Reviewer’s report

Title: Sauna bathing is associated with reduced cardiovascular mortality and improves risk prediction in men and women. A prospective cohort study

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Reviewer: Joel Trinity

Reviewer's report:

The manuscript by Laukkanen entitled "Sauna bathing is associated with reduced cardiovascular mortality and improves risk prediction in men and women. A prospective cohort study" is a timely and interesting report that clearly presents the impact of sauna bathing frequency and duration on cardiovascular health and mortality in men and women. The authors appear to have accounted for the majority of confounding variables that may be influencing their findings and the results are clear. The major strengths of this study include the prospective nature of the study with a 15 year follow up, the large number of participants, and the clear differences in the results in regards to frequency and duration of sauna bathing on CV mortality and risk prediction.

More detail should be provided regarding the total physical activity/week. An average of 10-11 hours per week of physical activity and the average of ~2300 met hours/year of are both quite high. Unfortunately a sedentary group that performed frequent sauna bathing was not included to see if sauna bathing, independent of a physically active lifestyle, is protective. The subgroup analysis presented in figure 4 is limited as only 2 groups for physical activity are defined. Based on previous reports from this group, it is surprising that a more thorough analysis with regards to physical activity was not conducted in the current study.

The data presented in Figure 4 is not the clearest in terms of interpretation. Based on the authors interpretation only history of diabetes had a significant impact on modifying the impact of sauna frequency on CVD mortality. However, with regards to sauna duration, it appears that many of the subgroupings had a large impact on the HRs. For instance, body mass, total cholesterol, LDL-C, HDL-C, PA, diabetes, and smoking status all modified the HR such that HR neared 1.

It may be worthwhile to state that socioeconomic status (SES) was accounted for in the abstract. For non-European readers the fact that use of sauna bath is not related to SES is surprising.

How long before enrollment had the participants been partaking in sauna bathing?

Line 31 page 5: CHD is not defined

It is interesting that the most frequent sauna bathers (4-7 times per week) also had higher BMI, alcohol intake, and energy intake, all factors that have independently been associated with
greater CV risk and mortality. This may provide indirect evidence that sauna bathing protects against other known risk factors.

Line 58 page 10: Should read "men and women" not "men and females"

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

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