for cefotaxime, ceftriaxone, ceftazidime, ertapenem, imipenem, and meropenem against carbapenem-resistant Enterobacteriaceae (CRE), *Pseudomonas aeruginosa* (CRPA), *Acinetobacter baumannii* (CRAB), and extended-spectrum β-lactamase–producing Enterobacteriaceae (ESBL) were collected from commercial antimicrobial susceptibility testing instruments (cASTI) in 3 Tennessee healthcare networks that also report to the NHSN AR Option. These data were linked to the NHSN data using 4 keys: date of birth, isolate collection date, pathogen, and specimen source. An isolate was defined as suppressed when susceptibility results were observed from the cASTI but not in NHSN. The proportions of suppressed results were calculated and stratified by genus, facility, and antibiotic. **Results:** Overall, 1,009 isolates were matched between the NHSN AR data and the laboratory test results. Of these, 4.1% were CRAB, 23.3% were CRPA, and 72.6% were Enterobacteriaceae. In total, 4,948 susceptibility results were available from cASTIs. Suppressed results in NHSN data were observed in 918 isolates (91.0%) and accounted for 2,797 results (56.6%). Of the 817 isolates tested against imipenem, 18.7% were found to be suppressed. Moreover, 100%, 57.9%, and 8.6% of imipenem tests against CRAB, CRPA, and Enterobacteriaceae, respectively, were suppressed. Of the suppressed results, 38.3%, 3.6%, and 58.1% were susceptible, intermediate, and resistant respectively. Of the 363 isolates tested against meropenem, 48.2% were found to be suppressed. In addition, 12.2%, 53.0%, and 52.2% of meropenem tests against CRAB, CRPA, and Enterobacteriaceae, respectively, were suppressed. Of the suppressed results, 47.4%, 11.4%, and 41.1% were susceptible, intermediate, and resistant, respectively. **Conclusions:** A large proportion of isolates had at least 1 analyzed antibiotic suppressed within the NHSN AR Option. It will be important to develop and implement strategies to ensure that nonsuppressed data are available to be reported to the NHSN AR module.

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**Presentation Type:**
Oral Presentation

***Escherichia coli* Antibiotic Susceptibility Patterns for Infants Admitted to NICUs Across the United States from 2009 to 2017**

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**Background:** *Escherichia coli (E. coli)* is a leading cause of infections among term and preterm newborn infants. Continued surveillance of neonatal *E. coli* antibiotic susceptibility patterns is important to optimize empiric antibiotic prescription for infants at risk for infection, in light of evolving reports of multidrug-resistant gram-negative bacteria in all settings. Our objective was to determine *E. coli* epidemiology and antibiotic susceptibility patterns among a large sample of infants admitted to neonatal intensive care units (NICUs) across the United States from 2009 to 2017. **Methods:** Retrospective observational study using the Premier Database, including infants born from 2009 to 2017 and admitted to academic or community NICUs contributing microbiology data during the study period. We analyzed antibiotic susceptibilities for *E. coli* isolated from blood, cerebrospinal fluid, and urine. We focused on clinically relevant and priority susceptibility categories: (1) ampicillin nonsusceptible; (2) aminoglycoside nonsusceptible; (3) carbapenem nonsusceptible; and (4) extended-spectrum β-lactamase (ESBL; phenotypic definition). We determined the proportion of infants with nonsusceptible organisms in each category by year and tested for changes over time. Lastly, we assessed susceptibility patterns by specimen source, birthweight, and timing of infection. **Results:** Of the 117,484 included infants, 733 (0.6%) had at least 1 *E. coli* episode, of which 721 (98.4%) had available susceptibility results, from 69 centers. Patient and center characteristics of infants with *E. coli* are shown in Table 1. Most organisms were tested against ampicillin (99.9%), gentamicin (99.6%), and ceftriaxone (91.5%). Figure 1 shows nonsusceptibility rates for the categories of interest. Overall, ampicillin nonsusceptibility ranged from 63.3% to 68.6% per year (mean, 66.8%±1.5%); aminoglycoside nonsusceptibility ranged from 10.7% to 23.2% (mean, 16.8%±4.5%); carbapenem nonsusceptibility was 0% for all years; and ESBL ranged from 1.2% to 11.3% (mean, 5.1%±3.4%). We detected no statistically significant trends for any of the categories of interest over time (all $P > .05$), and susceptibility trends were consistent when repeated by specimen source, birthweight, and timing of infection. **Conclusions:** We found stable, yet concerning, patterns of *E. coli* antibiotic nonsusceptibility among infants admitted to NICUs across the United States from 2009 to 2017. Rates of ampicillin nonsusceptibility and aminoglycoside nonsusceptibility were higher than previous reports. ESBL *E. coli* rates were low but present among neonatal patients. No carbapenem nonsusceptible *E. coli* was identified. These findings can inform empiric antibiotic prescription for infants admitted to NICUs across the United States.

