



## MEDFORD FIRE-RESCUE FIRE AND LIFE SAFETY DIVISION

[www.medfordfirerescue.org](http://www.medfordfirerescue.org)

200 S. Ivy St., Room #180  
Medford, OR 97501  
Telephone (541) 774-2300  
FAX (541) 774-2514

# 20 Year History of Fire Fatalities in Medford

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During the period between 1992 and 2011, Medford experienced 22 fire related deaths that occurred inside of structures located on residential properties. The following is a breakdown of where these deaths occurred:

- ◆ 13 occurred in one and two family residences
- ◆ 3 occurred in duplexes
- ◆ 2 occurred in multi-family residences
- ◆ 4 occurred in structures associated with residences (2 in a garage and 2 in a shed)

All of the fire deaths were attributed to exposure to smoke and/or heat. The average age of the victim was 52. The following shows a breakdown of age for these fatalities.

Age Group	Deaths	% of Fire Deaths
0 – 9	3	13.6
10 – 19	4	18.2
20 – 29	0	0
30 - 39	2	9.1
40 - 49	0	0
50 - 59	0	0
60 - 69	4	18.2
70 - 79	3	13.6
80 - 89	4	18.2
90 - 99	2	9.1
<b>Total</b>	<b>22</b>	<b>100.0</b>

In all but one of these fires, the occupant's actions had something to do with the cause of the fire (the one exception was a product defect-caused fire). In no circumstance in these fatalities was the structure (including permanent wiring and electrical systems, HVAC units, permanent natural gas piping, etc.) determined to have caused the fire. The age of the homes at the time of the fires ranged from 18 to 86 years old. While the

structures were not a factor in starting the fires, they were effective in trapping the smoke and heat to create an untenable environment.

Smoke alarms were present and functioning in 10 of the 18 fires (55%) that occurred inside residences. One adult foster home that experienced a fire killing four residents had seven working smoke alarms. Smoke alarms would not normally be present in the areas where the four died in a garage and a shed. Having an early warning in a house fire is essential for effective evacuation; increasing the possibility that someone may make it out alive. Having properly placed and maintained smoke alarms in the home reduces the risk of dying in a house fire by 50%. Smoke alarms are essential early warning devices; however, they do not guarantee survival. Survival depends on early detection, occupant evacuation capability, and the nature of the fire.

The question arises, in how many of these fires would a NFPA 13D residential fire sprinkler system have been effective at sparing the occupants life? After studying the reports, I believe that if all the residences were protected by a residential fire sprinkler system, 17 out of the 22 (77%) tragedies would not have occurred. A fire sprinkler system is normally not installed in garages or sheds (4 deaths), and the other death was a flash-fire involving cigarettes while using oxygen (would not have produced enough heat to activate the fire sprinkler head).

On average, nearly 3,000 people die and 13,500 people are injured in home fires annually in the United States. Fire kills more people each year in the United States than all natural disasters combined. In 2010, 92% of all civilian structure fire deaths resulted from home structure fires. A residential fire sprinkler system, combined with smoke alarms, significantly increases the occupant's chance of surviving a home fire. Even though smoke alarms are essential to provide an occupant an early warning signal to evacuate the home, they do not control the fire.

Residential fire sprinklers control the fire in the earliest stage, which provides the occupant a much greater chance of survival. A residential fire sprinkler system is designed to prevent flashover and thereby provide a survivable environment. Flashover is a condition of very dangerous fire behavior that can occur in as little as 3-5 minutes after ignition. It occurs when the fire builds enough momentum to produce substantial radiant heat which simultaneously ignites everything combustible in a room from floor to ceiling. Flashover is a fire condition that is unsurvivable throughout a structure, even when an occupant's location is remote from the area of origin.

An occupant's survival is directly related to the evacuation capability of the occupant while conditions are still tenable in the structure. Young children and elderly people are 2-4 times more at risk of dying in home fires as they have reduced evacuation capabilities. It is interesting to note that studies were conducted in the 1970's which showed the average safe window of escape time to be approximately 17 minutes. Today, with the home packed full of modern furnishing made from hydrocarbons, this time has been reduced to as little as 3 minutes. Fire sprinklers control the fire while it is still small, thereby giving everyone, regardless of evacuation capability, a much greater

chance to survive. By controlling the fire early, fire sprinklers provide the added benefit of reducing firefighter risks and property loss.

