**School of Public Health PhD Student Project**

**Title: Food allergy, atopy and asthma risk is affected by environment of child**

**Field of Research:** **Epidemiology**

**Supervisor/Contact Name: Nick Osborne**

**Supervisor/Contact Email:** n.osborne@uq.edu.au

**Link to UQ Researchers Page:** <https://researchers.uq.edu.au/researcher/23923>

**Prerequisite skills required for the project: Use of stata, epidemiological training, critical thinking skills**

**Project Synopsis:**

This study will use the resources of the Longitudinal Study of Australian Children to examine environmental risk factors of food allergy, atopy and asthma in Australian Children

Recent reports from both Australia and the United States suggest that vitamin D might play a role in the recent increase in allergic disease, in particular food allergy. Using indirect markers of food allergy status, such as prescription of hypoallergenic formula, EpiPen (Dey Pharma, Basking Ridge, NJ) prescription, and emergency department admission for probable food-induced anaphylaxis, they surmised that the further a person resides from the equator, the more likely he or she is to have food allergy. They further suggested that this could be possibly related to UV exposure, with those cities with the lowest ambient UV radiation likely to have the highest proportion of population with vitamin D insufficiency.

Australia is particularly strongly placed to examine these associations. It has among the highest prevalences of challenge-proved food allergy, eczema, and asthma. It also has one of the longest north-south borders in the world, measuring approximately 4500 km from the North of Queensland to the South of Tasmania. It also has a nationally representative epidemiologic study, the Longitudinal Study of Australian Children (LSAC), containing information on 2 cohorts of children on state of domicile; parental report of food allergy, eczema, and asthma; and potential confounders.

To examine the how the relationship between mental health and asthma has changed in Australian generations and their different exposures, through the lens of a holistic spatial life course protocol. This will see the bringing together of a range of potential risk factors and confounders (documented and otherwise) of asthma. In addition selection of cases of asthma in the cohort will be assessed by multiple routes to increase the validity of case selection (beyond existing self-diagnosis).

The study aims to move beyond examining the prevalence and risks of asthma exacerbation to tackle the underlying reason for the significant increase in this disease during the 1980-90s (Weiss and Wagener 1990, Taylor, Comino et al. 1997, Beasley 2002). A similar rise in food allergy has been witnessed globally in high income countries (Prescott and Allen 2011, Mullins, Dear et al. 2015) but limited evidence in LMICs (Hoyos-Bachiloglu, Escobar et al. , Loh and Tang 2018). While asthma and atopy are complex diseases with both genetic and environmental influences, both have increased in a short time, combined with data from emigrants suggesting higher rates of atopy in their adopted versus home countries suggesting the increase is due to environmental factors.

Key Goals:

1: In the selected cohorts we will examine if higher levels of stress are related to atopic disease outcomes

2: To what extent does stress contribute to atopic disease compared with a range of environmental factors such as poor diet, lack of exercise, smoking, traffic pollution, markers of adiposity, birth order?

3: Is green space a confounder to the relationship between stress and atopic disease and will this alter with climate change?

4: Are there critical periods in the lifecycle (e.g., Barker hypothesis, early childhood stress, adult onset) when exposure to stress programs the body to later onset of atopic disease?

5: What is the relationship between biomarkers of stress, reported psychological stress and atopic disease?

6: Work out an attributable risk of stress on atopic disease

**Link to additional information (if applicable):**

<https://pubmed.ncbi.nlm.nih.gov/22305679/>

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