reduction in slope (change in trend, IRR, 0.997; 95% CI, 0.995 to 0.999; $P = 0.007$). No concomitant change was seen in the trend of CA-CDI (change in trend, IRR, 0.997; 95% CI, 0.992 to 1.002; $P = 0.2$) despite a slight immediate change in level at inflection point (IRR, 1.131; 95% CI, 1.000 to 1.278; $P = 0.05$).

Conclusion. Between 2008 and 2015, the provincial incidence of hospitalized CA-CDI has significantly increased while the incidence rate of HA-CDI has remained relatively stable. Further studies are required to investigate the factors underlying this increase.

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478. Improving Acid Suppression Therapy to Reduce Hospital-Onset *C. difficile* infection (HO-CDI): Impact of a Novel Analytic Application

Stephen Eppes, MD[1]; Marci Drees, MD, MS[2]; Donna Walsh, PharmD[2]; Nicole Harrington, PharmD[3]; Michael Winiarz, BS, MS[2]; Anthony Gabriel, PharmD[3] and Edward F. Ewen, MD[2]; [1]Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia, Pennsylvania, [2]Christiana Care Health System, Newark, Delaware, [3]Pharmacy, Christiana Care Health System, Newark, Delaware

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Background. Proton pump inhibitors (PPIs) are among the most widely used classes of drugs, especially in the elderly, who are also at higher risk for CDI. Acid suppression therapy, especially using PPIs, has been shown to increase the risk of CDI. As part of an institutional effort to reduce HO-CDI, we developed an analytic application to support PPI stewardship.

Methods. We conducted this study in a 2-hospital, >1,100-bed community-based academic healthcare system in northern Delaware. We created a CDI-specific analytic application using the Health Catalyst analytics platform, over the existing data warehouse (Cerner), using 2016–2018 data (figure). The application refreshes daily and is able to provide near real-time patient data, including PPI and antibiotic use. We aimed to describe current PPI utilization patterns, calculate risk associated with PPI use adjusted for other risk factors for CDI, and measure the effect of interventions to decrease PPI use.

Results. Among 133,592 total inpatient encounters from January 1, 2016 to April 22, 2018, 39,156 (29%) received PPIs and 1,146 (0.9%) had a positive PCR result for *C. difficile*. Among the *C. difficile*-positive encounters, PPIs were used in 486 (42%), with an adjusted OR of 2.1 (95% CI 1.7–2.6). Of encounters involving high-risk antibiotics who had a positive *C. difficile* PCR, 52% (255/486) were receiving PPIs. The services most likely to prescribe PPIs were internal medicine, orthopedic surgery and general surgery. Targeted chart review indicated that most inpatients receiving PPIs lacked an identified upper gastrointestinal (GI) disorder, and 37% were on the same PPI as outpatients prior to admission. Duration of therapy varied widely, but PPI courses were longer in patients diagnosed with CDI.

Conclusion. A novel application using existing health record data confirmed the increased risk of CDI due to PPI use, and identified important opportunities to decrease HO-CDI by limiting such use. Using this analytics platform provides near real-time data and will support rapid cycle improvements and allow for early evaluation of CDI interventions.

Disclosures. **All authors:** No reported disclosures.

479. Trends in *C. difficile* Incidence, Mortality, and NAP1/027 Strain in the Population of Monroe County, New York

Trupti Hatwar, MPH; Rebecca Tsay, MPH, MLS; Deborah Nelson, MSN, RN; Christina B. Felsen, MPH and Ghinwa Dumyati, MD, FSHEA; NY Emerging Infections Program, Center for Community Health and Prevention, University of Rochester Medical Center, Rochester, New York

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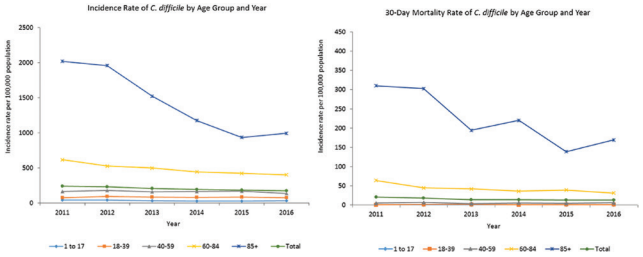
Background. Increases in the *C. difficile* infection (CDI) incidence, severity and mortality were reported in the early 2000s due to the emergence of the NAP1/027 strain. We evaluated the trends in incidence, mortality, hospitalization, and the prevalence of NAP1/027 strain in Monroe County, New York.

