

An aerial, black and white photograph of a city built along a riverbank. The city is densely packed with buildings and trees. A large, curved bridge spans the river in the lower half of the image. The text of the book cover is overlaid on the right side of the image.

WeBIOPATR 2025

**The Tenth International WEBIOPATR
Workshop & Conference
Particulate Matter: Research and Management**

**Abstracts of Keynote Invited Lectures
and Contributed Papers**

Milena Jovašević-Stojanović,

Alena Bartoňová,

Duška Kleut and Danka B. Stojanović, Eds

**“Vinča” Institute of Nuclear Sciences
National Institute of the Republic of Serbia
University of Belgrade
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2.2. PARTICULATE MATTER EXPOSURE AND CARDIOVASCULAR RISK – A REVIEW

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Exposure to particulate matter is a growing public health concern due to its strong association with respiratory and cardiovascular diseases (World Health Organization, 2022). Firefighters face a significant cardiovascular risk due to repeated exposure to particulate matter from smoke, ashes, and combustion by-products (Fabian et al., 2014), combined with disrupted sleep, physical-emotional strain, and extreme heat (Bralewska et al., 2024). Most research only focuses on acute events during active firefighting, neglecting the long-term effects of chronic particulate matter exposure on their cardiovascular health (Esteves et al., 2024).

This study reviews the association between long-term occupational exposure to particulate matter and cardiovascular risk in firefighters. A literature search was conducted using recent publications indexed in PubMed, CINAHL, Cochrane and Web of Science. Literature in English, published from January 2015 to December 2025, was included.

Research after the World Trade Center disaster found a strong link between higher exposure levels to particulate matter and increased cardiovascular events like heart attacks and strokes, even after adjusting for traditional risk factors (Cohen et al., 2019). Studies on wildland firefighters indicated that PM₄ exposure from smoke significantly raises the lifetime risk of cardiovascular disease, with risks increasing with career length and incident frequency (Navarro et al., 2019). There is also evidence of a dose-dependent relationship between firefighting exposure and atrial fibrillation, indicating the combined effects of inhaled pollutants and occupational stress (Vanchiere et al., 2022). Short-term PM_{2.5} exposure can lead to temporary blood pressure spikes, while chronic exposure contributes to sustained hypertension (Clementi et al., 2019). These findings emphasise the causal role of particulate matter exposure in cardiovascular issues and highlight the need for long-term monitoring and preventive measures for high-risk groups like firefighters. Future research should focus on addressing the gaps in long-term monitoring and exposure assessment to better understand cardiovascular risks associated with particulate exposure.

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