cooking materials: 74% of the deaths, 79% of the injuries, and 79% of the direct property damage. Food or starch, excluding fat and grease, was first ignited in 37% of the cooking material fires, 22% of the associated deaths, 17% of the civilian injuries and 14% of the direct property damage. (See Tables 2.12-2.14).

Flame damage was limited to the room of fire origin in 95% of range fires. Table 2.15 shows that two-thirds (67%) of all range or cooktop fires reported in 2009-2013 were coded with the incident type that indicated a cooking fire that was confined to the vessel of origin. In an additional 5%, fire spread was coded as confined to the object of origin. Combined, the roughly three-quarters of reported range fires that had a confined cooking fire incident type or were confined to object of origin caused 9% of the range fire deaths and more than one-quarter (29%) of the associated injuries. Flame damage spread beyond the room of origin in only 5% of reported range or cooktop fires. These incidents caused three-fifths (61%) of the associated deaths but only 17% of the reported non-fatal range fire injuries.

Frying is the leading activity associated with cooking fires.
NFIRS provides considerable information, but it cannot provide the level of detail available from special studies. A 1999 CPSC study analyzed the results of 289 range fire investigations. Three-quarters (218) began with the ignition of food. Sixty-three percent of the food ignitions involved frying, 18% baking and 10% boiling. Eighty-three percent of the frying ignitions and 88% of the baking ignitions occurred during the first fifteen minutes of cooking. Only 6% of the ignitions while boiling occurred this early in the cooking process.[30]

[30] Linda Smith, Ron Monticone, and Brenda Gillum. *Range Fires, Characteristics Reported in National Fire Data and a CPSC Special Study,* Washington, DC: U.S. Consumer Product Safety Commission, Division of Hazard Analysis, Directorate of Epidemiology. 1999.

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.[31] When oil or fat ignited:

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

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

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.

New UL 858 requirement will require electric coil ranges to prevent the ignition of cooking oil. In April of 2015, a proposal for an oil ignition test submitted to Underwriters Laboratories (UL) 858, *Standard for Houshold Electric Ranges* by the American Home Appliance Association (AHAM) was ratified. This test will require open coil electric range tops to prevent the ignition of a thin layer of canola oil in an aluminum pan for 30 minutes on the maximum heat setting. Listing organizations will set the effective date. Efforts to develop tests for other cooktop or range technologies are underway.[32]

The Fire Protection Research Foundation conducted several projects to develop an appropriate test. The proposal to UL grew out of this work. See two 2014 reports Analytical Modeling of Pan and Oil Heating on an Electric Coil Cooktop and Development of Standardized Cooking Fires for Evaluation of Prevention Technologies: Data Analysis for more details.

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.

One-third 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 2014, an estimated 39,600 people with injuries involving ranges or ovens

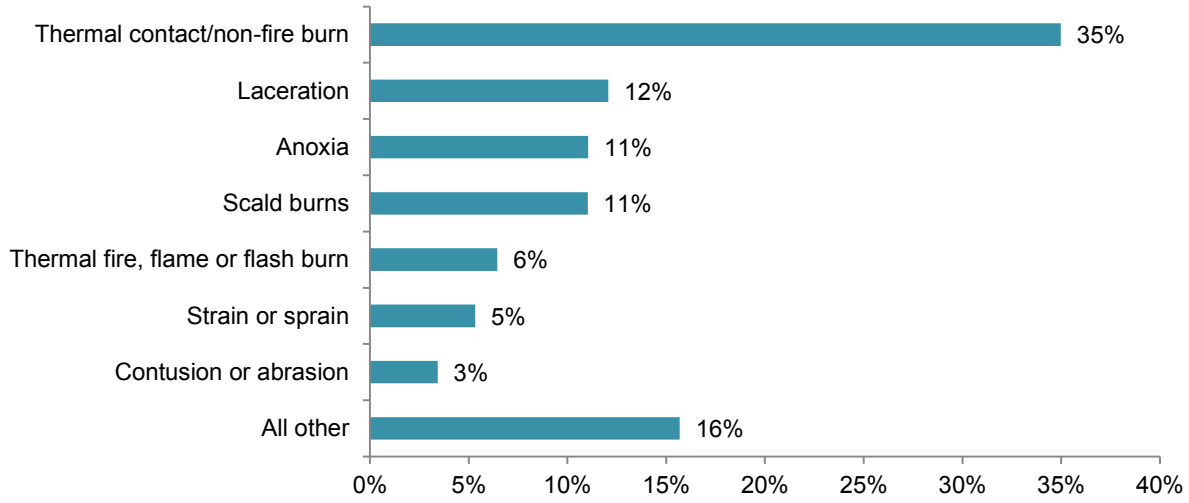
[31] Key Research and Marketing, Ltd. *New Zealand Fire Service Bay-Waikato Fire Region Kitchen Fire Research, Summary of Findings,* October 1998.
[32] Marty Ahrens, Josh Dinaburg, and Judy Comoletti, *What's Cooking with Range-Top Fire Safety??,* presentation given at NFPA's Conference and Expo in Chicago, IL, June 22, 2015

went to hospital emergency rooms.[33] Figure 2.4 and Table 2.16 show that two of every five (41%) such injuries were thermal burns, including 35% caused by contact with a hot object or other non-fire source (84% of the range or oven thermal burns). *Thirty-seven percent (5,100) of the 13,900 contact/non-fire burns were incurred by children less than five years of age*.

Six percent of the emergency room visits associated with a range or oven (16% of the thermal burns) resulted from a fire or flame. Twelve percent of the injuries were lacerations. Eleven percent were due to anoxia. Anoxia can be caused by smoke inhalation from fires, non-fire carbon monoxide poisoning, or exposure to leaking gas.

Another 11% of the range or oven burns were scalds, 5% were strains or sprains, and 3% were contusions or abrasions.

Figure 2.4. Injuries Involving Ranges or Ovens Seen at Hospital Emergency Rooms in 2014 by Diagnosis



Source: CPSC's NEISS, queried in October 2015.

After proportional allocation of the 82% of injuries involving ranges or ovens of unknown type, these injuries included 16,000 (41%) injuries involving gas-fueled ranges and ovens, and 23,300 (59%) injuries involving electric-powered ranges and ovens. The number of cases with "other ranges or ovens" was too small for reliable estimates. These cases were excluded from the calculations. See Table 2.17. Note that the breakdown of injury involvement of gas and electric ranges or ovens is much closer to the breakdown of households cooking with gas and electricity (40% and 60%, respectively) than the rates of fire and fire injuries.

[33] All statistics are based on National Electronic Injury Surveillance System (NEISS) data obtained from the U.S. Consumer Product Safety Commission (CPSC) website, www.cpsc.gov, accessed in October 2015.

Table 2.1. Home Fires Involving Ranges or Cooktops, by Year

Year	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions) As Reported	In 2013 Dollars
1980	112,200		380		4,210		$181	$513
1981	115,300		420		4,230		$701	$1,794
1982	102,900		370		4,600		$219	$528
1983	95,400		400		4,820		$267	$624
1984	94,200		420		4,150		$282	$632
1985	98,700		360		4,050		$267	$578
1986	99,000		390		4,210		$303	$645
1987	97,400		380		4,750		$304	$624
1988	98,700		390		4,940		$332	$655
1989	93,400		360		4,710		$335	$630
1990	92,700		380		5,050		$355	$634
1991	93,600		310		5,130		$465	$796
1992	99,300		290		4,960		$321	$534
1993	97,900		340		5,490		$417	$673
1994	88,900		270		4,480		$321	$505
1995	83,000		280		4,300		$309	$473
1996	84,500		360		4,350		$366	$544
1997	85,700		330		4,610		$382	$555
1998	78,600		410		4,280		$363	$520
1999	31,600	(17,100)	300	(300)	1,420	(900)	$239	(228) $334
2000	55,500	(23,700)	110	(110)	2,880	(1,850)	$265	(244) $359
2001	67,700	(28,500)	380	(380)	3,560	(2,400)	$355	(344) $468
2002	73,900	(28,000)	120	(120)	3,600	(2,480)	$475	(459) $616
2003	81,900	(26,400)	410	(410)	3,350	(2,490)	$520	(502) $659
2004	87,700	(28,000)	590	(580)	3,860	(2,810)	$542	(525) $670
2005	85,900	(28,900)	410	(410)	3,690	(2,890)	$552	(538) $659
2006	96,300	(31,000)	350	(350)	3,440	(2,590)	$488	(474) $564
2007	91,800	(31,800)	300	(300)	3,860	(2,820)	$400	(388) $449
2008	91,100	(30,400)	370	(370)	3,930	(2,920)	$682	(668) $739
2009	86,100	(27,600)	230	(230)	3,570	(2,590)	$697	(672) $757
2010	87,800	(29,500)	410	(410)	3,940	(2,990)	$678	(663) $726
2011*	88,500	(29,600)	430	(430)	4,290	(3,350)	$663	(647) $688
2012	107,600	(35,300)	270	(270)	4,530	(3,520)	$940	(923) $955
2013	108,900	(34,700)	500	(500)	4,370	(3,440)	$865	(845) $865

* A calculation error in estimates of confined fires in 2011 has been corrected, resulting in increased estimates of fires, civilian injuries, and direct property damage. The estimate for non-confined fires and losses (in parentheses) were correct.)

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution*. Inflation adjustment to 2011 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: NFIRS and NFPA fire department experience survey.

Table 2.2. Home Fires Involving Gas-Fueled Ranges, by Year

Year	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions) As Reported		In 2013 Dollars
1980	41,400		270		1,410		$53		$150
1981	41,300		210		1,390		$590		$1,510
1982	36,300		230		1,580		$79		$191
1983	32,900		250		1,570		$83		$194
1984	32,600		220		1,390		$79		$177
1985	37,000		140		1,380		$81		$175
1986	35,600		190		1,240		$90		$192
1987	33,900		170		1,410		$97		$199
1988	34,400		220		1,500		$118		$233
1989	32,400		230		1,410		$89		$167
1990	32,000		180		1,450		$100		$179
1991	32,800		160		1,540		$137		$234
1992	33,800		140		1,410		$96		$160
1993	33,600		120		1,400		$99		$160
1994	28,300		170		1,140		$86		$135
1995	23,800		170		1,020		$75		$115
1996	27,800		210		1,110		$103		$153
1997	26,800		180		1,060		$92		$134
1998	23,500		220		900		$84		$120
1999	11,000	(6,200)	80	(80)	650	(380)	$85	(83)	$119
2000	11,900	(5,800)	110	(110)	580	(580)	$90	(86)	$122
2001	13,100	(5,500)	190	(190)	570	(350)	$69	(68)	$91
2002	11,900	(4,600)	20	(20)	430	(370)	$75	(74)	$97
2003	15,100	(4,800)	200	(200)	570	(410)	$85	(83)	$108
2004	16,200	(5,100)	220	(220)	690	(480)	$86	(83)	$106
2005	14,600	(5,100)	60	(60)	430	(260)	$67	(65)	$80
2006	15,700	(5,500)	100	(100)	550	(440)	$73	(71)	$84
2007	15,600	(5,400)	120	(120)	560	(390)	$73	(72)	$82
2008	14,900	(4,300)	100	(100)	450	(330)	$102	(100)	$111
2009	15,000	(4,000)	40	(40)	520	(390)	$125	(124)	$136
2010	14,100	(4,100)	110	(110)	550	(410)	$89	(87)	$96
2011*	14,500	(4,000)	150	(150)	430	(340)	$79	(76)	$82
2012	22,000	(4,900)	40	(40)	610	(470)	$112	(109)	$113
2013	24,200	(5,000)	160	(160)	740	(540)	$134	(131)	$134

* A calculation error in estimates of confined fires in 2011 has been corrected, resulting in increased estimates of fires, civilian injuries, and direct property damage.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution*. Inflation adjustment to 2011 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: NFIRS and NFPA fire department experience survey.

