

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

ACH IP Course, 2022

Infection Prevention Training for ACH
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
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Perform Surveillance to Assess Prevention Progress

- LabID method is the nationally-recognized quality measure for the surveillance of MRSA/VRE BSI and CDI (National Quality Forum 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 of 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

[NHSN Patient Safety Manual: Chapter 12 \(PDF\)](#)

(www.cdc.gov/nhsn/pdfs/pscmanual/pscmanual_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

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

National Healthcare Safety Network (NHSN)

[CDC](#) > [NHSN](#) > [Materials for Enrolled Facilities](#)

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: Choose a reporting year:

Next...

[MDRO & CDI LabID Event Calculator](#)

(nhsn.cdc.gov/labid-calculator/mdrolabidcalc.html)

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
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Entering LabID Events in NHSN (Numerator)

NHSN Home
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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 *: 01/02/2020 4

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 *: 01/02/2020 4

Location *: .A7W.W1 - IUC-SURG/MED1 ▼

Date Admitted to Location *: 01/02/2020 4

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

Date of last discharge from your facility *: 12/25/2019 4

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

General

Line 1: Setting: Inpatient Total Facility Patient Days * : 12678 Total Facility Admissions * : 1698

Line 2: If your facility has a CMS-certified rehab unit (IRF) or CMS-certified psych unit (IPF), please subtract these counts from "Total Facility Patient Days" and "Total Facility Admissions" (Line 1). If you do not have these units, enter the same values you entered on Line 1.
Counts= [Total Facility - (IRF + IPF)]

Patient Days * : 11048 Admissions * : 1646

Line 3: If your facility has a CMS-certified IRF, CMS-certified IPF, NICU, or Well Baby Unit, please subtract those counts from "Total Facility Patient Days" and "Total Facility Admissions" (Line 1). If you do not have these units, enter the same values you entered on Line 1.
Counts= [Total Facility - (IRF + IPF + NICU + Well Baby Unit)]

Patient Days * : 10205 Admissions * : 1625

- **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 and 24 hour Observation Unit Summary Data in NHSN



MDRO and CDI Monthly Denominator Form

Location Code *: ED - EMERGENCY DEPARTMENT

Month *: January

Year *: 2021

General

Setting: Outpatient Total Encounters *: 4097

Organism Selection/Confirmation of No Events

Specific Organism Type	MRSA	Report No Events	CDIF	Report No Events	MSSA	Report No Events	CephR-Kleb	Report No Events	CRE-Ecoli	Report No Events	CRE-Enter	Report No Events	CRE-Kleb	Report No Events	MDR-Acine	Report No Events	VRE	Report No Events
Infection Surveillance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LabID Event (All specimens)	<input type="checkbox"/>	<input type="checkbox"/>	* <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LabID Event (Blood specimens only)	* <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	* <input checked="" type="checkbox"/>	<input type="checkbox"/>

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

[NHSN: A Guide to the SIR, Feb 2021](#) (PDF)

(www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf)



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 bed size*
 - Number of ICU beds*
 - Reporting from ED or 24
hour observation unit

*From Annual Facility Survey

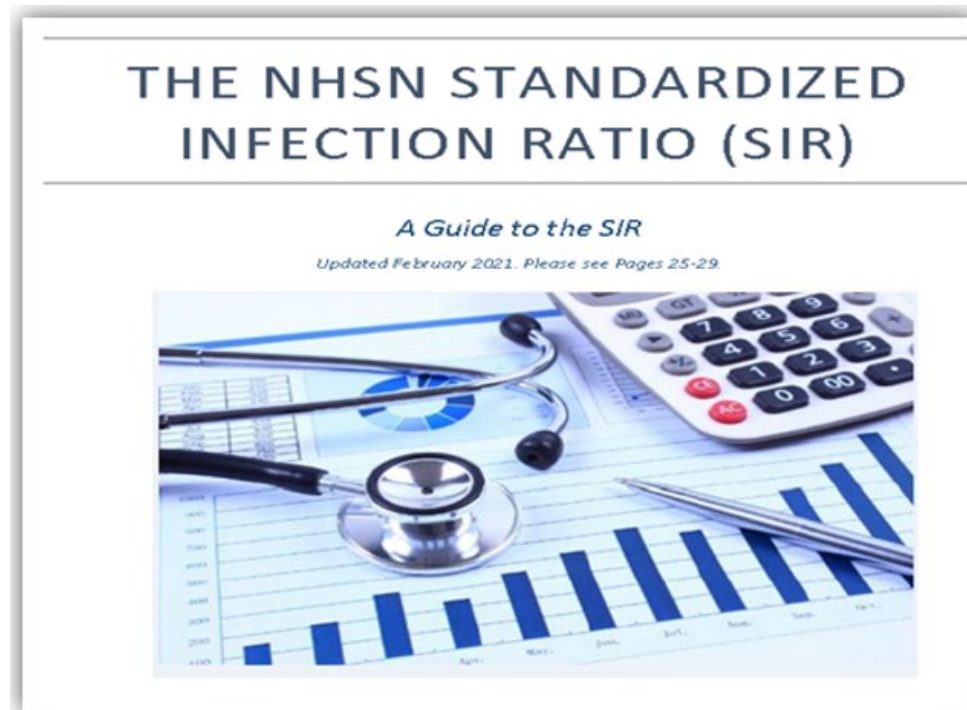
[NHSN: A Guide to the SIR Feb 2021 \(PDF\)](#)

