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Prevention of Healthcare Associated Infections: What, Who & How?

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Mercy

| Disclosures

- The presenters have no real or perceived conflicts of interest related to this presentation

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| Learning Objectives

At the end of this session, participants should be able to:

1. Recall the impact of healthcare associated infections (HAIs) on patients and healthcare organizations
2. Identify a plan to address HAIs in a healthcare organization
3. Recognize key stakeholders in the process of HAI reduction

| Healthcare Associated Infections (HAI)

- Central Line Associated Blood Stream Infection (CLABSI)
- Catheter Associated Urinary Tract Infection (CAUTI)
- Surgical Site Infection (SSI)
- *Clostridioides difficile* Infection (*C. diff*)
- Methicillin Resistant *Staphylococcus aureus* Bacteremia (MRSA)
- Other Infections associated with healthcare
 - Norovirus, Scabies, etc.

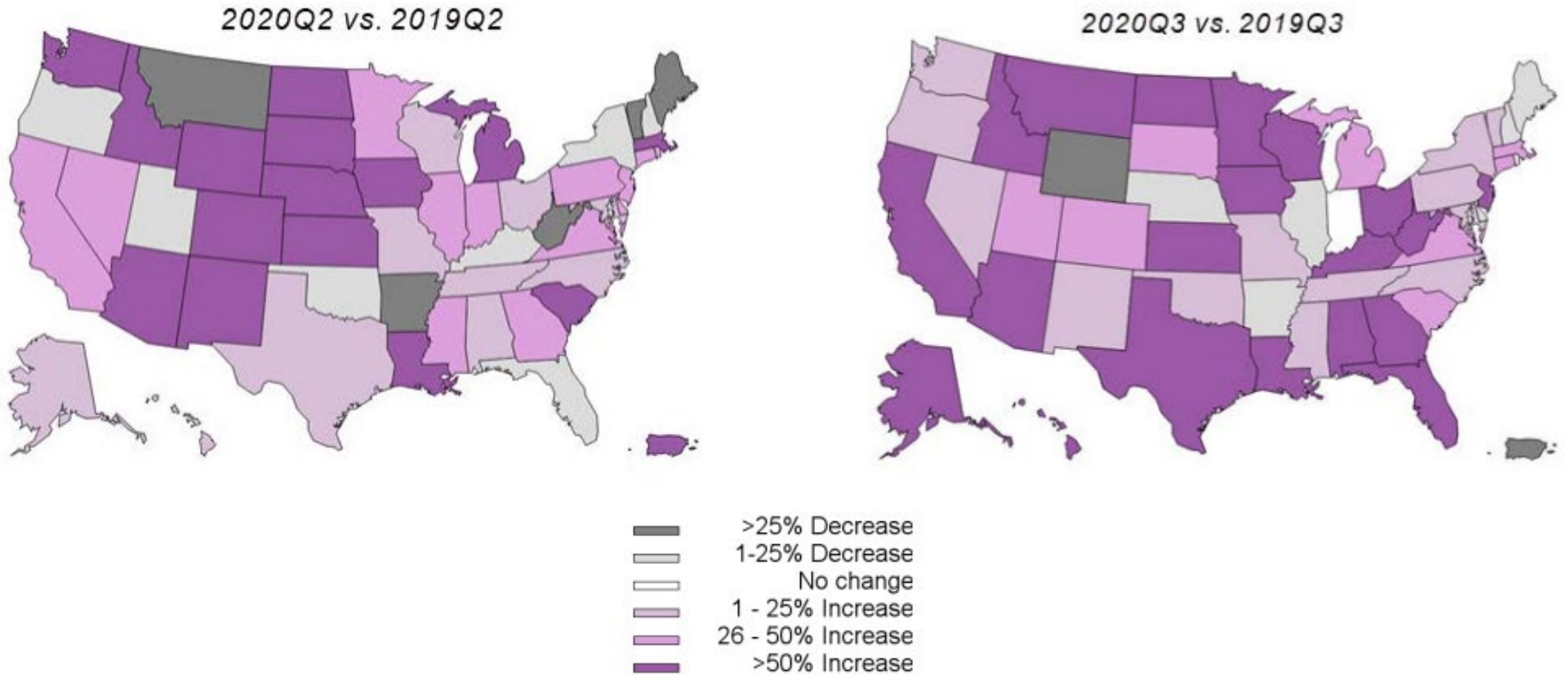
CDC HAI Progress Report 2020

- Each day 1 of every 31 hospitalized patients contracts at least 1 infection associated with hospital care
- Need for improvement in patient care practices
- Progress has been made, but more needed
- National Healthcare Safety Network (NHSN) membership encouraged
- Provides valuable data to your healthcare system
- Standard Infection Ratio (SIR) rates

