



Department of
Health

TDH Bi-Monthly Antibiotic Steward Call

June 11, 2024



Welcome

Introduce Yourself!



- **Please use the Teams Chat!**
- **Mute unless you're speaking**
 - But feel free to unmute and share!



Announcements

Announcements

- **Quarterly AU Quality and SAAR Reports for Q1 delivered**
 - **Please contact us with questions**

Alabama AS Conference



SAVE THE DATE

ALABAMA INFECTIOUS DISEASES SOCIETY'S
4TH ANNUAL
ANTIMICROBIAL STEWARDSHIP CONFERENCE



ALIDS
Alabama Infectious Diseases Society

July 20, 2024
Homewood, AL



Follow ALIDS on Twitter (@ALInfectDis) and
Facebook for registration information!

CE credit available for physicians, pharmacists, nurses,
nurse practitioners, and physician assistants!

TDH MDAG AS Subcommittee

- **Seeking one infectious diseases trained physician to serve on the TDH Multidisciplinary Advisory Group's Antimicrobial Stewardship Subcommittee**
- **From any TN region or facility type/practice site**
- **Commitments**
 - **2 – 3 meetings per year (2 hours each)**
 - **Provide feedback on current and proposed TDH stewardship projects**
 - **Next meeting July 19 at 10am EDT**



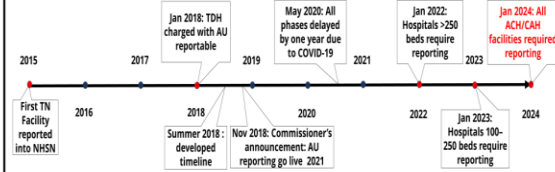
NHSN AU Unit- Based Analysis



Antimicrobial Use Rates by Patient Care Units using NHSN Antimicrobial Use Option in TN Reporting Facilities, 2015–2023

Background

- The National Healthcare Safety Network’s (NHSN) antimicrobial use (AU) Option provides a standardized method for facilities to monitor and report AU rates



- TDH currently uses the NHSN AU Option to calculate facilities’ AU rates and aggregated them at unit-levels
- Previous analyses **do not** assess unit-level AU rates

Methods

- Only Acute Care Hospitals that reported into the NHSN AU option from **2015 to 2023** were included
- Data were analyzed at the facility level and the individual unit levels
- Units** were defined as: critical care (CC) (including neonatal), ward, oncology ward (WARD_ONC), stepdown (STEP), operating room (OR), and ‘other’
- Unit types with **fewer than five** facilities represented were excluded

$$AURate = \frac{Days\ Of\ Therapy}{Days\ Present} \times 1000$$

- Data also identified the most used antimicrobial drugs across the unit-levels by AU rates
- Analysis conducted in SAS 9.4

Results

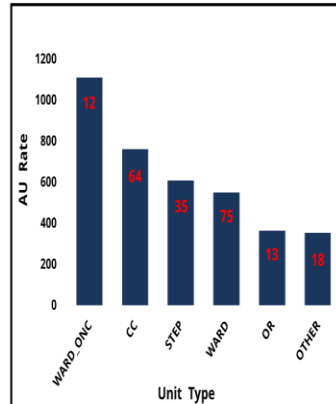


Figure 1: AU Rate over 2015–2023*

*Numbers in red, indicate # of facilities with those units

98 facilities reported ≥ one month of AU data

Increasing number of facilities reported into NHSN’s AU option

Oncology wards had a significantly higher AU rate (Figure 1) compared to other unit types

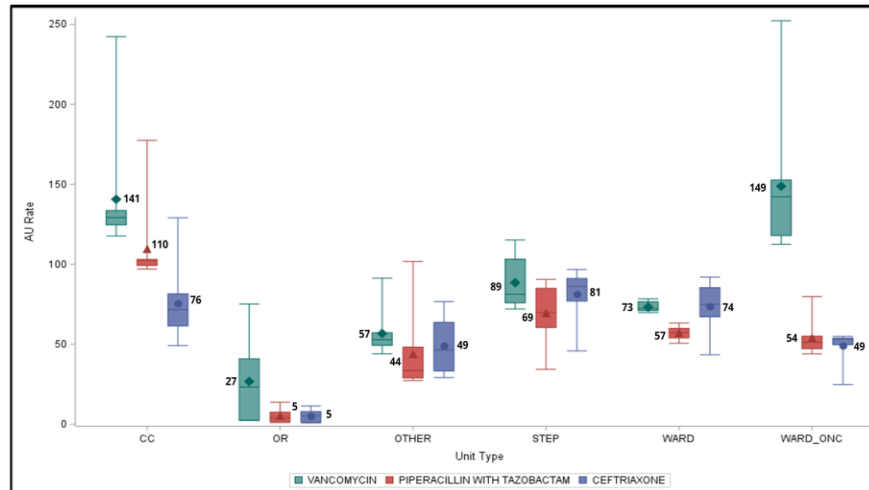
Statewide top 3 antimicrobials with the highest rates were:

Vancomycin (83 DOT/1000 DP),

Ceftriaxone (77 DOT/1000 DP), and

Piperacillin-Tazobactam (65 DOT/1000 DP)

Figure 2: Top 3 Antimicrobial Use Rates by Units



Discussion and Conclusions

- Addressing the diverse antimicrobial prescribing behaviors observed necessitates a **unit-specific approach**
- Tailored interventions are vital, acknowledging each unit’s distinct antimicrobial usage patterns
- By implementing unit-specific strategies, healthcare facilities can better address and mitigate inappropriate antimicrobial prescribing practices, thus **promoting stewardship** and combatting antimicrobial resistance

Contact Information

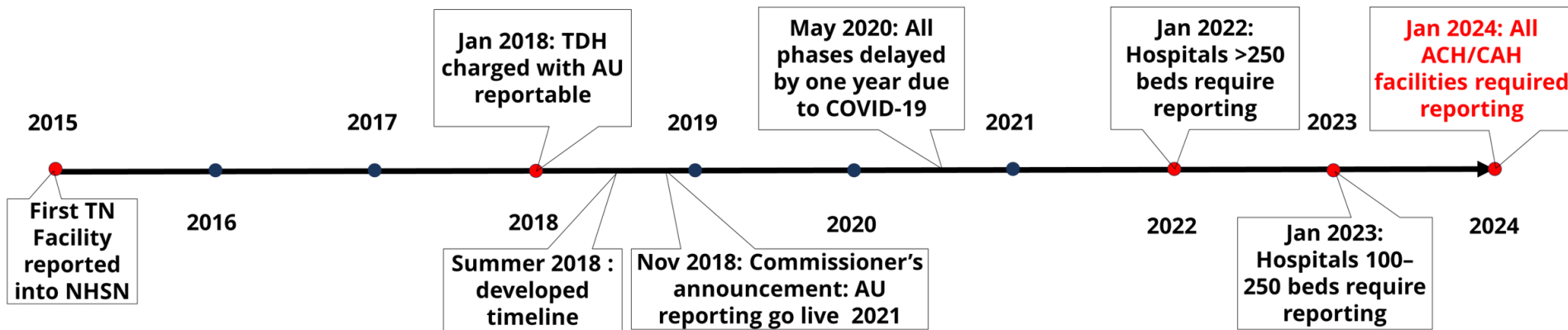
Dipen M. Patel, MBBS, MPH,MPM
Tennessee Department of Health
HA1.Health@tn.gov