(www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf)



NHSN: A Guide to the SIR

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




[NHSN: A Guide to the SIR Feb 2021 \(PDF\)](#)

(www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf)

NHSN MRSA and VRE Analysis Reports

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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


The screenshot displays the NHSN Analysis Reports interface. On the left is a vertical navigation menu with the following items: NHSN Home, Alerts, Dashboard, Reporting Plan, Patient, Event, Procedure, Summary Data, Import/Export, Surveys, Analysis, Users, Facility, Group, and Logout. The 'Analysis' menu item is highlighted. The main content area is titled 'Analysis Reports' and features a tree view of modules. The 'MDRO/CDI Module - LABID Event Reporting' is selected, and its sub-items are expanded. A dropdown menu is open over the 'Generate Data Sets' option, showing the following report types: 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, and SIR - ACH CDI FacwideIN LabID Data. A secondary dropdown menu is open over the 'SIR - ACH CDI FacwideIN LabID Data' item, showing three options: Run Report, Modify Report, and Export Data Set. The 'Run Report' option is highlighted.

- **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

Targeted Assessment for Prevention (TAP) Report

NHSN Home

- Alerts
- Dashboard ▶
- Reporting Plan ▶
- Patient ▶
- Event ▶
- Procedure ▶
- Summary Data ▶
- COVID-19 ▶
- Import/Export
- Surveys ▶
- Analysis ▶
- Users ▶
- Facility ▶
- Group ▶
- Logout

 **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
- MDRO/CDI Module - Infection Surveillance
- MDRO/CDI Module - Process Measures
- MDRO/CDI Module - Outcome Measures
- COVID-19 Module
- CMS Reports
- TAP Reports
 - Acute Care Hospitals (ACHs)
 - TAP TAP Report - ACH and CAH CLAB Data
 - TAP TAP Report - ACH and CAH CAU Data
 - TAP TAP Report - ACH and CAH FACWIDEIN MRSA LabID Data
 - TAP TAP Report - ACH and CAH FACWIDEIN CDI LabID Data
 - Long Term Acute Care Hospitals (LTACs)
 - Inpatient Rehabilitation Facilities (IRFs)

Run a TAP report to determine areas to target for prevention efforts

Targeted Assessment for Prevention (TAP)

Reports - CDI

National Healthcare Safety Network

TAP Report for FACWIDEIN CDI LabID data for Acute Care and Critical Access Hospitals (Baseline)

Totals for all Facilities in Group

SIR Goal : HHS Goal = 0.7

A TAP Report is the first step in the CDC TAP Strategy. For more information on the TAP strategy, please visit: <http://www.cdc.gov/ha>

