

Abstract

The CAPMS Project: Multiple Approaches to Air Quality Benefits Analysis
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Air pollution externality models can be classified as either a Linking Approach that uses separate components for each analytical step or an Integrated Models that perform multiple stages of the analysis. This presentation describes examples of both types of models developed by Abt Associates. CAPMS is an MS Windows© GIS-based Linking Approach modeling system that performs the exposure, health effect and valuation components of an air benefits analysis. CAPMS uses outputs of exogenous air quality models, including their temporal resolution. Census Block population data is aggregated to exactly match the geographic domain of the AQ model. Population data includes age, race, gender and income data necessary to conduct the health analysis. Future populations estimates use Census Tract or County growth estimates. Baseline health incidence data is utilized at the national, state or county level as available. The library of 521 concentration-response functions spans 18 broad health effect categories, allowing age, race and gender-specific estimation. An aggregation component allows the user to specify how to combine the incidence results, and a valuation component includes a library of alternative valuation estimation functions. A GIS mapping capability produces maps of all air quality and health results. CAPMS includes a major uncertainty component, allowing efficient Monte Carlo analysis which can include quantified uncertainty on all components used in the modeling system.

Abt Associates is now developing two examples of screening level Integrated Models, which allow a user to specify the emissions changes from specific sources. These models include EPA's S-R Matrix, which models both transport and formation of annual mean PM_{2.5}. The user can specify changes (either percentage or tons/year) in county level emissions. COBRA includes New York State emissions of all categories. BRAVE is a national model of 25 categories of mobile sources. Both models estimate the PM_{2.5} and PM₁₀ air quality changes and 9 categories of health impacts nationwide.