Table 2.3. Home Fires Involving Electric-Powered Ranges, by Year

Year	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions) As Reported		In 2013 Dollars
1980	67,200		100		2,690		$119		$337
1981	70,800		190		2,750		$106		$271
1982	63,400		110		2,910		$130		$314
1983	59,500		140		3,130		$174		$407
1984	58,800		170		2,660		$197		$441
1985	59,000		200		2,590		$175		$379
1986	60,600		200		2,870		$205		$436
1987	60,500		170		3,210		$191		$392
1988	61,200		140		3,290		$204		$402
1989	58,200		110		3,220		$235		$442
1990	58,100		190		3,480		$245		$437
1991	58,300		150		3,450		$316		$541
1992	62,800		150		3,420		$217		$361
1993	62,000		220		3,950		$307		$495
1994	58,500		100		3,270		$224		$352
1995	57,100		110		3,210		$222		$339
1996	54,400		140		3,110		$248		$369
1997	56,900		140		3,470		$281		$408
1998	53,400		170		3,320		$269		$385
1999	20,400	(10,800)	230	(230)	650	(380)	$153	(144)	$214
2000	34,100	(16,600)	0	(0)	1,930	(1,160)	$157	(146)	$213
2001	53,700	(22,200)	190	(190)	2,880	(1,940)	$282	(271)	$371
2002	59,200	(22,800)	100	(100)	3,090	(2,070)	$387	(374)	$502
2003	66,500	(21,500)	200	(200)	2,780	(2,080)	$435	(418)	$552
2004	71,500	(22,800)	360	(350)	3,170	(2,330)	$454	(439)	$561
2005	70,900	(23,700)	350	(350)	3,210	(2,600)	$483	(473)	$576
2006	80,400	(25,400)	240	(240)	2,880	(2,140)	$413	(400)	$478
2007	75,800	(26,300)	180	(180)	3,300	(2,430)	$326	(316)	$366
2008	76,000	(26,000)	260	(260)	3,470	(2,590)	$579	(566)	$628
2009	70,800	(23,600)	180	(180)	3,050	(2,190)	$571	(547)	$620
2010	73,400	(25,300)	280	(280)	3,390	(2,570)	$586	(573)	$627
2011*	73,900	(25,600)	280	(280)	3,850	(3,010)	$583	(570)	$605
2012	85,400	(30,300)	230	(230)	3,910	(3,040)	$826	(812)	$839
2013	84,500	(29,700)	330	(330)	3,610	(2,890)	$727	(711)	$727

* A calculation error in estimates of confined fires in 2011 has been corrected, resulting in increased estimates of fires, civilian injuries, and direct property damage.

Note: Numbers in parentheses exclude confined fires. Confined fires are fires reported as confined to a cooking vessel and involving cooking equipment; they are analyzed separately. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. *Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years are highly uncertain and must be used with caution*. Inflation adjustment to 2011 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: NFIRS and NFPA fire department experience survey.

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

Year	Gas	Electricity	Other Fuel	None
1950	59.6%	15.0%	25.2%	0.3%
1960	63.7%	30.8%	4.9%	0.5%
1970	57.6%	40.6%	1.4%	0.3%
1980	47.2%	52.1%	0.5%	0.2%
1985	43.7%	55.5%	0.3%	0.5%
1991	40.9%	58.2%	0.5%	0.4%
1993	40.1%	59.0%	0.5%	0.4%
1995	40.1%	59.0%	0.6%	0.3%
1999	39.9%	59.6%	0.1%	0.4%
2001	39.7%	59.9%	0.1%	0.3%
2003	40.3%	59.4%	0.1%	0.3%
2005	39.8%	60.0%	--	0.2%
2007	39.9%	59.9%	--	--
2009	39.8%	60.0%	0.1%	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 Charathe cteristics*, Series CH-2;and *Statistical Abstract of the United States*, 1994-2012 editions.

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

A. Input Data

	U.S. Households Using This Power As Primary Cooking Power (in Millions)	Annual Average of 2009-2013 U.S. Home Structure Fires Involving Range or Stove With This Power			
		Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
Gas	44.5	19,500	100	590	$111
Electricity	67.1	79,300	260	3,630	$681
All	118.8	99,000	370	4,230	$794

Note: Usage data after 2009 were not found. Therefore, in this analysis, usage is estimated by calculating the percentage of 2011 households obtained from "HH4.Households by Size: 1960 to Present" by the 2009 usage estimates presented in Table 2.4

Source: Data from NFIRS and NFPA fire department experience survey; *Statistical Abstract of the United States 2012*, Table 1001, and U.S. Census Bureau's HH4.Households by Size: 1960 to Present".

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 User Household
Gas	438	2.2	13.3	$2.50
Electricity	1,181	3.9	54.0	$10.20
All ranges	833	3.1	35.6	$6.70

Table 2.6. Home Fires Involving Ranges, by Factor Contributing to Ignition
2009-2013 Annual Averages

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment unattended	39,700	(40%)	190	(51%)	2,150	(51%)	$374	(47%)
Non-confined	14,800	(15%)	190	(51%)	1,730	(41%)	$370	(47%)
Confined	24,900	(25%)	0	(0%)	420	(10%)	$4	(0%)
Abandoned or discarded material or product	10,000	(10%)	30	(8%)	370	(9%)	$77	(10%)
Non-confined	2,900	(3%)	30	(8%)	230	(5%)	$76	(10%)
Confined	7,000	(7%)	0	(0%)	140	(3%)	$1	(0%)
Unintentionally turned on, not turned off	9,100	(9%)	30	(8%)	420	(10%)	$116	(15%)
Non-confined	3,600	(4%)	30	(8%)	350	(8%)	$115	(14%)
Confined	5,500	(6%)	0	(0%)	70	(2%)	$1	(0%)
Heat source too close to combustibles	8,100	(8%)	70	(19%)	450	(11%)	$86	(11%)
Non-confined	3,500	(4%)	70	(19%)	380	(9%)	$80	(10%)
Confined	4,600	(5%)	0	(0%)	70	(2%)	$5	(1%)
Failure to clean	6,800	(7%)	0	(1%)	60	(1%)	$11	(1%)
Non-confined	800	(1%)	0	(1%)	30	(1%)	$11	(1%)
Confined	6,000	(6%)	0	(0%)	30	(1%)	$0	(0%)
Unclassified misuse of material or product	6,300	(6%)	20	(5%)	290	(7%)	$47	(6%)
Non-confined	1,800	(2%)	20	(5%)	200	(5%)	$45	(6%)
Confined	4,500	(5%)	0	(0%)	80	(2%)	$2	(0%)
Unclassified factor contributed to ignition	4,800	(5%)	20	(5%)	200	(5%)	$33	(4%)
Non-confined	1,400	(1%)	20	(5%)	120	(3%)	$30	(4%)
Confined	3,400	(3%)	0	(0%)	80	(2%)	$3	(0%)
Electrical failure or malfunction	4,200	(4%)	10	(3%)	40	(1%)	$24	(3%)
Non-confined	1,300	(1%)	10	(3%)	40	(1%)	$24	(3%)
Confined	2,900	(3%)	0	(0%)	0	(0%)	$0	(0%)
Mechanical failure or malfunction	4,000	(4%)	0	(1%)	50	(1%)	$19	(2%)
Non-confined	1,100	(1%)	0	(1%)	40	(1%)	$18	(2%)
Confined	3,000	(3%)	0	(0%)	10	(0%)	$1	(0%)
Equipment not being operated properly	2,100	(2%)	10	(2%)	90	(2%)	$11	(1%)
Non-confined	500	(1%)	10	(2%)	60	(1%)	$10	(1%)
Confined	1,500	(2%)	0	(0%)	30	(1%)	$0	(0%)

Table 2.6. Home Fires Involving Ranges, by Factor Contributing to Ignition
2009-2013 Annual Averages (continued)

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified operational deficiency	1,800	(2%)	0	(1%)	70	(2%)	$11	(1%)
Non-confined	500	(0%)	0	(1%)	50	(1%)	$11	(1%)
Confined	1,300	(1%)	0	(0%)	20	(0%)	$0	(0%)
Improper container or storage	1,600	(2%)	0	(0%)	30	(1%)	$4	(0%)
Non-confined	300	(0%)	0	(0%)	20	(1%)	$3	(0%)
Confined	1,400	(1%)	0	(0%)	10	(0%)	$0	(0%)
Other known factor contributing to ignition	3,900	(4%)	20	(6%)	240	(6%)	$52	(6%)
Non-confined	1,600	(2%)	20	(6%)	190	(5%)	$51	(6%)
Confined	2,300	(2%)	0	(0%)	50	(1%)	$0	(0%)
Total Fires	99,000	(100%)	370	(100%)	4,230	(100%)	$794	(100%)
Non-confined	32,300	(33%)	370	(100%)	3,260	(77%)	$776	(98%)
Confined	66,700	(67%)	0	(0%)	970	(23%)	$19	(2%)
Total entries	102,400	(103%)	400	(109%)	4,470	(106%)	$864	(109%)
Non-confined	34,100	(34%)	400	(109%)	3,450	(82%)	$844	(106%)
Confined	68,300	(69%)	0	(0%)	1,010	(24%)	$19	(2%)
The following other known factors contributed to less than 2% of the fires but at least 2% of the deaths:								
Unclassified fire spread or control			10	(2%)				
Equipment used for unintended purpose			10	(2%)				
Flammable liquid or gas spilled			10	(2%)				

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 fire department experience survey.

Table 2.7. Home Fires Involving Gas-Fueled Ranges, by Factor Contributing to Ignition
2009-2013 Annual Averages

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment unattended	6,300	(32%)	30	(33%)	240	(40%)	$42	(38%)
Non-confined	1,500	(8%)	30	(33%)	170	(28%)	$41	(37%)
Confined	4,800	(24%)	0	(0%)	70	(12%)	$1	(0%)
Failure to clean	1,900	(10%)	0	(0%)	20	(3%)	$1	(1%)
Non-confined	200	(1%)	0	(0%)	0	(1%)	$1	(1%)
Confined	1,700	(9%)	0	(0%)	10	(2%)	$0	(0%)
Heat source too close to combustibles	1,800	(9%)	40	(37%)	90	(15%)	$13	(12%)
Non-confined	700	(4%)	40	(37%)	70	(12%)	$13	(12%)
Confined	1,100	(6%)	0	(0%)	20	(3%)	$0	(0%)
Abandoned or discarded material or product	1,700	(9%)	10	(8%)	50	(8%)	$8	(7%)
Non-confined	300	(1%)	10	(8%)	30	(6%)	$8	(7%)
Confined	1,500	(8%)	0	(0%)	10	(2%)	$0	(0%)
Unintentionally turned on, not turned off	1,600	(8%)	0	(3%)	50	(8%)	$17	(15%)
Non-confined	400	(2%)	0	(3%)	40	(7%)	$17	(15%)
Confined	1,200	(6%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified misuse of material or product	1,500	(8%)	10	(8%)	40	(7%)	$7	(7%)
Non-confined	300	(1%)	10	(8%)	30	(5%)	$7	(7%)
Confined	1,200	(6%)	0	(0%)	10	(2%)	$0	(0%)
Mechanical failure or malfunction	1,400	(7%)	0	(0%)	20	(4%)	$8	(7%)
Non-confined	500	(3%)	0	(0%)	20	(4%)	$8	(7%)
Confined	900	(5%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified factor contributed to ignition	1,200	(6%)	10	(12%)	30	(6%)	$7	(6%)
Non-confined	200	(1%)	10	(12%)	20	(3%)	$6	(6%)
Confined	1,000	(5%)	0	(0%)	20	(3%)	$0	(0%)
Improper container or storage	700	(4%)	0	(0%)	10	(2%)	$1	(1%)
Non-confined	100	(0%)	0	(0%)	10	(2%)	$1	(1%)
Confined	600	(3%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified operational deficiency	400	(2%)	0	(4%)	0	(1%)	$3	(2%)
Non-confined	100	(0%)	0	(4%)	0	(1%)	$3	(2%)
Confined	300	(2%)	0	(0%)	0	(0%)	$0	(0%)

Table 2.7. Home Fires Involving Gas-Fueled Ranges, by Factor Contributing to Ignition
2009-2013 Annual Averages (continued)

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment not being operated properly	400	(2%)	0	(0%)	10	(2%)	$2	(2%)
Non-confined	100	(0%)	0	(0%)	10	(2%)	$2	(2%)
Confined	300	(1%)	0	(0%)	0	(0%)	$0	(0%)
Other known factor contributing to ignition	1,100	(6%)	0	(3%)	70	(11%)	$10	(9%)
Non-confined	500	(2%)	0	(3%)	60	(11%)	$10	(9%)
Confined	600	(3%)	0	(0%)	0	(0%)	$0	(0%)
Total fires	19,500	(100%)	100	(100%)	590	(100%)	$111	(100%)
Non-confined	4,500	(23%)	100	(100%)	450	(76%)	$109	(98%)
Confined	15,000	(77%)	0	(0%)	150	(24%)	$2	(2%)
Total entries	20,100	(103%)	110	(108%)	640	(107%)	$117	(106%)
Non-confined	4,800	(25%)	110	(108%)	480	(82%)	$116	(104%)
Confined	15,200	(78%)	0	(0%)	150	(26%)	$2	(2%)

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 fire department experience survey.

