

#### 474. Temporal Trends of Inpatient *C. difficile* Infections Within the Veterans Affairs Hospitals: A Bioinformatics Analysis of Nationwide Metadata From the Past Decade

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**Background.** *C. difficile* infection (CDI) is an important infectious disease and a reportable hospital metric that results in significant healthcare expenditures. Understanding the epidemiology of CDI is pivotal to the implementation of future preventative measures.

**Methods.** This was a retrospective data analysis of admitted patients treated at Veteran Health Administration (VHA) hospitals within the United States from 2006 to 2016 using the VHA's national Corporate Data Warehouse (CDW). All patients with stool testing for *C. difficile* were identified via laboratory codes associated with *C. difficile*. CDI is defined as any stool positive laboratory-identified (LabID) event for *C. difficile* via PCR, Toxin, GDH + (Toxin or PCR), or culture. Hospital-onset healthcare facility-associated (HO-HCFA) CDI is defined as a positive LabID event collected after 48 hours from admission. Incidence is reported as cases per 100,000 admission-days. Recurrent CDI episodes were excluded from incidence analysis. Data were extracted using SQL management studio and analyzed in Excel and JMP.

**Results.** A total of 389,512 patients were tested for *C. difficile*. Overall incidence of CDI increased from 2006 (67.6) to 2016 (127.7). This rise in total CDI incidence correlates positively with rise of PCR ( $P < 0.0001$ ) and 30-days CDI mortality ( $P < 0.0001$ ). In July 2012, VHA implemented reporting of HO-HCFA CDI. Incidence of HO-HCFA CDI and 30-day CDI mortality increased from 2006 (45.6 and 12.3) to 2013 (69.2 and 17.1) with the rise of PCR ( $P < 0.001$ ) but decreased from 2013 (69.2 and 17.1) to 2016 (59.9 and 14.1) after implementation of HO-HCFA reporting ( $P = 0.0058$  and  $P = 0.0068$ ). The median time to testing has also been decreasing from 2006 (78.5 hours) to 2016 (45.5 hours). Amongst all patients with stool positive *C. difficile* LabID event, the frequency of ICD-9/10 discharge diagnosis code for CDI was 83.3%.

**Conclusion.** The incidence of CDI increased significantly as the use of PCR rose within the VHA. Increased incidence of CDI had a significant impact on mortality. Reporting of HO-HCFA CDI led to a downward trend in the incidence of HO-HCFA CDI and 30-days CDI mortality. Whether this is a true decrease or an improvement in testing programs is unclear as the time to *C. difficile* testing also declined over the study period. ICD-9/10 discharge diagnosis codes are not representative of all cases of CDI.

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#### 475. Burden of *Clostridium difficile* Infection in South Carolina: A Population-Based Study

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*Thursday, October 4, 2018: 12:30 PM*

**Background.** *Clostridium difficile* infection (CDI) is a major cause of morbidity and mortality in the United States. The aims of this cross-sectional population-based study are to determine overall incidence rate of CDI in the State of South Carolina and estimate the healthcare and financial burden of community-associated *C. difficile* infection (CA-CDI).

**Methods.** South Carolina CDI initiative identified CDI cases from National Healthcare Safety Network (NHSN), and the South Carolina Infectious Disease and Outbreak Network (SCION) from January 1, 2015 to June 30, 2016 through complete enumeration of the state's population, excluding infants <1 year old. A positive stool *C. difficile* test was regarded as a "CDI case" for purposes of this study. Only first and recurrent episodes after 8 weeks of initial one were included in this analysis.

**Results.** During the 18-month study period, 10,254 unique CDI events were identified in South Carolina residents  $\geq 1$  year old. Over one-half of CDI cases were CA-CDI (5192; 51%), 2,678 (26%) were community-onset healthcare facility associated (CO-HCFA), and 2,384 (23%) were hospital-onset (HO) cases. Overall incidence rate of CDI in South Carolina per 100,000 person-years was 141 (71, 37, and 33 for CA-CDI, CO-HCFA CDI, and HO-CDI, respectively). Among 5,192 episodes of CA-CDI, 2127 (41%) required hospitalization with a median length of stay of 5 days and median cost of \$31,270. Additionally, 574 (11%) of CA-CDI cases were treated in emergency rooms without admission to the hospital. The annual burden of CA-CDI on the South Carolina's healthcare system was estimated at 387 ambulatory emergency room visits and 9,282 hospital days. The estimated annual hospital charges for patients with CA-CDI in South Carolina were \$68,491,046.

**Conclusion.** The incidence rate of CA-CDI in South Carolina has surpassed both CO-HCFA CDI and HO-CDI combined. The heavy burden of CA-CDI justifies dedication of public health resources to combat CDI in ambulatory settings. Antimicrobial

stewardship initiatives targeting unnecessary and inappropriate antimicrobial use in the community may reduce the burden of CDI in South Carolina.

