

Presentation Type:

Poster Presentation

Subject Category: COVID-19**Transmission of *Acinetobacter baumannii* by Surgical Masks During the COVID-19 Pandemic**

Lisa Saidel; Abraham Borer and Orli Sagi

Background: *Acinetobacter baumannii*, one of the major causes of nosocomial infections in modern healthcare systems, is characterized by its great persistence in the environment and by its ability to rapidly develop resistance to many antimicrobials. Most *A. baumannii* infections occur in intubated critically ill patients, causing ventilator-associated pneumonia which is a leading cause of mortality. During the coronavirus disease 19 (COVID-19) pandemic an increase in hospital-acquired carbapenem-resistant *A. baumannii* (CRAB) infection and colonization in acute-care hospitals has been described. CRAB healthcare-associated infections are often linked to breaches of infection prevention and control (IPC). Beginning in April 2020, our hospital's IPC unit ordered mandatory universal masking for all healthcare workers (HCWs). Shortages of personal protective equipment during the COVID-19 pandemic led to extended use of surgical face masks by HCWs in our hospital. We investigated whether the extended use of surgical face masks was linked to an increase of CRAB colonization in our intubated critically ill patients. **Methods:** Surgical masks were collected from doctors, nurses, and housekeeping staff working in 2 internal medicine departments, each including a 4-bed unit for intubated critically ill patients. All surgical masks were worn continuously for 4–5 hours before removal. "Cases" were defined as HCWs who treated CRAB colonized critically ill patients. "Controls" were defined as HCWs who did not enter the critically ill patient unit. Surgical masks were incubated with BHI enrichment broth (HyLabs Rehovot, Israel) for 48 hours at 35°C. BHI was seeded on multidrug-resistant (MDR)-selective CHROMagar plates (HyLabs) and incubated overnight at 35°C. Identification was performed using MALDI-ToF mass spectrophotometry (bioMérieux, France). Susceptibility was tested using Vitek 2 (bioMérieux). **Results:** In total, 55 HCWs participated in the study: 25 cases and 30 controls. Masks from 10 cases (40%) were colonized with *Acinetobacter* spp versus only 3 masks (10%) from controls (OR, 5.98; 95% CI, 1.42–25; $P = .012$). Of 13 masks contaminated with *Acinetobacter* spp, 8 of 10 contaminated masks among cases were colonized with CRAB, whereas only 1 of 3 masks of controls was colonized with CRAB. **Conclusions:** During the COVID-19 pandemic, extended surgical mask use while treating patients colonized with CRAB increased mask contamination with this bacterium. Surgical masks should be changed after treating a patient colonized with CRAB the same way gown and glove removal and hand hygiene are performed.

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Subject Category: COVID-19**Whole-Genome Sequencing: The Key to Unlocking a Nosocomial Outbreak of Coronavirus Disease 2019 (COVID-19)**

Lindsey Gottlieb; Emilia Sordillo; Harm van Bakel; Barbara Smith; Bernard Camins; Sarah Alsamarai; Viviana Simon and Kilyoub Kim

Background: Accurately tracing nosocomial transmission of coronavirus disease 2019 (COVID-19) is critical to developing effective infection prevention policies. Given the high prevalence and variable incubation period of SARS-CoV-2 infection, the utility of traditional contact tracing is limited. We describe a nosocomial outbreak in which whole-genome sequencing (WGS) was pivotal to identifying the primary case. **Methods:** This study was conducted at a New York City academic hospital. The index case was identified on August 13, 2020, and the last case on September 9, 2020. Hospital policy required all inpatients to be screened for COVID-19 on © The Author(s), 2021. Published by Cambridge University Press on behalf of The Society for Healthcare Epidemiology of America. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

