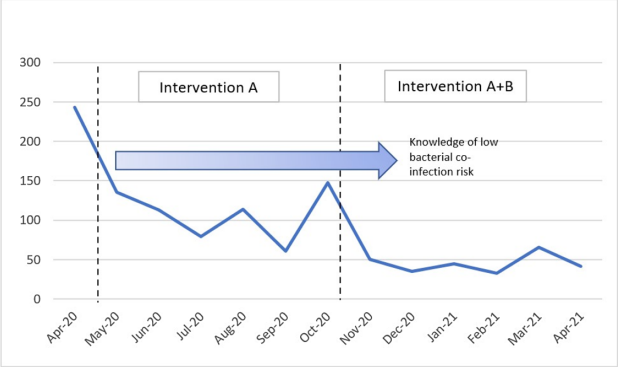
Figure 1. Community-acquired pneumonia antibiotics per 100 COVID-19 positive patients



using Poisson distribution. **Results:** During the study period, 814 unique patients had COVID-19 infection: 182 (22.4%) patients admitted to the acute-care center, 66 (8.1%) long-term care residents, and 566 (69.5%) were managed outside the hospital. Of these 814 patients, 211 (25%) were prescribed a CAP antibiotic. Of the antibiotics prescribed, 223 (61%) were ceftriaxone, cefpodoxime, amoxicillin-clavulanate, or ampicillin-sulbactam; 123 (34%) were azithromycin; and 16 (4.4%) were levofloxacin. We observed a decrease in the frequency of all antibiotic prescriptions after intervention B was added: 32% (86 of 273) vs 23% (125 of 541) (P = .01). Decreases in antibiotic prescriptions were observed in all locations: acute care (57% vs 44%), long-term care (53% vs 41%) and outpatient care (19% vs 15%). The rates of CAP antibiotic prescribing per 100 COVID-19–positive patients were 114 in the preintervention period and 45 in the postintervention period, a rate difference of −70 antibiotics per 100 COVID-19–positive patients (p **Conclusions:** Curbing antibiotic use for CAP indication during the COVID-19 pandemic was a challenge. A multifaceted approach focusing on education was an impactful intervention leading to significant decreases in antibiotic prescribing despite COVID-19 cases increasing.

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Impact of different COVID-19 encounter definitions on antibiotic prescribing rates in urgent care

Sharon Onguti; David Ha; Emily Mui; Amy Chang; Eddie Stenehjem; Adam Hersh and Marisa Holubar

Background: Billing data have been used in the outpatient setting to identify targets for antimicrobial stewardship. However, COVID-19 ICD-10 codes are new, and the validity of using COVID-19 ICD-10 codes to accurately identify COVID-19 encounters is unknown. We investigated COVID-19 ICD-10 utilization in our urgent care clinics during the pandemic and the impact of using different COVID-19 encounter definitions on antibiotic prescribing rates (APRs). **Methods:** We included all telemedicine and office visits at 2 academic urgent-care clinics from January 2020 to September 2021. We extracted ICD-10 encounter codes and testing data from the electronic medical record. We compared encounters for which COVID-19 ICD-10 codes were present with encounters for which SARS-CoV-2 nucleic acid amplification testing (NAAT) was performed within 5 days of and up to 2 days after the encounter (Fig. 1). We calculated the sensitivity of the use of COVID-19 ICD-10 codes against a positive NAAT. We calculated the APR as the proportion of encounters in which an antibacterial drug was prescribed. This quality improvement project

Table 1. Overall agreement in use of COVID-19 ICD-10 codes and NAAT

	NAAT positive	NAAT negative	Total
COVID ICD-10 present	1,154 (63%)	159 (1%)	1,313
COVID ICD-10 not present	686 (37%)	12,826 (99%)	12,826
Total	1,840	12,985	14,825

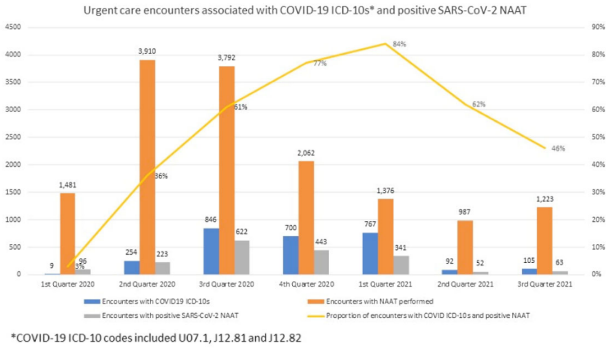
*COVID-19 ICD-10 codes included U07.1, J12.81 and J12.82

Table 2. Antibiotic prescribing rate (APR) for different COVID-19 encounter definitions

Encounters	N	APR n (%)
Z20.822 Contact with and (suspected) exposure to COVID-19	1,211	6 (0.5%)
U07.1 COVID-19	2,773	40 (1.4%)
J12.81 Pneumonia due to SARS-associated coronavirus	0	0
J12.82 Pneumonia due to COVID-19*	117	6 (5.1%)
NAAT performed	14,831	766 (5.1%)
Positive NAAT	1,840	37 (2.0%)
Positive NAAT or U07.1 OR J12.81 OR J12.8	3,459	62 (1.8%)

*All J12.82 encounters also had U07.1

Figure 1



*COVID-19 ICD-10 codes included U07.1, J12.81 and J12.82

was deemed non–human-subjects research by the Stanford Panel on Human Subjects in Medical Research.

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Tier-based antimicrobial stewardship metrics for genitourinary-related antibiotic use in Veterans' Affairs outpatient settings

Matthew Samore; Matthew Goetz; McKenna Nevers; Jacob Crook; Suzette Rovelsky; Ben Brintz; Kelly Echevarria; Melinda Neuhauser; Sharon Tsay; Lauri Hicks and Karl Madaras-Kelly

Background: Tracking antibiotic use is a core element of antimicrobial stewardship. We developed a set of metrics based on electronic health record data to support an outpatient stewardship initiative to improve management of urinary tract infections (UTIs) in Veterans' Affairs (VA) emergency departments (EDs) and primary care clinics. Because UTI diagnostic codes only capture a portion of genitourinary (GU)-related antibiotic use, a tier-based approach was used to evaluate practices. **Methods:** Metrics were developed to target practices related to antibiotic prescribing and diagnostic testing (Table 1). GU conditions were divided into 3 categories: tier 1, conditions for which antibiotics are usually or always indicated; tier 2, conditions for which antibiotics are sometimes indicated; and tier 3, conditions for which antibiotics are rarely or never indicated (eg, benign prostatic hypertrophy with symptoms). Patients with visits related to urological procedures, nontarget providers, and concomitant non-GU

Table 1: List of Metrics

Metric	Description	Target practice	Total n/N (%)
1	Proportion (prop) of GU conditions with antibiotic prescribed	Overall AU	11,840/69,816 (17.0%)
2	Prop of tier 3 GU conditions that were antibiotic treated	Unnecessary AU	1,276/39,386 (3.2%)
3	Prop of treated UTI (excluding pyelonephritis) visits associated with preferred antibiotic class	Antibiotic selection	3,545/5,020 (70.6%)
4	Prop of treated UTI (excluding pyelonephritis) where duration was ≤7 days	Treatment duration	3,242/5,020 (64.6%)
5	Prop of tier 1 GU visits with risk factors for antibiotic resistance with culture obtained	Diagnostic testing	1,183/1,676 (70.6%)
6a	Rate of collection of urinalyses (UA) per primary care/ED visit	UA ordering	266,784/ 1,214,620 (22.0%)
6b	Rate of collection of UA plus antibiotic prescription, per primary care/ED visit	AU	28,366/1,214,620 (2.3%)

Figure 1: Heatmap of correlation matrix

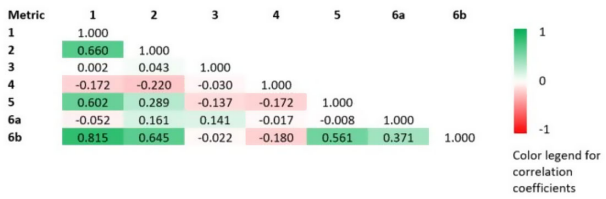
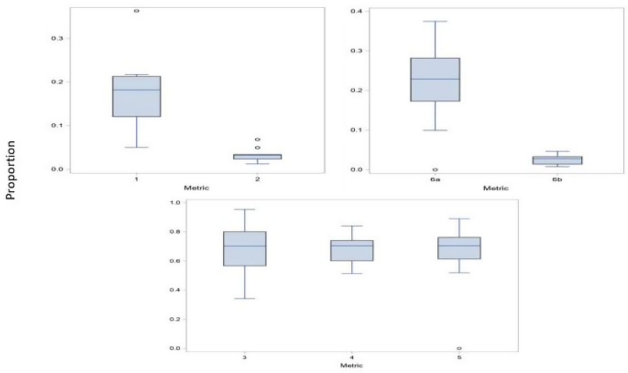


Figure 2 : Box plots for each metric showing median, upper quartile, lower quartile, outliers (circles) for metrics calculated on 18 facilities in a western VA network



infections were excluded. Descriptive analyses included calculation of the correlation matrix for the 7 metrics and the construction of box plots to display interfacility variability. **Results:** Metrics were calculated quarterly for 18 VA medical centers, including affiliated clinics, in a western VA network, from July 2018 to June 2020 (Table 1). Tier 3 GU conditions accounted for 1,276 of 11,840 (11%) of GU-related antibiotic use. Metrics 1 and 6b were strongly correlated with each other and were also positively correlated with metrics 2 and 5 (coefficients > 0.5) (Fig. 1). Substantial interfacility variation was observed (Fig. 2). **Conclusions:** Stewardship metrics for suspected or documented UTIs can identify opportunities for practice improvement. Broadly capturing GU conditions in addition to UTIs may enhance utility for performance feedback. Antibiotic prescribing for tier 3 GU conditions is analogous to unnecessary antibiotic use for acute, uncomplicated bronchitis and upper respiratory tract infections.