COVID Impact to HAI

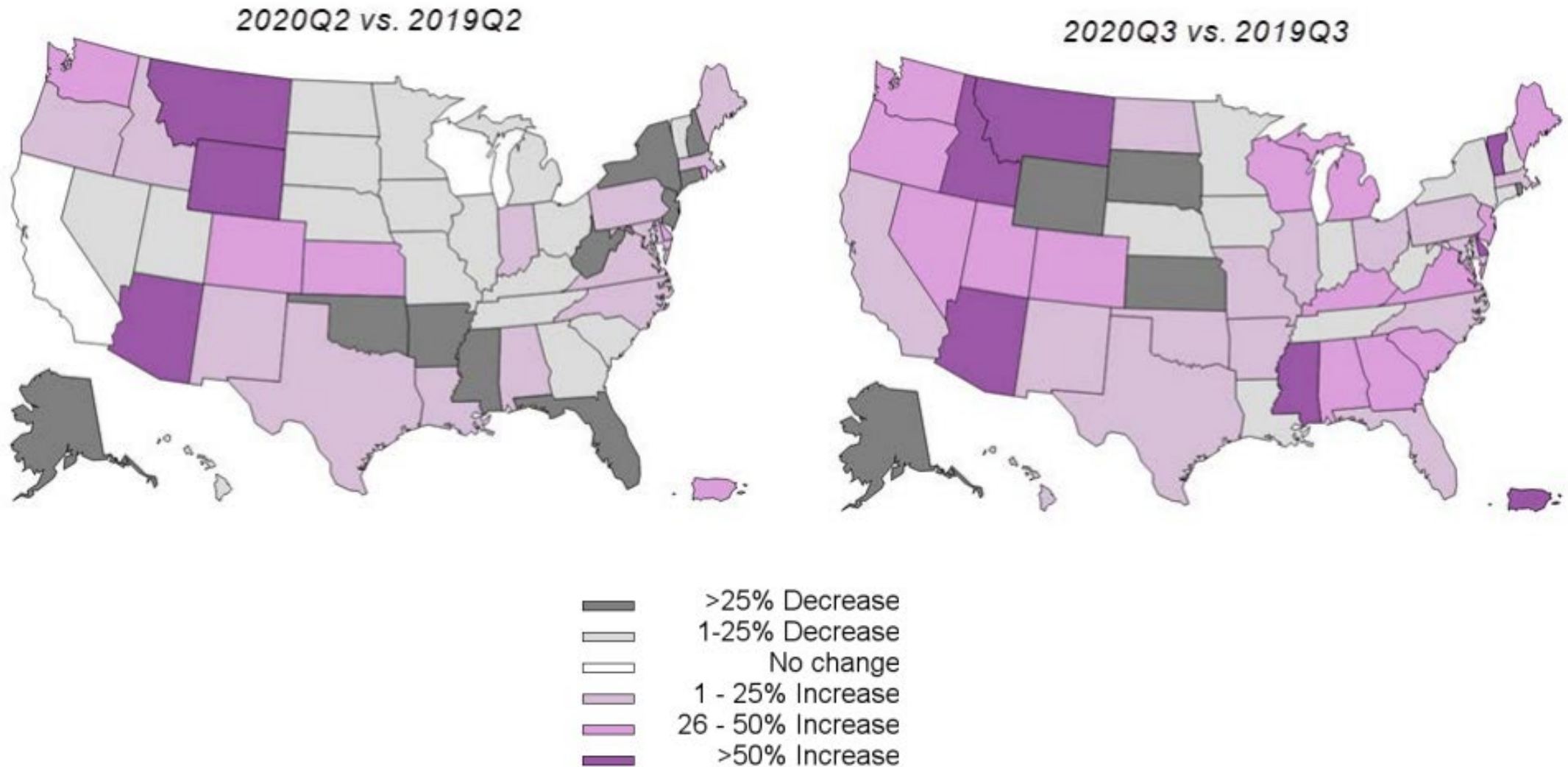
- Personnel shortage
- Equipment shortage
- Higher than usual hospitalizations
- Infection Prevention teams focused on COVID-19
- Increased ICU care, ventilator use, prone positioning, steroid use
- Increase in CLABSI, CAUTI, Ventilator Associated Events, MRSA bacteremia compared to 2019
- Decrease in *C. diff*

