

HAI & AU ANNUAL REPORT 2018

Michigan Department of Health and Human Services
SHARP Unit



Brenda Brennan, MSPH
*HAI Coordinator,
SHARP Unit Manager*

Sara McNamara, MPH,
MT (ASCP), CIC
*Antimicrobial Resistance
Epidemiologist*

Chardé Fisher, MSW
Health Educator

Noreen Mollon, MS,
CIC
*Infection Prevention
Consultant*

Elli (Ray) Stier, MPH
NHSN Epidemiologist

Anne Haddad, MPH
AMS Coordinator

Libby Reeg, MPH
Candidate
SHARP Unit Intern

SHARP UNIT

OBJECTIVES

Goals

- Describe NHSN group
- Discuss significant changes from 2017-2018
- Discuss significant SIRs
- Compare with national data where applicable

Outline

- Description of Hospitals and Surveillance Overview
- MDRO/CDI Module
- Device-Associated Module
- Procedure-Associated Module
- Antimicrobial Use Module

RESOURCES



[HAI COMMON ACRONYMS
AND PHRASES QUICK
REFERENCE](#)



CMS REPORTING
REQUIREMENTS
[CMS.GOV](#)



CDC CURRENT HAI
PROGRESS REPORT
[2018 NATIONAL HAI DATA](#)



PREVIOUS REPORTS AND
MORE INFORMATION
[MICHIGAN.GOV/HAI](#)

INTRODUCTION

This report includes statewide HAI counts, rates, and SIRs

January 1, 2018 – December 31, 2018

Surveillance data collected from Michigan facilities

- Voluntarily agreed to shared data with MDHHS SHARP

National Healthcare Safety Network (NHSN)

- Secure online surveillance system developed by CDC
- Patient Safety Component Modules
 - Device-Associated, Procedure-Associated, MDRO/CDI LabID, AU
- All data aggregated and facility de-identified
 - Data only displayed if ≥ 5 facilities reporting

INTRODUCTION, CONT.

Standardized Infection Ratio (SIR)

- Ratio of observed events compared to predicted events
- $SIR > 1$ = more events than expected
- $SIR < 1$ = less events than expected

Cumulative Attributable Difference (CAD)

- + = Number of infections needing to be prevented
- - = Number of infections prevented in excess

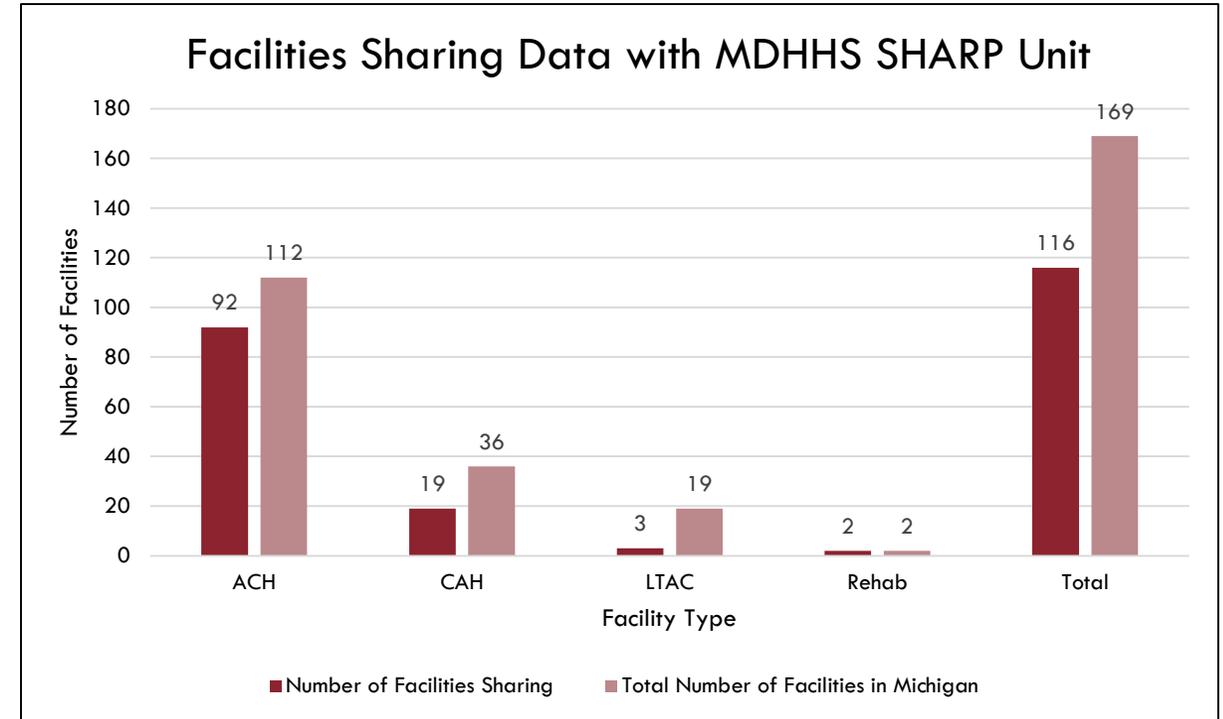
“Hospital,” “healthcare facility,” and “facility” used interchangeably

- May include ACH, CAH, Inpatient Rehab, and LTAC
- LTC and SNF are excluded

DESCRIPTION OF HOSPITALS AND SURVEILLANCE OVERVIEW

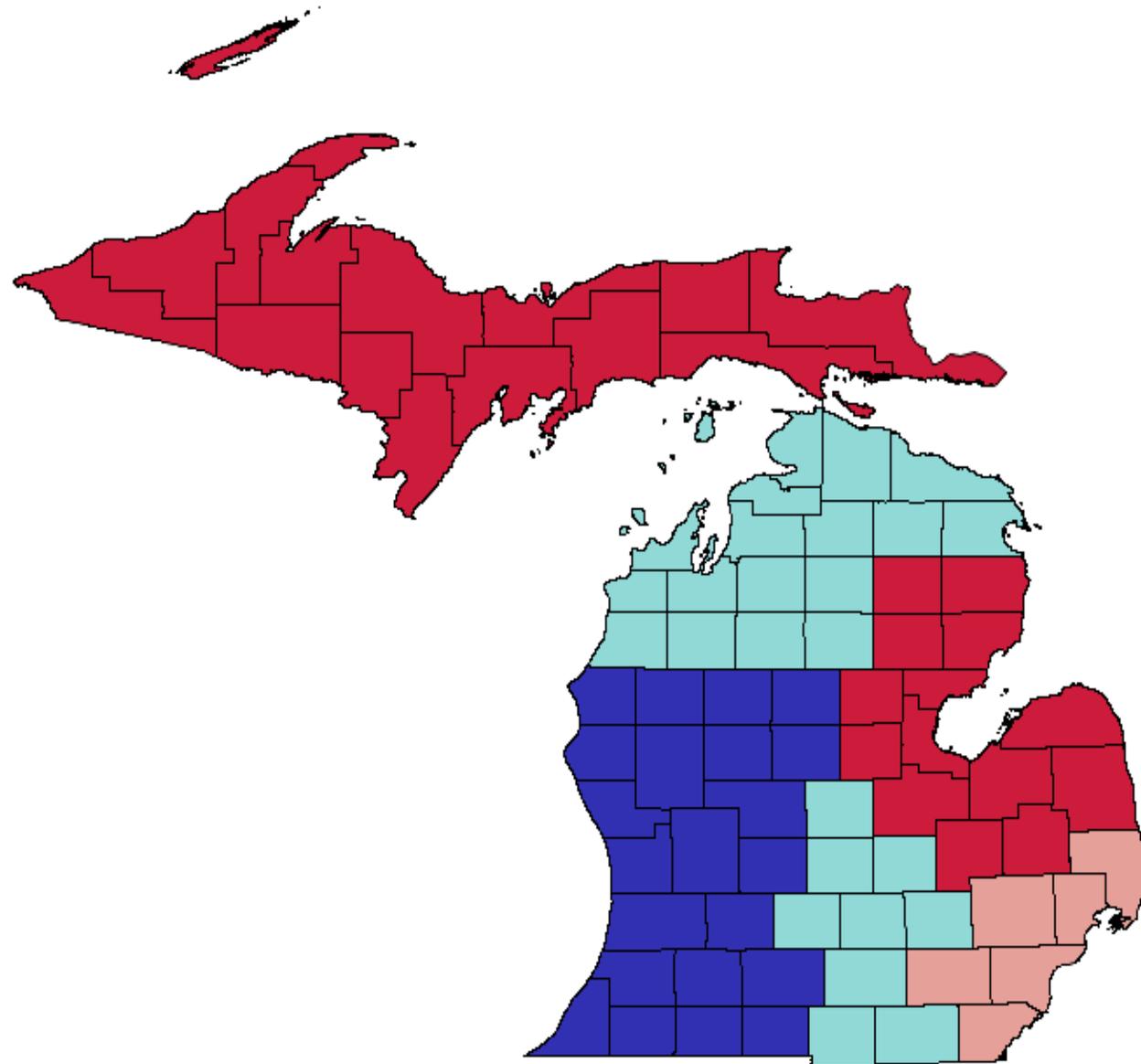


Facility Characteristics of the Michigan NHSN Group		
Facility Type	Number	Percent (n= 116 ¹)
Acute Care	92	79
Critical Access	19	26
Long Term Acute Care	3	3
Rehab	2	2
Region	Number	Percent (n= 116)
1	12	10
2N	17	15
2S	20	17
3	16	14
5	14	12
6	22	19
7	7	6
8	8	7
Medical School		
Affiliation	Number	Percent (n= 110 ²)
Teaching ³	78	71
Non-teaching	32	29
Bed size	Number	Percent (n= 110)
≤100	49	45
101–200	19	17
201–500	31	28
≥501	11	10
¹ Hospitals who have had a reporting plan in place for at least one month in 2018		
² Hospitals who have filled out a 2018 facility survey		
³ Teaching includes major, graduate, and limited affiliation with medical schools as indicated on their facility survey		



