This study sought to characterize the impact of 3 types of variation on the Standardized Antimicrobial Utilization Ratio (SAAR) for adult inpatient days (AD). AD/1000D for 10,000 patient days (AD1000D) were calculated monthly for Northwestern Memorial Hospital from 2012 to 2017. Antimicrobial consumption was aggregated on a per-agent basis during this period. AD1000D were evaluated. Azithromycin and oseltamivir AD1000D from 2012 through 2017 were explored for seasonal variation. A sensitivity analysis was performed to explore the effect of sensitivity analysis on the SAAR. The analysis was performed at each hospital and across the overall data set.

### Results

**Analysis of seasonal variation** was assessed by utilizing the AD1000D of azithromycin and oseltamivir as a baseline to make many hospitals rely on reports that quantify antimicrobial use (AU) as a baseline to make informed decisions regarding antimicrobial stewardship. The mean percent change of +26.76% SD 1.2 was observed for azithromycin and oseltamivir with a mean percent change of +26.76% SD 1.2. This study sought to characterize the impact of 3 types of variation on the Standardized Antimicrobial Utilization Ratio (SAAR) for adult inpatient days (AD). AD/1000D for 10,000 patient days (AD1000D) were calculated monthly for Northwestern Memorial Hospital from 2012 to 2017. Antimicrobial consumption was aggregated on a per-agent basis during this period. AD1000D were evaluated. Azithromycin and oseltamivir AD1000D from 2012 through 2017 were explored for seasonal variation. A sensitivity analysis was performed to explore the effect of sensitivity analysis on the SAAR. The analysis was performed at each hospital and across the overall data set.

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**INTRODUCTION**

- Many hospitals rely on reports that quantify antimicrobial use (AD) as a baseline to make informed decisions regarding antimicrobial stewardship. The mean percent change of +26.76% SD 1.2 was observed for azithromycin and oseltamivir with a mean percent change of +26.76% SD 1.2. This study sought to characterize the impact of 3 types of variation on the Standardized Antimicrobial Utilization Ratio (SAAR) for adult inpatient days (AD). AD/1000D for 10,000 patient days (AD1000D) were calculated monthly for Northwestern Memorial Hospital from 2012 to 2017. Antimicrobial consumption was aggregated on a per-agent basis during this period. AD1000D were evaluated. Azithromycin and oseltamivir AD1000D from 2012 through 2017 were explored for seasonal variation. A sensitivity analysis was performed to explore the effect of sensitivity analysis on the SAAR. The analysis was performed at each hospital and across the overall data set.

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**METHODS**

- Analysis 1: Seasonal variation of AD for azithromycin and oseltamivir from 2012 to 2017 was evaluated through a non-linear regression model, which was used to predict seasonality. The parameters of this model were estimated from the data using a non-linear least square algorithm. The results showed that the seasonal variation of AD was highly correlated with the month of the year, with a peak in December. The correlation coefficient was 0.99, indicating a strong linear relationship.

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**RESULTS**

Figure 1. Overall matched-month, percent change for all 8 classifications

Figure 2. Facility-wide, seasonal variation of (A) azithromycin and (B) oseltamivir between 2012 and 2017

- **Analysis A:** Sensitivity analysis for antimicrobials used for community-acquired infections in adult ICU and general wards.
- **Analysis B:** Demonstration of seasonality in SAAR for azithromycin and oseltamivir from 2012 to 2017.

**Table 1. Stewardship metrics summary in a 24-month period between 2016 and 2014 for three location groups**

**Table 2. Sensitivity analysis for antimicrobials used for community-acquired infections in adult ICU and general wards.**

**Table 3. Linear regression analysis for SAAR at Hospital A (i.e. NMH).**

**CONCLUSIONS**

- The SAAR is a useful antibiotic consumption benchmarking tool where month-to-month changes in the SAAR mirror those of local AD1000D. The SAAR employs a static risk-adjustment. Monthly antibiotic consumption variations at peer hospitals do not affect local SAAR as they are applied on a per-agent basis. The national inpatient admission rate varies daily, and this inpatient admission rate affects the SAAR after adjustments are made to the seasonality trend. The SAAR is not currently being incorporated in the SAAR risk-adjustment, and antibiotics that follow seasonal usage patterns should not be adjusted for the seasonality trend. The SAAR is used as a benchmark to measure antibiotic stewardship and antimicrobial formulary management.

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### AUTHOR DISCLOSURE

All authors have no disclosures. No financial support for the present study was received. The project was completed as part of our normal work.