

# TARGETED ASSESSMENT PREVENTION (TAP) STRATEGIES REPORT: STATEWIDE REPORT

HEALTHCARE-ASSOCIATED INFECTION/ANTIBIOTIC RESISTANCE (HAI/AR)  
PREVENTION PROGRAM

KENTUCKY DEPARTMENT FOR PUBLIC HEALTH  
275 East Main Street, Frankfort, Kentucky 40621



**Kentucky Public Health**  
Prevent. Promote. Protect.

Tuesday, July 30, 2019

Dear State IP's,

As the Kentucky Department for Public Health (DPH)/Healthcare-Associated Infection (HAI)/Antibiotic Resistance (AR) Prevention Program progresses towards reducing health-care associated infections and antibiotic resistant organisms (HAIs) throughout the state, we want to thank you and your staff for your efforts to deliver the safest healthcare and infection free admissions to Kentucky's patients.

As part of the HAI/AR efforts to reduce HAIs and AR organisms, annual Targeted Assessment Prevention Strategies (TAP) reports will be created for each acute care hospital, long term acute care hospital, and inpatient rehabilitation facility in Kentucky. The TAP Strategy is a framework created by the Centers for Disease Control and Prevention (CDC) to use data for action to prevent HAIs and AR. The TAP strategy consists of three components: 1) running TAP reports in the National Healthcare Safety Network (NHSN) to target healthcare facilities and specific units with an excess burden of HAIs, 2) administering TAP Facility Assessment Tools to identify gaps in infection prevention in the targeted locations, and 3) accessing infection prevention resources within the TAP Implementation Guides to address those gaps.

The TAP reports focus on the following HAIs: catheter-associated urinary tract infections (**CAUTI**), *Clostridium difficile* infections Lab identified events (**CDI LabID**), central line-associated bloodstream infections (**CLABSI**) and methicillin-resistant *Staphylococcus aureus* Lab identified events (**MRSA LabID**). The following pages contain a data overview, NHSN re-baseline and calculations, statistics at a glance, resources, and in-depth analysis sections.

When your facility has a Standardized Infection Ratio (SIR) higher than the national 2020 HHS goal (i.e. when the Cumulative Attributable Difference (CAD) is greater than 0), **we recommend taking steps to mitigate the issue**. Definitions for these terms can be found on page 5.

Please do not hesitate to contact us with any questions.

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## OVERVIEW

### THE PURPOSE

The purpose of this report is to support Hospital HAI/AR prevention efforts by summarizing hospital NHSN data, providing comparisons to the national benchmark and other state hospitals, and by introducing the TAP program.

### WHAT'S INCLUDED

This report includes data for Kentucky acute care hospitals participating in the Centers for Medicare & Medicaid Services (CMS) Prospective Payment Systems (PPS) reimbursement program. There are 72 PPS hospitals in Kentucky. This report includes measures required for CMS reporting that also have a TAP report available in NHSN (CLABSI, CAUTI, LabID CDI, and LabID MRSA).

### HOW THE DATA WERE OBTAINED

The data included in this report were obtained using the reportable disease surveillance mandate for the state (902 KAR2:020 Section 12). 902 KAR2:020 Section 12 states "Healthcare-Associated Infection Surveillance. (1) A healthcare facility in Kentucky that participates in CMS reporting programs shall authorize the CDC to allow the Kentucky Department for Public Health to access health care-associated infection data reported to the National Healthcare Safety Network (NHSN). (2) The Kentucky Department for Public Health shall preserve patient confidentiality and shall not disclose to the public any patient-level data obtained from any health care facility. (3) The Kentucky Department for Public Health may issue reports to the public regarding healthcare-associated infections in aggregate data form which: (a) May identify individual health care facilities; and (b) Shall comply with methodology developed by the CDC and CMS for national reporting of health care-associated infections. (4) The Kentucky Department for Public Health may evaluate healthcare-associated infection data for accuracy and completeness." This report focuses on all data available in NHSN since the mandate was finalized in 2015 (2015 Q1- 2017 Q4).

### CONFIDENTIALITY

This report contains facility-level NHSN data for Kentucky acute care hospitals (ACH). All data is aggregated at the facility level so that no patient can be identified through this report.

## NHSN RE-BASELINE AND CALCULATIONS

### CORRECTIONS MADE

CDC uses reported HAI data to calculate the Standardized Infection Ratio (SIR) which compares the number of infections in a facility or state to the number of infections that were “predicted”, or would be expected, to have occurred based on previous years (baseline data) of reported data. The number of predicted infections is an estimate based on aggregated data reported to CDC’s NHSN during a specific baseline period.

“Rebaseline” is a term that CDC’s NHSN staff use to describe updates to original HAI baselines. The 2015 rebaseline updates both the source of aggregate data and the risk adjustment methodology used to create the original baselines. Risk adjustment refers to the processes used to account for the differences in risk that may impact the number of infections reported by a hospital. When the data are risk-adjusted, it makes it possible to fairly compare hospital performance. In this report, the SIRs are adjusted for risk factors.

Independent models were created for each outcome calculated under the new baseline. Each model corrected the data independently for what is important for that outcome. For instance, the CLABSI model corrects for location codes, bed size, medical school affiliation, presence of a NICU, facility type and other variables. This allows for more fair comparisons of hospital performance. More information on these corrections can be found at <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf>. Information on analysis using this data can be found at <https://www.cdc.gov/nhsn/2015rebaseline/index.html> .

Previous data reported by the HAI/AR Prevention Program were calculated prior to the release of the rebaseline. For this reason any overlapping reported data may have differing numbers between this report and previous reports.

### DEFINITION OF CALCULATIONS

#### STANDARDIZED INFECTION RATIO (SIR) =

$\frac{\text{Observed HAI}}{\text{Predicted HAI}}$ : The ratio of observed to predicted HAIs. Predicted HAIs are calculated based on the 2015 National HAI aggregate data and adjusted using variables found to be significant predictors of HAI incidence (e.g., bed size and teaching status). SIRs are only calculated when at least 1 HAI is predicted. For more information please see the NHSN SIR guide at: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf> .

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CUMULATIVE ATTRIBUTABLE DIFFERENCE (CAD) =

*(Observed HAIs) – (Predicted HAIs \* SIR Goal)*: The number of infections that need to be prevented in order to meet an SIR goal. A positive CAD suggests that the number of infections is in excess of the SIR goal, while a negative CAD indicates that the SIR goal was met. There is no minimum threshold for calculating CAD, therefore CAD is available for all data points.

## CAUTI

**926**  
**0**  
**Better**

Infections reported from your facility.  
Infections in need of prevention to meet 2020  
HHS SIR Goal.  
In comparison to the National Average\*

Quarter	SIR	HHS GOAL
2015Q1	0.9	0.75
2015Q2	0.8	0.75
2015Q3	1.0	0.75
2015Q4	0.8	0.75
2016Q1	1.0	0.75
2016Q2	0.8	0.75
2016Q3	0.9	0.75
2016Q4	0.8	0.75
2017Q1	0.6	0.75
2017Q2	0.7	0.75
2017Q3	0.9	0.75
2017Q4	0.8	0.75

## CDI LabID

**4569**  
**925**  
**Worse**

Infections reported from your facility.  
Infections in need of prevention to meet 2020  
HHS SIR Goal.  
In comparison to the National Average\*

Quarter	SIR	HHS GOAL
2015Q1	1.1	0.7
2015Q2	1.0	0.7
2015Q3	1.05	0.7
2015Q4	1.0	0.7
2016Q1	1.0	0.7
2016Q2	0.85	0.7
2016Q3	0.8	0.7
2016Q4	0.85	0.7
2017Q1	0.8	0.7
2017Q2	0.7	0.7
2017Q3	0.8	0.7
2017Q4	0.75	0.7

## CLABSI

**831**  
**360**  
**Worse**

Infections reported from your facility.  
Infections in need of prevention to meet 2020  
HHS SIR Goal.  
In comparison to the National Average\*

Quarter	SIR	HHS GOAL
2015Q1	1.1	0.5
2015Q2	1.2	0.5
2015Q3	1.1	0.5
2015Q4	1.0	0.5
2016Q1	0.9	0.5
2016Q2	0.8	0.5
2016Q3	0.9	0.5
2016Q4	0.9	0.5
2017Q1	0.6	0.5
2017Q2	0.8	0.5
2017Q3	0.7	0.5
2017Q4	0.9	0.5

## MRSA LabID

**591**  
**212**  
**Worse**

Infections reported from your facility.  
Infections in need of prevention to meet 2020  
HHS SIR Goal.  
In comparison to the National Average\*

Quarter	SIR	HHS GOAL
2015Q1	1.5	0.8
2015Q2	1.2	0.8
2015Q3	1.4	0.8
2015Q4	1.3	0.8
2016Q1	1.25	0.8
2016Q2	1.2	0.8
2016Q3	1.2	0.8
2016Q4	1.1	0.8
2017Q1	1.0	0.8
2017Q2	0.9	0.8
2017Q3	0.85	0.8
2017Q4	1.15	0.8

\* THE INDIVIDUAL HOSPITAL REPORTS RANKS BY HOSPITALS WITHIN THE STATE NOT TO NATIONAL AVERAGE

## RESOURCES

### Step 1: Identify Problem Spots

- *Use the information provided within this report (appendix) to identify problem areas within the state*

### Step 2: Use CDC Tools

- *Click on the icons below for CDC TAP facility assessment tools for each specific HAI*



- *Click on the icons below for the CDC TAP facility implementation guide for each specific HAI*

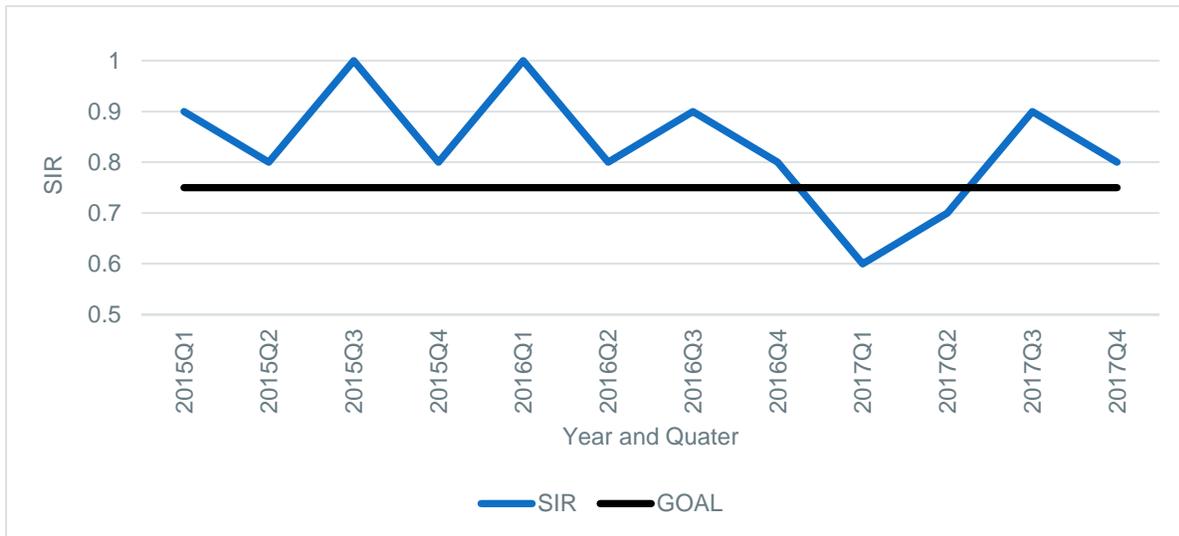


### Step 3: Additional Guidelines and Resources from Association for Professionals in Infection Control and Epidemiology (APIC)

- *Click on the icons below for the Association for Professionals in Infection Control and Epidemiology (APIC) guide to elimination for each specific HAI*

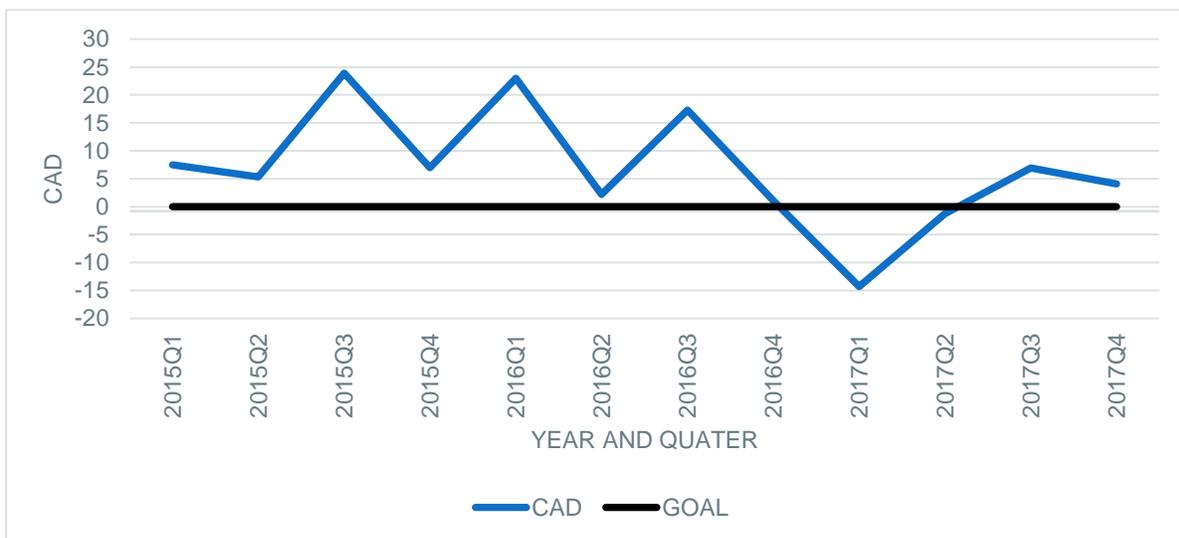


FIGURE 1: CAUTI 2015-2017 SIR BY YEAR AND QUARTER



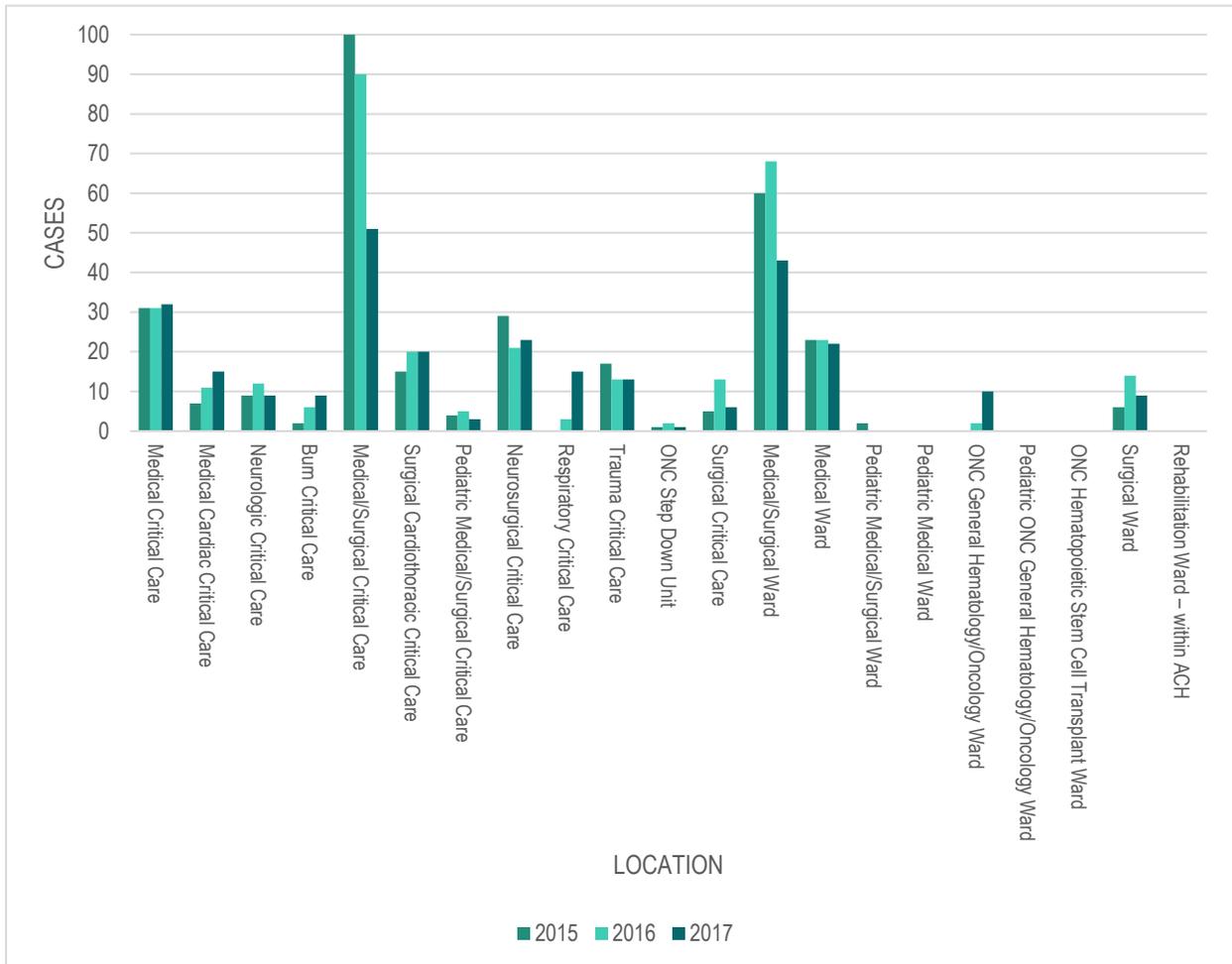
This figure shows the changing SIR for each quarter from 2015-2017, with the HHS SIR goal for CAUTI mapped for comparison. **AS OBSERVED ABOVE, MOST QUARTERS WERE ABOVE THE SIR GOAL, WITH AN IMPROVEMENT IN 2017Q1.**

FIGURE 2 CAUTI 2015-2017 CAD BY YEAR AND QUARTER



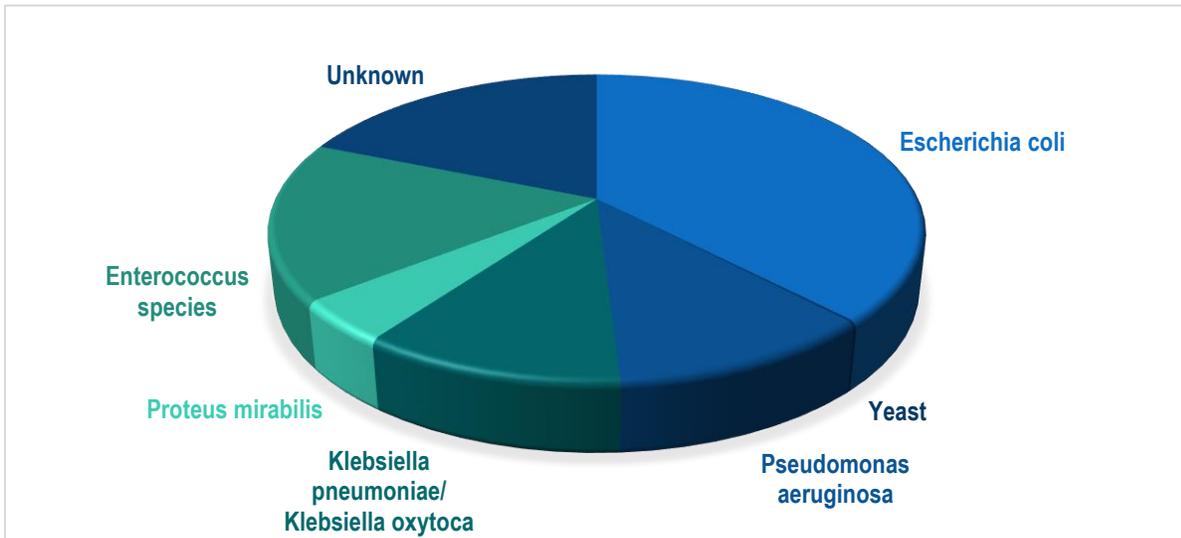
This figure shows the changing CAD for each quarter from 2015-2017, with the HHS CAD goal for CAUTI mapped for comparison. **AS OBSERVED ABOVE, MOST QUARTERS WERE ABOVE THE CAD GOAL, WITH AN IMPROVEMENT IN 2017Q1.**

