Reviewer’s report

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

Version: 0 Date: 04 Jul 2017

Reviewer: Roberto Pasetto

Reviewer's report:

INTRODUCTION

- Petrochemical plants are often the source of environmental contamination not only of air, but also of other environmental matrices. The authors should add something about the range of pollutants from petrochemical plants that can contribute to lung cancer risk for populations living close to them.

Example of a reference with information on pollutants from petrochemical plants:

- Even though the authors provide a formal meta-analysis of the association between residence near petrochemical industrial complexes and lung cancer mortality, they should report examples of - or review the- evidence from studies on lung cancer incidence that usually are focused on more recent periods.

- The authors should add something about the very heterogeneous nature of petrochemical complexes that can have inside refineries, some or several petrochemical plants with different productions, and also power plants. Furthermore, petrochemical complexes usually change their productions and technologies over the years, especially complexes that have been operative for decades. Something should be added on the possible variation of contamination in the ambient environment over time due to these changes.

METHODS

Review process and data extraction

- The authors declare that they selected the latest article if there were more than one for the same population.
They should consider to verify the selection strategy since, at least for what I know about the petrochemical plant in Sicily (ref 21), a more recent publication is available.


Some of the studies carried out to assess the risk for populations living close to industrial sources of contamination are focused on multiple diseases and have different study designs, therefore it is not simple to identify all the papers that report results on a specific disease. I suggest to check if there are more recent publications of the first and last authors of the selected papers that can be of interest.

It is not clear if the authors focused their meta-analysis on lung cancer mortality risk for populations living close to petrochemical complexes only or if they considered industrial areas including petrochemical complexes. They should consider that the following two selected papers regard industrial areas with multiple sources of contamination including petrochemical complexes.

'Does living near a constellation of petrochemical, steel, and other industries impair health?' (ref 16) 'Small area study of mortality among people living near multiple sources of air pollution' (ref 17)

It is not clear if the meta-analysis is focused on the effect of air pollution in terms of particulate matter from industrial areas including petrochemical plants, or if it is focused on the effect of the complex milieu of pollutants from petrochemical plants only.

STATISTICAL ANALYSIS

- The authors should clarify why they included the characteristic of ethnicity for subgroup analysis.

- It is questionable if latency, as defined, can be useful for the subgroup analysis. The authors should clarify what is the rationale for the chosen cutoff. Also, they should consider the categorization by years of observation after a chosen cutoff from the 'started operation year'.
ASSESSMENT OF DATA QUALITY

The assessment of data quality is not clear. The authors should clarify the meaning of the scores and how studies with different study design, as the ones selected for the meta-analysis (cohort, case-control, ecological/small-area), were classified.

AIR QUALITY STANDARD

The criterion of air quality standard is questionable since regulations were not effective in the past in many countries, especially in industrial areas. Furthermore, other pollutants emitted by industrial sources present in petrochemical complexes and causally associable with lung cancer are not considered in this kind of classification. It is not clear why the authors report air quality standard for TSP, PM10 and PM2.5 while they consider only PM10 in the analysis, and why the cutoff of 150 µg/m3 was chosen.

RESULTS AND DISCUSSION

To be revised after addressing the above observations.

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