Reviewer's report

Title: To what extent does sociodemographic composition of the neighbourhood explain regional differences in demand of primary out-of-hours care? A multilevel study.

Version: Date: 9 March 2015

Reviewer: Nat Wright

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To what extent does sociodemographic composition of the neighbourhood explain regional differences in demand of primary out-of-hours care? A multilevel study.

This is an impressive dataset covering almost ¼ of the postcode areas in the Netherlands. With the exception of the issue I have highlighted in bullet point 1 below, the analysis of the dataset is robust and the findings are important. I have made some recommendations for revision as outlined in the bullet points below:

• The reader would need to be convinced of the statement that postcode areas with at least 1000 inhabitants and for which data of at least 100 patients were available, were not included in the analyses, since models based on areas with less than 1000 inhabitants, or 100 patients were not considered reliable. Further supporting references from the generic mathematical modelling literature need to be offered in support of this statement, not least because the current supporting reference is one of the paper’s authors citing their own work.

• The authors need to explain why ICPC-1 was used to classify consultations which were conducted in the year 2012, not least because ICPC-2 was published in 1998. I suspect it would be a significant logistical challenge to re-code the data according to the ICPC-2 classification system. If so then the fact that data has been classified according to an out-of-date publication needs to be acknowledged as a limitation of the study.

• The authors state that unexplained residual variance resulted from differences between GP cooperatives that were not included in the model. They go on to state that more research is required to determine to what extent for instance access to GP day-care, triage procedures, presence of Emergency Departments, and joined triage in Integrated Emergency departments affect the number and nature of GP cooperative contacts. I appreciate that such data was not available in the routinely collected dataset. However it would not be difficult to acquire such data for a smaller random sample of GP cooperatives and therefore perform a subset analysis. I would suggest the authors explain why they did not undertake such a subset analysis to address the unanswered questions which they have posed regarding residual variance.
• Page 14 contains a typo

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

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

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests