



Strain-Specific Clinical Characteristics of Human Coronavirus Infection Among Adolescents and Adults with Influenza-like Illness

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Introduction

- Human coronavirus is a known cause of influenza-like illness (ILI).
- Symptomatology can vary by each individual experiencing the symptoms, especially by their current state of health.
- Clinical characteristics of the highly virulent coronavirus strains (i.e. SARS and MERS-CoV) have been increasingly described.
- Symptoms of four common types of human coronavirus (229E, NL63, HKU1, OC43) experienced have not been well characterized in an otherwise healthy population.
- We evaluated strain-specific clinical characteristics of human coronavirus infection among otherwise healthy military adolescents and adults with ILI.

Aim

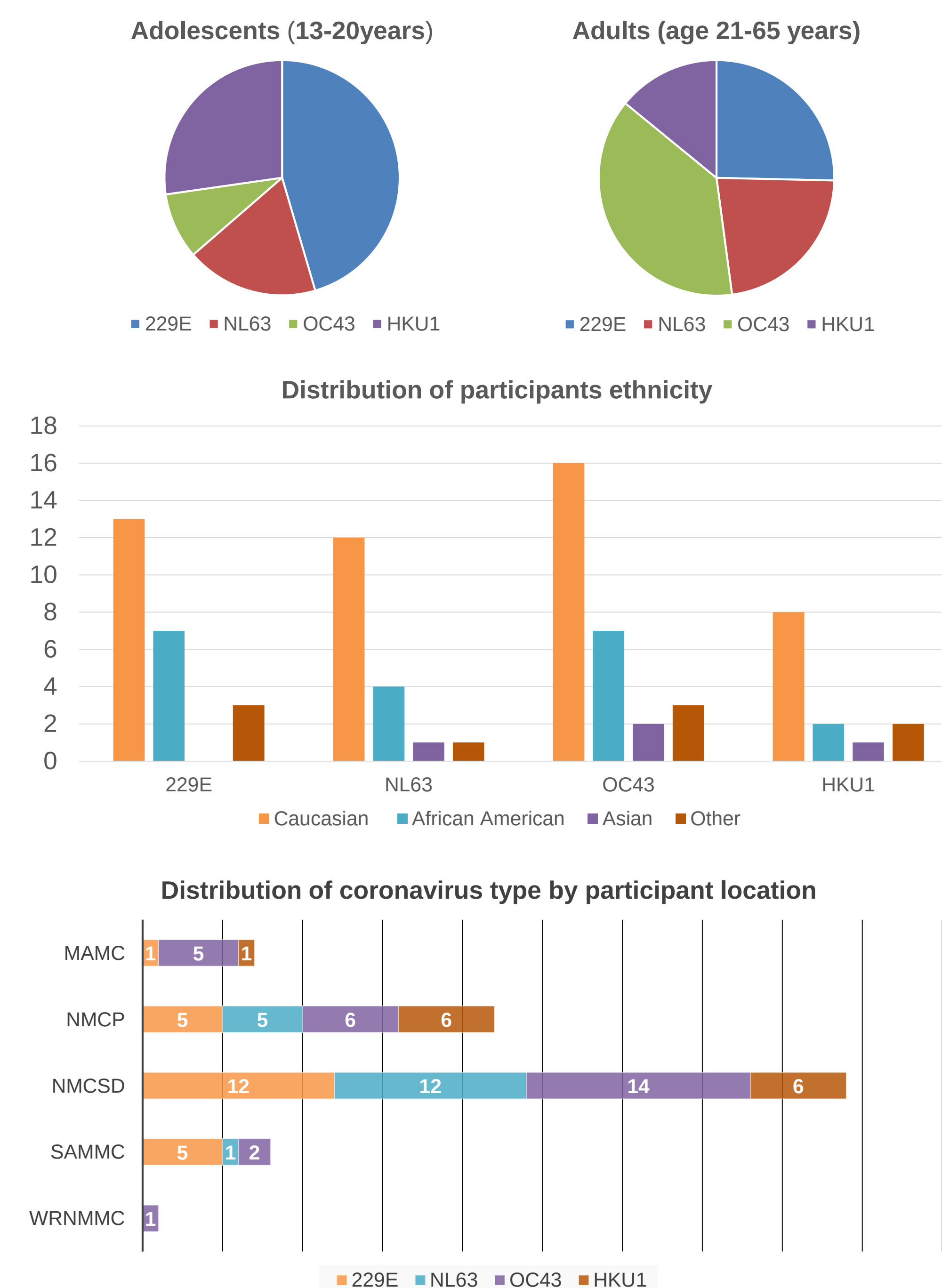
The aim of this study is to evaluate the epidemiology and clinical characteristics such as symptom severity of the more common human coronavirus strains among healthy adolescents and adults enrolled in a longitudinal study of influenza-like illness (ILI).

