Reviewer’s report

Title: Different analysis methods of Scottish and English child physical activity data explain the majority of the difference between the national prevalence estimates

Version: 0 Date: 14 Dec 2018

Reviewer: Rachel Colley

Reviewer's report:

Overall Impression: This paper is simplistic in its analysis and messaging but nonetheless stresses a very important point. It is unfortunate that comparisons have been made in the past between datasets that are very clearly not comparable. Perhaps the publication of this paper will help to raise awareness of this issue.

General Comments:

1. Why is the word "minimum" included in the naming of the "daily minimum method"? Does it add information beyond the simpler "daily method"?

2. From a purely mathematical perspective, estimates using the weekly average will always be higher than when using the daily method because it is simply a less strict mathematical approach. This is insinuated throughout but it may be worth explicitly stating it as such somewhere in the paper. This comment relates a little to Figure 1. In other words one should not be surprised that the values using the weekly average method are a lot higher compared to the daily method.

3. The introduction suggests that, in the past, others have made comparisons between groups of different age ranges. It is well established that PA decreases with age from childhood to adolescence so of course varying the age range in any comparative work will have an impact. The authors' conclusions in this paper stress harmonization in analytical approach but perhaps this recommendation should be broader to include simple aspects like age range as well.

4. The paragraph in the introduction talking about the debate about measuring compliance to PA guidelines using accelerometers when they are derived using mostly self-reported PA data doesn't really fit in this paper. If the authors wish to mention it in passing, the discussion may be a better place for it. It just seems to veer off track in the introduction which does a good job of building the rationale for this particular paper.
5. Just a point of clarification - it is noted that the SHeS asks parents whether 7 or more PA sessions have occurred in previous week and then the weekly average is calculated. When the authors were running the analysis for this paper, did they require that children had an average \( \geq 60 \) minutes per day and 7+ sessions in past week or just an average \( \geq 60 \) minutes per day? The 7+ sessions in week does not really fit with the guideline and is not an interpretation that others have used (to my knowledge). Did the authors look at how the inclusion of this additional requirement affected the estimates?

6. The fourth paragraph of the discussion mentions the need to create surveillance recommendations when developing guidelines. There is an example of this in Canada. See: Tremblay, Carson et al. Canadian 24-hour movement guidelines for children and youth: An integration of physical activity, sedentary behaviour, and sleep. Applied Physiology Nutrition Metabolism 2016; 41: S311-S327.

7. At the end of the 3rd last paragraph of the discussion, it is mentioned that others have shown the same gap between estimates of adherence to PA guidelines due to differences in analytical approaches. This issue is also discussed in detail in the Canadian context: see Colley, Carson et al. Physical activity of Canadian children and youth, 2007 to 2015. Health Reports 2017; 28(10): 8-16.

8. The authors reported that the magnitude of difference differed by age and sex in the results however, not mention of this was made in the discussion. It would be nice to include some discussion of this finding and offer some insights into why this was observed.

Editorial Comments:

Results - first line - is the word "weighted" appropriate here? I think you mean just sample sizes. Same applies for column headings in Table 2. The concern is that "weighted" may infer the number of people in the population that your sample represents, rather than the number in the sample yourself which is what I think you are presenting.
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.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
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I am able to assess the statistics

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