

Vacant Residential Building Fires (2013-2015)

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 National Fire Incident Reporting System. 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

- Each year, from 2013 to 2015, an estimated 23,800 vacant residential building fires were reported to fire departments within the United States and caused an estimated 75 deaths, 200 injuries and \$785 million in property loss.
- Vacant residential building fires are considered part of the residential fire problem and accounted for 6 percent of all residential building fires.
- Nonconfined fires accounted for 99 percent of vacant residential building fires.
- At 34 percent, intentional actions were the leading cause of vacant residential building fires.
- Of vacant residential building fires, 53 percent spread to involve the entire building. An additional 10 percent extended beyond the building to adjacent properties.
- At 12 percent, bedrooms were the leading area of fire origin in vacant residential building fires. Following closely were common rooms, such as dens, family rooms and living rooms (11 percent), and cooking areas/kitchens (8 percent).

From 2013 to 2015, an estimated 23,800 vacant residential building fires were reported annually in the U.S.^{1,2} Vacant residential building fires are considered part of the residential fire problem, accounting for 6 percent of all residential building fires, resulting in an estimated 75 deaths, 200 injuries and \$785 million in property loss each year.³

A large number of vacant residential buildings can present various problems. These buildings are rarely maintained and often serve as a common site for illicit or illegal activity. In addition, vacant residential buildings are sometimes used by homeless people as temporary shelters or housing. A major concern when a vacant building catches on fire is that little is known about the building's overall condition. Many buildings are in disrepair and can be missing certain structures, such as staircases or portions of floors. If individuals are known to use the vacant building as a residence, the unknown condition of the building and the unknown number of people using the building as a shelter can put the firefighters' lives in danger when they enter the building to attempt a rescue during a fire.

The surrounding nonvacant properties are also at risk when vacant residential buildings catch fire. It typically takes longer for vacant residential building fires to be detected, as there are no occupants to be alerted by the smell or sound of the fires or to respond to an alarm. Thus, the property loss is greater. In addition, if the fire has been intentionally set, especially with multiple ignition points, the damage can be greater, placing the lives of more individuals — firefighters, adjacent residents, and any squatters — in danger.

Fires in vacant residential buildings have become an even greater issue over the past decade. During the Great Recession of 2007 to 2009, many communities saw an increase in the number of vacant residential buildings, and with that they saw an increase in the number of vacant residential building fires.⁴ From 2013 to 2015, the leading cause of all vacant residential building fires was intentional actions (34 percent, as discussed later in this report), posing serious issues for many communities. These types of fires continue to be a problem and concern within our society.

This topical report addresses the characteristics of vacant residential building fires as reported to the National Fire Incident Reporting System (NFIRS) from 2013 to 2015, the most recent data available at the time of the analysis.⁵ The NFIRS data is used for the analyses throughout this report. Vacant residential building fires, as analyzed in this report, include properties where the building is under construction, under major renovation, being demolished, is vacant and secured, or is vacant and unsecured. The remaining building status categories (occupied and operating; idle, not routinely used; building status, other; and undetermined) are considered “nonvacant,” but not necessarily occupied.

For the purpose of this report, the terms “residential fires” and “vacant residential fires” are synonymous with “residential building fires” and “vacant residential building fires,” respectively. The term “vacant residential fires” is used throughout the body of this report; the findings, tables, charts, headings and endnotes reflect the full category “vacant residential building fires.”

Fire and fire loss estimates

The data shows that an estimated 23,800 vacant residential fires occurred annually between 2013 and 2015, resulting in an estimated total of 75 deaths, 200 injuries and \$785 million in property loss each year (Table 1). Of the vacant residential fires, 46 percent of the buildings were reported as vacant and unsecured, and another 36 percent were reported as vacant and secured.

Table 1. Vacant residential building fire loss estimates by building status (three-year average, 2013-2015)

Building status	Fires	Deaths	Injuries	Total dollar loss
Under construction	1,800	0	25	\$159,500,000
Under major renovation	1,600	10	50	\$85,100,000
Vacant and secured	8,500	25	50	\$314,500,000
Vacant and unsecured	11,000	35	75	\$208,100,000
Being demolished	900	5	0	\$17,600,000
Total	23,800	75	200	\$784,800,000

Source: NFIRS 5.0., National Fire Protection Association (NFPA).

Note: Fires are rounded to the nearest 100, deaths to the nearest five, injuries to the nearest 25, and dollar loss to the nearest \$100,000. Dollar loss was adjusted to 2015 dollars.

