Reviewer's report

Title: Family history of cancer on survival of patients with gastrointestinal cancer in northern Iran, using frailty models

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Reviewer: Hans C. van Houwelingen

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The data could be of interest and worth publishing; however the data-analysis is far from satisfying.

Issues to be addressed:

Major

1. Kaplan-Meier estimates of the survival function should be shown, to visualize the data and the effect of important predictors, like gender and family history.
2. The p-values of Table I, compare males and females, I presume. That is not very interesting. I rather had seen the p-values of the log-rank test and hazard ratios derived from simple Cox models for each covariate separately.
3. It does not make sense to compare the partial likelihood of a Cox model with the full likelihood of parametric models. Concluding that the Cox model behaves poorly on the basis of Table II is not correct
4. Table III is a bit incomprehensible. First of all, I would rather omit all predictors who do not seem to have an effect at all. Secondly, I expect more than one parameter for categorical covariates with more than two categories like Type and Ethnicity. Thirdly, I have never seen the standardized variability as used here. It is just 1/Z^2, where Z=Wald statistic, I presume. You might as well give the p-values.
5. Adding a gamma-frailty term improves the likelihood. That is fine. However, that should be interpreted with care. It shows that the simple model can be improved. Similar improvements could be obtained by adding time-varying effects in the Cox model, as already proposed by Cox in his original paper. The existence of “heterogeneity” can only be concluded if you firmly believe that true model is a simple linear model.

Minor

1. Since all your models have the same number of covariates, you do not need AIC. You can just compare the log-likelihoods.
2. I do not quite see the usefulness of the deviance residuals plots. They tell the same story as the likelihoods. If you want to give them, they would need some explanation for the clinical readers.

Level of interest: An article of limited interest
Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

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