

Panel V: Policy Impact on Public Health - Influence on Policy: Heat Index

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Background for overall project:

- Short-term associations between weather, air pollution, and various health outcomes have been reported in many cities in the U.S. and other countries.
- Time lag for availability of morbidity and mortality data can limit timeliness of public health decision making
- Syndromic surveillance provides timely data, but little research has been conducted on relationships of these near-real-time health to weather and air pollution.
- Potential for more timely public health action and policy.

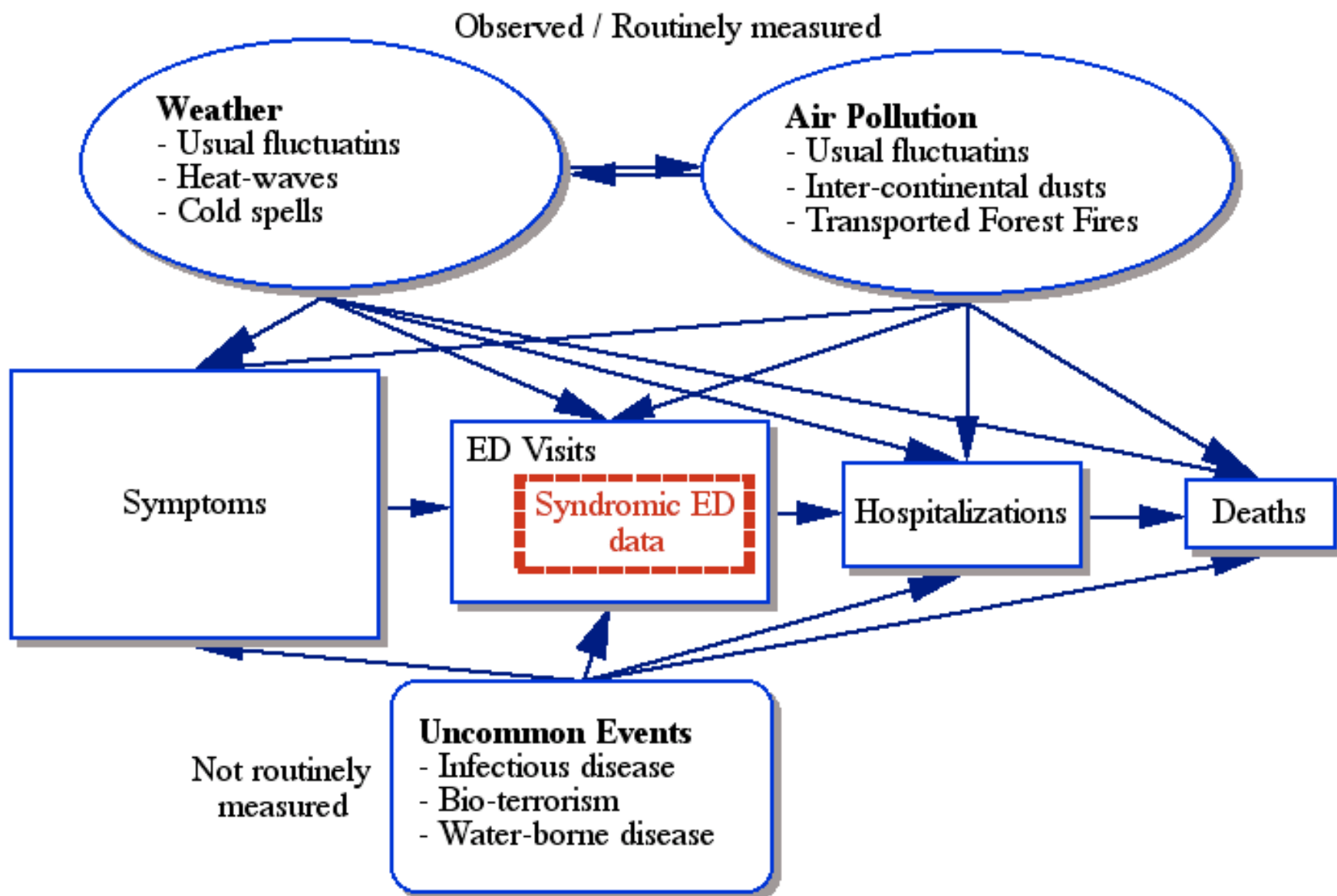
Background:

New York City Department of Health and Mental Hygiene (NYCDHMH) has ***Bureau of Environmental Surveillance and Policy*** that:

- collects environmental data
- conducts policy-relevant health effects analysis
- conducts health impact assessment, and
- communicates findings to other city agencies for policy decisions

General goal of the EPA grant to NYU/NYCDHMH:

- To develop a framework to model, in near real time where possible, acute health outcome indicators of environmental exposures in a large metropolitan area using various health outcome indicators available at NYCDHMH.



Framework of relationships between weather, air pollution, and health outcomes

Background and goal for this set of analyses
(see the poster for other analyses conducted
under this EPA grant):

