Reviewer’s report

Title: Cardiovascular health effects following exposure of human volunteers during fire extinction exercises

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Reviewer: Raphael Arku

Reviewer's report:

Comments on the manuscript entitled "Cardiovascular health effects following exposure of human volunteers during fire extinction exercises"

In this analysis, the authors measured 1-hydroxypyrene (1-OHP), a urinary metabolite of polycyclic aromatic hydrocarbons (PAHs), at different exposure scenarios to assess whether exposure during firefighting activities was associated with biomarkers of cardiovascular effects in young volunteers training to become firefighters. Using linear mixed effects analyses, the authors found that while significant PAH (1-OHP) exposure and changes in biomarkers of cardiovascular effects separately occurred during fire extinction exercises, there was no associations between 1-OHP and measured cardiovascular outcomes among these volunteers. While it is not clear to me, given the existing literature, whether these findings carry any major implications for on-duty (active) firefighters, the topics (PM/smoke/PAH exposure and cardiovascular health among firefighters) are very important. The paper is well written and the methods seem appropriate.

However, a couple of minor issues should be further addressed, which are listed as follows in no order of importance.

I thought the main focus of the paper was to examine the relationship between acute smoke exposures (PM/PAH) and markers of cardiovascular effects in firefighting scenarios. But in its current form, the associations between 1-OHP and measured cardiovascular endpoints seemed lost in both the results and the discussion. A bit more highlights of these associations in both the results and discussions sections of the main paper would be useful.

It is unclear why age and body temperature were not adjusted for in the regression models.

As indicated by the authors, the DustTrak used could measure PM of various size fractions (i.e. PM1, PM2.5, PM4, PM10, PMtotal), but the report only referred to PM without indicating which size fraction(s).

I wonder if a single measurement is the standard practice in blood pressure measurements. I believe most studies rely on average of two or three measurements.
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