

# NIOSH Fire Fighter Cancer Study

Conducted in Partnership with the National Cancer Institute and the U.S. Fire Administration

Issue 2

Summer 2012



## Notes from the (New) Study Director

Greetings from the National Institute for Occupational Safety and Health (NIOSH). NIOSH is part of the Centers for Disease Control and Prevention (CDC), and we work to make your job safer.

I am the new Study Director for the NIOSH Fire Fighter Cancer Study. Travis Kubale, the previous Study Director, is now the Scientific Program Official for the grant research components of the World Trade Center Health Program. Happily, in this new role he will still be involved in addressing health problems of first responders.

I have been with NIOSH since 2001 and with the Fire Fighter Cancer Study since it started in October 2010. We've made great progress since then. We have assembled most of the data needed for the study from the participating departments and obtained information on cancer cases. To date, we are managing records for more than 30,000 former and current fire fighters. Once data collection is complete, we will make final preparations to perform statistical analyses and publish the results.

In addition to providing you with information about the project, this newsletter features a profile of the San Francisco Fire Department. We plan to profile the other two fire departments in upcoming newsletters. We also started a new column, "Frequently Asked Questions." Please send your questions or comments about the NIOSH Fire Fighter Cancer Study to [FFstudy@cdc.gov](mailto:FFstudy@cdc.gov) or call us at 513-841-4203. Commonly asked questions could be addressed in an upcoming newsletter. Feel free to post this newsletter on your website!

Thank you for your interest and your help,

Robert (Doug) Daniels, PhD  
Health Scientist  
Director, NIOSH Fire Fighter Cancer Study

## By the Numbers

We've been busy! Here's a look at the study activities to date.\*

Data collection is more than **95%** complete for a total of **31,651** fire fighters. We've collected and coded detailed work history records for:

**15,461** participants from the Chicago Fire Department;

**10,652** participants from the Philadelphia Fire Department; and

**5,538** participants from the San Francisco Fire Department.

\*Numbers are likely to change with additional data collection

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Historic Photo of San Francisco Fire Department

## Assessing Cancer Risk among Fire Fighters: The Past, Present, and Future

### Previous fire fighter cancer studies

Much of what we know about cancer among fire fighters is based on a rather small number of studies with a limited number of fire fighters (fewer than 10,000). These earlier studies used information from death certificates and rarely looked at cancer diagnosis – those living with or recovered from cancer.

Findings from these studies vary. Some have found higher risks of certain cancers, while others have not. These differences are largely because the study populations were small and the likelihood of some cancers is small, too. The more people included in a study, the more confident researchers are with the results. Many past studies allowed for only a short amount of time after the exposure happened before looking at the health risks. It often takes many years after exposure for cancer to occur.

### What is our current understanding?

Several previous studies have suggested increased risk in some cancers as a consequence of fire fighting. In 2006, researchers at the University of Cincinnati reviewed 32 studies of cancer among fire fighters. They found a “probable” risk for multiple myeloma, non-Hodgkin’s lymphoma, and prostate and testicular cancer. In 2007, the World Health Organization’s International Agency for Research on Cancer Working Group classified fire fighting as “possibly carcinogenic to humans.” That agency concluded that more research is needed to better understand cancer risks among fire fighters.

### What cancers will we examine?

We plan to examine all cancers and cancer sites that others have identified as possibly related to fire fighting.

### What other recent studies should you know about?

In late 2011, a large-scale study of cancer and other causes of death among Australian fire fighters began. Up to 162,000 former and current career, part-time, paid and volunteer fire fighters will make up the study population. Like our study, the Australian study will investigate cancer and causes of death related to exposures. Also like our study, it will include female fire fighters. To learn more about the Australian study, visit <http://www.coeh.monash.org/ausfirefr.html>.

Look for more on the Australian study and the NIOSH study as they unfold. To learn more about other, earlier studies, contact [FFstudy@cdc.gov](mailto:FFstudy@cdc.gov).

## Timeline for the Study

### 2010:

NIOSH study of US fire fighters began.  
Partnership established with the National Cancer Institute and U.S. Fire Administration.  
Fire fighters from Chicago, Philadelphia, and San Francisco were identified for the study.

### 2011:

Study roster complete and exposure and work history information collected.

### 2012:

Health outcomes will be identified among fire fighters in the study.

### 2013:

Study analyses will be completed.  
Health risk among fire fighters will be determined.

### 2014:

Results will be communicated to fire fighters, stakeholders, and the public.

Welcome to the first in our series of profiles on the fire departments participating in the NIOSH Fire Fighter Cancer Study. This issue highlights the San Francisco Fire Department, with information from SFFD and the SFFD Museum, <http://GuardiansOfTheCity.org>.

