Reviewer’s report

Title: The incidence variation of prostate and cervical cancer according to socioeconomic level in the Girona Health Region.

Version: 2 Date: 19 May 2014

Reviewer: Amy Griffin

Reviewer’s report:

- Major Compulsory Revisions

1. I am surprised that the authors do not refer to many relevant papers in the area that could help to contextualise the relationship between deprivation and the cancers they studied.

   This is particularly in light of the fact that their study identified a different directionality of the relationship between deprivation and cancer incidence than what has been reported in many populations.

   For example, the following papers are relevant, among others:
   http://www.biomedcentral.com/1471-2407/8/271

   This paper might be used as evidence for a potential mechanism for why you found what you did for prostate cancer: spatial variation in PSA testing among lower deprivation quintiles:

2. It is unclear why you did not include individual level deprivation in the model. Is it because this information is unavailable? It has been found to have independent effects on cancer incidence and mortality (as well as many other health problems).

3. I think a more coherent argument should be made for why a Bayesian approach is the most suitable one for this analysis. Why, for example, is it more suitable than a multi-level regression model approach? Also, what are the putative mechanisms by which area level deprivation could influence cancer incidence? While an ecological study design does not allow you to definitely answer questions about causality, it is normal to make a case for why you are investigating this explanatory factor in the first place.
Also, why have you chosen the BYM model? There are papers you could cite in support of your decision (e.g.,: http://www.ncbi.nlm.nih.gov/pubmed/10960849)

4. You state that 'the population consists of several subpopulations (p. 9). What are these?

5. Your discussion of model results on p. 10 does not correctly describe the tables. You state, 'in the case of prostate cancer, they are lower when estimation is used, but they are slightly lower for estimation 1' (referring to spatial variability and the random effect).

This is only the case for Table 1 in the prostate cancer models. Table 2 has a different pattern.

6. I find the conclusions section to be quite weak. How will your paper enable better planning of health resources? Specifically what changes can be made?

7. I find it strange that the paper includes no maps when you are discussing both spatial and spatio-temporal effects.

- Minor Essential Revisions

1. In several places, the authors have still used the Spanish word for and -- 'y'.
2. On page 8, you use the word 'null', but I think you mean 'nil'.
2. Remove the word 'thus' on p. 11. This sentence does not logically follow from / depend upon the prior sentence, so the word thus should not be used.

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

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests.