Reviewer’s report

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

Version: 0 Date: 03 Jul 2017

Reviewer: Ana Rappold

Reviewer's report:

Thank you for the opportunity to review the manuscript "Cardiovascular health effects following exposure of human volunteers during fire extinguishment exercises." This manuscript addresses an important concern about the health impacts of firefighting on personnel regularly exposed to strenuous activities and smoke.

The manuscript is well written, results are clearly displayed and authors used appropriate statistical methods. My main comment is that I struggled to understand the aim of the study. More specifically, the aim of the study is presented as "to assess whether firefighting activities...were associated with cardiovascular effects". However, a significant effort is being placed on understanding the exposure to PM and PAH to trainees which would indicate the aim to be the effect of smoke and not firefighting activities on personnel. In either case firefighting activities and smoke exposure seem to be perfectly confounded so it may be both. I recommend more clarity and discussion of the limitations with respect to the confounded effects of the simultaneous exposure to physical activity and smoke. It is quite possible that it was not feasible to separate the effects of firefighting activities from the effects of smoke but such limitation could be discussed.

Second major comment is the lack of blood endpoints. I would suggest discussing the lack of blood endpoints in the study of cardiovascular health effects as a limitation.

Minor comments

Line 56-57. Is there a reference that could be added to support the statement?

Line 61. Is exposure to PM and chemicals among the factors that contribute to excess mortality?

Line 89. Replace was with were.

Line 139. I found the use of term "exposure" to be confusing since trainees were using PPEs. I would suggest another term to be used here.
Line 148. There is a jump from PM to PAH here that is not explained well. Is PAH used as a marker/biomarker of PM and exposure to smoke?

Have the authors tried to use HF and LF normalized by the heart rate?

Line 302. Discussion takes an unexpected focus on ultrafine particles that are not previously discussed.

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