Author's response to reviews

**Title:** The influence of calcium and magnesium in drinking water and diet on cardiovascular risk factors in individuals living in hard and soft water areas with differences in cardiovascular mortality.

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PDF covering letter
Please find the point-to-point comments to the reviewer's comments.

Typographical and grammatical errors.

The authors have rechecked the paper regarding these types of errors and made corrections.

The third paragraph of the background describes previous studies showing correlations between water and dietary magnesium. Are those correlations positive or negative?

The correlations were positive, which has been added into the text.

In the methods section the authors describe that 67 subjects received muscle biopsy. How were these subjects chosen from among the 207 study participants? Why were not all of the 207 subjects chosen? Was everyone asked to participate in the biopsy and only 67 agreed. It is important to make this clear.

All participants (207) were asked to receive a muscle biopsy of which 67 (29 in the western and 38 in the eastern municipality) agreed to participate. The biopsy was conducted on striated muscle (m. vastus).

Figure 1 requires a caption and the units of the axis labels need to agree with the results reported (ie they should be in mmol/l)

A caption to the figure is in the manuscript. Units of the axis are included in the figure. The unit for water data is mg/l.

How was the difference in the ratios of Mg/Ca tested?

As the ratio Mg/Ca was judged as skewed, the Mann-Whitney U-test was used.

Tables 5a and 5b do not present their results by sex. It is necessary to either report the results of the tables as they are or to add the results for sex into the table.

Results by sex are removed from the text and the tables remain unchanged.

Table 7 needs an explanation of the row labels. The authors could create a footnote saying that “S “ means serum and so on. All tables should be self-explanatory independent of the text in the manuscript.

A footnote with explaining labels is added.

The results would be easier to read if written in a form such as: "Table 3 shows..." Sometimes, because of new paragraphs, it is not clear (unless the reader looks at the tables) which Table the results refer to. This is done, for example, in the first sentence on page 8.
The text is changed according to the suggestions of the referee.

The results for diabetes in the first sentence on page 8 appear to be repeated in the second sentence.

This is removed from the text

Where linear regression analysis is used were the regression assumptions met? The final regression analysis, in which a response variable from the previous model is used as an explanatory variable in the current model, should be removed, as it is not really appropriate. Also, the percentage of variation the response variable explained by other variables indicate poor model fit (the percentages are quite low).

We agree that the last regression analysis should be removed. However, we don’t agree that the percentage explained variation is low. Often, when regression analyses are performed in situations like this, due to complex causal relations the R-square values are much lower. Residuals were checked for normality and showed no disturbing features.

The discussion on the lower half of page 11 simply repeats the results. For each sentence from “There was a significant correlation between s-magnesium…” onwards the authors should guide readers in the interpretation of these results. What do these results imply medically? The authors also need to concede for each point concerning correlations that these correlations, although significantly more than zero, are indicative of weak correlation at best.

Suggested explanations are included in the text

The discussion on the regression analyses is not really appropriate since interactions are not formally investigated. It may be more reasonable for the authors to simply suggest the possibility of complex relationships existing.

A new text according to the comments is added in the text.

The conclusion should also concede that the results in the paper show only weak correlation at best. The regression analyses did not look at cardiovascular mortality or region so the authors cannot make conclusions about those features, they can really only suggest that complex relationships may exist that were not revealed by these analyses.

The conclusion is revised according to the changes in the manuscript and the comments from the referee.

Please also note that the title of the manuscript was changed after the first revision!