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

Background. The COVID-19 pandemic has disproportionately affected nursing home (NH) patients, accounting for 5% of all cases and 32% of all COVID-19 deaths nationwide. Little is known about the frequency and persistence of SARS-CoV-2 environmental contamination in NHs. We characterize SARS-CoV-2 contamination in the rooms of COVID-19 patient rooms and common areas in and around COVID-19 units.

Methods. A prospective cohort study was conducted at four NHs in Michigan between October 2020 and January 2021. Clinical research personnel obtained swab specimens from high-touch room surfaces of COVID-19 infected patients, up to three times per patient. Weekly swab specimens from six high-touch surfaces in common areas were also obtained. Demographic and clinical data were collected from patient clinical records. Our primary outcome of interest was the probability of SARS-CoV-2 detection from specific environmental surfaces in COVID-19 patient rooms.

Results. One hundred four patients with COVID-19 were enrolled and followed for 241 visits. Patient characteristics included: 61.5% over the age of 80; 67.3% female; 89.4% non-Hispanic white; 50.1% short-stay. The study population had significant disabilities in activities of daily living (ADL; 81.7% dependent in four or more ADLs) and comorbidities including dementia (55.8%), diabetes (40.4%) and heart failure (32.7%) (Table 1). Over the 3-month study period, 2087 swab specimens were collected (1896 COVID-19 patient room surfaces, 191 common area swabs). Figure 1 shows contamination rates at sites proximate and distant to the patient bed. SARS-CoV-2 positivity was 28.4% (538/1896 swabs) on patient room surfaces and 3.7% (7/191 swabs) on common area surfaces. Over the course of follow-up, 89.4% (93/104) of patients had SARS-CoV-2 contamination in their room at least once (Figure 2). Environmental contamination detected on enrollment correlated with contamination of the same site during follow-up. Functional independence increased the odds of proximate contamination.

Table 1. Clinical and Demographic Characteristics of the Study Population Including Short- and Long-stay Patients

| Characteristic               | Total Population (n=104) | Short-stay patients (n=55) | Long-stay patients (n=49) | p-value |
|------------------------------|--------------------------|---------------------------|--------------------------|---------|
| Age                          |                          |                           |                          |         |
| 45-59                        | 12 (11.5)                | 5 (9.1)                   | 7 (14.3)                 | 0.115*  |
| 50-74                        | 29 (28.0)                | 17 (30.9)                 | 12 (24.5)                |         |
| 80-99                        | 36 (34.6)                | 16 (29.1)                 | 20 (40.8)                |         |
| Age<90                       | 26 (25.0)                | 13 (23.6)                 | 13 (26.5)                |         |
| Male                         | 34 (32.7)                | 21 (38.2)                 | 13 (26.5)                | 0.147*  |
| Race                         |                          |                           |                          |         |
| Non-Hispanic white           | 93 (89.4)                | 50 (90.9)                 | 43 (88.8)                | 0.125*  |
| Non-white or Unknown         | 11 (10.6)                | 5 (9.1)                   | 6 (12.2)                 |         |
| BMI ≤30, mean (SD)           | 10.4 (4.9)               | 10.2 (4.9)                | 11.2 (4.8)               | 0.265*  |
| Activities of Daily living   |                          |                           |                          |         |
| 0-3 disabilities (in all)    | 14 (13.5)                | 9 (16.4)                  | 5 (10.2)                 | 0.651*  |
| 1-4 disabilities            | 14 (13.5)                | 10 (18.2)                 | 4 (8.2)                  |         |
| Charlson Comorbidity index score, median (IQR) | 2 (1–3.5) | 2 (1–4.8) | 2 (2–3) | 0.756* |

Conclusion. We conclude that environmental contamination of surfaces in the rooms of COVID-19 patients is nearly universal and persistent. Patients with greater independence are more likely than fully dependent patients to contaminate their immediate environment.

