December 2021 | Volume 21, Issue 11

Portable Heater Fires in Residential Buildings (2017-2019)

The U.S. Fire Administration's (USFA's) topical reports are designed to explore facets of the U.S. fire problem as depicted through data collected in the USFA's National Fire Incident Reporting System (NFIRS) from incidents reported from local response agencies. 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 as reported to the National Fire Incident Reporting System

- Each year, from 2017 to 2019, an estimated average of 1,100 portable heater fires in residential buildings were reported to U.S. fire departments. These fires caused an estimated annual average of 65 deaths, 150 injuries and $51 million in property loss.
- Only 3% of heating fires in residential buildings involved portable heaters. However, portable heaters were involved in 41% of fatal heating fires in residential buildings.
- Portable heater fires in residential buildings peaked in January (25%).
- The leading reported factor contributing to ignition was placing the heat source too close to combustible objects (48%).
- Portable heater fires in residential buildings most often started in bedrooms (34%). In these fires, bedding, such as blankets, sheets and comforters, was the leading item first ignited at 16%.
- Smoke alarms were present in 41% of portable heater fires in occupied residential buildings.
- Full or partial automatic extinguishing systems (AESs), including residential sprinklers, were present in only 2% of portable heater fires in occupied residential buildings.

From 2017 to 2019, portable heater fires in residential buildings — a subset of heating fires in residential buildings — accounted for an estimated annual average of 1,100 fires in the U.S.[1, 2] These fires resulted in an estimated annual average of 65 deaths, 150 injuries and $51 million in property loss.[3] The term "portable heater fires" applies to those fires that are caused by catalytic heaters, oil-filled heaters or other heaters, such as electric heaters, that are designed to be carried or moved for use in a variety of locations.[4] Portable heaters are a subset of space heaters — small heaters designed to heat specific areas or rooms of a building.[5]

While portable heater fires in residential buildings were only 3% of all heating fires in residential buildings, their consequences were substantial, accounting for 41% of fatal heating fires in residential buildings. Many of these fires were preventable, as human error was a contributing factor to the fire — for example, placing the heater too close to combustible items or leaving the heater unattended.

As part of a series of topical reports that addresses fires in types of residential buildings, this report addresses the characteristics of portable heater fires in residential buildings as reported to the NFIRS.[6] NFIRS data are used for the analyses throughout this report. For a broader overview of heating fires, see the companion topical report, "Heating Fires in Residential Buildings (2017-2019)," Volume 21, Issue 10.

The focus of this report is on fires reported from 2017 to 2019, the most recent data available at the time of the analysis. Complete or full years of data are required for statistical analyses presented in these topical reports. Although NFIRS data for a calendar year are often reported to the USFA throughout the year, fire departments and/or states have until the official cutoff date as set forth by the National Fire Data Center to submit their data to the USFA. Typically, this cutoff date is July 1 after the end of the previous calendar year. This provides states

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with ample time to perform data quality checks and correct questionable incidents before they are set to released status in the national production database and Enterprise Data Warehouse. Once the data are released to the USFA, additional data quality reviews are completed before the data are prepared for public release.

For this report, the term "portable heater fires" is synonymous with "portable heater fires in residential buildings." "Portable heater fires" is used throughout the body of this report; the findings, tables, charts, headings and endnotes reflect the full category, "portable heater fires in residential buildings."

Type of fire

Building fires are divided into 2 classes of severity in the NFIRS: "confined fires" and "nonconfined fires." Confined building fires are small fire incidents that are limited in extent to specific types of equipment or objects, staying within pots, fireplaces or certain other noncombustible containers.[7] Confined fires rarely result in serious injury or large content loss and are expected to have no significant accompanying property loss due to flame damage.[8] Nonconfined fires extend beyond certain types of equipment or objects. They are generally larger fires resulting in more serious injury and larger losses of property and content.

Only 2% of portable heater fires were confined fires. The few fire incident records coded as "confined" portable heater fires in the NFIRS had sufficient data to be included in the overall analyses. As a result, the remainder of this report addresses all portable heater fires in residential buildings and does not distinguish between confined and nonconfined fires.

Loss measures

Table 1 presents losses of reported portable heater fires and all other heating fires in residential buildings (i.e., excluding portable heater fires) averaged over the 3-year period from 2017 to 2019.[9] All of the loss measures for portable heater fires were substantially higher than the same loss measures for all other heating fires in residential buildings. Portable heater fires were mostly nonconfined fires (98%) and their associated loss measures were higher since nonconfined fires are generally larger fires resulting in serious injury and more content losses. Because 77% of all residential heating fires were confined fires, it is also expected that the loss measures for all other heating fires in residential buildings were lower as most confined fires, which are smaller, rarely result in serious injury or large content losses.[10]

Table 1. Loss measures for portable heater fires in residential buildings (3-year average, 2017-2019)

Measure	Portable heater fires in residential buildings	Heating fires in residential buildings (excluding portable heater fires)
Average loss:		
Fatalities/1,000 fires	29.3	1.5
Injuries/1,000 fires	101.2	9.4
Dollar loss/fire	$29,360	$6,100

Source: NFIRS 5.0.
Notes: 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. The 2017 and 2018 dollar-loss values were adjusted to 2019 dollars.

