Intentionally Set Fires in Residential Buildings (2008–2010)

These topical reports are designed to explore facets of the U.S. fire problem as depicted through data collected in the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS). Each topical report briefly addresses the nature of the specific fire or fire-related topic, highlights important findings from the data, and may suggest other resources to consider for further information. Also included are recent examples of fire incidents that demonstrate some of the issues addressed in the report or that put the report topic in context.

Findings

- An estimated 16,800 intentionally set fires in residential buildings occur annually in the United States. These fires result in an estimated 280 deaths, 775 injuries, and $593 million in property loss each year.
- Five percent of all residential building fires were intentionally set.
- Lighters (22 percent), heat from other open flame or smoking materials (19 percent), and matches (15 percent) were the leading heat sources of intentionally set fires in residential buildings.
- The majority (76 percent) of intentionally set fires in residential buildings occurred in one- or two-family dwellings. An additional 19 percent of fires occurred in multifamily dwellings.
- Forty-one percent of the intentionally set residential fires occurred in vacant buildings.
- Rubbish, trash, and waste (8 percent); magazines, newspapers, and writing paper (7 percent); and uncontained flammable liquids or gas (6 percent) were the items most often first ignited in intentionally set fires in residential buildings.

From 2008 to 2010, an estimated average of 16,800 intentionally set fires in residential buildings occurred in the United States each year and resulted in an estimated annual average of 280 deaths, 775 injuries, and $593 million in property loss.[1, 2, 3] **Intentional fires** are those fires that require fire service intervention and are deliberately set. These fires may result from the deliberate misuse of a heat source, fires of an incendiary nature (arson), as well as other deliberate acts.

From 2008 to 2010, intentionally set fires accounted for 5 percent of all residential building fires responded to by fire departments across the Nation. Annual estimates of intentionally set fires in residential buildings and their associated losses for 2008 to 2010 are presented in Table 1.[4]

Table 1. National Estimates of Intentionally Set Fires and Losses in Residential Buildings by Year (2008–2010)

Year	Intentionally Set Fires and Losses in Residential Buildings			
	Fires	Deaths	Injuries	Dollar Loss
2008	18,300	310	825	694,200,000
2009	16,200	265	775	597,100,000
2010	16,000	260	750	489,000,000

Sources: NFIRS 5.0, residential structure fire-loss estimates from the National Fire Protection Association's (NFPA's) annual surveys of fire loss, and the U.S. Fire Administration's (USFA's) residential building fire-loss estimates.

Notes: 1) Fires are rounded to the nearest 100, deaths to the nearest 5, injuries to the nearest 25, and loss to the nearest hundred thousand dollars.
2) The 2008 and 2009 dollar-loss values were adjusted to their equivalent 2010 dollar-loss values to account for inflation.

This topical report addresses the characteristics of intentionally set fires in residential buildings reported to the National Fire Incident Reporting System (NFIRS) between 2008 and 2010. For the purpose of this report, the term "intentionally set residential fires" is synonymous with "intentionally set fires in residential buildings," as intentionally set residential fires commonly mean those fires that are intentionally set in buildings. "Intentionally set residential fires" is used throughout the body of this report; the findings, tables, charts, headings, and endnotes reflect the full category, "intentionally set fires in residential buildings."

Type of Fire

Building fires are divided into two classes of severity in NFIRS: "confined fires," which are fires confined to certain types of equipment or objects and "nonconfined fires," which are not. Confined building fires are small fire incidents that are limited in extent, staying within pots, fireplaces, or certain other noncombustible containers.[5] Confined fires rarely result in serious injury or large content losses and are expected to have no significant accompanying property losses due to flame damage.[6] For these reasons, NFIRS allows abbreviated reporting for confined fires; many reporting details of these fires are not required and, as a result, are often not reported.

Of the two classes of severity, nonconfined fires accounted for 88 percent of intentionally set residential fires (Table 2). The smaller, confined fires accounted for the remaining 12 percent (with trash or rubbish fires accounting for 58 percent of these confined fires). The fire incident records coded as "confined" intentionally set residential fires in NFIRS had sufficient data to be included in the overall analyses. As a result, the remainder of this report, except for the smoke alarm and automatic extinguishing system (AES) analyses, addresses all intentionally set fires in residential buildings and does not distinguish between confined and nonconfined fires.

Table 2. Intentionally Set Fires in Residential Buildings by Type of Incident (2008–2010)

Incident Type	Percent
Nonconfined fires	88.0
Confined fires	12.0
Cooking fire, confined to container	2.9
Chimney or flue fire, confined to chimney or flue	1.9
Incinerator overload or malfunction, fire confined	0.0
Fuel burner/boiler malfunction, fire confined	0.1
Commercial compactor fire, confined to rubbish	0.0
Trash or rubbish fire, contained	7.0
Total	100.0

Source: NFIRS 5.0.
Note: Total for confined fires does not add up to 12 percent due to rounding.

Loss Measures

Table 3 presents losses, averaged over the 3-year period for 2008 to 2010, for all reported intentionally set residential fires and all other residential building fires (i.e., excluding intentionally set fires).[7] The average losses of fatalities, injuries, and dollar loss for intentionally set residential fires were higher than those for all other residential building fires. In fact, the fatality rate for intentionally set residential fires was more than twice that of other residential building fires.