Background

- **The National Healthcare Safety Network's (NHSN) antimicrobial use (AU) Option provides a standardized method for facilities to monitor and report AU rates**
- **According to CDC:**
 - “**Purpose: The NHSN AUR Module provides mechanism for facilities to report and to analyze AU and/or AR data to inform benchmarking, reduce antimicrobial resistant infections through antimicrobial stewardship, and interrupt transmission of resistant pathogens at individual facilities or facility network”**
- **AU rate allows inter - and/or intra -facility comparisons among specific wards, combined ward, and facility-wide aggregated data**

Background

- TDH currently uses the NHSN AU Option to calculate facilities' AU rates and aggregated them at unit-levels
- Previous analyses do not assess unit-level AU rates



Methods

- Acute Care Hospitals that reported into the NHSN AU option from 2015 to 2023 were included
- facility-wide inpatient data analyzed at unit levels
- Units were defined as: critical care (CC) (including neonatal), ward, oncology ward (WARD_ONC), stepdown (STEP), operating room (OR), and 'other'
 - Unit types with *fewer than five* facilities represented were excluded

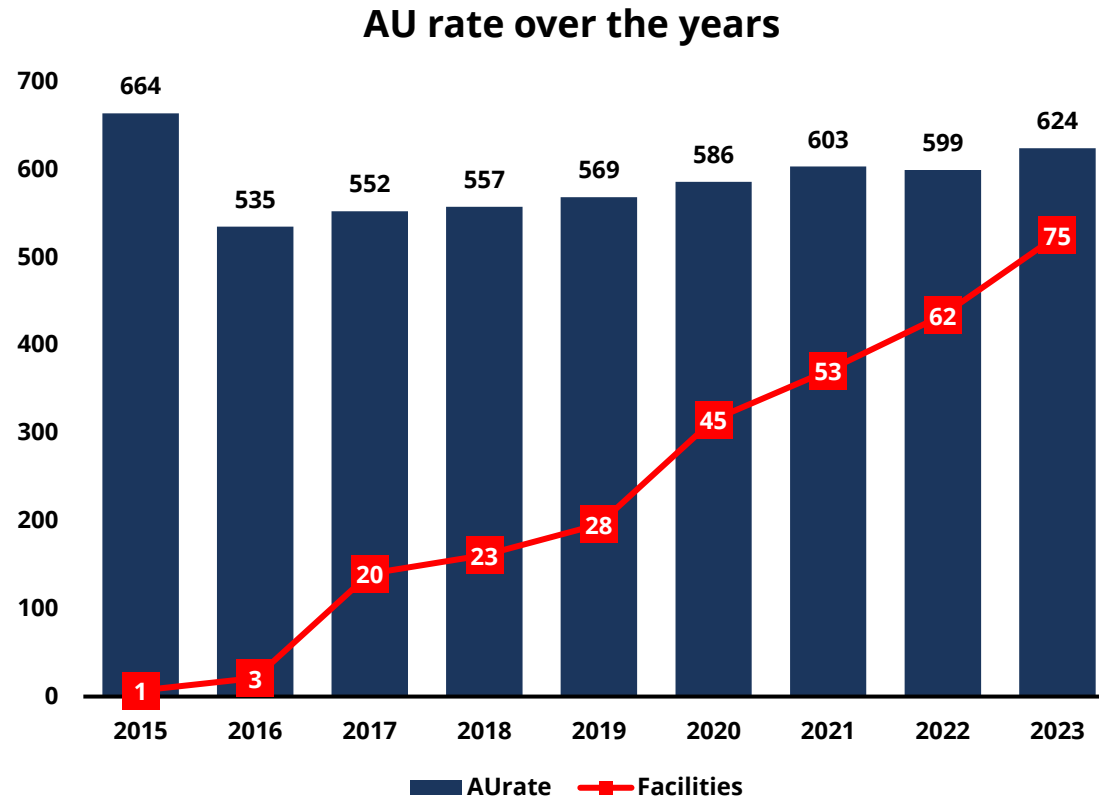
Methods

$$\mathbf{AURate} = \frac{\mathbf{Days\ Of\ Therapy}}{\mathbf{Days\ Present}} \times 1000$$

- **Data also identified the most used antimicrobial drugs across the unit-levels by AU rates**
- **Analysis conducted in SAS 9.4**