Where portable heater fires in residential buildings occur

Table 2 shows that one- and two-family residences were disproportionately represented in portable heater fires.[11] One- and two-family residences accounted for 85% of portable heater fires, yet they represented only 63% of residential building fires.[12] Multifamily dwellings accounted for an additional 8% of portable heater fires. Multifamily dwellings, especially older apartments, condominiums and the like, often have building-wide heating systems, and the need for portable heaters may be less, perhaps accounting for the differences in portable heater fire incidence.

Table 2. Portable heater fires in residential buildings by property use (2017-2019)

Property use	Portable heater fires in residential buildings (percent)
One- or two-family residential buildings	85.3
Multifamily residential buildings	8.0
Other residential buildings	6.7
Total	100.0

Source: NFIRS 5.0.

Table 3 shows that most portable heater fires started in bedrooms (34%) or family rooms and living rooms (15%). In an additional 23% of portable heater fires, the fire originated in other function areas (6%), vehicle storage areas (6%), bathrooms (5%) and crawl spaces (5%).[13]

Table 3. Leading areas of fire origin in portable heater fires in residential buildings (2017-2019)

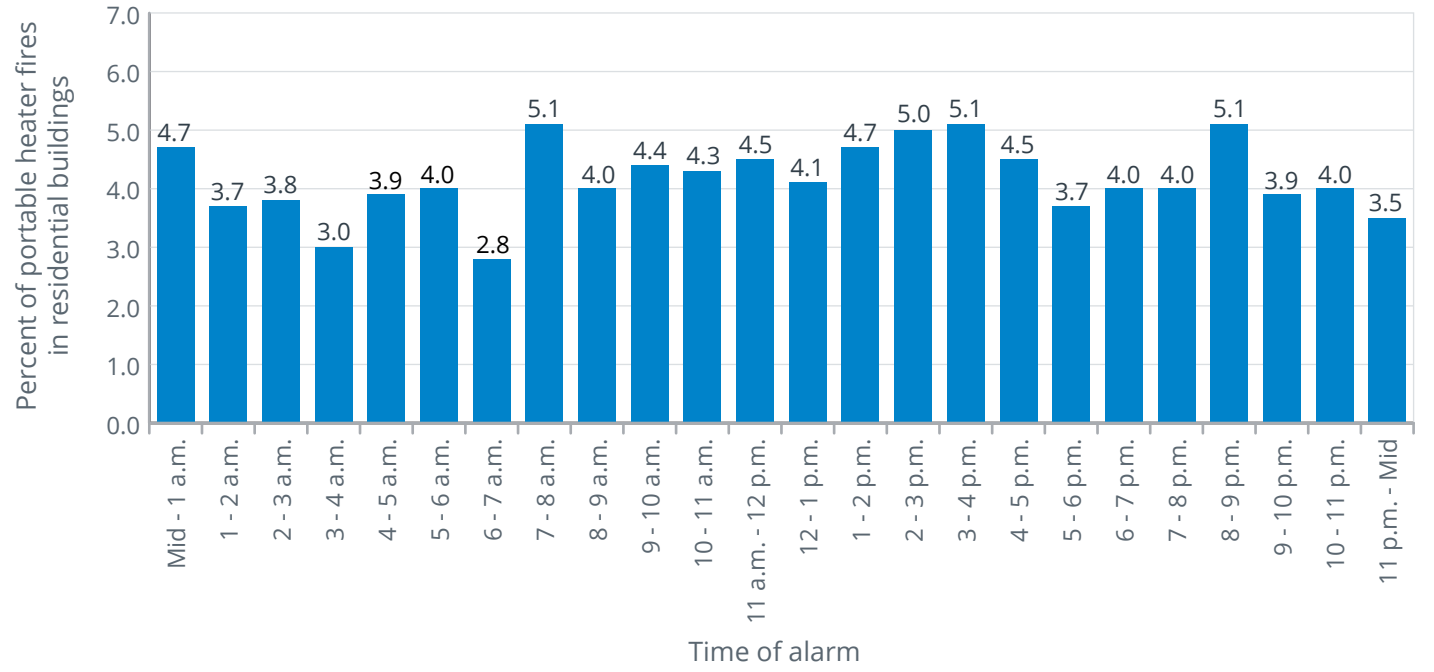
Areas of fire origin	Percent of portable heater fires in residential buildings (unknowns apportioned)
Bedrooms	33.6
Common room, den, family room, living room, lounge	15.4
Other function areas	6.3
Vehicle storage: garage, carport	6.3
Bathrooms	5.3
Substructure area or crawl space	4.7

Source: NFIRS 5.0.