FIGURE 3: CAUTI 2015-2017 COUNTS BY LOCATION



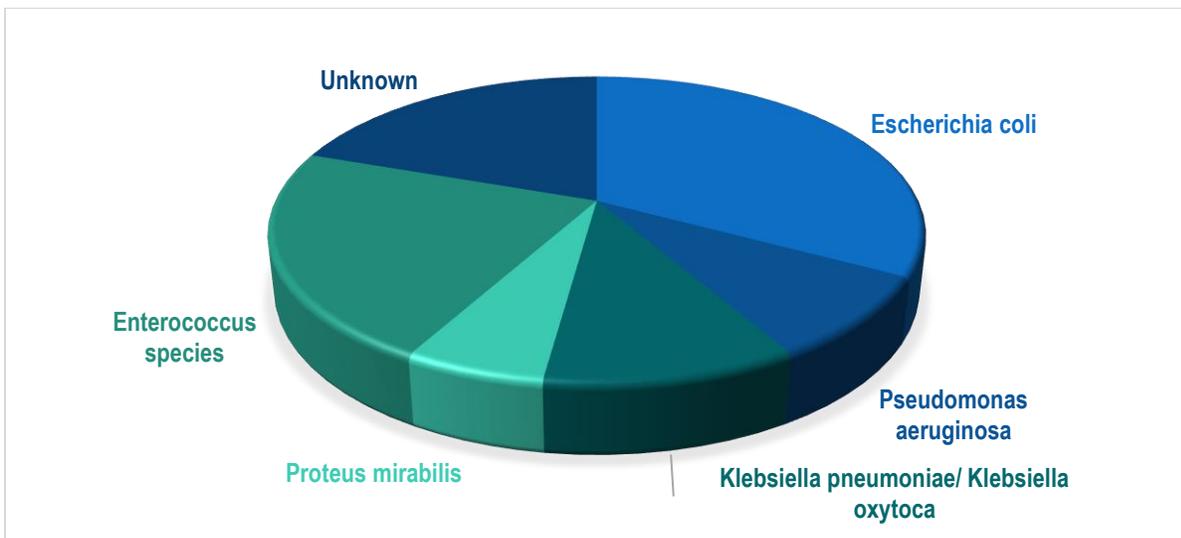
This figure shows how many CAUTI events each hospital location contributed to the CAUTI SIR. **\*\*\***  
**NOTICE THIS IS THE COUNT NOT SIR\*\*\*** THE LOCATIONS IN THE STATE WITH THE HIGHEST NUMBER OF  
**CASES IS THE MEDICAL/SURGICAL CRITICAL CARE UNITS (241).**

FIGURE 4: CAUTI 2015-2017 ICU(S) PATHOGENS



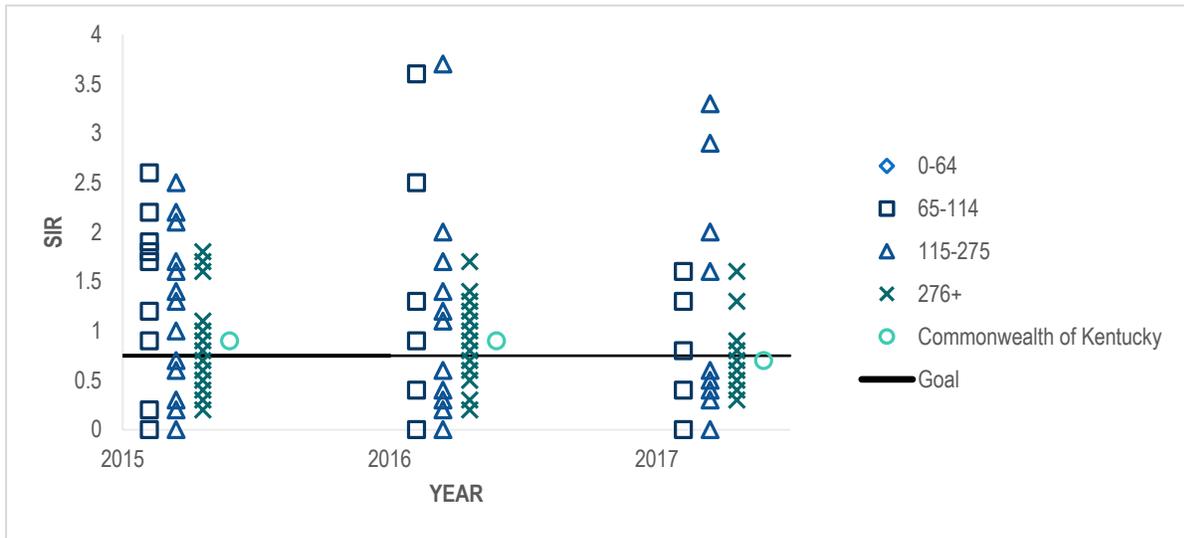
This figure shows the overall contribution of each pathogen measured for CAUTI within ICU(S) locations. **AS SEEN ABOVE, *ESCHERICHIA COLI* WAS THE LARGEST CONTRIBUTOR TO CAUTI CASES IN THE ICU(S).**

FIGURE 5: CAUTI 2015-2017 WARD(S) PATHOGENS



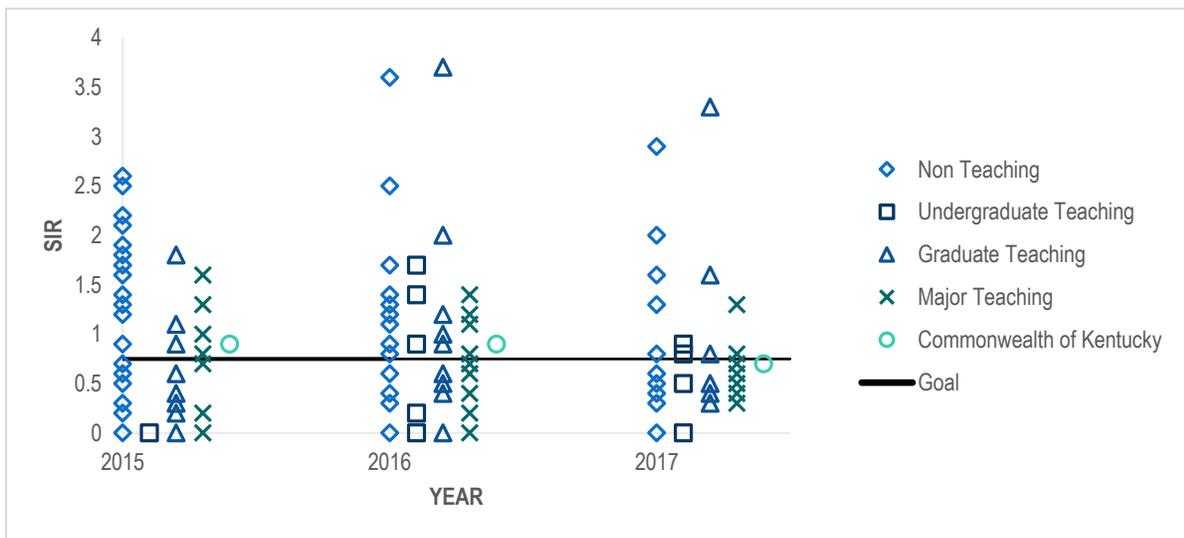
This figure shows the overall contribution of each pathogen measured for CAUTI within ward(s) locations. **OVERALL, *ESCHERICHIA COLI* WAS THE LARGEST CONTRIBUTOR TO CAUTI CASES IN THE WARD(S).**

FIGURE 6: CAUTI 2015-2017 SIR BY HOSPITAL SIZE



The figure above shows the state SIR and how it compares to hospitals of various size in the state.

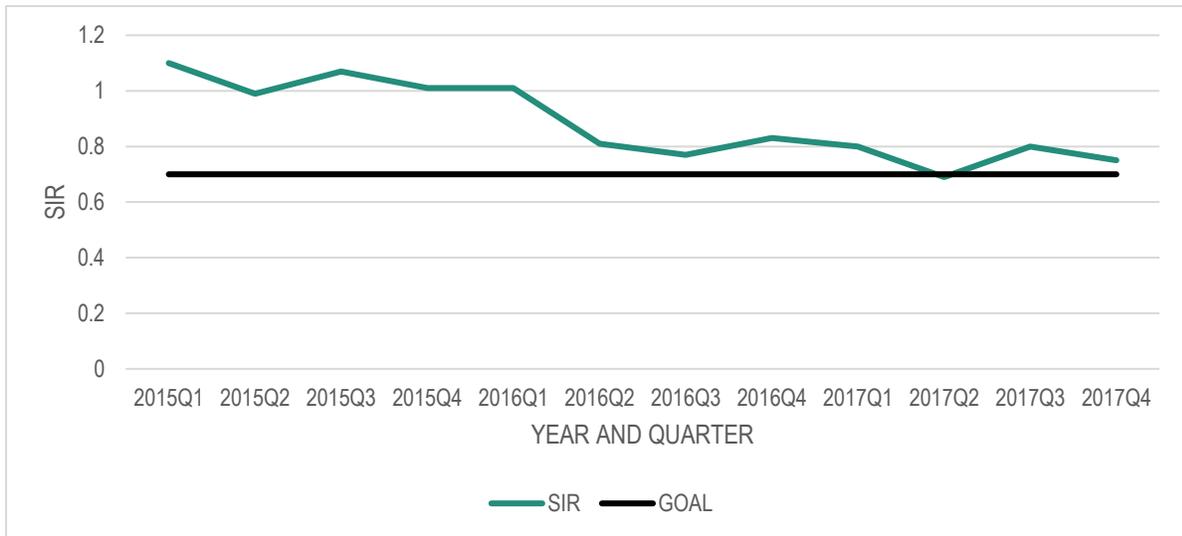
FIGURE 7: CAUTI 2015-2017 SIR BY TEACHING STATUS



The figure above shows the state SIR and how it compares to hospitals of various teaching statuses in the state.