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381. The Importance of Data Accuracy and Transparency for Policymaking During a Public Health Crisis: A Case Study in the State of Iowa

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Background. High-quality data are necessary for decision-making during the SARS-CoV-2 pandemic. Lack of transparency and accuracy in data reporting can erode public confidence, mislead policymakers, and endanger safety. Two major data errors in Iowa impacted critical state- and county-level decision-making.

Methods. The Iowa Department of Public Health (IDPH) publishes daily COVID-19 data. Authors independently tracked daily data from IDPH and other publicly available sources (i.e., county health departments, news media, social
networks). Data include: number and type of tests, results, hospitalizations, intensive care unit admissions, and deaths at state/county levels.

Results. Discrepancies were identified between IDPH and non-IDPH data, with at least two confirmed by IDPH. (1) The backdating of test results identified on May 28, 2020. IDPH labeled results as occurring up to four months before the actual test date. IDPH confirmed that if a person previously tested for SARS-CoV-2, a new test result was attributed to the initial test's date. Corrections on August 19, 2020 increased positivity rates in 31 counties, but decreased the state’s overall rate (9.1% to 7.5%). (2) The selective exclusion of antigen test results noted on August 20, 2020. Antigen testing was included in the total number of tests reported in metric denominators, but their results were being excluded from their respective numerators. Thus, positive antigen results were interpreted as de facto negative tests, artificially lowering positivity rates. Corrections increased Iowa's positivity rate (5.0% to 14.2%). In July 2020, the Iowa Department of Education mandated in-person K-12 learning for counties with < 15% positivity. These data changes occurred during critical decision-making, altering return-to-learn plans in seven counties. The Center for Medicare and Medicaid Services’ requirements also caused nursing homes to urgently revise testing strategies. Some observational studies suggest that vitamin D supplementation activates the innate immune system and reduces the incidence and severity of viral infections. It is estimated that 18% of adults in the U.S. take Vitamin D supplements. Hospitalization and mortality were higher among those taking Vitamin D in this cohort. Vitamin D is widely used to prevent and treat SARS-CoV-2 but without evidence of efficacy.

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383. Feasibility of Specimen Self-collection in Young Children Undergoing SARS-CoV-2 Surveillance for In-person Learning
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Background. While pediatric cases of COVID-19 are at low risk for adverse events, schoolchildren should be considered for surveillance as they can become infected at school and serve as sources of household or community transmission. Our team assessed the feasibility of young children self-collecting SARS-CoV-2 samples for surveillance testing in an educational setting.

Methods. Students at a K-8 school were tested weekly for SARS-CoV-2 from September 2020 - June 2021. Error rates were collected from September 2020 - January 2021. Clinical staff provided all students with instructions for anterior nares specimen self-collection and then observed them to ensure proper technique. Instructions included holding the sterile swab while making sure not to touch the tip, inserting the swab into their nostril until they start to feel resistance, and rubbing the swab in four circles before repeating the process in their other nostril. An independent observer timed random sample collections from April - June 2021.

Results. 2,590 samples were collected from 209 students during the study period when data on error rates were collected. Errors occurred in 3.3% of all student encounters (n=87). Error rates over time are shown in Figure 1, with the highest rate occurring on the first day of testing (n=20/197, 10.2%) and the lowest in January 2021 (n=3/202, 0.5%). 2,574 visits for sample self-collection occurred during the study period when independent timing data was collected (April - June 2021). Of those visits, 7.5% (n=193) were timed. The average duration of each visit was 70 seconds.

Figure 1. Swab Error Rates Over Time

Conclusion. Pediatric self-collected lower nasal swabs are a viable and easily tolerated specimen collection method for SARS-CoV-2 surveillance in school settings, as evidenced by the low error rate and short time window of sample self-collection during testing. School administrators should expect errors to drop quickly after implementing testing.

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384. SARS-CoV-2 Surveillance Testing Patterns among Hospitalized Pediatric Patients in a Single Academic Medical Center
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Conclusion. Pediatric self-collected lower nasal swabs are a viable and easily tolerated specimen collection method for SARS-CoV-2 surveillance in school settings, as evidenced by the low error rate and short time window of sample self-collection during testing. School administrators should expect errors to drop quickly after implementing testing.

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