

## **Data Analytics and Mathematical Statistics – Tutorial 1**

1. What are the possible issues with data collected from retrospective studies?
2. Are observational studies and designed experiments able to address these issues?
3. Studies have shown that environmental conditions can increase the risk of allergies (Lang-Yona, et al 2013; Peden and Reed, 2010). Anecdotally, you also notice that allergies among your friends seem to act up every time the weather is cold, and you wonder if there is a link between the two for the general population in our city.

For the abovementioned question:

- a. Formulate the hypothesis. Demonstrate the falsifiability of your hypothesis.
- b. Deduce a prediction for testing, and identify the dependent and independent variables in your tests.
- c. How would you go about collecting the relevant data?
- d. What are some factors that could affect the validity of outcomes in your study?