Reviewer’s report

Title: Personal Ultraviolet Radiation Exposure in a Cohort of Chinese Mother and Child Pairs: The Chinese Families and Children Study

Version: 1 Date: 02 Jan 2019

Reviewer: M. Khazova

Reviewer’s report:

The manuscript had been improved but I am not sure that some of the issues highlighted in both reviews had been fully addressed. In particular, I refer to the statements that the answers to a number of comments will be presented in future publications and not here - it was a review of this particular manuscript and not future unknown ones. I also agree with other Reviewer that the results as they are presented in this paper could be considered as validation or feasibility of suggested study protocol but not as inter-comparison of multiple variants as manuscript reported very limited analysis of collected data. At the same time, I'd like to stress that these comments relate to this manuscript only and don't reflect the objectives and quality of the project itself, which is very important and timely.

It is repeatedly stated that the study identified a strong regional variation in time spend outdoors and personal UVR exposures whereas the reported data don't support this statement: it can't be de-coupled from rural vs urban locations and corresponding differences in lifestyle and commitments. UVR exposure of different groups compared with each other but, as authors stated themselves, that these data are not directly comparable between the two locations and/or made unproven assumptions (see, for example, line 215-218).

Authors added some information about data collection but neither school or paid employment hours nor analysis of their implications on possible exposure, suggesting that it will be reported in a future.

I am still not convinced in logic of 14 days averaging of doses and not using 7 days mean for the week closest to the data collection period. It is also not clear why 3 days or personal dosimetry are averaged, considering that one the days was weekend and other two - weekdays, with potentially very different time available to spend outdoors. No explanation of the rational is given.

Poor correlation between questionnaires and measured doses may be also due to the timing of exposure: even long exposures later or earlier in the day may result in low recorded doses. This assumption is neither mentioned nor tested in this manuscript.

Some of the information (see for example lines 90-97, 163-167) is reported elsewhere and may be substituted by references.
Statement that polysulphone dosimetry is the gold standard for measuring solar UVR exposure is far too strong and technically incorrect. Polysulphone is a useful tool, especially when used with well validated questionnaires but it records time-integrated exposure only, doesn't provide any information about timing of exposure and requires individual dosimeters for each exposure day. UV data loggers give more detailed information - when spectroradiometers are not practical.

Advantages of personal dosimetry using polysuplone over satellite data and limitations of satellite data (lines 145-146) are arguable: satellite data do reflect local environments at specified time and location; radiation transfer models do take into account variation of clouds, aerosols and ozone column through the day, they are validated by ground measurements across the globe. In some cases, polysulphone may be more practical and better option for large population studies than the use of satellite data but not necessary for reasons stated here.

Lines 281-291. It is true that exposure to 4.5 MED far exceeds the recommended daily limit for outdoor workers; however, it is exposure of unprotected skin. Values measured by polysulphone dosimeters relate to exposures of unprotected skin, as authors mentioned themselves. Statement that personal exposures (e.g. exposure of unprotected skin) of rural mothers is too high is not supported by presented data.

Personal exposures shown in Fig.3 for the week ~ 31 May 2012 are significantly lower for both locations while ambient values are not too dissimilar to periods before and after this week. No explanation is suggested.

Fig.2 and 3 combine information about mothers and adolescents for two locations, e.g. 4 variables, and should be split to present comparison of one of the variables at a time.

Editorial comments

Line 111. Delete field before doctors

Line 171. Delete or Joules per meter squared (j/m2).

Line 194. Delete comma after on average

Lines 223-226. Difficult to follow sentence, needs re-wording.

Lines 228-230. Technically inaccurate wording: MED is used instead of exposure - MED as minimal erythema dose was assumed to be identical but exposures differed.

Line 264. Difference in dates of data collection is not "slight", in particular - between early April and late May.

Line 286. Personal exposure of 60% of ambient value seems to be much higher proportion than reported elsewhere. Please explain.
Line 294. Greenhouse-related activities are more likely indoor than outdoor.

Line 359. Please explain relevance of fitting dosimeters over thick winter clothing for measurements of erythema effective UV: thick winter clothing suggest no exposed skin, very low ambient UVR and shorter exposures unless involved in winter sports at high altitudes.

Like 368. Use of sunscreens could result in the same exposure reduction as clothing.

Line 399. What does utility mean in this context?

Fig.2 and 3 have the same titles of Y-axis: Personal UV exposure (MED/day) while Fig.2 represents ambient values as stated in the capture. Please correct

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

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

No

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

Not relevant to this manuscript

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Please indicate the quality of language in the manuscript:

Acceptable

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