

The Association of Environmental Factors on Acute Pediatric Asthma-Related Healthcare Utilization in a New York City Hospital: A Retrospective Analysis

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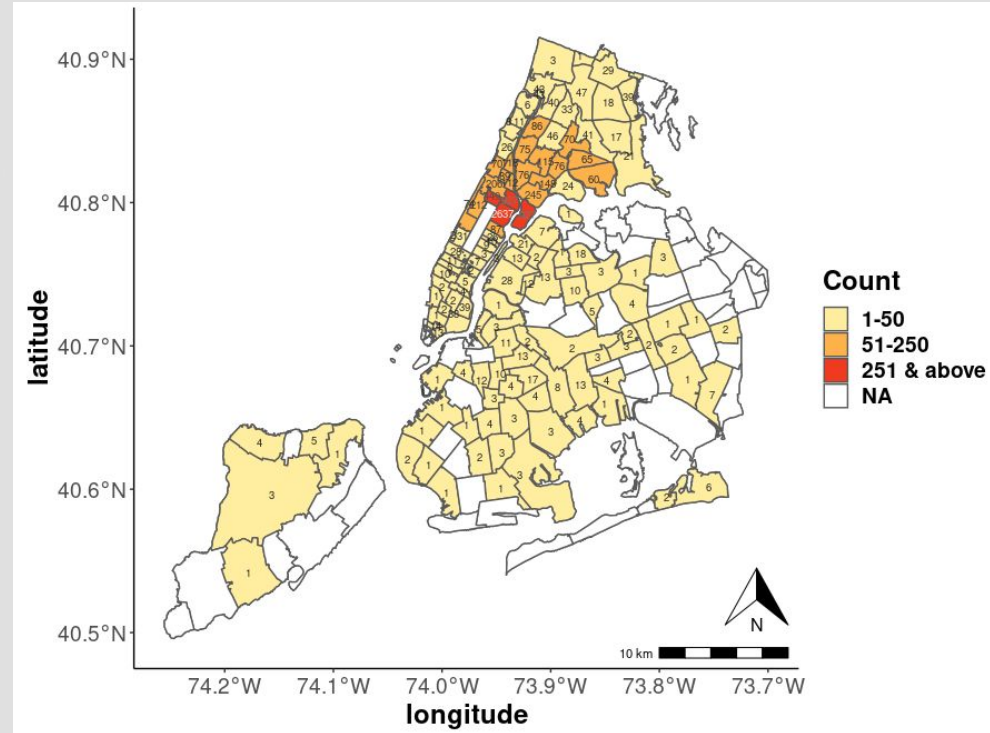
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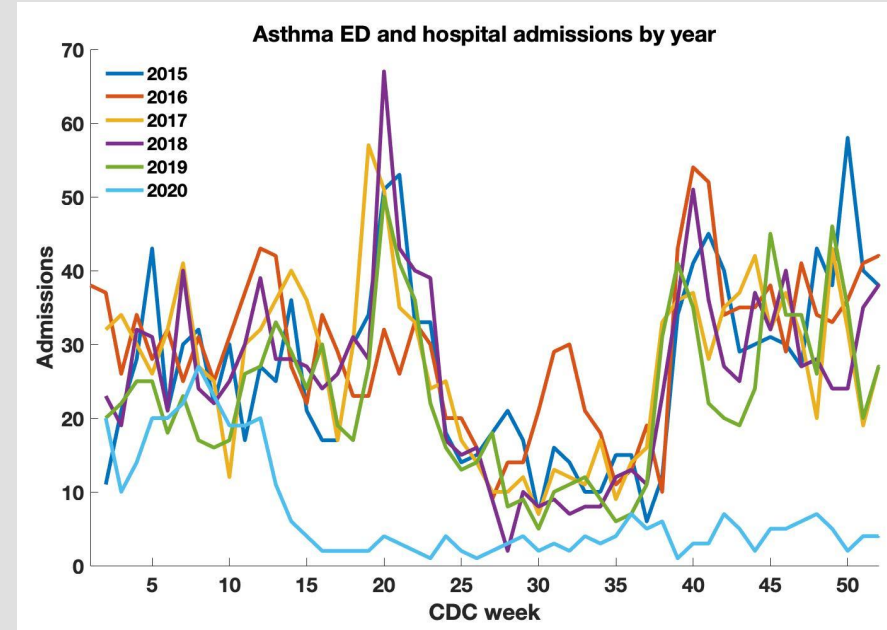
Introduction/Background

- Complex environmental exposures contribute to asthma exacerbations
- Although asthma exacerbations follow a seasonal pattern, our ability to precisely predict the timing and magnitude of increased asthma admissions remains limited
- Identify how the rates of pediatric emergency department (ED) visits and hospitalizations at a large urban medical center for asthma are impacted by environmental conditions