Methods. We conducted population and laboratory-based surveillance for CDI from 2011 to 2016 as part of the CDC Emerging Infections Program. An incident CDI case is defined as a positive *C. difficile* stool specimen from a resident of the county aged >1 year with no positive test in the prior 8 weeks. All the laboratories in our catchment area used nucleic acid amplification for diagnosis starting in 2011 as part of single or 2-step algorithm. A convenience sample of specimens were cultured and underwent molecular characterization. Mortality data was obtained via vital statistics databases and medical chart abstraction. Hospitalization within 2 days before to 7 days of diagnosis was collected.

Results. We identified 9189 incident CDI cases between 2011 and 2016. The CDI incidence decreased from 241 in 2011 to 175 cases per 100,000 persons in 2016, with the largest decrease among older adults aged ≥85 years. Similarly, the 30-day mortality rates decreased, with the largest decrease among persons aged ≥85 years: from 310 cases to 169 cases per 100,000 population (Figure 1). The percentage of isolates due to NAP1/027 decreased from 20.3% in 2011 to 6.5% in 2016. There was no decrease in the proportion of cases that died within 7 (range: 2% to 3%) and 30 days (range: 7% to 8%) and no decrease in the proportion of patients hospitalized after their CDI diagnosis (range: 34% to 40%). These findings are similar in persons aged ≥85 years.

Conclusion. From 2011 to 2016, the CDI incidence and mortality decreased concurrently with a decrease in the percentage of infections due to the NAP1/027 strain. Although NAP1/027 is known to be associated with more severe outcomes, we did not observe a reduction in the proportion of cases that died or the proportion of cases that were hospitalized.

Figure 1. Incidence and Mortality Rates of CDI



Disclosures. **G. Dumyati**, Seres: Scientific Advisor, Consulting fee.

480. Reduction in *Clostridium difficile* Infection Rates Following a Prevention Collaborative in Orange County, California, 2014–2017

Kyle Rizzo, MPH[1]; Erin Garcia, MPH, CPH[1]; Matthew Zahn, MD, FIDSA[2]; Sarah H. Yi, PhD[3] and Erin Epson, MD[1]; [1]Healthcare-Associated Infections Program, California Department of Public Health, Richmond, California, [2]Epidemiology and Assessment, Orange County Health Care Agency, Santa Ana, California, [3]Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia

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Background. The California Department of Public Health (CDPH) Healthcare-Associated Infections (HAI) Program and Orange County Health Care Agency convened a *Clostridium difficile* infection (CDI) prevention collaborative with health care facilities in Orange County (OC) to reduce CDI incidence in the region.

Methods. We invited all 34 hospitals and 76 skilled nursing facilities (SNF) in OC to participate from June 2015 to June 2016. Participants received onsite infection control and antimicrobial stewardship assessments, trainings, and an interfacility transfer communication improvement initiative. We used an interrupted time-series design and segmented regression analysis to evaluate monthly hospital-onset (HO) and community-onset (CO) CDI rates for acute care hospitals (ACH) reporting HAI data to CDPH via the National Healthcare Safety Network. The baseline period included 17 months (January 2014–June 2015) and the collaborative period 28 months (September 2015–December 2017). All OC acute care hospitals were included in the CO-CDI model to account for direct and indirect effects of the collaborative. We included only participating ACH in the HO-CDI model. For informal comparisons, we assessed changes in CO-CDI for ACH in three San Francisco Bay Area counties and HO-CDI rates in nonparticipant OC acute care hospitals.

Results. Collaborative participants comprised 15 ACH, three long-term acute care hospitals, one children's hospital, and 20 SNF; all but two SNF received an onsite assessment. Unadjusted, baseline pooled mean HO-CDI rates were 8.5 cases per 10,000 patient days for participant ACH, and CO-CDI rates were 4.9 cases per 1,000 admissions in OC acute care hospitals. During the collaborative period, HO-CDI rates in OC participant ACH decreased 2% per month (incidence rate ratio [IRR]: 0.98, 95% CI: 0.96, 0.99; $P < 0.001$). HO-CDI rates among OC nonparticipant ACH ($N = 10$) did not change during the same timeframe (IRR: 0.99, 0.96, 1.02; $P = 0.37$). During the collaborative period, Orange County CO-CDI rates also declined 2% per month (IRR: 0.98, 0.97, 0.99; $P < 0.001$); no changes in CO-CDI were observed among ACH ($N = 27$) in the comparison counties (IRR: 1.00, 0.99, 1.01; $P = 0.78$).

Conclusion. Our analysis of acute care hospitals in Orange County provides evidence that coordinated, regional multifacility initiatives can reduce CDI incidence.

Disclosures. **All authors:** No reported disclosures.

481. Implementation of a Prospective, Pharmacist-Driven *Clostridium difficile* PCR Pre-Authorization Process to Optimize Appropriate Testing

Erik LaChance, PharmD[1]; Jessica Miller, PharmD[2]; Imad Almanaseer, MD[3]; Jay Watson, IP Surveillance Analyst[4]; Robert Citronberg, MD[1]; Leo Kelly, MD[1]; Angelica Whaley, MS, MT(ASCP)[5] and Sarah M. Wieczorkiewicz, PharmD, BCPS AQ-ID[2]; [1]Advocate Lutheran General Hospital, Park Ridge, Illinois, [2]Pharmacy, Advocate Lutheran General Hospital, Park Ridge, Illinois, [3]Pathology, Advocate Lutheran General Hospital, Park Ridge, Illinois, [4]Infection Prevention, Advocate Lutheran General Hospital, Park Ridge, Illinois, [5]Lab, Advocate Lutheran General Hospital, Park Ridge, Illinois

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Background. Since the implementation of more sensitive molecular diagnostics such as the *Clostridium difficile* PCR assay, hospitals have reported 50–100% increases in *C. difficile* infection (CDI) rates.

Methods. This single-center, quasi-experimental study assessed appropriateness of *C. difficile* PCR testing pre- and post-implementation of a prospective,

pharmacist-led, pre-authorization process. The antimicrobial stewardship team prospectively reviewed all adult CDI-PCR cases sent to the laboratory prior to specimen processing twice daily, 7 days a week to assess for clinical appropriateness based on guideline criteria. Bone marrow transplant and pediatric patients were excluded. If a patient lacked appropriate CDI clinical criteria, the provider was contacted to discontinue the PCR. CDI-PCR appropriateness was assessed for all patients with a CDI-PCR during the preceding year as a retrospective, comparative cohort. The primary objective was to assess appropriateness of the CDI-PCR pre- and postintervention. Secondary objectives included intervention sensitivity, specificity, safety, total CDI-PCRs processed, and protocol adherence.

Results. A total of 714 patients were included (n = 360, preintervention; n = 354, postintervention). There were significantly more hospital-onset CDI cases and antimicrobial use within the past 30 days in the preintervention group [(248 vs. 133, respectively; $P < 0.001$) and (277 vs. 197, respectively; $P < 0.0001$)]. Appropriateness of the CDI-PCR significantly improved postintervention [n = 138 (38.3%) *vs.* n = 209 (59.1%), respectively; $P < 0.001$]. Prospective pharmacist intervention was required for 146 inappropriate CDI-PCRs resulting in 79 discontinued and 66 processed CDI-PCRs (n = 1 positive; n = 65 negative). No patient with a cancelled CDI-PCR required additional testing or escalation of care. When compared with the preintervention, the CDI-PCRs with pharmacist intervention demonstrated a significant increase in the sensitivity (64.7% vs. 98%; $P < 0.0001$) and decrease in specificity (66% vs. 48.3%; $P = 0.015$) with an improved NPV (91.9% vs. 99.3%; $P = 0.035$) and PPV (23.9% to 24.6%; $P = 0.869$).

Conclusion. Implementation of a pharmacist-led prospective CDI-PCR review improved PCR appropriateness and had no adverse clinical consequences although the PPV criteria remain low.

Disclosures. **All authors:** No reported disclosures.

482. Association between Socioeconomic Status Factors and Incidence of Community-Associated *Clostridium difficile* Infection Utilizing Factor Analysis—United States, 2014–2015

Kimberly Skrobarcek, MD[1]; Yi Mu, PhD[1]; Jennifer Ahern, PhD[2]; Zintars Beldavs, MS[3]; Geoff Brousseau, MPH[4]; Ghinwa Dumyati, MD, FSHEA[5]; Monica M. Farley, MD, FIDSA[6]; Stacy Holzbauer, DVM, MPH[7]; Marion A. Kainer, MBBS, MPH[8]; James I. Meek, MPH[9]; Rebecca Perlmutter, MPH[10]; Erin C. Phipps, DVM, MPH[11]; Lisa G. Winston, MD[12] and Alice Y. Guh, MD, MPH[1]; [1]Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia, [2]University of California at Berkeley, Berkeley, California, [3]Oregon Health Authority, Portland, Oregon, [4]Colorado Department of Public Health and Environment, Denver, Colorado, [5]NY Emerging Infections Program, Center for Community Health and Prevention, University of Rochester Medical Center, Rochester, New York, [6]Department of Medicine, Emory University School of Medicine and Atlanta VA Medical Center, Atlanta, Georgia, [7]Minnesota Department of Health, Saint Paul, Minnesota, [8]Communicable and Environmental Diseases and Emergency Preparedness, Tennessee Department of Public Health, Nashville, Tennessee, [9]Connecticut Emerging Infections Program, Yale School of Public Health, New Haven, Connecticut, [10]Maryland Department of Health, Baltimore, Maryland, [11]New Mexico Emerging Infections Program, University of New Mexico, Albuquerque, New Mexico, [12]Medicine, University of California, San Francisco and Zuckerberg San Francisco General Hospital and Trauma Center, San Francisco, California

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Background. Traditionally a healthcare-associated infection, *Clostridium difficile* infection (CDI) is increasingly emerging in communities. Health disparities in CDI exist, but the social determinants of health that influence community-associated (CA) CDI are unknown. We used factor analysis and disparate data sources to identify area-based socioeconomic status (SES) factors associated with CA-CDI incidence.

Methods. CDC's Emerging Infections Program conducts population-based CDI surveillance in 35 US counties. A CA-CDI case is defined as a positive *C. difficile* specimen collected as an outpatient or within 3 days of hospitalization in a person aged ≥1 year without a positive test in the prior 8 weeks or an overnight stay in a healthcare facility in the prior 12 weeks. 2014–2015 CA-CDI case addresses were geocoded to a 2010 census tract (CT) and incidence rates were calculated. CT-level SES variables were obtained from the 2011–2015 American Community Survey. The Health Resources and Services Administration provided medically underserved area (MUA) designations. Exploratory factor analysis transformed 15 highly correlated SES variables into threefactors using scree plot and Kaiser criteria: "Low Income," "Foreign-born," and "High Income." To account for CT-level clustering, a negative binomial generalized linear mixed model was used to evaluate the associations of these factors and MUA with CA-CDI incidence, adjusting for age, sex, race and diagnostic test.

Results. Of 13,903 CA-CDI geocoded cases, 63% were female, 80% were white, and 36% were aged ≥65 years. Annual CA-CDI incidence was 63.4/100,000 persons. In multivariable analysis, "Low Income" (rate ratio [RR]: 1.09; 95% confidence interval [CI]: 1.05–1.13) and "High Income" (RR: 0.90; CI: 0.87–0.93) were significantly associated with CA-CDI incidence.

Conclusion. Factor analysis was instrumental in identifying key drivers of disparities among interrelated SES variables. Low-income areas were surprisingly associated with higher CA-CDI incidence, given that known CDI risk factors include increased access to healthcare. Understanding how SES factors might impact CA-CDI incidence can inform prevention strategies in low-income areas.

Disclosures. **G. Dumyati**, Seres: Scientific Advisor, Consulting fee.

483. Clinical Characteristics of Military Trauma Patients With *Clostridium difficile* Infections

Sarah Schall, MD[1], Ping Li, MS[2], Teresa Merritt, BS[3], Leigh Carson, MS[4], Timothy J. Whitman, DO[5], Joseph L. Petfield, MD[6], David R. Tribble, MD, DrPH[7] and Dana M. Blyth, MD[8]; [1]Internal Medicine, San Antonio Uniformed Services Health Education Consortium, San Antonio, Texas, [2]Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc., Bethesda, Maryland, [3]Wilford Hall USAF Medical Center (WHMC), San Anotnio, Texas, [4]Preventive Medicine and Biostatistics, Infectious Disease Clinical Research Program, Uniformed Services University of the Health Sciences, Bethesda, Maryland, [5]Walter Reed National Military Medical Center, Bethesda, Maryland, [6]Landstuhl Regional Medical Center, Landstuhl, Germany, [7]Infectious Disease Clinical Research Program, Uniformed Services University, Bethesda, Maryland and [8]Dept of Medicine, Brooke Army Medical Center, Fort Sam Houston, Texas

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Background. *Clostridium difficile*-associated diarrhea (CDAD) is an important cause of nosocomial diarrhea with increasing morbidity, mortality, and healthcare costs. There is growing recognition that critically ill trauma patients comprise a unique at risk population. This study describes the clinical epidemiology of CDAD in military trauma patients.