As of: November 15, 2021 at 10:42 AM

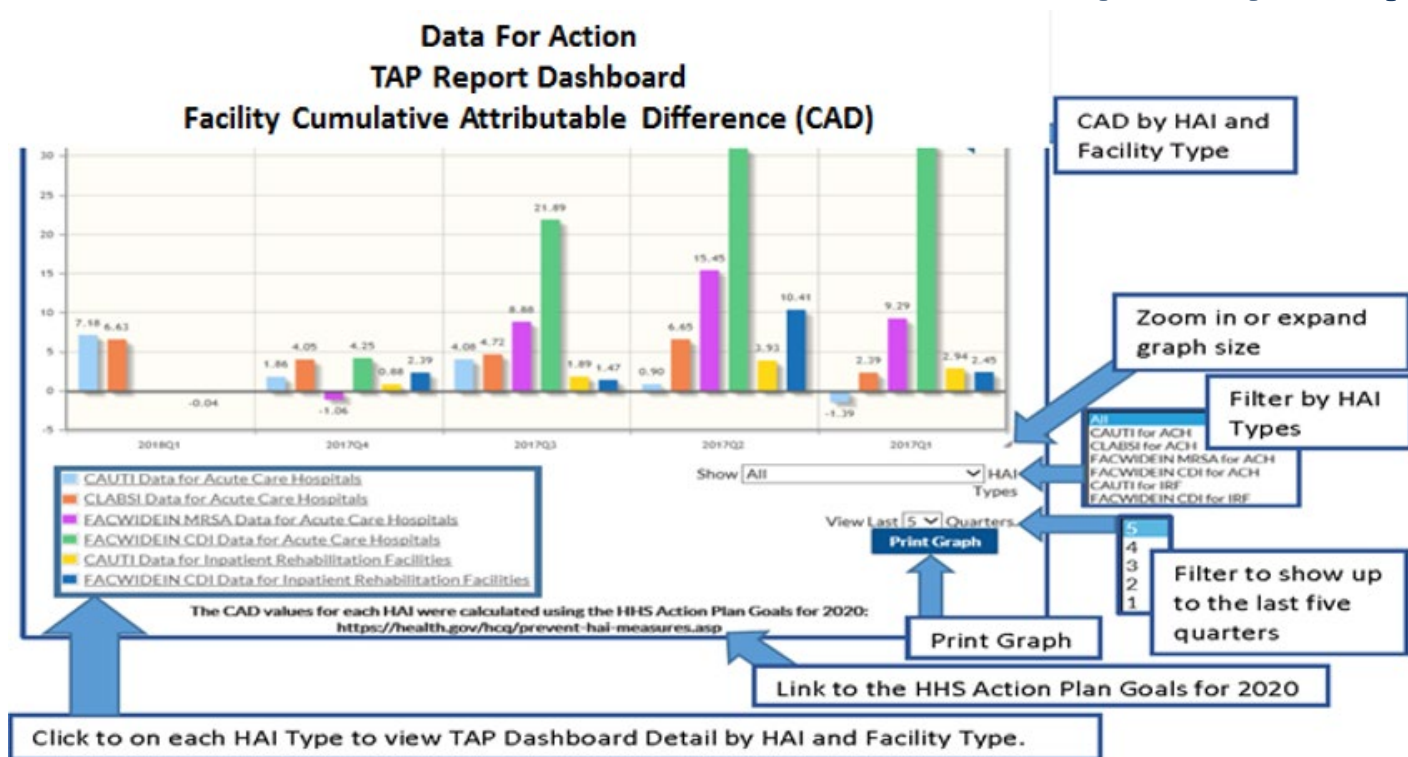
Date Range: BS2_CDI_TAP summaryYr 2021 to 2021

if (((orgID = "12275")))

faccount	numbeds	numpatdays	COHCFA_prevRate	CDIF_facInchOCount	numPred	grpCAD	SIR	SIRtest
1	453	60071	0.05	34	41.247	5.130	0.820	

- Cumulative Attribute Difference: Identifies the **number of infections that needed to be prevented** to reach targeted goal (CAD) during this time period

