APPENDIX AVAILABLE ON THE HEI WEB SITE

Research Report 178

National Particle Component Toxicity (NPACT) Initiative Report on Cardiovascular Effects

Sverre Vedal et al.

Section 1: NPACT Epidemiologic Study of Components of Fine Particulate Matter and Cardiovascular Disease in the MESA and WHI-OS Cohorts

Appendix Q. Adjusted EC and OC Findings

Note: Appendices that are available only on the Web have been assigned letter identifiers that differ from the lettering in the original Investigators' Report. HEI has not changed the content of these documents, only their identifiers.

Appendix Q was originally Appendix P

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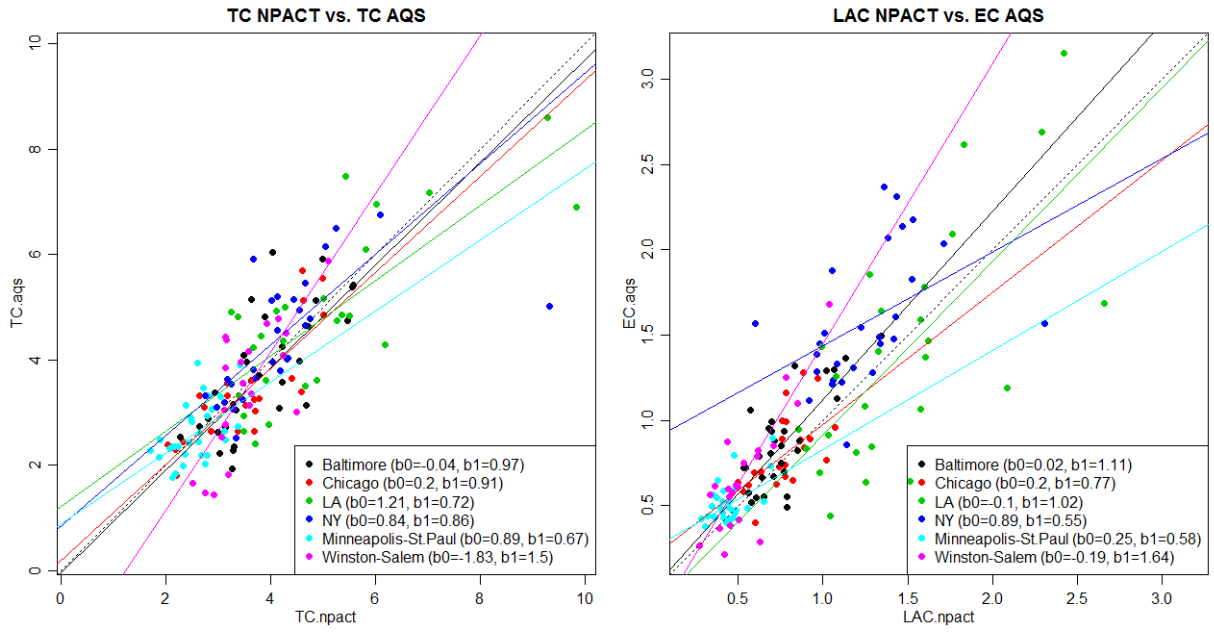
This document was reviewed by the HEI NPACT Review Panel but did not undergo the HEI scientific editing and production process.

