**Point-by-point review response and revision summary of Manuscript BA2012-009**

“Bayesian inference for Cox Proportional Hazard Models with Partial likelihoods, Semi-parametric Covariate Effects, and Correlated Observations”

Dear Dr Guindani (Editor-in-Chief) and Editors,

We wish to thank you for giving us this opportunity to revise our manuscript, and thank the associate editor and the referee for their detailed and helpful comments. We have read through the reviewer’s comments in details, and worked hard to address and incorporate all the suggestions in our revised manuscript, as detailed in the point-by-point responses in the following pages. The main revisions we made can be summarized as the followings:

* We have improved our posterior approximation method by removing the Gaussian noise in the additive linear predictors. The size of the latent parameter vector in the new posterior approximation method will no longer grow with the sample size, and hence makes the proposed method more computationally efficient and scalable.
* To address the AE’s comments, we expanded the two real data analysis examples in our revised manuscript. In the revised version, we not only implemented our proposed Laplace-approximation based method for the inference, but also the MCMC method for the same model based on partial likelihood. It turns out that our proposed approach gave similar result with MCMC method, but took significantly shorter time. This suggests that when computational efficiency is of primary concern, our proposed Laplace-approximation based method can be an appealing alternative to the practitioners who wish to conduct survival analysis based on partial likelihood.
* To address the referee’s comments, we expanded our simulation section to illustrate the accuracy of our proposed method. We considered two simulation settings where our approach tends to be more accurate than existing full-likelihood method, one with frailties of different sparsity, and another with semi-parametric smoothing with baseline hazards of different smoothness. As suggested in the referee’s comment, we measured accuracies in terms of Mean Square Errors (MSE) and posterior coverage probability with nominal level of 95 percent, through 300 independent replications. This provides guideline for practitioners who wish to conduct similar analysis, on how to choose the appropriate inference method depending on the setting of their problems.

We believe this revision is a significant improvement compared to our original manuscript, and we hope it is now suitable for publication in *Bayesian Analysis*. Thanks again for the consideration of our work.

Sincerely,

Ziang Zhang Alex Stringer Jamie Stafford Patrick Brown

PhD student PhD Candidate Professor Professor