

Figure 1.

Conclusions: Most COVID-19 cases following vaccination occurred in CTMs with infection incubating prior to vaccination. No significant attenuation of viral load is apparent among vaccinated CTMs with COVID-19, but asymptomatic CTMs diagnosed with COVID-19 following vaccination appear to have resolved infections. Our data reinforce the need to adhere to public health measures by people who have been vaccinated.

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Selection and Duration of Therapy as a Target for Antimicrobial Stewardship during COVID-19: Levees for a Hundred-Year Flood

Alfredo Mena Lora; Rodrigo Burgos; Ella Li; Nichelle Simpkins; Fischer Herald; John Marchionne; Mirza Ali; Eden Takhsh; Sherrie Spencer; Candice Krill; Susan Bleasdale and Scott Borgetti

Background: The disease caused by SARS-CoV-2, COVID-19, has caused a pandemic leading to strained healthcare systems worldwide and an unprecedented public health crisis. The hallmark of severe COVID-19 is lower respiratory tract infection (LRTI) and hypoxia requiring hospitalization. A paucity of data on bacterial coinfection and a lack of therapeutic options for COVID-19 during the first surge of cases has increased pressure on antimicrobial use and has challenged antimicrobial stewardship programs (ASPs). We implemented a multimodal approach to antimicrobial stewardship in an urban safety-net community hospital targeting selection and duration of therapy. **Methods:** Retrospective review of cases during the first wave of COVID-19 in a 151-bed urban safety-net community hospital from March to June 2020. EMR order sets (Figure 1) and prospective audit and feedback by ASPs targeting empiric antimicrobial selection and duration were implemented as part of the COVID-19 response. Hospitalized patients with COVID-19 were reviewed retrospectively. Demographic information was collected. Data on antimicrobial use were tabulated, including selection and duration of antimicrobials (Figure 1). **Results:** In total, 302 patients were reviewed, of whom 221 (73%) received empiric antimicrobials. The most commonly used antimicrobials were ceftriaxone and azithromycin (Figure 2). Days of therapy per 1,000 patient days (DOT/1,000 PD) for ceftriaxone increased from 71 in the quarter prior to 113 during the study period. Average duration of therapy was 6 days. In the ICU, average duration was 8 days compared to 5 days in non-ICU settings. Average durations of parenteral therapy were 5.54 days in the ICU and 3.36 days in non-ICU settings. Procalcitonin was obtained in 37 cases (17%) and ranged from 0.09 to 12.57 ng/mL, with an average of 1.21 ng/mL. No cases had documented bacterial coinfection (Figure 2).

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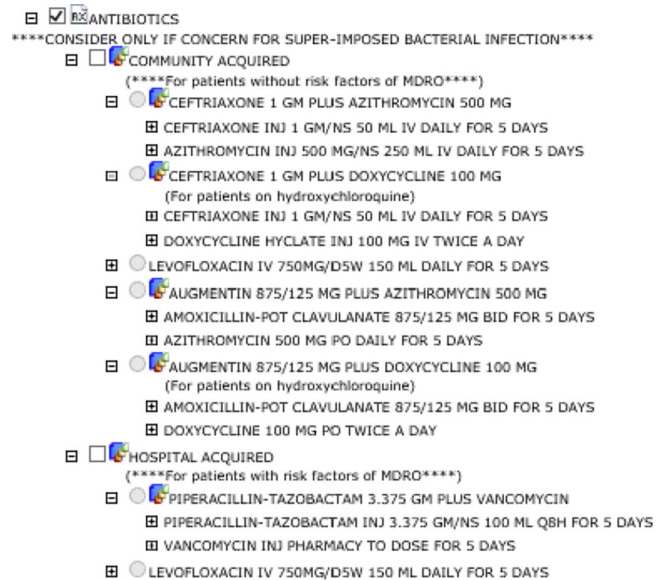


Figure 1. Antimicrobials in the electronic medical record COVID-19 order set.