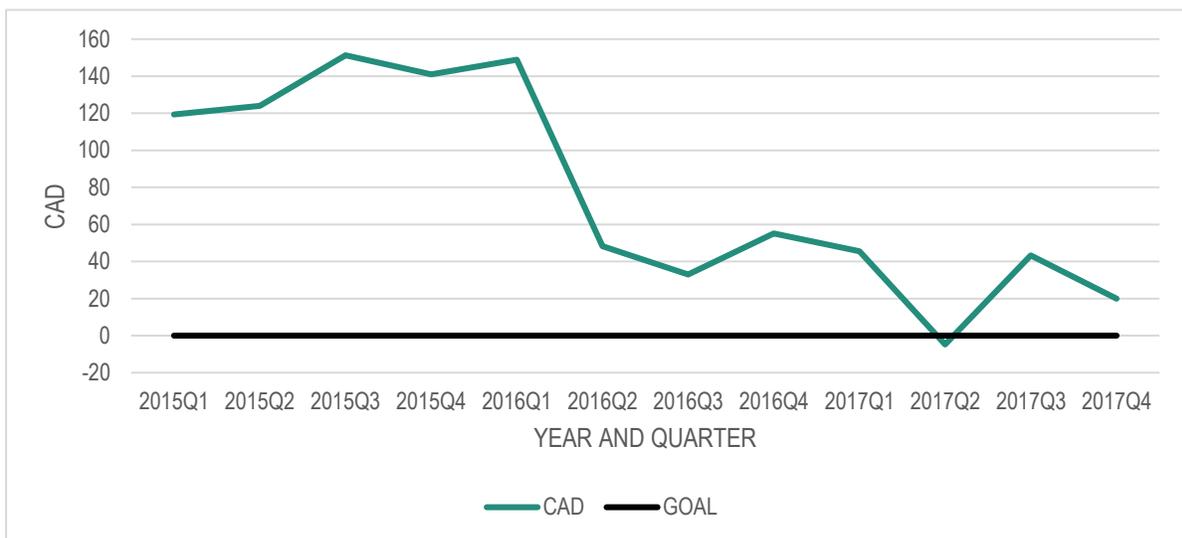
## CDI LABID IN-DEPTH ANALYSIS

FIGURE 8: CDI LABID 2015-2017 SIR BY YEAR AND QUARTER



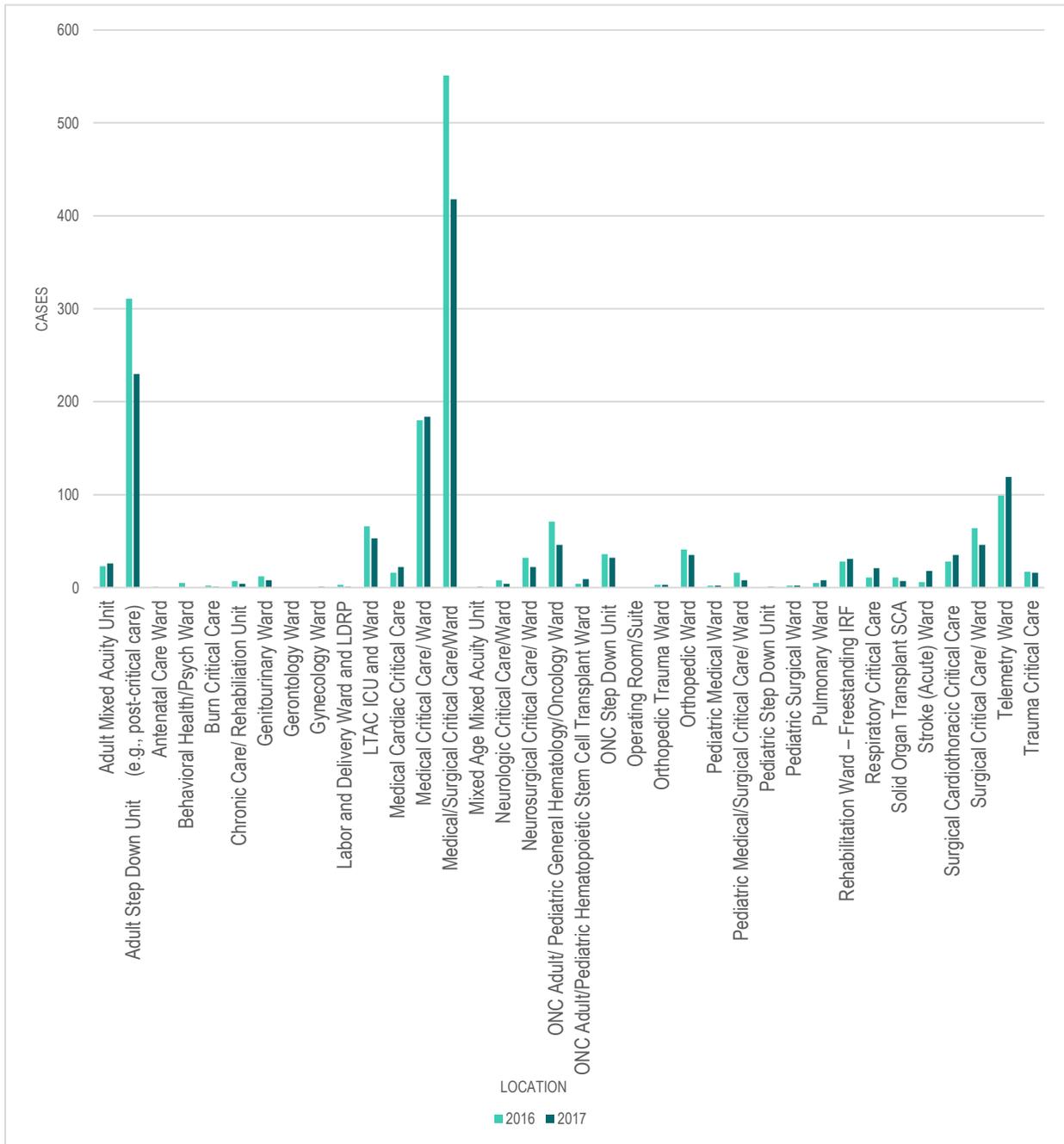
This figure shows the changing SIR for each quarter from 2015-2017 with the HHS SIR goal for CDI LabID mapped for comparison. **AS OBSERVED ABOVE, ALL QUARTERS WERE ABOVE THE SIR GOAL.**

FIGURE 9: CDI LABID 2015-2017 CAD BY YEAR AND QUARTER



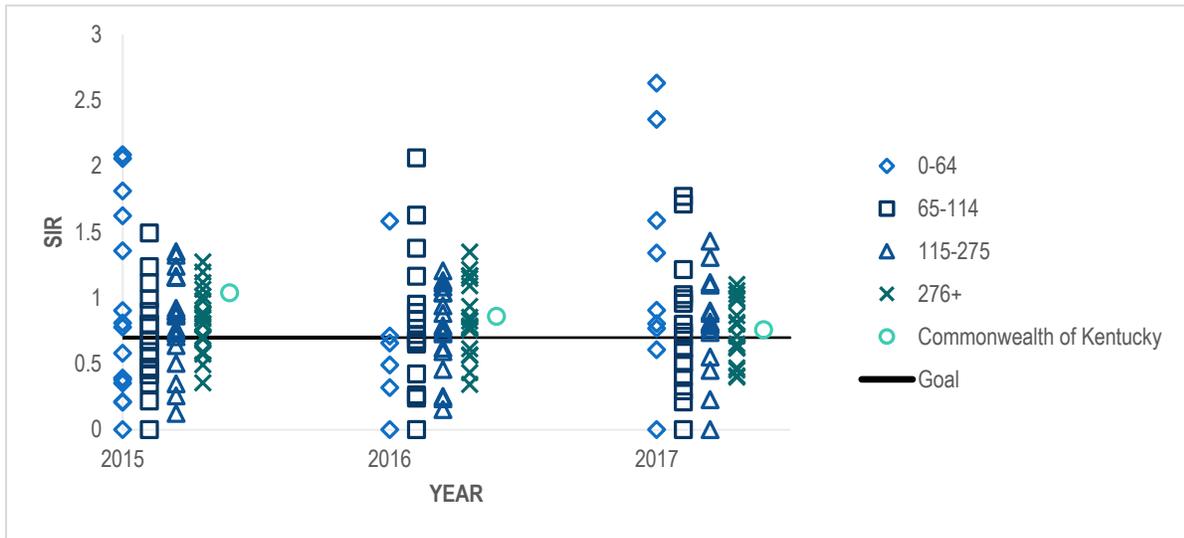
This figure shows the changing CAD for each quarter from 2015-2017 with the HHS CAD goal for CDI LabID mapped for comparison. **AS OBSERVED ABOVE, MOST QUARTERS WERE ABOVE THE CAD GOAL. IMPROVEMENTS WERE NOTED IN 2017Q2.**