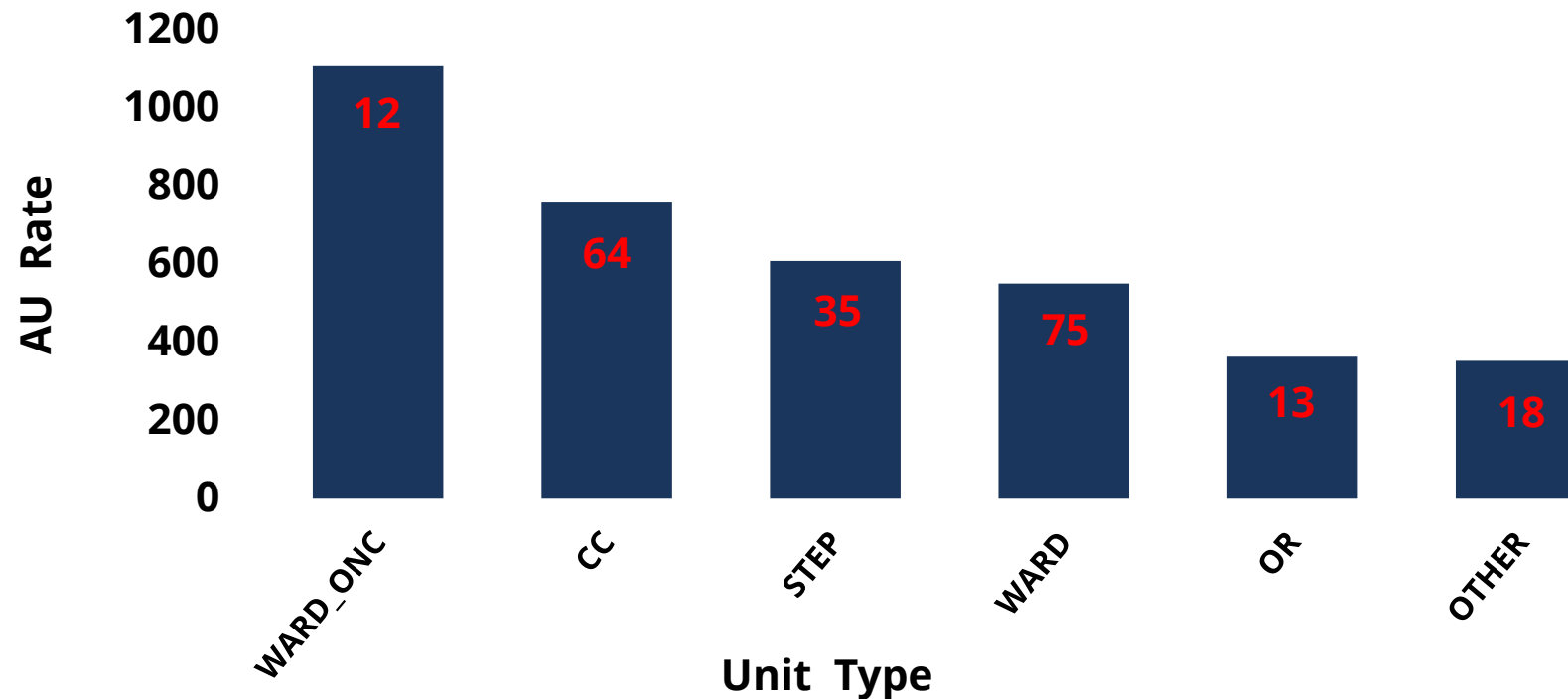
Results

- 98 facilities reported \geq one month of AU data



Results

- **Oncology wards** had a significantly higher AU rate compared to other unit types ($p < 0.001$)