- 68% of Michigan hospitals shared data with SHARP
- ACH and CAH represent most of the group (79%, 26%)
- More teaching than non-teaching (71%, 29%)
- 45% of facilities have < 100 beds

Percentage of SHARP-Participating Facilities by Region, 2018



Percent ■ 53.0 - 60.0 ■ 60.0 - 68.5 ■ 68.5 - 76.0 ■ 76.0 - 85.0

Types of Units in Reporting Plan

Unit Type	FacWideIn ¹	ICU/CCU ²	NICU ³	STEP ⁴	Wards ⁵	Other Inpatient ⁶	Outpatient ⁷
Number of Facilities⁸	115	94	20	27	110	28	105

¹FacWideIn: All Facility-Wide Inpatient locations

²ICU/CCU: Intensive Care Unit/Critical Care Unit

³NICU: Neonatal Intensive Care Unit

⁴STEP: Step-Down Unit

⁵Wards: Inpatient wards

⁶Other: All other inpatient locations, including inpatient rehab facilities, operating rooms, and locations designated as "other"

⁷Outpatient: All outpatient locations

⁸These numbers are not mutually exclusive

- Most participating hospitals are conducting NHSN surveillance facility-wide and in ICUs, and 1+ patient wards

- The most commonly used modules during the reporting period were CAUTI and LabID modules

NHSN Modules in Use

NHSN Module	Number of Facilities Using Module ¹	Number of Facilities Sharing Data ²
Catheter-Associated Urinary Tract Infection (CAUTI)	116	110
Clostridioides difficile Infection (CDI) Laboratory-identified (LabID) Event	116	113
Methicillin-Resistant Staphylococcus aureus (MRSA) LabID³	115	113
Central Line-Associated Bloodstream Infection (CLABSI)	114	110
Surgical Site Infection (SSI)	103	96
Ventilator-Associated Events (VAE)	89	87
Vancomycin-Resistant Enterococcus (VRE) LabID	15	16
Acinetobacter LabID	12	7
Carbapenem-Resistant Enterobacteriaceae (CRE) LabID	12	5
Cephalosporin-Resistant Klebsiella LabID	7	3

¹This is the number of hospitals that have indicated module use in each of their reporting plans for at least one month.

²This is the number of hospitals sharing data for the report period, as of the data access date, taken from those hospitals contributing to the SIR when available.

³MRSA LabID all specimens or blood (bld) only specimens

⁴In some instances, the number of hospitals sharing data is greater than the number of hospitals using the module. The option to 'view in-plan only data' is not available for all modules. Therefore, some out-of-plan data have been included when impossible to remove.

MDRO/CDI MODULE

METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS

MRSA LabID Events

- MRSA LabID events
 - 16 % HO
 - 84% CO
- Most specimens from blood sources (52%)
 - Wound (17%)
 - Other (13%)
- Location with greatest % of HO events was ICU/CCU (41%)
 - Specialty Care Areas (40%)

Cumulative Aggregate Methicillin-Resistant Staphylococcus aureus (MRSA) LabID Data

Frequency, Number	
Aggregated LabID Events	5,738
Onset, Number (%)	
Healthcare Facility-Onset (HO)	905 (16)
Community-Onset (CO)	4,833 (84)
Specimen Source, Number (% , %HO)¹	
Blood	2,996 (52, 17)
Sputum	248 (4, 35)
Wound	989 (17, 10)
Abscess	522 (9, 7)
Urine	225 (4, 8)
Skin	18 (0, 6)
Other	740 (13, 20)
Surveillance Location, Number (% , %HO)²	
Intensive/Critical Care Unit	714 (12, 41)
Specialty Care Area	15 (0, 40)
STEP Unit	205 (4, 34)
Wards	1,851 (32, 25)
Other (Mixed, Emergency Dept, Clinics, etc.)	2,953 (51, 2)

¹The numbers in parentheses under “Specimen Source” are the percent of isolates from each specimen source, followed by the percent of isolates from each specimen source which are healthcare-onset.

²The numbers in parentheses under “Surveillance Location” are the percent of isolates from each location, followed by the percent of isolates from each location which are healthcare-onset.

Cumulative Michigan MRSA Rate

	Facilities	Number of MRSA Events	Number of Patient Days	Number of Patient Admits/Encounters	MRSA Rate ¹	MRSA Prevalence Rate ²
MRSA Inpatient LabID	113	2,488	5,201,108	1,258,029 Admits	0.478 ↓	0.198 ↓
MRSA Bacteremia LabID³	113	1,086	5,201,108	1,258,029 Admits	0.209	0.087
MRSA Outpatient LabID⁴	105	2,853	----	4,485,279 Encounters	----	0.064 ↑
MRSA Rehab LabID⁵	35	16	456,720	23,268 Admits	0.035	0.004 ↓

↓ or ↑ Indicates statistically significantly less than or greater than previous year (respectively)

¹MRSA Rate: This is the number of MRSA LabID Events or surveillance infections per 1,000 patient days.

²MRSA Prevalence Rate. This is the number of MRSA LabID Events per 100 patients admitted or 100 encounters.

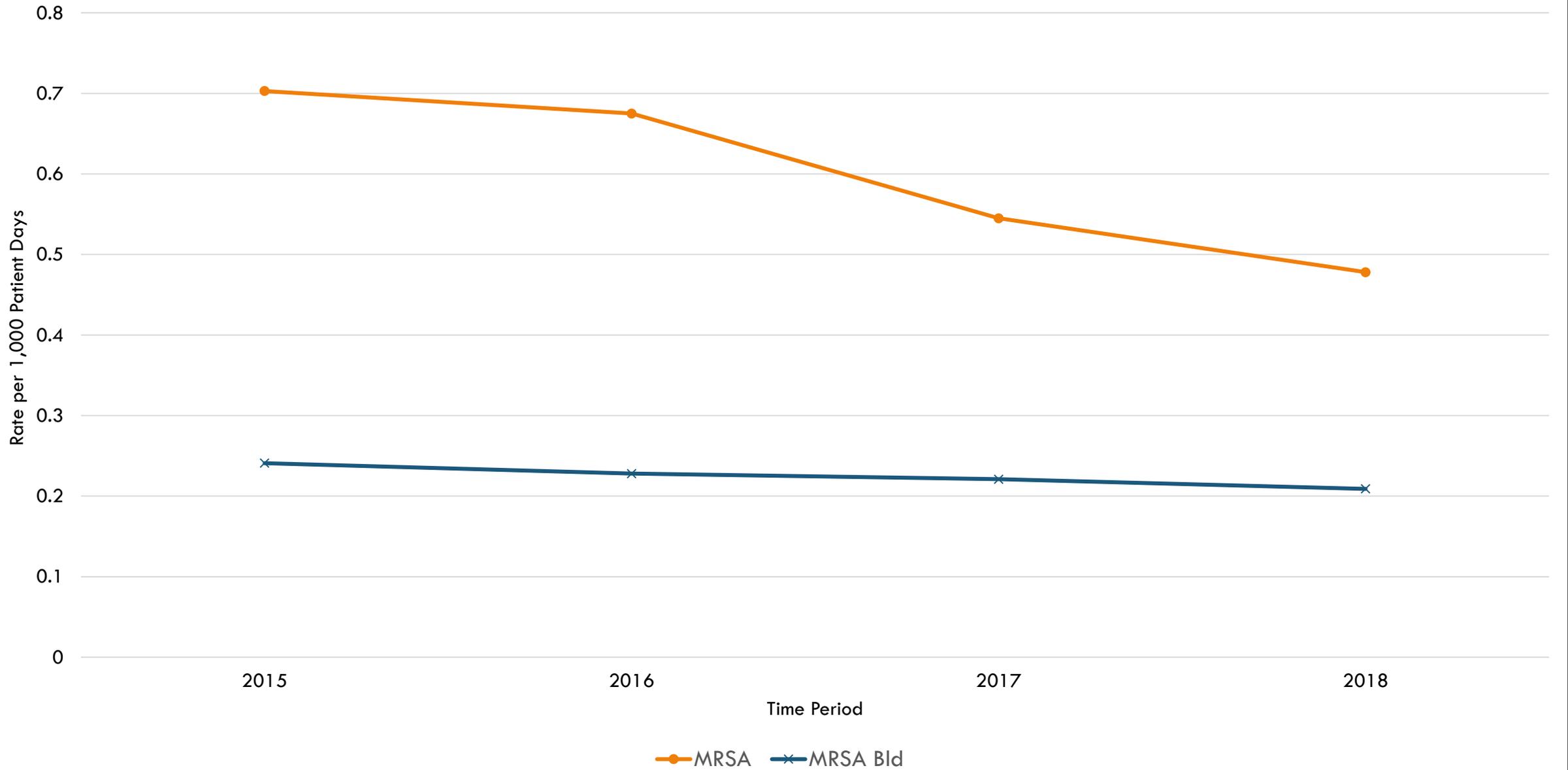
³MRSA bacteremia LabID: MRSA LabID event from a blood specimen

⁴MRSA outpatient LabID: MRSA LabID event taken in an outpatient location and reported only if the hospital is reporting outpatient events. These events are also reported in inpatient location and are attributed to the admitting location.

