

COVID-19 Employee and trainee Surveillance Project (COVID-19 ESP)

PI: Audrey Pettifor

Impact to the State (300 word limit)

Problem/Challenge: As North Carolina moves out of the COVID-19 shelter in place order and into a phased opening plan, more individuals will resume work. It is unclear how increased numbers of individuals returning to work will impact COVID-19 incidence and transmission. Updated NC DHHS COVID-19 testing guidance recommends clinicians test patients suspected to have COVID-19 infection. However, the prevalence of asymptomatic cases is one of the major challenging aspects of the COVID-19 pandemic, as people unknowingly infect others.

Solution: This project will assess the usefulness of asymptomatic testing and contact tracing of SARS-CoV-2 positive individuals to monitor disease outbreak and reduce virus transmission, using the research community at UNC-CH, broadly defined, as a cohort. This project also aims to inform best practices for how to open other similar workplaces throughout the state. It can also inform safety measures and testing methods for the return of students to university campuses.

The project is designed to:

- Understand the effectiveness of prevention measures, testing of asymptomatic people, and contact tracing to reduce the transmission of COVID-19 in the university research community
- Develop protocols, assess technology, and identify infrastructure needed for testing and contact tracing to inform return to work planning statewide
- Determine Incidence of infection in asymptomatic/pre-symptomatic individuals of a phased return to work strategy
- Determine prevalence of people of who have been exposed to SARS-CoV-2, and longevity of immune response through antibody testing
- Identify barriers and facilitators to adoption of prevention measures

The project also aims to inform logistics and best practices for return to work for North Carolina Institutions and other related work environments.

- Logistics, procedures, sampling methods, testing, contact tracing, data collection and analysis
- Test and assess new technologies and compare them to existing technology.
 - Case study: Assess a high throughput, inexpensive antibody testing assay developed by UNC-CH researcher Aravinda de Silva. These data would inform its usefulness for the public health Community and NC DHHS in targeted large-scale serology testing
 - Compare different types of samples and sample collection procedures to identify alternate testing solutions for a better sample collection experience or streamlined testing
- Stored biobank of SARS-CoV-2 positive and negative samples available for other researchers to conduct studies
- Contact tracing technology and social network methods to effectively reduce viral transmission

Milestones (300 word limit):

Description of what will be accomplished and what can be delivered by August 31, 2020, and by Dec. 31, 2020.

August 31, 2020 Milestones

- Implementation of a surveillance study among the research community at UNC -CH to assess the safety of re-opening research activities on campus
- Seroprevalence of SARS-COV-2 antibody at UNC-CH
- Prevalence of SAR-COV-2 infection (virus) in the research community and among an asymptomatic population
- 1 month incidence of SARS-COV-2 at UNC-CH
- Risk factors associated with infection
- Compliance of the research community with prevention measures

Dec. 31, 2020 Milestones

- Incidence of SARS-COV-2 over 6 months
- Efficacy of contact tracing and isolation
- Continued compliance of the research community with prevention measures over a 6-month period
- Risk factors for SARS-COV-2 incident infection
- Comparison and cross validation of different sampling technologies and testing assays
- Temporal dynamics of immune response to SARS CoV-2 as measured by UNC developed (de Silva) testing technology

Budget Justification (200 word limit):

Epidemiology Team: The Epidemiology team includes Audrey Pettifor (PI, 20% effort) and Allison Aiello (contact tracing, 5% effort), staff and trainees. The team is responsible for overall study design, contact tracing, understanding how prevention measures impact disease incidence, virus transmission, adherence, and possible control of disease. Study participants can opt to use of a contact tracing cell phone app to track movements and possible contacts with others in the work place.

Testing Team: The testing team includes Corbin Jones (overall operational design and management, 12% effort), Dirk Dittmer (Virology and virus genetic testing, 5% effort), and Ashok Krishamurthy (informatics), and staff. Testing budget includes sample collection, PCR and serology testing, and informatics support to track samples and analyze data. PCR testing will be conducted in a specialized campus research facility to reduce the need to use resources at the Respiratory Diagnostic Center (RDC). The group will procure specialized equipment to automate

the testing process in the research facility to maximize throughput. This group will also work with technology developers to help them assess new innovations of COVID testing.

Clinical Team: Arlene Sena-Soberano (Infectious disease clinician, 20% effort) and Kim Min (Infectious disease clinical fellow, 50% effort), and staff. They are responsible for coordination of sample collection from study subjects. They also design and implement the process for contacting subjects that are positive for SARS CoV-2, inform of risks, and provide direction regarding next steps.