COLUMBIA UNIVERSITY | MAILMAN SCHOOL of PUBLIC HEALTH

HAQAST

Climate and Health Program at the Mailman School of Public Health

COLUMBIA UNIVERSITY | MAILMAN SCHOOL of PUBLIC HEALTH
ENVIRONMENTAL HEALTH SCIENCES

ASSOCIATIONS BETWEEN AIR POLLUTION AND HOSPITAL ADMISSIONS IN NEW YORK STATE

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HAQAST3
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Introduction

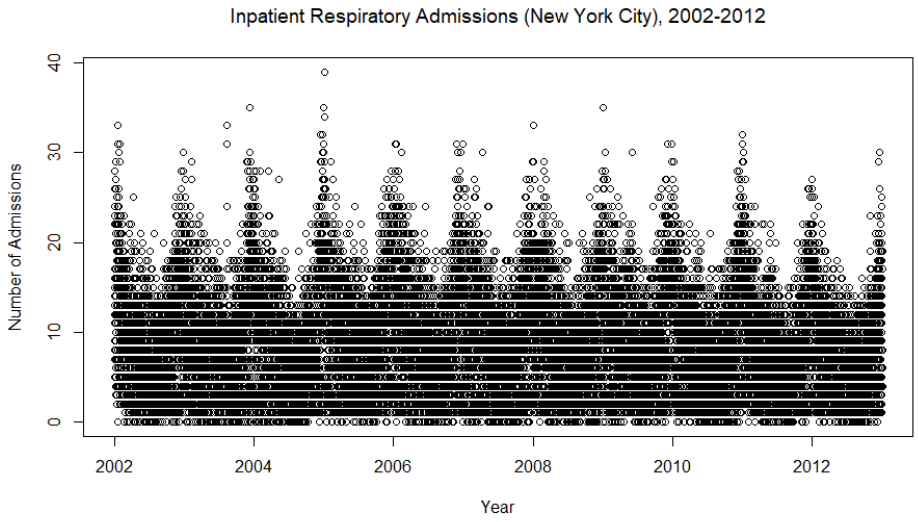
- Models + satellite products + ground-based measurements + health data = opportunity!
  - Effects of policy on air pollution
- Multi-pollutant air pollutant health analysis (O_3, $PM_{2.5}$, NO_2) over New York State over the past decade
- Today: association between daily exposure to $PM_{2.5}$ and inpatient cardiovascular/respiratory hospital admissions in NYS from 2002-2012
  - No satellite products for now – stay tuned!

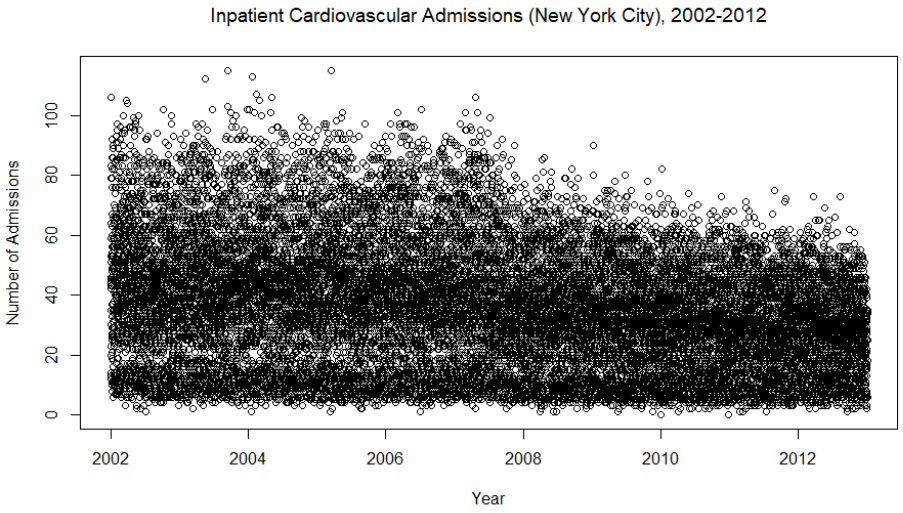
Methods

- Exposure assessment
  - Daily county-average $PM_{2.5}$ data from EPA
  - Meteorological data from the NASA
- Outcome assessment: daily inpatient cardiovascular/respiratory admissions from NYS DOH
- Statistical analysis: overdispersed Poisson regression models
  - Indicator variables for counties
  - Temperature (3 *df*), relative humidity (3 *df*), and long-term and seasonal trends (5 *df* per year)