⁵MRSA rehab LabID: MRSA LabID event taken in rehab locations reported under a differing CCN number from a facility's inpatient location.

- Significant decrease
 - MRSA Inpatient Rate & Prevalence Rate
 - MRSA Rehab Prevalence Rate
- Significant increase
 - MRSA Outpatient Prevalence Rate

Michigan 2018 MRSA LabID Rates



Michigan Inpatient MRSA LabID¹ Rate by Onset

Number of Facilities	Onset	Number of Inpatient MRSA LabID Events	Number of Patient Days	Number of Patient Admits	HO Incidence Rate	CO Prevalence Rate
90	HO	556 Lab ID	5,201,108	-----	0.107	-----
		302 Bld LabID ¹	5,201,108	-----	0.058	-----
90	CO	1,789 LabID	-----	1,258,029	-----	0.142
		634 Bld LabID	-----	1,258,029	-----	0.050

¹Bld LabID: MRSA bacteremia LabID events (LabID events from a blood specimen)

- No significant change since 2017

CLOSTRIDIoidES DIFFICILE INFECTION

CDI LabID Events

- 29% CDI events were HO
- 16% CDI events were CO-HCFA
- 54% CDI events were CO

- Previously positive (15%)
- Recurrent (6%)

- Greatest percentage of CDI LabID events came from wards (56%)
 - 36% of these events were HO

- Like MRSA, the surveillance location with greatest percentage of HO events was ICU/CCU (54%)

Cumulative Aggregate Clostridioides difficile Infection (CDI)¹ LabID² Data

Frequency, Number	
Aggregated LabID Events	9,470
Onset, Number (%)	
Healthcare Facility-Onset (HO)	2,791 (29)
Community-Onset Healthcare Facility-Associated (CO-HCFA)	1,562 (16)
Community-Onset (CO)	5,117 (54)
Previous CDI, Number (%)	
Previously Positive	1,426 (15)
CDI Assay, Recurrent	535 (6)
Surveillance Location, Number (% , %HO) ¹	
Intensive/Critical Care Unit	1,362 (13, 54)
Specialty Care Area	26 (0, 42)
STEP Unit	668 (7, 45)
Wards	5,740 (56, 33)
Other (Emergency Dept and Outpatient locations)	2,441 (24, 4)

¹The numbers in parentheses under "Surveillance Location" are the percent of isolates from each location, followed by the percent of isolates from each location which are healthcare-onset.

Cumulative Michigan CDI Rate

	Facilities	Number of CDI Events ⁴	Number of Patient Days	Number of Patient Admits/Encounters	CDI Rate ¹	CDI Prevalence Rate ²
CDI Inpatient LabID	113	6,736	4,870,254	1,161,433 Admits	13.83 ↓	0.580 ↓
CDI Outpatient LabID³	105	2,400	-----	4,501,715 Encounters	-----	0.053
CDI Rehab LabID⁴	35	100	456,720	23,268 Admits	2.19	0.430 ↓

↓ or ↑ Indicates statistically significantly less than or greater than previous year (respectively)

¹CDI Rate: Clostridioides difficile rate. This is the number of CDI LabID or surveillance events per 10,000 patient days.

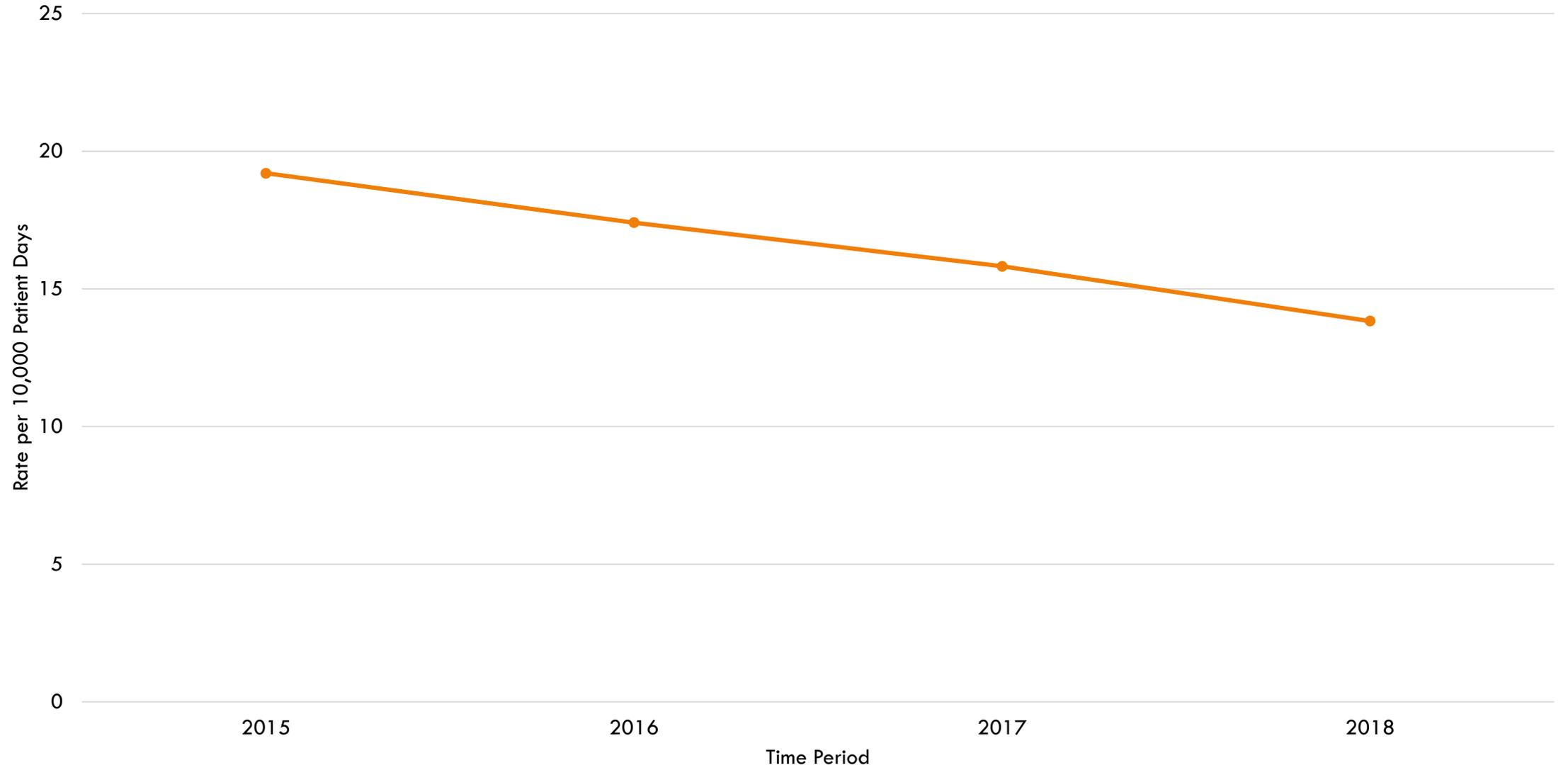
²CDI Prevalence Rate. This is the number of C. diff LabID events per 100 patients admitted or per 100 encounters.

³CDI Outpatient LabID: CDI LabID event specimen collected in an outpatient location and reported only if the hospital is reporting outpatient events. If a patient is then admitted as an inpatient, these events are also reported as inpatient events, and are attributed to the admitting location.

⁴CDI rehab LabID: MRSA LabID event taken in rehab locations reported under a differing CCN number from a facility's inpatient location.