Methods

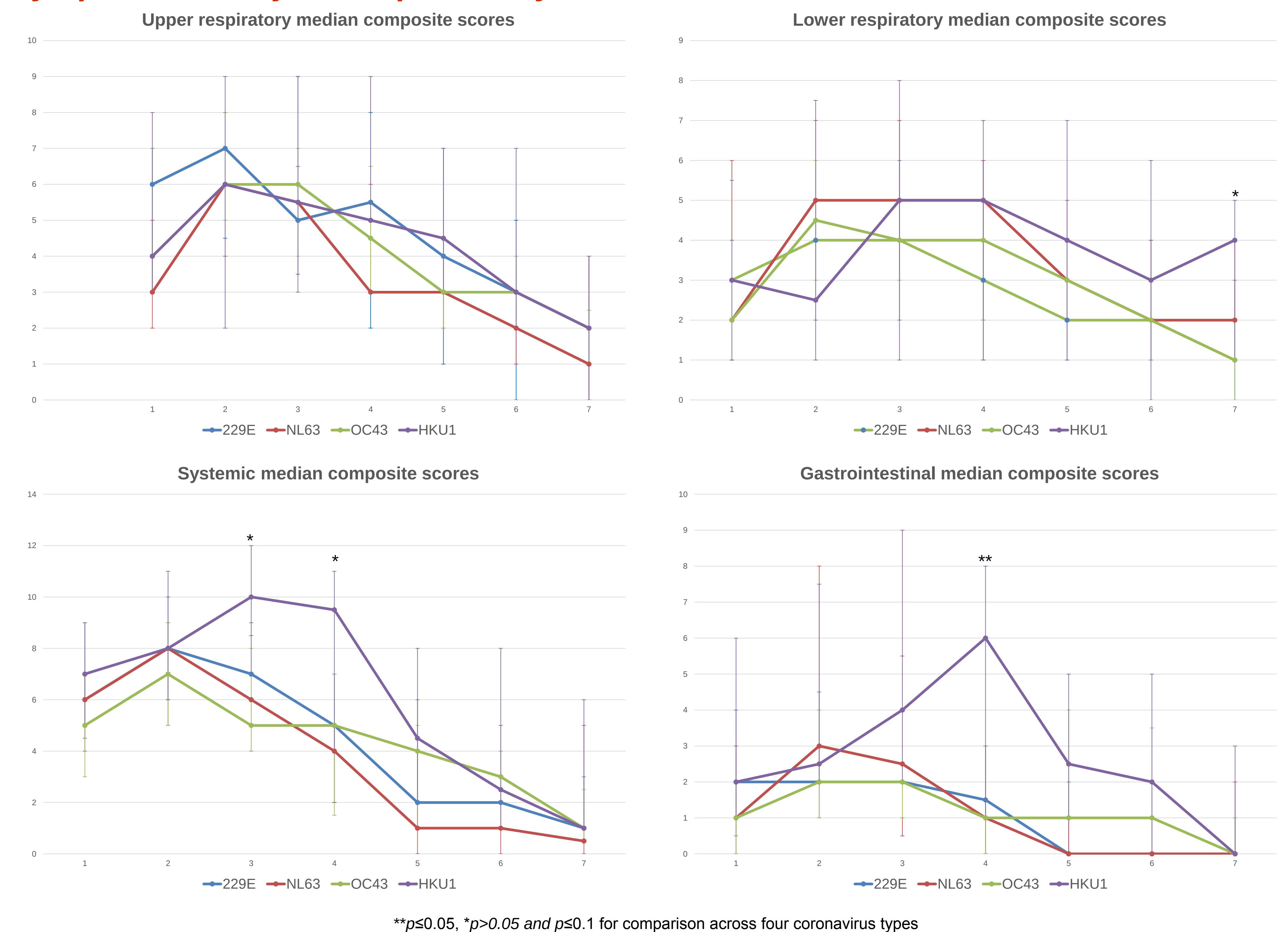
- The Acute Respiratory Infection Consortium (ARIC) conducted an observational, longitudinal study of ILI at five US military treatment facilities across the United States from 2009-2014.
- Participants were otherwise healthy military members, retirees, and their dependents who presented to the clinic with ILI symptoms within 72 hours.
- ILI is defined as having a fever ($>100.4^{\circ}$ F) with at least one of the following respiratory symptoms: cough, shortness of breath, sputum production, chest pain and/or sore throat.
- Symptom data was captured prospectively using a 7-day patient symptom diary with a standardized four-point grading scale.
- Symptom severity was captured in four categories: upper respiratory (earache, runny nose, sore throat, and sneezing), lower respiratory (cough, breathing difficulty, hoarseness, and chest pain), systemic (muscle ache, fatigue, headache, and chills), and gastrointestinal (nausea, vomiting, and diarrhea).
- Nasopharyngeal specimens were collected for etiologic determination that included the four common coronavirus strains. Cases with coronavirus infection were identified using Diatherix target-enriched multiplex PCR (TEM-PCR) platform. A TEM-PCR panel for 10 viral respiratory pathogens was developed by Diatherix Laboratories, LLC. (Huntsville, AL). The platform relies upon nested multiplex PCR to provide the initial target enrichment and super primers to amplify and label the PCR products. The viral respiratory pathogens on the panel include: adenovirus, coxsackievirus/echovirus, bocavirus, coronavirus, human metapneumovirus, rhinovirus, influenza A/B, parainfluenza and RSV.