## Spotlight: San Francisco Fire Department (SFFD)



SFFD personnel instrumental in the NIOSH study (l-r): Ginny Franklin, Assistant to Deputy Chief of Operations; Rhab Boughn, Compliance Officer; Joanne Hayes-White, Chief of Department; Phil Stevens, Assistant Deputy Chief of Support Services; Jesus Mora, IT Manager; Ramon Terrazas, Department Physician

### Growing out of gold

In 1849, the town council of this booming Gold Rush city organized a fire department. At the time, fire protection service consisted of hand-pump engines and hook & ladder companies pulled by volunteer fire fighters, with hoses made of buffalo hide. The paid Department began in 1866 and grew to include fireboat and chemical companies.

Providing enough water for fire suppression was always a challenge for the city built primarily of wood. After the devastating 1906 earthquake, construction began on the Auxiliary Water Supply System. This ingenious system, still in use, consists of underground cisterns, fireboats, manifolds and high-pressure hydrants – providing water for fire suppression without pumps.

Today, SFFD provides fire suppression and emergency medical services to an estimated 1.5 million people within the city's 49 square miles. The Department employs some 1,450 fire service men and women, responds to more than 110,000 calls per year, and has some of the busiest engine and truck companies in the nation.

### Working to improve the health of fire fighters

A recent cancer survivor, retired Captain Tony Stefani recognized the importance of prevention and detection to reduce cancer among fire fighters. In 2006, he collaborated with research doctors and SF Firefighters Local 798 to establish the San Francisco Firefighters Cancer Prevention Foundation. The non-profit foundation provides medically-approved cancer screenings among active and retired fire fighters. It also helps newly diagnosed cancer patients with medical referrals, worker compensation claims, and cancer information. The foundation supports ongoing research to examine bladder cancer and breast cancer in the SFFD. Learn more about the foundation at [www.sffcpf.org](http://www.sffcpf.org).

“The screenings that have been done by the San Francisco Firefighter Cancer Prevention Foundation have identified a number of members as having cancer at a very early stage. We're very grateful for the work that they are doing,” said Fire Chief Joanne Hayes-White.

Better understanding fire fighting and cancer may reduce the devastation caused by this disease. As an example, some recent case studies suggest an increase in breast cancer among women fire fighters. Previous studies of fire fighters have not examined cancer risks specific to women, although the number of women in the fire service is increasing.

“Women have now been in the Fire Service long enough to begin experiencing the effects of long-term exposure to the toxic chemicals of firefighting,” said Fire Chief Hayes-White. “The NIOSH study will be the first to look at cancer risks in women as a potential consequence from their firefighting experience.” Realizing the potential gains, Department leadership and active and retired fire fighters were eager to take part in the NIOSH study.

## How Will We Estimate Exposure?

In their work, fire fighters face changing and unpredictable conditions. They may be exposed to many different toxins and cancer-causing agents. It is not possible to measure exposures in most fire fighting situations, so the exact nature of a fire fighter's exposure is seldom known.

However, it is possible to group fire fighters for comparisons based on their *chance* of exposure. To come up with that estimate, we can look at individual work histories. There is also a wealth of useful information that fire departments keep, such as:

1. The number, type, and location of fire runs
2. The time fire fighters spend at the scene of the fire
3. The availability of personal protective equipment

We carefully collected this information from each fire department's records. Combining that data with input from active and retired fire fighters, we can estimate individual or group exposures. To explain, see the example below.

We could assign "John" to a high exposure group because he has a large number of fire runs and years of service. "Jim," on the other hand, could fall into a lower exposure group because he has fewer fire runs and years of service. We could then compare the exposure groups to see if there is a difference in the risk of disease. A greater risk of cancer in the higher exposed group compared to the lower exposed group may suggest an excess in risk due to fire fighting exposure.

Name	Rank	Location	Date	Fire Runs
John Firefighter	Fireman	Engine 1	1954-1978	87,500
	Fireman	Truck 19	1979-1982	16,000
	Fireman	Engine 20	1983-1984	7,500
			Time of Service= 30 years	Total Fire Runs= 111,000
Name	Rank	Location	Date	Fire Runs
Jim Firefighter	Fireman	Truck 26	1973-1974	2,500
	Fireman	Truck 6	1975-1976	1,250
	Fireman	Engine 16	1977	900
			Time of Service= 4 years	Total Fire Runs= 4,650

A few previous studies have used similar methods of assessing fire fighter exposures but not to the extent expected in our study.

## Frequently Asked Questions about the Fire Fighter Cancer Study

If you have a question, please email it to [FFstudy@cdc.gov](mailto:FFstudy@cdc.gov) or call the NIOSH Industrywide Studies Branch, 513-841-4203.

### Q: Will NIOSH call me for information?

A: No. This study is records-based. This means that we will get work history and exposure information directly from the fire departments. We will find cancer cases from death certificates maintained by the states and the National Death Index, and non-fatal cancer cases from individual state cancer registries. We will not contact you or your family for information during this study.

### Q. How will we find out the study results?

A. Once the study is complete, we will communicate the results to fire fighters, stakeholders, and the public.

Please look for the next issue of the newsletter, Winter 2012. To find out more about NIOSH efforts to promote safety for fire fighters, visit [www.cdc.gov/niosh/fire](http://www.cdc.gov/niosh/fire).