

MRSA and VRE Bloodstream Infection and *C. difficile* Infection Surveillance

Last Updated 2019

Basics of Infection Prevention
Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health



Objectives

- Review methicillin resistant *Staphylococcus aureus* (MRSA) and vancomycin resistant enterococcus (VRE) bloodstream infection (BSI) and *Clostridioides difficile* infection (CDI) surveillance methods and definitions
- Discuss importance of accurate data collection
- Demonstrate how to report MRSA and VRE BSI, and CDI data, using Lab ID, in National Healthcare Safety Network (NHSN)
- Discuss NHSN data analysis and feedback to staff

Perform Surveillance to Assess Prevention Progress

- LabID method is the nationally-recognized quality measure for the surveillance of MRSA/VRE BSI and CDI (NQF endorsed)
- Requires no clinical review or further evaluation of positive lab finding
- Track inpatients, ED patients, and 24-hour observation patients:
 - Report ALL MRSA and VRE positive blood specimens (only)
 - Report ALL *C. difficile* toxin-positive tests (final result)

MRSA/VRE and CDI LabID Surveillance

NHSN algorithm categorizes MRSA/VRE and CDI cases according to the admission date and specimen collection dates entered

Community-Onset (CO)	For Inpatient surveillance, a LabID event collected ≤ 3 days after admission to the facility (i.e., days 1, 2, 3 or admission)
Healthcare Facility-Onset (HO)	LabID event collected > 3 days after admission to the facility (on or after day 4)

Community-Onset Healthcare Facility - Associated (CO-HCFA)	LabID event collected from a patient who was discharged from the facility ≤ 4 weeks prior to current date of stool specimen collection
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NHSN Patient Safety Manual: Chapter 12

https://www.cdc.gov/nhsn/pdfs/pscmanual/pcsmanual_current.pdf

MRSA/VRE BSI and CDI LabID Surveillance

- NHSN also tracks if MRSA/VRE BSI and CDI cases are new or recurrent
 - Considered **recurrent** if >2 weeks and ≤ 8 weeks after last event reported for that patient
- All MRSA/VRE BSI and CDI cases should be identified and entered into NHSN
 - There is no advantage to not identifying and entering all cases into NHSN

NHSN Patient Safety Manual: Chapter 12

LabID Event Calculator

- Helps to accurately apply MDRO/CDI LabID Event algorithms
- Assists with MDRO/CDI LabID Event determinations

Note: When using calculator, CA hospitals required to report from inpatient, ED, and 24 hour observation locations

[MDRO & CDI LabID Event Calculator](https://nhsn.cdc.gov/nhsntraining/labid-calculator/mdrolabidcalc.html)

(<https://nhsn.cdc.gov/nhsntraining/labid-calculator/mdrolabidcalc.html>)

MDRO & CDI LabID Event Calculator

Enter a Reporting Plan...

Choose an organism to track:

Select
MRSA
MSSA
VRE
CephR-Klebsiella
CRE-Ecoli
CRE-Klebsiella
MDR-Acinetobacter
CDIF-C. difficile

All Specimen Types Blood Specimens Only

Use Generic Locations Type In Your Own

Choose a reporting month:

Select ▼

Choose a reporting year:

Select ▼

Reporting LabID Infections (Events)

- **Report all** positive MRSA/VRE blood specimens and CDI specimens, including inpatient locations, ED, and 24 hour observation units
- Attribute the infection to the location where the **specimen** was **collected**
 - Exception: If specimen collected at an affiliated outpatient location and patient is admitted to hospital on the same calendar day, attribute infection to the hospital admitting unit


Reporting LabID Events

- Data needed
 - Patient admission date
 - Specimen collection date
 - Location at time of collection
- If a patient has a repeat positive specimen less than 14 days since the last positive specimen
 - Do not report if patient's specimen from same location as already reported
 - Report if patient's specimen from new location