Methods. Through the Trauma Infectious Disease Outcomes Study (TIDOS), patients with a diagnosis of confirmed (laboratory supported) or presumptive (diarrhea with treatment for CDAD in absence of lab confirmation) CDAD (September 2009–February 2014) were analyzed. Patient demographic, injury, and infection data were evaluated. CDAD severity was defined per 2017 IDSA guidelines.

Results. Of 2,660 patients, 19 and four patients with confirmed and presumptive CDAD, respectively, were identified with an incidence of 2.76/10,000 (95% CI: 1.75–4.15) occupied bed days. Sixteen (70%) had blast injuries, four had gunshot wounds, and threehad other injuries. Median age was 24 years (IQR 23, 31). Median injury severity score was 38 (IQR 26, 47). Severe and fulminant CDAD was diagnosed in 8 (35%) and six (26%), respectively. Patients had a median hospitalization of 12 days (IQR 9.5, 34) and threeOR visits (IQR 2, 6) prior to CDAD diagnosis. Nineteen (83%) patients were in the ICU and 17 (74%) were intubated prior to or upon diagnosis. Seventeen patients had ≥1 infection before CDAD diagnosis, largely pneumonia (47%) and skin and soft-tissue infections (47%). Most patients (96%) were on antibiotics pre-CDAD diagnosis: first generation cephalosporins (1GC; 96%), tetracyclines (87%), vancomycin (74%), carbapenems (70%), and fluoroquinolones (FQ; 57%). Five (22%) received clindamycin. Of the 2637 patients without CDAD, 91% received antimicrobials during hospitalization (86% a 1GC, 47% FQ, and 16% clindamycin). Median length of hospital stay after CDAD diagnosis was 34 days (IQR 16, 55). Treatment included only oral metronidazole in 15 patients, IV metronidazole in 2, and some combination of oral vancomycin, metronidazole, and IV metronidazole in 6. No patients died.

Conclusion. Despite high rates of antimicrobial usage in this severely injured population, CDAD was uncommon. Though CDAD was severe or fulminant in >50%, no patients died.

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484. A Severity Score for Predicting In-Hospital Death in Patients With *Clostridium difficile* Infection: A Hospital-Based Cohort Study

Hsiu-Yin Chiang, PhD[1]; Han-Chun Huang, MS[1]; Chih-Wei Chung, MS[1]; Yi-Chun Yeh, BSN[1]; Ni Tien, PhD[2]; Hsiu-Shan Lin, MS[2] and Chin-Chi Kuo, MD, PhD[1,3,4]; [1]Big Data Center, China Medical University Hospital, Taichung City, Taiwan, [2]Department of Laboratory Medicine, China Medical University Hospital, Taichung City, Taiwan, [3]Department of Medical Research, China Medical University Hospital, Taichung City, Taiwan, [4]Kidney Institute and Division of Nephrology, Department of Internal Medicine, China Medical University Hospital, Taichung City, Taiwan

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Background. Current definitions for severe *C. difficile* infection (CDI) are based on populations of Western countries. We examined the predicting performance of existing definitions in Taiwanese population and developed a new severity score.

Methods. We included adult patients who were admitted to China Medical University Hospital and had first-time positive *C. difficile* culture or toxin test during 2012–2016. The index date was the sampling date of the specimen. Data were pulled from the electronic medical records. The primary outcome was in-hospital death during the index admission. Variables that were significantly associated with in-hospital death in the bivariable analyses were included in a multivariable logistic regression model. We assigned weight for each variable using the adjusted odds ratio (aOR) and summed up the weights to obtain a severity score.

Results. Of 544 patients, median age was 71 years old and 70 patients (12.9%) died during the index admission. Patients did not differ in: gender, age, prior infection (−30 to 0 day of index date), prior admission, prior anti-peptic ulcer medication use, index (−3 to 3 days) glucose and kidney function except for blood urea nitrogen (BUN). Variables included in the multivariable model were: complicated diabetes (aOR 2.0; 0.8–5.2), malignancy (2.0; 1.1–3.7), prior use of second-generation cephalosporins (1.8; 0.9–3.7), use of loperamide (1.8; 1.0–3.4) or probiotics within −14 to 14 days (2.4; 1.0–5.5), index white blood cell count (WBC) > 15,000 cells/μL (1.9; 1.0–3.6), index serum creatinine (sCr) ≥1.5 times premorbid level (1.1; 0.6–2.1), index BUN >30 mg/dL (1.7; 0.9–3.5), and index BUN/sCr ratio > 20 (1.3; 0.7–2.5). The severity score was