When portable heater fires in residential buildings occur

As shown in Figure 1, portable heater fires were relatively constant throughout the day with some slight variations. They were generally at their lowest in some of the early morning hours (3 to 4 a.m. and 6 to 7 a.m.) and then peaked several times during the day.[14]

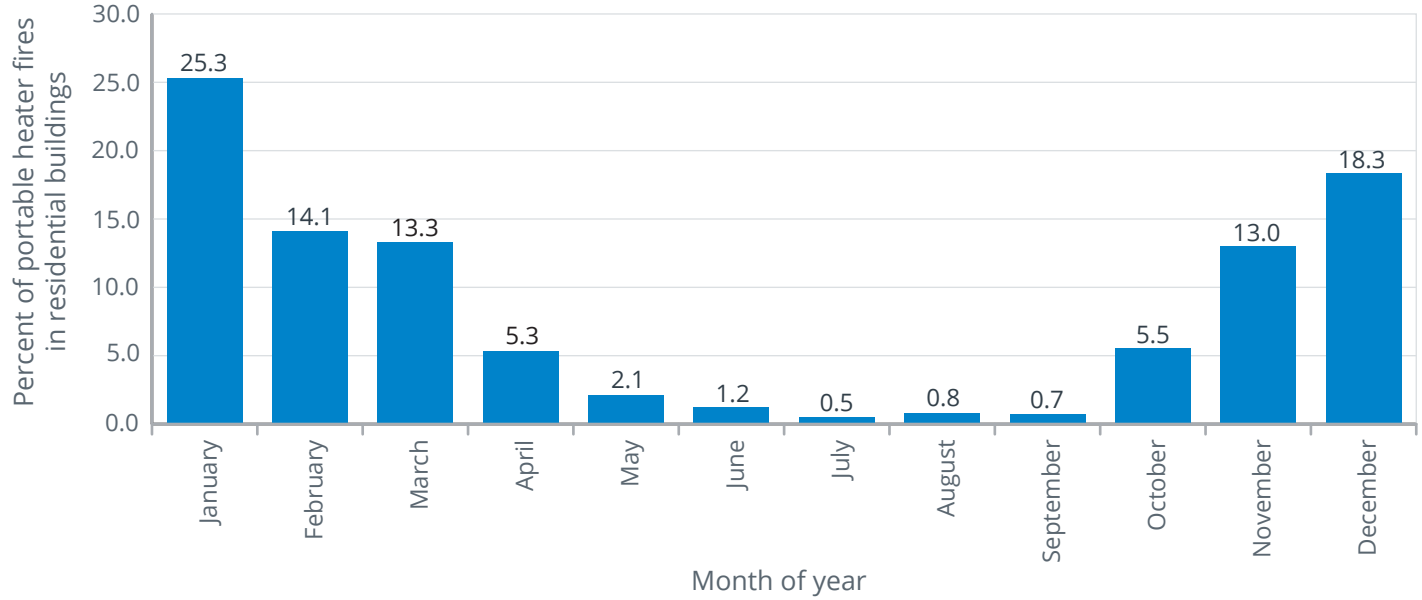
Figure 1. Portable heater fires in residential buildings by time of alarm (2017-2019)



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

Figure 2 shows the pattern of portable heater fires reported to the NFIRS throughout the year. As expected, the number of portable heater fires increased during the late fall and winter months (November through March), peaking in January (25%). From April to September, fire incidence declined from 5% to less than 1%. This is not surprising as the use of portable heaters is less common during the spring, summer and early fall months.

Figure 2. Portable heater fires in residential buildings by month (2017-2019)

