Reviewer's report

Title: Influence of socio-economic and lifestyle factors on overweight and nutrition related diseases among Tunisian migrants versus non-migrant Tunisians and French

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Reviewer: Myriam Khlat

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General
This is an interesting and original paper, which concerns the intriguing issue of the migrants' health advantage, first evidenced for Hispanics in the United States, and recently pinpointed in Europe. The added value of the paper is that it tries to provide clues for the interpretation by fitting a series of nested models to identify the mediating factors. Another interest is that it has gathered 3 groups for comparative purposes: Tunisian migrants in France, local-born French and Tunisians living in Tunisia. Few migrant studies have comparable data from country of origin, and this is undisputably an asset. There are also quite objective health measures and information on risk factors.

Conceptually speaking, there is however a problem, which is that one of the main explanations of the paradox, which is that of the « healthy migrant hypothesis », is not considered by the authors. According to that hypothesis, those who migrate and remain in the host country are the healthiest and strongest members of their population of origin. This selection hypothesis should be made explicit in the conceptual background section, and referred to in the interpretation. Another problem is the limited sample size, given the large number of co-variables in the regression models. The authors should be more convincing when asserting that they have sufficient statistical power with regard to their study objectives. Below are some more specific comments:

Page 2: in the Background: rather than mentioning an « effect » of migration, it would be more appropriate to comparisons of migrants with host country and country of origin, and to an analysis of the socio-economic factors and lifestyle factors involved in the differences.

Page 3: in the first paragraph, perhaps mention that migrants' studies have been widely developed within the framework of cancer epidemiology, in order to disentangle genetic factors from the influence of the environment (see Parkin & Khlat. Studies of Cancer in Migrants: Rationale and Methodological Issues. European Journal of Cancer, 32A, 5: 761-771, 1996). Also, at the end of the second paragraph, the different hypotheses should be presented, including the selection hypothesis (« healthy migrant hypothesis »). Why did you focus on men? Please justify.

Page 4, 2nd paragraph: the matching procedure should be explained with more details. What do you mean by « geographical origin »: what it at the regional level, or on a smaller scale?

Page 5: why did you rely on household wealth rather than on actual occupation? More details should be given regarding the PAL and the BMR, which are not familiar in epidemiology.

Page 6: How did you define current smokers and current drinkers? Was there a threshold? The conceptual framework is not clear. What do you mean by « directly »? Are you referring to genetic factors? What about the « healthy migrant hypothesis »? How does it fit within this framework?

Page 7: give a reference for the mediating effect ratio (MER), which is not traditionally used in epidemiology.

Pages 8-10: the layout of the Results is somewhat confusing. Why are certain analyses tabulated and others not? For instance, there are no tables presenting the regressions concerning hypercholesterolemia and hypertension (for which the differences were huge). It would be useful to have a more condensed presentation of the results. Also, the authors should make clear why certain analyses were tabulated and others not (based on ultimate findings?).

Page 12: at the end of the second paragraph, the diet is referred to. There is a large literature on the health advantages of the mediterranean diet, and this aspect should be considered in the interpretation (it is hardly mentioned in the middle of page 13).

Table 1: the chi_square columns could be ommitted. Same applies to Table 2. In Tables 3 to 5: do we really need the degrees of freedom? Try to condense the Results presentation.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)
Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Discretionary Revisions (which the author can choose to ignore)