admission by SARS-CoV-2 molecular amplification testing. All healthcare workers (HCWs) were required to wear masks and eye protection for patient care. After a patient (patient 1), who tested SARS-CoV-2 negative on admission, was positive on preprocedure screening on hospital day 9, contact tracing was initiated. Two patients (patients 2 and 3) and 13 HCWs with high-risk exposures (HREs) to patient 1 were quarantined and referred for testing. Additional surveillance testing was performed on 18 inpatients and 84 HCWs on the affected unit. Patients 2 and 3 and 3 HCWs (HCW-1, -2, and -3), only 1 of whom had a high-risk exposure to patient 1, tested positive. WGS was performed to further investigate this outbreak. **Results:** The outbreak variant (clade 20A) was found in samples from 6 patients and 2 HCWs. Patients 2 and 3 were roommates of patient 1 in the 2 days before patient 1's positive test, and they did not consistently wear masks in the room. HCW-1 placed a peripheral IV in patient 1 the day before patient 1's positive test without wearing eye protection. Four additional cases in this cluster (patients 4–6 and HCW-4) were identified by surveillance WGS of positive tests. A review indicated that patient 1 was located ~3 m (~10 feet) away from patient 4 in the emergency department (ED) for 6 hours on hospital day 1, when the admission SARS-CoV-2 test from patient 4 was not positive. No epidemiologic link was found to patient 5 or 6 or HCW-4. The specimen from HCW-2 was inadequate for WGS. The specimen from HCW-3 was not linked to this cluster. **Conclusions:** This complex nosocomial outbreak highlights the importance of WGS in understanding transmission events. Patient 4 was not identified by traditional contact tracing but was linked to patient 1 and was recognized as the primary case through WGS, having likely infected patient 1 in the ED. Based on these findings, we focused our corrective actions on more promptly isolating suspected COVID-19 cases in the ED, increasing inpatient masking, and improving HCW adherence to universal eye protection.

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Subject Category: COVID-19**Predicting SARS-CoV-2 Asymptomatic Infection Rate of Inpatients: A Time Series Analysis**

Frida Rivera; Kwang Woo Ahn and L. Silvia Munoz-Price

Background: Asymptomatic SARS-CoV-2 infections play a crucial role in viral transmission. However, they are often difficult to identify given that widespread surveillance has not been the norm. We sought to determine whether COVID-19 rates reported at the county level could predict the positivity rates for SARS-CoV-2 among asymptomatic patients tested in a large academic health system. **Methods:** This observational study was conducted from April 23, 2020, to December 10, 2020, at Froedtert Health (FH) system, the largest academic health system in Wisconsin. On April 23, 2020, FH implemented SARS-CoV-2 surveillance among all consecutive admissions not suspected of COVID-19, all patients scheduled for elective procedures and deliveries, and all asymptomatic patients with known exposures. Samples were processed by the FH laboratory using molecular methods (RT-PCR). To obtain the daily number of newly confirmed COVID-19 cases in Milwaukee County, we accessed the Wisconsin Department of Health Services publicly available COVID-19 database. For the purpose of this study, COVID-19 rates were defined as the percentage of positive tests among all daily tests performed at the county level, while SARS-CoV-2 positivity rates were the percentage of positive tests among all daily surveillance tests performed at FH among asymptomatic patients. The association between COVID-19 rates in Milwaukee County and asymptomatic rates at FH were assessed using an autoregressive moving average time series analysis. To examine the association between these rates, we fitted a seventh-order autoregression for the residuals based on autocorrelation function and partial autocorrelation function plots of the residuals from linear regression. **Results:** From April 23, 2020, to

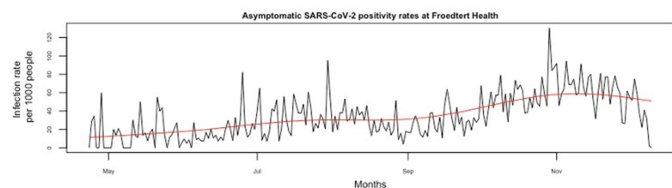


Figure 1.

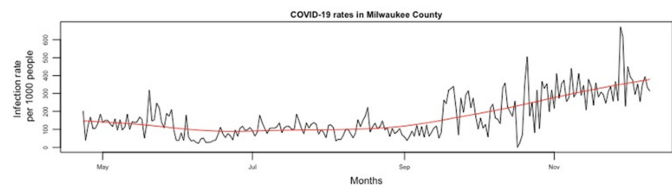


Figure 2.

December 10, 2020, there were 2,347 new asymptomatic infections detected at FH and 75,196 new COVID-19 cases reported in Milwaukee County. Figure 1 shows the time-series plot of asymptomatic SARS-CoV-2 positivity rates at FH and Figure 2 shows COVID-19 rates in Milwaukee County. As the COVID-19 rate in Milwaukee County increased by 1 unit, the asymptomatic infection rate in FH decreased by 0.024 unit (95% CI, -0.053 to 0.004; $P = .095$) after accounting for autocorrelation over time. Thus, there was no association between these rates. **Conclusions:** The positivity rates among asymptomatic patients at a large medical center were not predicted by the positivity rate at the county level. This finding suggests that the epidemiology at a county level may be determined by pockets in the population who may not interact, and thus not affect, the positivity rates among asymptomatic patients served by a hospital system within the county.