- Significant decrease from 2017
 - Inpatient CDI Rate
 - Inpatient CDI Prevalence rate
 - Rehab CDI Prevalence rate

Michigan SHARP-Participating Acute Care Hospital CDI LabID Event Rates



Michigan CDI LabID Rate by Onset

Number of Reporting Facilities	Onset	Number of Inpatient CDI LabID ¹ Events	Number of Patient Days	Number of Patient Admits	HO Incidence Rate	CO/CO-HCFA Prevalence Rate	Percentage of Total
113	HO	2,591 LabID	4,870,254	-----	5.320 ↓	-----	39
113	CO-HCFA	1,022 Lab ID	-----	1,161,433	-----	0.088	15
113	CO	3,055 Lab ID	-----	1,161,433	-----	0.263 ↓	46

↓ or ↑ Indicates statistically significantly less than or greater than previous year (respectively)

- Significant decrease from 2017
 - HO Incidence Rate
 - CO Prevalence Rate

MDRO/CDI LABID SIR |

MDRO/CDI Standardized Infection Ratios (SIR)

Type of Infection	Facilities	Patient Days	Observed	Predicted	SIR ¹	p-value	95% CI	CAD ²
MRSA Bac LabID ACH	92	5,128,431	300	335.87	0.893	0.0504	0.796, 0.999	48.096
MRSA Bac LabID CAH	18	45,228	0	0.94	.	.	.	-0.705
C.diff LabID ACH	92	4,796,711	2,571	3390.54	0.758 ↓	<0.001	0.729, 0.788	197.622
C.diff LabID CAH	18	43,713	5	14.50	0.345	0.005	0.126, 0.764	-5.15

Green Text or Red Text indicates significantly fewer or greater infections than expected (respectively).

↓ or ↑ Indicates statistically significantly less than or greater than previous year (respectively).

¹The SIR is only calculated if the number of Predicted events is ≥ 1.

²Cumulative Attributable Difference. HHS 2020 Target Reduction goals are 25% for MRSA and 30% for CDI.

- Significantly fewer infections than expected
 - CDI ACH
 - CDI CAH
- Significantly less infections than 2017
 - CDI ACH

MDRO/CDI Standardized Infection Ratios (SIR)

Type of Infection	Facilities	Patient Days	Observed	Predicted	SIR ¹	p-value	95% CI	CAD ²
MRSA Bac LabID ACH	92	5,128,431	300	335.87	0.893	0.0504	0.796, 0.999	48.096
MRSA Bac LabID CAH	18	45,228	0	0.94	.	.	.	-0.705
C.diff LabID ACH	92	4,796,711	2,571	3390.54	0.758 ↓	<0.001	0.729, 0.788	197.622
C.diff LabID CAH	18	43,713	5	14.50	0.345	0.005	0.126, 0.764	-5.15

Green Text or Red Text indicates significantly fewer or greater infections than expected (respectively).

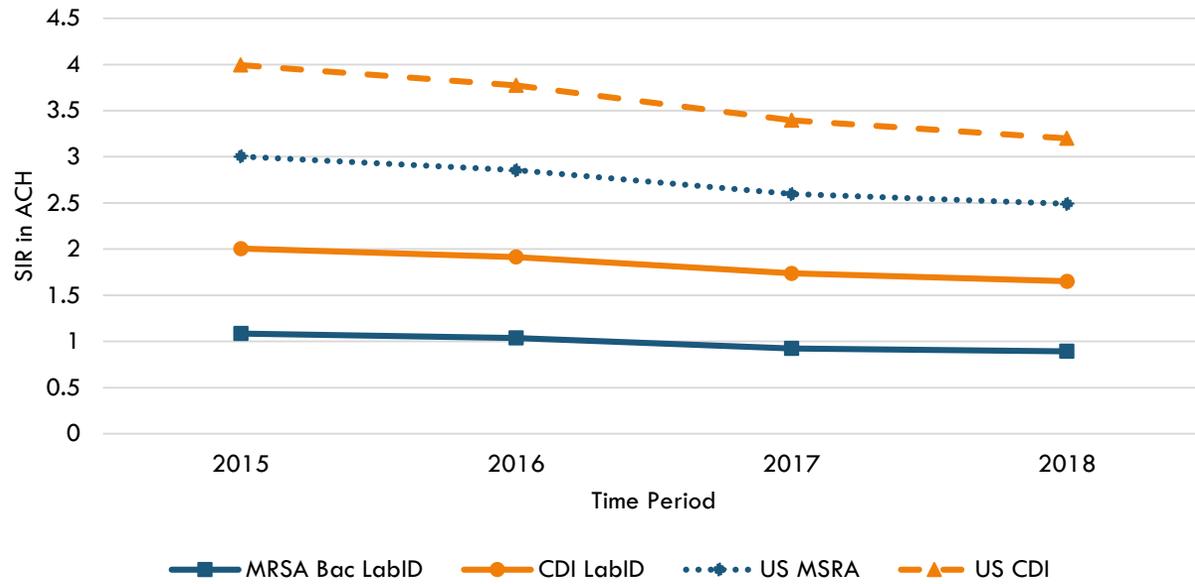
↓ or ↑ Indicates statistically significantly less than or greater than previous year (respectively).

¹The SIR is only calculated if the number of Predicted events is ≥ 1.

²Cumulative Attributable Difference. HHS 2020 Target Reduction goals are 25% for MRSA and 30% for CDI.

- Significantly fewer infections than expected
 - CDI ACH
 - CDI CAH
- Significantly less infections than 2017
 - CDI ACH

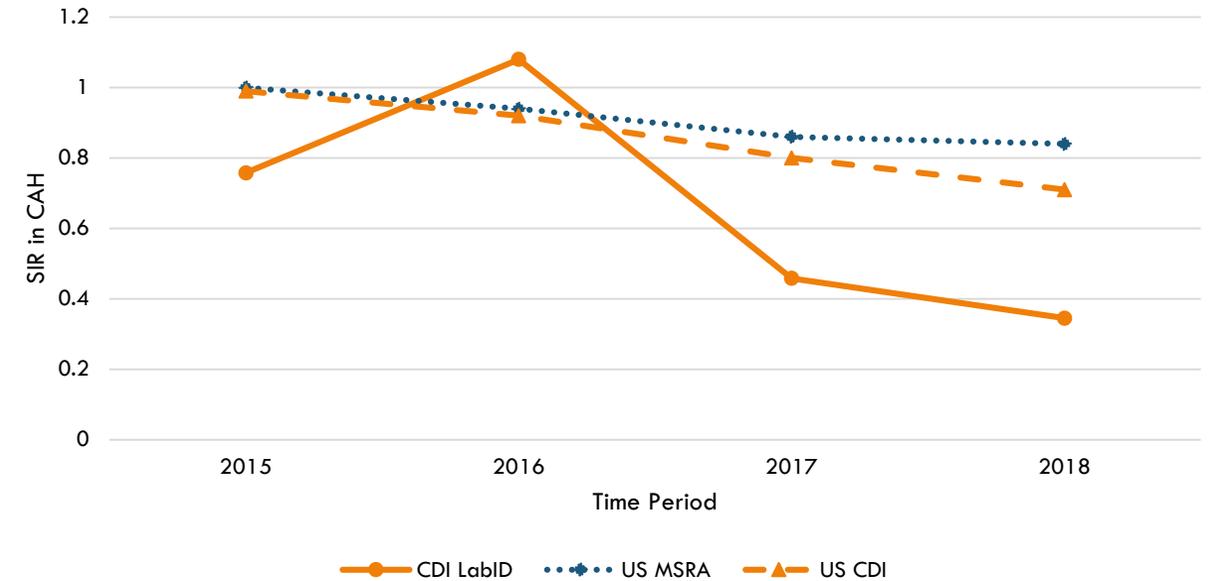
Michigan MDRO/CDI SIR Trends in Acute Care Hospitals



- Overall decrease in MDRO/CDI SIRs both nationally and within Michigan
- Michigan MDRO/CDI SIRs are lower than national MDRO/CDI SIRs

- No data available for MRSA in CAH
- Overall decrease in MDRO/CDI nationally
- Trending decrease in Michigan CDI
 - Peak in 2016
 - 2 high quarters

Michigan MDRO/CDI SIR Trends in Critical Access Hospitals



DEVICE-ASSOCIATED

Michigan Device-Associated Rates

Type of Infection	Number of Facilities	Number of Infections	Number of Patient Days	Number of Device Days	Rate ¹	DU ²
CAUTI	110	624	4,394,664	664,903	0.938	0.151 ↓
CLABSI	110	431	4,297,828	648,005	0.665	0.151 ↓
Total VAE	103	1,626	1,293,874	180,164	9.025 ↑	0.139 ↓
IVAC	89	591	1,293,874	180,077	3.282	0.139 ↓