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COVID-19 incidence among nonphysician healthcare workers at a tertiary care center—Iowa, 2020–2021

Takaaki Kobayashi; John Heinemann; Alexandra Trannel; Alexandre Marra; William Etienne; Oluchi Abosi; Stephanie Holley; Mary Kukla; Angie Dains; Kyle Jenn; Holly Meacham; Beth Hanna; Bradley Ford; Melanie Wellington; Patrick Hartley; Daniel Diekema and Jorge Salinas

Background: Whether working on COVID-19 designated units put healthcare workers (HCWs) at higher risk of acquiring COVID-19 is not fully understood. We report trends of COVID-19 incidence among nonphysician HCWs and the association between the risk of acquiring COVID-19 and work location in the hospital. **Methods:** The University of Iowa Hospitals & Clinics (UIHC) is an 811-bed, academic medical center serving as a referral center for Iowa. We retrospectively collected COVID-19–associated data for nonphysician HCWs from Employee Health Clinic between June 1st 2020 and July 31th 2021. The data we abstracted included age, sex, job title, working location, history of COVID-19, and date of positive COVID-19 test if they had a history of COVID-19. We excluded HCWs who did not have a designated working location and those who worked on multiple units during the same shift (eg, medicine resident, hospitalist, etc) to assess the association between COVID-19 infections and working location. Job titles were divided into the following 5 categories: (1) nurse, (2) medical assistant (MA), (3) technician, (4) clerk, and (5) others (eg patient access, billing office, etc). Working locations were divided into the following 6 categories: (1) emergency department (ED), (2) COVID-19 unit, (3) non–COVID-19 unit, (4) Clinic, (5) perioperative units, and (6) remote work. **Results:** We identified 6,971 HCWs with work locations recorded. During the study period, 758 HCWs (10.8%) reported being diagnosed with COVID-19. Of these 758 COVID-19 cases, 658 (86.8%) were diagnosed before vaccines became available. The location with the highest COVID-19 incidence was the ED (17%), followed by both COVID-19 and non–COVID-19 units (12.7%), clinics (11.0%), perioperative units (9.4%) and remote work stations (6.6%, p **Conclusions:** Strict and special infection control strategies may be needed for HCWs in the ED, especially where vaccine uptake is low. The administrative control of HCWs working remotely may be associated with a lower incidence of COVID-19. Given that the difference in

Table 1: Comparison of demographics between healthcare workers with and without COVID-19, 2020-2021, Iowa

	COVID positive N= 758	COVID negative N = 6213	P value	Odds ratio*
Age, mean (range)	35.1 (19-72)	38.4 (18-78)	<0.01	0.99 (0.98-0.99) per additional year
Gender (female)				
Female	655 (86.4%)	5193 (83.6%)	0.045	1.1 (0.88-1.4)
Male	103 (13.6%)	1020 (16.4%)		reference
Job title (% = # of positive HCW within the category)			<0.01	
Medical assistant N=394	64 (16.5%)	330 (83.8%)		1.55 (1.04-2.33)
Nurse N=4,030	489 (12.1%)	3541 (87.9%)		reference
Technician N=323	34 (10.5%)	289 (89.5%)		0.99 (0.67-1.47)
Clerk N=221	21 (9.5%)	200 (90.5%)		1.00 (0.62-1.61)
Other N=2,003	150 (7.5%)	1853 (92.5%)		0.74 (0.56-0.98)
Location (% = # of positive HCW within the category)			<0.01	
Emergency department N=188	32 (17.0%)	156 (83.0%)		1.55(1.04-2.33)
COVID units N=370	47 (12.7%)	323 (87.3%)		0.97 (0.70-1.35)
Non-COVID units N=2,576	326 (12.7%)	2250 (87.3%)		reference
Clinics N=1,972	217 (11.0%)	1755 (89.0%)		0.91 (0.72-1.15)
Peri-operative N=479	45(9.4%)	434 (90.6%)		0.75 (0.54-1.05)
Remote working N=1,386	91 (6.6%)	1295 (93.4%)		0.75 (053-1.08)