FIGURE 10: CDI LABID 2015-2017 COUNT FOR HOSPITAL ACQUIRED INFECTION BY LOCATION



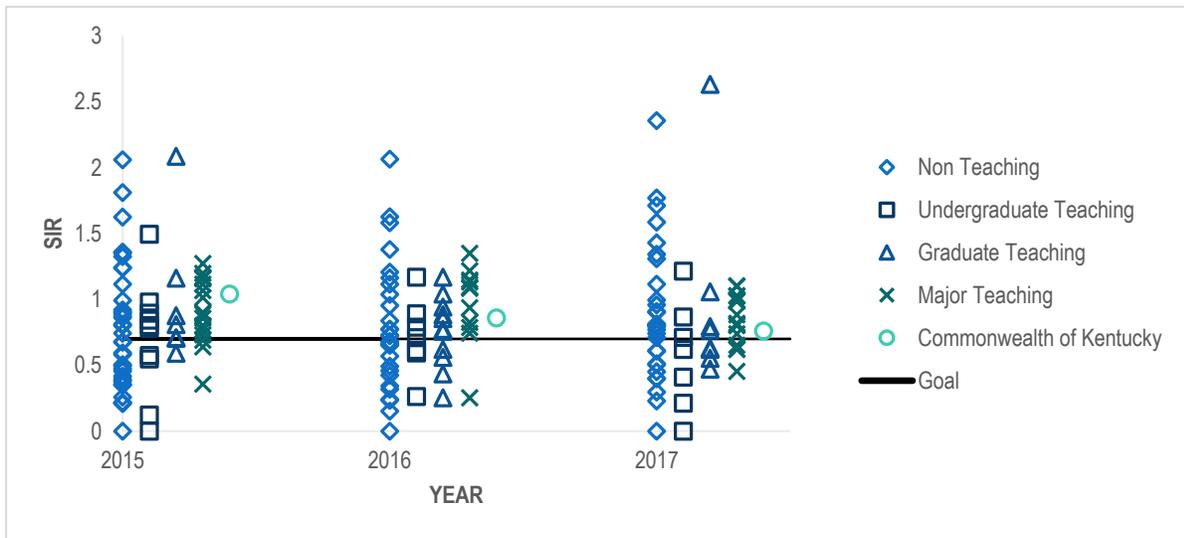
This figure shows how many CDI LabID events each hospital location contributed to the CDI LabID SIR. \*\*\*  
**NOTICE THIS IS THE COUNT NOT SIR\*\*\*** NOTICE THERE APPEARS TO BE WIDESPREAD  
**PROBLEM WITH CDI LABID THROUGHOUT THE STATE WARDS AND CCUS.**

FIGURE 11: CDI LABID 2015-2017 SIR BY HOSPITAL SIZE



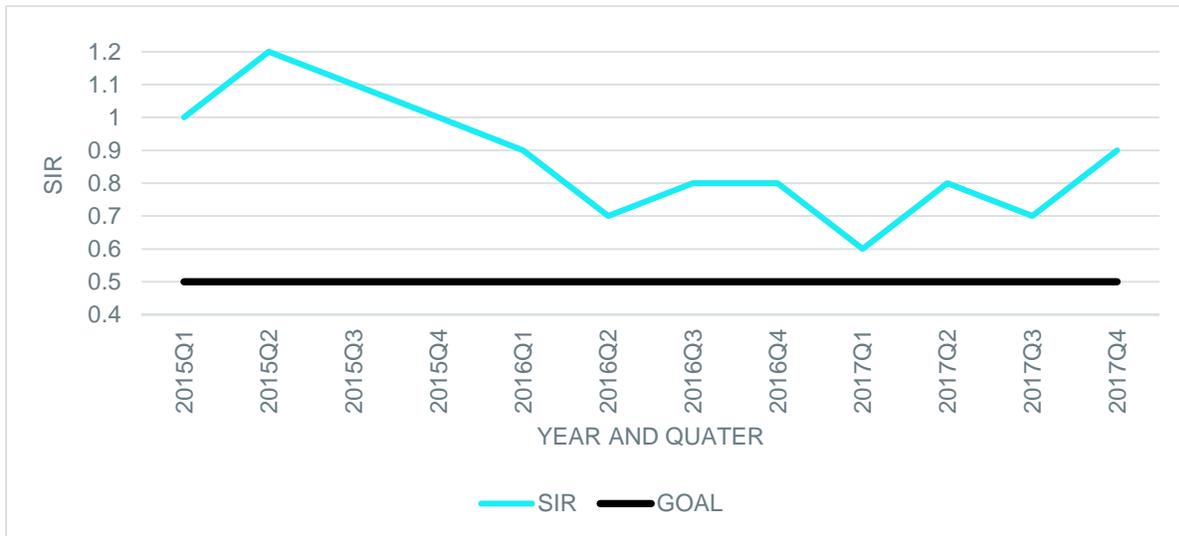
The figure above shows the state SIR and how it compares to hospitals of various size in the state.

FIGURE 12: CDI LABID 2015-2017 SIR BY TEACHING STATUS



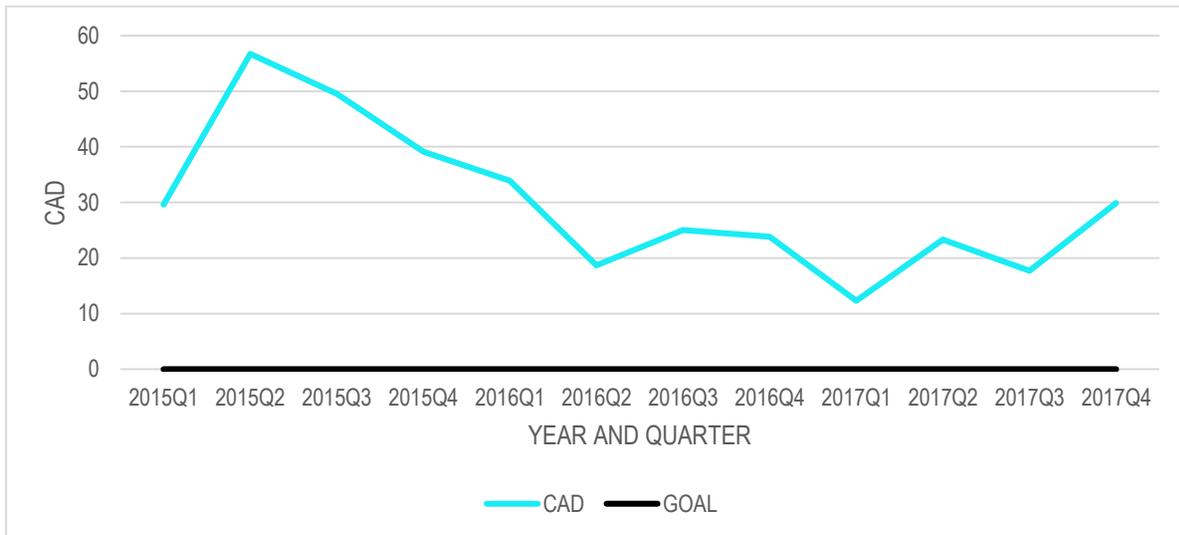
The figure above shows the state SIR and how it compares to hospitals of various teaching affiliations in the state.

FIGURE 13: CLABSI 2015-2017 SIR BY YEAR AND QUARTER



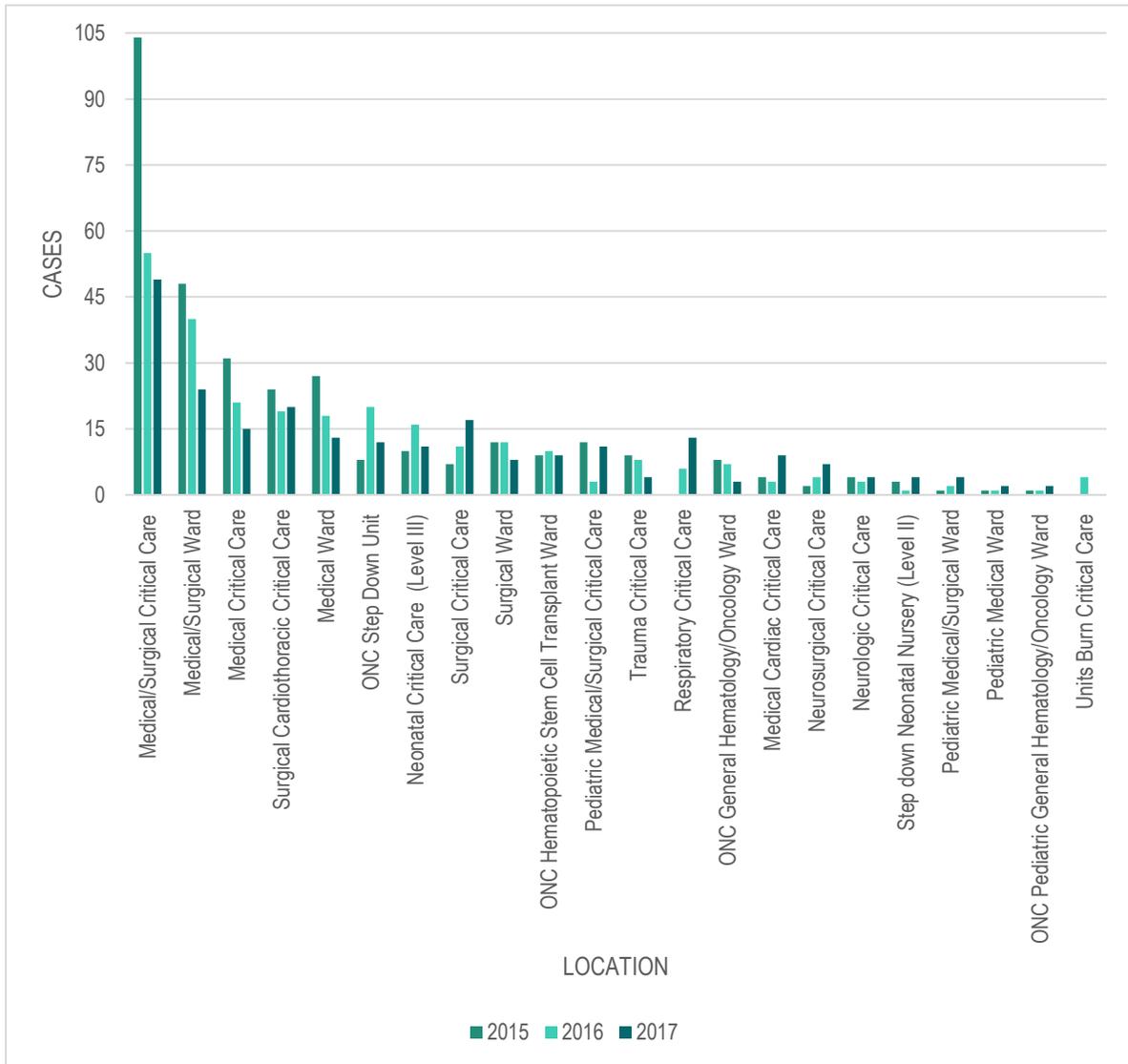
This figure shows the changing SIR for each quarter from 2015-2017 with the HHS SIR goal for CLABSI mapped for comparison. **AS OBSERVED ABOVE, ALL QUARTERS WERE ABOVE THE SIR GOAL.**

