Climate, Weather, Pollen, and Health

H-AQAST 1
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Pollen and Allergic Disease

Trees - Spring

Grasses - Summer

Ragweed - Fall

- Allergic rhinitis (AR) highly prevalent; estimated 23% of population in Europe
- Allergic asthma prevalence approx 10-40% in those with AR
- Significant impacts on health-related quality of life mediated primarily by absenteeism and presenteeism
- Estimated cost of $3-5b in US in 2003
- Three primary allergenic pollen sources Pollen production and dispersal primarily determined by climatic and weather factors
- Comprehensive modeling and forecasting of pollen primarily limited by lack of pollen datasets

Team and Data

Team

- UW – Cecilia Bitz, Kris Ebi, Jeremy Hess, Fiona Lo
- CDC – George Luber, Shubhayu Saha, Arie Manangan
- USDA – Lew Ziska

Data

- NASA MERRA-2 and other satellite observations
- Biota of North America Program
- CMIP 5 (RCPs 4.5, 6, 8.5)
- American Academy of Allergy, Asthma, and Immunology's National Allergy Bureau pollen data
- Google Trends data
- Health outcomes data (AHRQ NEDS, Marketscan)

Goals

1. Determine the climate factors that influence the timing and severity of the allergenic pollen season at a national scale
2. Identify the weather patterns during the pollen season that are related to high pollen count days
3. Determine links between pollen season parameters (e.g. onset, peak, duration) and health outcomes
4. Integrate this information to forecast pollen concentrations and health burden under future climate scenarios

Stakeholders & Products

- Stakeholders
  - People with allergic disease
  - Public health at multiple levels
  - Health care providers
  - Scientists of many stripes
- Products
  - Comprehensive description of associations between climate, weather, and pollen phenology
  - Seasonal