Reviewer’s report

Title: A Global Perspective on Coal-fired Power Plants and Burden of Lung Cancer

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Reviewer: William Grant

Reviewer's report:

This manuscript presents a geographical ecological analysis of the contribution of coal-fired power plants to lung cancer risk, along with estimates for other contributions to lung cancer risk. The geographical ecological approach is well-suited to investigating such associations. When done at the global scale, it is similar to using satellite images to see the big picture.

Suggest mentioning that PM2.5 appears to be linked to all of the cancers for which smoking is a risk factor:

Air pollution in relation to U.S. cancer mortality rates: an ecological study; likely role of carbonaceous aerosols and polycyclic aromatic hydrocarbons.

Grant WB.

Anticancer Res. 2009 Sep;29(9):3537-45.

Here is an ecological study of particulate matter and ischemic heart disease.

Particulate air pollution and chronic ischemic heart disease in the eastern United States: a county level ecological study using satellite aerosol data.

Hu Z, Rao KR.


Spatial analysis of MODIS aerosol optical depth, PM2.5, and chronic coronary heart disease.

What about the role of indoor cooking on lung cancer risk?

Home kitchen ventilation, cooking fuels, and lung cancer risk in a prospective cohort of never smoking women in Shanghai, China.


Additional sources of data on tobacco smoking trends.

http://gamapserver.who.int/gho/interactive_charts/tobacco/use/atlas.html

WHO global report on trends in prevalence of tobacco smoking 2015 http://apps.who.int/iris/bitstream/handle/10665/156262/978924156492?sequence=1

Figures 2 and 3 are impossible to read. Perhaps they should be separated into four each.

p. 14
Our identified confounders associated with both coal capacity and lung cancer at the 17 national level included adjustments for the appropriate latency period and strong temporality justifications for causal inference (41).

"Univariate, behavior-environmental, 5-year-lag, 10-year-lag and 15-year-lag models were 19 applied to examine the effect among males and females, respectively (Table 2). The point estimates 20 of per capita coal capacity among the year-lag models were similar, so we picked the 10-year-lag 21 model as our primary model."

Comment: Please discuss latency in greater detail. It is my understanding that lung cancer develops after smoking for several decades. Suggest redoing the analysis with the assumptions of 20- and 30-yr lag and seeing whether the correlations change.

"The model includes a three- to four-decade lag between a rise in the prevalence of smoking and a rise in smoking-attributable mortality" in Trends in smoking and lung cancer mortality in Japan, by birth cohort, 1949-2010.
Also, if Hill's criteria are to be invoked (Ref. 41), it would be useful to list the criteria considered and indicate how they are or are not satisfied.

Significant digits. The general rule is that no more non-zero digits should be given than are justified by the uncertainty of the value.

https://www.hccfl.edu/media/43516/sigfigs.pdf

If the uncertainty is greater than about 7%, only two non-zero digits are justified.

Thus, for example, in Table 1

GDP (PPP)  742.85 (573.38~912.31)
Should be 740 (570-910)

Smoking prevalence c
Males 32.23 (31.16~33.3)
Comment: The small range of the 95% CI does not make sense. Smoking rates vary considerably by country. Same comment for traffic index, industrialization index.

In Table 2, RR should be given to two decimal places unless the 95% CI values are within 0.02 of the RR value.

Please review numbers in the text and tables and adjust accordingly.

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An article of importance in its field

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Please indicate the quality of language in the manuscript:

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