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#### 476. Comparison of Community-Associated *Clostridium difficile* Infections With Other Reportable Enteric Pathogens, Minnesota, 2016

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**Background.** Differentiating community-associated (CA) *Clostridium difficile* infections (CDI) from acute diarrhea due to other etiologies among patients with no antibiotic exposure is difficult. MDH performs active population- and laboratory-based surveillance for CDI, other bacterial diarrheal illnesses (BDI) (*Campylobacter*, enteric *E. coli*, *Salmonella*, *Shigella*, *Vibrio*, *Yersinia*), and parasitic diarrheal illness (PDI) (*Amoebiasis*, *Cryptosporidium*, *Giardia*). We compared characteristics of patients with CA-CDI vs. other etiologies reported to the Minnesota Department of Health (MDH) from Benton, Morrison, Olmsted, Stearns and Todd counties in 2016.

**Methods.** CA-CDI cases were defined as a positive molecular assay, culture, or toxin, on a stool specimen from a person >1 year old without an overnight hospital/long-term care facility stay in the prior 12 weeks living in one of five Minnesota counties. Reported BDI and PDI cases >1 year old from the same counties were compared with CDI cases. Standardized interviews were attempted. Polytomous regression was used to detect differences in demographics and clinical presentation.

**Results.** During 2016, 1,064 reportable diarrheal illnesses were reported (525 CA-CDI cases [129 per 100,000 population], 341 BDI cases [84 per 100,000], and 198 PDI cases [49 per 100,000]); 66% of CA-CDI, 89% of BDI and 59% of PDI were interviewed. CDI cases were less likely to be 1-17 years compared with BDI or PDI cases (PDI OR: 0.07 [0.05, 0.1]; BDI OR: 0.3 [0.2, 0.4]) and more likely to be 65+ age years (PDI OR: 12.2 [5.3, 27.8]; BDI OR: 2.3 [1.6, 3.3]). CDI cases were more likely to be female (PDI OR: 2.0 [1.4, 2.8]; BDI OR: 1.6 [1.3, 2.3]). CDI cases had higher median days of diarrhea before seeking care (CDI = 8 days vs. PDI = 7 days,  $P < 0.02$ ; vs. BDI = 4 days,  $P < 0.001$ ), longer duration of diarrhea (CDI = 14 days vs. PDI = 13 days, [ $P = 0.02$ ]; vs. BDI = 7 days,  $P < 0.001$ ), and were less likely to report emesis (PDI OR: 0.3 [0.2, 0.4], BDI OR: 0.5 [0.3, 0.7]). CDI cases were less likely to report fever than BDI cases (OR: 0.3 [0.2, 0.4]).

**Conclusion.** CA-CDIs in Minnesota are as common as all other reportable enteric pathogens combined. We identified differences in age, gender, and clinical presentation that may help guide clinical testing and initial treatment, especially in healthy adults.

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#### 477. Trends in the Incidence of Community-Associated and Healthcare-Associated *Clostridium difficile* Infections in Quebec Over a 7-Year Period (2008-2015)

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**Background.** *Clostridium difficile* infections (CDI) affect hospitalized patients but also individuals in the community. The epidemiology of healthcare-associated (HA) CDI has received much scrutiny, but little is known regarding trends in the incidence rate of community-associated (CA) cases. We describe and compare long-term trends in the provincial incidence rate of CA-CDI and HA-CDI.

**Methods.** Hospitalized patients with CA-CDI and HA-CDI were identified prospectively between April 2008 and April 2015 through the Quebec CDI surveillance program (QCISP), a network of 95 acute-care institutions using standardized case definitions. Hospitalized CDI cases are classified as CA if they occur within 3 days of admission or >4 weeks after any inpatient or outpatient care. CDI cases are defined as HA-CDI if they occurred >3 days after admission and up to 4 weeks following discharge. Trends in the incidence of HA-CDI and CA-CDI were compared using time series with segmented regression and Poisson law.

**Results.** Between 2008 and 2015, 28,850 CDI were detected in hospitalized patients. Of these, 4,481 (15.5%) were CA and 24,369 (84.5%) HA-CDI. The annual CA-CDI incidence rate increased by 35.2% from 0.51 to 0.68 per 100,000 population (incidence rate ratio [IRR] per 4-week period, 1.005; 95% confidence interval [CI], 1.004 to 1.006;  $P < 0.0001$ ) whereas the incidence of HA-CDI remained stable from 6.6 to 7.0 per 10,000 patient-days (IRR per 4-week period, 1.000; 95% CI, 0.999 to 1.000;  $P = 0.23$ ). There was a significant difference between the trends in incidence of CA-CDI and HA-CDI (IRR, 1.005; 95% CI, 1.004 to 1.006;  $P < 0.0001$ ). Further analysis showed an inflection point in the incidence of HA-CDI in April 2011 with a