376. Sensitivity and Specificity of the WHO Probable SARS-CoV-2 Case Definition Among Symptomatic Healthcare Personnel

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Session: P-16. COVID-19 Epidemiology and Screening

Background. SARS-CoV-2 continues to spread globally, including in limited resource settings. It is therefore important to derive general case definitions that can be useful and accurate in the absence of timely test results. We aim to validate the World Health Organization (WHO) case definition, a symptom-screening tool currently used to identify SARS-CoV-2 cases in a cohort of symptomatic health care providers (HCP) who completed a symptom survey interview and received a PCR test at Boston Medical Center (BMC) between March 13, 2020 and May 5, 2020.

Methods. We classified each HCP as a probable or not probable case of SARS-CoV-2 based on the WHO case definition. We used a symptom test as gold standard, we computed the sensitivity and specificity of the WHO case definition. We used a stepwise logistic regression model on all PCR-tested HCP to identify symptoms predictive of PCR positivity.

Results. Of 328 included HCP, 109 (33.2%) were PCR positive, 213 (64.9%) negative, and 6 (1.8%) had indeterminate test result. The sensitivity of the WHO case definition was 65.1% and 74.6%, respectively. The positive predictive value was 56.8% and the negative predictive value was 80.7%. Symptoms found to be predictive of PCR positivity were fever, headache, loss of smell and/or taste, and muscle ache/joint pain. Sore throat was found to be predictive of PCR negativity.

Conclusion. We identified many SARS-CoV-2 transmission introductions into the University of Michigan campus in Fall 2020. While there was widespread transmission among students, there is little evidence that these outbreaks significantly contributed to the rise in COVID-19 cases that Washtenaw County experienced in November 2020.

Disclosures. Adam Lauring, MD, PhD, Roche (Advisor or Review Panel member) Sanofi (Consultant)

378. Descriptive Analysis of SARS-CoV-2 Infections Among Health System and University Employees

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CDC Epicherals

Session: P-16. COVID-19 Epidemiology and Screening

Background. We aimed to describe SARS-CoV-2 (COVID-19) infections among employees in a large, academic institution.

Table 1. COVID-19 Attribution Definitions

| Attribution Classification | Definition |
|-----------------------------|------------|
| Healthcare/Workplace-acquired | Exposure to a COVID-infected healthcare worker or co-worker during their infection window. |
| Patient | Exposure to a COVID-infected patient while not wearing adequate personal protective equipment (e.g., isolation/ or breach in personal protective equipment. |
| Visitor | Exposure to a COVID-infected visitor while not wearing adequate personal protective equipment. |
| Community-acquired | Exposure to a COVID-infected person in the community (or a co-worker outside the workplace) including non-Duke work environments during infectious window. |
| Unknown, likely community-acquired | Close contact with a person who has symptoms consistent with COVID (but has not been tested for COVID infection) during their infectious window; the contact occurred in the community (or co-worker outside the workplace) including non-Duke work environments during infectious window. |
| Unknown | No contact with a COVID-infected person in the community. |

Further evidence for global building of laboratory capacity and development of affordable diagnostics to improve global pandemic control.

Disclosures. All Authors: No reported disclosures

377. SARS-CoV-2 Genomic Surveillance Reveals Little Spread Between a Large University Campus and the Surrounding Community

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Session: P-16. COVID-19 Epidemiology and Screening

Background. Understanding SARS-CoV-2 transmission dynamics is critical for controlling and preventing outbreaks. The genomic epidemiology of SARS-CoV-2 on college campuses has not been comprehensively studied, and the extent to which campus-associated outbreaks lead to transmission in nearby communities is unclear. We used high-density genomic surveillance to track SARS-CoV-2 transmission across the University of Michigan-Ann Arbor campus and Washtenaw County during the Fall 2020 semester.

Methods. We retrieved all available residual diagnostic specimens from the Michigan Medicine Clinical Microbiology Laboratory and University Health Service that were positive for SARS-CoV-2 from August 16th - November 25th, 2020 (n = 2,245). We extracted viral RNA, amplified the SARS-CoV-2 genome by multiplex RT-PCR, and sequenced these amplicons on an Illumina MiSeq. We applied maximum likelihood phylogenetic analysis to whole genome sequences to define and characterize transmission lineages.

