

# **U.S. Fire Administration TOPICAL FIRE RESEARCH SERIES**

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## **Daycare Center Fires**

### **FINDINGS**

- An estimated 325 fires occur in daycare centers/facilities each year. These result in few fatalities, but cause \$1.6 million in property loss.
- Cooking is the leading cause of daycare center fires. Children playing fire are not a significant cause.
- Smoke alarms operate in 63% of daycare center fires—a much higher rate than in non-residential structures in general.
- Licensing regulations and building codes for daycare facilities emphasize fire prevention and protection.

Sources: NFPA and NFIRS

In 1997, 77% of preschool children with employed mothers were cared for in child-care centers, in family childcare located in providers' homes, by relatives, or by nannies for a least some period of time during the week.<sup>1</sup>

Each year between 1996 and 1998, approximately 325 fires were reported in structures classified as daycare centers.<sup>2</sup> These fires rarely injure or kill anyone—less than 10 injuries or fatalities each year—but they cause an average of \$1.6 million in property loss.<sup>3</sup> This report examines the causes and characteristics of daycare center fires.

This analysis addresses only those fires that are reported to the National Fire Incident Reporting System (NFIRS) and that occur in structures classified specifically as daycare centers. Currently it is not possible to determine from NFIRS data the frequency of fires in residential structures where someone is providing daycare services (licensed or unlicensed). Instead, information on these types of daycare centers and fires in them must be gleaned from other sources, such as the media.

This lack of data leads to a number of questions as to the incidence of fire in home daycare settings. Is there a higher incidence of fire in home daycare settings that can be attributed to children playing? Does current daycare licensing adequately protect young children from the threat of fire? Is there a correlation between the time of day when a fire originates and the presence of daycare children in the home? Does the pres-

ence of additional children in the home influence the incidence of children playing fires, or is a rise seen in other types of fires (e.g., cooking, heating)? Answers to these questions are not possible at this time.

## LOSS MEASURES

Figure 1 compares the loss measures for daycare center fires to those occurring generally in non-residential structures. Daycare center fires tend to cause less damage, but are slightly more injurious than non-residential structure fires. It is possible that the higher rate of injuries in daycare center fires is a result of the age of the center's occupants. Children may require more direction and assistance to leave a structure in the event of a fire than adults.

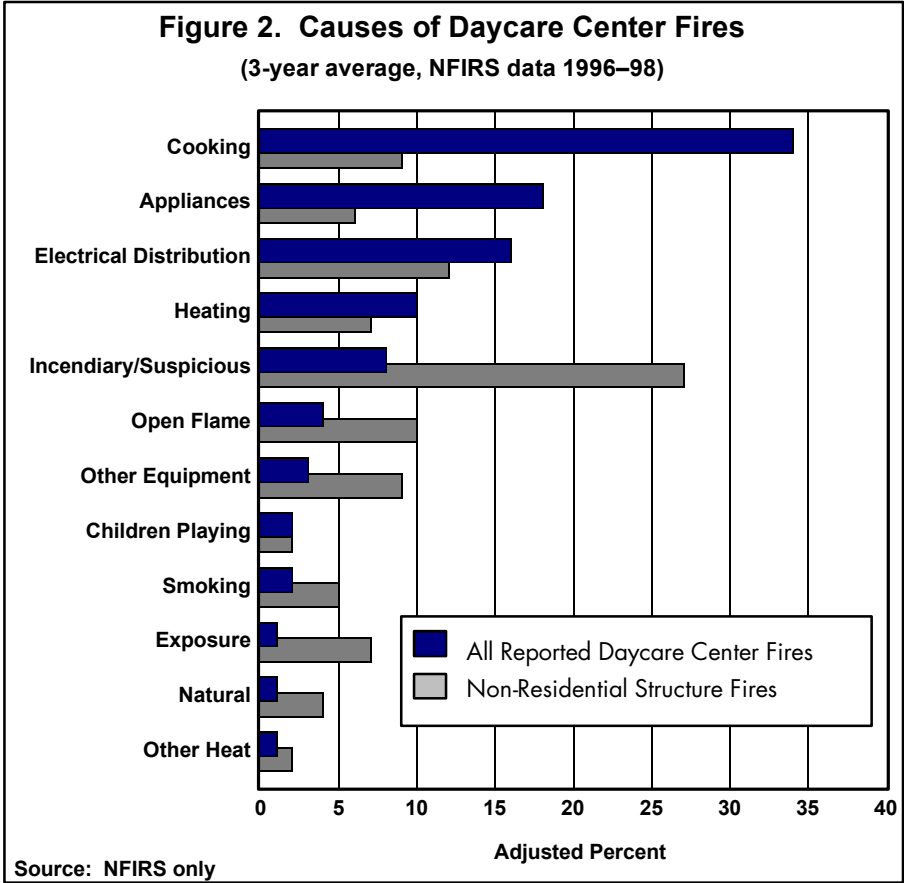
LOSS MEASURE	ALL NON-RESIDENTIAL STRUCTURE FIRES	DAYCARE CENTER FIRES
Dollar Loss/Fire	\$21,878	\$5,975
Injuries/1,000 Fires	22.1	23.9
Fatalities/1,000 Fires	1.7	0 <sup>4</sup>