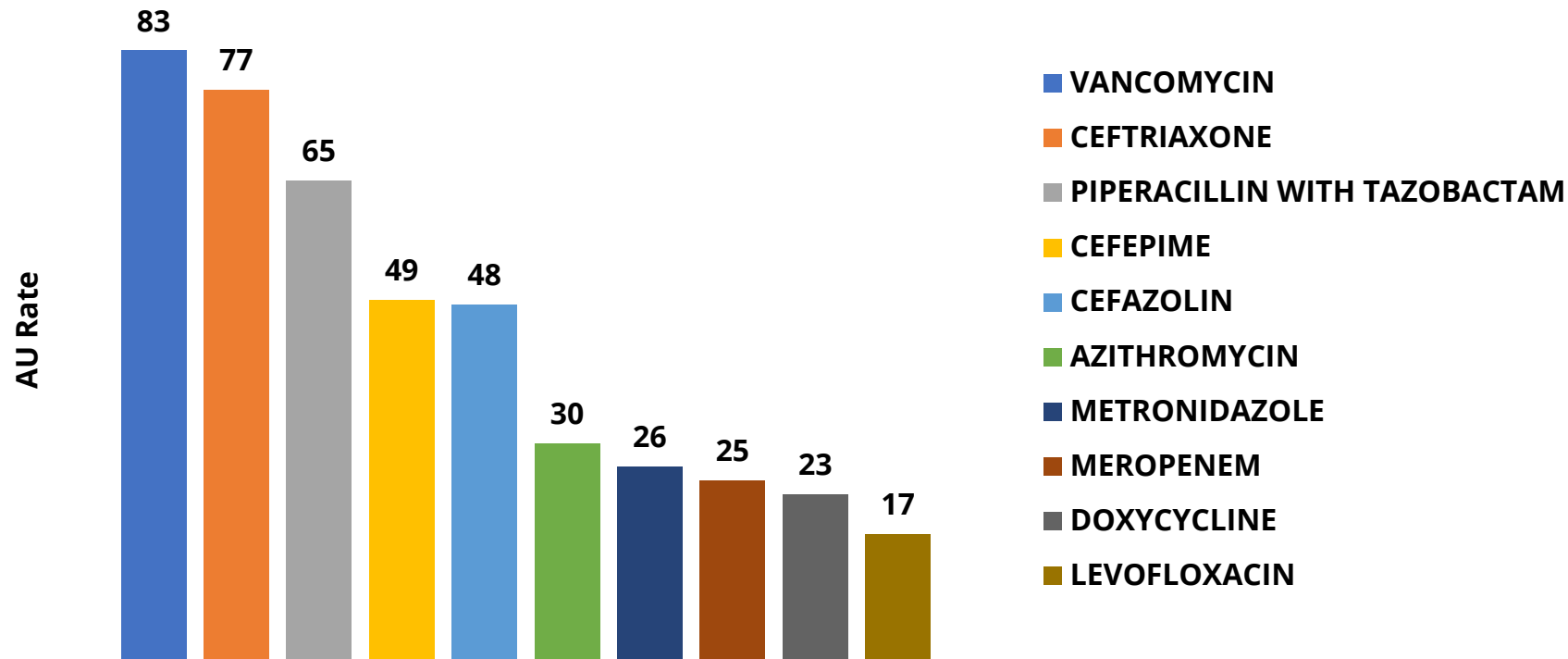


AU Rate by Unit types over 2015-2023*

* Numbers in red, indicate # of facilities with those units

Results

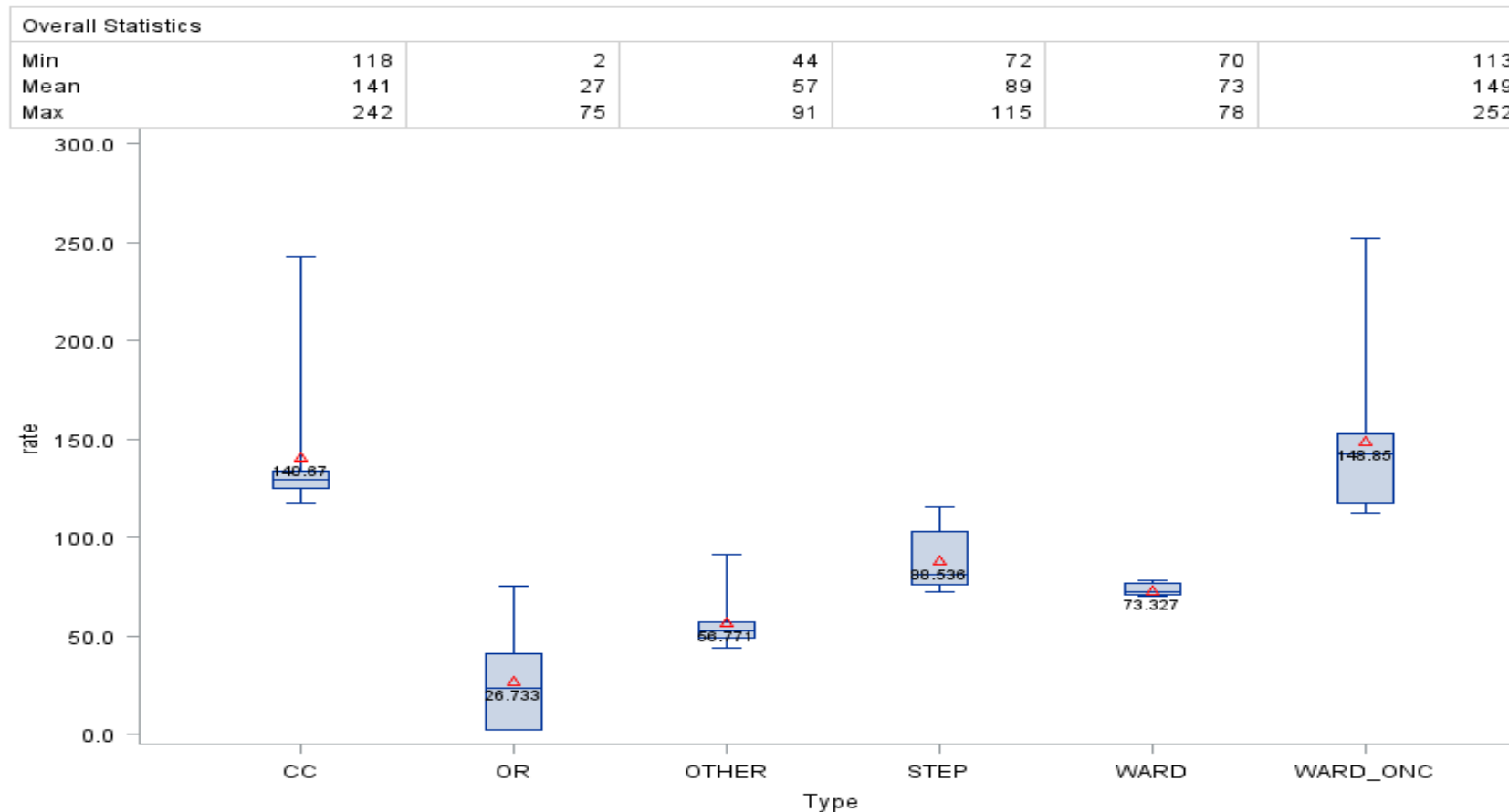
- Statewide top 3 antimicrobials with the highest rates were: **Vancomycin** (83 DOT/1000 DP), **Ceftriaxone** (77 DOT/1000 DP), and **Piperacillin-Tazobactam** (65 DOT/1000 DP)



Results

- **Vancomycin AU rates were significantly higher in oncology ward units compared to stepdown, ward, other, and OR units ($p < 0.0001$)**

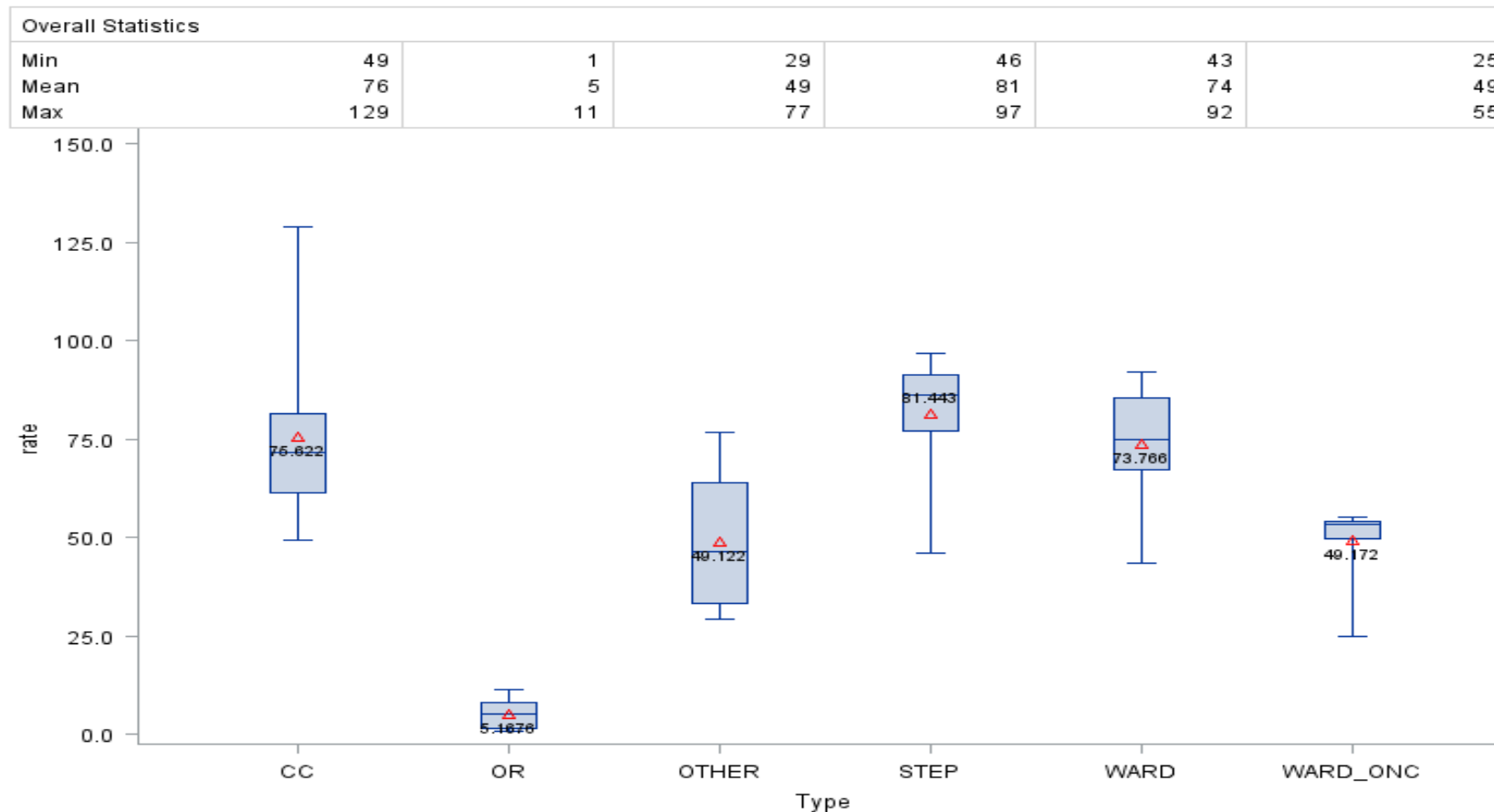
VANC AU rate in different units



Results

- Ceftriaxone AU rate was significantly higher in stepdown units compared to oncology ward, other, and OR units ($p < 0.0001$)