Results. We assembled complete viral genomes from 1,659 individual infections, representing roughly 25% of confirmed cases in Washtenaw County across the fall semester. Of these cases, 468 were University of Michigan students. Phylogenetic analysis revealed 203 genetically distinct introductions of SARS-CoV-2 into the student population, most of which were singletons (n = 171) or small clusters of 2–8 students. We identified two large SARS-CoV-2 transmission lineages (115 and 73 students, respectively), including individuals from multiple on-campus residences. Viral descendants of these outbreaks constituted less than 6% of cases in the community.

Conclusion. We identified many SARS-CoV-2 transmission introductions into the University of Michigan campus in Fall 2020. While there was widespread transmission among students, there is little evidence that these outbreaks significantly contributed to the rise in COVID-19 cases that Washtenaw County experienced in November 2020.

Disclosures. Adam Lauring, MD, PhD, Roche (Advisor or Review Panel member) Sanofi (Consultant)
Table 2. Description of 3,140 COVID-19 Infections in Employees from 3/2020 to 4/2021

| Variable                        | N (%)          |
|---------------------------------|----------------|
| Age                             |                |
| 18-25                           | 405 (13.0)     |
| 26-35                           | 1054 (33.8)    |
| 36-45                           | 625 (20.0)     |
| 46-55                           | 579 (18.6)     |
| 56-65                           | 197 (12.7)     |
| 65+                             | 59 (1.9)       |
| Initial Symptoms*               |                |
| Congestion or runny nose        | 810 (25.8)     |
| Headache                        | 709 (22.6)     |
| Cough                           | 654 (20.8)     |
| Muscle or body aches            | 530 (17.0)     |
| Sore throat                     | 441 (14.0)     |
| Fatigue                         | 376 (12.0)     |
| Fever or chills                 | 289 (9.2)      |
| Other*                          | 149 (4.7)      |
| New loss of taste or smell      | 138 (4.4)      |
| Nausea or vomiting              | 97 (3.1)       |
| Shortness of breath or difficulty breathing | 74 (2.4) |
| Diarrhea                        | 57 (1.8)       |

Asymptomatic                     | 265 (8.4)      |

Worked during infectious window   | 2518 (80.8)    |

Worked during pre-symptomatic window*** | 1397 (44.5) |

Worked with symptoms              | 1341 (43.3)    |

Quarantined prior to symptom onset| 219 (7.0)      |

Tested negative followed by a positive test | 63 (2.0) |

Severe disease                    | 70 (2.3)       |

Reinfection                      | 21 (0.7)       |

Attrition                        |                |

Community                        | 1644 (52.4)    |

Unknown, likely community         | 125 (4.0)      |

Unknown                          | 1657 (51.5)    |

Workplace                        | 308 (9.8)      |

Workplace-patient                | 81 (2.6)       |

Workplace-employee               | 22 (0.7)       |

Workplace-visitor                | 5 (0.2)        |

*Initial symptoms included all symptoms that the employee reported on the first day of symptom onset, therefore making the denominator greater than 3,140 symptoms
**Examples of “Other” symptoms include loss of appetite, night sweats, abdominal pain, dizziness
***Defined as 2 calendar days prior to the onset of symptoms

Methods. We prospectively tracked and traced COVID-19 infections among employees across our health system and university. Each employee with a confirmed positive test and 3 presumed positive cases were interviewed with a standard contact tracing template that included descriptive variables such as high-risk behaviors and contacts, dates worked while infectious, and initial symptoms. Using this information, the most likely location of infection acquisition was adjudicated (Table 1). We compared behavior frequency between community and unknown, likely community and community and unknown cases using descriptive statistics.