Source: NFIRS only

## CAUSES

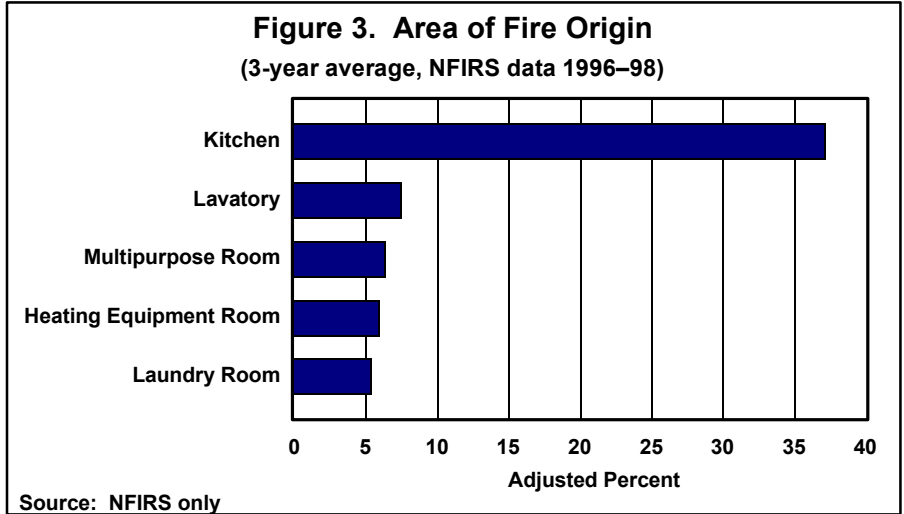
The leading causes of daycare center fires are cooking, appliances, electrical distribution, and heating (Figure 2). Nationally, the leading causes of non-residential structure fires are incendiary/suspicious (arson), electrical distribution, and open flame.

Interestingly, children playing fires are the same for both childcare centers and all non-residential structures. This may be due to the regulations incumbent on daycare centers that require certain staff-to-child ratios and the use of childproof cabinets, etc.<sup>5</sup>



**WHERE FIRES START**

Figure 3 illustrates where daycare center fires originate. Since cooking is the leading cause of fires, it is not surprising that the kitchen is the leading area (37%) where daycare center fires originate. About 25% of fires are nearly equally spread between lavatories, multipurpose rooms, heating equipment rooms, and laundry rooms.



Daycare center fires tend to be small, with 83% of flame damage confined to the object or room of origin. Moreover, a smoke alarm operates in 63% of daycare center fires, compared to only 18% in non-residential structures.

In 41% of daycare center fires, the factor influencing the fire's ignition is either an unattended heat source or a short circuit (Figure 4). Both are consistent with the high incidence of cooking fires (e.g., accidentally leaving food on the stove) and electrical appliance fires. Moreover, in 29% of daycare center fires, the material first ignited is cooking materials; in 22%, it is electrical wire (Figure 5).

**Figure 4. Leading Factors Influencing Ignition**  
(3-year average, NFIRS data 1996–98, adjusted percentage)

FACTOR INFLUENCING IGNITION	PERCENT OF FIRES
Unattended	21
Short Circuit	20
Combustible Too Close to Heat	8