Type of fire

Building fires are divided into two classes of severity in the NFIRS, as follows: “confined fires,” which are fires confined to certain types of equipment or objects, and “nonconfined fires,” which are fires that are not confined to certain types of equipment or objects. Confined building fires are small fire incidents that are limited in extent, staying within pots, fireplaces or certain other noncombustible containers.⁶ 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, whereas nonconfined fires generally have more substantial losses, some of which may be significant.⁷

Of the two classes of severity, nonconfined fires accounted for nearly all vacant residential fires (Table 2). Because there were so few confined vacant residential fires (1 percent), the subsequent analyses in this report include all vacant residential fires and do not distinguish between confined and nonconfined fires.

Table 2. Vacant residential building fires by type of incident (2013-2015)

Incident type	Percent
Nonconfined fires	99.2
Building fires	93.7
Fires in mobile homes and other mobile/portable buildings	5.5
Confined fires	0.8
Total	100.0

Source: NFIRS 5.0.

Loss measures

Table 3 presents losses, averaged over the three-year period from 2013 to 2015, of reported vacant residential fires and nonvacant residential fires.⁸ Fires in vacant residential buildings had lower casualty (fatality and injury) rates than fires in nonvacant residential buildings, but higher property loss rates.

Table 3. Loss measures for vacant and nonvacant residential building fires (three-year average, 2013-2015)

Measure	Vacant residential building fires	Nonvacant residential building fires
Average loss		
Fatalities/1,000 fires	2.4	5.7
Injuries/1,000 fires	7.1	27.5
Dollar loss/fire	\$30,150	\$15,940

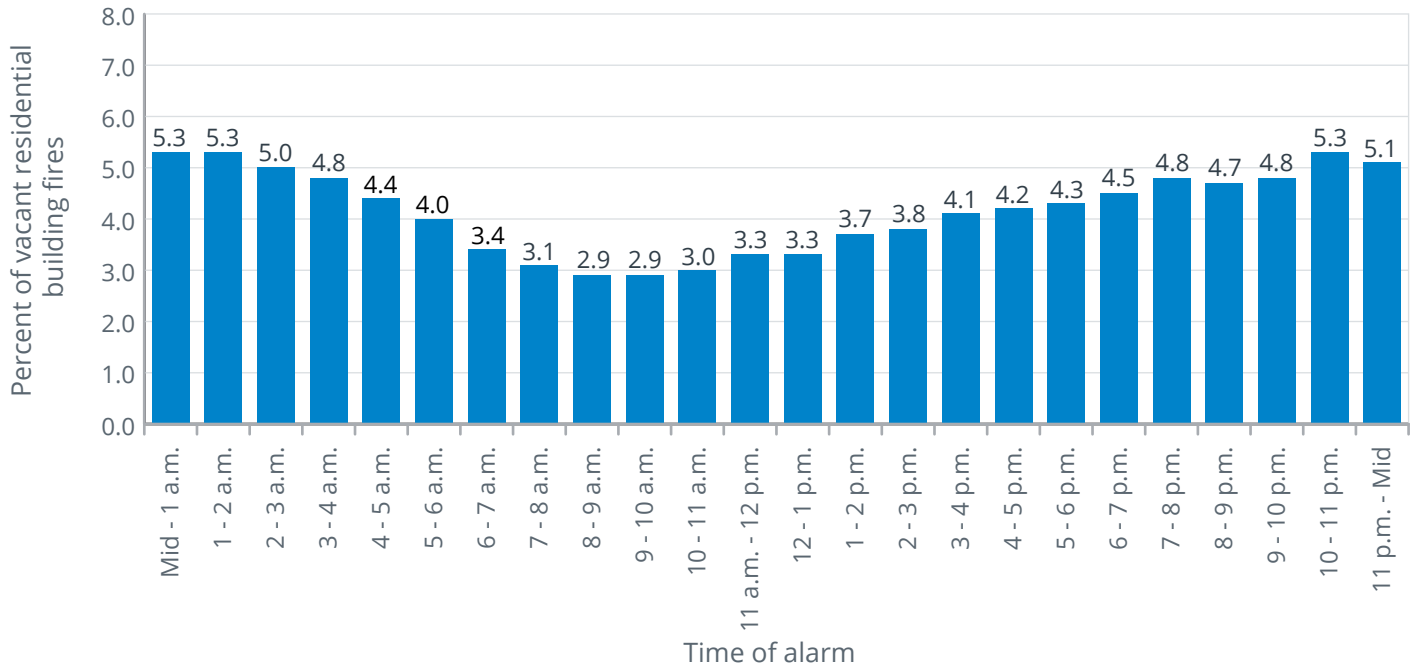
Source: NFIRS 5.0.

Note: 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. Dollar loss was adjusted to 2015 dollars.