Table 2.8. Home Fires Involving Electric-Powered Ranges, by Factor Contributing to Ignition
2009-2013 Annual Averages

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Equipment unattended	33,400	(42%)	150	(55%)	1,900	(52%)	$331	(49%)
Non-confined	13,300	(17%)	150	(55%)	1,550	(43%)	$327	(48%)
Confined	20,100	(25%)	0	(0%)	350	(10%)	$3	(0%)
Abandoned or discarded material or product	8,200	(10%)	20	(9%)	330	(9%)	$69	(10%)
Non-confined	2,700	(3%)	20	(9%)	200	(6%)	$68	(10%)
Confined	5,500	(7%)	0	(0%)	130	(4%)	$1	(0%)
Unintentionally turned on, not turned off	7,400	(9%)	20	(9%)	380	(11%)	$100	(15%)
Non-confined	3,200	(4%)	20	(9%)	310	(9%)	$99	(15%)
Confined	4,200	(5%)	0	(0%)	70	(2%)	$1	(0%)
Heat source too close to combustibles	6,300	(8%)	40	(16%)	360	(10%)	$72	(11%)
Non-confined	2,700	(3%)	40	(16%)	310	(9%)	$67	(10%)
Confined	3,500	(4%)	0	(0%)	50	(1%)	$5	(1%)
Failure to clean	4,900	(6%)	0	(1%)	50	(1%)	$11	(2%)
Non-confined	600	(1%)	0	(1%)	20	(1%)	$10	(2%)
Confined	4,300	(5%)	0	(0%)	20	(1%)	$0	(0%)
Unclassified misuse of material or product	4,700	(6%)	10	(3%)	240	(6%)	$39	(6%)
Non-confined	1,600	(2%)	10	(3%)	170	(5%)	$37	(5%)
Confined	3,200	(4%)	0	(0%)	60	(2%)	$2	(0%)
Electrical failure or malfunction	4,100	(5%)	10	(4%)	40	(1%)	$24	(3%)
Non-confined	1,200	(2%)	10	(4%)	40	(1%)	$23	(3%)
Confined	2,900	(4%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified factor contributed to ignition	3,500	(4%)	10	(3%)	170	(5%)	$26	(4%)
Non-confined	1,200	(1%)	10	(3%)	110	(3%)	$23	(3%)
Confined	2,400	(3%)	0	(0%)	60	(2%)	$3	(0%)
Mechanical failure or malfunction	2,600	(3%)	0	(1%)	30	(1%)	$11	(2%)
Non-confined	500	(1%)	0	(1%)	20	(1%)	$11	(2%)
Confined	2,100	(3%)	0	(0%)	10	(0%)	$0	(0%)
Equipment not being operated properly	1,700	(2%)	10	(2%)	70	(2%)	$9	(1%)
Non-confined	400	(1%)	10	(2%)	50	(1%)	$9	(1%)
Confined	1,200	(2%)	0	(0%)	20	(1%)	$0	(0%)

Table 2.8. Home Fires Involving Electric-Powered Ranges, by Factor Contributing to Ignition
2009-2013 Annual Averages
(Continued)

Factor	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified operational deficiency	1,400	(2%)	0	(0%)	60	(2%)	$8	(1%)
Non-confined	400	(0%)	0	(0%)	40	(1%)	$8	(1%)
Confined	1,000	(1%)	0	(0%)	20	(1%)	$0	(0%)
Other known factor contributing to ignition	3,900	(5%)	20	(6%)	200	(6%)	$47	(7%)
Non-confined	1,400	(2%)	20	(6%)	140	(4%)	$46	(7%)
Confined	2,500	(3%)	0	(0%)	60	(2%)	$0	(0%)
Total fires	79,300	(100%)	260	(100%)	3,630	(100%)	$681	(100%)
Non-confined	27,700	(35%)	260	(100%)	2,800	(77%)	$665	(98%)
Confined	51,600	(65%)	0	(0%)	820	(23%)	$17	(2%)
Total entries	82,200	(104%)	290	(111%)	3,820	(105%)	$746	(109%)
Non-confined	29,200	(37%)	290	(111%)	2,970	(82%)	$729	(107%)
Confined	53,000	(67%)	0	(0%)	860	(24%)	$17	(3%)
The following other known factors contributed to less than 2% of the fires but at least 2% of the deaths:								
Equipment used for unintended purpose			10	(2%)				
Unclassified fire spread or control			10	(2%)				

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

Source: Data from NFIRS 5.0 and NFPA fire department experience survey.

Table 2.9. Home Fires Involving Ranges, by Item First Ignited
2009-2013 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	69,200	(70%)	180	(49%)	3,100	(73%)	$476	(60%)
Non-confined	20,500	(21%)	180	(49%)	2,340	(55%)	$462	(58%)
Confined	48,700	(49%)	0	(0%)	760	(18%)	$14	(2%)
Household utensil	5,700	(6%)	30	(7%)	130	(3%)	$31	(4%)
Non-confined	1,300	(1%)	30	(7%)	100	(2%)	$30	(4%)
Confined	4,400	(4%)	0	(0%)	30	(1%)	$1	(0%)
Appliance housing or casing	4,900	(5%)	0	(1%)	100	(2%)	$31	(4%)
Non-confined	1,500	(2%)	0	(1%)	80	(2%)	$30	(4%)
Confined	3,400	(3%)	0	(0%)	20	(0%)	$1	(0%)
Unclassified item first ignited	3,900	(4%)	0	(1%)	120	(3%)	$21	(3%)
Non-confined	900	(1%)	0	(1%)	80	(2%)	$20	(3%)
Confined	2,900	(3%)	0	(0%)	40	(1%)	$1	(0%)
Flammable or combustible liquids or gases, piping or filter	3,300	(3%)	10	(2%)	260	(6%)	$34	(4%)
Non-confined	1,500	(2%)	10	(2%)	210	(5%)	$34	(4%)
Confined	1,800	(2%)	0	(0%)	50	(1%)	$1	(0%)
Cabinetry	2,300	(2%)	20	(5%)	130	(3%)	$68	(9%)
Non-confined	1,700	(2%)	20	(5%)	120	(3%)	$68	(8%)
Confined	500	(1%)	0	(0%)	10	(0%)	$0	(0%)
Other known item first ignited	9,700	(10%)	130	(34%)	380	(9%)	$134	(17%)
Non-confined	4,700	(5%)	130	(34%)	310	(7%)	$133	(17%)
Confined	4,900	(5%)	0	(0%)	60	(1%)	$1	(0%)
Total	99,000	(100%)	370	(100%)	4,230	(100%)	$794	(100%)
Non-confined	32,300	(33%)	370	(100%)	3,260	(77%)	$776	(98%)
Confined	66,700	(67%)	0	(0%)	970	(23%)	$19	(2%)

The following other known items were first ignisted in less than 2% of the fires but at least 10 or 2% of the deaths.

Clothing	70	(20%)
Interior wall covering	10	(3%)
Unclassified furniture or utensil	10	(2%)
Multiple items first ignited	10	(2%)

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

Source: Data from NFIRS Version 5.0 and NFPA fire department experience survey.

Table 2.10. Home Fires Involving Gas-Fueled Ranges, by Item First Ignited
2009-2013 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	12,500	(64%)	40	(39%)	330	(56%)	$53	(48%)
Non-confined	2,100	(11%)	40	(39%)	240	(40%)	$52	(47%)
Confined	10,400	(53%)	0	(0%)	90	(15%)	$1	(1%)
Household utensils	1,500	(8%)	0	(3%)	20	(4%)	$5	(4%)
Non-confined	200	(1%)	0	(3%)	20	(3%)	$4	(4%)
Confined	1,300	(7%)	0	(0%)	10	(1%)	$0	(0%)
Appliance housing or casing	1,000	(5%)	0	(0%)	10	(2%)	$4	(4%)
Non-confined	300	(1%)	0	(0%)	10	(1%)	$4	(4%)
Confined	700	(4%)	0	(0%)	0	(1%)	$0	(0%)
Unclassified item first ignited	1,000	(5%)	10	(5%)	30	(4%)	$5	(5%)
Non-confined	200	(1%)	10	(5%)	10	(2%)	$5	(4%)
Confined	800	(4%)	0	(0%)	10	(2%)	$0	(0%)
Flammable or combustible liquids or gases, piping or filter	900	(5%)	0	(3%)	80	(13%)	$7	(6%)
Non-confined	500	(2%)	0	(3%)	60	(11%)	$7	(6%)
Confined	400	(2%)	0	(0%)	10	(2%)	$0	(0%)
Cabinetry	300	(2%)	0	(3%)	30	(5%)	$9	(8%)
Non-confined	200	(1%)	0	(3%)	30	(5%)	$9	(8%)
Confined	100	(0%)	0	(0%)	0	(0%)	$0	(0%)
Box, carton, bag, basket, or barrel	300	(2%)	0	(0%)	10	(1%)	$4	(3%)
Non-confined	100	(1%)	0	(0%)	10	(1%)	$4	(3%)
Confined	200	(1%)	0	(0%)	0	(1%)	$0	(0%)
Other known item first ignited	2,100	(11%)	50	(47%)	90	(15%)	$23	(21%)
Non-confined	900	(5%)	50	(47%)	70	(13%)	$23	(21%)
Confined	1,100	(6%)	0	(0%)	10	(2%)	$0	(0%)
Total	19,500	(100%)	100	(100%)	590	(100%)	$111	(100%)
Non-confined	4,500	(23%)	100	(100%)	450	(76%)	$109	(98%)
Confined	15,000	(77%)	0	(0%)	150	(24%)	$2	(2%)
The following other known items were first ignited in less than 2% of the fires but at least 10 or 2% of the deaths:								
Clothing			30	(28%)				

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

Source: Data from NFIRS 5.0 and NFPA fire department experience survey.

Table 2.11. Home Fires Involving Electric-Powered Ranges, by Item First Ignited
2009-2013 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	56,300	(71%)	130	(50%)	2,760	(76%)	$422	(62%)
Non-confined	18,300	(23%)	130	(50%)	2,090	(58%)	$409	(60%)
Confined	38,000	(48%)	0	(0%)	670	(19%)	$13	(2%)
Household utensils	4,200	(5%)	30	(10%)	110	(3%)	$25	(4%)
Non-confined	1,100	(1%)	30	(10%)	90	(2%)	$25	(4%)
Confined	3,100	(4%)	0	(0%)	20	(1%)	$1	(0%)
Appliance housing or casing	4,000	(5%)	0	(2%)	90	(2%)	$25	(4%)
Non-confined	1,200	(2%)	0	(2%)	80	(2%)	$25	(4%)
Confined	2,800	(3%)	0	(0%)	10	(0%)	$1	(0%)
Unclassified item first ignited	3,000	(4%)	0	(0%)	100	(3%)	$16	(2%)
Non-confined	800	(1%)	0	(0%)	70	(2%)	$15	(2%)
Confined	2,200	(3%)	0	(0%)	30	(1%)	$0	(0%)
Flammable or combustible liquids or gases, piping or filter	2,500	(3%)	0	(1%)	180	(5%)	$27	(4%)
Non-confined	1,100	(1%)	0	(1%)	150	(4%)	$27	(4%)
Confined	1,400	(2%)	0	(0%)	30	(1%)	$0	(0%)
Cabinetry	2,000	(2%)	20	(7%)	110	(3%)	$57	(8%)
Non-confined	1,500	(2%)	20	(7%)	100	(3%)	$57	(8%)
Confined	400	(1%)	0	(0%)	10	(0%)	$0	(0%)
Electrical wire or cable insulation	1,200	(2%)	0	(0%)	10	(0%)	$7	(1%)
Non-confined	500	(1%)	0	(0%)	10	(0%)	$7	(1%)
Confined	700	(1%)	0	(0%)	0	(0%)	$0	(0%)
Other known item first ignited	6,100	(8%)	80	(31%)	270	(7%)	$101	(15%)
Non-confined	3,200	(4%)	80	(31%)	220	(6%)	$100	(15%)
Confined	2,900	(4%)	0	(0%)	50	(1%)	$1	(0%)
Total	79,300	(100%)	260	(100%)	3,630	(100%)	$681	(100%)
Non-confined	27,700	(35%)	260	(100%)	2,800	(77%)	$665	(98%)
Confined	51,600	(65%)	0	(0%)	820	(23%)	$17	(2%)
The following other known items were first ignited in less than 2% of the fires but at least 10 or 2% of the deaths:								
Clothing			50	(19%)				
Interior wall covering, excluding drapes			10	(5%)				

Note: Sums may not equal totals due to rounding errors. Unknowns have been allocated proportionally.
Source: Data from NFIRS 5.0 and NFPA fire department experience survey.

