Table: Concordance of Emerging Infections Program (EIP) and Medicare Claims CDI Epidemiologic Case Classification. Concordant classification in bold.

	EIP Classification				
Claims Classification	CA**	COHCFA*†	HO*‡	LTCFO*§	Total
No CDI identified	313	131	81	125	650
CA*	**581**	44	52	18	695
COHCFA†	43	**345**	43	40	471
HO‡	227	227	**684**	132	1,270
LTCFO§	15	18	38	**294**	365
Total	1,179	765	898	609	3,451

Claims - Community associated (CA) : a) CDI ICD-10-CM code from outpatient dataset, or b) during an inpatient visit in which: 1) CDI was the primary diagnosis; 2) the primary diagnosis was diarrhea, abdominal pain, or nausea and CDI was coded in a secondary position; or 3) CDI was coded in a secondary position and the hospital length of stay was ≤ 3 days. Patient had no prior inpatient or LTC stay w/in 12 weeks before diagnosis.

†*Claims – Community onset healthcare-facility associated (COHCFA):* a) CDI ICD-10-CM code from outpatient dataset, or b) during an inpatient visit in which: 1) CDI was the primary diagnosis; 2) the primary diagnosis was diarrhea, abdominal pain, or nausea and CDI was coded in a secondary position; or 3) CDI was coded in a secondary position and the hospital length of stay was ≤ 3 days. Patient had a prior inpatient stay or LTCF stay within 12 weeks before index claim date with CDI ICD-10-CM code.

‡*Claims – hospital onset (HO):* Secondary ICD-10-CM code of CDI without a primary diagnosis of diarrhea, abdominal pain, or nausea for a hospital stay lasting >3 days.

§*Claims – long-term care facility onset (LTCFO):* Beneficiary resides in LTCFO when infection occurred or transfers from LTCFO to hospital with (a) ICD-10-CM code of CDI as principal diagnosis for inpatient claim, or (b) CDI diagnosis for hospitalization lasting 3 or fewer days.

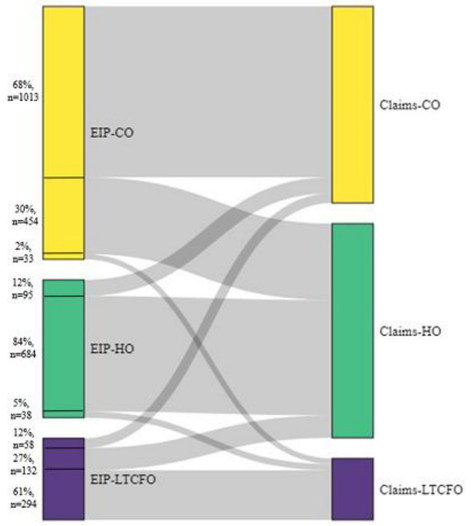
**_EIP – community associated (CA):_ Positive stool specimen collected from a patient in an outpatient setting or within 3 days of patient's hospitalization, who have no prior history of a stay in a healthcare facility within the 12 weeks prior stool specimen collection.

*†_EIP - Community onset healthcare-facility associated (COHCFA):_ Positive stool specimen collected from a patient in an outpatient setting or within 3 days of patient's hospitalization, who spent at least one night in a healthcare facility within the 12 weeks prior to stool specimen collection.

*‡_EIP – hospital onset (HO):_ Positive stool specimen collected more than 3 calendar days after hospital admission.

*§EIP – _long-term care facility onset (LTCFO):_ Patient was residing in a long-term care facility three days prior to positive specimen collection or specimen was collected in a long-term care facility.

Figure: Sankey diagram depicting CDI onset classification using Emerging Infections Program (EIP, left) and Claims-based definitions (right). The proportion of cases with each EIP onset classification and corresponding claims classifications are shown in gray. Discordant classifications by onset category are displayed in non-straight lines. For example, 30% of cases classified as community-onset by EIP are classified as hospital-onset by claims. CDI cases reported to EIP without CDI identified within claims data not depicted.