When vacant residential building fires occur

As shown in Figure 1, vacant residential fires occurred most frequently in the late night to early morning hours, peaking from 10 p.m. to 3 a.m. They gradually declined throughout the early morning, reaching the lowest point during the midmorning hours (8 a.m. to 10 a.m.). The fire incidence then began to rise steadily from 10 a.m. through the evening hours before reaching the peak period (10 p.m. to 3 a.m.), which accounted for 26 percent of vacant residential fires.⁹

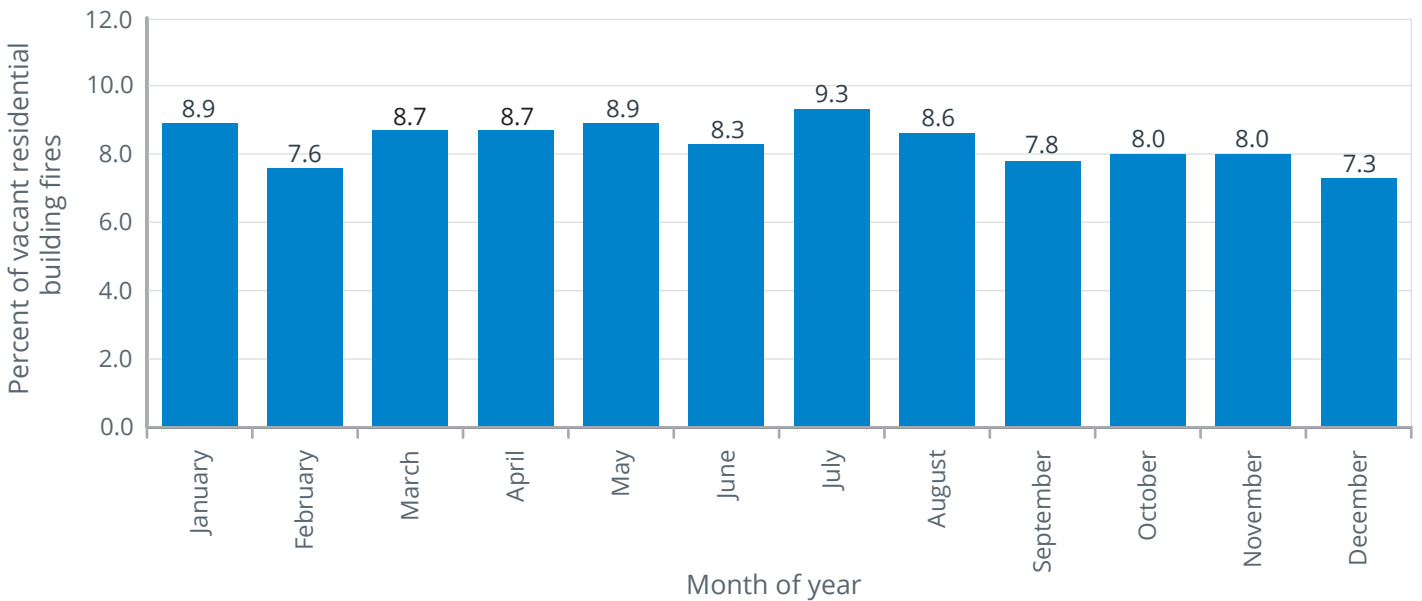
Figure 1. Vacant residential building fires by time of alarm (2013-2015)



Source: NFIRS 5.0.

Figure 2 illustrates that vacant residential fires peaked in July at 9 percent. Fire incidence in vacant residences was lowest in December at 7 percent.

Figure 2. Vacant residential building fires by month (2013-2015)



