THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

CREATE CHANGE

School of Public Health PhD Student Project

TITLE: **Modeling grass pollen movements and respiratory health outcomes**
FIELD OF RESEARCH: **Modelling, asthma and allergy**
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PREREQUISITE SKILLS REQUIRED FOR THE PROJECT: **N/A**

PROJECT SYNOPSIS:
Understanding the environment and its dynamic nature in a time of climate change and urbanisation is vital to reduce disease burden of chronic diseases that are increasing prevalent in both high and low to middle income countries.

We have been examining the relationship between levels of individual grass pollens at 16 sites across the UK with data collected over 3 years.

Several questions remain to be answered in this research. Firstly, our initial studies have examined measures at 16 sites across the UK. Pollen measures from the sites have been subsequently modelled and we wish in this studentship to use this modelled individual taxa grass pollen data with health data from across the UK to give us a better understanding of the associations between pollen and health outcomes.

This work has seen the development of a novel, mechanistic grass species' pollen model. This will enable better prediction via models (existing air quality models ERF-Chem and HYSPLIT). This environmental data will then be examined in the context of hospital episode statistics and GP prescription data. In addition to the modelled pollen data other biological, meteorological and demographic variables will be assessed. This knowledge will feed into predictions on how prevalence and incidence of allergy and asthma episodes may change with changing environmental and demographic conditions into the future.

Our findings will be examined in the both the Australian and UK contexts. We have been interacting with the Bureau of Meteorology Australia to pursue these concepts with available Australian data.

This has most recently been seen in their collaboration with the PollerGEN research project (£1.2M NERC grant 2016-9) *"Using molecular genetics to understand grass species pollen deposition: enhancing bio-aerosol models and implications for human health".*

This PhD will allow additional data obtained in the research program to be analysed and concepts and ideas examined in the Australian context (most allergenic taxa are common to both countries) with the ability to compare and contrast to the UK scenarios. The benefits of this work in allowing patients to better manage their chronic lifelong diseases of asthma and allergy has commercial potential as well as ongoing academic research funding.

If you are interested in this project, please email the named contact person as listed above