APPENDIX P: Adjusted EC and OC findings

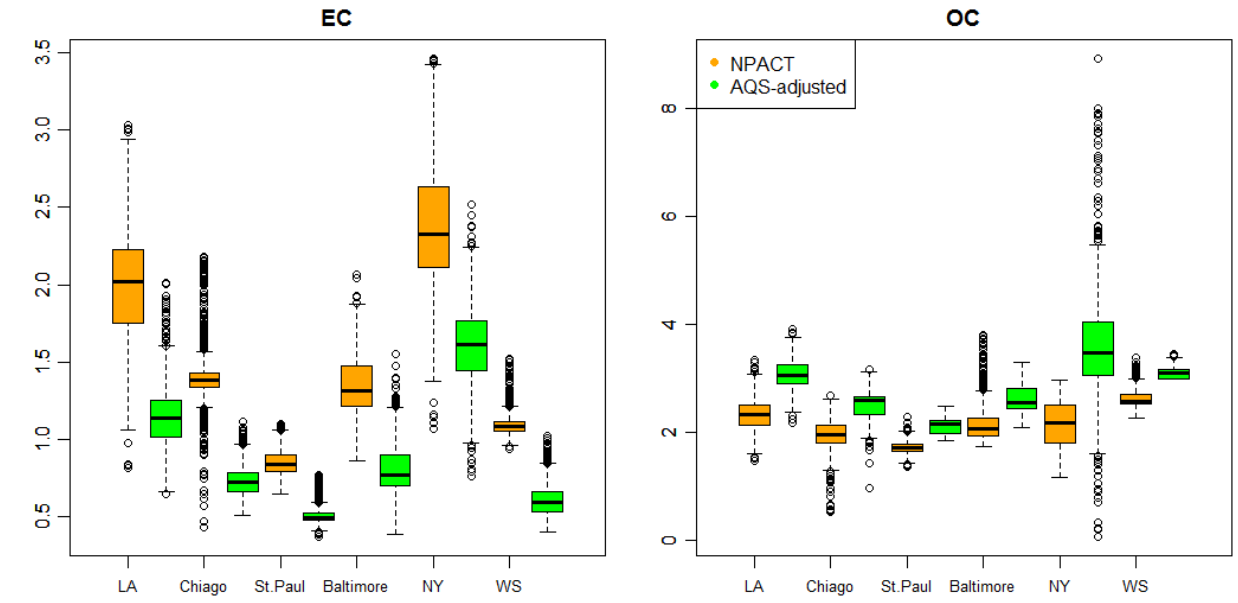
To explore the consistency of our health analysis findings for predicted EC and OC from the spatio-temporal model based on the NPAT monitoring data compared to the EPA AQS monitoring data, we created AQS-adjusted concentrations, fitted the spatio-temporal model, and performed the health analyses for predicted concentrations. We used TC from the NPACT as well as AQS monitoring data, and LAC from the NPACT and EC from the AQS data for calibration, given high correlations between the two networks. First, we fitted the regressions as shown below in each of six MESA cities using the NPACT and EPA AQS monitoring data at co-located sites during the overlapping sampling period (Appendix Figure P.1). Estimated city-specific parameters and the full NPACT TC and LAC data were used in computing AQS-adjusted TC and EC. AQS-adjusted OC was obtained by subtracting AQS-adjusted EC from AQS-adjusted TC.

$$TC_{aqs.adj} = \beta_{0.TC} + \beta_{1.TC} * TC_{npact} + \varepsilon_{TC}$$
$$EC_{aqs.adj} = \beta_{0.EC} + \beta_{1.EC} * LAC_{npact} + \varepsilon_{EC}$$
$$\widehat{OC}_{aqs.adj} = \widehat{TC}_{aqs.adj} - \widehat{EC}_{aqs.adj}$$

