

# poster ABSTRACT



## TITLE

Statistical Methods in Environmental Public Health Tracking (EPHT)

## THEME

Advance Environmental Public Health Science and Research

## KEYWORDS

Bayesian modeling, hierarchical linear modeling (HLM), spatial statistics, cluster analysis, GIS, health outcomes

## BACKGROUND

Of the statistical and GIS methods available for summarizing and displaying spatio-temporal trends in hazards, exposures and health outcomes, it is often unclear as to which of the methods should be applied. EPHT data are complex—multivariate and correlated in space and/or time, and models to incorporate correlation structures, estimate effects, test hypotheses and predict future outcomes are relatively new and lack extensive application in environmental public health. Appropriate modeling techniques are facilitated by recent advancements in specialized software.

## OBJECTIVE(S)

1) Compare statistical and GIS methods suitable for assessing spatio-temporal trends, 2) Use hierarchical methods to evaluate the association of hazards and exposures to health outcomes, 3) Discuss limitations of these methods.

## METHOD(S)

Methods to analyze spatio-temporal trends (surface creation, clustering, smoothing, disease incidence mapping) are used as well as hierarchical models to adjust for confounding variables. Advantages and disadvantages for each of these procedures will be addressed.

## RESULT(S)

Illustration and interpretation of the results via maps, graphs, figures and tables feature the most relevant information of interest to public health officials.

## DISCUSSION/RECOMMENDATION(S)

Spatio-temporal trends in environmental and health indicators may be misleading if they fail to account for the underlying complex nature of the data. Adjustment for confounders and smoothing techniques for multilevel data require more involved methods to provide reliable estimates of spatio-temporal trends.

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