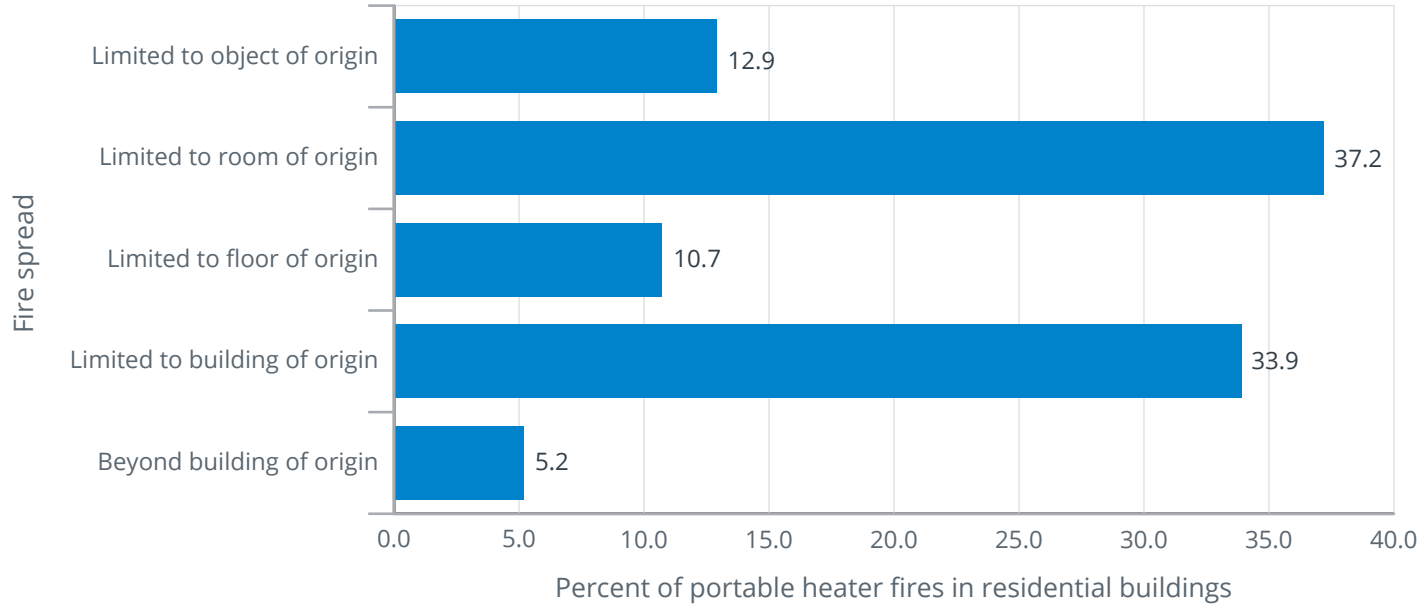


Source: NFIRS 5.0.
Note: Total does not add up to 100% due to rounding.

Fire spread in portable heater fires in residential buildings

In 50% of portable heater fires, the fire was limited to the object or room of origin (Figure 3). In the remaining 50% of portable heater fires, the fire spread beyond the room of fire origin. When compared to other residential heating-related fires, portable heater fires tended to spread farther throughout the home. Specifically, only 34% of nonconfined heating fires (excluding portable heater fires) in residential buildings spread beyond the room of origin. This increased fire spread may be, in part, why portable heater fires tended to be more serious, as shown by the loss measures in Table 1.

Figure 3. Extent of fire spread in portable heater fires in residential buildings (2017-2019)