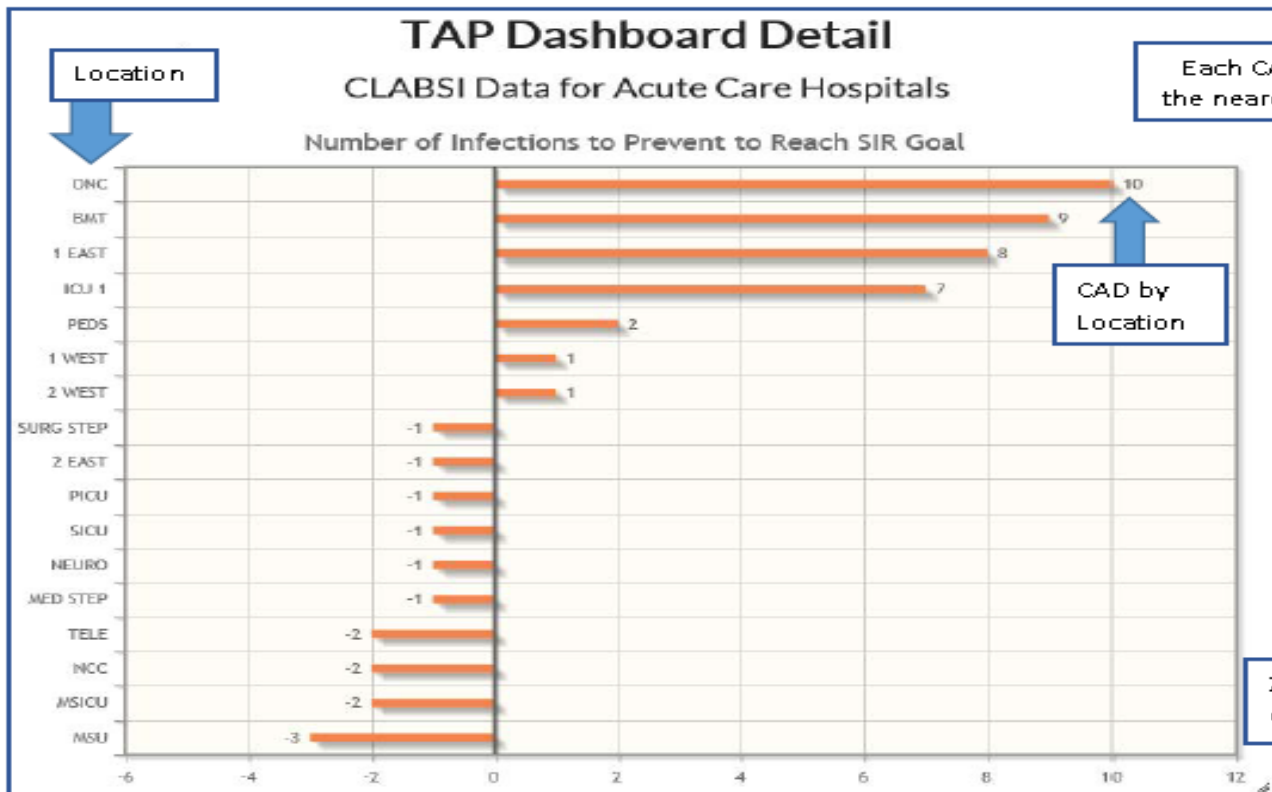
Targeted Assessment for Prevention (TAP) Reports



[TAP Report Quick Reference Guide \(PDF\)](#)

(www.cdc.gov/nhsn/pdfs/ps-analysis-resources/ref-guide/tap-dashboard-qrg-508.pdf)

TAP Dashboard Detail - Locations



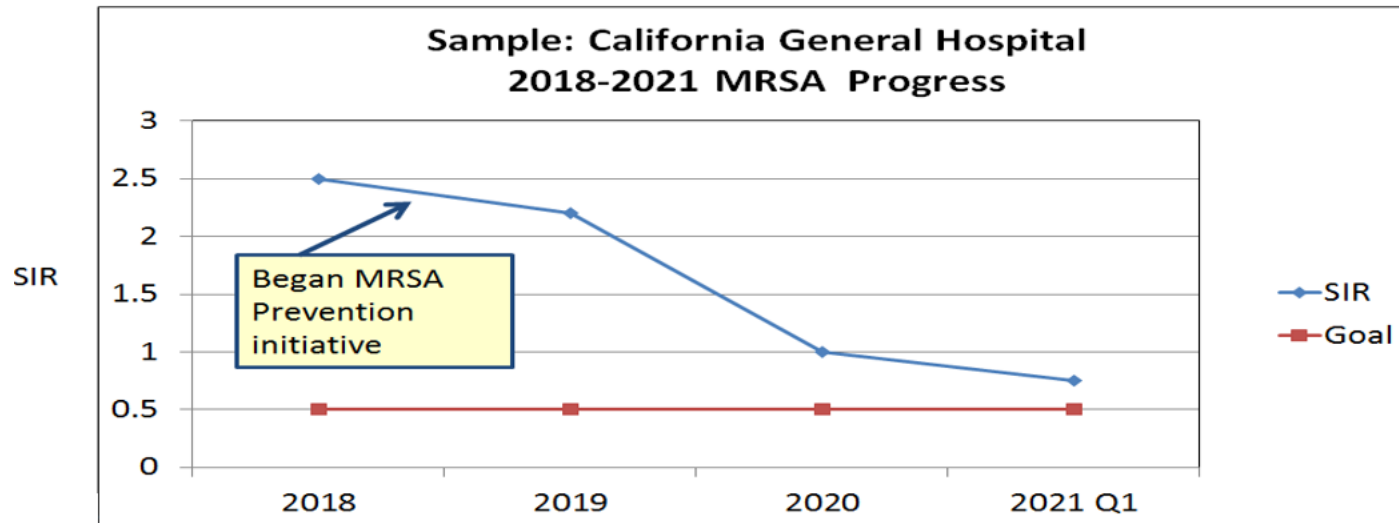
Each CAD is rounded to the nearest whole number

Use the TAP report to prioritize prevention efforts to the locations in need!