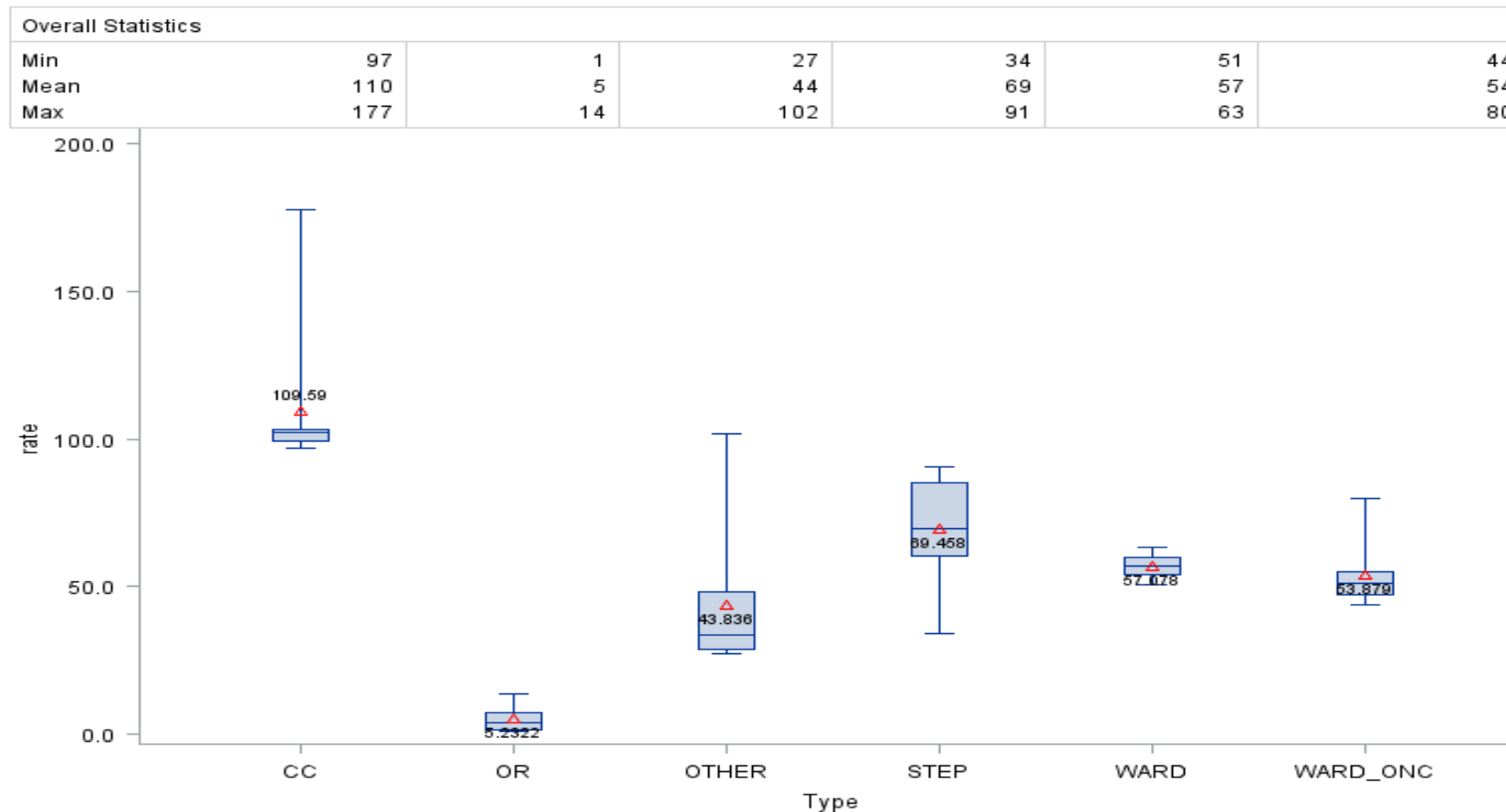
CEFTRX AU rate in different units



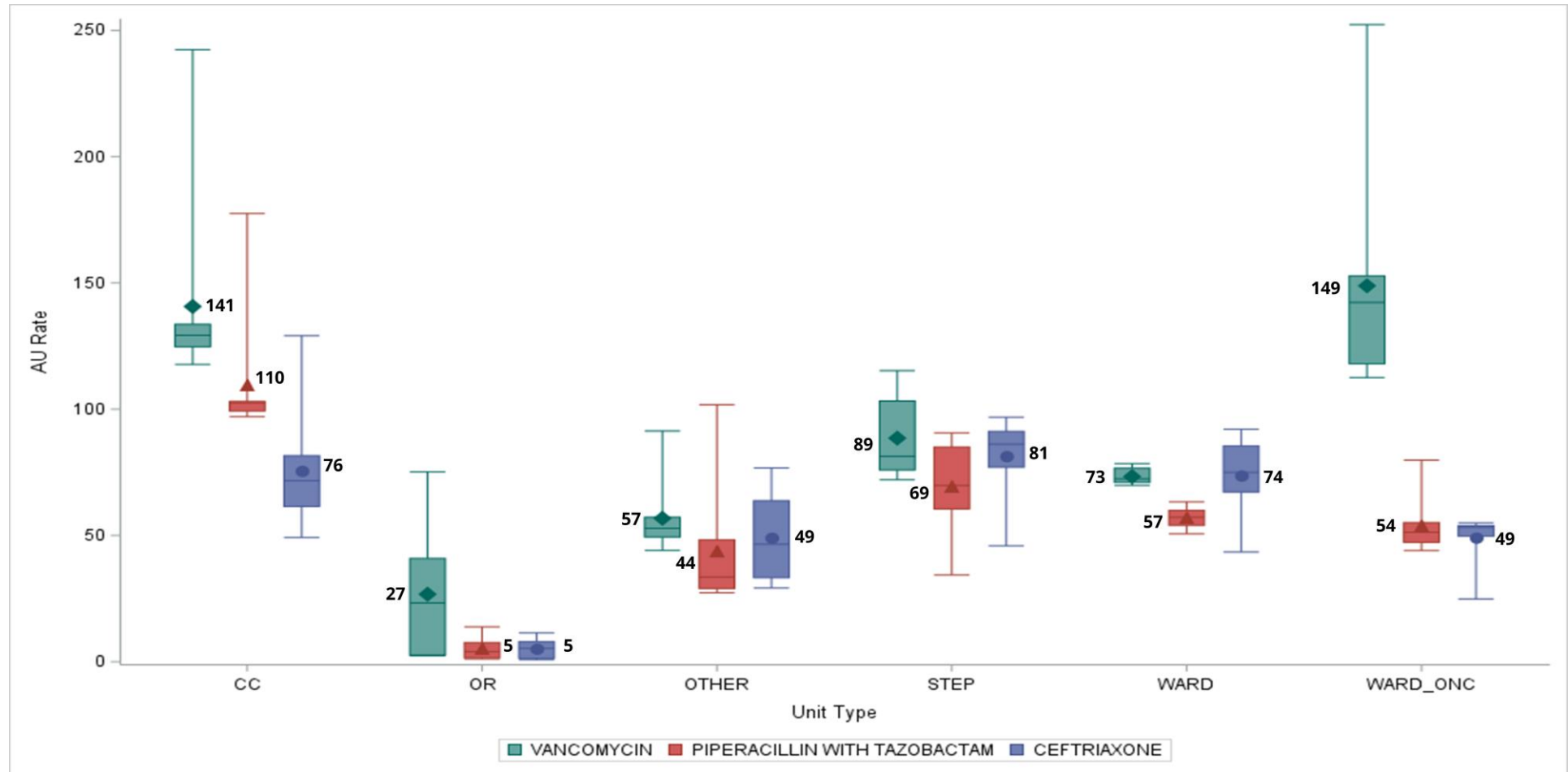
Results

- Piperacillin/tazobactam AU rate was significantly higher in critical care units compared to different unit types ($p < 0.0001$)