Are homes safer today? The answer is both yes and no. We know homes more than 40 years old are 3 times more likely to catch fire from electrical causes than homes 11-20 years old. While there have been great advances in preventing electrical fires, we also know that modern lightweight construction fails faster under fire conditions than conventional framing and becomes a hazard to firefighters. We also know that today's furnishings provide a much greater and more toxic fuel load than older furnishings. The following is an excerpt which explains it well:

Age of housing is a poor predictor of fire death rates. When older housing is associated with higher rates, it usually is because older housing tends to have a disproportionate share of poorer, less educated households. Statistically, the only fire safety issue that is relevant to the age of the home is outdated electrical wiring. Beyond that, age of the home has little to nothing to do with fire safety. A fire at 2:00 a.m. is just as deadly in a new home as it is in an older home.

In fact, new methods of construction negatively impact occupant and firefighter life safety under fire conditions. The National Research Council of Canada (NRC) tested the performance of unprotected floor assemblies exposed to fire. The findings of the study, [The Performance of Unprotected Floor Assemblies in Basement Fire Scenarios](#) assert that these structures are prone to catastrophic collapse as early as six minutes from the onset of fire.

In 2008, Underwriters Laboratories® (UL) conducted a study to identify the danger to firefighters created by the use of lightweight wood trusses and engineered lumber in residential roof and floor designs. The findings of the report, [Structural Stability of Engineered Lumber in Fire Conditions](#), point to the failure of lightweight engineered wood systems when exposed to fire. Firefighters expecting thirty minutes of structural integrity with dimensional wood structures face higher peril in lightweight structures. The same UL study found that the synthetic construction of [today's](#) home furnishings add to the increased risk by providing a greater fuel load. Larger homes, open spaces, increased fuel loads, void spaces, and changing building materials contribute to:

- Faster fire propagation
- Shorter time to flashover
- Rapid changes in fire dynamics
- Shorter escape time
- Shorter time to collapse

Lightweight construction has been variously estimated to be used in one-half to two thirds of all new one and two family homes, excluding manufactured homes. Fire

sprinklers can offset the increased dangers posed by lightweight construction and create a safer fire environment for firefighters to operate in.

Source:

<http://www.firesprinklerinitiative.org/resources/fact-sheets/myths-vs-facts.aspx>

Every fire fatality is a tragedy. Each tragedy effects family, friends, neighbors, emergency responders, and the community. We have the technology to prevent most of these tragedies. A retrospective look at the past 20 years of fire deaths in Medford presents a strong case that most of these fatalities could have been prevented if the residences were protected by a fire sprinkler system.

**Data:**

	Date	# Fatalities	Age of Occupants	Working Smoke Alarms?	Most Probable Cause/Nature of Fire	Property Type	Age of Structure
<b>A</b>	1-17-1991	2	19,33	N	Cigarette	Metal Shed	43
<b>B</b>	12-17-1991	1	76	Y	Chair Wiring	Duplex	18
<b>C</b>	10-26-1993	1	67	Y	Cig. Or Stove	MFR	68
<b>D</b>	1-12-1995	4	82,85,85,91	Y	Smoking-Chair	Adult Foster	35
<b>E</b>	8-18-1998	2	11,13	Y	Upholstery	SFR	23
<b>F</b>	3-15-1999	1	77	Y	Cigarette	SFR	23
<b>G</b>	12-21-2000	1	76	Unk	Extension Cord	SFR	28
<b>H</b>	12-14-2001	1	86	Unk	Cigarette	SFR	26
<b>I</b>	10-16-2002	2	4,4	N: Garage fire	Juvenile Fireplay	Garage	28
<b>J</b>	2-14-2003	1	60	N: Pres. w/o battery	Cigarette	SFR	79
<b>K</b>	1-17-2004	1	62	N: Vacant House	Extension Cord	SFR	Unk
<b>L</b>	6-16-2004	1	94	Unk	Cigarette/Lighter	SFR	41
<b>M</b>	11-14-2006	2	11,37	N: Tenant Removed	Juvenile Fireplay	Duplex	34
<b>N</b>	7-18-2011	1	7	Pres.-Unk. if oper.	Homocide/Arson	SFR	86
<b>O</b>	8-27-11	1	62	Y	Oxygen Flash Fire	MFR	46