Percent Change in CLABSI SIRs, by State: 2020 vs. 2019



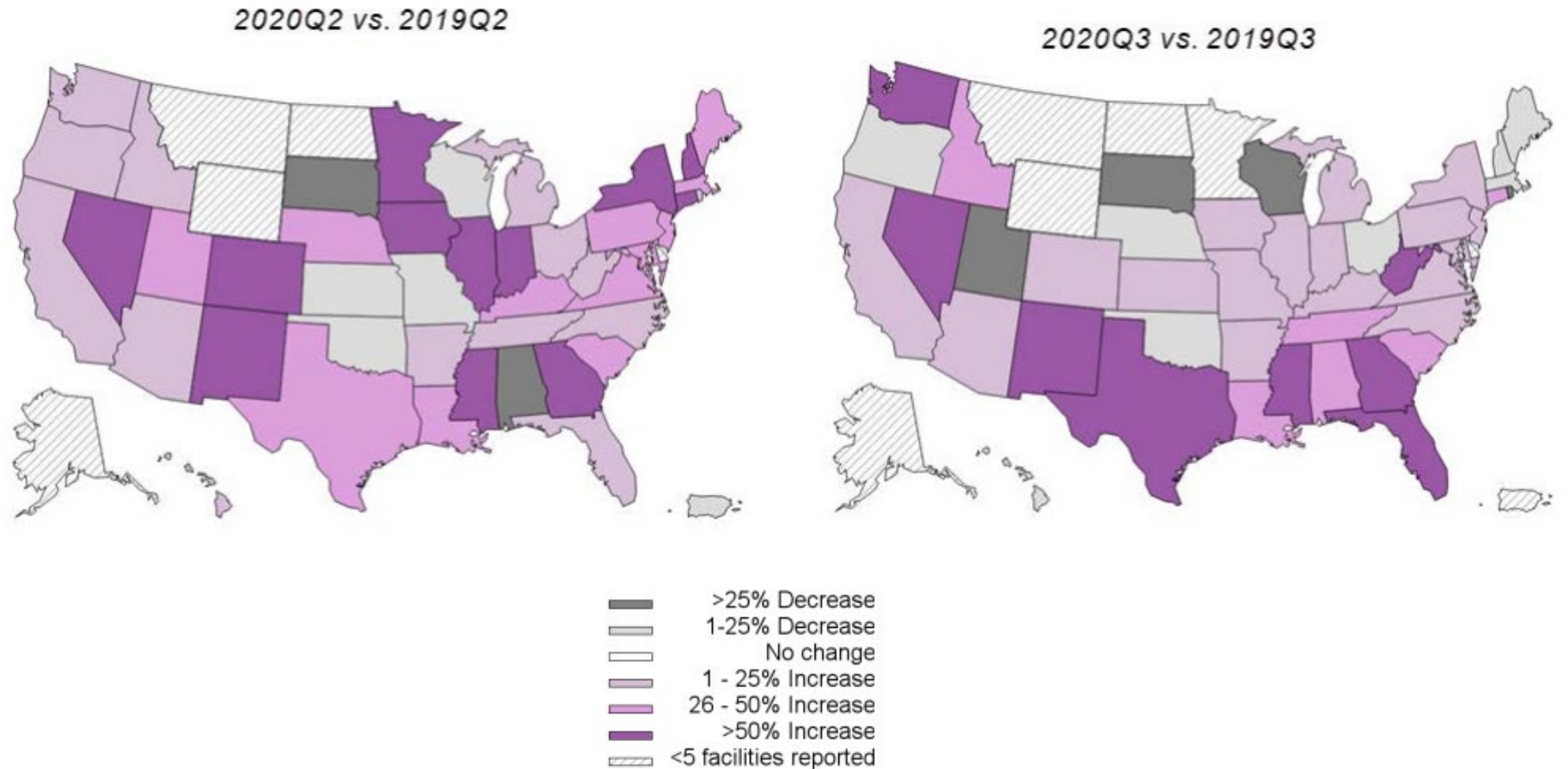
Source: CDC: <https://www.cdc.gov/nhsn/pdfs/datastat/supplements/sup3-statedata.xlsx>

Percent Change in CAUTI SIRs, by State: 2020 vs. 2019



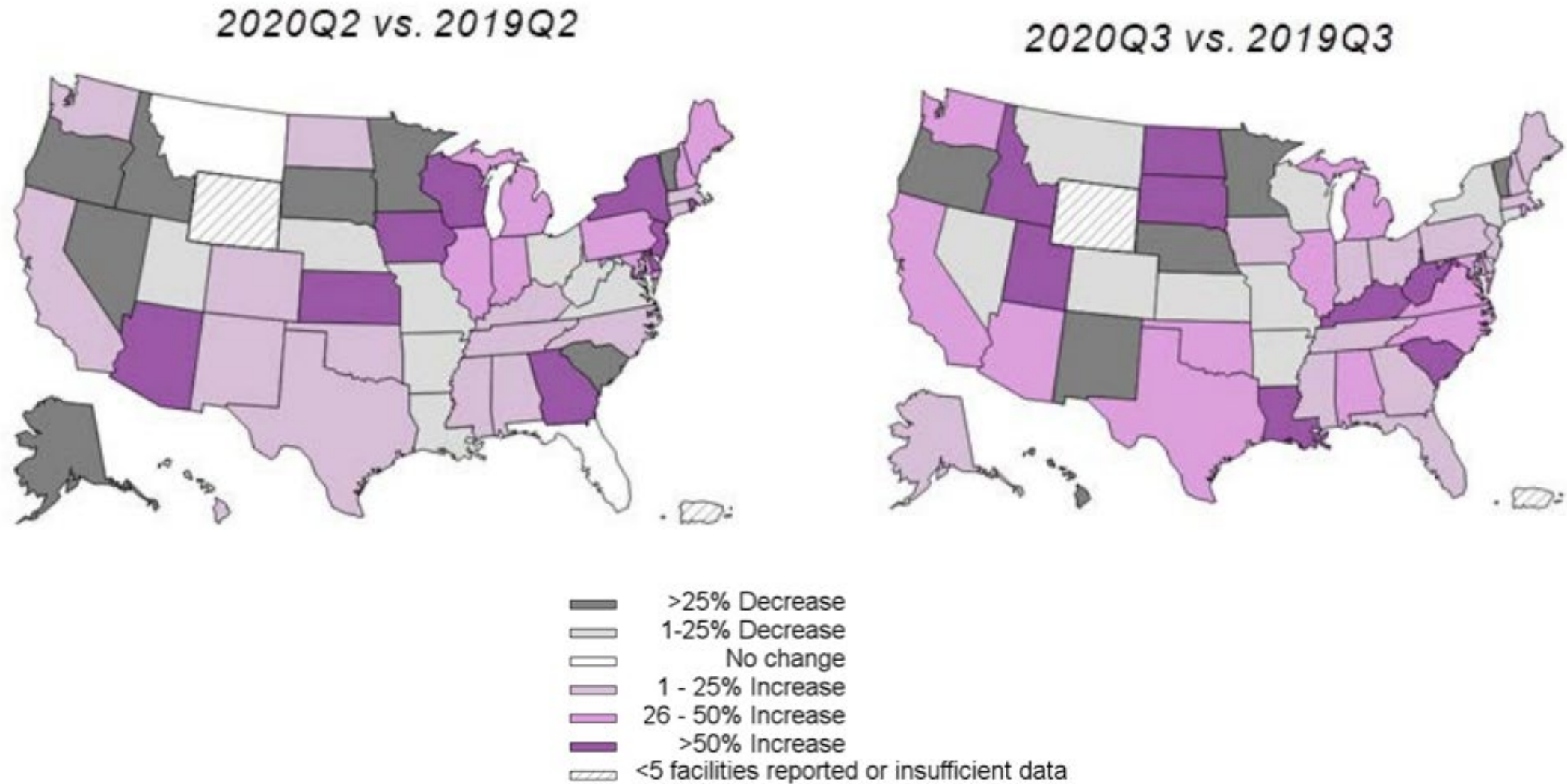
Source: CDC: <https://www.cdc.gov/nhsn/pdfs/datastat/supplements/sup3-statedata.xlsx>