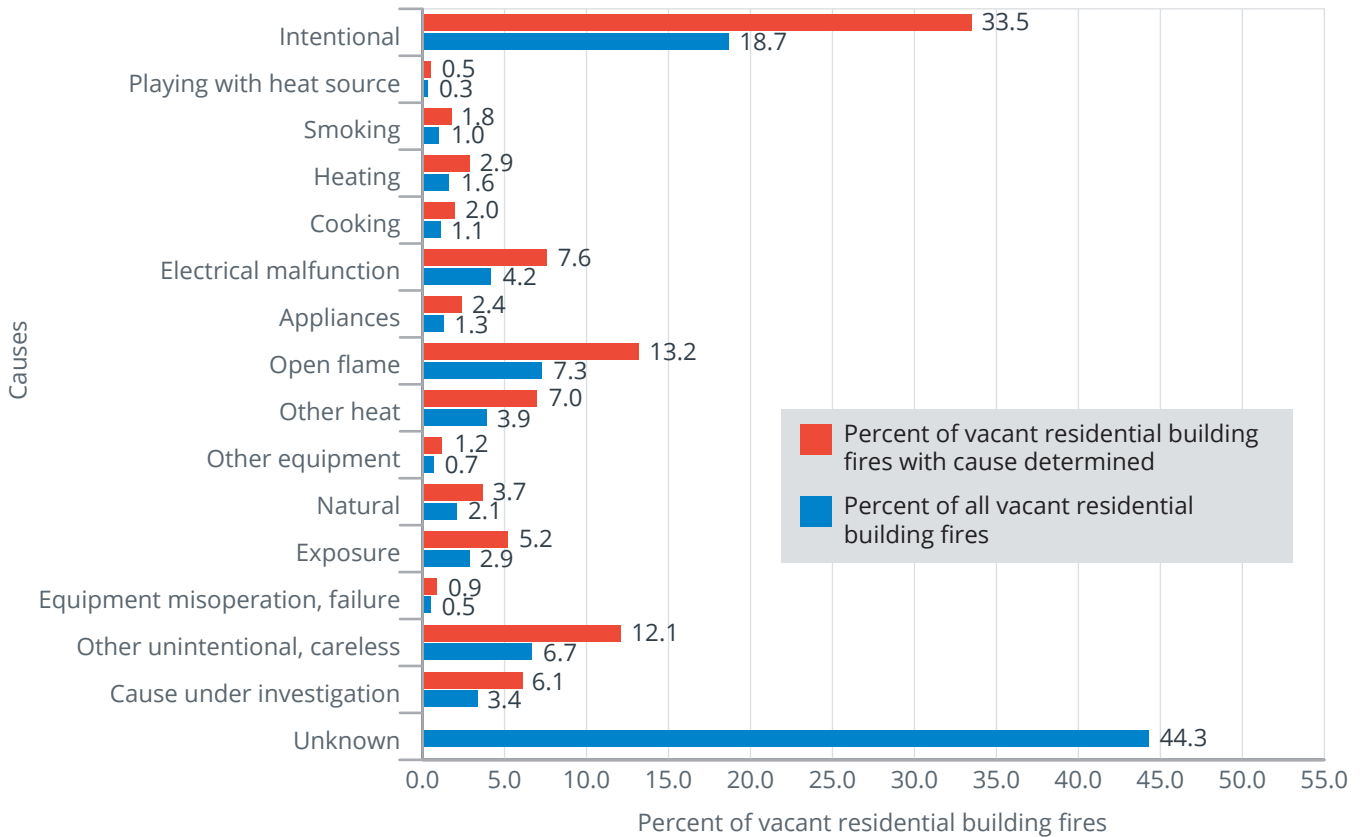
Source: NFIRS 5.0.

Note: Total does not add up to 100 percent due to rounding.

Causes of vacant residential building fires

The leading cause of vacant residential fires was intentional actions at 34 percent (Figure 3).¹⁰ The next three leading causes combined accounted for one third of vacant residential fires: open flame (13 percent); other unintentional, careless actions (12 percent); and electrical malfunction (8 percent).¹¹

Figure 3. Vacant residential building fires by cause (2013-2015)



Source: NFIRS 5.0.

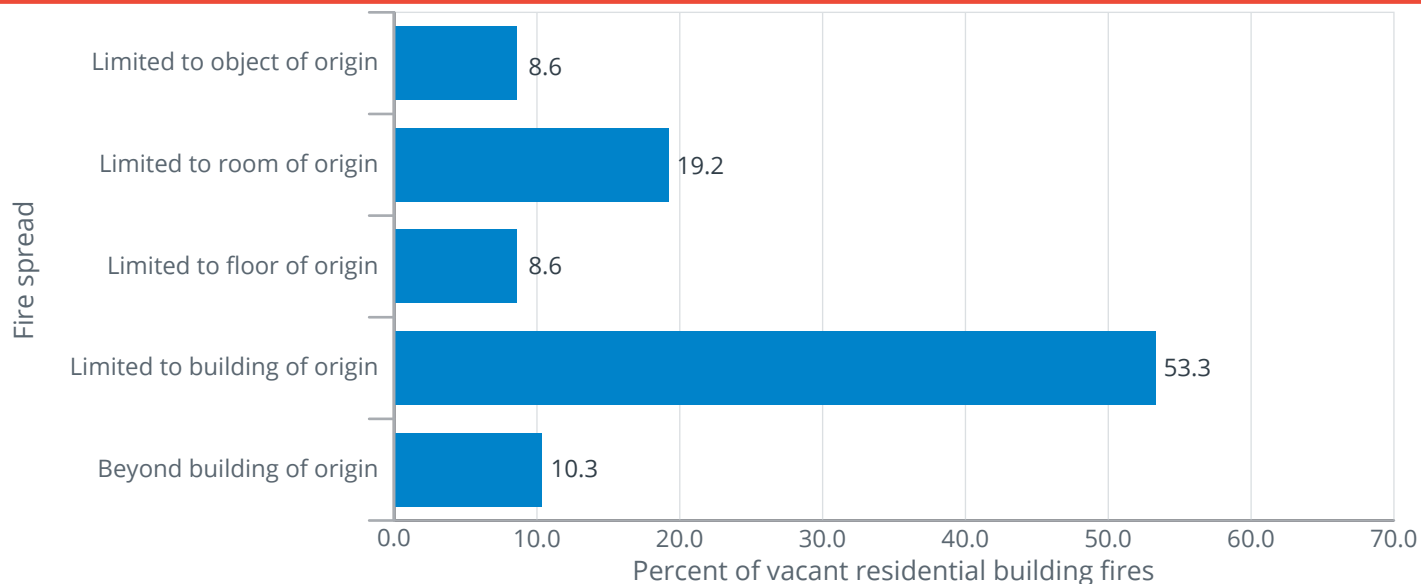
Notes: 1. Causes are listed in order of the U.S. Fire Administration (USFA) Structure Fire Cause Hierarchy for ease of comparison of fire causes across different aspects of the fire problem. Fires are assigned to one of 16 cause groupings using a hierarchy of definitions, as shown in the chart above. A fire is included in the highest category into which it fits. If it does not fit the top category, then the second one is considered, and if not that one, the third, and so on. For example, if the fire is judged to be intentionally set and a match was used to ignite it, it is classified as intentional and not open flame because intentional is higher in the hierarchy.