Results

Demographic Data

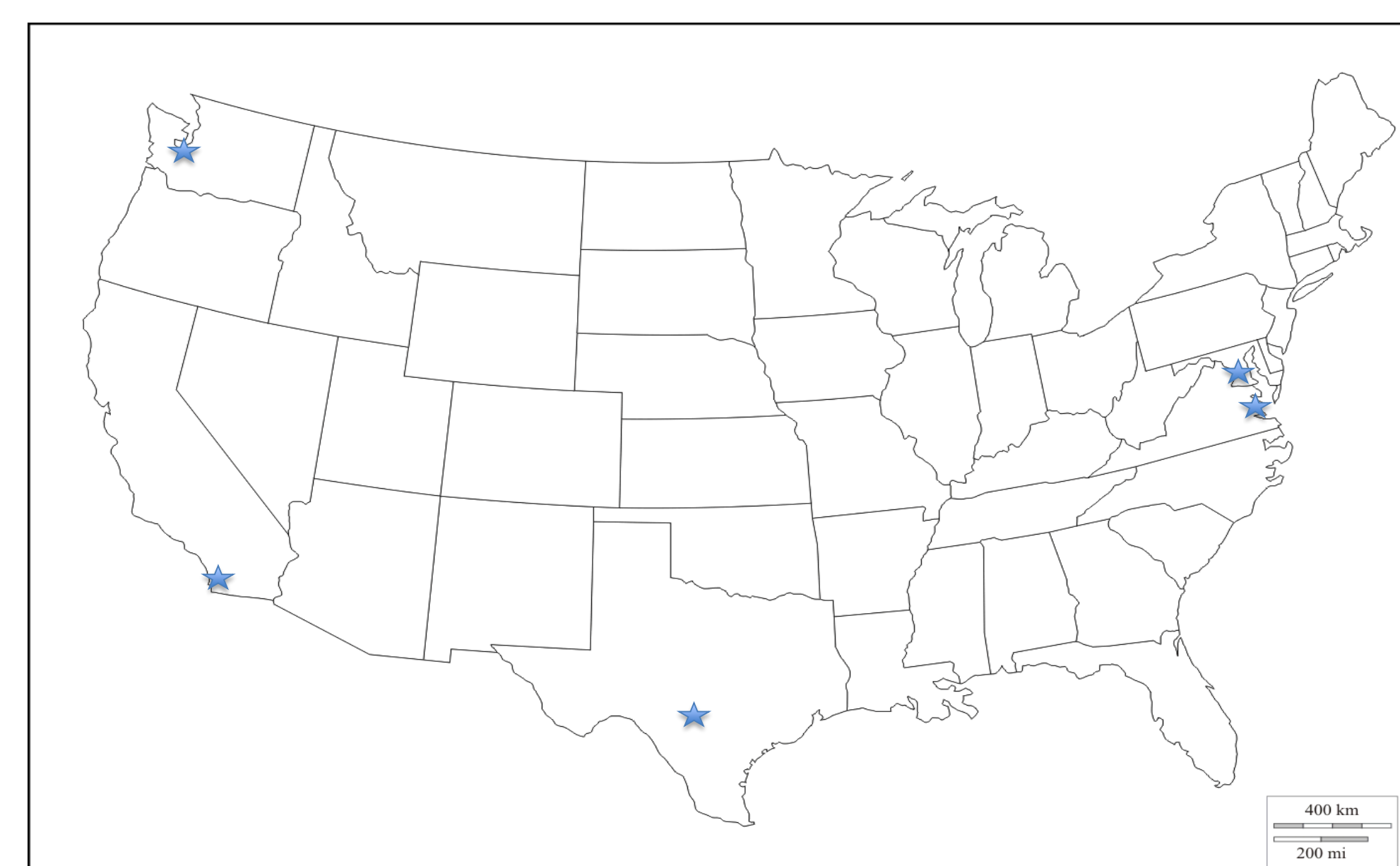


Symptom Severity Participant Diary Data

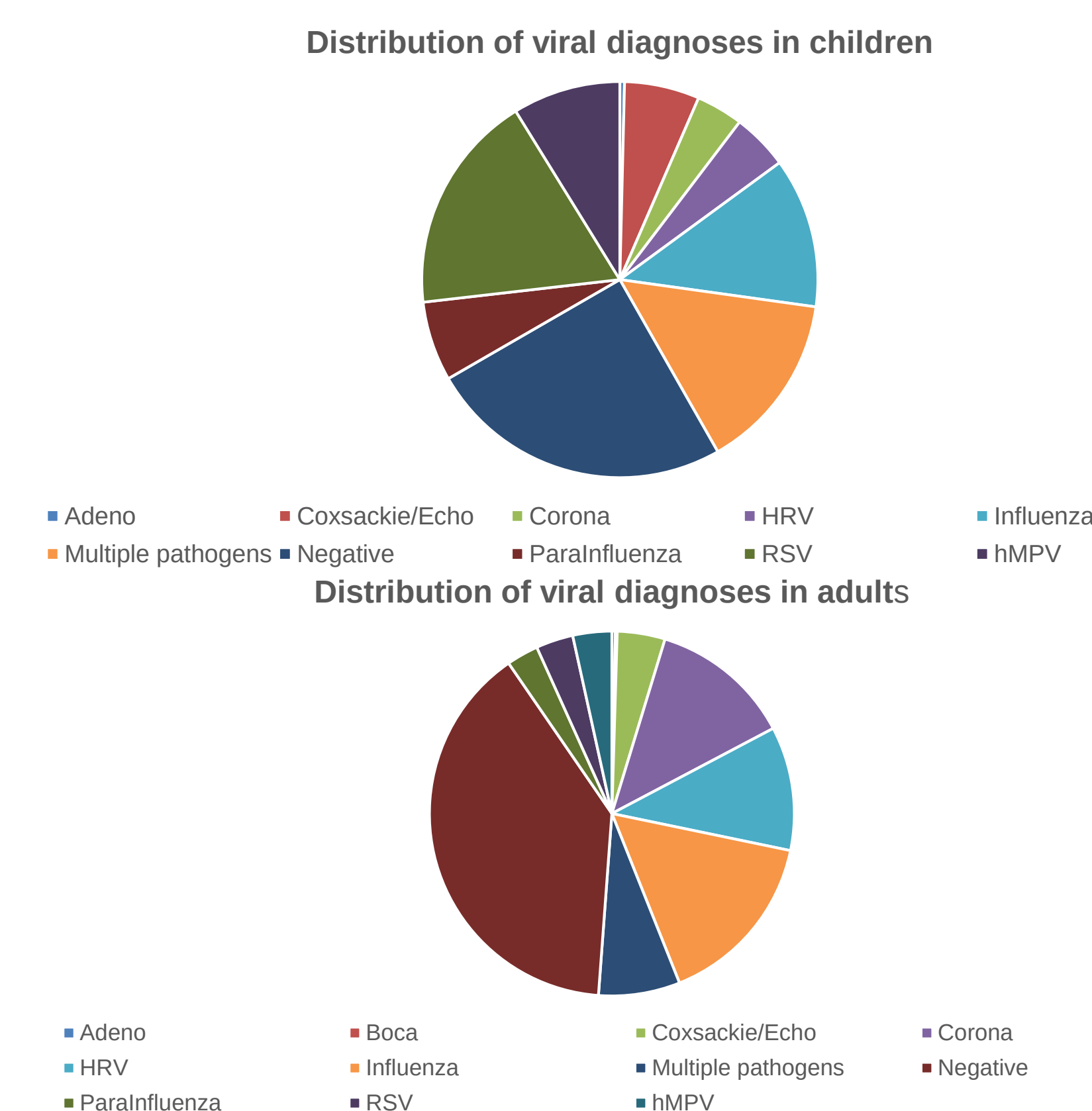


ARIC Data

Participating Study Sites



Distribution of ILI Diagnoses from 2010-2014



Conclusions

- Coronavirus prevalence differed by age with 229E more prevalent in adolescents, and OC43 in adults
- HKU1 higher GI composite scores; statistical significance at day 3
- HKU1 higher systemic composite scores through duration of illness
- HKU1 had lingering lower respiratory composite scores
- All viruses had consistent upper respiratory scores
- Further study is needed with more participants

Acknowledgements and Disclaimer

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