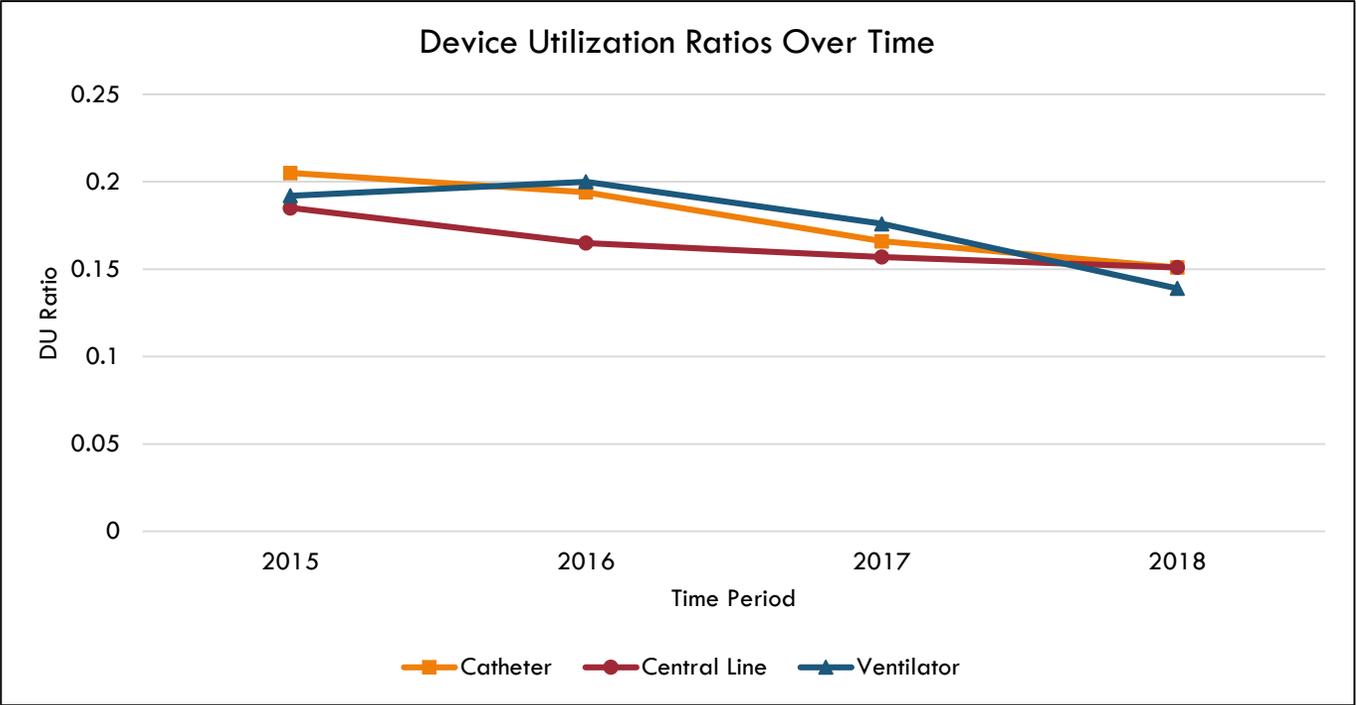
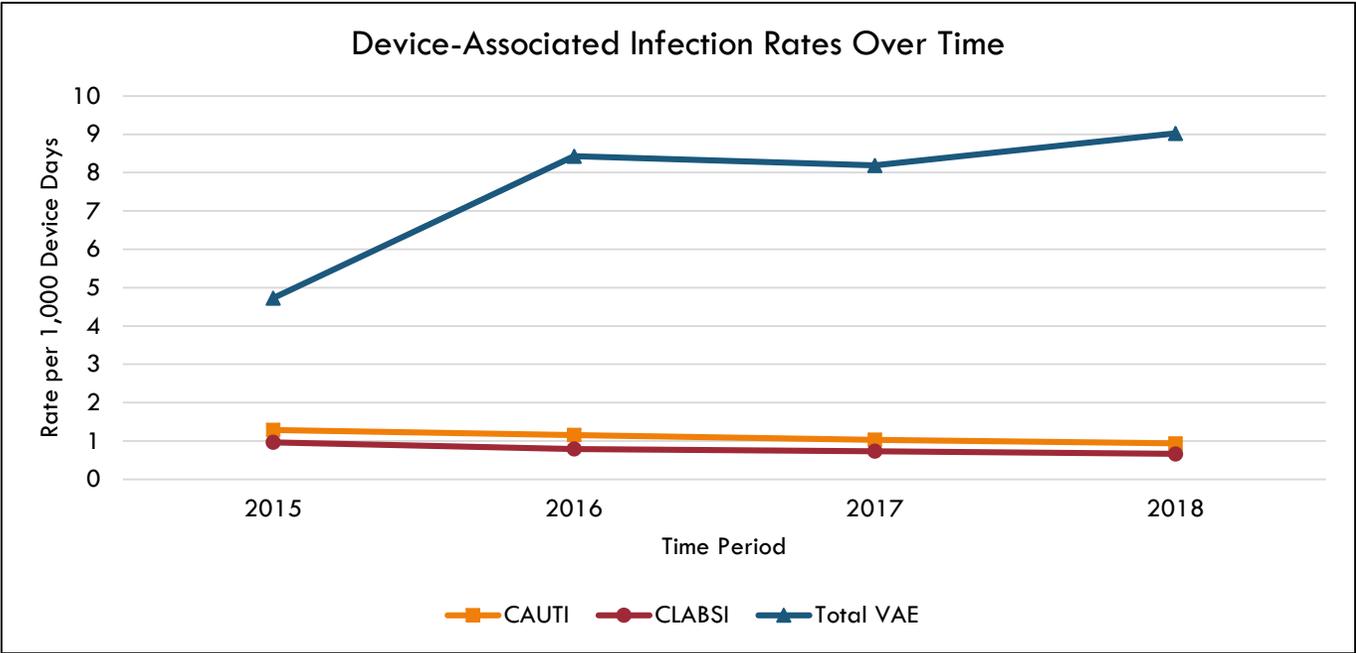
↓ or ↑ Indicates statistically significantly less than or greater than previous year (respectively)

¹MI Rate: The number of device-associated infections per 1,000 device days among participating hospitals.

²DU: Device Utilization. The proportion of days on a device divided by the total number of patient days reported for the unit. The device could be a catheter, central line, or ventilator. The MI DU is the proportion of Michigan patient days that are spent using a device.

- Significant decrease in DU
 - CAUTI, CLABSI, Total VAE, IVAC

- Significant increase in Total VAE Rate
 - Trending upward



Device Standardized Infection Ratios (SIR)								
Type of Infection	Number of Facilities	Device Days	Observed	Predicted	SIR ¹	SIR p-value	95% CI	CAD ²
CAUTI ACH	89	639,127	583	807.930	0.722	<0.001	0.665, 0.782	-22.948
CAUTI CAH	18	4,776	0	4.422	0	0.012	0, 0.677	-3.317
CLABSI ACH	89	623,467	414	648.048	0.639	<0.001	0.579, 0.703	89.976
CLABSI CAH	18	1,976	1	0.539	.	.	.	0.731
Total VAE ³ ACH	87	175,806	1,622	1,372.7	1.182 ↑	0.000	1.125, 1.240	N/A
Total VAE ³ CAH	14	87	0	0.124	.	.	.	N/A
IVAC ³ ACH	87	175,806	591	495.70	1.192 ↑	0.000	1.099, 1.291	N/A

Green Text or Red Text indicates significantly fewer or greater infections than expected (respectively).
↓ or ↑ Indicates statistically significantly less than or greater than previous year (respectively)
¹The SIR is only calculated if the number of Predicted events is ≥ 1.
²Cumulative Attributable Difference. HHS 2020 Target Reduction goals are 25% for CAUTI and 50% for CLABSI. There are currently no reduction goals for VAE.
³ Total VAE and IVAC may include out-of-plan data.

- Significantly fewer infections than expected
 - CAUTI
 - ACH
 - CAH
 - CLABSI
 - ACH

- Significantly greater infections than expected
 - Total VAE
 - ACH
 - IVAC
 - ACH

- Significantly more infections than 2017
 - Total VAE
 - ACH
 - IVAC
 - ACH

Device Standardized Infection Ratios (SIR)								
Type of Infection	Number of Facilities	Device Days	Observed	Predicted	SIR ¹	SIR p-value	95% CI	CAD ²
CAUTI ACH	89	639,127	583	807.930	0.722	<0.001	0.665, 0.782	-22.948
CAUTI CAH	18	4,776	0	4.422	0	0.012	0, 0.677	-3.317
CLABSI ACH	89	623,467	414	648.048	0.639	<0.001	0.579, 0.703	89.976
CLABSI CAH	18	1,976	1	0.539	.	.	.	0.731
Total VAE ³ ACH	87	175,806	1,622	1,372.7	1.182 ↑	0.000	1.125, 1.240	N/A
Total VAE ³ CAH	14	87	0	0.124	.	.	.	N/A
IVAC ³ ACH	87	175,806	591	495.70	1.192 ↑	0.000	1.099, 1.291	N/A

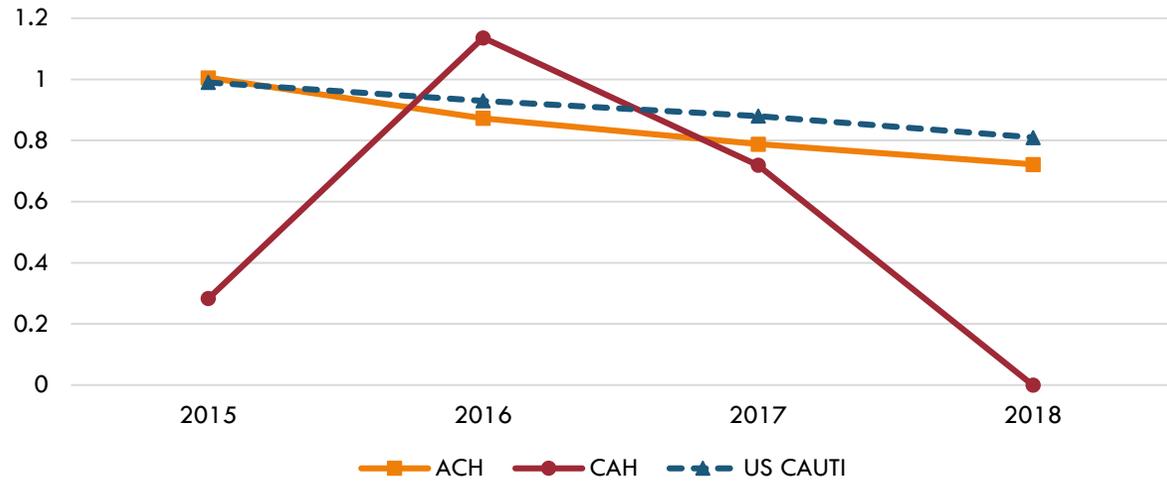
Green Text or Red Text indicates significantly fewer or greater infections than expected (respectively).
↓ or ↑ Indicates statistically significantly less than or greater than previous year (respectively)
¹The SIR is only calculated if the number of Predicted events is ≥ 1.
²Cumulative Attributable Difference. HHS 2020 Target Reduction goals are 25% for CAUTI and 50% for CLABSI. There are currently no reduction goals for VAE.
³ Total VAE and IVAC may include out-of-plan data.