Hypothesis

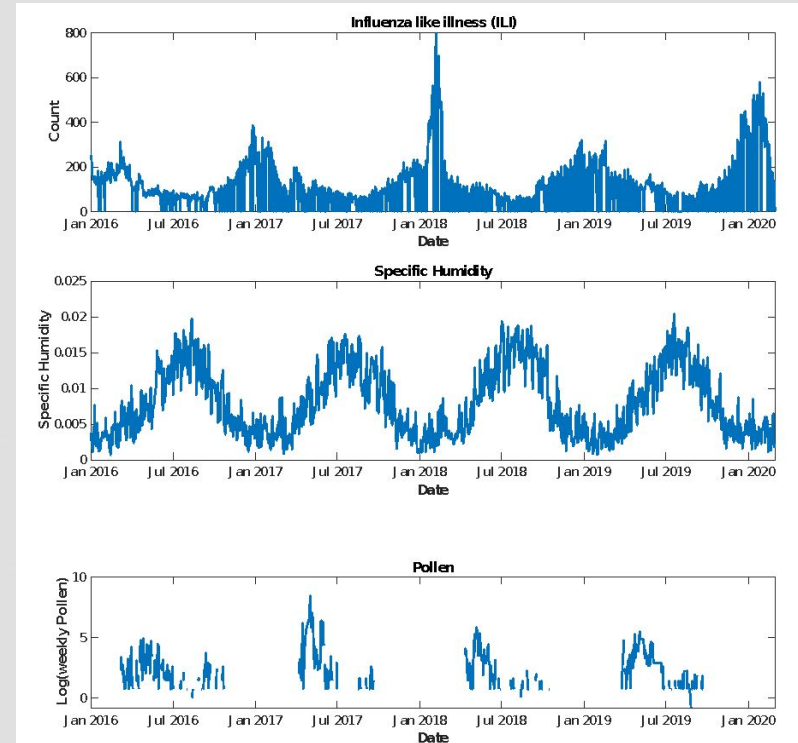
- Sharp decline in admissions secondary to start of the pandemic
- Here, we visualize bimodal distributions of admissions showing strong seasonal patterns
- We aim to delineate association between environmental factors and ED admissions over time



Experimental Design and Methods

Performed an exploratory analysis to look at associations between environmental drivers and ED admissions

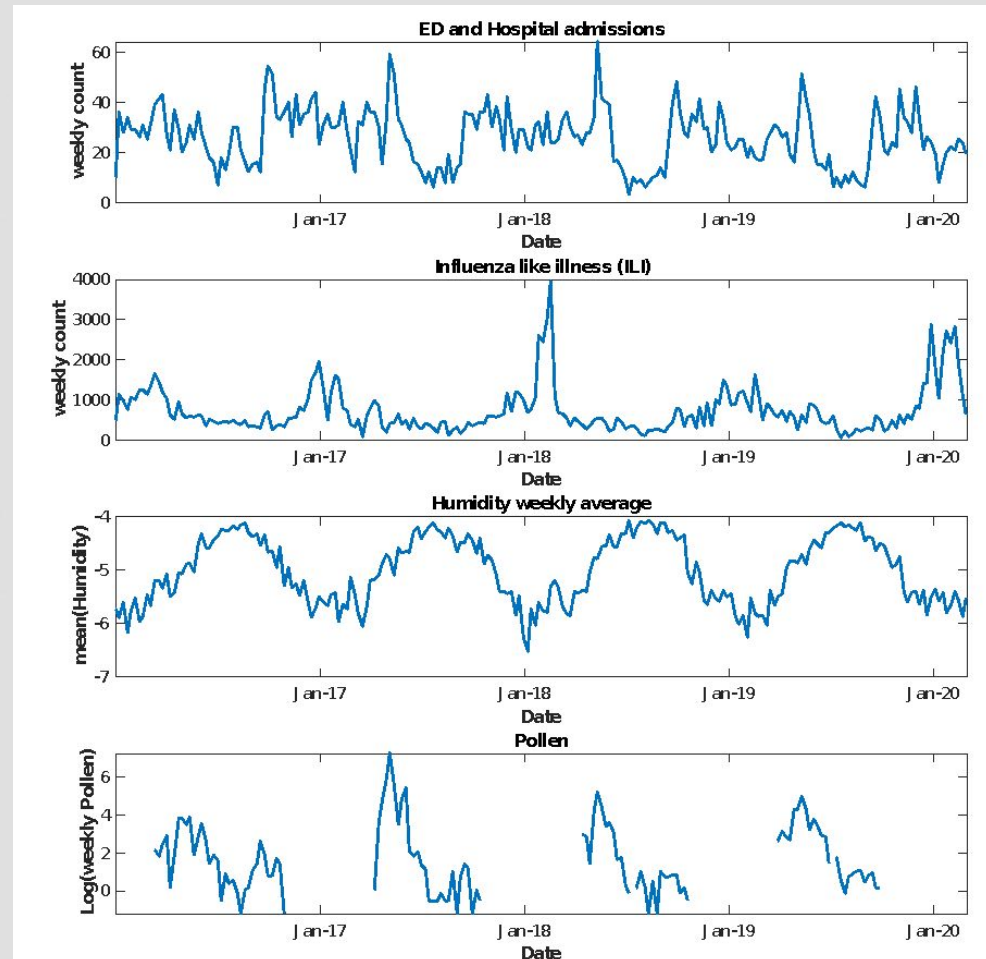
- Evaluated meteorological conditions:
 - Precipitation, temperature, wind speed, specific humidity
- Air pollution:
 - ozone, carbon monoxide, sulfur dioxide, nitrous dioxide, and PM 2.5
- Respiratory illnesses:
 - influenza like illness (ILI) count
- Pollen



Results

Strongest weekly asthma admission correlations:

- ILI – 0.4
- Humidity – -0.4
- Pollen – 0.3



Scientific impact

- With warmer winter months, we may see variation in peak values of pollen counts and shifts in humidity, yielding potential fluctuation in preparing for these surges for a health care system already operating at capacity
- These findings show that developing model inference systems to predict these potential surges, could help make hospital systems more prepared to absorb the increase in volume

