

**OBTAINING IMPROVED ESTIMATES IN TIME SERIES STUDIES OF THE ASSOCIATION BETWEEN
PARTICULATE MATTER AIR POLLUTION AND MORTALITY**

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We propose a method for obtaining improved estimates of the adverse health effects of particulate matter air pollution (PM) when PM time-series data are available only every-six-days, a protocol observed in the majority of United States cities. Every-six-day PM data are suboptimal for estimating adverse effects of PM as current evidence suggests that such effects are not concentrated on a single day but rather spread over multiple days. The proposed method estimates weights that are used to construct a linear combination of single-lag PM effect estimates obtained from every-six-day PM data. It is shown that this method provides substantially improved estimates of the effect of PM on mortality than currently available methods. Thus, improved estimates for the mortality effect of PM may be obtained for the majority of United States cities, with similar improvements available for multi-city PM studies. These new estimates will allow a better understanding of the public health burden of ambient PM and the concomitant benefits of regulatory standards.