PIPERWT AU rate in different units



Results

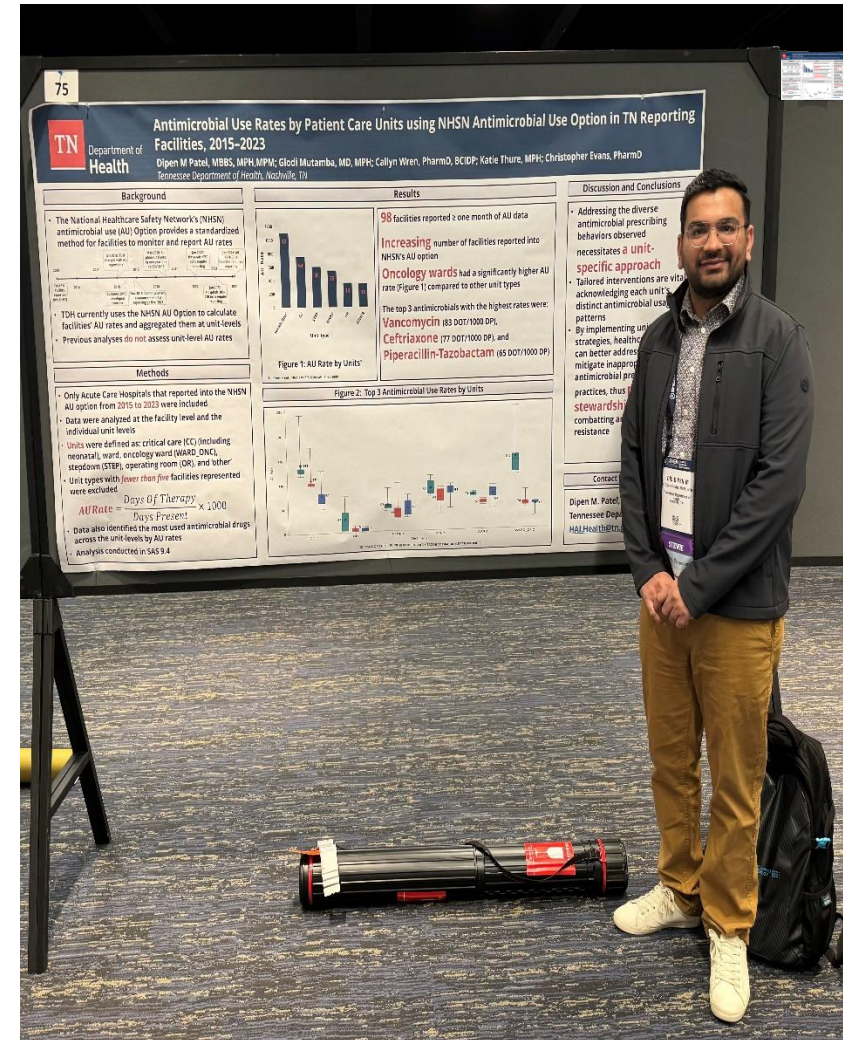


Discussion

- **Addressing the diverse antimicrobial prescribing behaviors observed necessitates a unit-specific approach**
- **Tailored interventions are vital, acknowledging each unit's distinct antimicrobial usage patterns**
- **By implementing unit-specific strategies, healthcare facilities can better address and mitigate inappropriate antimicrobial prescribing practices, thus promoting stewardship and combatting antimicrobial resistance**

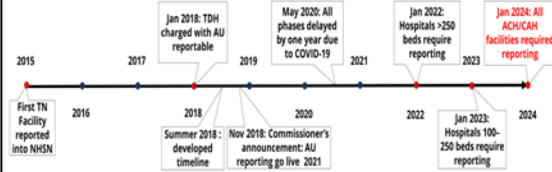
Thanks

- **Glodi Mutamba, MD, MPH**
- **Callyn Wren, PharmD, BCIDP**
- **Katie Thure, MPH**
- **Christopher Evans, PharmD**



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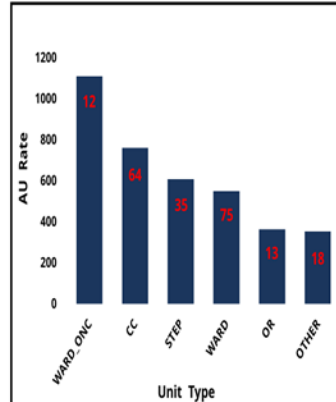


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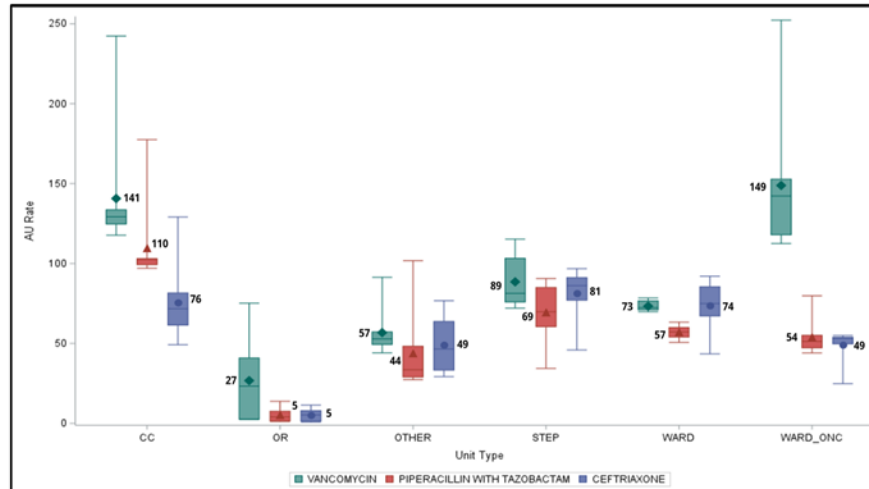
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Contact Information

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Stewardship Intervention Perceptions Survey

Stewardship Report Card- Overview

- Surveyed all stewards in TN, CO, VA
- For each stewardship intervention:
 - How essential is this intervention to the success of your antimicrobial stewardship program?
 - How effective is this intervention at driving antimicrobial use at your facility?