Entering LabID Events in NHSN

NHSN Home

- Alerts
- Dashboard
- Reporting Plan ▶
- Patient ▶
- Event ▶**
- Procedure ▶
- Summary Data ▶
- Import/Export
- Surveys ▶
- Analysis ▶
- Users ▶
- Facility ▶
- Group ▶
- Logout

 **Add Event**

Mandatory fields marked with *

Fields required for record completion marked with **

Fields required when in Plan marked with >


Add

Enter all MRSA, VRE, and CDI events

- Inpatient
- ED
- 24 hour observation

Event Information

Event Type *: LABID - Laboratory-identified MDRO or CDI Event ▼


Date Specimen Collected *: 10/01/2017 

Specific Organism Type *: CDIF - C. difficile ▼


Outpatient *: N - No ▼

Specimen Body Site/Source *: DIGEST - Digestive System ▼


Specimen Source *: STOOL - Stool specimen ▼

Date Admitted to Facility *: 10/01/2017 

Location *: 2 WEST - M/S ICU

Date Admitted to Location *: 10/01/2017 

Has patient been discharged from your facility in the past 4 weeks? *: Y - Yes ▼

Date of last discharge from your facility *: 9/28/2017 

Has the patient been discharged from another facility in the past 4 weeks?: ▼

Documented evidence of previous infection or colonization with this specific organism type from a previously reported LabID Event in any prior month?: ▼

Report Infection Twice if MRSA/VRE BSI Also a CLABSI

- All MRSA/VRE-positive blood cultures must be reported via the LabID module
- Must also review if MRSA/VRE BSI from a patient with a central line and meets the CLABSI surveillance definition
 - If yes, the **same BSI must be reported in both the LabID and CLABSI modules**

Reporting LabID Denominator (Summary) Data

Each month, enter numbers of

- Patient days (facility-wide)
- Hospital admissions
- ED and 24 hour observation visits (encounters)

NHSN Patient Safety Module: Chapter 12

Entering Inpatient Summary Data in NHSN



MDRO and CDI Prevention Process and Outcome Measures Monthly Monitoring

Setting: Inpatient Total Facility Patient Days * : 5927 Total Facility Admissions * : 1247

Setting: Outpatient Total Facility Encounters:

If monitoring MDRO in a FACWIDE location, then subtract all counts from patient care units with unique CCNs(IRF and IPF) from Totals:

MDRO Patient Days * : 4874 MDRO Admissions * : 1100 MDRO Encounters:

If monitoring *C. difficile* in a FACWIDE location, then subtract all counts from patient care units with unique CCNs(IRF and IPF) as well as NICU and Well Baby counts from Totals:

CDI Patient Days * : 4570 CDI Admissions * : 1007 CDI Encounters:

- **Total facility patient days**
- **Total facility admissions**
- **Total facility MDRO patient days** (Facility Pt Days minus units with unique CCN such as IRF and IPF)
- **Total facility MDRO patient admissions** (Facility Pt Days minus units with unique CCN such as IRF and IPF)
- **CDI Patient Days** (Facility Pt Days minus NICU/Well baby and units with unique CCN such as IRF and IPF)
- **CDI Patient Admissions**(Facility Pt Days minus NICU/Well baby and units with unique CCN such as IRF and IPF)
- ED and 24 hour Observation encounters entered separately

Entering ED & Observation Unit Summary Data in NHSN

NHSN Home
Reporting Plan ▶
Event ▶
Procedure ▶
Summary Data ▶
Surveys ▶
Analysis ▶
Logout



MDRO and CDI Prevention Process and Outcome Measures Monthly M

Location Code *: OBSERVATION UNIT

Month *: January

Year *: 2017

General

Setting: Inpatient Total Patient Days:

Setting: Outpatient Total Encounters *: 306

Location Code *: ED - ED

Month *: January

Year *: 2017

General

Setting: Inpatient Total Patient Days:

Setting: Outpatient Total Encounters *: 5737

Interpreting MRSA and VRE Surveillance Data

- NHSN has a risk model and calculates an SIR for MRSA BSI (but not for VRE BSI)
- Risk adjustment factors used by NHSN for MRSA BSI SIR:
 - Inpatient and outpatient community-onset MRSA BSI prevalence reported by your hospital
 - Average length of stay*
 - Facility Type*
 - Medical school affiliation*
 - Number of ICU beds*

* From Annual Facility Survey

Interpreting CDI Surveillance Data

- NHSN has a risk model and calculates an SIR for CDI
- Risk adjustment factors used by NHSN for CDI SIR:
 - Type of laboratory test
 - Inpatient community onset
CDI prevalence
 - Facility Type*
 - Medical school affiliation*
 - Facility bedsize*
 - Number of ICU beds*
 - Reporting from ED or 24
hour observation unit

* From Annual Facility Survey

NHSN: A Guide to the SIR

- How to interpret SIR
- How SIR is calculated
- Risk adjustment factors for specific HAI

THE NHSN STANDARDIZED INFECTION RATIO (SIR)

A Guide to the SIR

Updated August 2018. Please see [Page 2](#).




NHSN: A Guide to the SIR, Aug 2018

<https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf>

NHSN MRSA and VRE Analysis Reports

NHSN Home
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Analysis Reports

Expand All
Collapse All

- ▶ Device-Associated (DA) Module
- ▶ Procedure-Associated (PA) Module
- ▶ HAI Antimicrobial Resistance (DA+PA Modules)
- ▶ Antimicrobial Use and Resistance Module
- ▶ MDRO/CDI Module - LABID Event Reporting
 - ▶ All LabID Events
 - ▶ All MRSA LabID Events
 - ▨ Line Listing for All MRSA LabID Events
 - ▨ Frequency Table for All MRSA LabID Events
 - ▨ Bar Chart for All MRSA LabID Events
 - ▨ Pie Chart for All MRSA LabID Events
 - ▨ Rate Table - MRSA LabID Data
 - SIR SIR - ACH MRSA Blood FacwideIN LabID Data
 - SIR SIR - CAH MRSA Blood FacwideIN LabID Data
 - SIR SIR - IRF MRSA Blood LabID Data
 - SIR SIR - LTAC MRSA Blood FacwideIN LabID Data
 - ▶ All MSSA LabID Events
 - ▶ All C. difficile LabID Events
 - ▶ All VRE LabID Events
 - ▶ All CephR-Klebsiella LabID Events
 - ▶ All CRE LabID Events
 - ▶ All CRE-Klebsiella LabID Events

- Generate data set prior to creating a report
- Choose report according to need
 - MRSA SIR report- Your incidence compared to expected incidence
 - VRE: Line list or rate tables and charts

NHSN CDI Analysis Reports

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Analysis Reports

Expand All Collapse All Search

- Device-Associated (DA) Module
- Procedure-Associated (PA) Module
- HAI Antimicrobial Resistance (DA+PA Modules)
- Antimicrobial Use and Resistance Module
- MDRO/CDI Module - LABID Event Reporting
 - All LabID Events
 - All MRSA LabID Events
 - All MSSA LabID Events
 - All C. difficile LabID Events

Generate Data Sets

- Line Listing for All CDIF LabID Events
- Frequency Table for All CDIF LabID Events
- Bar Chart for All CDIF LabID Events
- Pie Chart for All CDIF LabID Events
- Rate Tables for CDIF LabID Data
- SIR SIR - ACH CDI FacwideIN LabID Data**