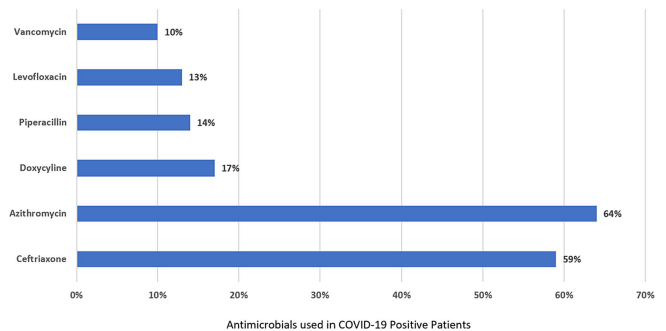


Figure 2. Antimicrobials used in patients with COVID-19.

Conclusions: Antimicrobials were commonly prescribed during the first wave of COVID-19 in a safety-net community hospital. Procalcitonin did not guide therapy nor did lack of documented coinfection change physician behavior. With limited resources, ASP successfully guided clinicians toward IDSA guideline recommendations for selection and duration, as evidenced by antimicrobial use. During this unprecedented surge of LRTIs, a multimodal approach to antimicrobial stewardship was used and guided toward early transition to oral agents and shorter durations.

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Impact of COVID-19 on Antimicrobial Use and Resistance in an Urban Safety-Net Community Hospital

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Background: The disease caused by SARS-CoV-2, COVID-19, has caused a pandemic leading to strained healthcare systems worldwide and an

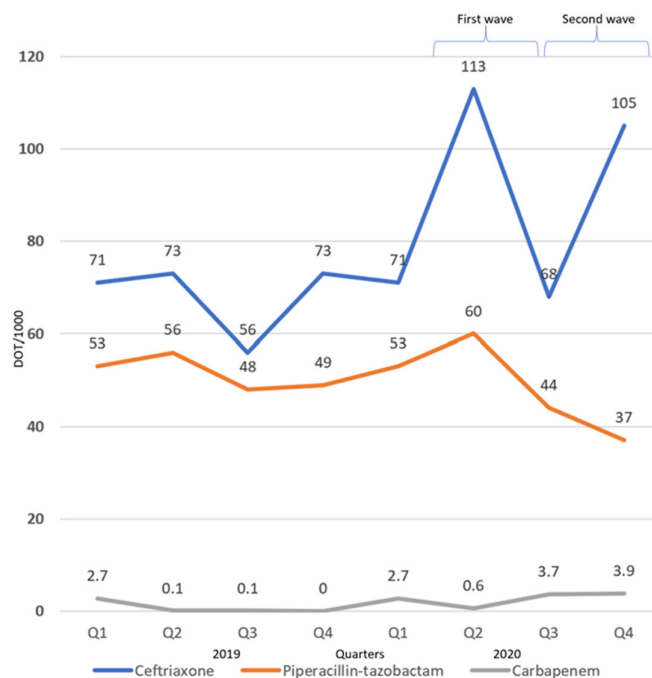


Figure 1. DOT per 1,000 PD by quarter (Q1–Q4) during the first and second waves of COVID-19.

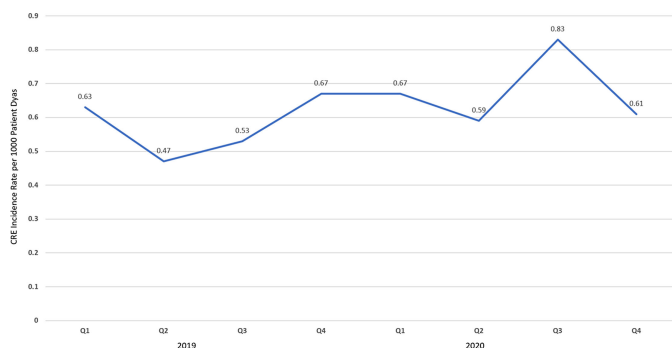


Figure 1. CRE infection incidence rate per 1,000 patient days.

