

References

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regarding best practices for measurement; and an outpatient EHR infrastructure that limited effective guideline distribution and measurement. **Conclusions:** Outpatient stewardship programs were aligned with current guidance, although frequently missing outpatient-specific committee representation, data and education. Few hospitals received additional resources for expansion into outpatient stewardship and most lacked dedicated leaders at clinics, putting additional burden on inpatient ASP leads. While some hospitals have developed guidelines, tracked prescriptions, and provided clinic or clinician feedback, there is need for investment in staff and EHR infrastructure to improve outpatient-specific guideline development, distribution and measurement.

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Poster Presentation

Subject Category: Antibiotic Stewardship

Linking Antimicrobial Use and Resistance Data to Obtain a Surrogate for Appropriateness: An Approach for Assessing Carbapenem Use

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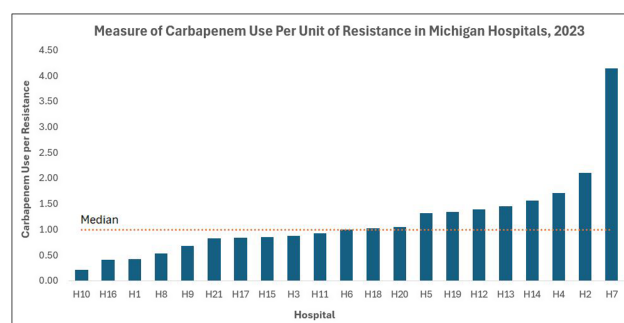
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Background: Carbapenem use is a primary target of antimicrobial stewardship programs with attempts made to limit usage to patients with suspected or documented multidrug resistant Gram-negative infections. Antimicrobial use (AU) data and the standardized antimicrobial administration ratio (SAAR) are metrics for comparing observed to predicted days of antimicrobial therapy and are increasingly used by stewardship programs to assess use within their institutions. However, the SAAR does not account for individual drug class or resistance rates within an institution, limiting the ability to assess appropriateness and whether a high or low SAAR requires action. To try to assess carbapenem use as a function of resistance within hospitals in Michigan, we developed a novel measure utilizing National Healthcare Safety Network (NHSN) AU and Antimicrobial Resistance (AR) data. **Methods:** Included hospitals had reported both AU and AR data for the calendar year of 2023. To assess the “resistance burden” requiring carbapenem use at an institution, three antimicrobial resistance phenotypes from the NHSN AR data were chosen as a surrogate; extended-spectrum cephalosporin resistant (ESC) *E.coli*, ESC *Klebsiella* spp., and resistant *Pseudomonas aeruginosa*, which was defined as any isolate intermediate or resistant to cefepime, ceftazidime, or piperacillin/tazobactam. The resistance rates for these three phenotypes were combined to create a weighted antibiogram for total resistance burden requiring carbapenem usage at an institution. AU data for carbapenem use per 1,000 days present for each institution was then employed to normalize carbapenem use (numerator) to resistance burden (denominator at each

institution), measured as carbapenem use per unit of resistance. The median value for included hospitals was then calculated, and finally, institutional use relative to this median was reported. **Results:** Twenty-one hospitals, ranging from 6 to 1,011 beds, met inclusion criteria. There were 18 acute care and 3 critical access hospitals; 19 (90.4%) were part of a health system. When normalized to the median value, adjusted carbapenem use per unit of resistance within hospitals ranged from 0.214 to 4.155 (Figure 1). The highest value of adjusted carbapenem use per resistance was 19.4 times that of the lowest value. **Conclusion:** This novel measure of antimicrobial use attempts to correct for the burden of resistance in individual facilities. As such, when applied to hospital populations, this represents a step forward in assessing antimicrobial use appropriateness and would have public health impact related to antimicrobial stewardship efforts. Future objectives include application to additional hospitals, years of data, antimicrobial resistance phenotypes, and agents.

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Setting, Age, and Geography Impact Antimicrobial Prescribing in Children with Upper Respiratory Infections Across a Large Health System

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Background: Upper respiratory infections (URIs) are common causes of outpatient visits in children. While many URIs are viral, antimicrobial prescribing remains high. In preparation for action planning to address this issue within our multi-state health system, this study aimed to characterize current antimicrobial prescribing patterns for pediatric URIs in our outpatient setting. **Methods:** Retrospective analysis of pediatric (<18 years) antimicrobial prescribing for URI diagnosis codes in 639 outpatient sites (nine states), including clinics, urgent cares, and emergency departments (ED) between July 1, 2023 to June 30, 2024. Primary outcome was overall antimicrobial prescribing rates for URIs and by individual URI diagnosis (sinusitis, bronchitis, pharyngitis, otitis media). Logistic regression machine learning model was used with SHapley Additive exPlanations (SHAP) analysis to show feature contributions to antimicrobial prescribing. **Results:** A total of 125,590 patient visits by children with URI were included. Antimicrobial prescribing rates varied by diagnosis (sinusitis: 53%, bronchitis: 18%, pharyngitis: 45%, otitis media: 40%, $p < 0.001$). Overall prescribing ranged from 18%–52% across states. Patients seen in the ED had the lowest use of antimicrobials (25%) while those seen in urgent care had the highest utilization (58%). Non-bronchitis diagnosis, non-ED encounters, ≤ 10 years of age, and specific states had the strongest positive associations with antimicrobial prescribing, while race and social vulnerability index (SVI) were not associated. **Conclusions:** Antimicrobials were most