- Significantly fewer infections than expected
 - CAUTI
 - ACH
 - CAH
 - CLABSI
 - ACH

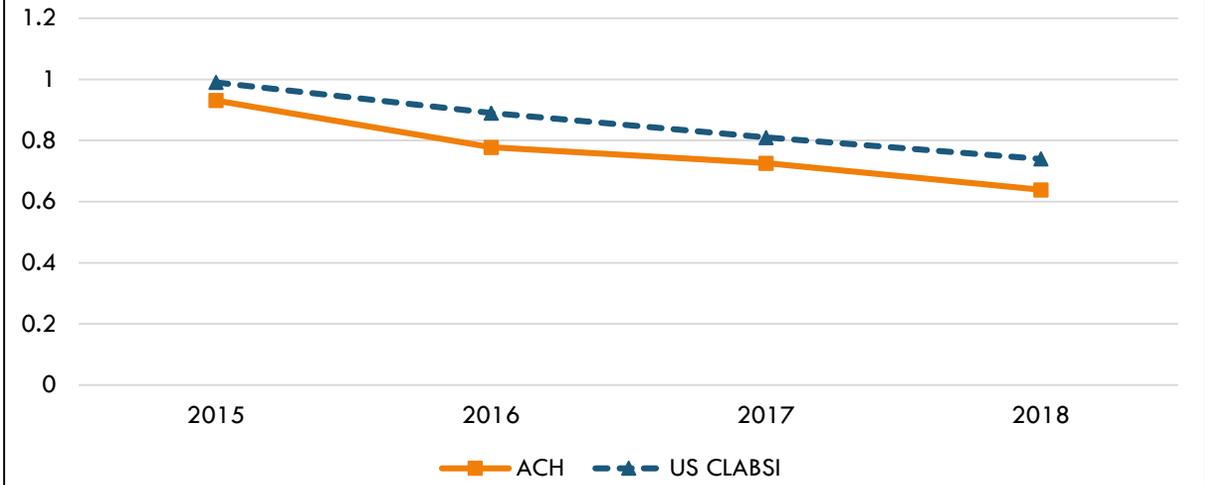
- Significantly greater infections than expected
 - Total VAE
 - ACH
 - IVAC
 - ACH

- Significantly more infections than 2017
 - Total VAE
 - ACH
 - IVAC
 - ACH

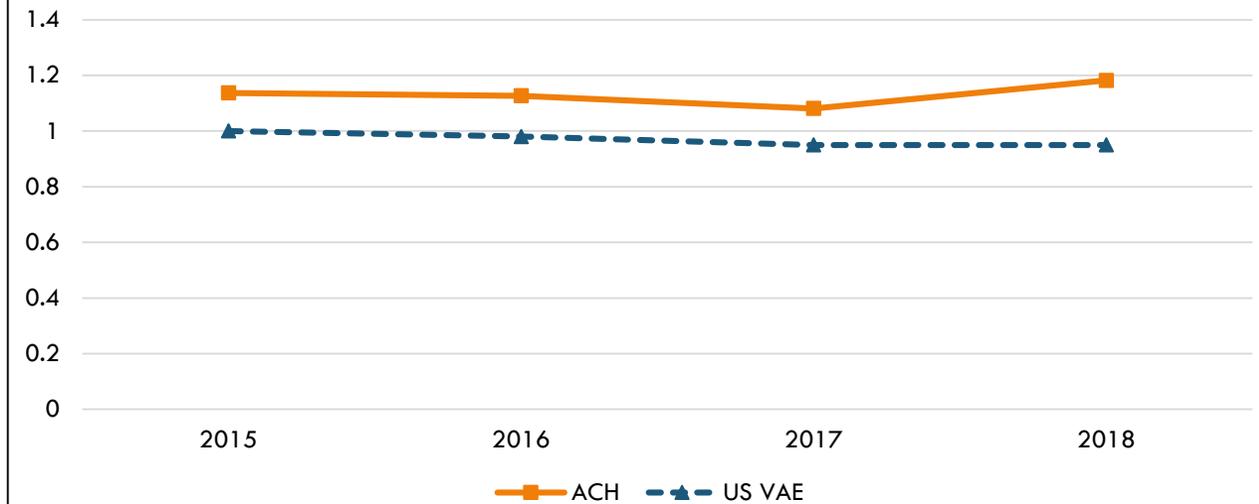
CAUTI SIR Trends Over Time



CLABSI SIR Trends Over Time



VAE SIR Trends Over Time



Michigan NICU Device-Associated Rates by Birth Weight

Type of Infection	Birth weight Code	Number of Facilities	Number of Infections	Number of Patient Days	Number of Device Days	Rate ¹	DU ²
CLABSI	Overall	18	22	168,340	27,796	0.791	0.165 ↓
	A ⁴	18	6	20,708	5,549	1.081	0.268 ↓
	B ⁵	18	4	19,648	5,019	0.797	0.255
	C ⁶	18	7	36,260	6,251	1.12	0.172 ↓
	D ⁷	18	2	53,730	5,209	0.384	0.097 ↓
	E ⁸	18	3	37,994	5,768	0.52	0.152 ↓
VAP	Overall	12	3	59,314	5,511	0.544	0.093 ↑
	A	12	2	6,105	1,804	1.109	0.295 ↑
	B	10	1	8,069	1,093	0.915	0.135 ↑
	C	11	0	12,510	743	0	0.059 ↑
	D	8	0	19,774	714	0	0.036 ↑
	E	8	0	12,856	1,157	0	0.09 ↑

↓ or ↑ Indicates statistically significantly less than or greater than previous year (respectively)

¹Rate: The number of device-associated infections per 1,000 device days among participating Michigan hospitals.

²DU: Device Utilization. The proportion of days on a device over the total number of patient days reported for the unit. The device could be a catheter, central line, or ventilator. The MI DU is the proportion of Michigan patient days that are spent using a device.

⁴A: Birthweight ≤750g

⁵B: Birthweight 751–1000g

⁶C: Birthweight 1001–1500g

⁷D: Birthweight 1501–2500g

⁸E: Birthweight >2500g

- Significant decrease since 2017
 - NICU CLABSI in all birthweight classes, except B
- Significant increase since 2017
 - NICU VAP in all birthweight classes

PROCEDURE-ASSOCIATED



Table 18. 2018 Annual SSI Rates and SIR by Procedure Type

Procedure Type	Number of Facilities	Number of Procedures	Number of Observed SSIs	Number of Predicted SSIs	Rate	SIR	SIR p-value	SIR 95% Confidence Interval	CAD
Overall	96	70,593	599	580.99	0.849	1.031	0.4656	0.951, 1.116	192.304
CBGB¹	8	1,171	8	9.7	0.683	0.825	0.6161	0.383, 1.566	1.210
CBGC²	8	131	0	0.967	0.000	.	.	.	-0.677
COLO³	94	10,294	270	265.353	2.623	1.018	0.7917	0.901, 1.144	84.253
CSEC⁴	9	5,391	17	11.512	0.315	1.477	0.1231	0.889, 2.316	8.942
FUSN⁵	8	3,581	27	20.241	0.754	1.334	0.1453	0.897, 1.914	12.831
HPRO⁶	73	14,021	90	89.176	0.642	1.009	0.9167	0.816, 1.235	27.577
HYST⁷	85	8,958	67	63.611	0.748	1.053	0.6592	0.823, 1.329	22.472
KPRO⁸	73	19,247	76	66.509	0.395	1.143	0.2478	0.907, 1.422	29.444
LAM⁹	7	1,230	4	3.974	0.325	1.007	0.9274	0.320, 2.428	1.218
VHYS¹⁰	5	196	0	1.438	0.000	0	0.2375	, 2.084	-1.007

