

How to mitigate firefighters' occupational exposure in non-fire settings?

¹Madureira, Joana, ¹Esteves, Filipa, ¹Pires, Joana, ²Teixeira, João Paulo and ²Costa, Solange

¹*Institute of Public Health, University of Porto*

²*National Institute of Health Dr. Ricardo Jorge*

Abstract

Wildland firefighters are at greater risk due to the nature of their work, being considered one of the most dangerous occupations in the world. Their proximity to fire exposes them to high temperatures and high concentrations of hazardous pollutants (e.g., volatile organic compounds, PAHs, carbon monoxide). Besides the evident forms of firefighters' exposure to pollutants, in the field, other relevant occupational contamination sources exist. Firefighters are also exposed to pollutants in the return to the fire station and into the building via contaminated vehicles, personal protective equipment, among others. It can greatly influence the indoor air quality contaminating the "clean" areas (e.g. offices and bedrooms) where firefighters remain for long periods. Such exposure can be easily modified through changes in systems, protocols or behaviours, representing potential useful intervention targets. Fire stations must be designed in compliance with legal standards and regulations to maintain the good air quality in the workplace, including the circuit of "contaminated" and "clean" areas to guarantee a clean airflow within spaces. The implementation of efficient ventilation systems must be a concern, particularly in the areas of the fire station where contaminated material is handled. The air quality of fire stations should be regularly monitored to guarantee safe exposure levels to air pollutants. Preventing contamination will keep firefighters and other fire station personnel protected from smoke-related contaminants. Fire stations should have a standard set of guidelines with safe practices and policies to protect the safety and health of firefighters.

Keywords: indoor air quality, firefighters, non-occupational settings

Acknowledgments: This work received financial support from the project PCIF/SSO/0017/2018 by the Fundação para a Ciência e a Tecnologia (FCT), Ministério da Ciência, Tecnologia e Ensino Superior (MCTES) through national funds. Filipa Esteves, the recipient of the Ph.D. grant UI/BD/150783/2020, is supported by FCT and by the European Social Fund (ESF). Joana Madureira, under the grant SFRH/BPD/115112/2016, is supported by FCT and by ESF, through Programa Operacional Capital Humano (POCH). The authors are grateful to the Foundation for Science and Technology (FCT, Portugal) for financial support by national funds in the scope of

projects UIDB/04750/2020 and LA/P/0064/2020.

DRAFT