



**Carolina Population Center  
Summer 2021 Undergraduate Research Program**

**Project Name**

Understanding the Relationship Between Herd Immunity and Geographic Scale to Improve Estimates of Localized Infectious Disease Outbreak Risk

**Faculty Mentor**

Dr. Paul Delamater, Department of Geography

**Project Description**

This project focuses on herd immunity and its relationship with infectious disease outbreak risk at local geographic scales. The broader project goals include the developing and evaluating approaches to define herds within a larger population, identifying the geographic scale(s) at which the effects of herd immunity are detectable, and estimating localized disease outbreak risk in the context of these findings.

**Scope of Work for Internship**

The intern's work will focus on evaluating the COVID-19 vaccination campaign in North Carolina. They will be leading the process of cleaning and consolidating a large spatiotemporal database of COVID-19 cases and vaccination. The intern will also work on models to create high (geographic) resolution estimates vaccination coverage over time. The intern will also be responsible for assisting in conducting literature searches, creating maps and graphics, and producing narrative text describing their data and methods (for a report).

**Expected Deliverables**

The expected deliverables include 1) a cleaned version of the NC vaccination data, 2) analysis/estimation of vaccination estimates, and 3) a report detailing the findings.

**Preferred Skills**

The intern must have prior experience with coding (R preferred) and working with large tabular databases. The intern must be extremely detail-oriented and have excellent organizational skills. Experience with GIS is a plus. Prior statistical training is a plus as well.

**Time Commitment**

Full time (approximately 35 hours/week)