A Few Facts at the Household Level

Fire Analysis and Research Division

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National Fire Protection Association
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Chances are *you* will have a fire

- Number of home fires your household can expect in an average lifetime: 5
- Chances your household will have a *reported* home fire in an average lifetime: 1 in 4
- Chances that someone in your household will suffer a fire *injury* in an average lifetime: 1 in 10
- Chances that someone in your household will suffer an injury in a *reported* fire in an average lifetime: 1 in 89

Households can expect to average a home fire every 15 years or five fires in an average lifetime. (Life expectancy now averages 78 years in the U.S., according to the *Statistical Abstract*.) That is one of the results of the latest survey of unreported fires, conducted by the U.S. Consumer Product Safety Commission in 2004-2005, when combined with NFPA's annual tracking of reported fires.

Most of these will be small fires resulting in little or no damage and will not be reported to a fire department, but even a trivial fire causes at least some temporary anxiety.

Your household has a one in four chance of having a home fire large enough to be reported to a fire department during an average lifetime.

Someone in your household also has a one in ten chance of suffering a *fire injury* in a home fire an average lifetime. More likely than not, this will be a minor injury suffered in a fire that you did not report to the fire department. You might not even remember the injury a month after it happened. About one out of nine of these injuries will occur in a reported home fire, which means someone in your household has a one in 89 chance of suffering a fire injury in a reported home fire in an average lifetime.

In any small group, there probably is someone who knows someone who died in a fire.

- Number of adults killed by fire, per year: 2,700
- Estimate of (maximum) size of an adult's social network: 150
- Number of adults likely to have a social network that included someone who died in a fire in any given year: 405,000
- Average (median) age of an adult: 44
- Average number of years that an adult has been an adult: 27
- Number of adults likely to have had someone in their social network die of fire since they became adults: 11 million
- Chances an adult, since becoming an adult, has had someone in their social network die in a fire: 1 in 20
- Number of adults that could say that someone they knew died in a fire: 1 in 10

In any room, in any group, no matter the reason why you are all together, there is a story to be told about fire and human loss.

Suppose you are giving a talk about fire safety, and you want to make it personal. It is very likely that one or more people in your audience have a personal connection to someone who died in a fire. Their tragedy will make the facts about fire hazards and rules of fire safety more real, for everyone in the room.

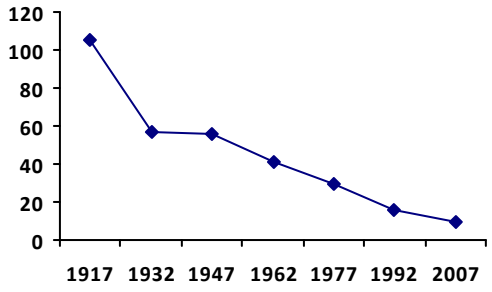
We decided to test this idea by asking the 300 or so NFPA staffers to tell us whether they knew someone who had died in a fire, and if so, what their connection was to that person. Nearly half of NFPA staffers responded, and 15% of those who responded – or one out of seven – said they knew someone who died in a fire. That is three times the rate we estimated based on the concept of social network and the estimate of 150 for the size of an adult's social network. (The estimate of a maximum of 150 for an adult's social network comes from Malcolm Gladwell's *The Tipping Point*.)

It may be that "someone you know" tends to include more people than are counted in a social network. Regardless, the general rule applies: In any small room – a jury room, the dining area of a fast food restaurant, a school assembly – the chances are better than 50/50 that someone in the room knows someone who died in a fire. Their experience is the key to translating fire statistics into personal stories and giving everyone in the room a reason to know more and do more about fire safety.

Each generation has a lower risk of dying in fire than the previous generation

- Out of a million Americans, average number who died of unintentional injury due to fire

in 2007:	9
in 1992:	16
in 1977:	29
in 1962:	41
in 1947:	56
in 1932:	57
in 1917:	105



If you went back 90 years, your chances of dying in a fire in the U.S. would have been about 12 times what they are today.

This graph shows fire death rates for different years spaced 15 years apart. The NFPA *Fire Protection Handbook* shows a graph with fire death rates for every year back to 1913. In that graph, you can see much more year-to-year variation, and the long-term trend may not be so clear.

If you focus in on a single decade, it is not unusual to see a trend that looks flat or even seems to be heading up. Only when you open up the graph to cover most of a century can you see that our long-term trend is, and always has been, more safety for every succeeding generation.

If you hear someone say that we've hit a plateau and fire deaths are no longer coming down, tell them to not to worry. History tells us that more good news is coming – and especially if we keep working hard on the next generation of great leaps forward in fire safety.

