School of Public Health PhD Student Project

TITLE: Pollen and its contribution to respiratory outcomes in subtropical regions

FIELD OF RESEARCH: Epidemiology

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LINK TO UQ RESEARCHERS PAGE: https://researchers.uq.edu.au/researcher/23923

PREREQUISITE SKILLS REQUIRED FOR THE PROJECT:

Background in this field with research experience and/or prior work experience in air pollution research, particularly air pollution measurement. Experience working with large health data sets and/or epidemiological studies is highly desirable.

PROJECT SYNOPSIS:

Air quality is a strong predictor of respiratory health. In comparison to traditional sources like industry, transport, open burning, bushfires, power plants, the contribution of plant pollen is not so well studied in the sub-tropical/arid climate. Residents in the subtropical regions show higher allergic sensitivity and subfamily-specific immunoreactivity with pollen of Chloridoideae and Panicoideae grasses, compared with temperate grass pollen. Therefore, knowledge of species and amount of pollen in air column is essential to preparing more accurate predictions of episodes when respiratory disease burden would be high and focusing public health efforts.

We plan to examine what biologics are in the air column in Delhi and Brisbane as currently there is very little knowledge. Aerial dispersion of pollen gives an important snapshot of the biodiversity of the surrounding environment. New environmental DNA (eDNA) techniques allow samples of plant pollens and fungal spores to be collected and analysed using stored data (DNA barcode library) or other sequencing techniques allowing sapling of all genes in all organisms present in a complex sample via high-throughput molecular methods. This information, when combined with the next generation air quality models provides a variety of tools to examine the release, dispersion and transformation of bioaerosols and how it affects the environment. Further we expect to analyse the respiratory morbidity data from the two cities to understand the health risk of exposure to pollen.

We will collect pollen at different times of year. Using eDNA techniques and light microscopy we will ascertain diurnal and seasonal fluctuations in pollen genera and species, and their relationship to human health outcomes.

Critical Start/Finish Dates (if applicable):

Link to additional information (if applicable):

https://uqidar.org/projects/pollen-and-its-contribution-to-respiratory-outcomes-in-subtropical-regions/

This project will allow the student to spend time in both Australia and India researching.

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