Analyzing the Allergenic Airborne Pollen Season for Health Stakeholders

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HAQAST 4: Madison, WI

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Year 2 Progress Update, PI Hess

POLLEN, WEATHER, CLIMATE, & HEALTH

1. Influence of Weather, Climate on Pollen Season
   • Large descriptive analysis completed, presented AAAAI, paper in review
   • Ongoing analysis on weather/climate drivers of pollen season indices
   • Goal: to develop seasonal pollen forecast

2. Relationship between Pollen and Health Outcomes
   • Completed analysis of tree, weed, grass pollens and health outcomes, presented AAAAI, paper in preparation with CDC collaborators
   • Goal: expand analysis to individual pollen types

3. Developing Pollen Indicators
   • Preliminary analyses of Google search terms promising; paper describing proof of concept
   • 5 academic talks (AAAAI, AMS); 1 poster (PNWCC), 2 public talks (UW), 6 stakeholder meetings (EPA re: climate change indicators; CDC and CSTE re: pollen and weather in environmental public health tracking; AAAAI re: pollen sampling and exposure assessment; NADP re: pollen sampling)

TIGER TEAMS

• TT Arlene Fiore. Using Satellite Data in SIPS.
  • In calls as scheduling allows; focused on public health stakeholder engagement
• TT Pat Kinney.
  • Collecting air pollution samples from Puget Sound region for wildland fire analysis; exploring use of MRI for pollen monitoring
Pollen Calendar: Madison

- Visualization of climatology of daily pollen concentration
- Define start date of pollen season by allergic symptoms
- Madison starts sampling pollen too late, late bias in start date
Start Date of Oak Pollen Season and Growing Degree Days

Growing Degree Days = accumulation of daily mean temperatures (Jan 1)

- Growing Degree Day and oak start date are significantly correlated over all stations for 2003-2017 ➞ Temperature influences start date of the pollen season
- Latitudinal dependence
Pollen and Health Outcomes Related to allergies

Health Outcomes:
1. Allergic Rhinitis Outpatient visits
2. Asthma Outpatient visits
3. Emergency Dept visits
4. Prescription Medication Refills

*Days categorized as 'low' to 'high' pollen counts based on these values (grains/m³) – Tree = (15,100,250), Grass = (5,15,50), Weed = (5,15,50)*

Relative Risk of prescription medication refills on days of high vs low pollen.
Next Steps:

• Is there a relationship between seasonal precipitation and solar radiation and pollen season characteristics?
• What affects daily pollen concentration? Temperature, precipitation, humidity, solar radiation, winds
• Health Outcomes: how do other pollen types besides oak pollen affect health outcomes?