Run Report

Modify Report

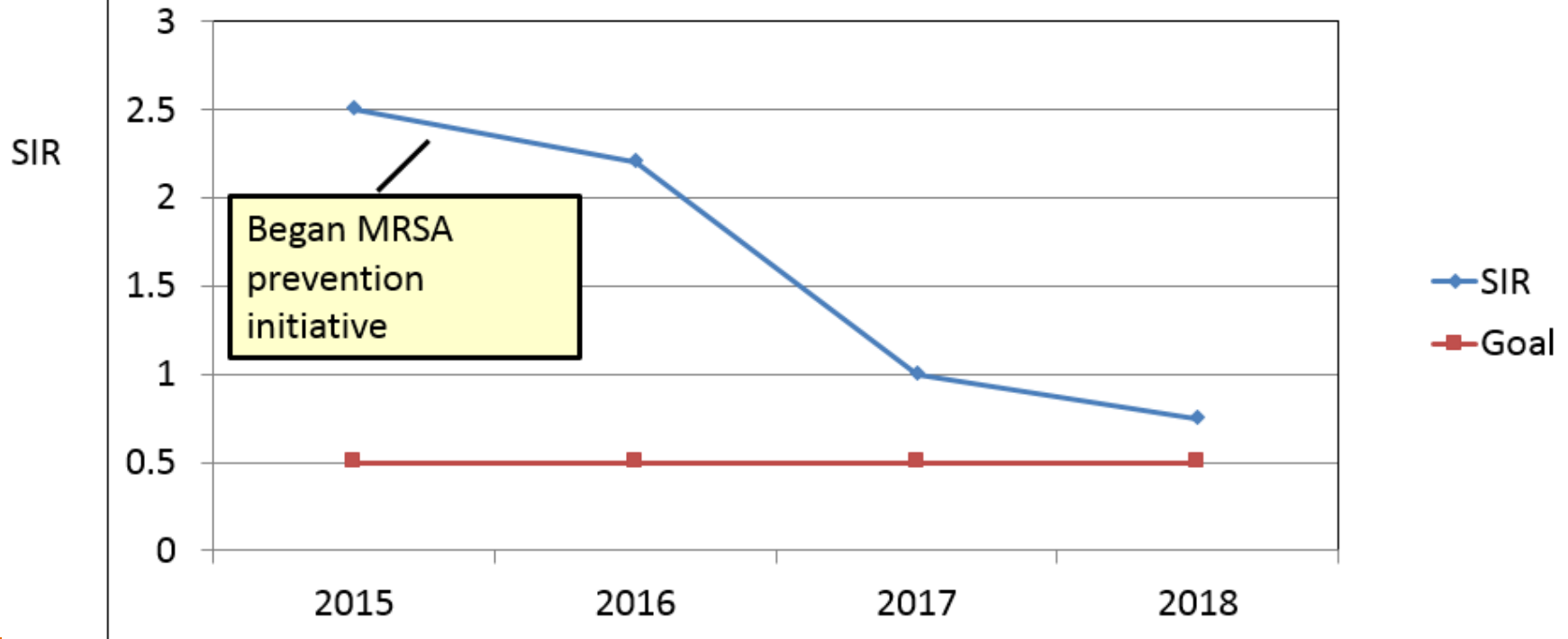
Export Data Set

- Generate data set prior to creating a report
- Choose report according to need
 - SIR report- Your incidence compared to expected incidence
 - TAP report – Number of events that needed to be prevented to reach facility targeted goal

Track Progress Over Time

- Feedback results to staff
- Celebrate successes!

