Professor Janet Davies
Head Allergy Research Group, Queensland University of Technology
Assistant Director Research, Metro North Hospital and Health Service

GRASS POLLEN ALLERGEN TRIGGERS OF ASTHMA
Triggers for allergy and asthma

Upper airways:

- COMMON COLD
- HAY FEVER
  • 15% population

Lower airways:

- ASTHMA
  • 10% of population
Seasonal patterns of asthma

**FIG 1.** The total numbers of asthma admissions to the Royal Children’s Hospital and participants enrolled in the Melbourne Air Pollen Children and Adolescent Health study (smoothed) and the seasonal distribution (in days) of ambient grass pollen during the study period.
Grass biology in Australia

Ryegrass

Bermuda

Johnson

Bahia

Davies et al., Clin Trans Allergy 2012
Exposure to Grass Pollen Triggers

Beggs et al., *Aust NZ J Pub Health* 2015
Medek et al., *Aerobiologia* 2016
Thunderstorm asthma epidemics: evidence, knowledge gaps and public health implications


10 Deaths
35 Intensive care unit
888 hospital admissions;
1874 Home Doctor Service visits (6 fold increase)
9909 (7 fold increase) Emergency department presentations;
3212 respiratory and 1428 nil diagnosis

Individual susceptibility
- Sensitised to allergen
- History of rhinitis/asthma
- Behavioural factors: being outside/ unmedicated

Environmental & Aeroallergens
- Grass pollen
- Fungal spores
- Ruptured pollen/spores

Meteorological
- Thunderstorm: lightning, outflows
- Season: spring/summer

(Commissioned by Victorian Dept Health Human Services)
Janet M Davies, Bircan Erbas, Marko Simunovic, Jane Al Kouba, Andelija Milic

QUT ihbi Institute of Health and Biomedical Innovation
AusPollen workflow

Phenology → Pollen count → Model → Analysis → Forecast → Transmit → Health data → Health impact

weather data

AusPollen
The Australian Pollen Allergen Partnership

QUT
Institute of Health and Biomedical Innovation
Grass pollen forecasting by remote satellite sensing

ARC Remote sensing project: Huete, Davies Beggs
AusPollen Aerobiology Collaboration Network on National Environmental Monitoring Site Register

- “Add data” -> Environmental Monitoring Sites Register -> Air
- -> AusPollen Aerobiology Collaboration Monitoring Network
- Click “Add to map”
  - Being established

Live 6 December 2017
Allergy innovations → new tests and treatment

source

Proteome
Transcriptome
Allergome

Allergen component
test
treatment

Davies et al. Mol Immunol 2008; 2011
Campbell et al. (Davies), JACI 2015; Davies et al ALLERGY 2005
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