Table 3. Loss Measures for Intentionally Set Fires in Residential Buildings (3-year average, 2008–2010)

Measure	Intentionally Set Residential Building Fires	Residential Building Fires (Excluding Intentional Fires)
Average Loss:		
Fatalities/1,000 Fires	8.3	3.3
Injuries/1,000 Fires	34.6	26.0
Dollar Loss/Fire	$21,320	$11,800

Source: NFIRS 5.0.
Note: 1) Average loss for fatalities and injuries is computed per 1,000 fires; average dollar loss is computed ***per fire*** and is rounded to the nearest $10.
2) When calculating the average dollar loss per fire for 2008–2010, the 2008 and 2009 dollar-loss values were adjusted to their equivalent 2010 dollar-loss values to account for inflation.
3) The category "Residential Building Fires (Excluding Intentional Fires)" does not include fires of unknown cause.

Where Intentionally Set Fires in Residential Buildings Occur

Property Use

The majority (76 percent) of intentionally set residential fires occurred in one- or two-family dwellings (Table 4).[8] Multifamily and other residential properties accounted for an additional 19 and 6 percent of the fires, respectively. Other residential properties include barracks, dormitories, and boarding/rooming houses among other categories.

Table 4. Intentionally Set Fires in Residential Buildings by Property Use (2008–2010)

Property Use	Intentionally Set Fires in Residential Buildings (Percent)
One- or two-family dwellings	75.8
Multifamily dwellings	18.5
Other residential buildings	5.7
Total	100.0

Source: NFIRS 5.0.

Occupancy Status

More than half (56 percent) of intentionally set fires occurred in residential buildings that were occupied or considered to be in normal use (Table 5). This includes properties that are unoccupied for a brief period of time such as a house with no one at home. Forty-one percent of the intentionally set fires occurred in vacant buildings. This percentage was substantially higher than that for all other residential building fires—7 percent of all other residential building fires occurred in vacant buildings.[9] Of the intentionally set fires occurring in vacant buildings, 54 percent of the residences were found to be unsecured while 35 percent were secured. In 3 percent of the intentional fires, the residence was idle or not routinely in use. These types of buildings include seasonal properties not in use during the off-season.

Table 5. Intentionally Set Fires in Residential Buildings by Occupancy Status (2008–2010)

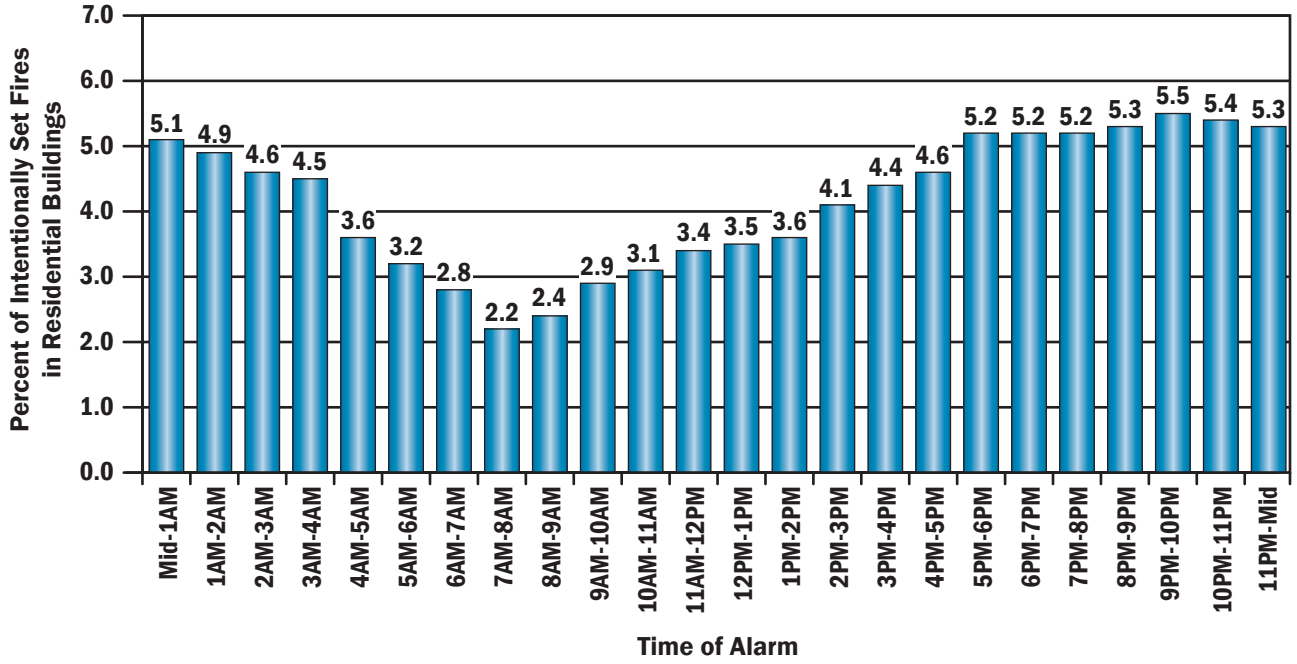
Occupancy Status	Percent
Occupied (in normal use)	56.0
Vacant	40.8
Vacant and unsecured	22.1
Vacant and secured	14.3
Being demolished	2.0
Under construction	1.2
Under major renovation	1.2
Idle, not routinely used	2.7
Status, other	0.6
Total	100.0

Source: NFIRS 5.0.
Notes: Includes only incidents where the occupancy status was specified. Total does not add to 100 percent due to rounding.

When Intentionally Set Fires in Residential Buildings Occur

As shown in Figure 1, intentionally set residential fires occurred mainly in the evening hours, slightly peaking from 9 to 10 p.m. at 6 percent.[10] Fire incidence then declined throughout the night and early morning hours reaching the lowest point from 7 to 8 a.m. at 2 percent.