Sample: California General Hospital
2015-2018 MRSA Progress

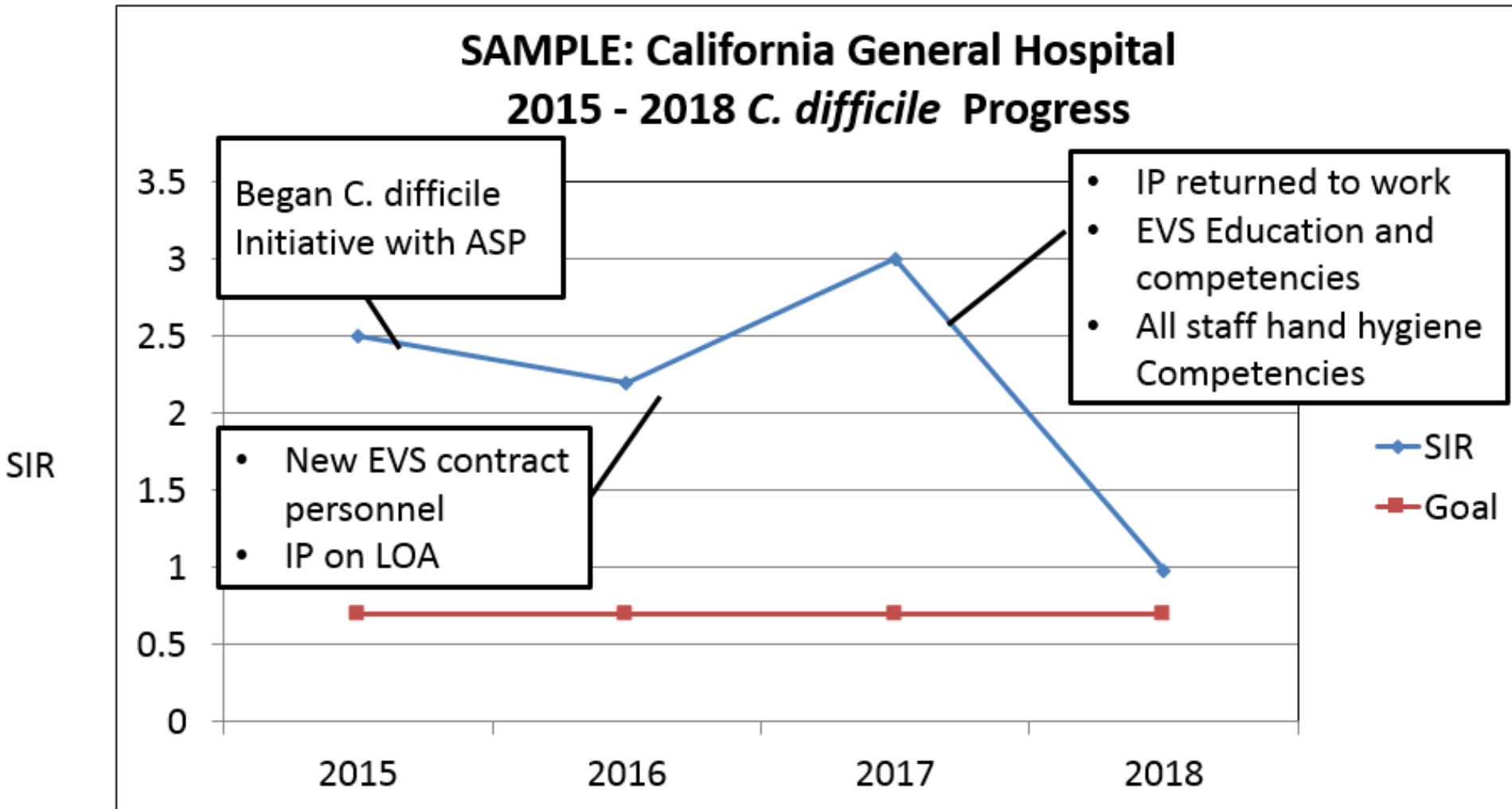


Targeted Assessment for Prevention (TAP) Reports - CDI

Number of Beds	Patient Days	COHCFA Prevalence	CDIF Facility Incident HO LabID Event Count	CDIF Facility Incident HO LabID Number Expected	Facility CAD	SIR
354	60059	0.14	61	55.034	22.48	1.108

- Identifies the **number of infections that needed to be prevented** to reach targeted goal (CAD)

Track CDI Progress Over Time



MRSA, VRE and CDI Surveillance Summary

- Report all MRSA and VRE blood specimens to NHSN
- Report all CDI-positive stool specimens to NHSN
- Accurate data are necessary for NHSN to calculate SIR and perform analysis
 - Including data from Facility Annual Survey
- Feedback incidence for (MRSA and CDI) or rates (VRE) with adherence monitoring results to all units and leadership

Questions?

For more information,
please contact any
HAI Program Team member

Or email

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