Reviewer’s report

Title: The relevance of spatial aggregation level and of applied methods in the analysis of geographical distribution of cancer mortality in mainland Portugal (2009-2013)

Version: 0 Date: 29 Nov 2017

Reviewer: Pablo Fernández-Navarro

Reviewer’s report:

The manuscript "Geographical distribution of cancer mortality in mainland Portugal: the relevance of choice of spatial aggregation scale and applied methods" is a valuable report where authors try "to identify spatial aggregation levels that best suit the analysis of mortality data from all malignant cancer in mainland Portugal by comparing different scales of spatial administrative units, as well as different methods of data analysis".

However, there are some concerns and the authors may attend the suggestions and criticisms below indicated.

1) The abstract should be revised attending to the suggestions below indicated.

2) In the introduction section, authors should define better in the objectives the statistical methods that they are going to use, or at least in what context. For example, methods related with the detection of Cluster of Disease, the SMR smoothing models, etc.

3) It is difficult to find in Material and Methods section which are the criteria that is going to be followed to achieve the objectives. For example: low CV values, or other estimator from the statistical descriptive analysis performed; lack of clear spatial patterns in maps; something related with the Cluster detection. Some of these considerations are in the Discussion section.

4) Additionally, in Material and Methods section, the different analyses described should be introduced and justified in relation with the objectives.

5) Authors should include in the manuscript the evaluation of the Posterior Probabilities (RR>1) in the context of the BYM models, in order to assess correctly the RRIs shown in the maps.

6) Authors should include a descriptive analysis of the spatial units studied (polygonal areas (km)) in order to be able to extrapolate these results to other contexts outside of Portugal. For example, a bar-plot of the polygonal areas (in km) in the context of the different spatial units used. In this way, a map with the population by spatial unit could be useful too.

6) Expected deaths calculation should be better explained.

7) The descriptive analysis for SMR and the RR should be detailed in material and methods section. Looking at the results, it seems to based on the calculation of means and standard
deviations. Perhaps, authors should show the median and percentiles 25 and 75 according to the distribution of the values.

7) A map with the names of the NUTS could help to better follow the results and the discussion.

8) In the Discussion section, authors should include a first paragraph with the summary results according to the objectives of the study.

9) Some of the paragraphs in the discussion section include details that should be in material and methods section. I recommend a revision of this section to transfer that information.

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