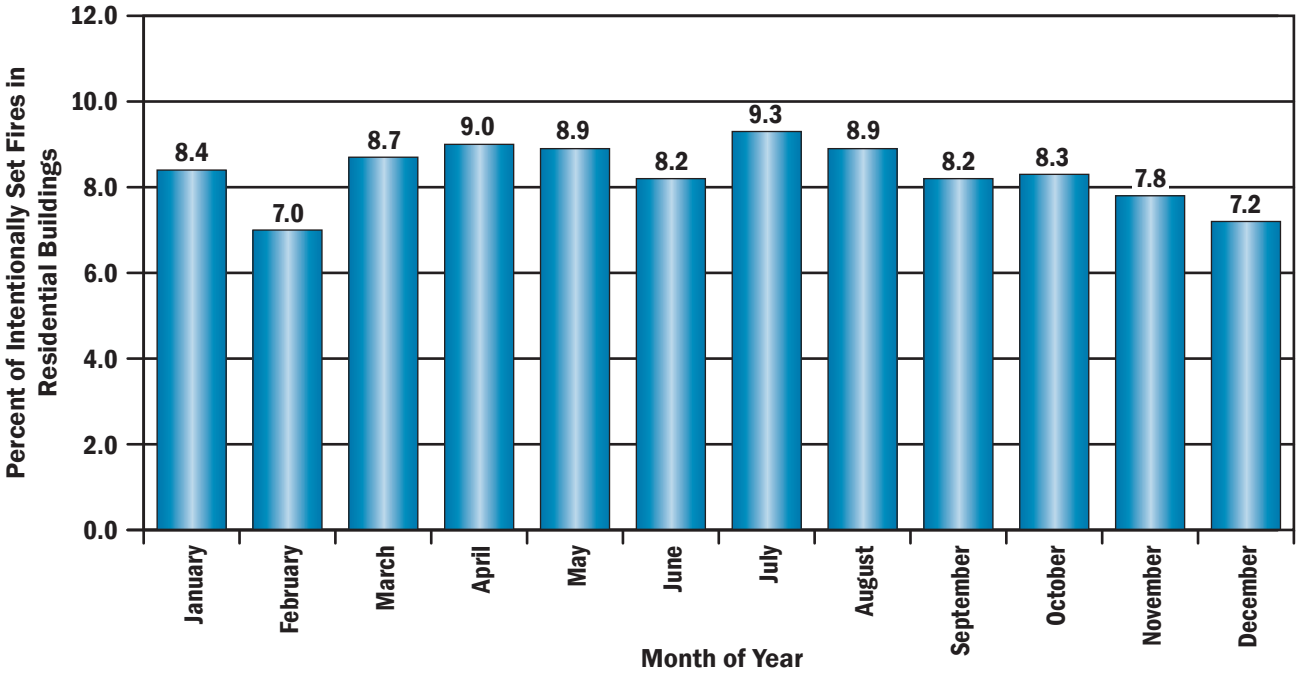
Figure 1. Intentionally Set Fires in Residential Buildings by Time of Alarm (2008–2010)



Source: NFIRS 5.0.

Figure 2 illustrates that the percentage of intentionally set residential fires ranged from 7 to 9 percent for each month throughout the year, peaking slightly in July, but not by much more than the previous and following months. From March to August, fires fluctuated between 8 and 9 percent, accounting for just over half of all intentionally set residential fires (53 percent). While fireworks played a role in the July fires, their role was limited to July 4 and 5 when fireworks accounted for 21 percent of intentionally set residential fires.

Figure 2. Intentionally Set Fires in Residential Buildings by Month (2008–2010)



Source: NFIRS 5.0.
Note: Total does not add to 100 percent due to rounding.

Where Intentionally Set Fires in Residential Buildings Start (Area of Fire Origin)

Intentionally set residential fires most often started in bedrooms (18 percent) as shown in Table 6. Cooking areas and kitchens (10 percent) and family rooms or lounge areas (9 percent) were the next most common areas of fire origin in the home. Combined, these three leading areas of fire origin accounted for over one third of intentionally set residential fires. Also of interest, 5 percent of intentionally set residential fires started on exterior wall surfaces, and an additional 4 percent started in unspecified outside areas.

Table 6. Leading Areas of Fire Origin in Intentionally Set Fires in Residential Buildings (2008–2010)

Area of Origin	Percent of Intentionally Set Fires in Residential Buildings (Unknowns Apportioned)
Bedrooms	17.5
Cooking area, kitchen	9.5
Common room, den, family room, living room, lounge	9.0
Multiple areas	6.1
Function areas, other	5.0
Exterior wall surface	4.7
Unspecified outside areas	4.3