Table 2.12. Home Range Fires that Began with Cooking Materials, Including Food by Type of Material Fires Ignited: 2009-2013 Annual Averages

Type of Material First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Food or starch, excluding fat and grease	25,400	(37%)	40	(22%)	530	(17%)	$66	(14%)
Non-confined	3,400	(5%)	40	(22%)	310	(10%)	$65	(14%)
Confined	22,100	(32%)	0	(0%)	210	(7%)	$1	(0%)
Cooking oil, transformer or lubricating oil	22,500	(33%)	70	(39%)	1,610	(52%)	$250	(52%)
Non-confined	10,000	(15%)	70	(39%)	1,280	(41%)	$247	(52%)
Confined	12,500	(18%)	0	(0%)	340	(11%)	$3	(1%)
Fat, grease, butter, margarine or lard	16,600	(24%)	60	(34%)	820	(26%)	$126	(26%)
Non-confined	5,900	(9%)	60	(34%)	650	(21%)	$122	(26%)
Confined	10,800	(16%)	0	(0%)	170	(6%)	$4	(1%)
Unclassified type of material	1,300	(2%)	0	(2%)	20	(1%)	$5	(1%)
Non-confined	100	(0%)	0	(2%)	10	(0%)	$3	(1%)
Confined	1,100	(2%)	0	(0%)	10	(0%)	$1	(0%)
Plastic	900	(1%)	0	(0%)	20	(1%)	$3	(1%)
Non-confined	200	(0%)	0	(0%)	20	(1%)	$3	(1%)
Confined	700	(1%)	0	(0%)	10	(0%)	$0	(0%)
Other known type of material	2,400	(4%)	0	(2%)	90	(3%)	$27	(6%)
Non-confined	800	(1%)	0	(2%)	80	(3%)	$22	(5%)
Confined	1,600	(2%)	0	(0%)	20	(1%)	$5	(1%)
Total	69,200	(100%)	180	(100%)	3,100	(100%)	$476	(100%)
Non-confined	20,500	(30%)	180	(100%)	2,340	(75%)	$462	(97%)
Confined	48,700	(70%)	0	(0%)	760	(25%)	$14	(3%)

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

Source: Data from NFIRS 5.0 and NFPA fire department experience survey.

Table 2.13. Home Gas Range Fires that Began with Cooking Materials, Including Food by Type of Material First Ignited 2009-2013 Annual Averages

Type of Material First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Food or starch, excluding fat and grease	6,200	(49%)	0	(0%)	80	(25%)	$8	(15%)
Non-confined	400	(3%)	0	(0%)	40	(12%)	$7	(14%)
Confined	5,800	(46%)	0	(0%)	40	(13%)	$0	(1%)
Fat, grease, butter, margarine or lard	2,700	(22%)	10	(17%)	50	(14%)	$12	(23%)
Non-confined	600	(5%)	10	(17%)	40	(13%)	$12	(23%)
Confined	2,100	(17%)	0	(0%)	0	(1%)	$0	(0%)
Cooking oil, transformer or lubricating oil	2,500	(20%)	30	(73%)	170	(50%)	$28	(52%)
Non-confined	900	(7%)	30	(73%)	140	(42%)	$27	(51%)
Confined	1,500	(12%)	0	(0%)	30	(8%)	$0	(1%)
Unclassified type of material	300	(2%)	0	(10%)	10	(2%)	$1	(2%)
Non-confined	0	(0%)	0	(10%)	0	(1%)	$1	(2%)
Confined	300	(2%)	0	(0%)	0	(1%)	$0	(0%)
Plastic	200	(2%)	0	(0%)	10	(2%)	$0	(1%)
Non-confined	0	(0%)	0	(0%)	0	(1%)	$0	(1%)
Confined	200	(1%)	0	(0%)	0	(1%)	$0	(0%)
Other known type of material	600	(5%)	0	(0%)	20	(7%)	$4	(8%)
Non-confined	100	(1%)	0	(0%)	10	(4%)	$4	(7%)
Confined	500	(4%)	0	(0%)	10	(3%)	$0	(0%)
Total	12,500	(100%)	40	(100%)	330	(100%)	$53	(100%)
Non-confined	2,100	(17%)	40	(100%)	240	(72%)	$52	(98%)
Confined	10,400	(83%)	0	(0%)	90	(28%)	$1	(2%)

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

Source: Data from NFIRS 5.0 and NFPA fire department experience survey.

Table 2.14. Home Electric Range Fires that Began with Cooking Materials, Including Food by Type of Material First Ignited 2009-2013 Annual Averages

Type of Material First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Food or starch, excluding fat and grease	19,500	(35%)	30	(27%)	1,430	(52%)	$222	(53%)
Non-confined	9,100	(16%)	30	(27%)	1,130	(41%)	$220	(52%)
Confined	10,400	(18%)	0	(0%)	300	(11%)	$3	(1%)
Cooking oil, transformer or lubricating oil	19,400	(34%)	30	(26%)	440	(16%)	$59	(14%)
Non-confined	2,900	(5%)	30	(26%)	260	(10%)	$58	(14%)
Confined	16,500	(29%)	0	(0%)	180	(7%)	$1	(0%)
Fat, grease, butter, margarine or lard	14,000	(25%)	60	(43%)	780	(28%)	$113	(27%)
Non-confined	5,300	(9%)	60	(43%)	610	(22%)	$109	(26%)
Confined	8,700	(15%)	0	(0%)	170	(6%)	$4	(1%)
Unclassified type of material	1,000	(2%)	0	(0%)	20	(1%)	$4	(1%)
Non-confined	100	(0%)	0	(0%)	0	(0%)	$2	(1%)
Confined	900	(2%)	0	(0%)	10	(0%)	$1	(0%)
Other known type of material	2,500	(4%)	0	(3%)	90	(3%)	$25	(6%)
Non-confined	900	(2%)	0	(3%)	80	(3%)	$20	(5%)
Confined	1,600	(3%)	0	(0%)	10	(0%)	$5	(1%)
Total	56,300	(100%)	130	(100%)	2,760	(100%)	$422	(100%)
Non-confined	18,300	(33%)	130	(100%)	2,090	(76%)	$409	(97%)
Confined	38,000	(67%)	0	(0%)	670	(24%)	$13	(3%)

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

Source: Data from NFIRS 5.0 and NFPA fire department experience survey.

Table 2.15. Home Fires Involving Ranges, by Extent of Flame Damage
2009-2013 Annual Averages

Extent of Flame Damage	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	66,700	(67%)	0	(0%)	970	(23%)	$19	(2%)
Confined to object of origin	5,000	(5%)	30	(9%)	240	(6%)	$36	(5%)
Confined to room of origin	22,100	(22%)	110	(30%)	2,290	(54%)	$306	(39%)
Confined to floor of origin	1,700	(2%)	60	(16%)	270	(6%)	$105	(13%)
Confined to building of origin	3,200	(3%)	140	(38%)	420	(10%)	$297	(37%)
Extended beyond building of origin	200	(0%)	30	(7%)	40	(1%)	$32	(4%)
Total	99,000	(100%)	370	(100%)	4,230	(100%)	$794	(100%)

2.16. Hospital Emergency Room Visits for Injuries
Involving Ranges or Ovens During 2012, by Leading Diagnoses

Diagnosis	Injuries	
Thermal burn	16,400	(41%)
Thermal contact/non-fire burn	13,900	(35%)
Victim under 5	**5,100**	**(13%)**
Thermal fire, flame or flash burn	2,600	(6%)
Laceration	4,800	(12%)
Anoxia	4,400	(11%)
Scald burns	4,400	(11%)
Strain or sprain	2,100	(5%)
Contusion or abrasion	1,400	(3%)
All other	6,200	(16%)
Total	39,600	(100%)

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

Table 2.17. Hospital Emergency Room Visits for Injuries Involving Ranges or Ovens During 2012, by Range Power Source

Power Source	Injuries	
Electric range or oven	23,300	(59%)
Gas range or oven	16,000	(41%)

Note: Unspecified types of ranges or ovens were allocated proportionally among the specified types of ranges or ovens. The number of cases with "other ranges or ovens" was too small for reliable estimates. These cases were excluded from the calculations.

Source: CPSC's National Electronic Injury Surveillance System (NEISS) queried in October 2011.

Appendix A.
How National Estimates Statistics Are Calculated

The statistics in this analysis are estimates derived from the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA's) annual survey of U.S. fire departments. NFIRS is a voluntary system by which participating fire departments report detailed factors about the fires to which they respond. Roughly two-thirds of U.S. fire departments participate, although not all of these departments provide data every year. Fires reported to federal or state fire departments or industrial fire brigades are not included in these estimates.

NFIRS provides the most detailed incident information of any national database not limited to large fires. NFIRS is the only database capable of addressing national patterns for fires of all sizes by specific property use and specific fire cause. NFIRS also captures information on the extent of flame spread, and automatic detection and suppression equipment. For more information about NFIRS visit http://www.nfirs.fema.gov/. Copies of the paper forms may be downloaded from http://www.nfirs.fema.gov/documentation/design/NFIRS_Paper_Forms_2008.pdf.

NFIRS has a wide variety of data elements and code choices. The NFIRS database contains coded information. Many code choices describe several conditions. These cannot be broken down further. For example, area of origin code 83 captures fires starting in vehicle engine areas, running gear areas or wheel areas. It is impossible to tell the portion of each from the coded data.

Methodology may change slightly from year to year.
NFPA is continually examining its methodology to provide the best possible answers to specific questions, methodological and definitional changes can occur. *Earlier editions of the same report may have used different methodologies to produce the same analysis, meaning that the estimates are not directly comparable from year to year*.

NFPA's fire department experience survey provides estimates of the big picture.
Each year, NFPA conducts an annual survey of fire departments which enables us to capture a summary of fire department experience on a larger scale. Surveys are sent to all municipal departments protecting populations of 50,000 or more and a random sample, stratified by community size, of the smaller departments. Typically, a total of roughly 3,000 surveys are returned, representing about one of every ten U.S. municipal fire departments and about one third of the U.S. population.

The survey is stratified by size of population protected to reduce the uncertainty of the final estimate. Small rural communities have fewer people protected per department and are less likely to respond to the survey. A larger number must be surveyed to obtain an adequate sample of those departments. (NFPA also makes follow-up calls to a sample of the smaller fire departments that do not respond, to confirm that those that did respond are truly representative of fire departments their size.) On the other hand, large city

departments are so few in number and protect such a large proportion of the total U.S. population that it makes sense to survey all of them. Most respond, resulting in excellent precision for their part of the final estimate.

The survey includes the following information: (1) the total number of fire incidents, civilian deaths, and civilian injuries, and the total estimated property damage (in dollars), for each of the major property use classes defined in NFIRS; (2) the number of on-duty firefighter injuries, by type of duty and nature of illness; 3) the number and nature of non-fire incidents; and (4) information on the type of community protected (e.g., county versus township versus city) and the size of the population protected, which is used in the statistical formula for projecting national totals from sample results. The results of the survey are published in the annual report *Fire Loss in the United States*. To download a free copy of the report, visit http://www.nfpa.org/assets/files/PDF/OS.fireloss.pdf.

Projecting NFIRS to National Estimates

As noted, NFIRS is a voluntary system. Different states and jurisdictions have different reporting requirements and practices. Participation rates in NFIRS are not necessarily uniform across regions and community sizes, both factors correlated with frequency and severity of fires. This means NFIRS may be susceptible to systematic biases. No one at present can quantify the size of these deviations from the ideal, representative sample, so no one can say with confidence that they are or are not serious problems. But there is enough reason for concern so that a second database -- the NFPA fire department experience 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 fire department experience survey where its statistical design advantages are strongest.

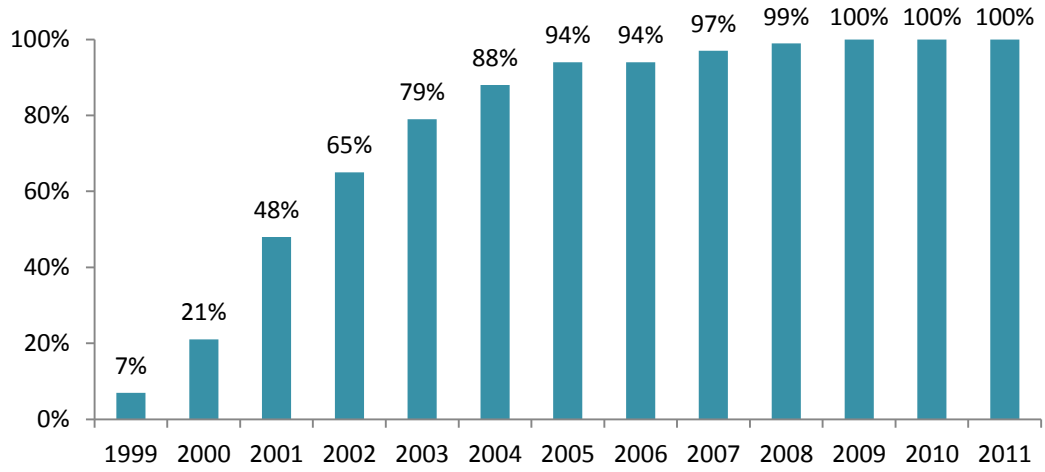
Scaling ratios are obtained by comparing NFPA's projected totals of residential structure fires, non-residential structure fires, vehicle fires, and outside and other fires, and associated civilian deaths, civilian injuries, and direct property damage with comparable totals in NFIRS. Estimates of specific fire problems and circumstances are obtained by multiplying the NFIRS data by the scaling ratios. Reports for incidents in which mutual aid was given are excluded from NFPA's analyses.