FIGURE 14: CLABSI 2015-2017 CAD BY YEAR AND QUARTER



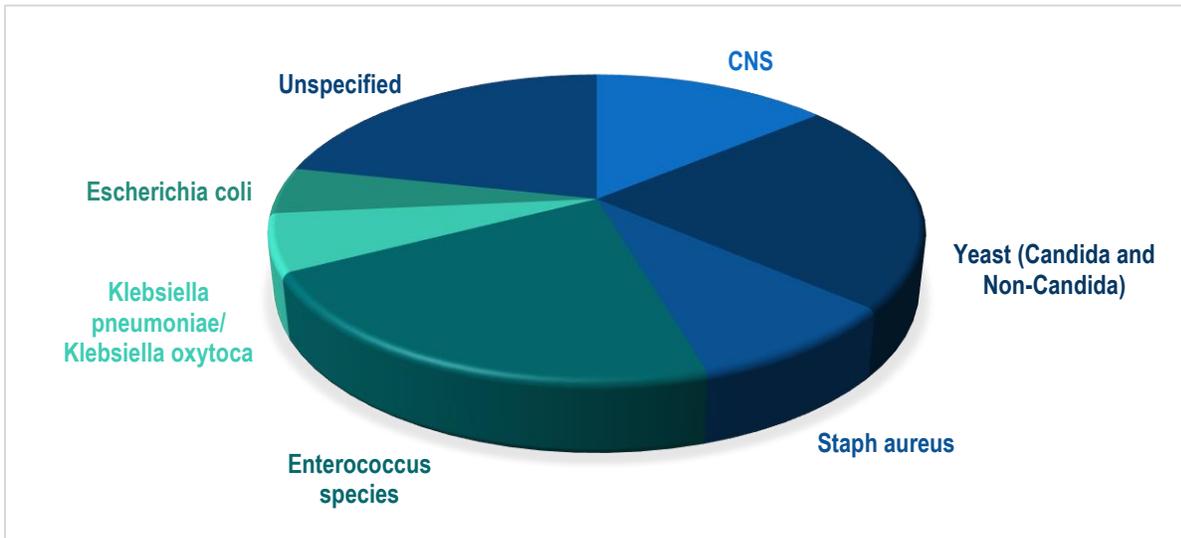
This figure shows the changing CAD for each quarter from 2015-2017 with the HHS CAD goal for CLABSI mapped for comparison. **AS OBSERVED ABOVE, ALL QUARTERS WERE ABOVE THE CAD GOAL.**

FIGURE 15: CLABSI 2015-2017 COUNTS BY LOCATION



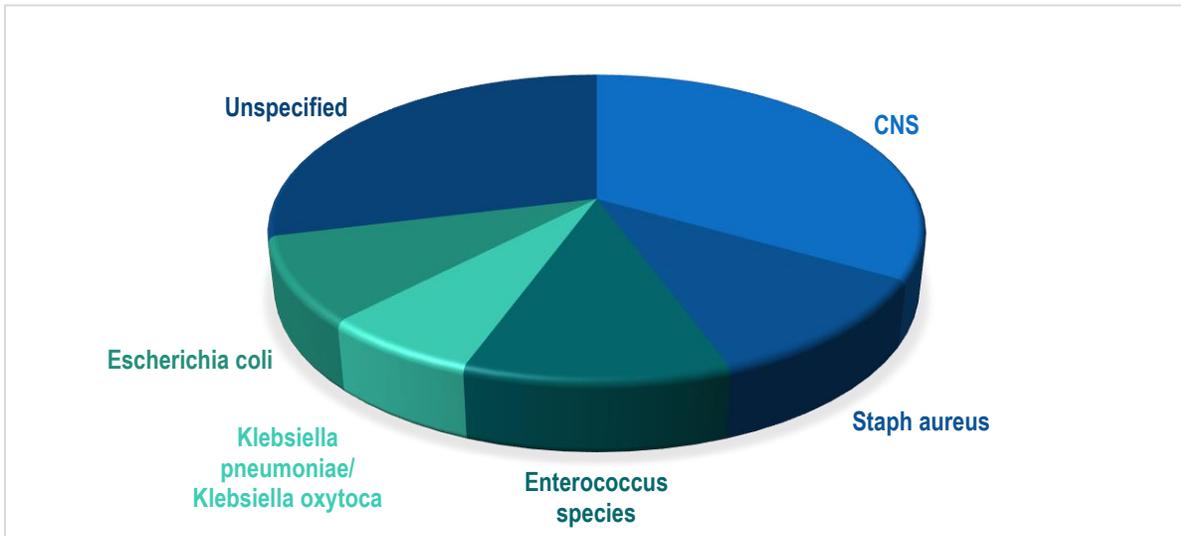
This figure shows how each hospital location contributed to the CLABSI SIR. **\*\*\* NOTICE THIS IS THE COUNT NOT SIR\*\*\*** LOCATION MEDICAL/ SURGICAL CRITICAL CARE APPEARS TO CONTAIN THE LARGEST BURDEN FOR THE HOSPITAL.

FIGURE 16: CLABSI 2015-2017 ICU(S) PATHOGENS



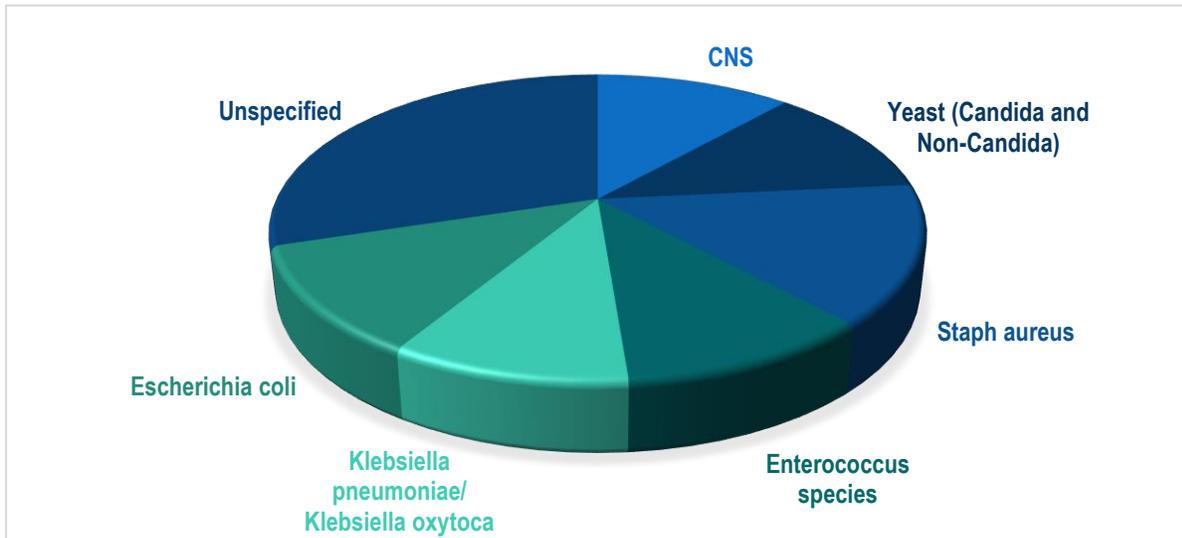
This figure shows the overall contribution of each pathogen measured for CLABSI within ICU(S) locations. **AS SEEN ABOVE, ENTEROCOCCUS SPECIES WAS THE LARGEST CONTRIBUTOR TO CLABSI CASES IN THE ICU(S).**