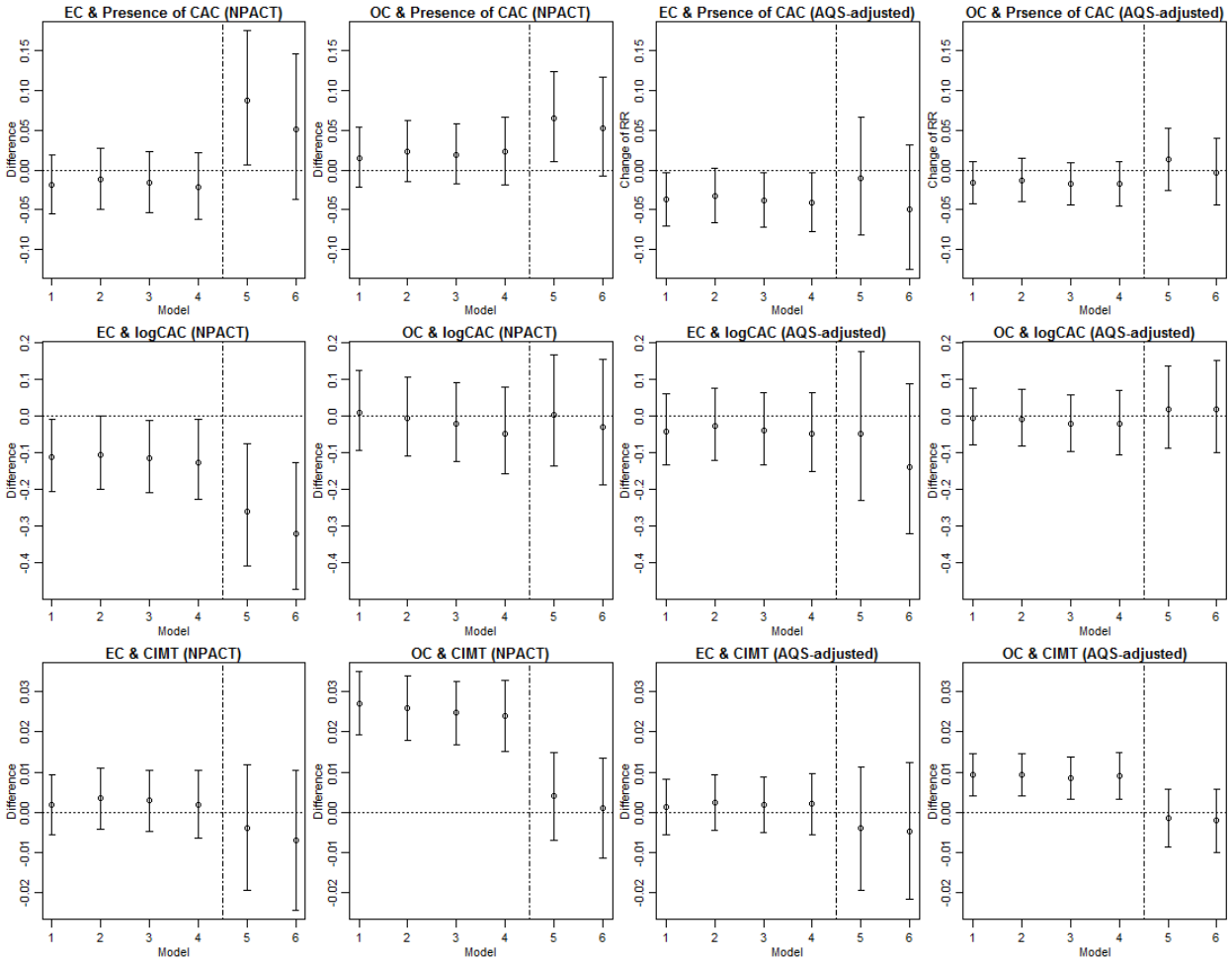
Predicted long-term concentrations of EC from the spatio-temporal model for the AQS-adjusted EC were lower than predictions produced from the NPACT monitoring data, whereas predicted AQS-adjusted OC were higher than predicted NPACT OC (Appendix Figure P.2), reflecting the same patterns of EC and OC measurements between AQS and NPACT (Appendix Figure B.2). In the health analyses, AQS-adjusted EC and OC predictions gave consistent findings in cross-sectional as well as longitudinal analyses with those of NPACT EC and OC predictions. There was the evidence of the cross-sectional association between AQS-adjusted OC predictions and CIMT, with lower effect estimates than those of NPACT OC predictions (Appendix Figures P.3 and P.4).