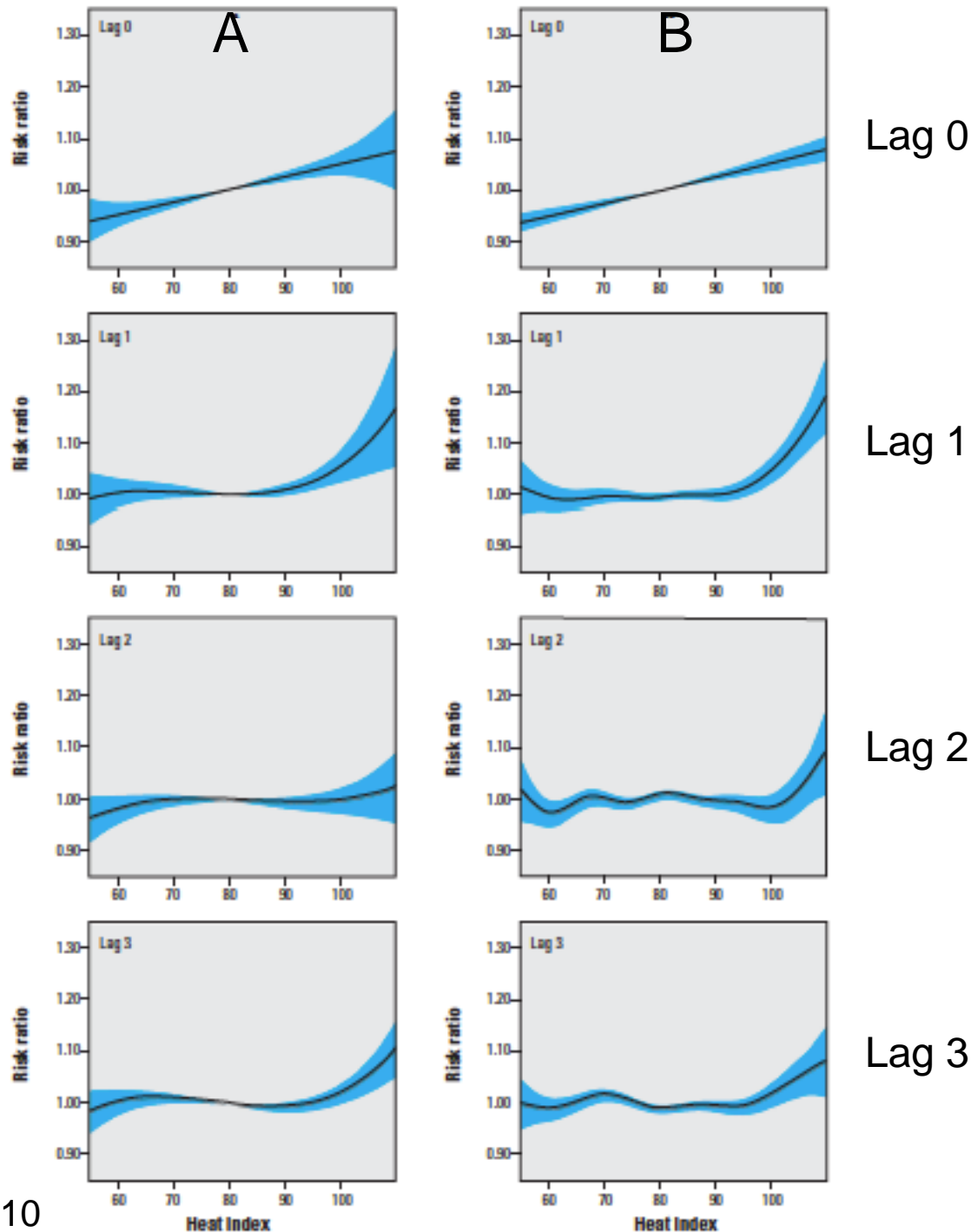
- National weather service criteria for heat advisories, watches and warnings were not based on NYC-specific exposure-risk relationships
- Goal: To determine, using natural cause mortality as an outcome, an appropriate threshold of temperature index at which the heat advisories should be issued and public heat responses initiated.

Methods

- Estimate weather–natural-cause mortality relationships using Poisson time-series generalized linear models (GLM) and generalized additive models (GAM) in the warm season (May-September) for the years 1997-2006.
- Examined various weather metrics, lag and averaging times, and functional forms.

Results:

- Comparable results for the parametric (A) and non-parametric (B) models.
- Non-linear relationship, with increasing slope $>$ ~ 95 -100 degrees HI.
- The impact of two consecutive days of 95 degrees HI on mortality was approximately equivalent to a single day of 100 degrees HI.
- HI performed as well or better than alternative metrics.



Impact on Policy

- We met with the New York City Office of Emergency Management (OEM) and local National Weather Service office in mid-April, 2008, to communicate the findings.
- Considered both risk function and potential 'alert fatigue' from too frequent warnings
- Subsequently DOHMH formally recommended that these agencies modify the threshold (adding two consecutive days or more of 95+ degree HI) for heat advisories and activating a response.
- Provider and public outreach and free A/C program to vulnerable to address risk at less extreme temperatures
- Similar model used in DOHMH heat illness syndromic surveillance



Local Forecast by
"City, St" or ZIP code

City, St

Excessive Heat

Definitions

Heat Wave: At least 3 consecutive days with high temperatures of at least 90 degrees.

Highest Temperatures: Mid July through mid August across interior locations.

Heat Index: An estimate of how hot it feels when air temperature and humidity are combined.

Heat Advisory: Issued when maximum daytime heat index values are forecast to reach 100 to 104°F for at least 2 consecutive hours.

NOTE: For New York City, a Heat Advisory is issued when the heat index is forecast to reach 95 to 99°F for at least 2 consecutive days or 100 to 104°F for any length of time.

Excessive Heat: Issued when heat index values are forecast to reach or exceed 105°F for at least 2 consecutive hours. Watch is issued 24 to 48 hours of the event. Warning is issued within 24 hours of the event.

<http://www.erh.noaa.gov/okx/ExcessiveHeat.html>

Discussions:

- Timeliness:
 - The EPA grant started in 2007 November.
 - Focused analysis on heat-wave completed in April 2008.
 - Results communicated to OEM and weather service in mid-April 2008.
 - The new heat-wave warning plan implemented in July 2008.
(- A peer-review paper published in EHP late 2009)
- Through the EPA grant, the collaboration between the university and NYCDOH produced a research result that impacted a policy decision of the city and improved health surveillance methods.