Results

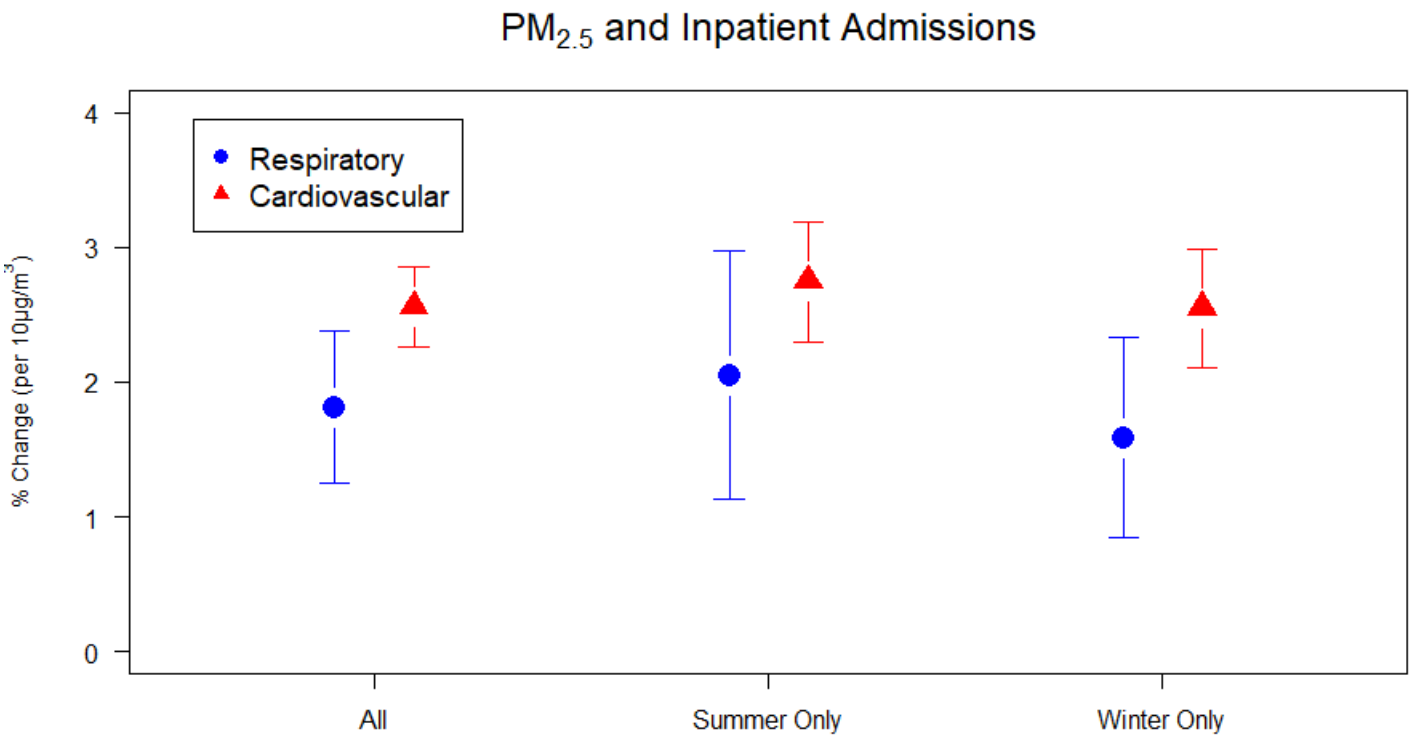
Variable	N	Mean	Min	25%	50%	75%	Max
$PM_{2.5}$ ($\mu g/m^3$)	246,428	9.77	0.25	5.57	8.24	12.27	99.74
Temperature (°C)	246,428	9.05	-25.29	0.80	9.48	18.09	31.54
RH (%)	246,428	79.32	26.16	73.75	80.45	86.44	100.86
RESP Admissions	246,428	1.62	0.00	0.00	0.00	2.00	39.00
CVD Admissions	246,428	6.83	0.00	1.00	2.00	5.00	115.00





Results

Per 10 μg/m^3 increase in $PM_{2.5}$:



Conclusions

- $PM_{2.5}$ may increase both cardiovascular and respiratory admissions in NYS
- Effect estimates are larger during the summer: potential role of secondary $PM_{2.5}$ species
- Next steps:
  - Other pollutants (ozone, NO_2), nonlinear effects
  - Additional exposure models, identify source-specific exposure patterns
  - Effects from implementing emission reductions

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