Author's response to reviews

**Title:** Bilaterality can be ignored when analysing the revision risk of knee prostheses: Analysis of a population based sample of 44 590 patients with 55 298 knee prostheses from the national Swedish Knee Arthroplasty Register

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Dear Editor.

Thank you for your and your reviewers work.

The revised manuscript we are submitting as your guidelines suggest.

Regarding our response to the comments of the reviewers we address each reviewer points separately.

Reviewer Ove Furnes discretionary revisions:

1. The authors only include age and sex...
   We appreciate that OA, RA and time period might be potential confounding factors when estimating the revision risk of UKA relative to TKA. However, the purpose of our paper is not to find a confounding-free estimate of the relative revision risk but to investigate the consequences of ignored bilaterality. A paragraph has been added to the discussion section to clarify this.

2. On page 2 the number of patients with revisions of one or two prostheses...
   Such an effect is not self-evident. Even if the proportion bilateral revisions are the same between UKA and TKA their effects on the prosthesis survival might be different for UKA and TKA. We would prefer not to include the discussion into the paper.

3. In the discussion the authors could possibly include a couple of other studies...
   The suggested studies have been included in the discussion.

Reviewer Birgitte Espehaug compulsory revisions

1. The title may be unclear...
   The title has been revised.

2. In all the formulas for the hazards, the index for observation i is missing...
   Oops, corrected.

3. I would prefer to use another letter than b to indicate the random effect vector...
   We have replaced "b" with greek gamma but would prefer to use lambda instead of mu for the hazards to facilitate for readers familiar with this presentation of the proportional hazards model. Yi has been
explicitly defined.

4. Furthermore, while Y follows a gamma distribution...
This has been clarified.

5. Is the interpretation of the frailty variance, as a measure for correlation...
We agree with the reviewers questioning and have reconsidered using the measure.

6. Have the authors discussed possible effects of not having preset group sizes...
No, not really, but the phenomenon is now mentioned in the discussion section.

7. What was the estimation technique...
The estimation technique is now described.

Birgitte Espehaug orthographic corrections

Abstract
- Background, line 2: ... one or both knees in a patient... - corrected
- Background, line 3: Risk calculations are...(delete 'such') - deleted
- Methods line 4: ... which allows patients to ... - corrected
- The result paragraph was difficult to read - rewritten
- Conclusion, line 3: a relatively low proportion - corrected

Background
- page 1, lines 4-6 unclear sentence - rewritten

Methods
- page 1, line 4: 1985-2000 (the abstract says 1985-1999) - corrected
- Statistical methods
- page 2, line 1: Lifetimes of prostheses are often analysed - corrected
- page 2, line 5: and time t, common for all subjects containing... - corrected
- page 2, line: We used the statistical software R.... - corrected
- page 3, line 1: The shared gamma frailty... (delete 'For'). - corrected

Results
- page 4, line 2: hazard ratio estimate of 1.98 - corrected

Conclusions
- page 5, line 3: a relatively low proportion - corrected

References
- Reference 2 Author name is Hougaard, P. - corrected

Birgitte Espehaug discretionary revisions

1. Was the estimated frailty statistically significant...
These results are now presented in the results section.