FIGURE 17: CLABSI 2015-2017 NICU(S) PATHOGENS



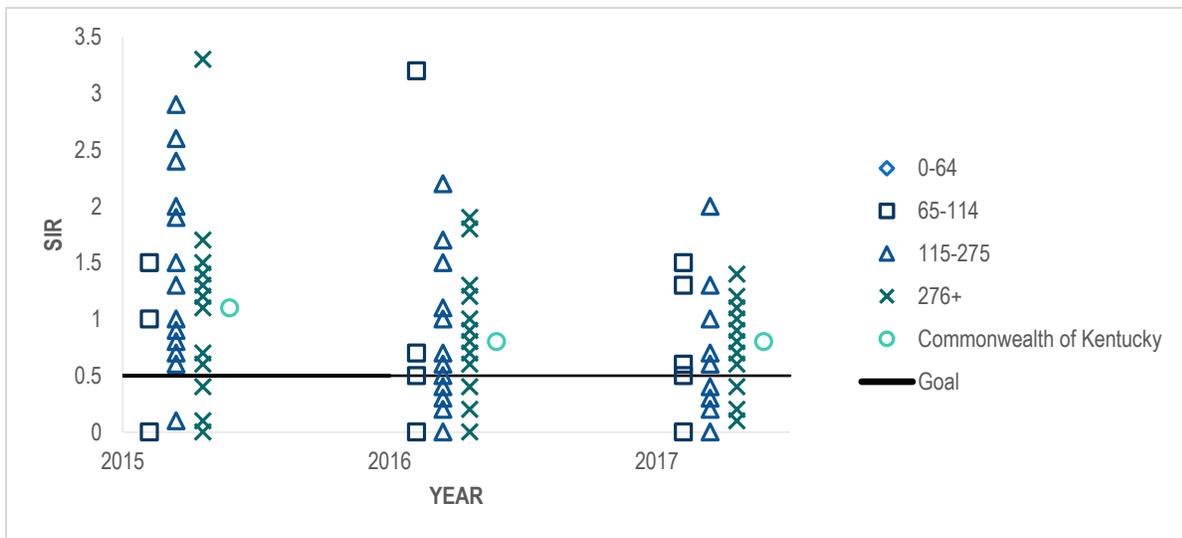
This figure shows the overall contribution of each pathogen measured for CLABSI within ICU(S) locations. **AS SEEN ABOVE, COAGULASE-NEGATIVE STAPHYLOCOCCI WAS THE LARGEST CONTRIBUTOR TO CLABSI CASES IN THE NICU(S).**

FIGURE 18: CLABSI 2015-2017 WARD(S) PATHOGENS



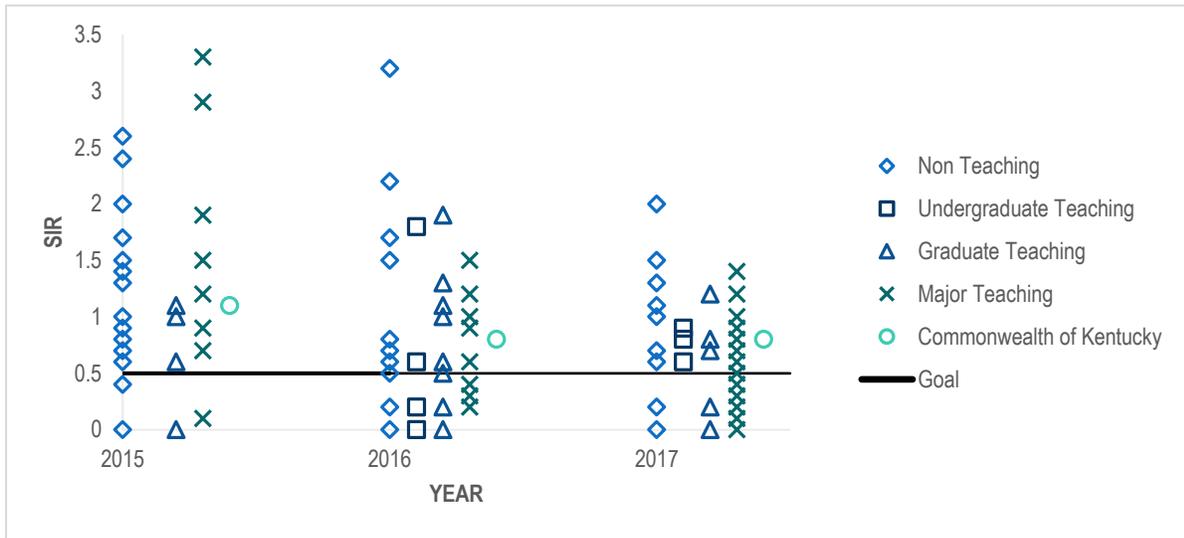
This figure shows the overall contribution of each pathogen measured for CLABSI within ward(s) locations. **AS SEEN ABOVE, STAPHYLOCOCCUS AUREUS WAS THE LARGEST CONTRIBUTOR TO CLABSI CASES IN THE WARD(S).**

FIGURE 19: CLABSI 2015-2017 SIR BY HOSPITAL SIZE



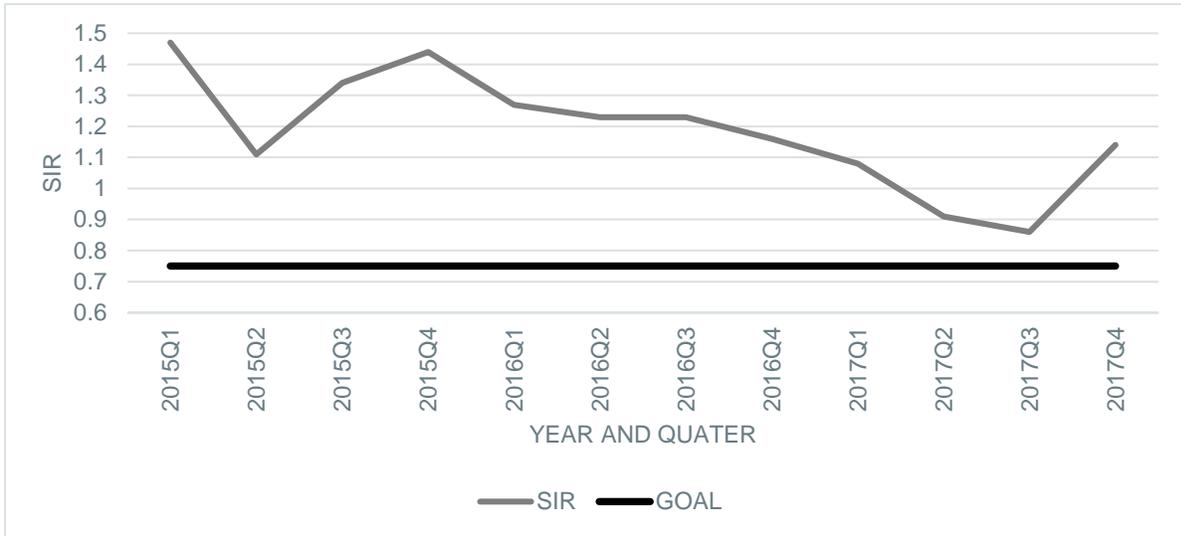
The figure above shows the state SIR and how it compares to hospitals of various size in the state.

FIGURE 20: CLABSI 2015-2017 SIR BY TEACHING STATUS



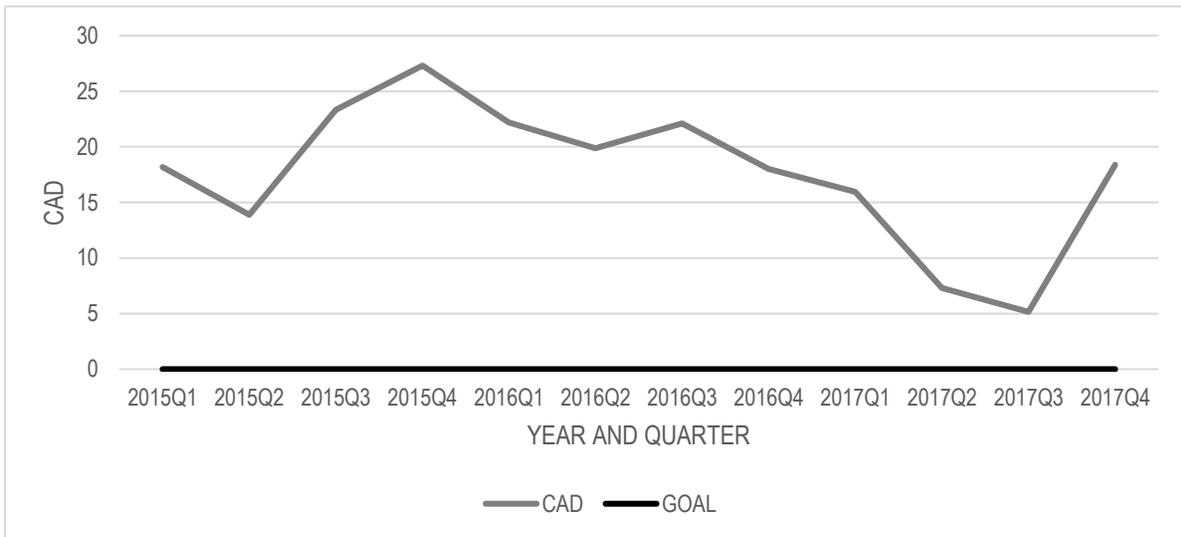
The figure above shows the state SIR and how it compares to hospitals of various teaching affiliations in the state.

