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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Relationship between particulate matter and childhood asthma – basis of a future warning system for Central Phoenix" *by* R. Dimitrova et al.

Anonymous Referee #1

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The manuscript by Dr Dimintrova and Colleagues concerns epidemiological assessment of the association of emergency room visits and hospitalizations caused by asthma incidences and ambient particulate matter pollution as measured at five static PM10 monitoring stations in Phoenix metropolitan area, Arizona, US. Additionally four temporary mobile monitoring stations were used for the validation of spatial interpolations. Exposures of the patients were estimated as interpolated PM10 concentrations at the home address locations.

The manuscript is well written and provides a good demonstration of the association between ambient particulate matter levels and population health. The modelling com-

ponent of PM10 exposures is based on standard krigingusing the atmospheric particles observed in the Maricopa County Department of Air Quality network and inverse distance weighed interpolation, making the work as such not well suited for the scope of Atmospheric Chemistry and Physics. However, as part of the Urban Megacity Special Issue it is highly relevant to consider also the epidemiological aspect of atmospheric research. Ambient epidemiology is the main source of information on the toxicity of ambient particles on human health and therefore the Megacity special issue needs to cover the epi/health aspect. Therefore I recommend publications after accounting for the remarks raised below.

Some detailed remarks

Introduction, last para - (clearer) definition of the objectives at the end of the Introduction instead of listing the merits of the current approach would be more appropriate formulation for the final paragraph

2.2. Asthma data, firstpara 3rd row from end - statement that then change in the number of incidences as function of changing the washout period from 7 to 28 days is minimal would be more specific by stating what is the change between these upper and lower limits. Final selection of the shortest washout period is suspicious – if there is no substantial change, why did the authors use the most precautious washout period of 28 days?

2.5 Methods: description of the terms - formulation of this part of the manuscript as a dictionary does not seem appropriate for a journal article.

3. Results, 2nd -3rd rows - reference to 2- and 5-mile radii is not clear to a reader who has not read the methods section; please add "from the nearest monitoring station" to clarify

Table 2 - definition of lags: normally lag0 is considered the incident day mean concentration, lag1 the previous day etc. The table lists daily mean and then continues from

lag2, which is confusing. Where is lag1 result? - all presented results from daily mean to lag6 are statistically significant (95

Figure 1 - formatting x-axis as Julian day is not acceptable. Seasonal variation is an interesting feature of both air quality as well as asthma, and therefore the months of the year have to be shown

Figure 2 - besides the 5-mile radius shown well in the graph also the 2-mile radius should be indicated with e.g. a darker shade

Figures 3-4 - unit of measurement for the shown parameters has to be included

Figure 5 - presentation of log (actually natural log) odds is not appropriate; it merely makes the interpretation of the results more difficult while in the shown range the relationship against non-transformed odds is almost linear; thus odds should be shown as such.

Figures 7-8 - presentation of the 2 and 5 mile radius results would be much better viewable if presented as a stacked column format in the same graph so that the 0-2 mile data would be the bottom part of the column and the 3-5 mile data stacked on it in another color. - however, looking at the graphs it also seems that the selection of the radius does not really affect the results much; why do the authors want to present both? To show that the results are not caused by artificial selection of the radius? Please clarify.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 28627, 2011.