Firefighters inhale, ingest, and absorb hundreds of toxic, carcinogenic chemicals in smoke and soot during each fire-fighting operation. Exposure assessment is critical for understanding the health effects of fire fighting.

Exposure Assessment

Most investigations of fire fighter exposure have focused on a limited number of compounds (e.g., polychlorinated biphenyls, PCBS, PCBDDs) following acute fire events. A recent pilot study of fire fighters from northern California represents the most extensive exposure assessment among fire fighters to date. The California study was the first to analyze PCBDDs, along with PCBDDs, PCBDS, and PCBDFs, with more comprehensive chemical analysis.

Conclusions

Overall, the data indicate that occupational exposure to toxic, carcinogenic chemicals including flame retardants and combustion by-products (PCBs) places fire fighters at increased risk for cancer, stroke, and other serious health effects.

The California Fire Fighter Study

The California cohort comprised 12 veteran San Francisco fire fighters including nine Caucasian males, two Asians (one male, one female) and one African-American male, ages 32–59 years. Participants had worked in industries with known chemical emissions; (2) were fire fighters for at least 5 years; and (3) had responded to fire scenes at least 20 times in the past 5 years. Concomitant concentrations of PCBDDs, PCBDDs/PSs, PCBDDs/PSs, and PCBDDs were determined in fire fighter serum samples by HRGC/HRMS; concentrations of PCDFS, BPA, and TBBPA were determined by HPLC/MS/MS as previously described.

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