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Assessment of Ambient Exposures Firefighters Encounter while at the Fire Station: An Exploratory Study

Introduction: Firefighters are at increased risk for many types of cancer due to the hazardous nature of their job. While most studies on firefighters and cancer focus on the exposures encountered while fighting fires, low levels of contaminants encountered at the fire station are also cause for concern. This pilot aimed to describe air quality within a few fire stations in the Boston, MA area, and to investigate factors (physical and organizational) that influenced contaminant levels in the air.

Methods: Air sampling of particulate matter (PM2.5) and particle-bound poly-aromatic hydrocarbons (PAHs) was completed at four fire stations in the spring of 2016 for approximately five days per station. At each station, sampling occurred outside the station, in the truck bay, and in the fire station kitchen. Data were analyzed to assess differences between and within stations. Interviews (n=7) were conducted with officers at each station to explore organizational policies and practices that relate to health and safety at the fire station. Interviews were transcribed and analyzed for thematic content.

Results: Levels of PM2.5 and PAHs were generally higher in the truck bays than the outside or kitchen, and varied the most throughout the day. The station with the highest exposures in the truck bay had the lowest level in the kitchen, which was possibly explained by the new building materials in place at the station and the strong separation between building zones. The age and structure of the firehouses appeared to determine the extent to which policies favoring exhaust capture were actually implemented. Conclusion:

The levels of PM2.5 and PAH observed at these fire stations may contribute to firefighter cancer risk. Through understanding the variability and range of values found, we can begin to design and test interventions that improve firefighter cancer prevention.

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