Table 3. Risk Factors for Community, Likely Community, and Unknown Cases

| Risk Factor                        | Community N=1640 | Unknown, Likely Community N=129 | Unknown N=1057 |
|-----------------------------------|-----------------|---------------------------------|----------------|
| Travel within 24 days             | 385 (23.4)      | 36 (27.9)                       | 213 (20.2)     |
| Masked gatherings (yes, church)   | 937 (56.9)      | 73 (56.6)                       | 543 (51.4)     |
| Unmasked gatherings/activities     | 745 (45.3)      | 61 (37.4)                       | 395 (37.4)     |

Number of SARS-CoV-2 cases among employees between 3/2020 and 4/2021 by month and stratified according to clinical employee working in the healthcare system, non-clinical employee employed by the healthcare system, and university employee

Results. From 3/2020 to 4/2021 we identified 3,140 COVID-19 infections in 3,119 employees out of a total of 34,562 employees (9.0%) (Figure 1). Of those 3,119 employees 1,685 (54.0%) were clinical employees working in the health system, 916 (29.4%) were non-clinical employees working in the health system, and 518 (16.6%) were university employees. Descriptive characteristics for the COVID-19 infections and adjudications are outlined in Table 2. Severe disease among employees was significantly less frequent compared to patients in the health system (15.3% vs 22.2%, p< 0.01). The frequency of travel within 14 days, masked gatherings and unmasked gatherings/activities was not significantly different between the community and unknown, likely community groups or the community and unknown groups (Table 3).

Conclusion. The majority of COVID-19 infections were linked to acquisition in the community, and few were attributed to workplace exposures. Employees with unknown sources of COVID-19 participated in higher-risk activities at approximately the same frequency as employees with community sources of COVID-19. The most frequently reported initial symptoms were mild and non-specific and rarely included fever. Despite a comprehensive testing and benefit program, a large proportion of COVID-positive employees worked with symptoms, highlighting ongoing challenges with prevalence in healthcare.

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379. Abstract For Comparison of Mandatory vs Non-Mandatory Compliance Rates For SARS-CoV-2 Testing in Grades K-12

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Session: P-16. COVID-19 Epidemiology and Screening

Background. Rapid testing to identify asymptomatically infected students with SARS-CoV-2 in elementary schools has been suggested as a possible method to reduce risk for in person instruction. As of August 3, 2020 (updated on January 25, 2021), California schools who obtained a waiver to conduct in-person instruction are not required to have mandatory testing for asymptomatic students, except for high contact sports which are required to undergo weekly testing. We explored the uptake of voluntary vs mandatory testing in a private waivered school.

Methods. Between the dates January 25, 2021 to April 16, 2021, the K-12 school superintendent sent an email to all parents outlining the voluntary testing program with a link to the on-line sign up and consent form. All students were offered weekly self-collected anterior nares BinaxNOW Rapid Antigen Test. Signed parental consent was required and tests were performed at the school. Students participating in contact sports were required to undergo testing the week a varsity game was played as a condition of participation. Data was gathered from the school administration and de-identified.

Results. K-5 Lower school had a school population of 448 students. Testing was offered on 8 weeks during the period of 2/15-2/19 to 4/5-4/9. 2 students (0.45%) received screening. 6-12 Upper school had a school population of 360 enrolled students. Testing was offered 3/8-3/12 and 3/15-3/19. The upper school had 22 students (6.11%) receive testing on the week of 3/8-3/12 and 21 students (5.83%) on the week of 3/15-3/19. Contact sports teams had 67 students on their roster. Weekly testing was offered from 3/22-3/26 to 4/12-4/16. Contact sports teams had 10 students (14.93%) receive testing on the week of 3/22-3/26, 33 students (52.24%) on the week of 4/5-4/9, and 32 students (49.25%) on the week of 4/12-4/16. Figure 1. Percent of students from each campus and sports team screened per week offered.

Percent of Students Tested

Conclusion. Voluntary SARS-CoV-2 screening was not a feasible approach for detection of asymptomatically infected individuals due to low uptake, however in the same school, mandatory testing had high uptake and would be a feasible strategy.

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380. Environmental Contamination with SARS-CoV-2 in Nursing Homes

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