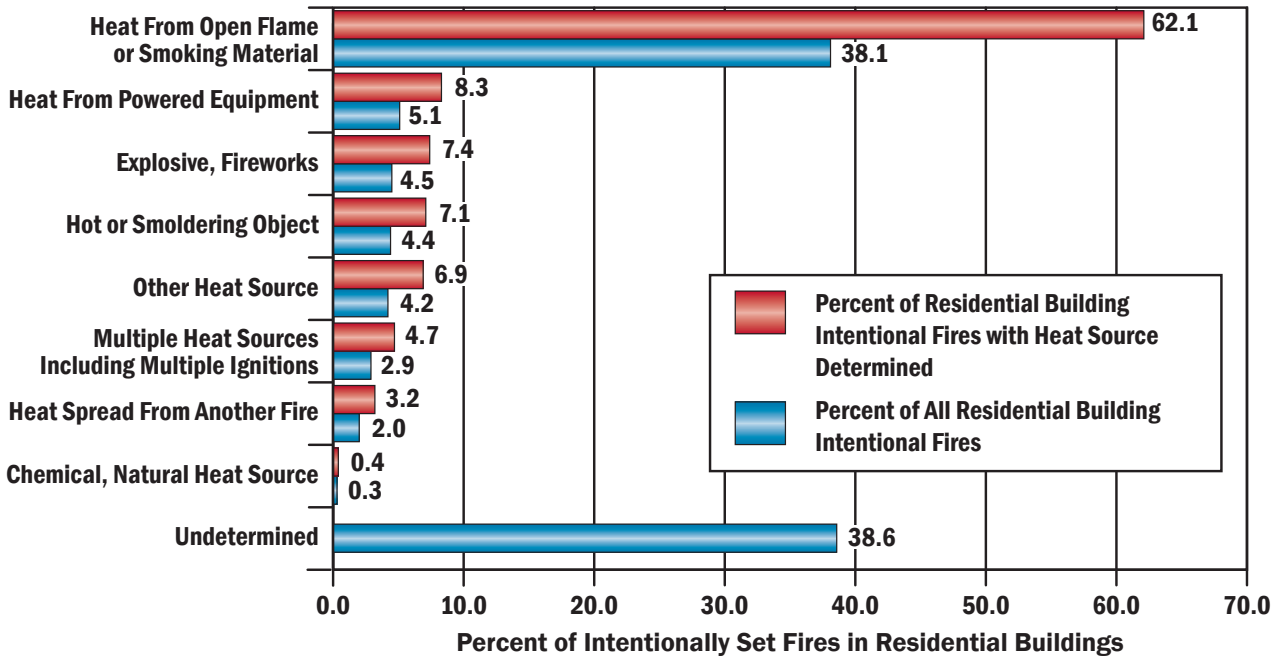
Source: NFIRS 5.0.

How Intentionally Set Fires in Residential Buildings Start (Heat Source)

The heat source for 62 percent of intentionally set residential fires was derived from the "heat from open flame or smoking material" category (Figure 3). Not surprisingly, the subcomponents of this category comprised three of the top four specific leading sources of heat in all intentionally set residential fires—lighters for cigarettes or cigars (22 percent), heat from other open flame or smoking materials (19 percent), and matches (15 percent).

The heat source for another 8 percent of intentionally set residential fires fell under the "heat from powered equipment" category. The categories "explosive, fireworks," "hot or smoldering object," and "other heat source" each accounted for 7 percent of intentionally set residential fires.

Figure 3. Sources of Heat in Intentionally Set Fires in Residential Buildings by Major Category (2008–2010)



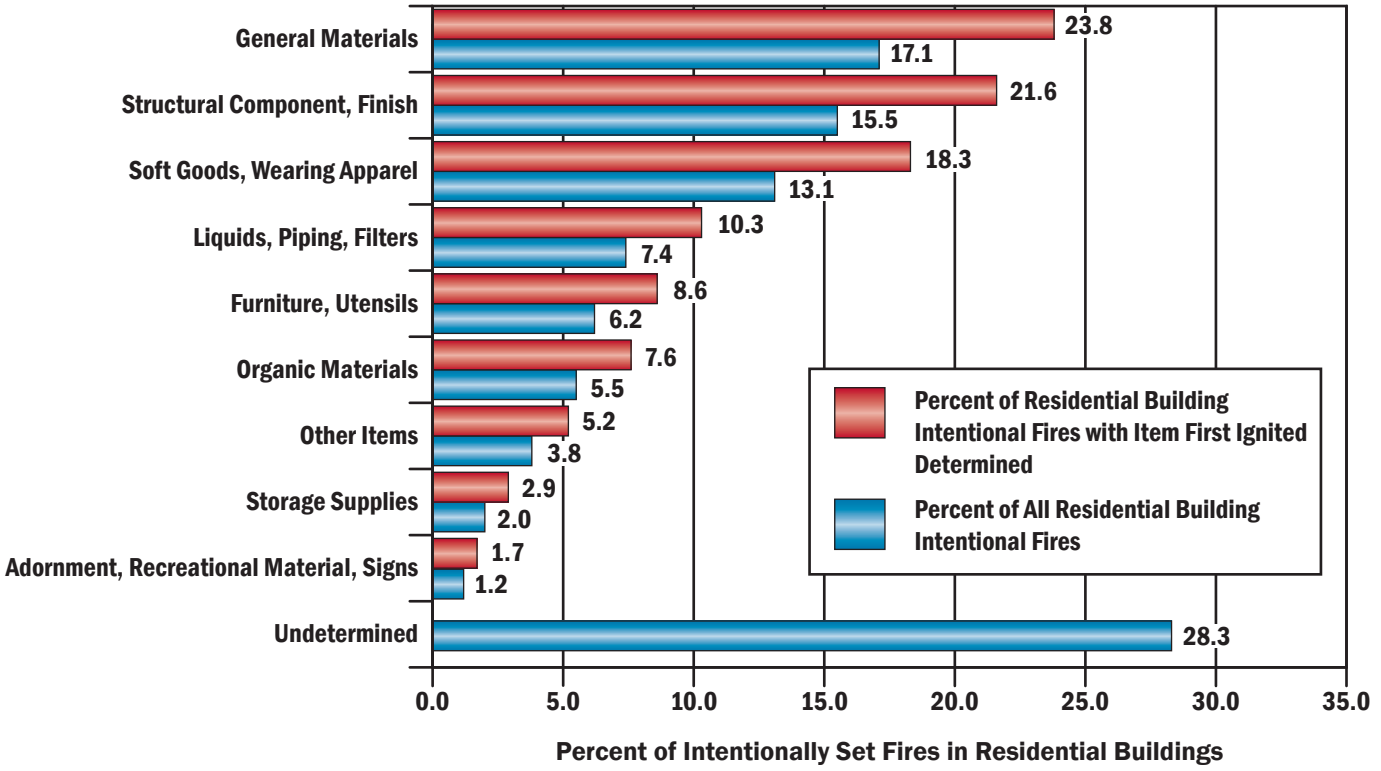
Source: NFIRS 5.0.
Note: Totals do not add to 100 percent due to rounding.

What Ignites First in Intentionally Set Fires in Residential Buildings

Twenty-four percent of the items first ignited in intentionally set residential fires fell under the leading category of "general materials" (Figure 4). This category includes items such as books, magazines, newspapers, rubbish, and trash. An additional 22 percent of the items first ignited fell under the "structural component, finish" category. This category includes materials such as floor coverings, rugs, carpets, or mats as well as exterior sidewall coverings, surfaces, or finishes. The third leading category, "soft goods, wearing apparel," accounted for 18 percent of intentionally set residential fires.

Rubbish, trash, and waste (8 percent); magazines, newspapers, and writing paper (7 percent); and uncontained flammable liquids or gas (6 percent) were the specific items most often first ignited in intentionally set residential fires.

Figure 4. Item First Ignited in Intentionally Set Fires in Residential Buildings by Major Category (2008–2010)

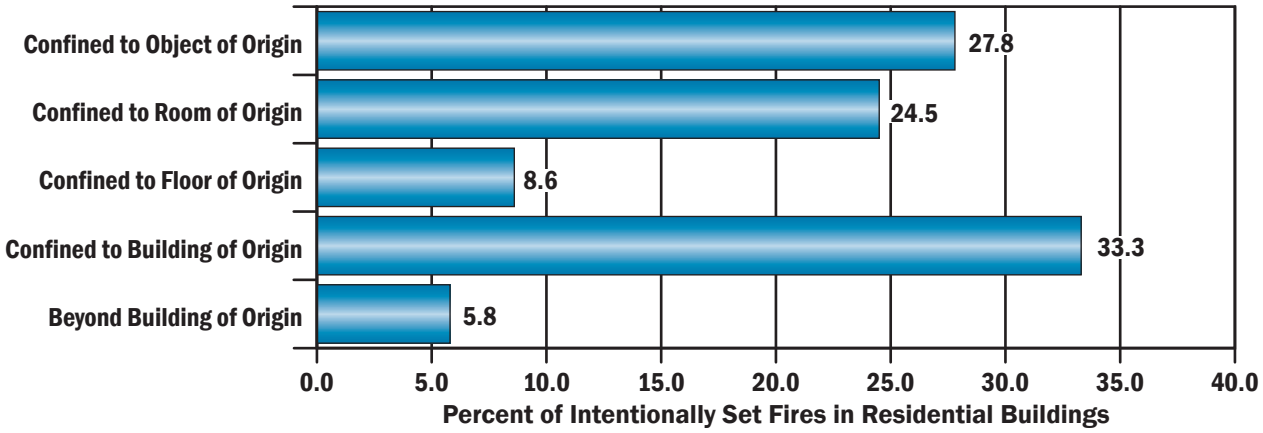


Source: NFIRS 5.0.
Note: Total of all intentionally set fires in residential buildings does not add to 100 percent due to rounding.

Fire Spread in Intentionally Set Fires in Residential Buildings

Figure 5 shows the fire spread in intentionally set residential fires. Fifty-two percent of the intentionally set residential fires were confined to the object or room of origin—in 28 percent of the intentional fires, the fire was confined to the object of origin, and an additional 25 percent were confined to the room of origin.[11] Thirty-three percent of intentionally set fires were confined to the residential building.

Figure 5. Extent of Fire Spread in Intentionally Set Fires in Residential Buildings (2008–2010)



Source: NFIRS 5.0.

Factors Contributing to Ignition in Intentionally Set Fires in Residential Buildings

Table 7 shows the leading factor contributing to the ignition of intentionally set residential fires was "misuse of material or product" (24 percent). Next was "other, unspecified factors contributing to ignition" (23 percent), which includes unspecified components that do not fit into any other category of contributing ignition factors. "Playing with heat source" was the third leading factor at 21 percent. The "playing with heat source" factor includes playing with lighters, matches, and other open flame or smoking materials. The remaining factors were "flammable liquid used to kindle fire" (8 percent) and "abandoned or discarded materials or products" (7 percent).

Table 7. Leading Factors Contributing to Ignition for Intentionally Set Fires in Residential Buildings (Where Factor Contributing to Ignition Specified, 2008–2010)

Factors Contributing to Ignition	Percent of Intentionally Set Fires in Residential Buildings
Misuse of material or product, other	23.6
Other, unspecified factors contributing to ignition	22.5
Playing with heat source	21.3
Flammable liquid used to kindle fire	8.0
Abandoned or discarded materials or products	7.3

Source: NFIRS 5.0.
Notes: Includes only incidents where factors that contributed to the ignition of the fire were specified. Multiple factors contributing to fire ignition may be noted for each incident.

Suppression/Alerting Systems in Intentionally Set Fires in Residential Buildings

Technologies to detect and extinguish fires have been a major contributor in the drop in fire fatalities and injuries over the past 30 years. Smoke alarms are now present in the majority of residential buildings. In addition, the use of residential sprinklers is widely supported by the fire service and is gaining support within residential communities.

Smoke alarm data are available for both confined and nonconfined fires, although for confined fires, the data are very limited in scope. As different levels of data are collected on smoke alarms in confined and nonconfined fires, the analyses are performed separately. Note that the data presented in Tables 8 to 10 are the raw counts from the NFIRS data set and are not scaled to national estimates of smoke alarms in intentionally set residential fires. In addition, NFIRS does not allow for the determination of the type of smoke alarm (i.e., photoelectric or ionization) or the location of the smoke alarm with respect to the area of fire origin.