FIGURE 21: MRSA LABID 2015-2017 SIR BY YEAR AND QUARTER



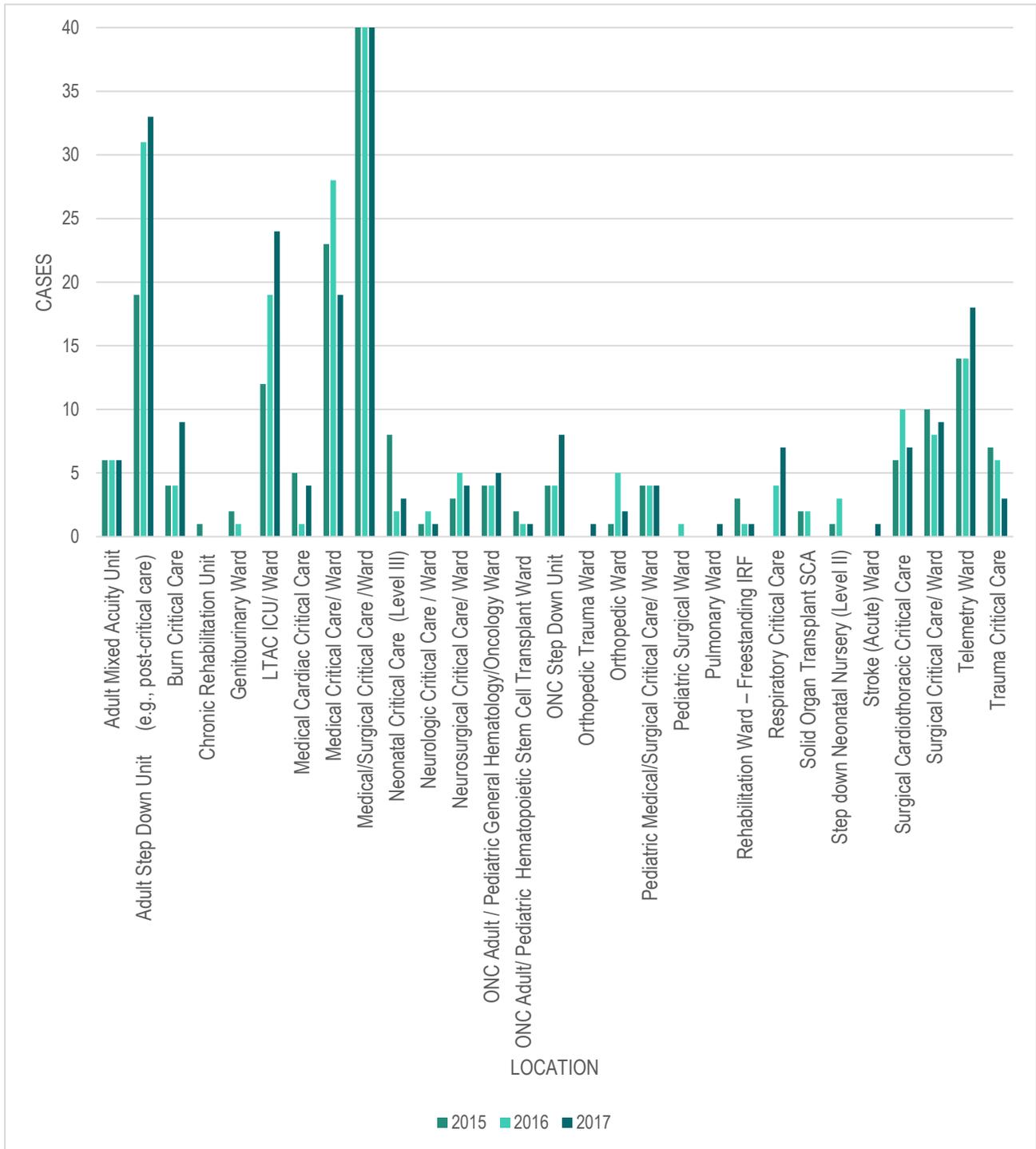
This figure shows the changing SIR for each quarter from 2015-2017 with the HHS SIR goal for MRSA mapped for comparison. **AS OBSERVED ABOVE, ALL QUARTERS WERE ABOVE THE SIR GOAL**

FIGURE 22: MRSA LABID 2015-2017 CAD BY YEAR AND QUARTER



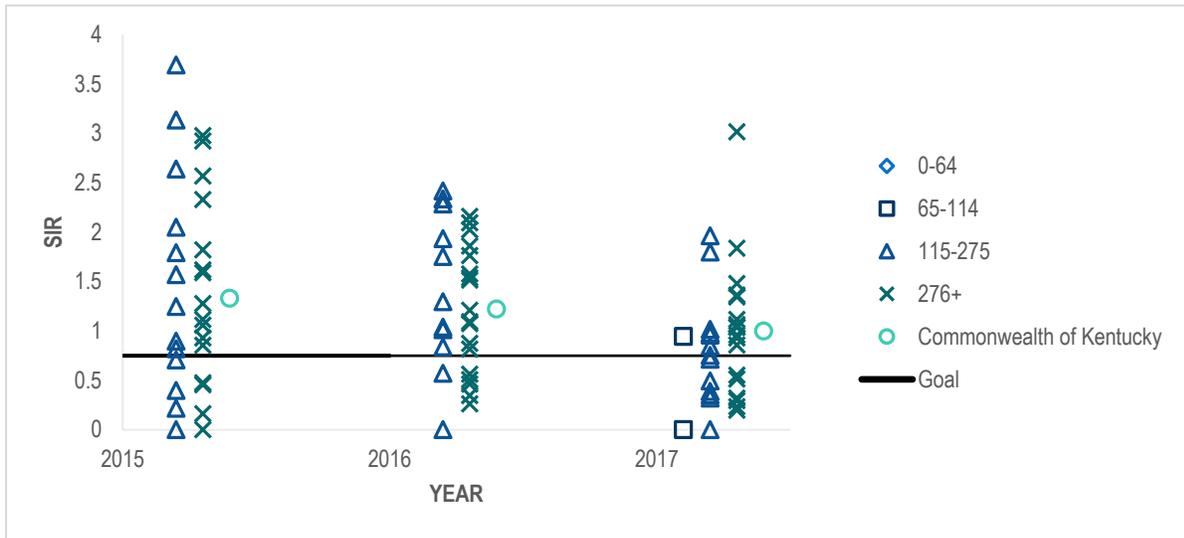
This figure shows the changing CAD for each quarter from 2015-2017 with the HHS CAD goal for MRSA LabID mapped for comparison. **AS OBSERVED ABOVE, ALL QUARTERS WERE ABOVE THE CAD GOAL.**

FIGURE 23: MRSA LABID 2015-2017 HOSPITAL ACQUIRED (HO) COUNTS BY LOCATION



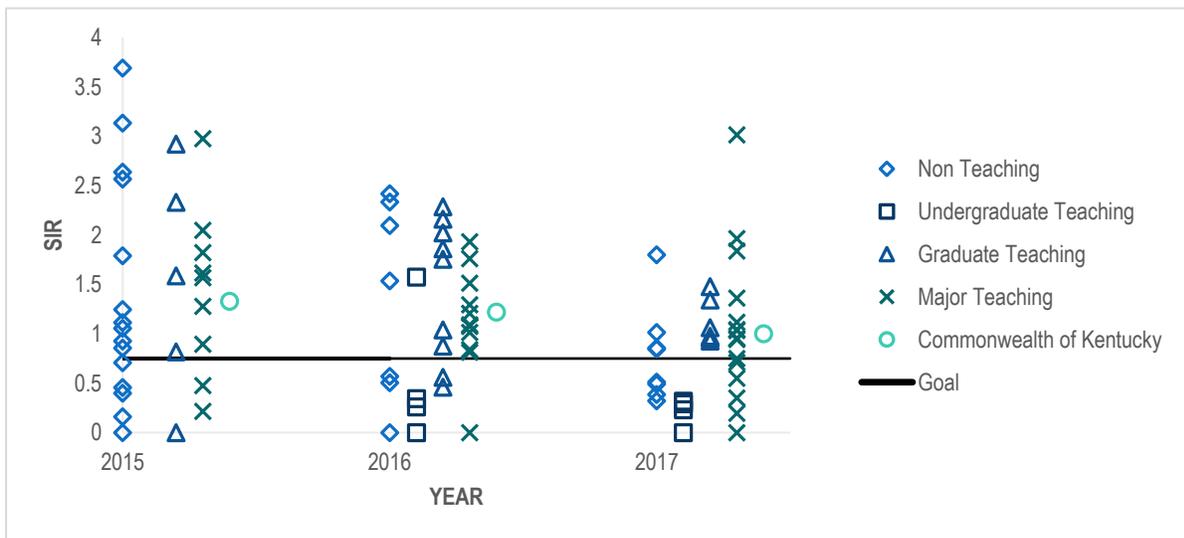
This figure shows the MRSA LabID HO count for specific locations. **\*\*\* NOTICE THIS IS THE COUNT NOT SIR\*\*\***  
**LOCATION MEDICAL/ SURGICAL CRITICAL CARE APPEARS TO CONTAIN THE LARGEST BURDEN FOR THE HOSPITAL.**

FIGURE 24: MRSA LABID 2015-2017 SIR BY HOSPITAL SIZE



The figure above shows the state and how it compares to hospitals of various size in the state.

FIGURE 25: MRSA LABID 2015-2017 SIR BY TEACHING STATUS



The figure above shows the state and how it compares to hospitals of various teaching affiliations in the state.

## NOTES ON FINDINGS

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### CAUTI

- Overall, the CAUTI SIR was above the HHS goal with an improvement in 2017Q1.
- The location medical/surgical critical care units had the highest burden of CAUTI.
- In the ICU(s) and the ward(s) *Escherichia coli* was the most common pathogen.

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### CDI LABID

- Overall, CDI LabID SIR was higher than the HHS goal.
- The location with the highest burden of CDI LabID was the medical/ surgical ward, but several units contributed cases.

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### CLABSI

- Overall, the CLABSI SIR was above the HHS goal.
- Location medical/ surgical critical care had the highest burden of CLABSI.
- In the ICU(s), *Enterococcus species* had the highest pathogen burden; in the NICU(s) *coagulase-negative staphylococci*; in the ward(s) *Staphylococcus aureus*.

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### MRSA LABID

- Overall, the MRSA LabID events have been above the HHS goal.
- Overall, the MRSA LabID SIR was lower than hospitals of similar size and teaching status.

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### OVERALL

- As a state we did a good job on controlling CAUTI cases in our hospitals.
- We recommend focus on lowering your **CDI LabID, CLABSI, and MRSA LabID**. Please refer to CDC guidance below on the mitigation of these HAIs.

CDI LABID TAP  
IMPLEMENTATION  
GUIDE

CLABSI TAP  
IMPLEMENTATION  
GUIDE

MRSA LABID TAP  
IMPLEMENTATION  
GUIDE