2. Due to rounding, the total does not add up to 100 percent for vacant residential building fires with cause determined.

Fire spread in vacant residential building fires

Of the fires that occurred in vacant residences, 10 percent extended beyond the building to adjacent properties. While 90 percent of vacant residential fires never spread beyond the building of fire origin (Figure 4), 53 percent of the fires involved the entire building. The spread of fires in vacant residential buildings was different than the fire spread of nonvacant residential fires, where most fires were limited to the object of origin (59 percent) and only 15 percent involved the entire building.

Figure 4. Extent of fire spread in vacant residential building fires (2013-2015)



Source: NFIRS 5.0.

Where vacant residential building fires start (area of fire origin)

At 12 percent, bedrooms were the leading area where vacant residential fires started (Table 4). Fires that began in family rooms or living rooms (11 percent) and cooking areas/kitchens (8 percent) were the next leading areas of fire origin. Less common were fires that started in attics (6 percent), on exterior wall surfaces (5 percent), and in other function areas (5 percent).

Table 4. Leading areas of fire origin in vacant residential building fires (2013-2015)

Areas of fire origin	Percent (unknowns apportioned)
Bedrooms	11.6
Common room, den, family room, living room, lounge	10.8
Cooking area, kitchen	8.2
Attic: vacant, crawl space	5.6
Wall surface, exterior	5.4
Other function areas	5.3

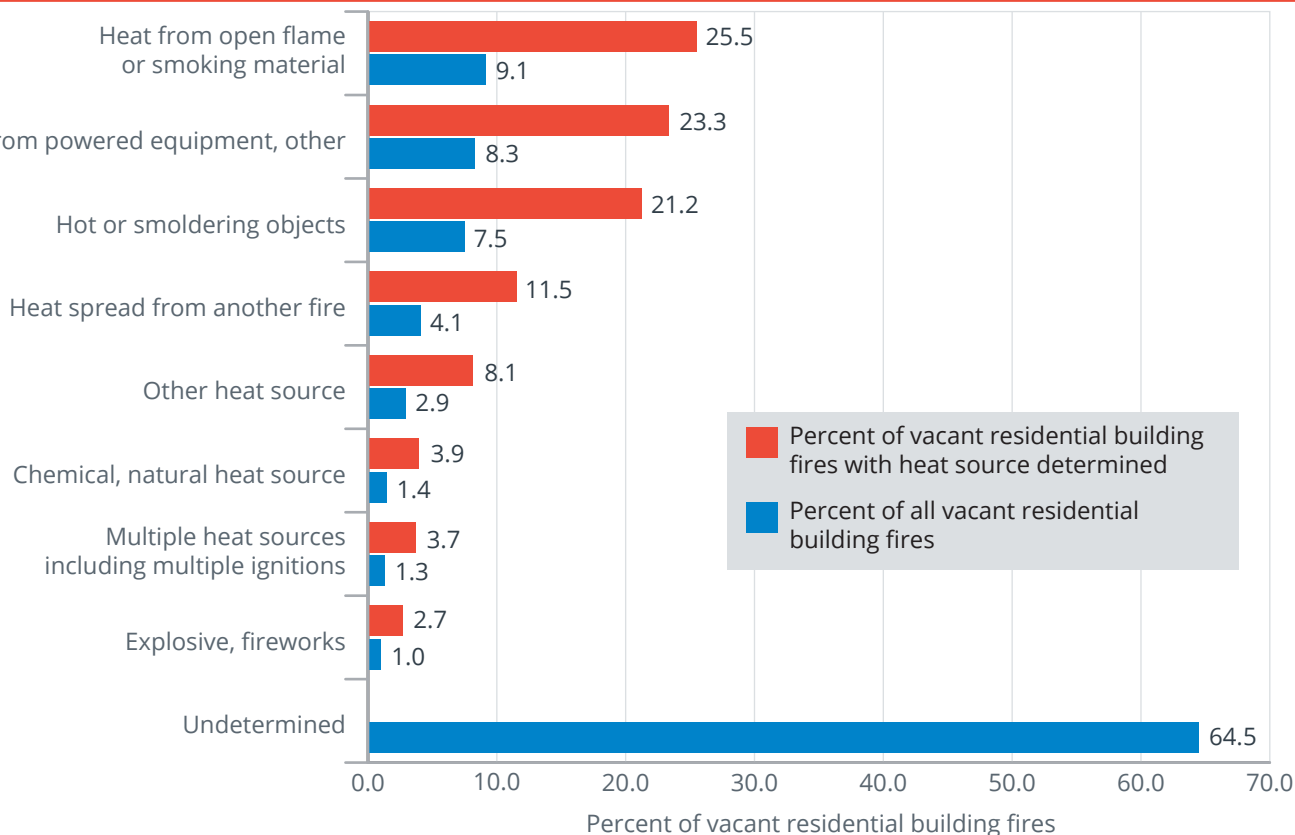
Source: NFIRS 5.0.

