Reviewer's report

Title: Seasonal variance of 25-(OH) vitamin D in the general population of Estonia, a Northern European country

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Reviewer: Kevin D Cashman

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Kull et al. 2008 Seasonal variance of 25-(OH) vitamin D in the general population of Estonia, a Northern European country

This is an interesting paper on the vitamin D status and its determinants in an Estonian population, which is quite Northerly and does not ave a fortified milk system. The authors pose a clear research question and the paper largely addresses their findings. The authors could consider the following points/amendments which would help the reader:

A general point:
Just as a general note – the text of the manuscript downloaded from the web system was fragmented in places making it difficult to read the paper. May have been a consequence of uploading system.

Major points:
There is no need for Figure 1 as data is presented in Table 1 – just add two new lines which show the mean (SD) delta or change from winter to summer for 25(OH)D and PTH as well as statistics.

Table 2 should show the posthoc analysis to further the ANOVA p-value ! Are the increments in summer and winter stepwise ? and significant ?

Suggest omit Table 3 as this is more appropriate for a review style paper. Authors can provide references to other countries and vitamin D status in text.

Please present the outcome of the multiple regression in a table. The effect of BMI, age etc that dissappear when sun expore preference is included isn't clear until the data are provided. This is also needed in terms of supporting the conclusion authors draw which appears to suggest that these effect sunbathing. Is it possible that exposure to sun (as indicated b sunbath habits) was just such a major determinant that these other factors became insignificant rather than some causal effect ? Again during winter, dietary intake and indeed use of supplements could be important determinants of serum 25(OH)D. How much of the variance in serum 25(OH)D did the summer and winter regression analyses explain ?

Gender differences - again if possible account or discount differences in intake of vitamin D
Minor essential revisions:

In the Methods section

Is there any information available on inclusion/exclusion criteria based on medications? Please specify

Please indicate whether or not there were any subjects who went to a destination where there would be significant dermal production of vitamin D both prior to and during the winter period of the study

Please specify the vitamin D contents of the supplements which were taken, if known

Is there any dietary data available? If so, it would be useful to present vitamin D intake and possibly calcium intakes of the group and include in the multiple regression models as possible predictors of 25OHD

In addition to the analysis of the 25(OH)D v. PTH relation in the entire group of subjects, serum PTH is influenced by age, therefore the authors could split the non-linear regression analysis into subjects above or below some age-cut-off (e.g. 50 (or other) years of age).

In the Results section

Please state the age/gender profile of the subjects with hyperparathyroidism. If possible please also state whether these subjects have abnormal serum calcium values. It is important to be able to distinguish whether it is due to low 25OHD or abnormal serum calcium

What was the R square value for the relationship between 25OHD and PTH? Please insert in text

The line in 2nd paragraph – ‘Those subjects taking ..... (43.5 nmol/L vs. 53.9 nmol/L, P=0.053)’ - while presumable the later figure is that of supplement users and former that of non-users, please state.

In the Discussion section

As the authors have identified two points of inflection (serum 25(OH)D at which PTH reaches a plateau) - how does the reader interpret this. Which is the more important from a health perspective?

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable
**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**
I declare that I have no competing interests.