Author’s response to reviews

Title: New ways of estimating excess mortality of chronic diseases from aggregated data: Insights from the illness-death model

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Reviewer reports and point-to-point response

Reviewer 1

Overall, this is a well written paper. The findings are novel and relevant considering the fact that the methodological approach arrived at will be useful in the estimation of excess mortality of a chronic condition from aggregated age-specific incidence and prevalence data. That said, authors should note the following comments that relate to the various sections of the manuscript submitted for review.

Authors’ reply: We thank the reviewer for the kind words and his advice to further improve the manuscript.

Background

The Background section is well written, with the rationale for the conduct of the analysis stated clearly.

Methods

The methods section is succinct with the needed information to understand the approaches involved in the analysis well presented. Authors should however take note of this comment and consider rectifying it:
Page 8, Line 148, citation [13] is not appropriately presented. Authors should mention name(s) of authors of the citation.

Authors’ reply: Thank you for this hint, we added the name according the reviewer’s suggestion.

Results
Result are well presented.

Discussion
The results are well discussed with the limitations of the methods well articulated. Overall, the section is well written.

Authors’ reply: Thank you.

Reviewer 2
The authors have shown that a previously developed PDE can be used to estimate the excess mortality from age-specific prevalence and incidence, based on aggregated data. This work shows originality.

Authors’ reply: We thank reviewer 2 for the kind words and his advice to further improve the manuscript.

Just a few comments:
On line 63, make the word ill to be in italics too.

Authors’ reply: Thank you for spotting. We changed the format accordingly.

How sensitive are the estimates on the choice of priors for R: where uniform distributions(R(50) \(\sim\) U(2; 9) and R(90) \(\sim\)U(1; 2); again) are currently used ? Sensitivity analysis would help to check this.

Authors’ reply: Based on the reviewer’s suggestion, we analyzed the impact of a bivariate normal prior distribution on the maximum a posteriori (MAP) estimators. Compared to the (weakly informative) uniform priors, the bivariate normal puts more weight at a predefined location. When changing the priors from uniform to bivariate normal, the MAP estimators
change only slightly—an effect of the high number of people in the prevalence data. We added the description, results and conclusion of the sensitivity analysis to the manuscript.