Smoke Alarms in Nonconfined Intentionally Set Fires in Residential Buildings

Smoke alarms were present in 31 percent of nonconfined intentionally set residential fires (Table 8). No smoke alarms were present in 46 percent of nonconfined intentionally set residential fires, and firefighters were unable to determine if a smoke alarm was present in another 24 percent of these fires. Thus, smoke alarms were potentially missing in between 46 and 69 percent of these fires with the ability to spread and possibly result in fatalities.

Table 8. Presence of Smoke Alarms in Nonconfined Intentionally Set Fires in Residential Buildings (2008–2010)

Presence of Smoke Alarms	Percent
Present	30.5
None present	46.1
Undetermined	23.5
Total	100.0

Source: NFIRS 5.0.
Note: Total does not add to 100 percent due to rounding.

Forty-five percent of all nonconfined intentionally set fires occurred in residential buildings that were **not** currently or routinely occupied. These occupancies—buildings under construction, undergoing major renovation, vacant, and the like—are unlikely to have alerting and suppression systems that are in place and, if in place, that operate. In fact, only 5 percent of all nonconfined intentionally set fires in unoccupied residential buildings were reported as having smoke alarms that operated. As a result, the detailed smoke alarm analyses in the next section focus on nonconfined intentionally set fires in occupied residential buildings only.

Smoke Alarms in Nonconfined Intentionally Set Fires in Occupied Residential Buildings

Smoke alarms were reported as present in 47 percent of nonconfined intentionally set fires in occupied residential buildings (Table 9). In 27 percent of nonconfined intentionally set fires in occupied residential buildings, there were no smoke alarms present. Firefighters were unable to determine if a smoke alarm was present in another 27 percent of these fires; unfortunately, in 40 percent of the fires where the presence of a smoke alarm was undetermined, either the flames involved the building of origin or spread beyond it. The fires were so large and destructive that it is unlikely the presence of a smoke alarm could be determined.

When smoke alarms were present (47 percent) and the alarm operational status is considered, the percentage of smoke alarms reported as present consisted of:

- smoke alarms present and operated—27 percent;
- present but did not operate—12 percent (alarm failed to operate, 6 percent; fire too small, 6 percent); and
- present, but operational status unknown—8 percent.

When the subset of incidents where smoke alarms were reported as present is analyzed separately and as a whole, smoke alarms were reported to have operated in 58 percent of the incidents. Smoke alarms failed to operate in 14 percent of the incidents, and in another 12 percent, the fire was too small to activate the alarm. The operational status of the alarm was undetermined in 16 percent of these incidents.

Table 9. NFIRS Smoke Alarm Data for Nonconfined Intentionally Set Fires in Occupied Residential Buildings (2008–2010)

Presence of Smoke Alarms	Smoke Alarm Operational Status	Smoke Alarm Effectiveness	Count	Percent
Present	Fire too small to activate smoke alarm		807	5.8
	Smoke alarm operated	Smoke alarm alerted occupants, occupants responded	2,646	19.0
		Smoke alarm alerted occupants, occupants failed to respond	178	1.3
		No occupants	480	3.4
		Smoke alarm failed to alert occupants	78	0.6
		Undetermined	376	2.7
	Smoke alarm failed to operate		878	6.3
	Undetermined		1,056	7.6
None present			3,693	26.5
Undetermined			3,726	26.8
Total incidents			13,918	100.0

Source: NFIRS 5.0.
Note: The data presented in this table are raw data counts from the NFIRS data set. They do not represent national estimates of smoke alarms in nonconfined intentionally set fires in residential buildings. They are presented for informational purposes.

Smoke Alarms in Confined Intentionally Set Fires in Residential Buildings

Less information about smoke alarm status is collected for confined fires, but the data still give important insights about the effectiveness of alerting occupants in these types of fires. The analyses presented here do not differentiate between occupied and unoccupied residential buildings, as this data detail is not required when reporting confined fires in NFIRS; however, an assumption may be made that confined fires are fires in occupied housing as these types of fires are unlikely to be reported in residential buildings that are not occupied.

Smoke alarms alerted occupants in 18 percent of confined intentionally set residential fires (Table 10). Occupants were not alerted by the smoke alarm in 31 percent of the confined fires.[12] In 51 percent of these confined fires, the smoke alarm effectiveness was unknown.

Table 10. NFIRS Smoke Alarm Data for Confined Intentionally Set Fires in Residential Buildings (2008–2010)

Smoke Alarm Effectiveness	Count	Percent
Smoke alarm alerted occupants	641	18.3
Smoke alarm did not alert occupants	1,078	30.7
Unknown	1,791	51.0
Total incidents	3,510	100.0

Source: NFIRS 5.0.

Notes: The data presented in this table are raw data counts from the NFIRS data set. They do not represent national estimates of smoke alarms in confined intentionally set fires in residential buildings. They are presented for informational purposes.

Automatic Extinguishing Systems in Nonconfined Intentionally Set Fires in Residential Buildings

AES data are available for both confined and nonconfined fires, although for confined fires, the data are also very limited in scope. In confined residential building fires, an AES was present in less than 1 percent of reported incidents.[13, 14] In addition, the analyses presented here do not differentiate between occupied and unoccupied housing, as extremely few reported fires in unoccupied housing have AESs present.

