Reviewer's report

Title: Variations in the estimated intake of acrylamide from food in the Japanese population

Version: 0 Date: 11 Nov 2019

Reviewer: David Collins

Reviewer's report:

The manuscript title is slightly misleading as the majority of the analyses are based on dietary records which I would not classify as 'questionnaire data'. FFQ's are questionnaire data. Dietary records involve the participant recording their food and drink intake in a food diary which is much more comprehensive than questionnaire data.

It does not appear as if the structure of the dietary record intake data (3 consecutive-day food record at 3-month intervals across 4 seasons) has been taken into account in the calculation of between- and within-individual variation. Instead these have been used as 12 independent records. The correlation between the 3 consecutive-day records will be stronger than the correlation between seasons and this appears to have been ignored in these analyses.

Some references (specifically 25 and 27 which are critical to understanding the manuscript) are not open access. They appear to be behind the pay wall. The authors need to provide an alternative citation of an open access paper or provide more details of the information referenced within these papers. Currently it is not possible to make a judgement on the formula being suggested or the validity of their assumptions.

Line 151 - it is stated that untransformed data is used for the 'number of days of DRs needed' analysis, whereas line 172 states that log-transformed data is used for the 'validity and reproducibility of the FFQ data' analysis. This is inconsistent. A sensitivity analysis could be undertaken to show the impact of using log-transformed data in the former analysis.

Justification is needed for choosing 10% and 20% degree of error as a percentage of long-term habitual intake (line 158) and also for choosing r-value 0.9 to estimate the number of days required to rank individuals (line 164). The impact of these choices is large. For example, changing from r-value 0.9 to 0.8 has a large impact on the variance ratio multiplier (4.26 compared to 1.78).
Line 191. Is the term 'Underestimations' referring to the 5th percentiles? I found this term confusing.

Discussion - Line 218 - the first sentence is implied from the first paragraph. Using the word 'also' implies it is a different point from the first paragraph. Consider re-structuring sentences. Line 221 - it would be helpful to include VR from this study as a comparison to protein and fat VR's. Line 232 states that others have used r-value of 0.8 which is different to the authors choice of 0.9 previously.

Table 2 - The mean intake column needs units (presumably μg/day). Units for columns D1, D2 and D3 are 'd' - this would be better stated as 'days' to avoid confusion with other single letter notation on the table. Footnote c should apply to D1 aswell. Footnote for D3 is given as 'd' in the column but given as 'e' under the table.

Table 3 - It appears that 'Snacks (Potato chips)' and 'Traditional dry confectionery' are in the wrong order based on their Partial R-Square.

Table S2 - The reasons for including the 'Food group number' is not clear - consider removing. Horizontal lines between each food group would make it clearer to understand that the top 5 contributing foods come from each food group. Are food groups with 0% proportion required in this table.

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