

Campfire/Paradise Firefighter Biomonitoring Study Results Overview August 22 2020

The Campfire/Paradise fires were one of the most devastating fires in California, burning over 140,000 acres, destroying 18,000 structures. Firefighters deployed to these wildland/urban interface fires could not use equipment such as self-contained breathing apparatus or turnout gear during these fires because they needed to be as mobile as possible, given the speed at which such fires move. But without such protective gear, firefighters may have been exposed to chemicals from burning household products or from firefighting gear. Eighty firefighters who responded to the Campfire/Paradise fires on November 2018, were tested a few hours after deployment for a set of chemicals considered to be toxic and likely to have been encountered on the fire ground.

The results from Campfire Firefighter Biomonitoring Study indicate that firefighters immediately post fire were carrying in their bodies a mixture of chemical toxicants, including flame retardants, stain and water repellent substances, and some heavy metals at levels higher than those found in the general US population. The majority of chemicals tested for in this study are considered to be carcinogens, and many are associated with reproductive, cardiovascular and kidney and liver dysfunction. Of special concern are exposures to a set of chemicals called PFAS, some of which are considered to be immune-suppressors able to damage the body's capacity to protect against disease, a critically important function during the time of pandemic.

Given the increase of wildland and urban interface (WUI) fires in California and elsewhere in the United States, we can expect the toxic chemical body burden of firefighters who are deployed to these fires to increase as well. Firefighters currently have higher rates of some cancers compared to the general public, and the toxic chemical mixtures absorbed by firefighters during WUI fires should be considered one of the primary reasons for these elevated cancer incidences. This study is a red flag indicating the need to lower these exposures to firefighters, and to the communities who live downwind, downstream or within the area of WUI fires.

Study Results Overview:

OFRs:

All firefighters in the study carried flame retardants called organophosphate flame retardants (OPRs) in their systems post-fire at higher levels than levels found in the US general population. The OFRs tested for are considered to be carcinogens, and some are associated with lower sperm count, neurological damage and cardiovascular problems. These flame retardants are found in some plastics, electronic casings and wiring, and some polyurethane foam in furniture, and may be released from these products during fires.

PFAS (per and polyfluoroalkyl substances):

All firefighters in the study carried levels of PFAS chemicals in their bodies, and some firefighters' levels of the most frequently studied PFAS chemicals were two to 5 times higher

than the median levels found in the US general population. The PFAS chemicals found in the CampFire firefighters are linked to kidney and liver cancers, cardiovascular disease, infertility, or thyroid and liver problems.

PFAS is used to make hundreds of products water and stain resistant, including outdoor gear and firefighter turnout gear, food packaging, furniture and some nonstick cook ware. A primary source of exposure to PFAS to the US population is drinking water located downstream from industrial emissions and use of firefighting foam. PFAS from the fire ground may be carried back to the fire station, and recent research indicates the fire station living quarter dust as well as household dust contain PFAS. PFAS chemicals are extremely persistent, remaining in the environment for decades, and are known as “legacy chemicals,” difficult to extract and difficult to destroy.

Heavy metals:

Some firefighters in the study also had higher levels of mercury and lead in their bodies compared to levels found in the US population. Mercury is found in some household products, emissions from coal fired power plants and gold extraction, and in fish who have consumed mercury found in their environment. Mercury can affect the nervous system, kidney function, and increase the risk of cancer.

Lead is found at construction and demolitions sites, shooting ranges and recycling facilities for electronics batteries, and scrap metal. Lead is also found in some cosmetics and household products. Lead can increase blood pressure, decrease kidney and brain function and cause reproductive problems. Lead can increase risk of cancer.

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This overview is submitted by Sharyle Patton, Director, Commonweal Health and Environment Program. Contact: (415 686 4857)

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