Percent Change in VAE SIRs, by State: 2020 vs. 2019



Source: CDC: <https://www.cdc.gov/nhsn/pdfs/datastat/supplements/sup3-statedata.xlsx>

Percent Change in MRSA Bacteremia LabID Event SIRs, by State: 2020 vs. 2019



Source: CDC: <https://www.cdc.gov/nhsn/pdfs/datastat/supplements/sup3-statedata.xlsx>

| HAI Impact to Various Groups

- Different goals
- Important to understand motivation of diverse groups
- The different goals bring complexity
- Differing talents bring real advantage
- Your job is to build and support the team
- Focus on the outcome of patient safety

| Patient & Society Impact of HAI

- Cost
- Loss of work & productivity
- Morbidity & mortality, 1-in-31 hospitalized patients
- Increased length of stay
- Patient satisfaction
- Increased expense
- Long courses of antibiotic therapy
- Multidrug resistant organisms (MDRO)

| Health System Impact of HAI

- Patient satisfaction
- Coworker satisfaction
- Reputation
- Accreditation
- Recognition—The Leap Frog, Joint Commission
- Specific service lines
- Reimbursement
- Payors
- Accountable Care Organization (ACO)
- Regulation
- Transparency

| Payor Impact of HAI

- Morbidity & mortality
- Quality of care
- Increased cost
- Impact to reimbursement—Quality metrics built into contracts
- Patients want health plans to partner with high quality health systems

Provider Impact of HAI

- Quality metrics
- Patient selection of provider
- Patient satisfaction
- Health plan participation
- Centers of Excellence
- Patient risk

| Can we get to zero HAIs?

- If you know the protocols required to avoid infection, if you follow them precisely every single time, then zero infections are possible.
- When you're talking about something that can cost people their lives and zero is possible, no other benchmark makes sense.

-
- Many health systems and units with 0 CLABSI
 - *C. diff* rates down significantly
 - Continued work and innovation will lead us to zero or minimal patient harm
 - Teamwork is critical

Source:

<http://www.ihl.org/resources/Pages/ImprovementStories/WhatZeroLooksLikeEliminatingHospitalAcquiredInfections.aspx#:~:text=If%20you%20know%20the%20protocols,no%20other%20benchmark%20makes%20sense.%E2%80%9D>

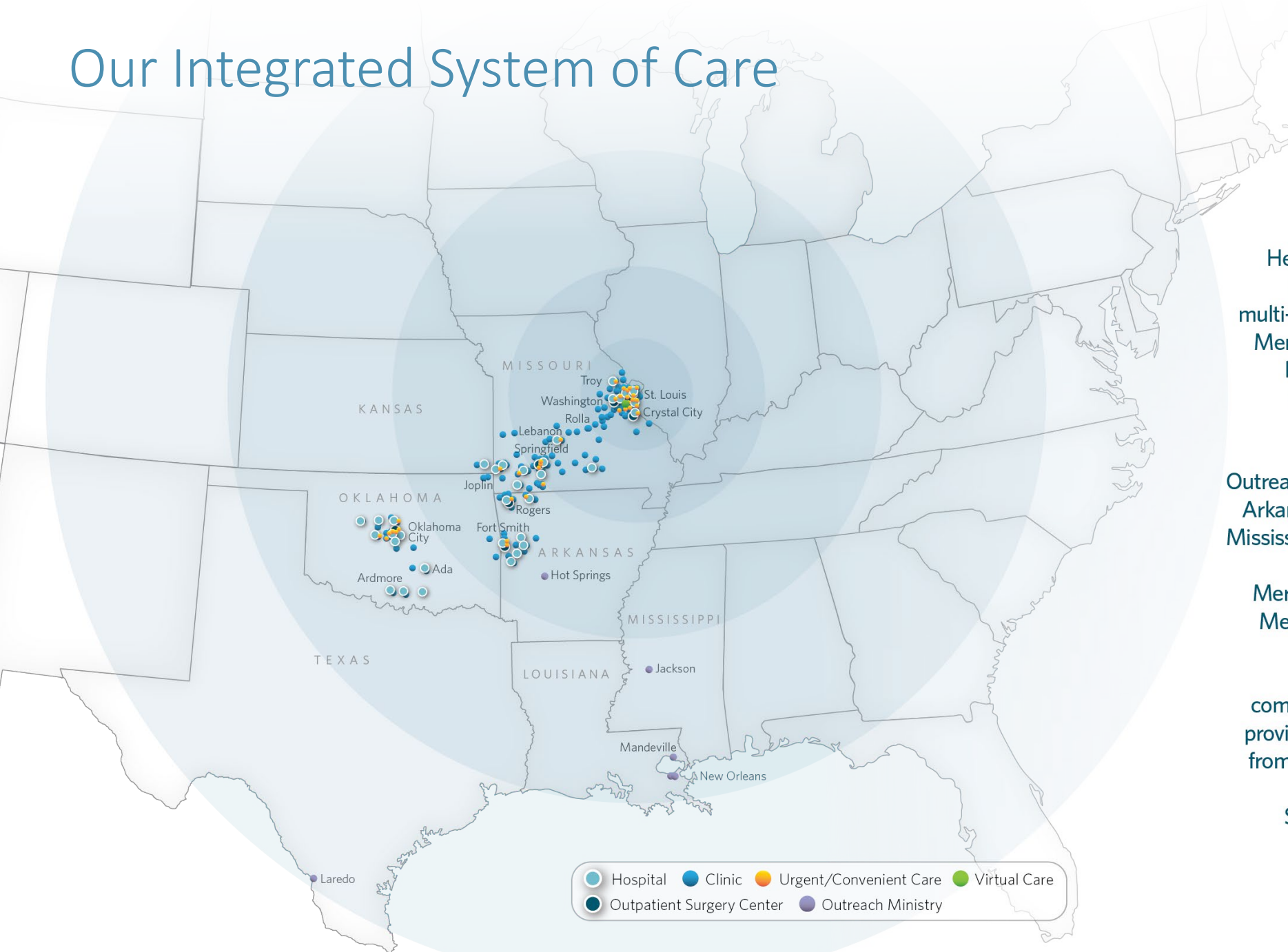
| Can we get to zero HAIs?

