

Concise Communication

Tracking antimicrobial stewardship activities beyond days of therapy (DOT): Comparison of days of antibiotic spectrum coverage (DASC) and DOT at a single center

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Abstract

Even though antimicrobial days of therapy did not significantly decrease during a period of robust stewardship activities at our center, we detected a significant downward trend in antimicrobial spectrum, as measured by days of antibiotic spectrum coverage (DASC). The DASC metric may help more broadly monitor the effect of stewardship activities.

(Received 28 September 2022; accepted 3 December 2022; electronically published 10 January 2023)

In the United States, days of therapy (DOT) is the preferred metric for measuring inpatient antimicrobial consumption.¹ In addition, DOT is used for the National Healthcare Safety Network (NHSN) standardized antimicrobial administration ratio (SAAR), which is a comparison of observed DOT to predicted DOT.² Although it is widely used, a major disadvantage of DOT is that it does not account for antimicrobial spectrum.

Antimicrobial stewardship programs (ASPs) promote optimal antimicrobial prescribing, including the avoidance of unnecessarily broad-spectrum antimicrobials, through a variety of strategies, such as clinical pathways, education, antimicrobial allergy assessments, and prospective audit and feedback (PAF).^{3–5} By avoiding unnecessarily broad-spectrum antimicrobials, ASPs can help decrease the risk of developing antimicrobial resistance and *Clostridioides difficile* infection without a negative impact on clinical outcomes.^{6–8}

However, stewardship efforts to avoid broad-spectrum antimicrobials are not captured by DOT. DOT counts the number of unique antimicrobials per day without taking the spectrum of antimicrobials into account. Furthermore, if a patient is prescribed a combination of 2 or more types of antimicrobials, DOT could be higher while the antimicrobial spectrum is narrower (eg, piperacillin-tazobactam vs ceftriaxone and metronidazole). Although the NHSN provides several metrics that aggregate the use of antimicrobials with similar spectrums of activity (eg, narrow-spectrum β -lactam agents), no single summative metric in the NHSN captures the antimicrobial spectrum for all prescribed agents.

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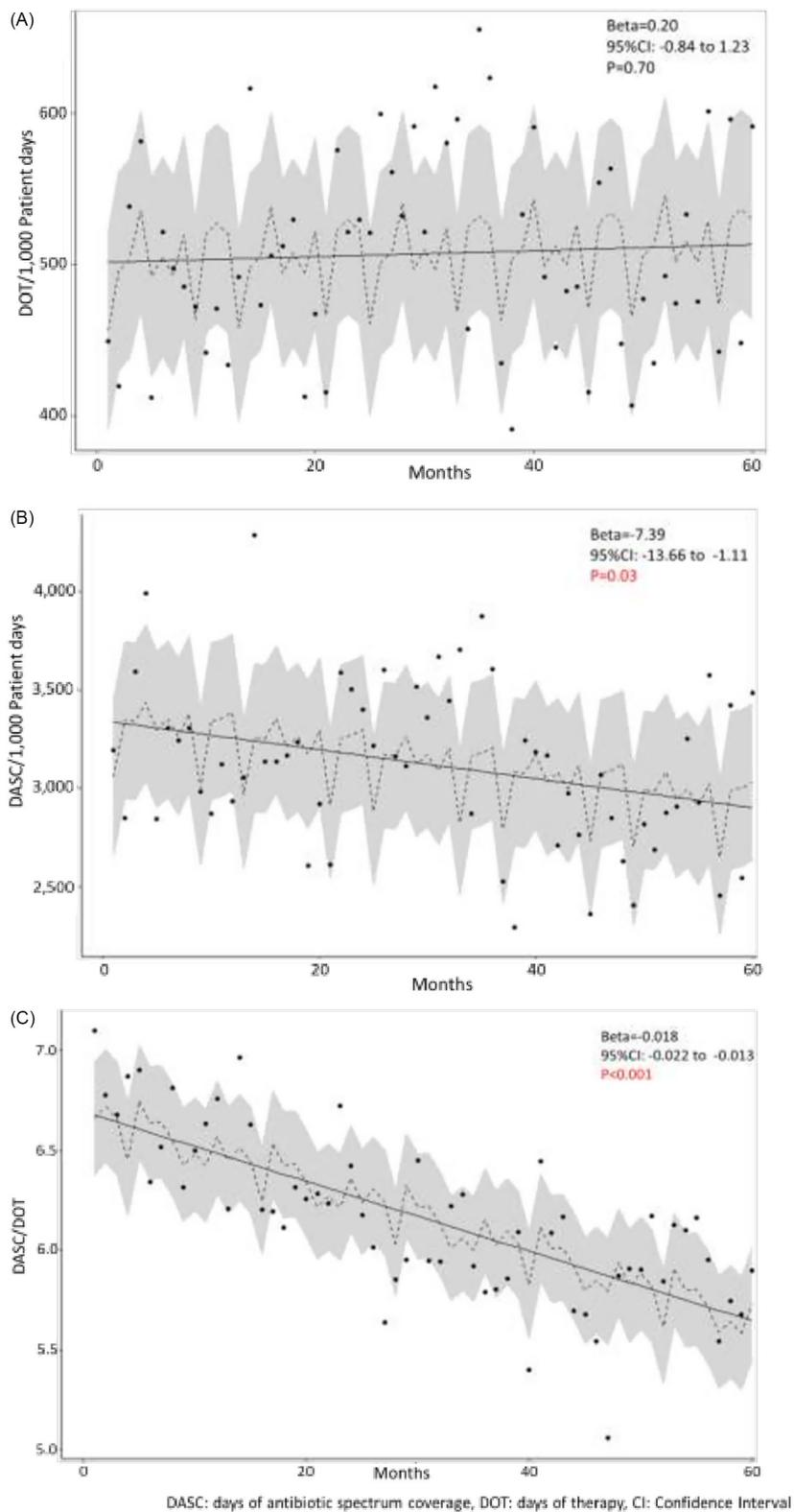
Cite this article: Suzuki H, et al. (2023). Tracking antimicrobial stewardship activities beyond days of therapy (DOT): Comparison of days of antibiotic spectrum coverage (DASC) and DOT at a single center. *Infection Control & Hospital Epidemiology*, 44: 934–937, <https://doi.org/10.1017/ice.2022.312>

To overcome the limitation of existing metrics, we proposed a new metric for antimicrobial consumption: days of antibiotic spectrum coverage (DASC). DASC is calculated by multiplying DOT and the antibiotic spectrum coverage (ASC) score, which is a summative score of antimicrobial spectrum (Table 1).⁹ It is possible that DASC, which captures both antimicrobial spectrum and volume, could better reflect the effect of ASP activities than DOT, but no study has compared the 2 metrics over time in a facility with an active ASP. This study was designed to help address this knowledge gap.

In this study, we evaluated the performance of DASC versus DOT within the Iowa City Veterans' Affairs Healthcare System (ICVAHCS).

Methods

This retrospective study was conducted at the ICVAHCS's acute-care hospital, which has 83 inpatient beds including 10 ICU beds. The ICVAHCS provides care for veterans in eastern Iowa, western Illinois, and northern Missouri. We retrospectively analyzed inpatient antimicrobial use during calendar years 2017 through 2021. During the observational period, the ICVAHCS had an ASP led by 1 infectious diseases (ID) pharmacist (1.0 full-time equivalents or FTE) and 1–2 ID physicians (total, 0.5 FTE). The ASP monitored all inpatients on antimicrobials and performed prospective audit-and-feedback (PAF) every weekday. Our PAF process led to a mean of 9.7 (SD, ± 1.9) documented real-time recommendations per week during the study period. Additional ASP activities included a monthly educational lecture to medical residents or students; promotion of a local antimicrobial-prescribing guide available via a free smartphone software application (cf, app); and routine assignment of a clinical pharmacist to each inpatient physician team for assistance with ordering antimicrobials.



Solid line = trendline, dash line=model-predicted value, shadow=95% CI for model-predicted value

Fig. 1. Antimicrobial consumption at the Iowa City VA Healthcare System during 2017–2021, using (A) days of therapy (DOT), (B) days of antibiotic spectrum coverage (DASC), and (C) DASC/DOT.

Supplementary material. For supplementary material accompanying this paper visit <https://doi.org/10.1017/ice.2022.312>

Acknowledgments. We thank Mr. Erik Stensgard for allowing us to use the antimicrobial consumption data through VISN 23 ASP dashboard. The views

expressed in this article are those of the authors and do not necessarily reflect the position or policy of the US Department of Veterans' Affairs.

Financial support. No financial support was provided relevant to this article.

Conflicts of interest. All authors report no conflicts of interest relevant to this article.

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