Reviewer's report

Title: A cross-sectional, observational study examining associations of health, physical activity and weight status with motorised travel and transport carbon dioxide emissions

Version: 1 Date: 7 April 2012

Reviewer: Anthony (Tony) J. McMichael

Reviewer's report:

1. Is the question posed by the authors new and well defined?
   A: In part new, yes – and that is quite well defined. It has to do with several specific variables and their relationships, and with the more general cautionary issue referred to in their Conclusion: “health-environmental ‘co-benefits’ cannot be assumed.”

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work?
   A. Yes

3. Are the data sound and well controlled?
   A. Yes

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   A. Standards, yes. Unsure about data deposition.

5. Are the discussion and conclusions well balanced and adequately supported by the data?
   A. They are OK. Some re-writing, to clarify, is needed.

6. Do the title and abstract accurately convey what has been found?
   A. Abstract is rather mediocre

7. Is the writing acceptable?
   A. This is somewhat of a problem. The paper contains a substantial stream of information, mostly without any clear sense of priority. This makes for hard reading; some indigestion. This, I fear, typifies the reporting of much modern epidemiological research, carried out with sophisticated, ready-to-hand, statistical analytic techniques. The authors should re-think what they most want to convey to readers – and not overload them with a undifferentiated item by item parade of results.

Recommendations
Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)

There is need for some re-writing and clearer ordering/structure for the reader (see above)

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

See my detailed specific comments below – some sentences, some phrases, some words need attention

Specific Comments

Abstract:
- Opening sentence is ambiguous: You do not mean that the associated CO2 levels contribute to obesity
- The final paragraph is poorly written
- In para 2, the unadorned use of the word 'predicted' is inappropriate: "Walking for recreation and leisure-time physical activity predicted higher motor travel distance and therefore higher CO2 emissions". These cross-sectional data do not allow inferences about 'prediction' (as you eventually point out, in the Discussion). Besides, it is quite plausible that any causal relationship runs in the other direction: those who have to drive to work every day (for whatever reason) then must attain their physical activity/exercise via recreation.

P.10: The following sentence will not be meaningful to most readers: "All analyses weighted participants by the 2001 age and sex profile of their Lower Super Output Area (population around 1500)." Why was this weighting being done, and what is the Lower Super Output Area?

P.10: The linear regression methods are well explained.

P.17: The sentence " In this study overweight and obesity were independently associated with higher transport CO2 emissions." is ambiguous. Does this mean that those two measures of BMI each showed an independent relationship, or are they a package? (The latter, I assume -- so re-word this.)

Later in same para: Same issue - " Walking for recreation and other leisure-time physical activity were likewise independently associated"

Paras on pp 18, 19 are too long. Difficult for readers.

P. 19, line 4: The phrase "travel further in total" needs some elaboration. This presumably refers to motorised travel plus other modes of travel. Clarify for reader.

P. 19: Good discussion about direction of causality between obesity and car
usage, including the novel (though minor) contribution from information about engine size.

P. 20 (and Abstract): The sentence "Transport CO2 emissions are differently associated with different health characteristics" is poorly worded, and a bit obscure. Would it be better to write: "Transport CO2 emissions are associated in different ways with the several different health-related characteristics"?

P. 21 and Abstract: The phrase "health-environmental 'co-benefits'" is unusual, and has not been defined, I think.

Tables: These are rather busy, but unavoidably so. Clearly labelled. OK for the dedicated reader who wants to get into some of the specific details.

Additional file 2: ['Calculation of transport CO2 emissions': Details of calculation of transport carbon dioxide emissions.] This appears to be a sound set of arithmetic for the refined calculation of likely actual emissions.

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

**Declaration of competing interests:**

'I declare that I have no competing interests'