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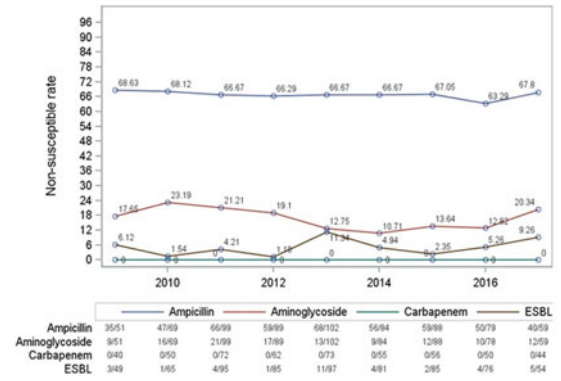
Table 1: Patient-level and center-level characteristics of infants with *Escherichia coli* infection (N=721)

| | |
|---|---|
| Birthweight Category (n, %) | |
| • <1,500 grams | 437 (60.6) |
| • ≥1,5000 grams | 284 (39.4) |
| Sex (n, %) | |
| • Male | 434 (60.2) |
| • Female | 287(39.8) |
| Race/ethnicity (n, %) | |
| • Black | 206 (28.6) |
| • White | 301 (41.8) |
| • Hispanic | 7 (1.0) |
| • Other | 191 (26.4) |
| • Unknown | 17 (2.4) |
| Timing (for first episode) (n, %) | |
| • Early-onset (first 3 days) | 220(30.5) |
| • Late-onset (>3 days) | 501 (69.5) |
| Specimen source (for first episode) (n, %) | |
| • Blood | 393 (54.5) |
| • Cerebrospinal fluid | 6 (0.8) |
| • Urine | 322 (44.7) |
| Number of episodes during admission (n, %) | |
| • 1 episode | 694 (96.3) |
| • 2 episodes | 24 (3.3) |
| • 3 episodes | 3 (0.4) |
| Length of stay (days, median [IQR]) | 55.5 (26,94) |
| Disposition (n, %) | |
| • Home | 583 (80.9) |
| • Died | 61 (8.5) |
| • Other | 77 (10.7) |
| Geographic region (n, %) | |
| • Midwest | 124 (17.2) |
| • Northeast | 77(10.7) |
| • South | 389 (54.0) |
| • West | 131 (18.2) |
| Geographic classification (n, %) | |
| • Urban setting | 693 (96.1) |
| • Rural setting | 28 (3.9) |
| Hospital academic classification (n, %) | |
| • Teaching hospital | 486 (67.4) |
| • Non-teaching hospital | 235 (32.6) |
| Hospital bed size (n, %) | |
| • ≥200 beds | 681 (94.5) |
| • <200 beds | 40 (5.6) |

Figure 1: *Escherichia coli* Antibiotic Non-Susceptibility Rates Among Infants Admitted to Neonatal Intensive Care Units (2009 – 2017)




Footnote: Includes *Escherichia coli* isolated from blood, urine, and cerebrospinal fluid. ESBL (extended-spectrum β-lactamase).

