Reviewer's report

Title: On the proportional hazards model for occupational and environmental case-control analyses

Version: 2 Date: 7 September 2012

Reviewer: Chi-hong Tseng

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This paper presents a new variance estimator using a superpopulation approach for the weighted Cox model to estimate the effects of time-dependent exposures. The new estimator is a direct application for the variance estimator derived by Lin (2000).

The proposed variance estimator was evaluated using simulations and applied to a case-control data on pleural mesothelioma.

Major Compulsory Revisions

1. The authors need to provide the explicit formula for the observed information matrix and variance estimator, instead of just the code from R software.

2. The robust sandwich variance estimator is not intended for the superpopulation framework. It needs to be evaluated in a different simulation set-up. The direct comparison does not seem fair.

3. The simulation is done with case-control of 1:1 ratio. Generally fewer cases and more control subjects are available. Various different case-control ratios might be useful in the simulation study to evaluate their relative efficiency.

Discretionary Revisions

1. It appears that the logistic regression (conditional or unconditional) methods usually provide estimates with better efficiency, although it does not take into account the time-dependent covariates. The weighted method does not appear to be very useful.

2. In the real example, estimates based on the weighted method and the logistic regression gives very different results that many of 95% CI are not overlapped. Can the authors provide some interpretation on the discrepancy?

3. The authors need to double check spelling and notations (e.g, dfbetas?)

Level of interest: An article whose findings are important to those with closely related research interests

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