LEADERSHIP SUPPORT PAGE 1 OF 2

How **ESSENTIAL** is each intervention below to the success of your antimicrobial stewardship program? (1 being non-essential and 7 being absolutely essential)

	1	2	3	4	5	6	7	
Providing stewardship program leader(s) dedicated time to manage the program and conduct daily stewardship interventions. <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Allocating resources (for example, IT support, training for stewardship team) to support antibiotic stewardship efforts. <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Having a senior executive that serves as a point of contact or "champion" to help ensure the program has resources and support to accomplish its mission. <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Presenting information on stewardship activities and outcomes to facility leadership and/or board at least annually. <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ensuring the stewardship program has an opportunity to discuss resource needs with facility leadership and/or board at least annually. <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset

Methods

- **Core Elements:**

- **Leadership**
- **Accountability**
- **Physician Expertise**
- **Pharmacist Expertise**
- **Stewardship Interventions**
- **Pharmacy Interventions**
- **Nursing-driven**
- **Tracking**
- **Education**
- **Microbiology**
- **Breakpoint Interventions**

Methods

- Respondents rated each intervention from one to seven.
 - 1 = **non-essential**/**effective**
 - 7 = being absolutely **essential**/**effective**.
- The overall mean for each category was calculated by averaging the means of each intervention for that specific element.

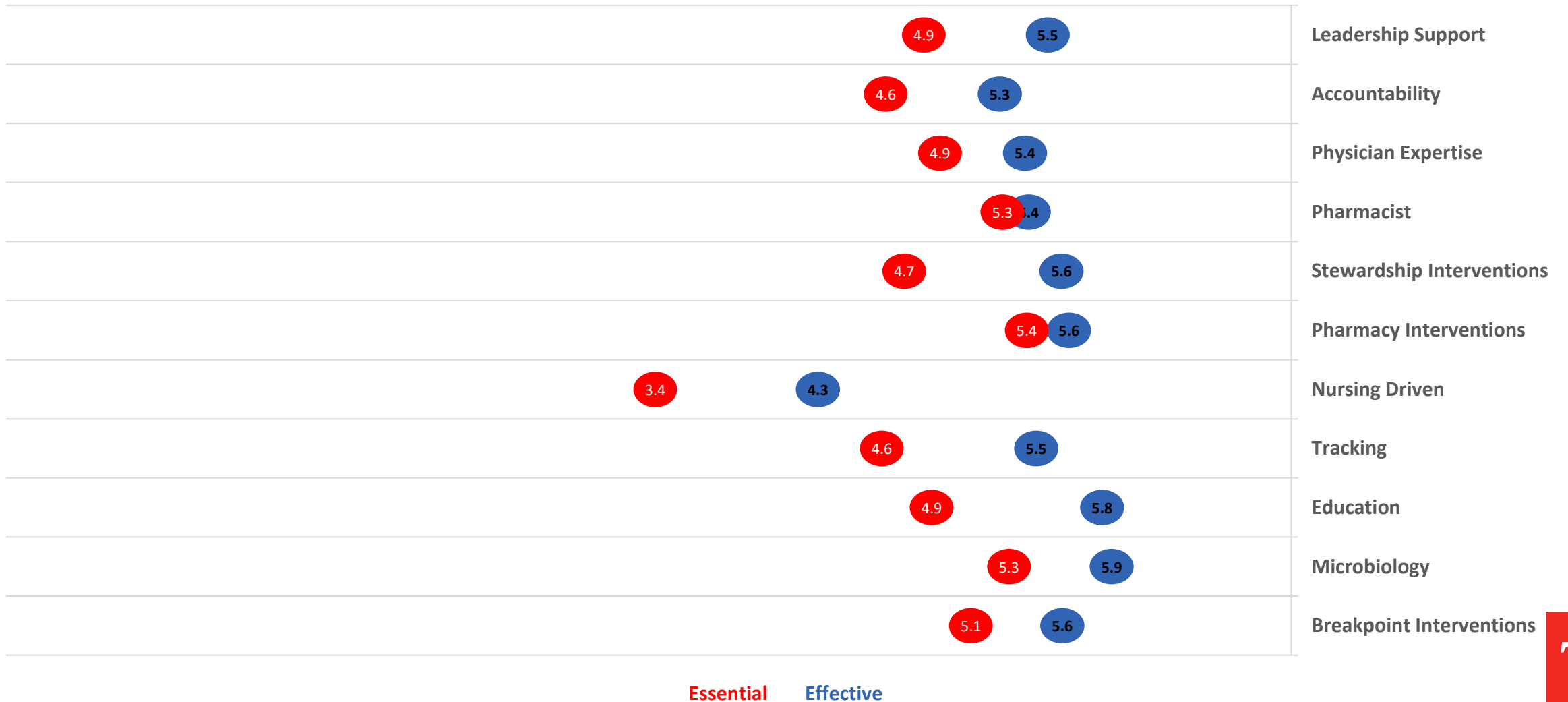
Accountability Category	Essential Mean	Effective Mean
Physician	6.36	5.43
Pharmacist	6.98	6.38
Other (RN, PA, NP)	4.50	3.71
Remote stewardship expert	3.21	3.05

Respondent Demographics

- **64 stewards responded to the survey**
- **90.6% are from Tennessee facilities**
- **82.8% are Pharmacists**
- **46.9% work in facilities >250 beds**

Overall Intervention Scores (by category)

Overall Average Effectiveness and Essentialness of Core Elements



Leadership Support

	Essential Mean	Effective Mean
Providing stewardship program leader(s) dedicated time	6.57	6.19
Allocating resources to support antibiotic stewardship efforts.	6.21	5.81
Having a senior executive that serves as a point of contact or "champion"	5.77	4.81
Presenting information on stewardship activities/outcomes to facility leadership at least annually.	5.11	4.50
Stewardship program has an opportunity to discuss resource needs with facility leadership at least annually.	5.60	4.50
Communicating to staff about stewardship activities.	4.91	4.24
Providing opportunities for hospital staff training and development on antibiotic stewardship.	5.28	4.55
Providing a formal statement of support for antibiotic stewardship.	4.40	3.45
Ensuring that staff from key support departments and groups are contributing to stewardship activities.	5.62	4.90
Antibiotic stewardship activities integrated into quality improvement and/or patient safety initiatives	5.77	5.55

Accountability

	Essential Mean	Effective Mean
Physician	6.36	5.43
Pharmacist	6.98	6.38
Other (RN, PA, NP)	4.50	3.71
Remote stewardship expert	3.21	3.05