How vacant residential building fires start (heat source)

Figure 5 shows sources of heat categories in vacant residential fires. The “heat from open flame or smoking materials” category accounted for 26 percent of all vacant residential fires. Within this category, heat from other open flames or smoking materials accounted for 12 percent, cigarette or cigar lighters accounted for 4 percent, and matches accounted for 3 percent of all vacant residential fires.

The “heat from powered equipment” category accounted for 23 percent of vacant residential fires. This category includes electrical arcing (10 percent); heat from other powered equipment (5 percent); radiated or conducted heat from operating equipment (5 percent); and sparks, embers or flames from operating equipment (3 percent). The third largest category pertains to “hot or smoldering objects” (21 percent). This category includes items such as hot embers or ashes (10 percent) and miscellaneous hot or smoldering objects (9 percent).

Figure 5. Sources of heat in vacant residential building fires by major category (2013-2015)



Source: NFIRS 5.0.

Note: Totals for each distribution do not add up to 100 percent due to rounding. In 65 percent of the reported vacant residential building fires, the heat source was undetermined.

What ignites first in vacant residential building fires

“Structural member or framing” (15 percent); “exterior sidewall covering, surface, finish” (10 percent); and “structural component or finish, other” (7 percent) were the specific items most often first ignited in vacant residential fires (Table 5). “Rubbish, trash, waste” and “multiple items first ignited” accounted for an additional 13 percent of the fires.

Table 5. Leading items first ignited in vacant residential building fires (2013-2015)

Item first ignited	Percent (unknowns apportioned)
Structural member or framing	14.8
Exterior sidewall covering, surface, finish	10.2
Structural component or finish, other	7.4
Rubbish, trash, waste	6.4
Multiple items first ignited	6.4

Source: NFIRS 5.0.

Factors contributing to ignition in vacant residential building fires

Table 6 shows the categories of factors contributing to ignition in vacant residential fires. By far, the leading category was the “misuse of material or product” (41 percent). Abandoned or discarded materials or products (13 percent), misuse of materials or products (9 percent), and heat source too close to combustibles (9 percent) accounted for the majority of fires in this category.

The “fire spread or control” category was a contributing factor in 26 percent of vacant residential fires. Rekindling of fires (14 percent) and exposure fires (8 percent) were the leading specific factors contributing to ignition in this category.

The categories “electrical failure, malfunction” and “other factors contributing to ignition” were the next leading factors at 13 percent each. The remaining categories also accounted for 13 percent of vacant residential fires.

Table 6. Factors contributing to ignition for vacant residential building fires by major category (where factors contributing to ignition were specified, 2013-2015)

Factors contributing to ignition category	Percent of vacant residential fires
Misuse of material or product	40.6
Fire spread or control	26.2
Electrical failure, malfunction	12.6
Other factors contributing to ignition	12.6
Operational deficiency	4.3
Natural condition	3.9
Mechanical failure, malfunction	3.0
Design, manufacture, installation deficiency	1.3

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; total will exceed 100 percent.

Alerting/Suppression systems in vacant residential building fires

Fire fatalities and injuries have declined over the last 35 years, partly due to new technologies to detect and extinguish fires. Smoke alarms are present in most homes. In addition, the use of residential sprinklers is widely supported by the fire service and is gaining support within residential communities.

