Reviewer's report

Title: Cardiovascular mortality and exposure to extremely low frequency magnetic fields: a cohort study of Swiss railway workers

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Reviewer: Christoffer Johansen

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Roosli M et al. Cardiovascular mortality and exposure to extremely low frequency magnetic fields: a cohort study of Swiss railway workers

This study is a report from a nationwide cohort of workers employed at the Swiss railway system. The cohort covers a long time span and seems to include all relevant persons employed at the Swiss railways. The exposure assessment is based on measurements conducted with almost a ten year time span and the assignment of the actual exposure is based on these measurements and a number of historical information about engines, railway organization and job duties. The outcome is defined as a number of cardiovascular diseases on the death certificate. The study do not include information on well defined risk factors for these diseases such as smoking, physical activity, diet, weight (BMI) or other lifestyle variables. The study follows a straightforward cohort analysis plan.

Major comment

However, I do not see that this study contribute that much to the evidence concerning the supposed association. As mentioned in the reference no 7, there is a need for more sophisticated studies in order to shed more light on the hypothesis. One may say that the conclusion in reference no 7 ‘buries’ the idea that exposure to EMF in any way would be associated with the occurrence of cardiovascular diseases. Therefore the lack of confounder information in the present study becomes a problem. One may suggest that the authors by revisiting the death certificates would be able to come up with some more causes of death in order to validate the cause of death which they include as their measure of the outcome. The immediate cause of death in combination with a contributing and/or underlying cause of death indicating a lifestyle, which characterizes a person at high risk for cardiovascular disease would indirectly validate the immediate cause of death. These two other causes of death indicates the degree to which a given person may be expected to have lived a life which we would characterise as a ‘risk life’ with regard to the risk for cardiovascular disease. I am only emphasizing this opportunity because the current data, in my opinion, would benefit of a more aggressive and ambitious approach. In addition it is often used in cohort studies of an occupational exposure to interview fellow workers and/or spouses or family members. This would also be possible in a sample of the cohort in order to obtain more information on the lifestyle of cohort members. Once more, the approach is too
conservative especially in the light of the conclusions of reference no 7.

Minor

The probabilistic method by which death certificates and actual persons in the cohort become linked is somehow mysterious in the current explanation. I am not sure that I really understand the exact procedure. Would it be possible to enlarge this section in order to be able to understand the discussion of this procedure with regard to bias (?)

The reference number 12 on second line from the bottom on page 10 lacks brackets

The first two lines of the Acknowledgement is redundant of the following two lines

One may consider too leave out the figure, which does not provide the reader with any special information but seems to be included just to show that actual measures exist.

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.