Reviewer's report

Title: Neighbourhood socioeconomic status and cardiovascular risk factors: a multilevel analysis of nine cities in the Czech Republic and Germany

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Reviewer: Basile Chaix

Reviewer's report:

The interest of this paper, as discussed by the authors, consists in its cross-country comparison of associations that have mostly been investigated each time within a single country.

General comments:

Limitations of the present study include the lack of adjustment at the individual level: only individual education was considered, but not household income. Obviously, individual education captured important disparities in risk factors. Despite that, controlling for income and occupation may have reduced further the area-level effects estimated.

As discussed by the authors, a major limitation of the study, given the aim of cross-country comparisons, is that the area units considered were much larger in Germany than in the Czech Republic. This decisive limitation is adequately commented in the discussion section, but probably hampers to fulfil the main study objective.

Data on cholesterol were not available in both databases?

An important aspect the authors have to correct before publication is related to their interpretation that individual education was a mediator of the area SES effect. It is true that individual education is influenced by the living conditions of individuals in their neighbourhood at the time of childhood. But it is also true that selective mobility based on attained education takes place at each generation, as if individuals were resorting themselves between neighbourhoods at each generation. Individual education is therefore as much a confounder of the association than a mediator, and the authors clearly had no way to distinguish between these 2 aspects in their analysis. I would therefore not conclude than individual education was a mediator in their analysis. This aspect needs to be corrected in the abstract, result section, and in the conclusion of the paper.

Specific comments:


Background section: Do the authors know how many previous studies performed
cross-country comparisons of neighbourhood effects on risk factors for coronary heart disease? It could be relevant to cite it to emphasize the originality of the study.

Methods, “data” section: This first paragraph should indicate when the baseline date of these studies was.

Page 5: what were the standardized questionnaire used for physical activity and smoking? Were the same questionnaires used in both studies?

Page 5, “it was hypothesized that economically inactive … are at higher risk for negative health effects...”: It suggests that an interaction of effects was tested. Was it the case?

Was social isolation defined with the very same, or with an approximately similar question in the 2 studies? This should be clarified.

Page 7, “these random effects were assumed to be correlated”: I am surprised of this statement. If a common level in risk factors exists among the neighbourhoods of a city, then it should be captured by the city-level random effect. After that, there should be no correlation among neighbourhood-level and city-level random effects.

Whatever, I am not sure the use of city-level random effects is appropriate, especially in the German sample in which there were only 3 cities. Perhaps fixed effects for the cities would be more appropriate here?

In table 1, do not call the variable “overcrowding” but “mean living space” because it is what is shown.

Is it adequate to list “education” as a risk factor in table 2?

Page 8, “it is notable that in Czech Republic a contrast becomes evident not until the third quartile”. I don’t see that very clearly in the results, comparatively to Germany.

Page 9: why plural for “psychosocial characteristics”?

Page 11: “combine both individual and structural prevention in neighbourhoods”: This statement is rather vague...

Page 11: Homogeneity is not a criterion for defining residential areas (it is a rather common mistake to believe so). People are affected by the environment around them, whether it is homogeneous or not. There are other reasons for criticizing administrative boundaries (see for example Am J Epidemiol 2005;162:171-182).

Page 12, last paragraph: It is very common to measure neighbourhood socioeconomic characteristics from census data. I almost only know the GLOBE study that aggregates data from the individual participants to define the neighbourhood characteristics.
There are some mistakes in the journal names for ref 17 and ref 43.

What next?: Accept after minor essential revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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.