Physician Expertise

	Essential Mean	Effective Mean
Has antibiotic stewardship responsibilities in their contract, job description, or performance review	6.17	5.57
Is physically on-site in your facility (either part-time or full-time)	6.31	6.02
Completed an ID fellowship	5.19	5.12
Completed a certificate program on antibiotic stewardship	4.64	3.93
Completed other training(s) on antibiotic stewardship	4.69	4.05

Pharmacist Expertise

	Essential Mean	Effective Mean
Has antibiotic stewardship responsibilities in their contract, job description, or performance review	6.75	6.23
Is physically on-site in your facility (either part-time or full-time)	6.10	6.28
Completed a PGY2 ID residency and/or ID fellowship	4.70	4.70
Completed a certificate program on antibiotic stewardship	4.70	4.43
Completed other training(s) (for example, conferences or online modules)	4.85	4.75

Steward Interventions - Actions

	Essential Mean	Effective Mean
Prospective audit and feedback for specific antibiotic agents	6.46	6.14
Preauthorization for specific antibiotic agents.	5.51	5.38
Treatment teams review antibiotics 48-72 hours after initial order	5.38	4.78
Stopping antibiotic(s) in new cases of <i>Clostridioides difficile</i> infection	5.11	4.22

Steward Interventions - Guidelines

	Essential Mean	Effective Mean
Facility-specific treatment recommendations to assist with antibiotic selection for common clinical conditions	6.22	5.05
Community-acquired pneumonia guideline	6.00	4.76
Urinary tract infection guideline	5.89	4.54
Skin and soft tissue infection guideline	5.73	4.59
Guideline for optimal management of sepsis	5.97	5.08
<i>Staphylococcus aureus</i> bloodstream infection guideline	5.84	4.95
Culture-proven invasive (bloodstream) infections guidelines	5.57	4.35
Penicillin allergy guideline	5.70	5.11
Outpatient parenteral antibiotic therapy (OPAT) guideline	4.32	3.76
Guideline for antibiotics at discharge for common clinical conditions	4.68	3.70

Pharmacy Interventions

	Essential Mean	Effective Mean
Pharmacy-driven changes from intravenous to oral antibiotics without a physician's order	5.78	5.67
Alerts to providers about potentially duplicative antibiotic spectra	5.25	4.92
Automatic antibiotic stop orders in specific situations	5.89	5.64

Nursing-driven

	Essential Mean	Effective Mean
Nurses receive training on appropriate criteria for sending urine and/or respiratory cultures.	5.22	4.33
Nurses initiate discussions with the treating team on switching from intravenous to oral antibiotics.	4.03	3.25
Nurses initiate antibiotic time-out discussions with the treating team.	4.03	3.08
Nurses track antibiotic duration of therapy	3.81	2.89

Tracking

	Essential Mean	Effective Mean
Tracking Antibiotic resistance patterns at least annually	6.64	5.83
Tracking Clostridioides difficile infections at least annually	6.08	5.33
Tracking Antibiotic use in days of therapy (DOT) per 1000 patient days or days present, at least quarterly	6.28	5.44
Tracking Antibiotic use in defined daily doses (DDD) per 1000 patient days, at least quarterly	3.92	3.36
Tracking Antibiotic expenditures at least quarterly	4.39	3.69
Individual provider feedback reports on antibiotic use	5.17	4.33
Unit or service specific reports on antibiotic use	5.00	4.14
Report Annual Antibigram to prescribers	6.17	5.08
Antimicrobial stewardship reports to staff	5.50	4.39

Education

	Essential Mean	Effective Mean
Educating Prescribers	6.56	5.47
Educating Nursing Staff	5.11	4.33
Educating Pharmacists	6.53	5.83
Educating Patients	5.08	3.94

Microbiology

	Essential Mean	Effective Mean
Selective/Cascading reporting of antimicrobial susceptibility testing results	5.81	5.64
Placing comments in microbiology reports to improve prescribing	5.69	5.06
On-site laboratory that performs bacterial antimicrobial susceptibility testing	5.78	5.06
Laboratory test bacterial isolates for presence of carbapenemase	5.94	5.17
Laboratory test bacterial isolates for presence of extended-spectrum beta-lactamases (ESBL) for E. coli or Klebsiella spp.	6.14	5.64

Breakpoint Interventions

	Essential Mean	Effective Mean
Cephalosporin and monobactam breakpoints for Enterobacterales in 2010	5.64	5.31
Carbapenem breakpoints for Enterobacterales in 2010	5.67	5.19
Ertapenem breakpoints for Enterobacterales in 2012	5.31	4.78
Carbapenem breakpoints for <i>Pseudomonas aeruginosa</i> in 2012	5.72	5.19
Fluoroquinolone breakpoints for <i>Pseudomonas aeruginosa</i> in 2019	5.64	5.11
Fluoroquinolone breakpoints for Enterobacterales in 2019	5.64	5.06

Conclusions

- Respondents considered all interventions to be **essential**, although most displayed lower **efficacy** in influencing antimicrobial use
- As evidenced by these data, not all interventions are perceived equal in driving antimicrobial usage.
- A potential influence on these results was survey fatigue. Questions were not required.

Next steps

- **Create a “score card” for each facility that submits an NHSN Annual Facility Survey**
- **Steps:**
 - **Count the number of statements per category (e.g. 10 overall for Leadership).**
 - **Calculate the essential and effective mean for each intervention.**
 - **Rank essential & effectiveness scores**
 - **Average the essential and effective ranks**
 - **Rank the average ranks**
 - **Apply 1,000 points to the scorecard in the order of the average rank (lowest value items have the lowest # points, highest value items have the highest # points)**

Example

Physician Expertise Category	Essential Mean	Effective Mean	Essential Rank	Effective Rank	Average Rank	Rank of Average Ranks	Points for Scorecard
Has antibiotic stewardship responsibilities in their contract, job description, or performance review	6.17	5.57	2	2	2	2	267
Is physically on-site in your facility (either part-time or full-time)	6.31	6.02	1	1	1	1	333
Completed an ID fellowship	5.19	5.12	3	3	3	3	200
Completed a certificate program on antibiotic stewardship	4.64	3.93	5	5	5	5	67
Completed other training(s) (for example, conferences or online modules) on antibiotic stewardship	4.69	4.05	4	4	4	4	133
Fictional Hospital Scorecard							
	Hospital Reports	Score					
Has antibiotic stewardship responsibilities in their contract, job description, or performance review	N	0					
Is physically on-site in your facility (either part-time or full-time)	Y	333					
Completed an ID fellowship	Y	200					
Completed a certificate program on antibiotic stewardship	Y	67					
Completed other training(s) (for example, conferences or online modules) on antibiotic stewardship	Y	133					
		73%	Final Score				

Next Steps

- **Next Call**
 - August 13 at 2pm Eastern/1pm Central Time
 - Topic: Targeted Assessment for Antimicrobial Stewardship
 - Topic: NHSN AR Option Updates

- **Feedback always appreciated**
 - Christopher.evans@tn.gov