¹CBGB: Coronary artery bypass graft with both chest and donor site incisions

²CBGC: Coronary artery bypass graft with chest incision only

³COLO: Colon surgery

⁴CSEC: Cesarean Section

⁵FUSN: Spinal fusion

⁶HPRO: Hip prosthesis

⁷HYST: Abdominal hysterectomy

⁸KPRO: Knee prosthesis

⁹LAM: Laminectomy

¹⁰VHYS: Vaginal hysterectomy

Cumulative Attributable Difference. HHS 2020 Target Reduction goals are 30% for SSIs

- No procedure type had statistically more/less infections than expected
- No procedure type had statistically more/less infections than 2017
- Top four reported procedures and overall SIR are above 1.0
- SSI prevention is needed in all SSIs overall and individually to meet the HHS target reduction goal of 30%

Table 18. 2018 Annual SSI Rates and SIR by Procedure Type

Procedure Type	Number of Facilities	Number of Procedures	Number of Observed SSIs	Number of Predicted SSIs	Rate	SIR	SIR p-value	SIR 95% Confidence Interval	CAD
Overall	96	70,593	599	580.99	0.849	1.031	0.4656	0.951, 1.116	192.304
CBGB¹	8	1,171	8	9.7	0.683	0.825	0.6161	0.383, 1.566	1.210
CBGC²	8	131	0	0.967	0.000	.	.	.	-0.677
COLO³	94	10,294	270	265.353	2.623	1.018	0.7917	0.901, 1.144	84.253
CSEC⁴	9	5,391	17	11.512	0.315	1.477	0.1231	0.889, 2.316	8.942
FUSN⁵	8	3,581	27	20.241	0.754	1.334	0.1453	0.897, 1.914	12.831
HPRO⁶	73	14,021	90	89.176	0.642	1.009	0.9167	0.816, 1.235	27.577
HYST⁷	85	8,958	67	63.611	0.748	1.053	0.6592	0.823, 1.329	22.472
KPRO⁸	73	19,247	76	66.509	0.395	1.143	0.2478	0.907, 1.422	29.444
LAM⁹	7	1,230	4	3.974	0.325	1.007	0.9274	0.320, 2.428	1.218
VHYS¹⁰	5	196	0	1.438	0.000	0	0.2375	, 2.084	-1.007

¹CBGB: Coronary artery bypass graft with both chest and donor site incisions

²CBGC: Coronary artery bypass graft with chest incision only

³COLO: Colon surgery

⁴CSEC: Cesarean Section

⁵FUSN: Spinal fusion

⁶HPRO: Hip prosthesis

⁷HYST: Abdominal hysterectomy

⁸KPRO: Knee prosthesis

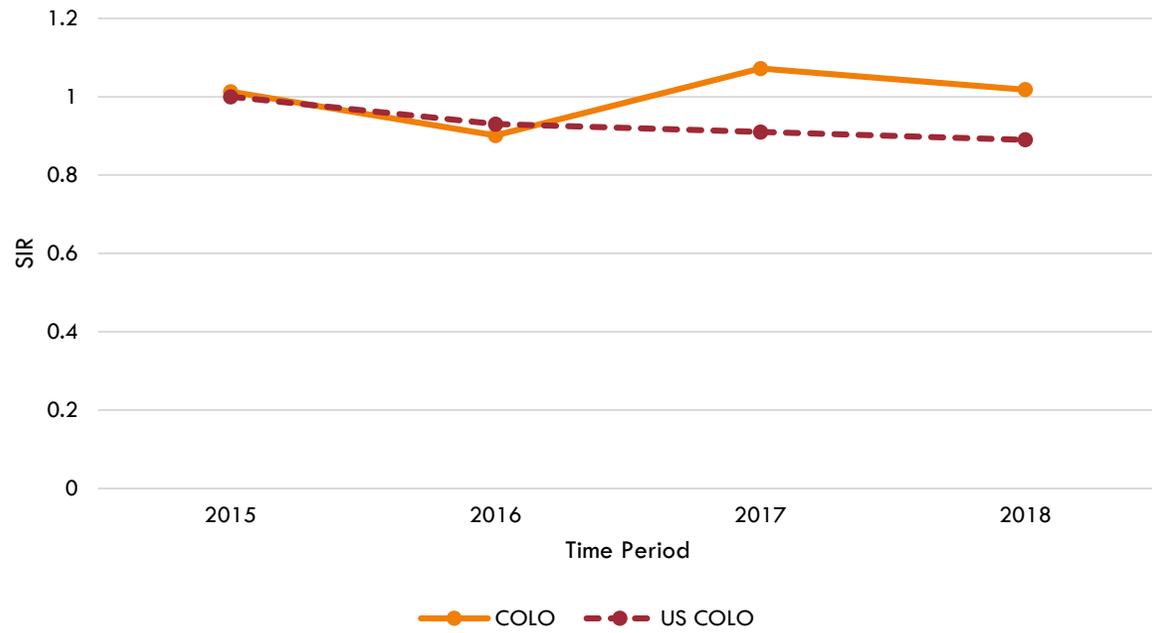
⁹LAM: Laminectomy

¹⁰VHYS: Vaginal hysterectomy

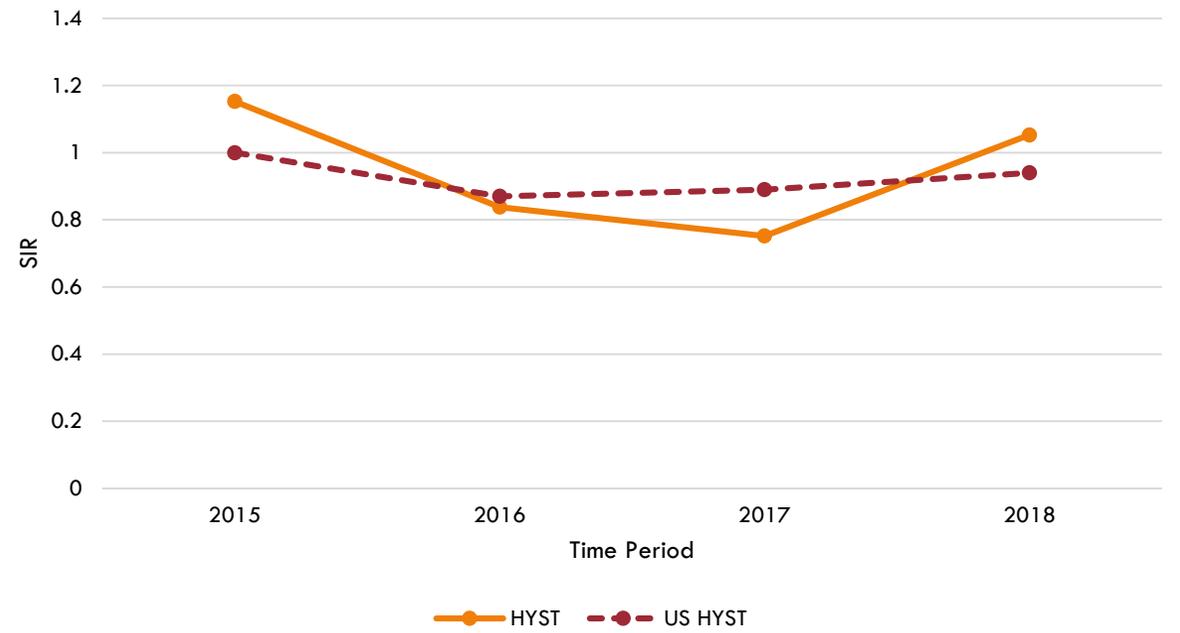
Cumulative Attributable Difference. HHS 2020 Target Reduction goals are 30% for SSIs

- No procedure type had statistically more/less infections than expected
- No procedure type had statistically more/less infections than 2017
- Top four reported procedures and overall SIR are above 1.0
- SSI prevention is needed in all SSIs overall and individually to meet the HHS target reduction goal of 30%

COLO SIR Trends Over Time



HYST SIR Trends Over Time



ANTIMICROBIAL USE

CORE ELEMENTS

Antibiotic Stewardship Core Elements Met, 2018 MI NHSN Group

Core Element	Number	Percent (n= 110)
Leadership	109	99
Accountability	105	95
Pharmacy Expertise	105	95
Action	107	97
Tracking	107	97
Reporting	102	93
Education	106	96
Facilities Meeting all 7 Core Elements	MI %	US %
	89	85

CORE ELEMENTS

Antibiotic Stewardship Core Elements Met, 2018 MI NHSN Group

Core Element	Number	Percent (n= 110)
Leadership	109	99
Accountability	105	95
Pharmacy Expertise	105	95
Action	107	97
Tracking	107	97
Reporting	102	93
Education	106	96
Facilities Meeting all 7 Core Elements	MI %	US %
	89	85