Smoke alarm and automatic extinguishing system (AES) data presented in Tables 7 and 8 are the raw counts from the NFIRS dataset and are not scaled to national estimates of smoke alarms or AESs in vacant residential fires. The evaluation of the operation and effectiveness of alerting and suppression systems is problematic in vacant properties. As the properties are vacant, it is not expected that power, or water in the case of AESs, will be available to operate the systems. Therefore, the tables and analyses below only address data on the presence of these systems. As expected, both systems were largely absent in vacant residential fires.

Smoke alarm data

Smoke alarms were present in 13 percent of vacant residential fires (Table 7). In 59 percent of vacant residential fires, there were no smoke alarms present. In another 28 percent of these fires, firefighters were unable to determine if a smoke alarm was present.

Table 7. NFIRS smoke alarm presence for vacant residential building fires (2013-2015)

Presence of smoke alarms	Count	Percent
Present	6,371	12.9
None present	29,255	59.1
Undetermined	13,877	28.0
Total incidents	49,503	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 2013 to 2015. They do not represent national estimates of smoke alarms in vacant residential building fires. They are presented for informational purposes.

Nationally, only 3 percent of households do not have smoke alarms.¹² 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 and fire service organizations to improve and develop new smoke alarm technologies. More information on smoke alarm technologies, performance, disposal and storage, training bulletins, and public education and outreach materials is available at https://www.usfa.fema.gov/prevention/technology/smoke_fire_alarms.html. Additionally, the USFA's position statement on smoke alarms is available at https://www.usfa.fema.gov/about/smoke_alarms_position.html.

Automatic extinguishing system data

Overall, full or partial AESs, mainly sprinklers, were present in just 1 percent of vacant residential fires (Table 8). The lack of suppression equipment (sprinklers) in vacant residential properties is not unexpected. The data presented in Table 8 are the raw counts from the NFIRS dataset and are not scaled to national estimates of AESs in vacant residential fires.

Table 8. NFIRS automatic extinguishing system data for vacant residential building fires (2013-2015)

Automatic extinguishing system presence	Count	Percent
Automatic extinguishing system present	577	1.2
Partial system present	35	0.1
Automatic extinguishing system not present	44,837	90.6
Unknown	4,054	8.2
Total incidents	49,503	100.0

Source: NFIRS 5.0.

Note: Total percent does not add up to 100 percent due to rounding. The data presented in this table are raw data counts from the NFIRS dataset summed (not averaged) from 2013 to 2015. They do not represent national estimates of AESs in vacant residential building fires. They are presented for informational purposes.

Residential sprinkler systems help to reduce the risk of deaths and injuries, homeowner insurance premiums, and uninsured property losses. Although they are often found in hotels and businesses, many homes still do not have AESs. 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. Presently, however, they are largely absent in residences nationwide.¹³

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

Examples

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

- September 2017: Around noon, firefighters responded to a vacant house fire in Atwater, California. The house was fully engulfed in flames when firefighters arrived on scene. It was reported that there were multiple fires at the home in the past. The house was vacant for three years and frequented by homeless people. There was no one in the home at the time of the fire. No injuries were reported as a result of the blaze; however, the structure was a total loss. The cause of the fire is under investigation.¹⁴
- September 2017: Three homes were damaged by a fire that broke out in a vacant house in Wilkes-Barre, Pennsylvania. The fire was reported around 3:50 p.m., and by the time fire crews arrived at the scene, the structure was fully engulfed in flames. Although the fire spread to two neighboring, occupied homes, no injuries were reported. The cause of the blaze is under investigation.¹⁵
- August 2017: A vacant house fire in Baton Rouge, Louisiana, was determined to be intentionally set. The fire started around 11:20 p.m. Upon arrival at the scene, firefighters found the back of the home on fire, but extinguished the blaze before it could spread. The rest of the home suffered smoke damage. No injuries were reported.¹⁶
- July 2017: Around noon, firefighters extinguished a fire in a vacant house in the Village of East Davenport, Illinois. According to the fire chief, the fire spread to the second floor of the home, and there was smoke coming out of the roof. It was reported that the home was being remodeled at the time the fire started. No injuries occurred as a result of the blaze.¹⁷

Resources

The number of vacant building fires that occur each year in the U.S. has always been a concern. This concern escalates with the effects of downturns in the economy, with overall increases in the number of vacant buildings and, incidentally, in the number of vacant building fires.

The Center for Community Progress provides information, tools and assistance to support communities in an effort to revitalize vacant properties. This information can be found at <http://www.communityprogress.net/>.

NFIRS data specifications for vacant residential building fires

Data for this report were extracted from the NFIRS annual Public Data Release files for 2013, 2014 and 2015. Only Version 5.0 data were extracted.