Analysts at the NFPA, the USFA and the Consumer Product Safety Commission developed the specific basic analytical rules used for this procedure. "The National Estimates Approach to U.S. Fire Statistics," by John R. Hall, Jr. and Beatrice Harwood, provides a more detailed explanation of national estimates. A copy of the article is available online at http://www.nfpa.org/osds or through NFPA's One-Stop Data Shop.

Version 5.0 of NFIRS, first introduced in 1999, used a different coding structure for many data elements, added some property use codes, and dropped others. The essentials of the approach described by Hall and Harwood are still used, but some modifications have been necessary to accommodate the changes in NFIRS 5.0.

Figure A.1 shows the percentage of fires originally collected in the NFIRS 5.0 system. Each year's release version of NFIRS data also includes data collected in older versions of NFIRS that were converted to NFIRS 5.0 codes.

Figure A.1. Fires Originally Collected in NFIRS 5.0 by Year



From 1999 data on, analyses are based on scaling ratios using only data originally collected in NFIRS 5.0:

NFPA fire department experience survey projections
NFIRS totals (Version 5.0)

For 1999 to 2001, the same rules may be applied, but estimates for these years in this form will be less reliable due to the smaller amount of data originally collected in NFIRS 5.0; they should be viewed with extreme caution.

NFIRS 5.0 introduced six categories of confined structure fires, including:

- cooking fires confined to the cooking vessel,
- confined chimney or flue fires,
- confined incinerator fire,
- confined fuel burner or boiler fire or delayed ignition,
- confined commercial compactor fire, and
- trash or rubbish fires in a structure with no flame damage to the structure or its contents.

Although causal and other detailed information is typically not required for these incidents, it is provided in some cases. Some analyses, particularly those that examine cooking equipment, heating equipment, fires caused by smoking materials, and fires started by playing with fire, may examine the confined fires in greater detail. Because the confined fire incident types describe certain scenarios, the distribution of unknown data differs from that of all fires. Consequently, allocation of unknowns must be done separately.

Some analyses of structure fires show only non-confined fires. In these tables, percentages shown are of non-confined structure fires rather than all structure fires. This approach has the advantage of showing the frequency of specific factors in fire causes, but the disadvantage of possibly overstating the percentage of factors that are seldom seen in the confined fire incident types and of understating the factors specifically associated with the confined fire incident types.

Other analyses include entries for confined fire incident types in the causal tables and show percentages based on total structure fires. In these cases, the confined fire incident type is treated as a general causal factor.

For most fields other than Property Use and Incident Type, NFPA allocates unknown data proportionally among known data. This approach assumes that if the missing data were known, it would be distributed in the same manner as the known data. NFPA makes additional adjustments to several fields. *Casualty and loss projections can be heavily influenced by the inclusion or exclusion of unusually serious fire*.

In the formulas that follow, the term "all fires" refers to all fires in NFIRS on the dimension studied. The percentages of fires with known or unknown data are provided for non-confined fires and associated losses, and for confined fires only.

Cause of Ignition: This field is used chiefly to identify intentional fires. "Unintentional" in this field is a specific entry and does not include other fires that were not intentionally set: failure of equipment or heat source, act of nature, or "other" (unclassified)." The last should be used for exposures but has been used for other situations as well. Fires that were coded as under investigation and those that were coded as undetermined after investigation were treated as unknown.

Factor Contributing to Ignition: In this field, the code "none" is treated as an unknown and allocated proportionally. For Human Factor Contributing to Ignition, NFPA enters a code for "not reported" when no factors are recorded. "Not reported" is treated as an unknown, but the code "none" is treated as a known code and not allocated. Multiple entries are allowed in both of these fields. Percentages are calculated on the total number of fires, not entries, resulting in sums greater than 100%. Although Factor Contributing to Ignition is only required when the cause of ignition was coded as: 2) unintentional, 3) failure of equipment or heat source; or 4) act of nature, data is often present when not required. Consequently, any fire in which no factor contributing to ignition was entered was treated as unknown.

In some analyses, all entries in the category of mechanical failure, malfunction (factor contributing to ignition 20-29) are summed and shown as one entry, "mechanical failure or malfunction." This category includes:

21. Automatic control failure;
22. Manual control failure;
23. Leak or break. Includes leaks or breaks from containers or pipes. Excludes operational deficiencies and spill mishaps;
25. Worn out;
26. Backfire. Excludes fires originating as a result of hot catalytic converters;
27. Improper fuel used; Includes the use of gasoline in a kerosene heater and the like; and
20. Mechanical failure or malfunction, other.

Entries in "electrical failure, malfunction" (factor contributing to ignition 30-39) may also be summed into one entry, "electrical failure or malfunction." This category includes:

31. Water-caused short circuit arc;
32. Short-circuit arc from mechanical damage;
33. Short-circuit arc from defective or worn insulation;
34. Unspecified short circuit arc;
35. Arc from faulty contact or broken connector, including broken power lines and loose connections;
36. Arc or spark from operating equipment, switch, or electric fence;
37. Fluorescent light ballast; and
30. Electrical failure or malfunction, other.

Heat Source. In NFIRS 5.0, one grouping of codes encompasses various types of open flames and smoking materials. In the past, these had been two separate groupings. A new code was added to NFIRS 5.0, which is code 60: "Heat from open flame or smoking material, other." NFPA treats this code as a partial unknown and allocates it proportionally across the codes in the 61-69 range, shown below.

61. Cigarette;
62. Pipe or cigar;
63. Heat from undetermined smoking material;
64. Match;
65. Lighter: cigarette lighter, cigar lighter;
66. Candle;
67 Warning or road flare, fuse;
68. Backfire from internal combustion engine. Excludes flames and sparks from an exhaust system, (11); and
69. Flame/torch used for lighting. Includes gas light and gas-/liquid-fueled lantern.

In addition to the conventional allocation of missing and undetermined fires, NFPA multiplies fires with codes in the 61-69 range by

$$\frac{\text{All fires in range 60-69}}{\text{All fires in range 61-69}}$$

The downside of this approach is that heat sources that are truly a different type of open flame or smoking material are erroneously assigned to other categories. The grouping "smoking materials" includes codes 61-63 (cigarettes, pipes or cigars, and heat from undetermined smoking material, with a proportional share of the code 60s and true unknown data.

Equipment Involved in Ignition (EII). NFIRS 5.0 originally defined EII as the piece of equipment that provided the principal heat source to cause ignition if the equipment malfunctioned or was used improperly. In 2006, the definition was modified to "the piece of equipment that provided the principal heat source to cause ignition." However, much of the data predates the change. Individuals who have already been trained with the older definition may not change their practices. To compensate, NFPA treats fires in which EII = NNN and heat source is not in the range of 40-99 as an additional unknown.

To allocate unknown data for EII, the known data is multiplied by

$$\frac{\text{All fires}}{\text{(All fires – blank – undetermined – [fires in which EII =NNN and heat source <>40-99])}}$$

In addition, the partially unclassified codes for broad equipment groupings (i.e., code 100 - heating, ventilation, and air conditioning, other; code 200 - electrical distribution, lighting and power transfer, other; etc.) were allocated proportionally across the individual code choices in their respective broad groupings (heating, ventilation, and air conditioning; electrical distribution, lighting and power transfer, other; etc.). Equipment that is totally unclassified is not allocated further. This approach has the same downside as the allocation of heat source 60 described above. Equipment that is truly different is erroneously assigned to other categories.

In some analyses, various types of equipment are grouped together.

Code Grouping	**EII Code**	**NFIRS definitions**
Central heat	132	Furnace or central heating unit
	133	Boiler (power, process or heating)
Fixed or portable space heater	131	Furnace, local heating unit, built-in
	123	Fireplace with insert or stove
	124	Heating stove
	141	Heater, excluding catalytic and oil-filled
	142	Catalytic heater
	143	Oil-filled heater
Fireplace or chimney	120	Fireplace or chimney
	121	Fireplace, masonry
	122	Fireplace, factory-built
	125	Chimney connector or vent connector
	126	Chimney – brick, stone or masonry
	127	Chimney-metal, including stovepipe or flue
Fixed wiring and related equipment	210	Unclassified electrical wiring
	211	Electrical power or utility line
	212	Electrical service supply wires from utility
	213	Electric meter or meter box
	214	Wiring from meter box to circuit breaker
	215	Panel board, switch board or circuit breaker board
	216	Electrical branch circuit
	217	Outlet or receptacle
	218	Wall switch
	219	Ground fault interrupter
Transformers and power supplies	221	Distribution-type transformer
	222	Overcurrent, disconnect equipment
	223	Low-voltage transformer
	224	Generator
	225	Inverter
	226	Uninterrupted power supply (UPS)
	227	Surge protector
	228	Battery charger or rectifier
	229	Battery (all types)
Lamp, bulb or lighting	230	Unclassified lamp or lighting

	231	Lamp-tabletop, floor or desk
	232	Lantern or flashlight
	233	Incandescent lighting fixture
	234	Fluorescent light fixture or ballast
	235	Halogen light fixture or lamp
	236	Sodium or mercury vapor light fixture or lamp
	237	Work or trouble light
	238	Light bulb
	241	Nightlight
	242	Decorative lights – line voltage
	243	Decorative or landscape lighting – low voltage
	244	Sign
Cord or plug	260	Unclassified cord or plug
	261	Power cord or plug, detachable from appliance
	262	Power cord or plug- permanently attached
	263	Extension cord
Torch, burner or soldering iron	331	Welding torch
	332	Cutting torch
	333	Burner, including Bunsen burners
	334	Soldering equipment
Portable cooking or warming equipment	631	Coffee maker or teapot
	632	Food warmer or hot plate
	633	Kettle
	634	Popcorn popper
	635	Pressure cooker or canner
	636	Slow cooker
	637	Toaster, toaster oven, counter-top broiler
	638	Waffle iron, griddle
	639	Wok, frying pan, skillet
	641	Bread making machine

Equipment was not analyzed separately for confined fires. Instead, each confined fire incident type was listed with the equipment or as other known equipment.

Item First Ignited. In most analyses, mattress and pillows (item first ignited 31) and bedding, blankets, sheets, and comforters (item first ignited 32) are combined and shown as "mattresses and bedding." In many analyses, wearing apparel not on a person (code 34) and wearing apparel on a person (code 35) are combined and shown as "clothing." In some analyses, flammable and combustible liquids and gases, piping and filters (item first ignited 60-69) are combined and shown together.

Area of Origin. Two areas of origin: bedroom for more than five people (code 21) and bedroom for less than five people (code 22) are combined and shown as simply "bedroom." Chimney is no longer a valid area of origin code for non-confined fires.

Rounding and percentages. The data shown are estimates and generally rounded. An entry of zero may be a true zero or it may mean that the value rounds to zero. Percentages are calculated from unrounded values. It is quite possible to have a percentage entry of up to 100% even if the rounded number entry is zero. The same rounded value may account for a slightly different percentage share. Because percentages are expressed in integers and not carried out to several

decimal places, percentages that appear identical may be associated with slightly different values.

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.

Man dies when clothes ignite in kitchen fire, Virginia
A man who was reheating leftovers in his kitchen died when his clothing ignited.

The fire occurred in a two-story, owner-occupied, single family dwelling that was divided into two units. The building was constructed of wood framing, with an exterior of wood and brick veneer. The dimensions of the home were not reported. Only the base of a smoke alarm was present, and no detectors were found in the home. There were no sprinklers.

Investigators determined that the victim was intoxicated when he returned home and tried to reheat some food. When his clothing ignited, he tried to extinguish the flames and ran to his roommate's room, banging on the door. The roommate was initially scared when he opened his door and closed it again, but then reopened it and led the victim to the bathroom tub, where firefighters found him.

Fire spread in the house was minimal, with damages estimated at $8,000. The victim, whose age was not reported, died of his injuries, including smoke inhalation and burns.

Kenneth J. Tremblay, 2008, Firewatch, NFPA Journal, September/October 2015

Sprinkler extinguishes apartment building fire, Tennessee
A single sprinkler extinguished a fire that began in the apartment of a man with a mobility disability when a pan of smoking oil he was trying to put into the sink suddenly ignited.