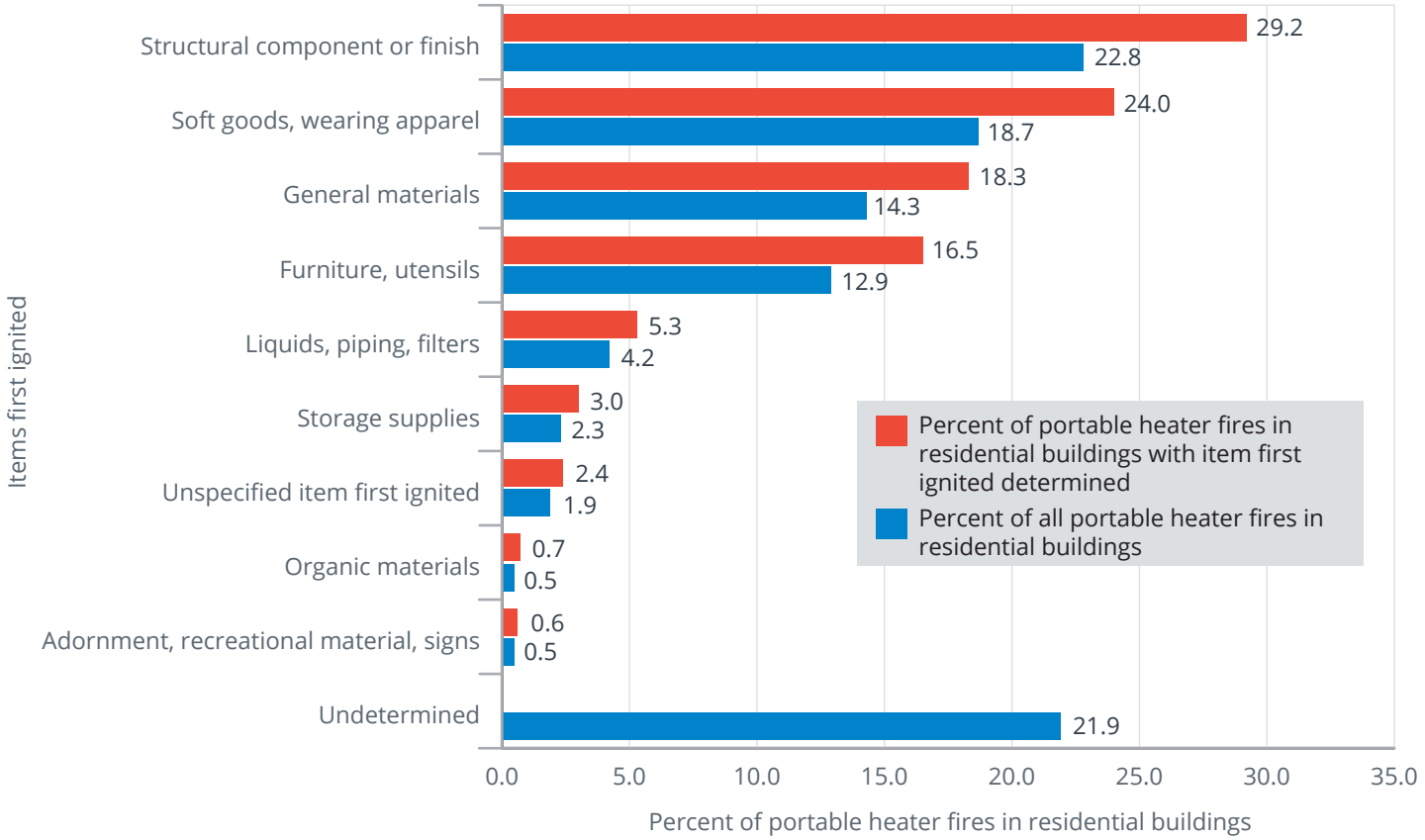


Source: NFIRS 5.0.
Note: Total does not add up to 100% due to rounding.

Item first ignited in portable heater fires in residential buildings

The leading category of items first ignited in portable heater fires, structural component or finish, accounted for 29% of fires (Figure 4). This category includes structural members or framing, exterior trim and finishes, interior wall coverings, insulation within the walls, and floor coverings such as rugs or carpets. The next leading category, soft goods, wearing apparel, accounted for another 24% of portable heater fires. This category includes bedding, curtains and clothing. General materials was the third leading category at 18%.

Figure 4. Item first ignited in portable heater fires in residential buildings by major category (2017-2019)



Source: NFIRS 5.0.

Of the fires that originated in bedrooms (Table 3), bedding (such as blankets, sheets and comforters) was the leading item first ignited by portable heaters (16%). Clothing not on a person and electrical wire/cable insulation accounted for another 12% each.

For portable heater fires that originated in family rooms or living rooms, 20% were started with the ignition of upholstered sofas and chairs. Floor coverings, such as rugs, carpets or mats, accounted for 15%, while electrical wire and cable insulation accounted for an additional 13%.

Factors contributing to ignition in portable heater fires in residential buildings

Table 4 shows the leading factors contributing to ignition of portable heater fires. Placing a heat source too close to combustible objects was the leading contributing factor (48%). Unspecified electrical failure, malfunction, was a contributing factor in 12% of portable heater fires, and unattended equipment was a contributing factor in 10% of the fires. These 3 contributing factors played a role in 70% of residential portable heater fires.

Table 4. Leading factors contributing to ignition for portable heater fires in residential buildings (where factors contributing to ignition were specified, 2017-2019)

Factors contributing to ignition	Percent of portable heater fires in residential buildings (unknowns apportioned)
Heat source too close to combustibles	47.9
Unspecified electrical failure, malfunction	12.1
Unattended equipment	10.0
Unspecified short-circuit arc	5.3
Unspecified mechanical failure, malfunction	4.9

Source: NFIRS 5.0.
Notes: 1. Includes only incidents where factors that contributed to the ignition of the fire were specified.
2. Multiple factors contributing to fire ignition may be noted for each incident.

Portable heater equipment involved in ignition

Table 5 shows the specific type of portable heater that provided the principal heat source to cause the ignition of the fire. Heaters, including floor furnaces, wall heaters and baseboard heaters, were the leading equipment involved in ignition in 79% of the reported portable heater fires in residential buildings. Oil-filled heaters and catalytic heaters accounted for the remaining 21% of portable heaters involved in the ignition of these fires.

Table 5. Portable heater equipment involved in ignition in residential buildings fires (2017-2019)

Equipment involved in ignition	Percent of portable heater fires in residential buildings (unknowns apportioned)
Heater: includes floor furnaces, wall heaters and baseboard heaters	79.2
Heater, oil filled	11.6
Heater, catalytic	9.3

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

Suppression/alerting systems in portable heater fires in residential buildings

Fire fatalities and injuries have declined over the last 40 years, partly due to new technologies to detect and extinguish fires. Smoke alarms are present in most homes. In addition, residential sprinklers have gained support from the fire service and many communities.

In this report, "smoke alarms" refer to both smoke alarms and smoke detectors. Smoke alarms are stand-alone devices with their own power source and notification capability. Smoke detectors detect smoke as a component of a larger system containing separate notification capability, typically in larger areas or structures.

