Reviewer’s report

Title: Lung cancer mortality of residents living near petrochemical industrial complexes: a metaanalysis

Version: 0 Date: 27 Jun 2017

Reviewer: Andrew Watterson

Reviewer's report:

The paper provides a valuable, clear, carefully framed and I think a well executed large pooled meta-analysis of the topic that applies what look like appropriate methods and stats tests. It fills a useful gap in the literature and, in the process, raises some important points for discussion in any future studies.

I have a small number of questions that as far as I can see are not addressed or not addressed fully in the text. It would be useful if the authors could either explain why they are not covered or include some brief mention in the text. I also have a small number of suggested minor amendments that I think will strengthen the text. My comments relate primarily to the methods used to underpin the study, the selection of the studies for analysis that could have different characteristics warranting a slightly fuller discussion, and the limitations of the study which also merit a little expansion.

I assume an expert statistical reviewer has looked at the study.

The 12 independently studies populations selected in the meta-analysis

'Areas' selected for the study are tabulated. Some give details on geographical zones and others do not. It would be helpful to have more discussion of this characteristic at the end. I am unclear as to the extent which occupation overlapping with residency might play a part in such analyses in the future and wondered if it was considered in the meta-analysis planning? WHO in 2011 considered 1 in 10 lung cancer cases to be work-related. I am aware that in some of the studies selected, workers may live close to petro-chemical and steel and other industrial complexes - the steel industry being one of a number of complicating factors? - where lung carcinogens are present. Was this also considered in setting up the study and, if so, how? If not, why not? Also, were any study areas affected by radon? I believe in Sicily for example, it is present and would be a factor in lung cancer mortality? If so, was this factored into any analysis and does it merit a brief discussion at the end? And was there any discussion of plume characteristics and prevailing winds that applied to the selected study areas that might affect exposure? Again, whilst using ambient air quality indicators on a regional or national basis makes good sense for the meta-analysis, the subject may merit some mention in the discussion which touches on the
'assumption' that 'most factories followed local regulations to some extent'. This statement is not referenced and it would help to provide some evidence about how air pollution regulations compare in Sicily, elsewhere in Italy, Taiwan, USA and UK if available?

Methods.

Could the authors, for information, identify the other sources they used to identify the relevant studies beyond Pubmed? Pubmed is sometimes probably the least comprehensive source, Web of Science and Science Direct may often much better.

With regard to use of the Newcastle-Ottowa QA scale for bias in non-RCT studies, it is notable that those who created the scale were relatively recently still looking to test some aspects of its validity. Others who have used the scale have some reservations too about the criteria used. It would therefore be useful to have this aspect briefly mentioned in the paper and referenced.

Discussion

The last point in the methods section could also be picked up in the discussion section with a little expansion of the limitations section and comment on the sub-group analysis which addressed issues surrounding not just location but 'area' including radon and prevailing wind issues(?), along with the possibility of occupation of residents muddying the epi waters (?)

Appendices

Could these be slightly expanded to provide a little more information along the lines flagged above?

Minor 'stylistic' points.

p6 line 11 and 12 has an incomplete sentence and an orphan 'were'.

p9 line 13 should read data 'were' limited and not 'was'.

p16 line 12 should read 'fewer' not 'less'
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