- Remember it is a culture change not a sprint
- Education will be an ongoing task
- HAIs are preventable
- Goal should be zero patient harm
- Metric focused
- Use benchmarks if available such as NHSN

Who is on the team?

- Must be a priority of the president or CEO
- Infection Prevention team cannot address change alone
- Who is needed (not inclusive); teams vary depending on needs
 - Environmental Services
 - Finance
 - Information Technology
 - Pharmacy
 - Nursing
 - Education Dept.
 - Marketing and Communication
 - Planning and Construction, HVAC
 - Supply Chain
 - Physician leaders, medical and surgical
 - Radiology and Transport
 - Emergency Department

Our Integrated System of Care



Headquartered in St. Louis with a multi-state footprint, Mercy is one of the largest Catholic health systems in the US.

1827
founded

44
hospitals

Outreach ministries in Arkansas, Louisiana, Mississippi and Texas.

925
physician practices & outpatient facilities

Mercy's IT division, Mercy Technology Services and Mercy Virtual commercially serve providers & patients from coast to coast.

4,200
integrated providers¹

42,000
co-workers

Serving millions each year.

\$7B
revenue

¹ providers includes physicians and advanced practice clinicians

| Mercy Infection Prevention, Collaboration & Standardization

- Ministry IP team
- Ministry Quality team
- Local IP team/local Quality team
- Clinic IP leaders
- Infectious Diseases Specialty Council
- Infection Prevention leader meeting, all communities
- Mercy One Leadership weekly meeting (presidents and CMOs)
- Mercy Nursing Leadership meeting
- Mercy Environmental Services
- Mercy IT meetings
- Mercy Emergency Preparedness

| *Clostridioides Difficile* Infection (CDI)

- Gram positive anaerobic spore forming Bacillus, produces toxin (B>A)
- Causative agent in antibiotic associated diarrhea
- NAP1 new (2000) virulent due to increased toxin production
- Colonization rates significant
- Newly colonized patients have higher risk of CDI
- Some community onset CDI may not be antibiotic associated

