

Reviewer's report

Title: Estimating BTEX exposure using land use regression in Sarnia, "Chemical Valley", Ontario, Canada

Version: 1 **Date:** 25 November 2008

Reviewer: Jason Su

Reviewer's report:

Land use regression (LUR) models have been used extensively for exposure analysis and improved health outcome studies. The main application of LUR is for modeling long-term average concentrations of nitrogen oxides. This paper used LUR to model volatile organic compounds and thus will add a useful contribution to literature of the feasibility of LUR for modeling other ambient pollutants. After some minor revisions, this paper is suitable for publication in Environmental Health.

1. The authors did not specify how AADT was summarized in a selected buffer. Besides, I think the way of using ratio to derive AADT of a road segment within a buffer was inappropriate. It is better to derive VMT (vehicle miles traveled = AADT * length of road segment) for each road segment within a buffer and add up all the VMTs inside that buffer.
2. The authors stated that they used buffers 50 - 3000m of interval 50m around the monitoring stations. This implies that for each variable there are 60 buffers and therefore 60 statistics. Though the authors mentioned that each predictor variable was screened by a bivariate model to identify variables of the highest correlation with BETX, they did not mention how a buffer distance of a variable was chosen.
3. Two-week sampling period (more often two or three two-week periods) is usually used for LUR models; however it requires that the two-week sampling is representative of the long term average concentrations. The authors have done a good job demonstrating the stability of concentration patterns in the region. However, it would be useful if they could explain in more detail while the neighboring three not four, five or other number of sites were used to compare with the NAPS station.
4. It would be useful to compare the kriging interpolation results with LUR results to see if the two methods differ significantly.
5. Some minor grammar issues.

Page 2 Results: "Although the correlations between measured BTEX compounds was high...". Change "was" to "were".

Page 4 Background: "Chang [9], working in Taiwan, reported that toluene exposure could exacerbate hearing loss in a noisy environment". It might be

better to change it to something like " Chang [9] reported that toluene exposure could exacerbate hearing loss in a noisy environment in Taiwan". We do not care if an author works in Taiwan or New York, but we do care where the study was conducted.

Reference: Make sure they are consistent in citing style.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.