Full or partial AESs were present in only 3 percent of nonconfined intentionally set residential fires (Table 11). While the use of residential sprinklers is widely supported by the fire service and is gaining support within residential communities, the lack of AESs is not unexpected as they are not yet widely installed. In fact, only 3 percent of all nonconfined residential building fires had AESs present.[15]

Table 11. NFIRS Automatic Extinguishing System (AES) Data for Nonconfined Intentionally Set Fires in Residential Buildings (2008–2010)

AES Presence	Count	Percent
AES present	704	2.7
Partial system present	37	0.1
AES not present	23,607	91.7
Unknown	1,400	5.4
Total incidents	25,748	100.0

Source: NFIRS 5.0.

Notes: 1) The data presented in this table are raw data counts from the NFIRS data set. They do not represent national estimates of AESs in nonconfined intentionally set fires in residential buildings. They are presented for informational purposes.
2) Total does not add to 100 percent due to rounding.

Examples

The following are recent examples of intentionally set residential fires reported by the media:

- July 2012: Officials believe an early morning fire that started in a two-family home in Covington, KY, may have been intentionally set. Three people were found to be in the home when firefighters from the Covington Fire Department arrived on the scene. A neighbor reported seeing an individual set the fire before leaving the scene and that several people were digging around the residence the previous day. The fire damaged the back porch of the home, displacing four adults and their children. No injuries were reported, and the estimated amount of damages was undetermined.[16]

- July 2012: Firefighters from Zachary, Baker, Central, and Slaughter Fire Departments were dispatched to a mid-morning fire at a single-family home in Zachary, LA. The homeowners were not present at the time of the fire, and no injuries were reported. Heavy fire, smoke, and water damage was mainly contained to the home's large, attached garage. The home's value was estimated at $1 million. A multiagency investigation was conducted, and it was determined that the fire was intentionally set. One of the homeowners was arrested and charged with simple arson and arson with intent to defraud.[17]

- June 2012: A late afternoon fire was reported at a home near Rome, NY. A male occupant of the home suffered serious injuries, was removed from the burning residence, and transported to a hospital for treatment. Investigators ruled that the fire was intentionally set after it was discovered that accelerants were used in starting the fire. The occupant of the home had not been ruled out as a suspect, and the motive for starting the fire remained unclear.[18]

- June 2012: Honolulu officials determined that a midafternoon fire at a rental cottage in Aiea, HI, was intentionally set by a 66-year-old male tenant. The fire grew rapidly from the rear of the structure and resulted in an estimated $70,000 in damages to the home and its contents. The tenant suffered burns to his head and hands and was rescued from the burning home by a passing motorist who sustained smoke inhalation injuries. Police were unclear of the suspect's motive.[19]

NFIRS Data Specifications for Intentionally Set Fires in Residential Buildings

Data for this report were extracted from the NFIRS annual Public Data Release (PDR) files for 2008, 2009, and 2010. Only version 5.0 data were extracted.

Intentionally set residential fires were defined by the following criteria:

- Aid Types 3 (mutual aid given) and 4 (automatic aid given) were excluded to avoid double counting of incidents.

- Incident Types 111 to 123 (excluding Incident Type 112):

Incident Type	Description
111	Building fire
113	Cooking fire, confined to container
114	Chimney or flue fire, confined to chimney or flue
115	Incinerator overload or malfunction, fire confined
116	Fuel burner/boiler malfunction, fire confined
117	Commercial compactor fire, confined to rubbish
118	Trash or rubbish fire, contained
120	Fire in mobile property used as a fixed structure, other
121	Fire in mobile home used as fixed residence
122	Fire in motor home, camper, recreational vehicle
123	Fire in portable building, fixed location

Notes: 1) Incident Types 113–118 do not specify if the structure is a building.
2) Incident Type 112 was included in data analyses prior to 2008 as previous analyses showed that Incident Types 111 and 112 were used interchangeably. As of 2008, Incident Type 112 is excluded.

- Property Use series 400 which consists of the following:

Property Use	Description
400	Residential, other
419	One- or two-family dwelling, detached, manufactured home, mobile home not in transit, duplex
429	Multifamily dwelling
439	Boarding/Rooming house, residential hotels
449	Hotel/Motel, commercial
459	Residential board and care
460	Dormitory-type residence, other
462	Sorority house, fraternity house
464	Barracks, dormitory

- Structure Type:
  - For Incident Types 113–118:
    - 1—Enclosed building,
    - 2—Fixed portable or mobile structure; and
    - Structure Type not specified (null entry).
  - For Incident Types 111 and 120–123:
    - 1—Enclosed building and
    - 2—Fixed portable or mobile structure.

- The U.S. Fire Administration (USFA) Structure Fire Cause Methodology was used to determine intentionally set fire incidents in residential buildings.[20]

The analyses contained in this report reflect the current methodologies used by the USFA. The USFA is committed to providing the best and most current information on the United States fire problem and continually examines its data and methodology to fulfill this goal. Because of this commitment, data collection strategies and methodological changes are possible and do occur. As a result, analyses and estimates of the fire problem may change slightly over time. Previous analyses and estimates on specific issues (or similar issues) may have used different methodologies or data definitions and may not be directly comparable to the current ones.

To request additional information or to comment on this report, visit http://apps.usfa.fema.gov/feedback/

Notes:

[1] National estimates are based on 2008–2010 native version 5.0 data from the National Fire Incident Reporting System (NFIRS), residential structure fire loss estimates from the National Fire Protection Association's (NFPA's) annual surveys of fire loss, and the U.S. Fire Administration's (USFA's) residential building fire loss estimates. Fires are rounded to the nearest 100, deaths to the nearest 5, injuries to the nearest 25, and loss to the nearest million dollars.