Chances are *you* will have a *cooking* fire

- Number of home cooking fires your household can expect in an average lifetime: 3
- Chances your household will have a *reported* home cooking fire in an average lifetime: 1 in 10
- Chances that someone in your household will suffer a *fire injury* in a home cooking fire in an average lifetime: 1 in 14
- Chances that someone in your household will be injured in a *reported* home cooking fire in an average lifetime: 1 in 325

Chances are you or someone in your house or apartment cooks, perhaps every day, possibly multiple times a day. But did you know that this routine act is the leading cause of reported fires and associated civilian injuries in the home? In a typical cooking fire, the cook was not paying attention to the cooking. This practice is the leading contributor to home cooking reported fires, deaths, injuries, and direct property damage.

What's more, cooking and other kitchen activities account for two of every three unreported home fires and more than two-thirds of injuries in those fires. That means your household can expect to average one kitchen fire every 23 years (or three in an average lifetime). Cooking fires also account for two out of five reported home fires and one-third of fire injuries.

The person most likely to be cooking in a household is a young adult female.
The person most likely to be killed in a home cooking fire is an older adult male.

- When cooking is going on, chances that the person doing the cooking is male: 1 in 4
- Chances that the fatal victim of a cooking fire is a male: 5 in 9
- Age group with highest risk of being the cook when a cooking fire results: 30 to 49
- Age group with highest risk of being killed by a home cooking fire: 65 and older

The risk of having a cooking fire is highest for those between the ages of 30 and 49, probably because they are the ones most likely to be doing the cooking, but older adults age 65 and over are the ones with the highest rate of cooking fire *deaths* per million population.

When cooking is going on, males are much less likely than females to be doing the cooking, but they are more likely than females to be fatal victims if fire occurs. That doesn't necessarily mean that the victims were all the cooks who started the fires. As with all fire causes, you don't have to be the person who started the fire, through an unsafe behavior or inattention, to be hurt by the fire. For example, young children – too young to be cooking themselves – have one of the highest risks of death due to a cooking fire.

Being around smokers means a higher risk of death in fire

- Number of U.S. adults who are currently smoking: 1 in 5
- Number of deaths due to home fires started by cigarettes in 2003-06: 700
- Chance that home fire death was started by cigarettes in 2003-06: 1 in 4
- Chance that home cigarette fire death victim was not the smoker: 1 in 4

Most people may know that smoking is the leading cause of fatal fires in the U.S., but you don't have to be a smoker to be at risk of dying in a smoking fire. It is estimated that one out of four fatal victims of smoking fires is not the smoker whose cigarette started the fire. For example, young children, who are very unlikely to smoke, and older adults, who are less likely to smoke than any other adult age group, have the highest risks of death due to a smoking-material fire.

Consider a comparison of the smoker vs. non-smoker risks of death from tobacco smoke vs. death from cigarette fire. Deaths of smokers from tobacco smoke (e.g., lung cancer, heart disease) are estimated to outnumber deaths of non-smokers from second-hand smoke by about 9-to-1 (438,000 to 50,000, according to the American Lung Association's website).

A smoker has 17 times the risk of dying in a cigarette fire that a non-smoker has.[1] A smoker has 51 times the risk of dying from cigarette smoke that a non-smoker has.[2]

The principal fatal risk that smokers pose to the non-smokers around them still comes from second-hand smoke (50,000 deaths to nearly 200 deaths). But the smokers have spread proportionally more of the fire death risk they created to non-smokers for cigarette fire deaths than for tobacco smoke deaths, even though the tobacco smoke deaths dwarf the cigarette fire deaths.

Whether it is second-hand smoke or a large fire in a household containing both smokers and non-smokers, the decision to smoke is not an exclusively personal choice whose consequences are borne by the smokers who make the choice. Smoking threatens everyone.

Fire costs you a bundle

- Cost per household of all property damage in fires (reported or unreported, direct or indirect, home or elsewhere) in 2006: $120
- Cost per household of all human and property loss to fire in 2006: $500
- "Total cost" per household of fire losses and expenditures to prevent greater losses in 2006: $2,800

[1] The one-fifth of adults who smoke represent about 15% of the total U.S. population (because only 75% of the population are adults). So 15% of the people (smokers) have 75% of the cigarette fire deaths and the other 85% of the people (non-smokers) have the other 25% of the cigarette fire deaths. The relative risk for smokers is proportional to 75/15 = 5 and the relative risk for non-smokers is proportional to 25/85 = 5/17. Divide the first number (5) by the second number (5/17), and you find that the risk for smokers is 17 times the risk for non-smokers.