The single-story, wood-frame apartment building measured 100 feet (30 meters) by 45 feet (14 meters) and contained five units. A wet-pipe sprinkler system provided coverage in all the living areas, and smoke detectors were located in the hallway of each unit.

The man was cooking eggs, when he left the stove unattended to use the bathroom. In his absence, the oil in the pan overheated and began smoking. After he returned, he tried to move the

pan to the sink when it suddenly ignited. Fortunately, the sprinkler activated, extinguishing the fire and preventing the man from
being injured.

The building, valued at $250,000, and its contents, valued at $5,000, sustained damage estimated at just $1,100.

Kenneth J. Tremblay, 2008, Firewatch, NFPA Journal, July/August 2015

Unattended cooking causes residential fire,Minnesota
A fire that started when the occupant of a second-floor apartment left a pan of food heating on the stove was quickly doused by the building's sprinklers before it could do much damage.

The two-story concrete structure, which measured 141 feet (43 meters) by 30 feet (9 meters), had been converted from a motel into a nine-unit apartment building. Each apartment contained hardwired smoke detectors with battery back-up, as well as a full-coverage wet-pipe sprinkler system that was monitored by a central station alarm company.

An occupant below the unit of origin called 911 at 3 p.m. after she heard the smoke alarm sounding and saw water dripping into her own apartment from above. By the time firefighters arrived, a single sprinkler head had extinguished the blaze, which investigators determined started when the food in the pan overheated and spread around the stovetop until the sprinklers activated.

Damage to the building was estimated at $5,000, while damage to its contents came to $2,000.

Kenneth J. Tremblay, 2015," Firewatch", NFPA Journal, May/June 2015

Man dies in kitchen fire, Tennessee
A 64-year-old man died in a fire that was determined by investigators to have started in cookware on the kitchen stove, then spread to a family room and hallway.

The one-story, wood-frame dwelling, which was 50 feet (15 meters) long and 20 feet (6 meters) wide, had smoke alarms outside the bedrooms and in the stairwell leading to the basement.

A passerby discovered the fire and called 911 at 1 a.m. Responding firefighters found heavy flames coming from the rear of the house and the attic, and advanced two hose lines into the building to attack the fire in the kitchen and in the living room and bedrooms. During a secondary search of the premises, they located the victim's body in the kitchen.

The house, which was valued at $120,000, sustained an estimated $80,000 in damage. Its contents, which were valued at $50,000, sustained $1,500 in damage.

Kenneth J. Tremblay, 2015," Firewatch", NFPA Journal, May/June 2015

Woman dies in unattended cooking fire, Minnesota

A 50-year-old woman died of smoke inhalation in a fire that started in the kitchen of her one-story duplex, which had neither smoke alarms nor sprinklers.

Firefighters received a 911 call reporting the fire at 10:18 p.m. and arrived three minutes later to find smoke coming from the front door. They advanced a hose line into the house, confining the fire to the kitchen, and quickly found the victim. Medics performed CPR on her but were unable to revive her, and she was pronounced dead at the scene. They also found the body of the woman's dog.

Investigators determined that the fire started when the woman left a pan of food cooking unattended on the gas stove. When reconstructing her activities, they deduced that she moved the pan to the counter, where it smoldered, and that fire burned upwards to the cupboards, creating heavy smoke. One of the knobs on the stovetop was found in the "on" position.

The victim's boyfriend discovered the fire when he came home at about 10 p.m. and found the apartment filled with smoke. He found the woman lying between the kitchen and bathroom. He tried to pull her out of the unit, but he was overwhelmed by the smoke. Unable to save her, he called 911 to report the fire.

Damage to the duplex and its contents was estimated at $150,000.

Kenneth J. Tremblay, 2015," Firewatch", *NFPA Journal*, March/April 2015

Couple killed in house fire, Florida

A 65-year-old man and 64-year-old wife, both of whom had mobility disabilities, died in a house fire that started when the man, who used a wheel chair, splattered hot cooking grease on the kitchen cabinets and the floor.

The one-story, wood-frame house, which measured 50 feet (15 meters) by 24 feet (7 meters), had no smoke alarms or sprinklers.

An occupant of the house called 911 at 5:45 p.m., but the couple was unable to use the wheelchair ramp to escape because it was blocked by fire. Both victims suffered smoke inhalation; the man was also burned.

The home, which was valued at $40,000, sustained damage estimated at $30,000. Its contents, valued at $10,000, sustained an estimated $5,000.

Kenneth J. Tremblay, 2015," Firewatch", *NFPA Journal*, January/February 34.

Man dies in cooking fire, Wisconsin
A man died in a fire that started on the kitchen stove in his single-family home.

The two-story, wood-frame house, which measured 40 feet (12 meters) by 28 feet (9 meters, had a smoke alarm, but firefighters did not hear it operating. There were on sprinklers.

A neighbor called 911 at 5:37 a.m. to report that a house was on fire and that the occupant was trapped inside. By the time firefighters arrived seven minutes later, they found most of the first floor of the home involved in flames. The incident commander began a defensive attack and ordered additional resources to the scene.

Once the fire was under control, firefighters entered the house to search for the trapped man. Upon reaching the second floor, however, they encountered intense heat and had to pull back. Additional hose lines were deployed to control the fire, which was spreading to the garage. Forty-five minutes later, firefighters spotted the victim through a first-floor window.

Investigators determined that the fire started on the stove and spread to other areas of the house undetected. Possible alcohol impairment was cited as contributing factor.

The victim, whose age was not reported, died of smoke inhalation and burns. The fire destroyed the house, which was valued at $85,000.

Kenneth J. Tremblay, 2015," Firewatch", *NFPA Journal*, January/February 30.

Unattended cooking blamed for fatal house fire, Minnesota
A 31-year-old man died of smoke inhalation in a fire that started when food left cooking unattended on the stove ignited.

The fire occurred in a one-story, side-by-side, wood-frame duplex that was 40 feet(12 meters) long and 30 feet (9 meters) wide. The victim's apartment had two bedrooms, a bath, a kitchen, a living/dining room, and an attached garage. Hardwired smoke detectors with battery backup had been installed in the hallway outside the bedrooms, but neither neighbors nor firefighters reported hearing the alarm. There were no sprinklers.

The occupant of the other half of the duplex called 911 at 12:48 a.m. when he was awakened by a pounding sound and the smell of smoke.

Responding firefighters forced the door open and discovered that a fire in the kitchen had nearly burned itself out. They extinguished the blaze and found the victim kneeling in a closet that was closest to a hallway door, overcome by smoke inhalation. Fire medics began advanced life support at the scene until emergency responders arrived to transport him to the hospital, where he later died.

Investigators determined that a pot of food had been left heating unattended on the gas stove in the kitchen. Eventually, the contents ignited, and the fire spread to overhead wooden cabinets,

filling the unit with smoke. The also found a smoke detector, which had no battery, lying on the floor, where they believe it had fallen from the ceiling.

The house, valued at $181,000, sustained an estimated $40,00 in damage. Damage to its contents was estimated at $10,000.

Kenneth J. Tremblay, 2014," Firewatch", *NFPA Journal*, November/December 34.

Woman dies in unattended cooking fire, Georgia
A 48-year-old woman died of smoke inhalation after a fire broke out in her basement apartment.

The unsprinklered apartment was in a two-story duplex that measured 37 feet (11 meters) by 28 feet (9 meters). A single-station, battery-operated smoke alarm had been installed in the living/dining room of the apartment of origin, but it did not have a battery.

Investigators determined that the fire started after food heating on the gas stove ignited. Firefighters believe the victim might have been trying to open a window to escape. Investigators also determined that the victim was under the influence of prescription medication, which might have contributed to her death.

The house, valued at $75,000, sustained $10,000 in damage. Damage to its contents, valued at $10,000, is estimated at $4,000.

Kenneth J. Tremblay, 2014," Firewatch", *NFPA Journal*, November/December 33-34.

Flash fire injures two, Maryland
Two occupants of a third-floor condominium suffered burns to their faces and hands when a portable butane-fired burner they were using to cook on top of a dining room table ignited in a flash fire. Fortunately, a sprinkler activated and controlled the fire until the fire department arrived.

The condominium, which was part of a four-story, multi-unit building, covered approximately 1,800 Square feet (167 square meters). Monitored, hardwired smoke detectors had been installed in each unit, as had a wet-pipe sprinkler system.

Firefighters received the automatic alarm at 7:51 p.m. and were met on arrival by the two burn victims, who were standing outside the building. They told the fire crews that the fire "was not active" but that they needed emergency medical care. When the fire crews entered the building, they found the other occupants, who had evacuated upon hearing the fire alarms, gathering on the first floor. Entering the unit of origin, they found that the sprinkler had already extinguished the blaze.

Investigators determined that a butane leak or a failure of the stove led to the release of gas, which ignited in a flash fire. The occupants told them that the stove had been in use for 20

minutes when the flame went out. About 20 minutes after one of them restarted the stove, the fire occurred.

Damage was estimated at $3,000.

Kenneth J. Tremblay, 2014," Firewatch", *NFPA Journal*,July/August, 30-31.

Unattended cooking leads to fatal fire, Maryland
A 79-year-old man died of smoke inhalation and burns during a fire that started in the kitchen of his apartment when food he had left cooking unattended in a microwave ignited.

The 18-story apartment building, which housed older adults, had no sprinklers n the units or in the common areas. However, every unit was equipped with local smoke alarms.

Firefighters, who arrived on scene minutes after the fire was reported at 6:54 p.m., found the door to the 16th-floor apartment locked and forced their way in. Once inside, they found the victim lying on the kitchen floor with his clothing in flames. He was unconscious but breathing, and they transported him t the hospital, where he succumbed to his injuries.

Investigators found the remains of the victim's dinner half in and half out of the microwave oven and determined that the food had ignited when left unattended. The location of the burnt meal and the proximity of the victim suggested that he was trying to remove the food from the microwave as the flames spread to combustibles on the counter, the stove, the kitchen floor, and his clothes.

The victim, who was using home oxygen at the time of the fire, had recently returned home from a stay in the hospital and had to use a walker for support when moving around his apartment.

Property damage to the apartment contents was estimated at $2,000. Damage to the structure was estimated at $10,000.

Kenneth J. Tremblay, 2014," Firewatch", *NFPA Journal*, May/June, 50.

Victim's clothing ignites, Virginia
A 92-year-old man, who used a walker, died of burns he suffered when his clothes ignited during a fire that started when oil he had left heating in a pan ignited.

the 14-story, steel-frame apartment building, which contained 203-units, had no sprinklers. However, local smoke alarms had been installed in each unit, and the common areas were equipped with smoke detectors and manual pull stations.

The victim, who was still conscious when firefighters arrived, told them that he used the water spray from his kitchen faucet to extinguish the flames, then removed his burned clothes and walked to the foyer to call for help. A neighbor heard his dries and called 911 at 9:40 p.m. He was taken to the hospital, where he died.

Investigators found evidence in the kitchen consistent with the victim's account. The burner controls were located on the back of the stove, and when the man reached over the flaming pan to turn off the burner, his sleeve ignited.

Property damage was estimated at approximately $2,000.

Kenneth J. Tremblay, 2014," Firewatch", *NFPA Journal*, May/June, 44.

Woman dies when stove ignites clothing, Ohio
A 78-year-old woman died of burns she received when her pajama sleeve caught fire as she cooked breakfast for her husband.

The fire occurred in a two-story, wood-frame house that was 32 feet (10 meters) long and 36 feet (11 meters) wide. The smoke alarm on the first floor of the single-family home operated. There were no sprinklers.

The fire department received a 911 call at 10:25 a.m. reporting the fire, and by the time firefighters arrived at the house, the flames on the victim's clothing had been extinguished.

Investigators determined that the sleeve of the woman's loose-fitting flannel pajamas ignited when it passed over the gas burner on which she was cooking eggs. The smoke alarm located just outside the kitchen alerted her husband, who tried to extinguish the fire with his hands, severely burning them. Both victims were taken to a burn clinic, where the woman died of second-and third-degree burns to 60 percent of her body.

No loss estimates were reported for the house, valued at $78,000, or its contents, valued at $10,000. There was only smoke damage in the kitchen.

Kenneth J. Tremblay, 2014," Firewatch", *NFPA Journal*, March/April 30-31.

Grill ignites deck and spreads to interior of home, North Carolina
A 36-year-old man and his two daughters, ages 4 and 6, died in a fire that investigators believe began when a charcoal grill on the wooden deck of their home ignited decking material during the night.

The two-story, wood-frame house had smoke detectors on the first and second floors that were tied into a monitored fire and burglar alarm system. There were no sprinklers.

