Author's response to reviews

Title: Optimizing cost-efficiency in mean exposure assessment - cost functions reconsidered

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Gävle, October 22nd, 2010

Re: manuscript for the BMC Medical Research Methodology Journal

Dear editor,

Please receive the enclosed manuscript “Optimizing cost-efficiency in mean exposure assessment – cost functions reconsidered”, which we kindly ask you to consider for publication in the BMC Med Res Methodol.

The results have not been published in any other scientific journal, and the manuscript has not been submitted elsewhere.

No financial or other relationships may lead to conflicts as regards the publication of this material.

Both authors have contributed significantly to the manuscript, and have approved it in its present, submitted form.

Reliable exposure data is a vital requirement in medical epidemiology and intervention research. We believe that the present paper adds substantially to sound medical research practice by presenting a novel methodology for identifying an exposure assessment strategy that leads to an optimal statistical performance under a constrained budget. While a few previous studies have discussed procedures for the simple case of costs for collecting data being proportional to the number of measurements, the present paper deals with the very probable scenario that costs vary with measurements in a non-linear fashion. In doing so, the paper presents both a theoretical derivation of proper procedures, a numerical illustration of these procedures for realistic scenarios, and a thorough discussion of the generalizability of the procedures and their sensitivity, for instance to uncertainties in indata.

Yours sincerely,

Svend Erik Mathiassen