The data presented in Tables 7 and 8 show the reported counts from the NFIRS dataset. These counts are not scaled to national estimates of smoke alarms in portable heater fires. In addition, the 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 portable heater fires in residential buildings

As shown in Table 6, smoke alarms were reported as present in 39% of portable heater fires. Smoke alarms were not present in 34% of portable heater fires, and firefighters were unable to determine if a smoke alarm was present in another 25% of these fires. Additionally, smoke alarm presence was not reported in 1% of incidents.[15, 16] Thus, smoke alarms were potentially missing in 34% to 61% of these fires with the ability to spread and possibly result in fatalities.

Table 6. Presence of smoke alarms in portable heater fires in residential buildings (2017-2019)

Presence of smoke alarms	Percent
Present	39.4
None present	34.0
Undetermined	25.2
Null/blank	1.4
Total	100.0

Source: NFIRS 5.0.

While 8% of all portable heater fires occurred in residential buildings that were **not** currently or routinely occupied, these buildings — which are 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 are operational. In fact, only 15% of all portable heater 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 portable heater fires in occupied residential buildings only.

Smoke alarms in portable heater fires in occupied residential buildings

Smoke alarms were reported as present in 41% of portable heater fires in occupied residential buildings (Table 7). No smoke alarms were present in 33% of portable heater fires in occupied residential buildings, and firefighters were unable to determine if a smoke alarm was present in another 26% of these fires.

When smoke alarms were present (41%) and the alarm operational status was considered, the percentage of smoke alarms reported as present consisted of:

- Present and operated — 26%.
- Present but did not operate — 10% (alarm failed to operate, 6%; fire too small, 4%).
- Present but operational status unknown — 6%.[17]

When the subset of incidents where smoke alarms were reported as present was analyzed, smoke alarms were reported to have operated in 62% of the incidents. Smoke alarms failed to operate in 13% of the incidents, and in another 10%, the fire was too small to activate the alarm. The operational status of the alarm was undetermined in 15% of the incidents.

If a fire occurs, properly installed and maintained smoke alarms provide an early warning signal to everyone in a home. Smoke alarms help save lives and property.

The USFA continues to partner with other government agencies, nongovernment organizations and fire service organizations to improve and develop new smoke alarm technologies. More information on smoke alarm technologies, performance, training bulletins, and public education and outreach materials can be found at http://www.usfa.fema.gov/prevention/technology/smoke_fire_alarms.html. Additionally, the USFA's position statement on home smoke alarms is available at https://www.usfa.fema.gov/about/smoke_alarms_position.html.

Table 7. NFIRS smoke alarm data for portable heater fires in occupied residential buildings (2017-2019)

Presence of smoke alarms	Smoke alarm operational status	Smoke alarm effectiveness	Count	Percent
Present	Fire too small to activate smoke alarm		68	4.0
	Smoke alarm operated	Smoke alarm alerted occupants, occupants responded	308	17.9
		Smoke alarm alerted occupants, occupants failed to respond	11	0.6
		No occupants	63	3.7
		Smoke alarm failed to alert occupants	6	0.3
		Undetermined	52	3.0
	Smoke alarm failed to operate		95	5.5
	Undetermined		105	6.1
None present			571	33.2
Undetermined			440	25.6
Total incidents			1,719	100.0

Source: NFIRS 5.0.

Notes: 1. The data presented in this table are raw data counts from the NFIRS dataset summed (not averaged) from 2017 to 2019. They do not represent national estimates of smoke alarms in portable heater fires in occupied residential buildings. They are presented for informational purposes.
2. Total does not add up to 100% due to rounding.

Automatic extinguishing systems in portable heater fires in occupied residential buildings

The analyses presented here also differentiate between occupied and unoccupied housing, as very few reported fires in unoccupied housing have AESs present. Full or partial AESs were present in only 2% of portable heater fires in occupied housing (Table 8).

Table 8. NFIRS automatic extinguishing system data for portable heater fires in occupied residential buildings (2017-2019)

AES presence	Count	Percent
AES present	28	1.6
Partial system present	2	0.1
AES not present	1,645	95.7
Unknown	44	2.6
Total incidents	1,719	100.0

Source: NFIRS 5.0.

Note: The data presented in this table are raw data counts from the NFIRS dataset summed (not averaged) from 2017 to 2019. They do not represent national estimates of AESs in portable heater fires in occupied residential buildings. They are presented for informational purposes.

Residential sprinkler systems help to reduce the risk of deaths and injuries, homeowners insurance premiums, and uninsured property losses. Despite these advantages, many homes do not have AESs, although they are often found in hotels and businesses. Sprinklers are required by code in hotels and many multifamily residences. There are major movements in the U.S. fire service to require sprinklers in all new homes. At present, however, they are largely absent in residences nationwide.[18]

The USFA and fire service officials across the nation are working to promote and advance residential fire sprinklers. More information on costs and benefits, performance, training bulletins, and public education and outreach materials

regarding residential sprinklers is available at http://www.usfa.fema.gov/prevention/technology/home_fire_sprinklers.html. Additionally, the USFA's position statement on residential sprinklers is available at http://www.usfa.fema.gov/about/sprinklers_position.html.