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Investigation on Occupational Protection and Exposure of Medical Staff in the Diagnosis and Treatment of COVID-19 in Sichuan

Wenzhi Huang; Zhiyong Zong; Fu Qiao and Ji Lin

Background: We investigated the contact status of medical staff with confirmed or suspected patients with COVID-19 in Sichuan Province, China, as well as the use of personal protective equipment at the time of contact, and we explored the factors affecting the effective use of personal protective equipment. **Methods:** We performed a cross-sectional study by distributing a questionnaire on occupational protection and exposure of medical staff in the diagnosis and treatment of COVID-19 using a convenience sampling method for online surveys from February 23 to February 29, 2020. **Results:** In total, 13,829 valid questionnaires from 644 hospitals in Sichuan Province were retrieved, and 802 people were exposed to confirmed or suspected patients with COVID-19, accounting for 5.80%. 688 (85.79%) of 802 people who reported that they had taken effective personal protection measures for each exposure. Sex, work department, and length of service were the independent factors influencing the effective use of personal protective equipment in multivariate analysis ($P < .05$). **Conclusions:** Medical institutions need to continue to strengthen the training regarding standard precautions and personal protection, especially for general departments other than fever clinics and isolation wards, as well as medical staff with few working years, to ensure the occupational safety of medical staff.

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COVID-19 Vaccine Superstations as a Model to Rapidly Achieve Herd Immunity

Jocelyn Keehner; Francesca Torriani; Shira Abeles and Lucy Horton

Background: The County of San Diego Health and Human Services (SDHSA) established a goal to vaccinate 1.9 million residents as quickly as possible to attain vaccine induced herd immunity. This strategy would minimize the emergence of more transmissible variants, to which some vaccines may be less effective. With this strategy in mind, UC San Diego Health (UCSDH) collaborated with the local health authorities and the San Diego Padres to build a superstation in downtown San Diego in the parking lot of a baseball stadium. **Methods:** Building on the experience of rapidly vaccinating the UCSDH workforce in mid-December 2020, UCSDH and SDHSA partnered to more efficiently distribute SARS-CoV-2 vaccine in San Diego County by building a vaccine superstation. The San Diego Padres offered their parking lot as the site; it was centrally located, easily accessible, quick to set up, and semipermanent. They also provided infrastructure support, event coordination, and internet capability. Occupying a space of ~6.5 acres, the superstation included 12 lanes serving 12 cars each, with ~3 cycles every hour, as well as a pedestrian walk-up station. Altogether, the site had the capacity for >5,000 vaccinations daily. This effort required coordination among administration, healthcare providers, IT specialists, and support staff—a daily workforce of >300 persons. The workforce needs were met using a multipronged approach, including flexible staffing, coordination of volunteers, and recruitment of previously retired providers. The private-public partnership enabled the superstation to be up and running in 5 days. **Results:** The operation was quickly ramped up to provide >6,000 vaccines daily. Initially only open to healthcare workers, on January 17 the superstation was expanded to persons aged >75 years, with further expansion to those aged ≥65 years on January 23. From January 11 to February 5, >100,000 individuals received their first dose of vaccine at the superstation, corresponding to ~31% of all San Diego county vaccinations. **Conclusions:** Vaccination of as many people as quickly as possible is essential to controlling the pandemic. Unchecked replication of SARS-CoV-2 allows increases the chance that the virus may develop mutations that render vaccines and therapeutics less effective. Our model vaccine superstation was replicated at 3 more sites around the county, the limited allocation of vaccine has been the only barrier to further expansion. A force of 10 superstations could administer a first dose to the remaining 1.6 million county residents within 32 days.

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Mortality Among Veterans' Affairs Community Living Center (CLC) Residents with COVID-19

Taissa Bej; Brigid Wilson; Sunah Song; Janet M Briggs; Richard Banks; Sonya Kothadia; Federico Perez; Robin Jump and Nicole Mongilardi

Background: Outcomes among nursing home residents with asymptomatic compared to symptomatic COVID-19 are not well characterized. We assessed all-cause mortality among Veterans' Affairs (VA) community living center (CLC) residents; we compared those residents with a negative SARS-CoV-2 test to residents with symptomatic, presymptomatic, and