The residents were wakened by the smoke detector and called 911 from the house at 1:50 a.m. The male victim's wife was on the scene when firefighters arrived and told them that her husband and two children were still inside the house. They advanced a hose line through the front door and tried to go up the stairs to rescue the girls from their bedroom at the front of the house.

When high heat and heavy smoke prevented them from advancing to the second floor, additional crews put a ladder up to the girls' bedroom window and advanced a hose line into the room, where they found the two girls, one on a bed and the other on the floor near the door. Both had been overcome by smoke inhalation. Firefighters found the father outside their room,k overcome by smoke. Only the mother, who suffered smoke inhalation and burns, survived.

Investigators believe that the fire burned on the deck before making its way into the house through the back door. Once inside, it filled both levels of the home with flames, heat, and smoke. They also learned that, although the smoke detector operated, the monitoring company failed to notify the fire department. The fire destroyed both the house and its contents.

Kenneth J. Tremblay, 2014," Firewatch", *NFPA Journal*, March/April 30.

Sprinkler extinguishes cooking fire, Illinois

A single sprinkler extinguished a fire in a high-rise apartment building that started when a pan of cooking oil left heating unattended on the stove ignited.

The 17-story, steel-frame high-rise which was 325 feet (99 meters) long and 125 feet (38 meters) wide, was protected by a wet-pipe sprinkler system. A monitored fire detection system that included smoke detectors and manual pull stations had been installed in the common hallways, and there were heat detectors and local smoke alarms in each unit.

The fire department received the water flow alarm at 9:45 a.m. While firefighters were en route to the address, dispatch received a 911 call from the apartment of fire origin and heard an occupant yelling to others to get out of the apartment. By the time fire crews arrived, the sprinkler had extinguished the blaze, which had spread from the stove to a microwave and cabinets overhead. The firefighters helped control the water flow to the sprinkler and placed salvage covers in units below the fire to prevent damage.

Damage to the $20 million building came to $5,000. EMTs evaluated the unit's residents at the scene, but the three did not require any treatment.

Kenneth J. Tremblay, 2014," Firewatch", *NFPA Journal*, January/February 35-36.

Unattended cooking fire kills elderly man, Virginia

A 92-year-old man, who was unable to walk without the assistance of a walker, died of burns when this clothes ignited as he tried to turn off an electric burner on the stove in his apartment after a pan of cooking oil caught fire.

The 14-story, 203-unit, steel-frame apartment building had concrete floors and walls. Each unit had local smoke alarms, and a fire detection system protected all the common areas. There were no sprinklers.

The fire began when the man overheated the oil he had put in a pan to fry a steak. When he saw the flames, he reached for the controls at the rear of the range to shut off the stove burner, and in

the process, ignited his clothes. He used water from the sink and another pan to control the flames, then removed his clothes and made his way to the foyer, where a neighbor heard him calling for help and called 911.

The victim was conscious and alert upon arrival at the hospital, but he later died. There were no structural damages to the victim's unit. Damage to its contents, valued at $100,000, was estimated at $2,000.

Kenneth J. Tremblay, 2014," Firewatch", *NFPA Journal*, January/February 31-32.

One dead, one injured in home fire, Virginia

A 47-year-old woman who was physically disabled died of smoke inhalation and her 8-year-old son was injured in a fire that began when a pot of food on the stove ignited and filled the home with smoke.

The fire occurred in the end unit of a two-story, wood-frame, townhouse-style apartment building that had wooden walls with a brick veneer and a roof covered with asphalt shingles. Firefighters found a battery-operated smoke alarm on the floor but did not hear it operating when they entered the home. There were no sprinklers.

The victim called 911 to report the fire at 5:37 p.m. and stayed on the line with the dispatcher, who advised her to get on the floor after learning she could not leave the apartment and hearing her cough due to smoky conditions. Firefighters who arrived seven minutes after the alarm found no visible smoke outside the front of the building. When they forced open the front door, however, they smelled smoke and saw hundreds of roaches trying to escape from the house.

The firefighters entered the structure, where they saw fire near the kitchen and heard the victim calling to them. Unable to see through the heavy smoke and hampered by trash, they worked their way toward the woman by calling out and listening for her replies. Eventually, they found her in the living room.

They removed her and used a hose line to extinguish the small fire in the kitchen. Once the smoke cleared, crews performed a secondary search and found the boy on the couch in the living room, still alive. They brought both victims to the hospital, where the mother was pronounced dead.

Investigators determined that the woman allowed her son to make macaroni and cheese on the stove. While cooking, he told his mother, who was in the living room, that it was spilling on the floor. when she asked what was spilling, he said "fire." It appears that the food overheated and ignited, and that the resulting fire spread along the trash that covered the kitchen floor for an area of 6 square feet (0.5 square meters) around the stove.

The house, valued at $289,000, sustained just $1,000 in damage, as did its contents, valued at $12,000.

Kenneth J. Tremblay, 2013," Firewatch", *NFPA Journal*, November/December-21-23..

Man dies trying to extinguish house fire, California
A man died in a fire that started when he left a pan of oil heating on the stove before going outside to talk to a friend. When the friend left, witnesses said, the victim saw smoke from the fire and ran back into the house, where he was overcome by heat and smoke.

The double-wide, wood-frame, manufactured home, which was 40 feet (12 meters) long and 24 feet (7 meters) wide, had wooden exterior walls and lightweight truss roof covered in asphalt shingles over a steel frame. Neither smoke alarms nor sprinklers had been installed.

Someone called 911 at 5:31 p.m. Once firefighters extinguished the blaze, they found the victim in the living room, overcome by heat and smoke. Ambulance and fire personnel administered emergency medical treatment, but he died as a result of his injuries.

Investigators determined that the man had place the pan of oil on the gas range and turned the control knob to high before he left the house. The oil overheated and ignited, and the fire spread from the kitchen throughout the house.

The fire did $150,000 in damage to the house and its contents.

Kenneth J. Tremblay, 2013," Firewatch", *NFPA Journal*, November/December 20-21.

Sprinkler extinguishes unattended cooking fire, Minnesota
A single sprinkler extinguished an apartment fire that started when the occupant left a pan of oil heating unattended on the stove.

The apartment was in a 12-unit, wood-frame building that covered an area of approximately 25,000 square feet (2,323 square meters). Each apartment was protected by local smoke alarms connected to a building fire alarm system, as well as a monitored wet-pipe sprinkler system. A dry-pipe system had been installed in the attic.

The alarm monitoring company notified the fire department of the water flow alarm at 6:05 p.m., and firefighters arrived at the scene seven minutes later to find light smoke inside the building. Once inside the apartment of origin, they discovered that sprinklers had already extinguished the fire.

The apartment's occupant told investigators that he had put a pan of oil on the stove and turned the burner on high before he went to watch a video in another room. When he noticed that the pan was on fire, he moved the pan to the sink and tried to douse the flames with salt. As he did so, the sprinkler activated and extinguished the blaze.

Fire damage was limited to the kitchen cabinets, although there was smoke damage throughout the apartment. The building, which was valued at $1 million, sustained $10,000 in damage. The

contents of the apartment of origin, valued at $10,000, sustained an estimated $5,000 in damage. There were no injuries.

Kenneth J. Tremblay, 2013," Firewatch", *NFPA Journal*, September/October 25-26.

Hoarding contributes to fire deaths, Maryland
A 63-year-old woman and her 40-year-old daughter died in their row house in a fire that started when items on the stove were left too close to an operating gas burner and ignited. The three-story house had no smoke alarms or sprinklers.

The fire was discovered by a pizza delivery person, who called 911 at 7:29 p.m. Firefighters arrived five minutes later, but their entry was hindered by large amounts of debris in the house.

Eventually, they found the older woman in the first-floor living room and her daughter in a second-floor bathroom, and transported them both to the hospital, where they were pronounced dead.

Investigators examining the scene found the stove covered with canned goods, a pizza box, and pans. Noting that a burner knob was in the "on" position, they determined that heat from the burner ignited the cardboard box and other combustibles and that the fire spread up the wall behind the stove. Fire damage in the kitchen was heavy, as was smoke damage in the living room.

The house, which was valued at $122,000, sustained $25,000 in damage. Its contents, the value of which was not reported, sustained an estimated loss of $4,000.

Kenneth J. Tremblay, 2013," Firewatch", *NFPA Journal*, July/August, 20.

Woman dies in cooking fire, Wisconsin
An 88-year-old woman died after her clothing caught fire while she tried to control a cooking fire in her single-family home.

The one-story, wood-frame house, which was 50 feet (15 meters) long and 20 feet (6 meters) wide, had no sprinklers, It did have a battery-operated smoke alarm in the hallway, but the battery was dead.

A passerby saw the smoke and called 911 at 6:15 p.m. Arriving firefighters found a small smoldering fire and discovered the woman's body in the kitchen.

Investigators determined that her clothes ignited when she tried to carry a burning pan to the kitchen sink.

The house, valued at $140,000, sustained damage estimated at $4,000. Its contents, valued at $10,000, were not damaged.

Kenneth J. Tremblay, 2013," Firewatch", *NFPA Journal*, May/June 24.

Unattended cooking leads to two fire deaths, Kansas
A 21-year-old woman and a 23-year-old man died of smoke inhalation and burns in an apartment fire that began in their kitchen when the contents of a pan left unattended ignited while the victims slept. The fire triggered an automatic fire alarm in the building's hallways, and the alarm company called the fire department, as did a passerby, who dialed 911.

The fire occurred in a 2 1/2 story, 24-unit, wood-frame apartment building that was 200 feet (61 meters) long and 60 feet (18 meters) wide. A fire alarm system monitored by a central station alarm company provided coverage in the common spaces, including hallways, and each apartment had local battery-operated smoke alarms. There were no sprinklers.

Although the fire had been burning for some time, it was confined to the kitchen. Investigators concluded that it started when the contents of a pan left cooking unattended on the electric stove ignited and that the fire spread to other combustibles in the room. The lack of a battery in the apartment's smoke alarm prevented early warning. In addition, one of the victims was described as possibly being intoxicated.

The building, which was valued at $1 million, sustained damage estimated at $150,000. Damage to its contents was estimated at $50,000. One firefighter suffered minor injuries.

Kenneth J. Tremblay, 2013," Firewatch", *NFPA Journal*, May/June 27-28.

Unattended cooking leads to two fire deaths, Kansas
A 21-year-old woman and a 23-year-old man died of smoke inhalation and burns in an apartment fire that began in their kitchen when the contents of a pan left unattended ignited while the victims slept. The fire triggered an automatic fire alarm in the building's hallways, and the alarm company called the fire department, as did a passerby, who dialed 911.

The fire occurred in a 2 1/2 story, 24-unit, wood-frame apartment building that was 200 feet (61 meters) long and 60 feet (18 meters) wide. A fire alarm system monitored by a central station alarm company provided coverage in the common spaces, including hallways, and each apartment had local battery-operated smoke alarms. There were no sprinklers.

Although the fire had been burning for some time, it was confined to the kitchen. Investigators concluded that it started when the contents of a pan left cooking unattended on the electric stove ignited and that the fire spread to other combustibles in the room. The lack of a battery in the apartment's smoke alarm prevented early warning. In addition, one of the victims was described as possibly being intoxicated.

The building, which was valued at $1 million, sustained damage estimated at $150,000. Damage to its contents was estimated at $50,000. One firefighter suffered minor injuries.

Kenneth J. Tremblay, 2013," Firewatch", *NFPA Journal*, May/June 27-28.

Combustibles on stove ignite, Alaska
A 92-year-old-woman who lived in the basement apartment of a two-family house died of smoke inhalation in a fire that started when the heating element of her electric stove ignited a cookbook.

the basement of the wood-frame house, which was 60 feet (18 meters) long and 30 feet (9 meters) wide, had been converted to a separate living unit with access to the outside from a door next to the garage. A battery-operated smoke alarm had been installed in the hallway on the first floor, but there were no in the basement. There were no sprinklers.

a neighbor called 911 at 1:28 p.m., and firefighters arrived shortly thereafter. As they began advancing a hose line into the apartment, they were told that the woman might be inside. They found her face-up by the door and took her outside the house before quickly extinguishing the fire.

Investigators determined that the woman was heating water for a cup of tea when the cookbook ignited, and the fire spread to cabinets and other combustibles in the kitchen. Wall voids allowed the fire to spread vertically to a kitchen cabinet in the first-floor unit directly above the point of origin. In addition, fire traveled through the voids and into the roof truss, where it burned through. Drywall kept the fire from breaking through into the living area. The victim, who had a history of limited mobility and dementia, was overcome by the smoke.

The house and its contents, together valued at $229,600, sustained a combined loss of $90,000. The first-floor unit had minor smoke and fire damage in the kitchen.

Kenneth J. Tremblay, 2013," Firewatch", *NFPA Journal*, March/April, 20-21.