Examples

The following are recent examples of portable heater fires reported by the media:

- April 2021: One man died as a result of a fire in a New Miami, Ohio, house that lacked electricity. The fire was reported about 7 a.m. and was likely caused by a space heater, which was using electricity run through an extension cord from a neighboring property. The owner of the house was letting the man live in the home even though there was no electricity. The home was considered a total loss because of the fire.[19]
- February 2021: The Freeport Fire Department reported that a space heater being too close to combustibles caused a house fire in Freeport, Illinois. Immediately after midnight, a neighbor noticed the fire and called 911. The family who lived in the home was using several space heaters to heat the home. No injuries were reported as the family was not at home at the time of the fire. Several cats, however, died, and the house was deemed a total loss.[20]
- January 2021: Firefighters reported that a Beacon, New York, house fire was caused by a propane space heater that was being used to heat the home. Beacon firefighters responded to the early morning fire and were on the scene for about 5 hours. Flame damage was limited to the first floor and front porch, but smoke damage occurred throughout the home. The occupants of the home were able to escape without injury.[21]

NFIRS data specifications for portable heater fires in residential buildings

Data for this report were extracted from the NFIRS annual public data release files for 2017, 2018 and 2019. Only version 5.0 data were extracted.

Portable heater fires in residential buildings were defined using the following criteria:

- Incident Types 111, 114, 116, 120 to 123:[22]

Incident Type	Description
111	Building fire
114	Chimney or flue fire, confined to chimney or flue
116	Fuel burner/boiler malfunction, fire confined
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: Incident Types 114 and 116 do not specify if the structure is a building.

- Incidents with Aid Types 3 (mutual aid given) and 4 (automatic aid given) were excluded to avoid counting a single incident more than once.

- Property Use Series 400, which consists of the following:

Property Use	Description
400	Residential, other
419	One- or two-family dwelling
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 114 and 116:
    - 1 — Enclosed building, or
    - 2 — Fixed portable or mobile structure, or
    - Structure Type not specified (null entry).
  - For Incident Types 111 and 120 to 123:
    - 1 — Enclosed building, or
    - 2 — Fixed portable or mobile structure.

- The USFA Structure Fire Cause Methodology was used to determine residential building heating fire incidents.[23] Heating fire incidents involving heating stoves and food were believed to be cooking fires. As a result, fires with equipment involved in Ignition Code 124 (stove, heating) and Item First Ignited Code 76 (cooking materials, includes edible materials for man or animal, excludes cooking utensils) were excluded from the heating cause category.

- Equipment involved in Ignition Codes 141 to 143:

Equipment involved in ignition	Description
141	Heater; includes floor furnaces, wall heaters and baseboard heaters; excludes hot water heaters
142	Heater, catalytic
143	Heater, oil-filled

- Equipment Portability Code 1 was used to identify portability.

Although voluntary, the NFIRS is the world's largest national, annual database of fire incident information. By contributing to the NFIRS, the fire service is helping to make data-based decisions from local budget development to the identification of national preparedness initiatives. It is important that fire departments participate in the NFIRS and critical that the data they report is complete and accurate so that sound decisions can be made that have impact on community risk and emergency response.

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 U.S. fire problem and continually examines its received 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.

Information regarding the USFA's national estimates for residential building fires, as well as the data sources used to derive the estimates, can be found in the document "Data Sources and National Estimates Methodology Overview for the U.S. Fire Administration's Topical Fire Report Series (Volume 21)," https://www.usfa.fema.gov/downloads/pdf/statistics/data-sources-and-national-estimates-methodology-vol21.pdf. This document also addresses the specific NFIRS data elements analyzed in the topical reports, as well as "unknown" data entries and missing data.

To request additional information, visit: http://www.usfa.fema.gov/contact.html. Provide feedback on this report.

Notes:

[1]In NFIRS Version 5.0, a structure is a constructed item of which a building is one type. In previous versions of the 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 the NFIRS 5.0 includes 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 structures 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 occur in 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.

[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, boarding houses or residential hotels, dormitories, sorority/fraternity houses, 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]National estimates are based on 2017 to 2019 native Version 5.0 data from NFIRS, residential structure fire loss estimates from the National Fire Protection Association's (NFPA's) annual surveys of fire loss, and the USFA's residential building fire loss estimates: http://www.usfa.fema.gov/data/statistics/order_download_data.html. Further information on the USFA's residential building fire loss estimates can be found in the "National Estimates Methodology for Building Fires and Losses," August 2012, http://www.usfa.fema.gov/downloads/pdf/statistics/national_estimate_methodology.pdf. For detailed information regarding the NFPA's survey methodology, see the NFPA's "Methodology used in calculating national estimates from NFPA's 2020 fire experience survey," August 2021, https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/US-Fire-Problem/Methodsfirelossandothers.ashx. In this topical report, fires are rounded to the nearest 100, deaths to the nearest 5, injuries to the nearest 25 and dollar loss to the nearest million dollars.

