

Interactive comment on “Effect of regional precursor emission controls on long-range ozone transport – Part 2: steady-state changes in ozone air quality and impacts on human mortality” by J. J. West et al.

Anonymous Referee #1

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This study quantifies the long-term, steady-state changes in surface ozone caused by emission reductions in different regions of the world and compares the impacts of these changes on human health using simple ozone-mortality relationships. The results presented here are new and valuable, and the authors are to be strongly commended for drawing attention to the competing effect of long-term ozone changes on the immediate short-term ozone changes that almost all previous studies have focused on. The estimated impacts on human mortality are necessarily uncertain (and the sensitivity of the results to some of the assumptions are explored in the paper), but this is a valuable and

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important step towards informing the policy community of the implications of trace gas emission changes. Further advances will be needed to make the results sufficiently robust and reliable to allow decisions to be based on them, but this is an important step forward. The manuscript is very well written and is suitable for publication in ACP largely in its present form; a few minor changes are suggested below.

p.7083 - a brief summary of the origin of the emissions data would be valuable here.

p.7089 - the ozone-mortality relationship is assumed to be linear above a given threshold, and is based on 24-hour average ozone. How sensitive are the results likely to be to differences between the diurnal variation in ozone in the model and in reality? Are differences in diurnal patterns in different regions likely to influence the results?

p.7089 - a full discussion of baseline mortality rates is not required in this paper, but some indication of regional mortality rates would be valuable so that the reader can judge how significant the calculated changes are.

p.7096 - it would be valuable to estimate the effects of PM changes so that the reader can understand the significance of the calculated ozone effects. Are they of the same order of magnitude, or are the effects of PM likely to be much greater?

Direct numerical comparison of the tables would be easier if some of them were combined, particularly tables 2 and 4, and tables 6 and 7.

Figures 1 and 2 are small and somewhat difficult to read. I recommend that they are redrafted, perhaps in color to emphasize key elements. The caption in figure 1 should note the change of scales between the plots.

In Table S3, the SA(IN) column should be labeled IN for consistency with the rest of the paper.