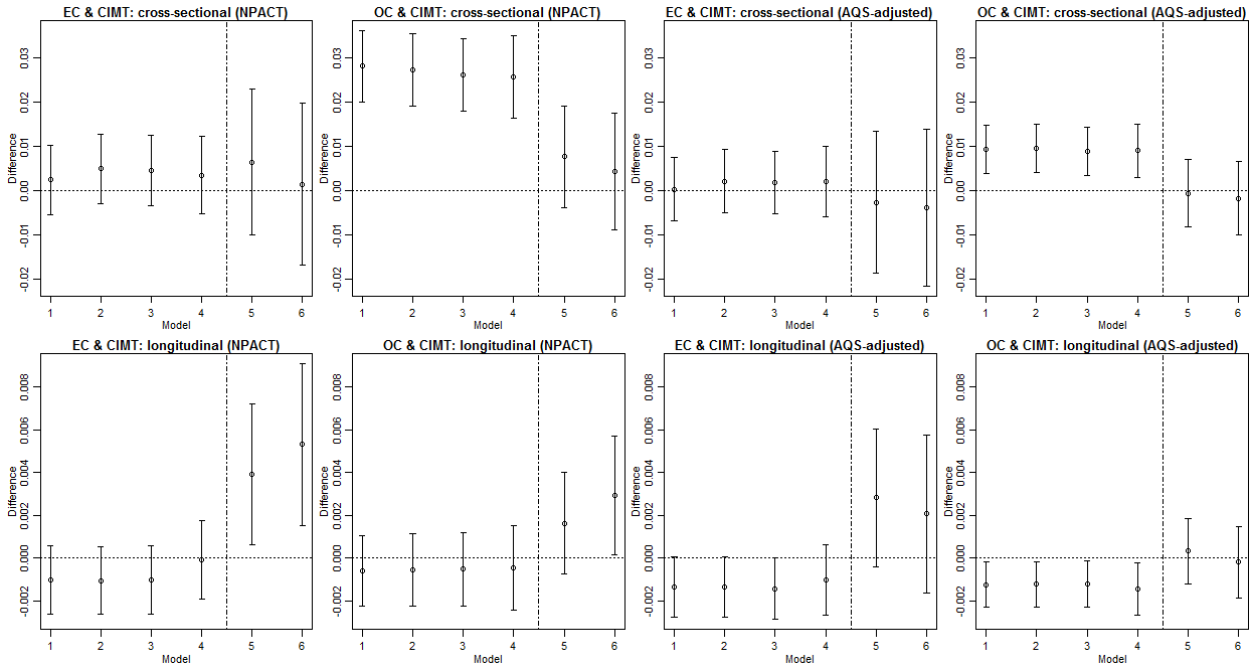
Appendix Figure P.1. Scatter plots between TC from the NPACT and EPA AQS monitoring data and between LAC from the NPACT and EC from the EPA AQS monitoring data at co-located sites during the matching sampling period by 6 cities



Appendix Figure P.2. Box plots of predicted long-term concentrations of EC and OC at MESA participant addresses from the spatio-temporal model based on the NPACT monitoring data and AQS-adjusted data by 6 cities



Appendix Figure P.3. Cross-sectional associations for presence of CAC, log(CAC) and CIMT in MESA at exam 1 for an interquartile increase (0.89 and 0.69 for NPACT EC and OC; 0.55 and 0.73 for AQS-adjusted EC and OC) in predicted EC and OC concentrations based on the NPACT and AQS-adjusted data from the spatio-temporal models in six cross-sectional models



Appendix Figure P.4. Cross-sectional and longitudinal associations for CIMT in MESA for an interquartile increase (0.89 and 0.69 for NPACT EC and OC; 0.55 and 0.73 for AQS-adjusted EC and OC) in predicted EC and OC concentrations based on the NPACT and AQS-adjusted data from the spatio-temporal models in six longitudinal models