**Fig. 1.**

**Presentation Type:**
Oral Presentation

**Evaluating Facility Characteristics and Connectivity Metrics as Predictors of *Clostridioides difficile* Rates in Nursing Homes, Atlanta, GA**

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**Background:** Nursing home (NH) residents are at high risk for *Clostridioides difficile* infection (CDI) due to older age, frequent antibiotic exposure, and previous healthcare exposure. Incidence of CDI attributed to NHs is not well established, but it is hypothesized to be related to the magnitude of transfers. We evaluated the relationship between NH CDI incidence and facility characteristics to explain variability in rates in Atlanta, Georgia. **Methods:** Incident *C. difficile* cases from 2016 to 2018 were identified through the Georgia Emerging Infections Program (funded by the Centers for Disease Control and Prevention), which conducts active population-based surveillance in the 8-county metro Atlanta area. An incident case was defined as an NH resident with a toxin-positive stool specimen (without a positive test within 8 weeks). Sampled (1 to 3 on age and gender) incident cases were attributed to a NH if a patient was an NH resident within 4 days of specimen collection. Facility characteristics (beds, resident days, admissions, and average length of stay [ALOS]) were obtained from NH cost reports, and facility-specific connectivity metrics were calculated (indegree and betweenness) from 2016 Medicare claims data. Case counts were aggregated to estimate yearly incidence and correlated with facility characteristics and location within the healthcare network using the Spearman correlation. A negative binomial model was used to assess residual variability in NH CDI incidence. **Results:** In total, 386 incident CDI cases were attributed to 64 NHs (range, 0–27). Approximately half (54.7%) resided in the NH at the time of specimen collection; however, 33.7% were in inpatient units (≤4 days of admission), and 10.9% were in an emergency room (ER). The frequency of NH CDI cases correlated strongly with admissions ($r = .70$; $P < .01$), inversely with ALOS ($r = -0.53$; $P < .01$), and moderately with resident days ($r = .38$; $P < .01$). After accounting for admissions, incidence (per 1,000 admissions) still varied (Fig. 1) (median 14; range, 0–34). The inverse association with ALOS decreased and incidence no longer correlated with the remaining facility characteristics or location within the healthcare transfer network ($P > .05$, all comparisons). However, there was residual correlation with connectivity metrics (indegree $r = 0.26$; $P = .04$). **Conclusions:** Our data suggest that attributing CDI to NHs requires the inclusion of hospital and ER-based specimen collection. NH CDI incidence appears highest among facilities with a low ALOS and a high number of admissions; incidence rates calculated per 1,000 admissions may best account for infection risk inherent early in a resident's stay. Residual variability attributed to connectivity to the

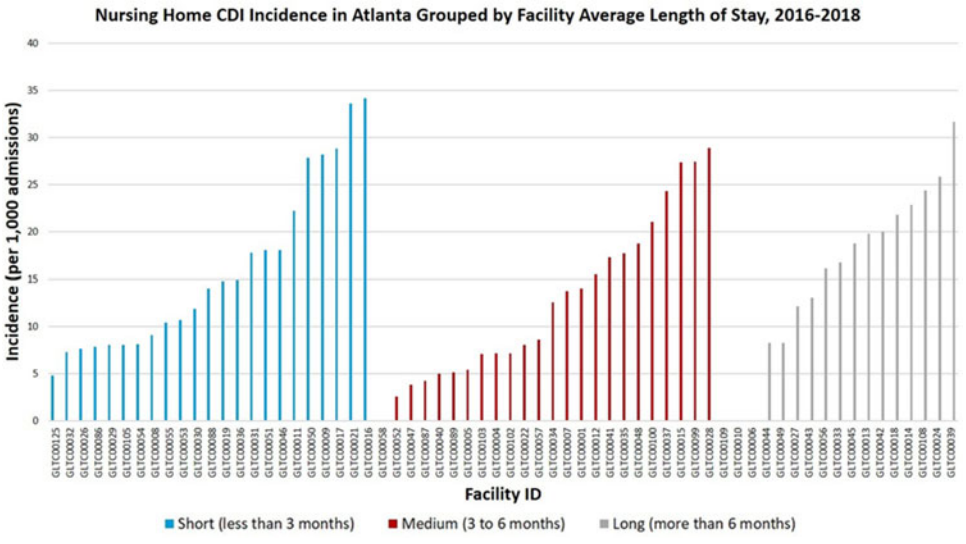


**Fig. 1.**



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