

TITLE

A Multi-Site Time Series Study of Hospital Admissions for COPD and Fine Particles in the National Medicare Cohort: A Case Study for National Public Health Surveillance

THEME

Advance Environmental Public Health Science and Research

KEYWORDS

linking national databases for environmental public health surveillance, COPD, fine particles

BACKGROUND

The development and integration of complex and rich national databases, like mortality and hospital admission rates from the National Medicare Cohort and the national air pollution monitoring network, provides the unique opportunity for tracking health risks associated with environmental exposures at a national scale. This study is supported by the CDC Center for Excellence in EPHT at the Johns Hopkins Bloomberg School of Public Health.

OBJECTIVE(S)

1) To assemble a national database of time series data for the period 1999-2002 on hospital admissions for COPD, fine particulates, and weather for approximately 500 U.S. counties; and 2) to estimate community-specific, regional, and national average relative rates of hospital admissions for COPD associated with short-term changes in fine particulate matter (PM_{2.5}); and 3) to illustrate how integration of national tracking databases on health and environmental exposures provides the unique opportunity for implementing a national health monitoring system.

METHOD(S)

1) State-of-the-art computer science expertise to link the entire National Medicare cohort (48 million individuals) to the national air pollution monitoring network by zip code of resident. 2) Bayesian hierarchical models for estimating county-specific relative rates of COPD hospital admissions associated with short-term exposures to fine particles adjusted for time-varying confounders.

RESULT(S)

National, regional, and county-specific estimates of short-term effects of PM_{2.5} on COPD hospital admissions, obtained by combining time series data for the period 1999-2002 for over 500 U.S. counties.

DISCUSSION/RECOMMENDATION(S)

Linking national databases and developing statistical methods that can properly analyze them are essential steps for a successful national public health surveillance system. To illustrate the strength of our approach, we have carried out the

largest national study of the health effects of PM2.5. We anticipate that epidemiological evidence from this study will have a high policy weight.

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