87. Impact of State of Residence on Adult Vaccination Uptake: A Multilevel Modeling Approach

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Session: O-16. Current Issues in Public Health

Background: Previous studies on adult vaccination coverage found inter-state variability that persists after adjusting for individual demographic factors. Assessing the impact of state-level factors may help improve uptake strategies. This study aimed to:

- Update previous estimates of state-level, model-adjusted coverage rates for influenza; pneumococcal; tetanus, diphtheria, and acellular pertussis (Tdap); and herpes zoster (HZ) vaccines (individually and in compliance with all age-appropriate recommended vaccinations)
- Evaluate effects of individual and state-level factors on adult vaccination coverage using a multilevel modeling framework.

Methods: Behavioral Risk Factor Surveillance System (BRFSS) survey data (2015–2017) were retrospectively analyzed. Multivariable logistic regression models estimated state vaccination coverage and compliance using predicted marginal proportions. BRFSS data were then combined with external state-level data to estimate multilevel models evaluating effects of state-level factors on coverage. Weighted odds ratios and measures of cluster variation were estimated.

Results: Adult vaccination coverage and compliance varied by state, even after adjusting for individual characteristics, with coverage ranging as follows:

- Influenza (2017): 35.1–48.1%
- Pneumococcal (2017): 68.2–80.8%
- Tdap (2016): 21.9–46.5%
- HZ (2017): 30.5–50.9%

Few state-level variables were retained in final multilevel models, and measures of cluster variation suggested substantial residual variation unexplained by individual and state-level variables. Key state-level variables positively associated with vaccination included health insurance coverage rates (influenza/HZ), pharmacists' vaccination authority (HZ), presence of childhood vaccination exemptions (pneumococcal/Tdap), and adult immunization information system participation (Tdap/HZ).

Conclusion: Adult vaccination coverage and compliance continue to show substantial variation by state even after adjusting for individual and state-level characteristics associated with vaccination. Further research is needed to assess additional state or local factors impacting vaccination disparities.

88. Impact of a Computerized Clinical Decision Support Tool on clostridioides Difficile Testing and Oral Vancomycin Utilization as a Balancing Metric

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Session: O-17. Diagnostic Stewardship

Background: Over diagnosis of hospital-onset *Clostridioides difficile* infection (HO-CDI) is directly tied to inappropriate *C. difficile* testing which does not distinguish between infected or colonized individuals. This can lead to inappropriate therapy. Multiple studies have utilized Computerized Clinical Decision Support (CCDS) tools to reduce inappropriate *C. difficile* testing. Our study looks at the impact of a Self-Assessment CCDS tools on *C. difficile* testing for HO-CDI and oral vancomycin utilization as a balancing metric.

Methods: Our institution utilizes a two-step test to diagnose HO-CDI that consists of toxin A/B enzyme immunoassay followed by a confirmatory PCR. We applied a self-assessment driven CCDS approach to reduce testing for HO-CDI. Our intervention was deployed in the 3rd quarter of 2018. It asked 3 questions about stool frequency, laxative use and previous *C. difficile* testing in the order itself. Inappropriate indications for testing included any of the following: < 3 bowel movements within 24 hours, receipt of a laxative within the past 48 hours, or a previous *C. difficile* test within the previous 7 days. Ordering providers would self-answer these questions. A 'yes' response to any of the three questions prevented further test ordering; though respondents had the freedom to change the answer and still proceed with the test order. We evaluated 3

metrics that were all calculated per 1000 inpatient census days: oral vancomycin usage, HO-CDI rates and *C. difficile* testing rates.

Results: Compared to baseline, our intervention resulted in a significant reduction in *C. difficile* testing and HO-CDI rates (Figure 1, Table 1). Oral vancomycin usage also decreased significantly (Figure 2, Table 1).

Figure 1. C. difficile testing and Hospital Onset C. difficile Infection Rates by Month, Before and After Intervention
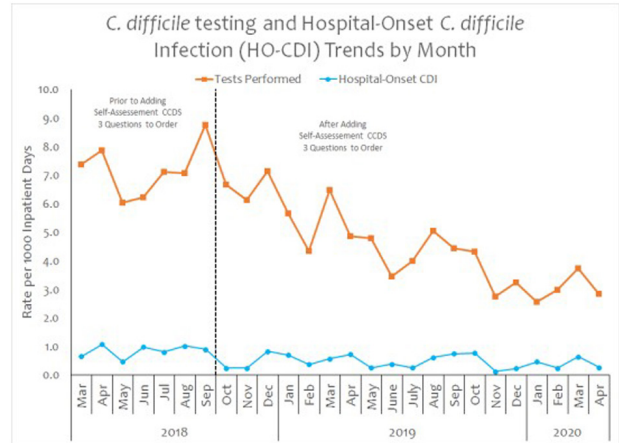

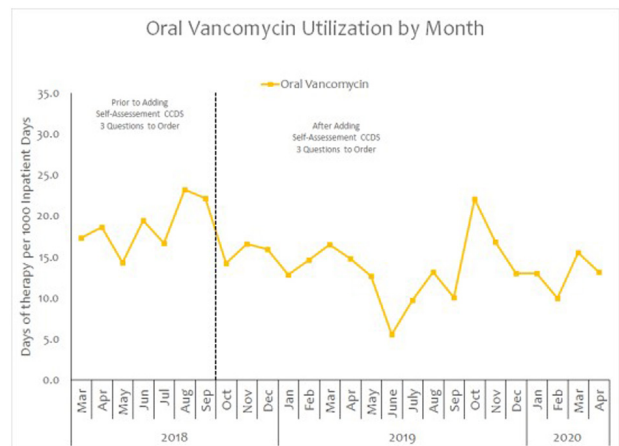Figure 2. Oral Vancomycin Utilization by Month, Before and After Intervention

Table 1. Changes in Median Rates of C. difficile testing, Hospital Onset C. difficile Infections and Vancomycin Utilization, Before and After Intervention.

	Prior to Adding Self-Assessment CCDS 3 Question to the Order	After Adding Self-Assessment CCDS 3 Question to the Order	P-value
Median C. Difficile Testing Rate Per 1000 Inpatient days (IQR)	7.1 (6.2-7.9)	4.4 (3.6-6.5)	0.004
Median HO-CDI Rate Per 1000 Inpatient Days (IQR)	0.9 (0.7-1.0)	0.4 (0.2-0.7)	0.007
Median Oral Vancomycin Days of Therapy Per 1000 Inpatient Days (IQR)	18.6 (16.7-22.1)	13.2 (12.7-16.0)	0.005

Conclusion: Our self-assessment driven CCDS-based diagnostic stewardship resulted in a significant reduction in inappropriate *C. difficile* testing for HO-CDI and HO-CDI rates. Oral vancomycin utilization as a balancing metric also decreased significantly. This was despite the use of a self-assessment driven approach with the freedom to change the answers in order to proceed with the test order.

89. Construction of an Electronic Algorithm to Efficiently Target Antimicrobial Stewardship Efforts for Adults Hospitalized with Community-acquired Pneumonia

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