unprecedented public health crisis. Lower respiratory tract infections (LRTIs) and hypoxia caused by COVID-19 has led to an increase in hospitalizations. We sought to define the impact of COVID-19 on antimicrobial use and antimicrobial resistance (AMR) in an urban safety-net community hospital. **Methods:** Retrospective review of antimicrobial use and AMR in a 151-bed urban community hospital. Antimicrobial use was calculated in days of therapy per 1,000 patient days (DOT/1,000 PD) for ceftriaxone, piperacillin-tazobactam and meropenem during 2019 and 2020. Ceftriaxone, piperacillin-tazobactam and meropenem were reviewed for calendar year 2019 and 2020. AMR was assessed by comparing the carbapenem resistant Enterobacteriaceae (CRE) infection incidence rate per 1,000 patient days between 2019 and 2020. **Results:** The average quarterly DOT/1,000 PD increased from 359.5 in 2019 to 394.25 in 2020, with the highest increase in the second and fourth quarters of 2020, which temporarily correspond to the first and second waves of COVID-19. Ceftriaxone and meropenem use increased during the first and second waves of COVID-19. Piperacillin-tazobactam use increased during the first wave and declined thereafter (Figure 1). Rates of CRE increased from a quarterly average of 0.57 to 0.68 (Figure 2). **Conclusions:** Antimicrobial pressure increased during the first and second waves of COVID-19. Ceftriaxone was

the most commonly used antimicrobial, reflecting internal guidelines and ASP interventions. CRE rates increased during COVID-19. This finding may be due to an overall increase in antimicrobial pressure in the community and in critically ill patients. Antibiotics are a precious resource, and antimicrobial stewardship remains important during the COVID-19 pandemic. Appropriate use of antimicrobials is critical to preventing AMR.

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Sociodemographic Factors, Cycle Threshold Values, and Clinical Outcomes of COVID-19

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Background: The gold standard for diagnosis of COVID-19 has been SARS-CoV-2 detection by reverse-transcriptase-quantitative polymerase chain reaction (RT-qPCR), which provides a semiquantitative indicator of viral load (cycle threshold, Ct). Our research group previously described how African American race and poverty were associated with an increased likelihood of hospitalization due to COVID-19. We sought to characterize the relationship between Ct values and clinical outcomes while controlling for sociodemographic factors. **Methods:** We conducted a cross-sectional study of SARS-CoV-2-positive patients admitted to Froedtert Health between March 16 and June 1, 2020. Ct values were obtained by direct interrogation of either cobas SARS-CoV-2 or Cepheid Xpert Xpress platforms. Patient demographics, comorbidities, symptoms at admission, health insurance, and hospital course were collected using electronic medical records. A proxy for socioeconomic disadvantage, area-deprivation index (ADI), was assigned using ZIP codes. Multivariate models were performed to assess associations between Ct values and clinical outcomes while controlling for ADI, race, and type of insurance. **Results:** Overall, 302 patients were included. The mean age was 60.89 years (SD, 18.2); 161 (53%) were men, 177 (58%) were African Americans; and 156 (51%) had Medicaid or were uninsured. Of the 302 inpatients, 158 (52%) required admission to the ICU, 199 (65.9%) were discharged to home, 49 (16.2%) were discharged to a nursing home, and 54 (17.9%) died. Lower Ct values (higher viral load) were associated with Medicaid or lack of insurance (coefficient, -2.88 , 95% confidence interval [CI], -4.96 to -0.79 , $P = .007$) and age >60 years old (coefficient, -2.98 , 95% CI -4.87 to -1.08 , $P = .002$). Contrary to what was expected, higher CT values (lower viral load) were associated with higher ADI scores (coefficient, 2.62, 95% CI, 0.52–4.85; $P = .017$). However, when patients were stratified into low, medium, and high

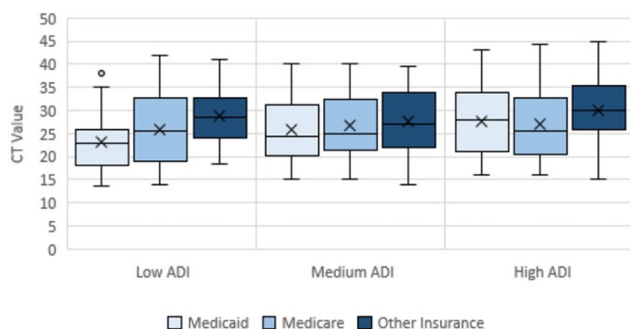


Figure 1: Cycle Threshold (CT) Value Distribution by Patient Insurance Type stratified by Area Deprivation Index (ADI). Medicaid group includes no insurance. High ADI is worse. Higher CT values represent lower viral loads and vice versa.