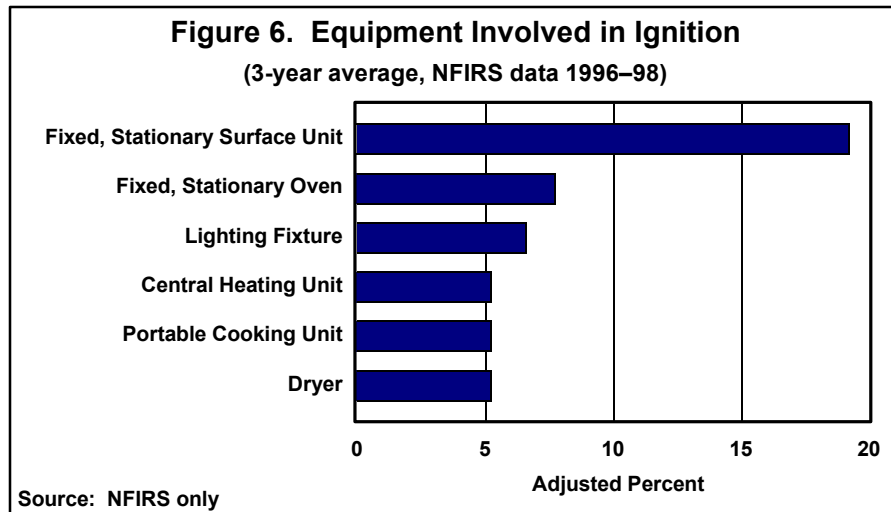
Source: NFIRS only

**Figure 5. Type of Material Ignited**  
(3-year average, NFIRS data 1996–98, adjusted percentage)

MATERIAL IGNITED	PERCENT OF FIRES
Cooking Materials	29
Electrical Wire	22
Framing/Structural Materials	5

Source: NFIRS only

In keeping with the high incidence of cooking fires, the leading equipment involved in the ignition of daycare center fires is a fixed, stationary piece of cooking equipment (e.g., a stove) (Figure 6). Other types of equipment involved in daycare center fires are ovens, lighting fixtures, and dryers.



## BUILDING CODES

Most building codes do not allow daycare centers to be above the second floor. Further, they are often required to have sprinkler systems, panic hardware on the doors, fire-rated corridors, extinguishers, and records of fire drills.<sup>6</sup>

Specific regulations vary from state to state regarding the licensing of daycare facilities. However, all states address fire protection and emergency procedures in their licensing requirements. Fire prevention and protection provisions generally include monthly fire drills, fire extinguisher inspections, means of egress from the facility, and procedures for calling 911.

Family daycare centers based in providers' homes are also subject to a range of regulations concerning fire safety. These are generally similar to those required of daycare centers, but are modified to apply to residential structures. For example, as in daycare centers, many codes and regulations prohibit children in family daycares from being cared for above the second floor of a residence.

## EXAMPLES

- In August 1999, a smoke alarm in a home daycare center was deliberately activated in a routine fire drill. The alarm itself overheated, melted loose from its mounting, and ignited a fire on the carpet below. The ensuing fire caused only \$1,000 in damage and no one was hurt.<sup>7</sup>
- In January 1999, a faulty clothes dryer ignited a daycare center fire. The ensuing blaze killed the center's owner and three children, ages 2, 1, and 3 months. A fourth child suffered permanent brain damage.<sup>8</sup>
- In December 1997, a daycare center was destroyed by arson after thieves robbed it and set it on fire. No one was hurt, but the building and its contents were a total loss.<sup>9</sup>

## CONCLUSION

Although daycare center fires are somewhat rare, they have the potential to harm thousands of children. For further information regarding daycare center fire protection regulations in your state, contact the National Resource Center for Health and Safety in Child Care (<http://nrc.uchsc.edu/index.html>), the USFA, or your local fire department.

## NOTES:

1. Capizzano, Adams, and Sonenstein, *Child Care Patterns of School-Age Children With Employed Mothers*, The Urban Institute, 2000.
2. National estimates are based on data from the National Fire Incident Reporting System (NFIRS) (1996–1998) and the National Fire Protection Association’s (NFPA’s) annual survey, *Fire Loss in the United States*.
3. NFIRS analysis, 1996–98 data.
4. Since deaths are rare and because this report represents statistical estimates based on a sample of fires, it is possible that the estimates reflect no deaths during a time period where a fatal fire occurred.
5. Regulations vary widely from state to state.
6. Corbett, Glenn, “So You Have To Inspect. . . A Child Daycare Center,” *Fire Engineering*, February 1998.
7. “Smoke Detector Causes Daycare Fire,” The Associated Press, August 7, 1999.
8. “Lawsuit Filed in Daycare Fire That Killed Three Children,” *The Mobile Register*, November 2, 2000.
9. “Donations Save Day for Daycare,” *The Kansas City Star*, December 2, 1997.

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