Unattended cooking fire damages apartment building, California
When the occupant of a second-floor apartment left a pan of French fries cooking in oil unattended on the stove, the oil ignited, and the resulting fire spread to nearby combustibles, then throughout the apartment to the roof above.

The two-story, wood-frame apartment building, which contained 16 units, was equipped with smoke detectors but had no sprinklers.

The smoke alarms operated as designed, alerting the occupant, who called 911 at 5:54 p.m. Police and firefighters evacuated other building occupants when they arrived seven minutes later.

A smoke and flames poured out a second-floor window, firefighters positioned a 2 1/2-inch hose line to the left side of the building to protect exposures and brought additional hose lines into the structure. When they encountered heavy fire in the ventilation holes made in the roof, a second alarm was called. After part of the roof collapsed and all personnel were accounted for, the incident commander requested a third alarm.

The building sustained an estimated $1,750,000 in damages, while damage to contents was estimated at $500,000. There were no injuries.

Kenneth J. Tremblay, 2013," Firewatch", *NFPA Journal*, March/April, 21-22.

Sprinklers extinguish unattended cooking fire, Florida
Two sprinklers controlled a fire in an apartment in a 24-unit building that started after its occupant left a pan of oil heating unattended on the stove.

The three-story, wood-frame building, which was 200 feet (61 meters) long and 50 feet (15 meters) wide, had a pitched roof covered with asphalt shingles. Local single-station smoke alarms had been installed in the apartments, and monitored smoke detectors protected the common areas. The property was protected by an NFPA 13R wet-pipe sprinkler system.

When the occupant of the apartment noticed the fire, she grabbed her child and left the building, before calling 911 at 7:53 p.m. Shortly afterward, the central station monitoring company also notified the fire department. Smoke from the fire activated the building fire alarm, alerting the other occupants, and the two sprinklers fused and extinguished the blaze. The smoke alarms in the unit of fire origin did not operate.

First-due firefighters found smoke coming from the second floor of the building and advanced a pre-connected hose line into the structure, only to find that the sprinklers had already extinguished the blaze.

The building, which was valued at $700,000, and its contents, which were valued at $650,000, each sustained an estimated loss of $15,000. There were no injuries.

Kenneth J. Tremblay, 2012," Firewatch", *NFPA Journal*, November/December, 27.

Sprinkler controls microwave oven fire, South Carolina
A sprinkler contained a fire in an apartment in a four-unit building that began when a microwave oven exhaust over the kitchen range malfunctioned.

The single-story, wood-frame building sat on a concrete slab and had an asphalt-shingled roof. A wet-pipe residential sprinkler system provided coverage in living space, and hardwired smoke detectors were located in the apartments' hallways by the bedrooms and kitchens.

The fire department was notified of the fire at 7:37 p.m. by an alarm company and received several phone calls, as well. When firefighters arrived, they initially saw nothing unusual on the building's exterior. While conducting a perimeter size-up, however, they noted heavy black smoke blocking windows. When they entered the unit, they found that a sprinkler in the kitchen was operating and that the fire was nearly out. They quickly extinguished the remaining fire that was above the sprinkler line.

Investigators determined that the microwave's exhaust had malfunctioned and ignited nearby combustibles.

The building, which was valued at $288,000, sustained $15,000 in damage. The unit's contents, which were valued at $5,000, were destroyed. There were no injuries.

Kenneth J. Tremblay, 2012," Firewatch", *NFPA Journal*, November/December, 26.

Hot coals start multimillion-dollar fire, California
An early morning fire that started on the wooden deck of a waterfront house destroyed the home and severely damaged three others.

The single-family, three-story, wood-frame house covered approximately 2,700 square feet (250 square meters). Smoke alarms on each level operated. There were no sprinklers.

On the afternoon of the fire, the occupants of the house used a charcoal barbeque grill to cook food on their rear-facing wooden deck. Once they were finished, they went inside and left the grill unattended. As the coals continued to burn, they eventually became small enough to fall onto the wooden deck through rust holes in the grill. The deck ignited, and strong winds helped spread the fire to three neighboring houses.

Passersby saw the fire and called 911 at 4:50 p.m.

No one was injured, but the buildings, valued at $4.5 million, and their contents, valued at $450,000, were destroyed. The occupants, who were renting the house, were not aware that there were holes in the grill.

Kenneth J. Tremblay, 2012, "Firewatch," *NFPA Journal*, September/October 22.

Elderly sisters die in cooking fire, Tennessee
A 101-year-old woman and her 95-year-old sister died of smoke inhalation and burns in a fire that started when oil heating on the stove ignited. One of the victims had mobility problems and required help getting around. Her sister was severely visually impaired.

The single-family, wood-frame, split-level house, which covered approximately 2,850 square feet (265 meters), had living spaces, a kitchen, and a master bedroom and bath on the grade level and other bedrooms and bathrooms on the other level. There were no smoke alarms or sprinklers.

A neighbor noticed heavy smoke and called 911 at 7:19 p.m., reporting both the fire and the presence of the two women. Arriving firefighters found smoke venting from the front middle portion of the house and heavy fire at the rear. They began an aggressive interior attack and started searching for the two sisters. When they approached the victims' shared bedroom, they found the door closed, but heavy smoke and toxic fire gases had begun to fill the room.

One of the women slept propped up in a hospital bed, which subjected her to more heat than her sister, who slept in a twin bed in the same room. Firefighters took the two to the hospital, where the 95-year-old died the next day of her injuries. Her sister died eight days after the fire of complications from her injuries.

The sisters lived with one of the women's daughters and one of the daughter's two children. Just before the fire started, the daughter cooked dinner for her mother and aunt. After dinner, she put her mother to bed while her aunt sat in a chair near their bedroom. She then left the house to deliver some food to a sick friend who lived about 15 minutes away.

After the neighbor who discovered the fire called 911, he tried to enter the rear of the house to rescue the women but was turned back by heat and smoke. He then ran to the front of the house, broke the women's bedroom window, cutting his hand. He tried calling to them, but they did not answer. Other neighbors called the daughter to alert her to the fire.

Investigators determined that a frying pan containing a small amount of grease had been left on the electric burner, which was set at a low temperature, possibly, so low that the daughter thought the burner was off. The grease continued to heat and ignited quickly, spreading to the kitchen wall paneling and from there to the den.

The house, valued at $125,000, sustained $78,500 in structural damage. Damage to its contents, valued at $78,500, was estimated at $60,000.

Kenneth J. Tremblay, 2012, *NFPA Journal*, July/August, 28.

Unattended cooking starts deadly fire, South Carolina
A 22-year-old woman died of smoke inhalation in her single-family townhouse during a fire that began when she left French fries cooking in the kitchen and went to bed.

The two-story, wood-frame townhouse was one of eight in a row, and was 35 feet (11 meters) wide and 165 feet (50 meters) long, with its exterior walls covered with brick. Smoke alarms had been installed in the stairway between the first and second floors and on the landing at the top of the stairs. There were no sprinklers.

The fire department received a 911 call at 5:30 a.m. and arrived shortly afterward to find flames coming from three sides of the building, heavy smoke coming from the fourth side, and fire seeping from the peak of the roof. Crews extinguished the blaze using a hose stream and deployed a hose line to prevent the fire from spreading to other units. An additional hose line was deployed when it arrived.

Once they knocked the fire down, firefighters entered the townhouse and found the victim in a second-floor bedroom. They found another occupant at a neighboring home.

Investigators determined that the victim had arrived home early in the morning and started to cook French fries but left them unattended on the stove when she went to bed. The grease in the pan overheated and ignited, starting a fire that spread to other combustibles. Her roommate, who was asleep on a couch in the living room, awoke, possibly to the smoke alarm sounding, and escaped to a unit two doors down. She placed the 911 call once she was outside.

Meanwhile, the victim awoke, possibly also due to the smoke alarm sounding. She initially tried to control the fire, but retreated to the second floor, possibly believing her roommate was in the other upstairs bedroom. Firefighters found the victim in a second-floor bedroom.

The home, valued at $250,000, and its contents, valued at $100,000, sustained $55,000 in damage.

Kenneth J. Tremblay, 2012, *NFPA Journal*, July/August, 26-27.

Hoarding may have played a role in cooking fire death, Tennessee

A 73-year-old man died of smoke inhalation as a result of a fire that started in the kitchen of his single-family home. Evidence suggests that the occupant, who had an extensive medical history, attempted to extinguished the fire before collapsing in the living room, which was located next to the kitchen.

The one-story, wood-frame dwelling was 40 feet (12 meters) long and 35 feet (11 meters) wide. There were no smoke alarms or sprinklers.

Someone called 911 at 7:03 a.m. Responding firefighters entered the house through an unlocked door and found the fire in the kitchen. After searching the house several times, they discovered the man's body n the living room, covered by a large amount of clutter. He was left in place for the medical examiner.

The victim appeared to have been cooking when the fire started, and heat or flames spread from the stove to the cabinets above it and eventually to the attic. Investigators found evidence that the man might have tried to move burning items to the sink to control the fire. Firefighters suspect he tried to escape, but that he may have been delayed by objects he had hoarded or by his unsuccessful attempts to retrieve a pet.

The fire did an estimated $15,000 worth of damage to the house, which was valued at $152,000, and $7,600 damage to its contents, which were valued at $76,000.

Kenneth J. Tremblay, 2012, *NFPA Journal*, July/August, 24-25.

Woman dies when clothing ignites, Minnesota
An 85-year-old woman died of burns and smoke inhalation when a gas stove ignited her clothing.

The two-story, single-family, wood-frame house had a smoke alarm in the hallway near a first-floor bedroom. There were no sprinklers.

The woman's son had called his mother twice in the morning. She mentioned that she had slept well but thought she had stomach flu. When he called again in the early afternoon, she did not answer, and he became worried so he left work to check on her. When he arrived at her house, he found the doors locked and thought he heard a smoke alarm sounding. He entered the house, to find it filled with smoke. In the kitchen, he found a stove burner on and shut it off, before he saw his mother lying on the floor. He called 911 at 2:13 p.m.

Responding firefighters found that the fire, which investigators later determined started when the woman's clothes ignited as she was cooking or heating a kettle of water, had extinguished itself after consuming most of her clothing and spreading to some kitchen cabinets. The investigators believe that the woman fell backwards or tripped when her clothes started burning and hit the counter on the way to the floor. She suffered burns to nearly her entire body.

The house, valued at $159,400, sustained damage estimated at $30,000. Damage to its contents was estimated at $20,000.

Kenneth J. Tremblay, 2012, *NFPA Journal*, May/June, 34-35.

Unattended cooking fire kills one, New York
A woman died of smoke inhalation as a result of a fire that started when she placed a pan of oil on the stove, went into the living room, and fell asleep.

The two-story, three-family, wood-frame house had a flat roof covered by rolled roofing. There were wall-mounted smoke alarms in the apartment's hall, bedroom, and living room. There were no sprinklers.

A first-floor tenant heard smoke alarms operating in the upstairs apartment and went to investigate. When he found the door locked and hot to the touch, he called 911 at 9:40 a.m.

A police officer was first to arrive and forced his way in, only to be driven back by smoke and heat. Shortly afterward, responding firefighters entered the building and found the victim lying on her living room floor.

While one team of firefighters carried the woman out of the house and began cardio pulmonary resuscitation, a second team used a hose line to extinguish the blaze.

The fire appeared to have consumed only the cabinets over the stove and some of their contents before it began to burn itself out. Firefighters found the electric element on the stove still glowing red.

Fire investigators determined that the woman, who was intoxicated, started to cook something, but left the pan unattended and went into the living room, where she fell asleep. She did not respond to the sounding smoke alarm.

Although damage estimates were not reported, the unit sustained heavy smoke damage. Fire damage was limited to the kitchen.

Kenneth J. Tremblay, 2012, "Firewatch," *NFPA Journal*, March/April, 15-16.

Unattended cooking starts fatal fire, Alabama

A 25-year-old man and a 17-year-old woman died in a fire that started when one of them fell asleep, leaving food cooking on the stove. The fire also injured a 15-year-old boy.

The one-story, single-family manufactured home, which was 32 feet (10 meters) long and 14 feet (4 meters) wide, had a metal roof and metal exterior walls. Investigators found no evidence of smoke alarms, and there were no sprinklers.

When the occupant fell asleep, grease in a pan on the electric stove overheated and started a fire that spread throughout the dwelling. It burned undetected for an unknown period until a neighbor called 911 at 12:30 a.m.

The man and woman died of exposure to smoke and products of combustion. The boy was burned and suffered from smoke inhalation.

The structure, valued at $10,000, and its contents, valued at $5,000, were destroyed.

Kenneth J. Tremblay, 2012, “Firewatch,” *NFPA Journal*, January/February 16.