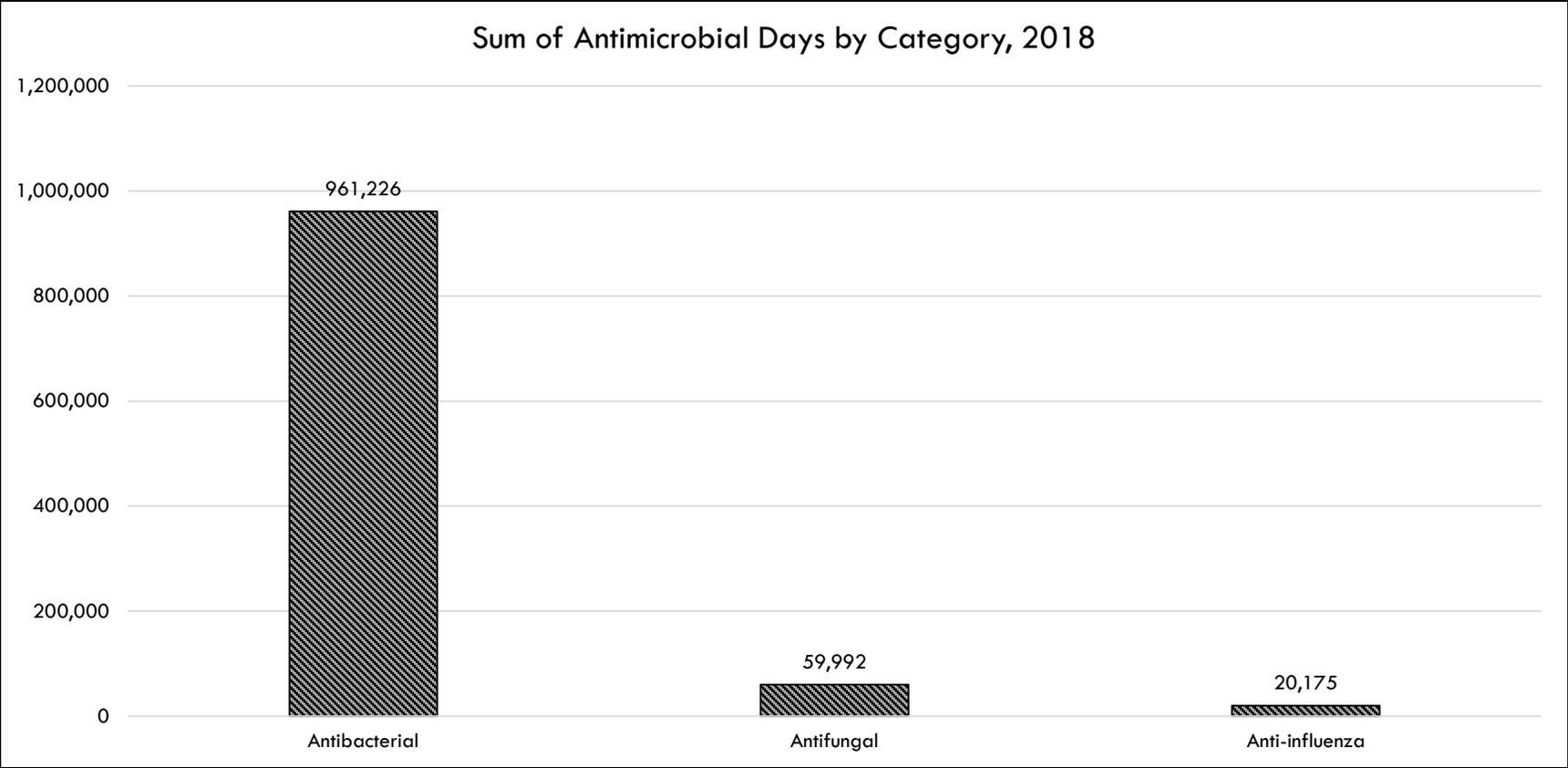
AU MODULE

MDHHS SHARP Unit began collecting AU data from AU/AR Module of NHSN in 2016

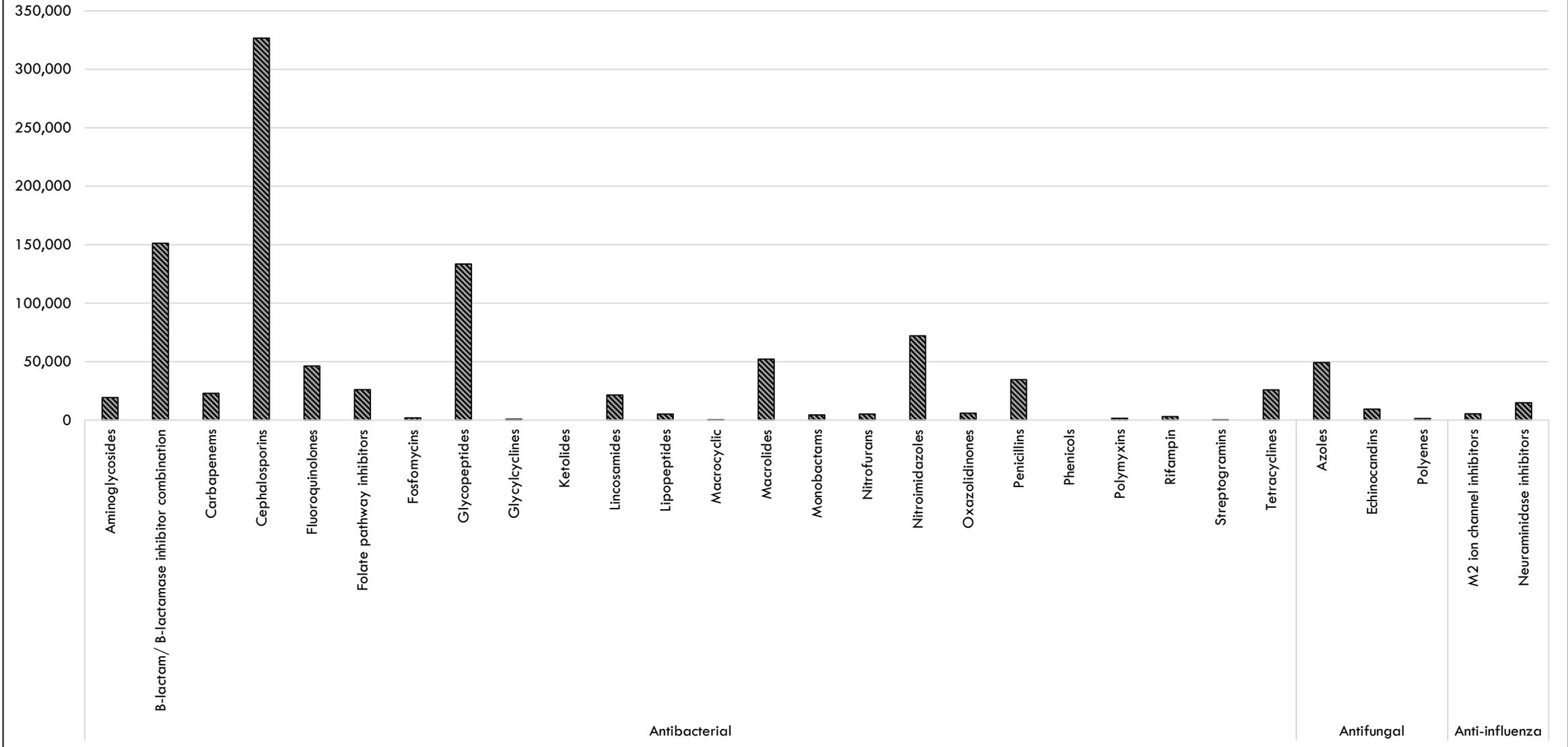
- 29 facilities sharing in the AU portion of module
- Data in this report will only include 2018

More information and definitions

- [Antibiotic Use and Resistance \(AUR\) protocol](#)



Sum of Antimicrobial Days by Class, 2018



Rate of Antimicrobial Days per 1,000 Days Present

All Agents	
All	409.96
Ceftriaxone	51.32
Vancomycin	50.21
Cefazolin	38.62
Agents with Highest Risk of C. difficile Infection	
All	106.393
Ceftriaxone	51.30
Cefepime	24.51
Clindamycin	9.35
Agents Predominately Used for Extensively Antibiotic Resistant Bacteria	
All	1.16
Colistimethate	0.53
Tigecycline	0.30
Ceftazidime/Avibactam	0.17
Agents Predominately Used for Hospital Onset Infections	
All	767.92
Piperacillin with Tazobactam	35.75
Cefepime	24.51
Meropenem	6.21
Agents Predominately Used for Community Onset Infections	
All	75.08
Ceftriaxone	51.30
Ciprofloxacin	9.15
Levofloxacin	8.88

- Top 3 agents
 - Ceftriaxone
 - Vancomycin
 - Cefazolin

- Agents with the highest risk of CDI
 - Rate = 106.93

- Rates for agents used for HO infections
 - Rate = 767.92

- Rates for agents used for CO infections
 - Rate = 75.08

- Rate for agents used for extensive AR bacteria
 - Rate = 1.16

CONCLUSIONS



CONCLUSIONS

Significantly decreasing from 2017-2018

- MRSA
- CDI

Significantly increasing from 2017-2018

- VAE

Additionally, while not significant:

- CAUTI, CLABSI rates
 - Slowly decreasing from >1 in 2015 to <1 in 2018
 - Below national trendline
- SSIs
 - Positive CAD values – infections need to be prevented
 - SIRs >1 – more infections than expected
- AU
 - More antimicrobial days for antibiotics than antifungals or anti-influenza

QUESTIONS?