[2] The term "residential buildings" includes what are commonly referred to as "homes," whether they are one- or two-family dwellings or multifamily buildings. It also includes manufactured housing, hotels and motels, residential hotels, dormitories, assisted living facilities, and halfway houses—residences for formerly institutionalized individuals (patients with mental disabilities, drug addicts, or those formerly incarcerated) that are designed to facilitate their readjustment to private life. The term "residential buildings" does not include institutions such as prisons, nursing homes, juvenile care facilities, or hospitals, even though people may reside in these facilities for short or long periods of time.

[3] In NFIRS, version 5.0, a structure is a constructed item of which a building is one type. In previous versions of NFIRS, the term "residential structure" commonly referred to buildings where people live. To coincide with this concept, the definition of a residential structure fire for NFIRS 5.0 has, therefore, changed to include only those fires where the NFIRS 5.0 Structure Type is 1 or 2 (enclosed building and fixed portable or mobile structure) with a residential property use. Such fires are referred to as "residential buildings" to distinguish these buildings from other structures on residential properties that may include fences, sheds, and other uninhabitable structures. In addition, confined fire incidents that have a residential property use, but do not have a structure type specified, are presumed to be buildings. Nonconfined fire incidents that have a residential property use without a structure type specified are considered to be invalid incidents (structure type is a required field) and are not included.

[4] Residential Building National Estimates (2003–2010), http://www.usfa.fema.gov/statistics/estimates/index.shtm (released December 2011).

[5] In NFIRS, confined fires are defined by Incident Type codes 113–118.

[6] NFIRS distinguishes between "content" and "property" loss. Content loss includes loss to the contents of a structure due to damage by fire, smoke, water, and overhaul. Property loss includes losses to the structure itself or to the property itself. Total loss is the sum of the content loss and the property loss. For confined fires, the expectation is that the fire did not spread beyond the container (or rubbish for Incident Type code 118), and hence, there was no property damage (damage to the structure itself) from the flames. There could be, however, property damage as a result of smoke, water, and overhaul.

[7] The average fire death and fire injury loss rates computed from the national estimates do not agree with average fire death and fire injury loss rates computed from NFIRS data alone. The fire death rate computed from national estimates is (1,000*(280/16,800)) = 16.7 deaths per 1,000 intentionally set fires in residential buildings, and the fire injury rate is (1,000*(775/16,800)) = 46.1 injuries per 1,000 intentionally set fires in residential buildings. In addition, NFPA has a separate estimate for intentionally set structure fires. The fire death rate computed from these estimates for intentional structure fires for 2010 is (1,000*(200/27,500)) = 7.3 deaths per 1,000 intentional structure fires. Intentional structure fire injuries are not reported. (NFPA, *Fire Loss in the United States*, September 2011).

[8] "One- and two-family residential buildings" include detached dwellings, manufactured homes, mobile homes not in transit, and duplexes. "Multifamily residential buildings" include apartments, townhouses, rowhouses, condominiums, and other tenement properties. "Other residential buildings" include boarding/rooming houses, hotels/motels, residential board and care facilities, dormitory-type residences, sorority/fraternity houses, and barracks.

[9] All other residential building fires exclude intentionally set fires in residential buildings as well as those fires of unknown cause.

[10] For the purposes of this report, the time of the fire alarm is used as an approximation for the general time the fire started. However, in NFIRS, it is the time the fire was reported to the fire department.

[11] Total does not add to 52 percent due to rounding.

[12] In confined fires, the entry "smoke alarm did not alert occupants" can mean: no smoke alarm was present, the smoke alarm was present but did not operate, the smoke alarm was present and operated but the occupant was already aware of the fire, or there were no occupants present at the time of the fire.

[13] "Residential Building Fires (2008–2010)," USFA, April 2012, Volume 13, Issue 2, http://www.usfa.fema.gov/downloads/pdf/statistics/v13i2.pdf.

[14] As confined fires codes are designed to capture fires contained to noncombustible containers, it is not recommended to code a fire incident as a small, low- or no-loss confined fire incident if the automatic extinguishing system (AES) operated and contained the fire as a result. The preferred method is to code the fire as a standard fire incident with fire spread confined to the object of origin and provide the relevant information on AES presence and operation.

[15] "Residential Building Fires (2008-2010)," USFA, April 2012, Volume 13, Issue 2, http://www.usfa.fema.gov/downloads/pdf/statistics/v13i2.pdf.

[16] Candace Gamel and Sarah Beth Hensley, "Covington Fire Forces Family Out of Home, May Have Been Intentionally Set," kypost.com, July 11, 2012, http://www.kypost.com/dpps/news/region_northern_kentucky/covington/early-morning-blaze-displaces-two-families_7672271 (accessed August 1, 2012).

[17] Stacy Gill, "UPDATE: Zachary Fire Intentionally Set, Pastor Arrested For Arson," zacharytoday.com, July 9, 2012, http://www.zacharytoday.com/view/full_story/19284433/article-UPDATE--Zachary-fire-intentionally-set--pastor-arrested-for-arson?instance=secondary_sports_left_column (accessed August 1, 2012).

[18] Rocco LaDuca, "Rome House Fire Intentionally Set, Motive Remains Unclear," uticaod.com, June 6, 2012, http://www.uticaod.com/news/x1067108375/Rome-house-fire-intentionally-set-motive-remains-unclear (accessed August 1, 2012).

[19] Sarah Yoro, "Police: Tenant Intentionally Set Fire to Aiea Home," hawaiinewsnow.com, June 1, 2012, http://www.hawaiinewsnow.com/story/18676750/police-tenant-intentionally-sets-fire-to-aiea-home (accessed August 1, 2012).

[20] The USFA Structure Fire Cause Methodology is designed for structure fires of which buildings are a subset. The cause definitions can be found at http://www.usfa.fema.gov/fireservice/nfirs/tools/fire_cause_category_matrix.shtm.