Author's response to reviews

Title: Bias and imprecision in posture percentiles assessed from limited exposure samples

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Author's response to reviews: see over
Re: resubmission of manuscript for the BMC Medical Research Methodology Journal

Dear editor,

Please receive our revised manuscript "Bias and imprecision in posture percentiles assessed from limited exposure samples", which we kindly ask you to consider again for publication in the BMC Med Res Methodol.

We appreciate the very relevant request for a pre-review edition of the paper. We have changed the text accordingly, as described below with reference to the two points made in your mail of December 6, 2011. We hope that the changes will satisfy your expectations:

1. The authors identify the problems (bias and low precision) associated with the existing approaches but fail to provide guidelines/better approaches in terms of how to summarize the exposure data in the manuscript.
   > We have now included a specific section in the discussion, “Posture metrics - alternatives to percentiles”, which reviews and discusses viable alternatives for expressing posture distributions in epidemiologic studies, including a recommendation for using metrics based on proportions of time in pre-defined angle sectors rather than percentiles.

2. The 10th-90th percentile approach may provide a biased exposure variable. However, it’s unclear how the bias would affect the estimation of the association between the exposure and risk for musculoskeletal disorders.
   > We have added a section in the discussion, “Effects of exposure bias and imprecision in epidemiologic studies”, which discusses the possible consequences of using metrics based on percentiles as exposure estimates in interventions studies as well as in examinations of exposure-outcome relationships.

We would also like to repeat the statement of relevance included in the cover letter accompanying the first submission:

Reliable posture data is a vital requirement in medical epidemiology and intervention research dealing with musculoskeletal health and performance at work and during leisure. Postures have, as an accepted standard, been expressed in terms of percentiles of the cumulative distribution of sampled values across time, and these percentile estimates have very often been based on short samples. The present paper shows for the first time that posture percentile samples of durations typically found in the literature can be substantially biased, let alone highly imprecise. While this is, in its own right, important information for researchers addressing postures, it also suggests that other posture variables than percentiles should be used if the researcher is, for reasons of feasibility or resources, forced to base posture assessments on short samples.

Yours sincerely, on behalf of the authors

Svend Erik Mathiassen