[4]For this analysis, portable heater fires in residential buildings are defined as those residential buildings (defined above in endnote 2) for which the cause of the fire was determined to be portable heaters.

[5]Space heaters may be fixed (stationary) or portable. Space heaters typically include heating and wood stoves, heaters (including portable kerosene heaters, portable electric heaters, oil-filled heaters and catalytic heaters), local furnaces and fireplace inserts.

[6]Fire department participation in the NFIRS is voluntary; however, some states do require their departments to participate in the state system. Additionally, if a fire department is a recipient of a Fire Act Grant, participation is required. From 2017 to 2019, 68% of the NFPA's annual average estimated 1,309,800 fires to which fire departments responded were captured in the NFIRS. Thus, the NFIRS is not representative of all fire incidents in the U.S. and is not a "complete" census of fire incidents. Although the NFIRS does not represent 100% of the incidents reported to fire departments each year, the enormous dataset exhibits stability from one year to the next without radical changes. Results based on the full dataset are generally similar to those based on part of the data.

[7]In the NFIRS, confined fires are defined by Incident Type Codes 113 to 118.

[8]The NFIRS distinguishes between "content" and "property" loss. Content loss includes losses 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. However, there could be property damage as a result of smoke, water and overhaul.

[9]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 x 65/1,100) = 59.1 deaths per 1,000 portable heater fires in residential buildings, and the fire injury rate is (1,000 x 150/1,100) = 136.4 injuries per 1,000 portable heater fires in residential buildings.

[10]"Heating Fires in Residential Buildings (2017-2019)," USFA, November 2021, Volume 21, Issue 10, https://www.usfa.fema.gov/downloads/pdf/statistics/v21i10.pdf.

[11]"One- and two-family residential buildings" include detached dwellings, manufactured homes, mobile homes not in transit and duplexes. "Multifamily residential buildings" include apartments, town houses, row houses, 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.

[12]"Residential Building Fires (2017-2019)," USFA, May 2021, Volume 21, Issue 2, https://www.usfa.fema.gov/downloads/pdf/statistics/v21i2.pdf.

[13]Total does not add up to 23% due to rounding.

[14]For this report, the time of the fire alarm is used as an approximation for the general time at which the fire started. However, in the NFIRS, it is the time at which the fire was reported to the fire department.
[15]All incidents where smoke alarm presence was not reported (i.e., null/blank) were confined fires (Incident Type code 116). The NFIRS allows abbreviated reporting for confined fires. Many reporting details of these fires (including smoke alarm presence) are not required, and as a result, may not be reported.
[16]Total does not add up to 100% due to rounding.
[17]Total does not add up to 41% due to rounding.
[18]U.S. Department of Housing and Urban Development and U.S. Census Bureau, American Housing Survey for the United States: 2011, September 2013, "Health and Safety Characteristics-All Occupied Units," Table S-01-AO, https://www.census.gov/content/dam/Census/library/publications/2013/demo/h150-11.pdf (accessed Sept. 29, 2021).
[19]Rutledge, Mike, "Man killed in Butler County house fire likely started by space heater," www.journal-news.com, April 1, 2021, https://www.journal-news.com/news/man-killed-in-butler-county-residential-fire-this-morning/RME7JBCGZBEKJE3ZXE564QDTNQ/ (accessed Sept. 29, 2021).
[20]Carrigan, Andrew, "Officials: Space heater leads to Freeport house fire, 'several' cats killed," wrex.com, Feb. 16, 2021, https://wrex.com/2021/02/16/officials-space-heater-leads-to-freeport-house-fire-several-cats-killed/ (accessed Sept. 29, 2021).
[21]The Highlands Current Staff, "Space Heater Causes House Fire," highlandscurrent.org, Jan. 8, 2021, https://highlandscurrent.org/2021/01/08/space-heater-causes-house-fire/ (accessed Sept. 29, 2021).
[22]Heating is defined by the equipment used to heat a residential building. Incident Types 113, 115, 117 and 118 were excluded because, by definition, these Incident Types are not heating fires.
[23]The USFA Structure Fire Cause Methodology is designed for structure fires of which buildings are a subset. This methodology was used to determine heating as a cause of fires in residential buildings. The cause methodology and definitions can be found in the document "National Fire Incident Reporting System Version 5.0 Fire Data Analysis Guidelines and Issues," July 2011, http://www.usfa.fema.gov/downloads/pdf/nfirs/nfirs_data_analysis_guidelines_issues.pdf.