classify CDI onset and healthcare association using claims data have been published, but the degree of misclassification is unknown. **Methods:** We linked patients with laboratory-confirmed CDI reported to four Emerging Infections Program (EIP) sites from 2016-2020 to Medicare beneficiaries using residence, birth date, sex, and hospitalization and/or healthcare exposure dates. Uniquely linked patients with fee-for-service Medicare A/B coverage and complete EIP case report forms were included. Patients with a claims CDI diagnosis code within ±28 days of a positive CDI test reported to EIP were categorized as hospital-onset (HO), long-term care facility onset (LTCFO), or community-onset (CO, either healthcare facility-associated [COHCFA] or community-associated [CA]) using a previously published algorithm based on claim type, ICD-10-CM code position, and duration of hospitalization (if applicable). EIP classifies CDI into these categories using positive specimen collection date and other information from chart review (e.g. admit/discharge dates). We assessed concordance of EIP and claims case classifications using Cohen's kappa. **Results:** Of 10,002 eligible EIP-identified CDI cases, 7,064 were linked to a unique beneficiary; 3,451 met Medicare A/B fee-for-service coverage inclusion criteria. Of these, 650 (19%) did not have a claims diagnosis code ±28 days of the EIP specimen collection date (Table); 48% (313/650) of those without a claims diagnosis code were categorized by EIP as CA CDI. Among those with a CDI diagnosis code, concurrence of claims-based and EIP CDI classification was 68% (κ=0.56). Concurrence was highest for HO and lowest for COHCFA CDI. A substantial number of EIP-classified CO CDIs (30%, Figure) were misclassified as HO using the claims-based algorithm; half of these had a primary ICD-10 diagnosis code of sepsis (226/454; 50%). **Conclusions:** Evidence of CDI in claims data was found for 81% of EIP-reported CDI cases. Medicare classification algorithms concurred with the EIP classification in 68% of cases. Discordance was most common for community-onset CDI patients, many of whom were hospitalized with a primary diagnosis of sepsis. Misclassification of CO-CDI as HO may bias findings of claims-based CDI studies.

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Age related Antibiotic Prescribing Trends of Clostridioides Difficile Incident Cases within Davidson County TN 2012-2020

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Age related Antibiotic Prescribing Trends of Clostridioides Difficile Incident Cases within Davidson County Tennessee 2012-2020 Michael Norris, MSN, Priscilla Pineda, MPH, Malakai Miller, MPH, Raquel Villegas, PhD, MS **Background:** Clostridioides difficile infection (CDI) is one of the most common healthcare-associated infections in the United States. Antibiotic use is considered a predisposing factor for CDI. The State of Tennessee collaborates with the CDC as part of an ongoing Emerging Infections Program (EIP). We sought to better understand the impact of antimicrobial use prior to the date of incident of CDI within the defined age groups of Davidson County, Tennessee. **Methods:** Surveillance data from the years 2012–2020 were examined for all positive CDI cases within Davidson County. A positive CDI case was defined as a laboratory confirmed case who is ≥ 1 year old living in Davidson County, Tennessee. Antibiotic use was assessed in the 12 weeks prior to CDI. Trends of overall antibiotic use, including the top five antibiotics prescribed by our defined age groups were examined. Analyses were performed using SAS version 9.4. Only fully abstracted cases are included in the study. **Results:** Among 7,346 positive CDI incident cases identified between 2012–2020, 5,467 (74.4%) received antibiotics 12 weeks prior to a confirmed infection. We looked at the trend of antibiotic prescription over time from 2012-2020 (77.0%, 76.7%, 74.3%, 80.7%, 76.3%, 75.1%, 73.7%, 74.8% and 71.5%) which has decreased since 2015. The prevalence of antibiotic use by age group 1-18 years, 19-44 years, 45-64 years, 65-74 years, and 75+ years was 53.4%, 68.8%, 74.5%, 79.2% and 83.1% respectively. The five most prescribed antibiotics were ceftriaxone ((11.1%), followed by vancomycin IV (10.9%), ciprofloxacin (10.2%), metronidazole (9.1%), and piperacillin (8.6%). Cases in the 45-64 years age group were more likely to be prescribed vancomycin IV, ciprofloxacin, metronidazole, and piperacillin-tazobactam compared to other age groups ($p < 0.0001$). There was no statistically significant association between ceftriaxone prescription and our defined age groups. **Conclusion:** In this study, almost three quarters of the CDI cases had received antimicrobial therapy in the 12 weeks prior to infection. Since antibiotic prescription is a potentially modifiable risk factor for CDI, a more in-depth study, combined with an antibiotic stewardship program implementation in all settings would be beneficial to reduce the risk of CDI complications of antibiotic usage.

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