Vacant residential building fires were defined using the following criteria:

- Aid Types 3 (mutual aid given) and 4 (automatic aid given) were excluded to avoid double counting incidents.
- Incident Types 111 to 123 (excluding Incident Type 112), which consists of the following:

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

Note: Incident Types 113 to 118 do not specify if the structure is a building.

- 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 to 118:
 - ▶▶ 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.

- Structure Status:

- ▶ 1—Under construction.
- ▶ 4—Under major renovation.
- ▶ 5—Vacant and secured.
- ▶ 6—Vacant and unsecured.
- ▶ 7—Being demolished.

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 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 18)," https://www.usfa.fema.gov/downloads/pdf/statistics/data_sources_and_national_estimates_methodology_vol18.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 <https://www.usfa.fema.gov/contact.html>. To comment on this specific report, visit [https://apps.usfa.fema.gov/contact/dataReportEval?reportTitle=Vacant%20Residential%20Building%20Fires%20\(2013-2015\)](https://apps.usfa.fema.gov/contact/dataReportEval?reportTitle=Vacant%20Residential%20Building%20Fires%20(2013-2015)).

Notes:

¹National estimates are based on 2013 to 2015 native Version 5.0 data from the NFIRS, residential structure fire loss estimates from the NFPA's annual surveys of fire loss, and the USFA's residential building fire loss estimates: https://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, https://www.usfa.fema.gov/downloads/pdf/statistics/national_estimate_methodology.pdf. For information on the NFPA's survey methodology, see the NFPA's report "Fire Loss in the United States During 2015," September 2016, <http://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics/Overall-Fire-Statistics/FireLoss2015.ashx?la=en&hash=7659AE333C3BE6971ACA23F1C49BA3926A518125>. In this topical report, fires are rounded to the nearest 100, deaths to the nearest five, injuries to the nearest 25, and dollar loss to the nearest million dollars.

²In 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 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.

³The 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 addictions, 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.

⁴Howley, Kathleen M., "Arson Surges for Foreclosed Homes Lost to Subprime (Update 1)," July 3, 2008.

⁵Fire 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 2013 to 2015, 67 percent of the NFPA's annual average estimated 1,294,500 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 percent 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.

⁶In the NFIRS, confined fires are defined by Incident Type codes 113 to 118.

⁷The 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); 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.

⁸The 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 the NFIRS data alone. The fire death rate computed from national estimates is $(1,000 \times (75/23,800)) = 3.2$ deaths per 1,000 vacant residential building fires, and the fire injury rate is $(1,000 \times (200/23,800)) = 8.4$ injuries per 1,000 vacant residential building fires.

⁹For the purposes of 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.

¹⁰Fires caused by intentional actions include, but are not limited to, fires that are deemed to be arson. Intentional fires are those fires that are deliberately set and include fires that result from the deliberate misuse of a heat source and fires of an incendiary nature (arson) that require fire service intervention. For information and statistics on arson fires only, refer to the Uniform Crime Reporting Program arson statistics from the U.S. Department of Justice, FBI, Criminal Justice Information Services Division, <https://www.fbi.gov/about-us/cjis/ucr/ucr>.

¹¹The USFA Structure Fire Cause Methodology was used to determine the cause of vacant residential building fires. 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, https://www.usfa.fema.gov/downloads/pdf/nfirs/nfirs_data_analysis_guidelines_issues.pdf.

¹²Greene, Michael and Andres, Craig "2004-2005 National Sample Survey of Unreported Residential Fires," Division of Hazard Analysis, Directorate for Epidemiology, U.S. Consumer Product Safety Commission, July 2009.

¹³U.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 (National)," Table S-01-AO, <https://www.census.gov/content/dam/Census/programs-surveys/ahs/data/2011/h150-11.pdf> (accessed Oct. 18, 2017).

¹⁴Velez, Monica, "Vacant Atwater home destroyed in fire," www.modbee.com, Sept. 4, 2017, <http://www.modbee.com/news/article171231442.html> (accessed Oct. 19, 2017).

¹⁵Kernan, Patrick, "Fire breaks out at vacant home in Wilkes-Barre, spreads to neighboring houses," www.timesleader.com, Sept. 2, 2017, <http://www.timesleader.com/news/local/673992/673992> (accessed Oct. 19, 2017).

¹⁶"Fire at vacant home on Delaware Street found to be arson, Baton Rouge Fire Department says," www.theadvocate.com, Aug. 29, 2017, http://www.theadvocate.com/baton_rouge/news/crime_police/article_09cd73b6-8cb6-11e7-a70f-ff3dcb904223.html (accessed Oct. 19, 2017).

¹⁷Noe, Megan, "Vacant home in Village of East Davenport catches fire," wqad.com, July 14, 2017, <http://wqad.com/2017/07/14/vacant-home-in-village-of-east-davenport-catches-fire/> (accessed Oct. 19, 2017).