[2] Note that 15% of the people (smokers) have about 90% of the cigarette smoking deaths and the other 85% of the people (non-smokers) have the other 10% of the cigarette smoking deaths. The relative risk for smokers is proportional to 90/15 = 6 and the relative risk for non-smokers is proportional to 10/85 = 2/17. Divide the first number (6) by the second number (2/17), and you find that the risk for smokers is 51 times the risk for non-smokers.

In 2006, direct property damage in reported home fires cost about $59 per household, while total property damage – reported or unreported, direct or indirect, in homes or elsewhere – averaged about $119 per household. But fire costs us all a great deal more.

There are deaths and injuries. With the standard dollar equivalents for a statistical life or injury, as used in economic cost-benefit analysis, the total for all types of loss is more than four times the total of property damage alone, or roughly $500 per household. But that's not the whole story.

We spend money to avoid greater losses. If you factor in the cost of fire safety built into construction, the cost of insurance and fire departments to mitigate and manage losses, and the value of the time donated by volunteer firefighters, the total cost of fire translates into about $2,800 per household per year.

Is it worth it? Back in the 19th century, property damage due to fire was 8-10 times as large a share of the national economy (measured by gross domestic product) as it is today, and fire deaths relative to population were also 8-10 times what they are now. Add in the fact that a dollar in loss translates into more than just a dollar in pain and disruption, as contrasted to a dollar spent in safety, and it looks like a pretty good deal.

You probably have a home smoke alarm,
but you probably do not have a carbon monoxide detector or fire sprinklers

- Chances of *not* having a home smoke alarm: 1 in 20 to 1 in 25
- Chances of having home fire sprinklers: 1 in 26
- Chances of having home fire sprinklers if you live in a single-family dwelling: 1 in 53
- Chances of having home fire sprinklers if you live in an apartment: 1 in 9
- Chances of having home fire sprinklers if you live in a building built no more than 4 years ago: 1 in 8
- Chances of having a working carbon monoxide detector: 1 in 3
- Chances of having a fire extinguisher that was purchased or recharged within the previous two years: 2 in 5

The percentage of U.S. households with at least one smoke alarm has been up around 94-96% for more than a decade. If you don't have any smoke alarms, you are part of a very small group of people at greatly heightened risk of death from fire. Smaller percentages of households have the level of protection we demand today in all new homes – smoke alarms on every level, in every bedroom, hard-wired for reliability, and interconnected so fires detected in the basement will sound an alarm in the bedrooms upstairs. If you have smoke alarms, but you don't have all of these features – and most households don't have them all – then you need to upgrade. And whatever smoke alarms you have, you need to keep them working.

On the other hand, only 4% of homes had fire sprinklers in 2007, including only 2% of single-family dwellings. Home fire sprinklers cut the risk of dying in a home fire by about 80%. The average cost of installation is $1.61 per square foot for new construction. That totals

considerably less than the discretionary upgrades – the "glitter" if you will – that the average home-buyer tacks on to the basic purchase price.

Nearly a third (31%) of housing units were reported in 2007 as having working carbon monoxide detectors. The operational status might be exaggerated, but it seems clear that this fairly recent household safety equipment has spread rapidly into U.S. homes.

Two out of five housing units (39%) were reported in 2007 as having fire extinguishers that had been purchased or recharged within the previous two years. There might be some over-reporting of maintenance in those statistics, but at least it appears clear that nearly half of households have fire extinguishers. The percentage is the same for homes built in the previous four years, and panel studies by *Good Housekeeping* magazine were showing similar fire extinguisher usage statistics decades ago.

We don't have statistics on how many people with fire extinguishers know how to use them. Be sure everyone in your home who might use an extinguisher has read and understands the directions. You don't want to wait until a fire occurs to learn.

Someone you know is probably in the fire service

- Number of career and volunteer municipal firefighters in the U.S.: 1.1 million
- Chances that an adult is a firefighter: 1 in 200
- Estimate of (maximum) size of an adult's social network: 150
- Chances that a person living in the U.S. is an adult: 3 in 4

An average adult knows more than 100 other adults, and the chances that an adult is a firefighter are 1 in 200. That means the chances are better than 50/50 that you know a firefighter. If you live in a rural area (a community with less than 2,500 population), then nearly all the firefighters are volunteers, and the ratio of firefighters to population is about five times higher. In those communities, you are almost certain to know a firefighter.