



Air Quality and the Demand for Health Services in New Hampshire

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Objectives

- GOAL: Investigate the link between hospital respiratory and cardiovascular services and air quality indicators in New Hampshire.
- Specific Objectives:
 - Identify magnitude and timing of seasonal patterns in seacoast hospital asthma services.
 - Link seasonal patterns with variations in air quality.
 - Develop a regional prediction model for the demand for health services based on air quality.



Previous Studies:

Fall Peak of asthma hospitalizations found in Maryland, Blaisdell et al (2002), Maine, Langley-Turnbaugh et al. (2004) and in Canada, Johnston et al. (2005).

Asthma Seasonality (fall kink) in NH: seacoast area 2003

Air Quality and Asthma

- Various studies have shown a relationship between asthma and criteria pollutants.
- In our analysis CO, SO₂, O₃ did not correlate with the fall kink.
- Ragweed Pollen peaks in September and may explain the fall asthma kink.

Data

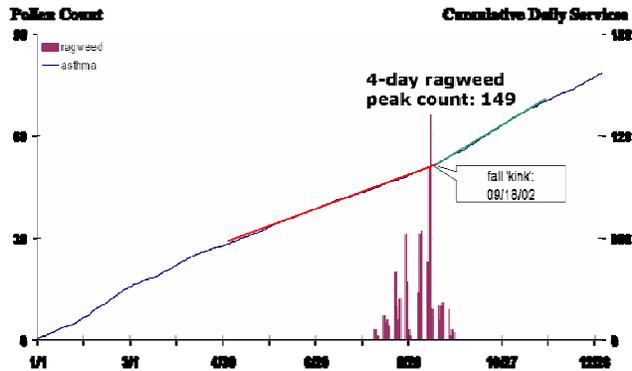
- Three NH Seacoast Hospital Services
 - 2002-2004
 - 4800 asthma services
- Air Pollutants from Thompson Farm, UNH
- Pollen : ragweed

Methodology

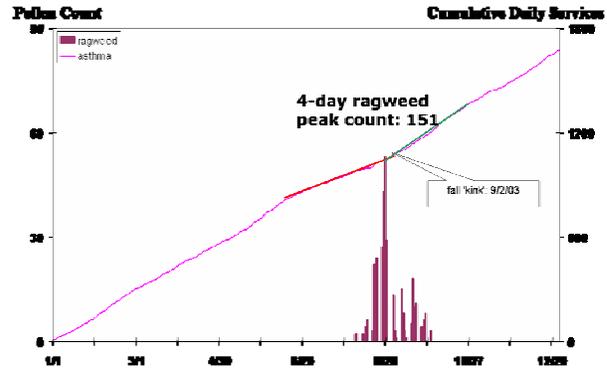
- Clearly identify the day of the asthma kink using regression analysis
 - select the day with the highest R-squared

- Compare the timing of the asthma kink with the timing of the peak in ragweed pollen.

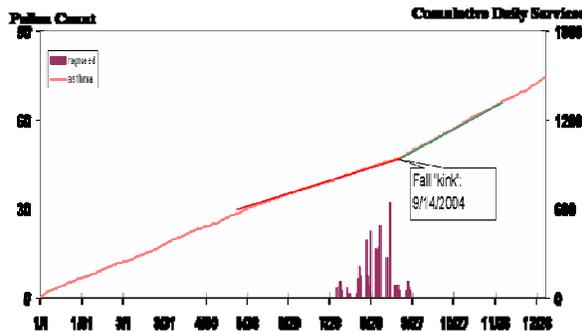
Cumulative Asthma Services (In-and Out-patient), 2002



Cumulative Asthma Services (In-and Out-patient), 2003



Cumulative Asthma Services (In-and Out-patient), 2004



Cost of Fall Asthma Rise in NH-seacoast

	2002	2003	2004
Additional Inpatient Costs	\$67,980	\$161,800	\$141,920
Additional Outpatient Costs	\$68,350	\$87,100	\$121,150
Total Cost of Fall Peak	\$136,330	\$248,900	\$263,070

Results

Future Work

- Extend the analysis to more years of data
 - Collaboration with local hospital
 - Pollen monitoring Network
- Test different hypothesis for fall increase
 - School start date/Labor day
 - Air pollutants
- Develop a regional prediction model for demand for health services which will help improve public health by:
 - Providing warning to population at risk
 - Assist hospital management teams in anticipated demand for services