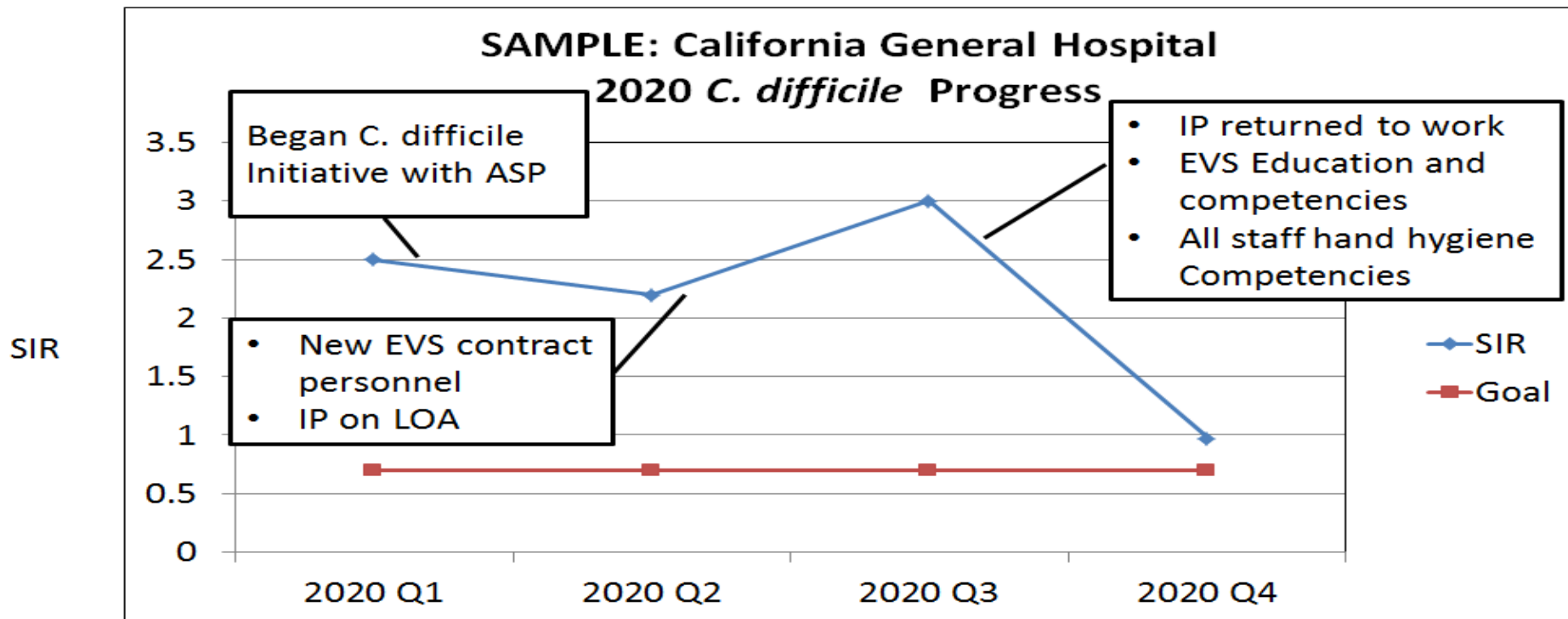
Zoom in or expand graph size

Track Progress Over Time

- Feedback to staff
- Celebrate successes!



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
 - Use NHSN TAP reports to determine where to focus infection prevention efforts
 - Feedback incidence for (MRSA and CDI) or rates (VRE) with adherence monitoring results to all units and leadership
-
-

Questions?

For more information,
please contact

HAIPprogram@cdph.ca.gov

Include “ACH IP Basics Class” in
the subject line

Post Test

Now that you have completed
this module,

Click on the “Post Test” link
when it pops up

To Return to
Learning Stream
and take the post test

If the Post Test link does not pop up, you will be sent a link via e-mail