

# **Morningside Graduate School of Biomedical Sciences Clinical & Population Health Research Program**

Announces the PhD Dissertation Defense of

## **CARLY HERBERT**

### **HOME DIAGNOSTICS, VIRAL DYNAMICS, AND POST-ACUTE SEQUELAE OF SARS-COV-2**

Friday, February 9, 2024 at 2 p.m. in AS9.2072 and Zoom

**Introduction:** The emergence of the novel coronavirus, SARS-CoV-2, has necessitated prompt evaluations of viral dynamics to inform clinical and public health strategies.

**Methods:** Using data from the RADx Clinical Studies Core collected from October 2021-February 2022, we evaluated the longitudinal performance of reverse transcriptase polymerase chain reaction (RT-PCR) and antigen-detecting rapid diagnostic tests (Ag-RDT) by day past symptom onset and close-contact exposure and compared performance by sex, age, vaccination status, and variant (Aim 1). We further examined the association between SARS-CoV-2 viral load, BMI, and sex (Aim 2). Lastly, we conducted a follow-up survey in August 2023 regarding Long COVID. We then modeled the relationship between viral clearance of SARS-CoV-2 and Long COVID (Aim 3).

**Results:** RT-PCR and Ag-RDT showed the highest percent positivity two days past symptom onset (RT-PCR: 91.2%; Ag-RDT: 71.1%) and six days past exposure (RT-PCR: 91.8%; Ag-RDT: 86.2%). Performance did not differ by vaccination status, variant, age category, or sex. In males, increasing BMI was associated with higher viral load in a dose-response fashion, and males had significantly lower viral load than females for BMI>29. Lastly, the risk of long COVID with 3-4 symptoms and 5+ symptoms increased by 2.90 times (95% CI: 1.09-7.74) and 4.54 times (95% CI: 1.84-11.2) per viral load slope-unit increase, respectively.

**Conclusion:** Understanding SARS-CoV-2 viral dynamics is critical to identify effective diagnostic strategies for COVID-19, explain differences in COVID-19 outcomes across sex and BMI, and understand mechanistic contributors of Long COVID.

#### **Mentor**

Apurv Soni, MD, PhD

#### **Dissertation Exam Committee**

Jennifer Tjia, MD, MSCE (Chair)

Kate Lapane, PhD

Benjamin Gerber, MD, MPH

Kimberly Fisher, MD

Anne Wyllie, PhD (Yale School of Public Health) -  
External Member