| *C. diff*

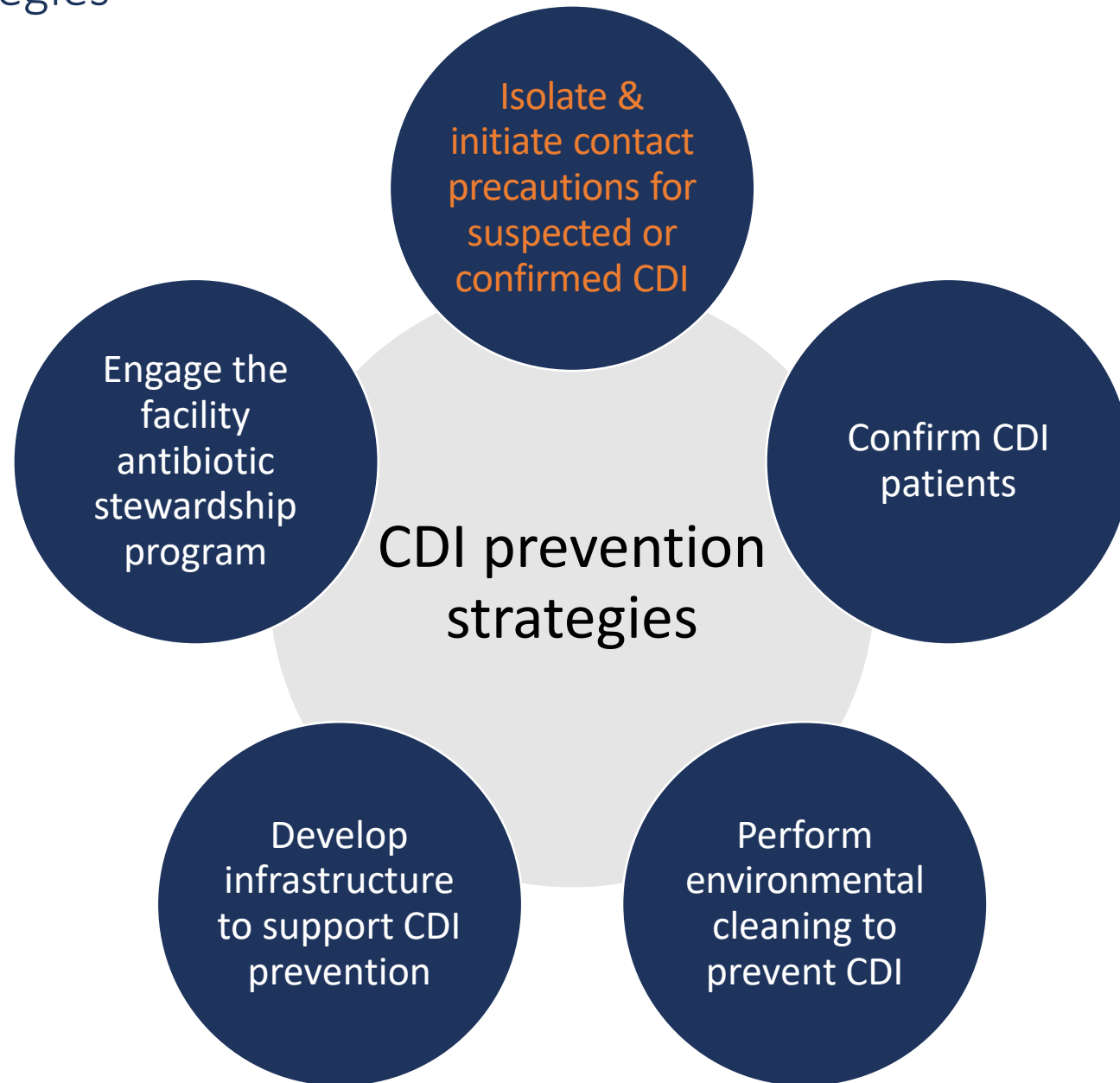
- Toxins lead to tissue injury in the colon and diarrhea
- Increased antibody response to toxin less likely to develop severe disease
- Complications for toxic megacolon, perforation, renal failure, ICU
- Some requiring colectomy
- Risk factors, immunosuppression, diabetes mellitus
- Antibiotic use, disrupts colonic flora

Prevention of *C. diff*

What everyone needs to know about *C. diff* in the hospital

- Build the team to tackle the problem
- Basics of prevention
 - Hand hygiene, soap and water on the way out of room
 - Isolation, contact with bleach for cleaning equipment
 - Single use items, if possible
 - Avoid storage of equipment and supplies in room, if possible
 - Rapid identification of the illness
 - Rapid testing
 - Treatment, recurrent disease common
 - Antibiotic stewardship
 - Education, education, education
 - Good signage helps with recognition and education

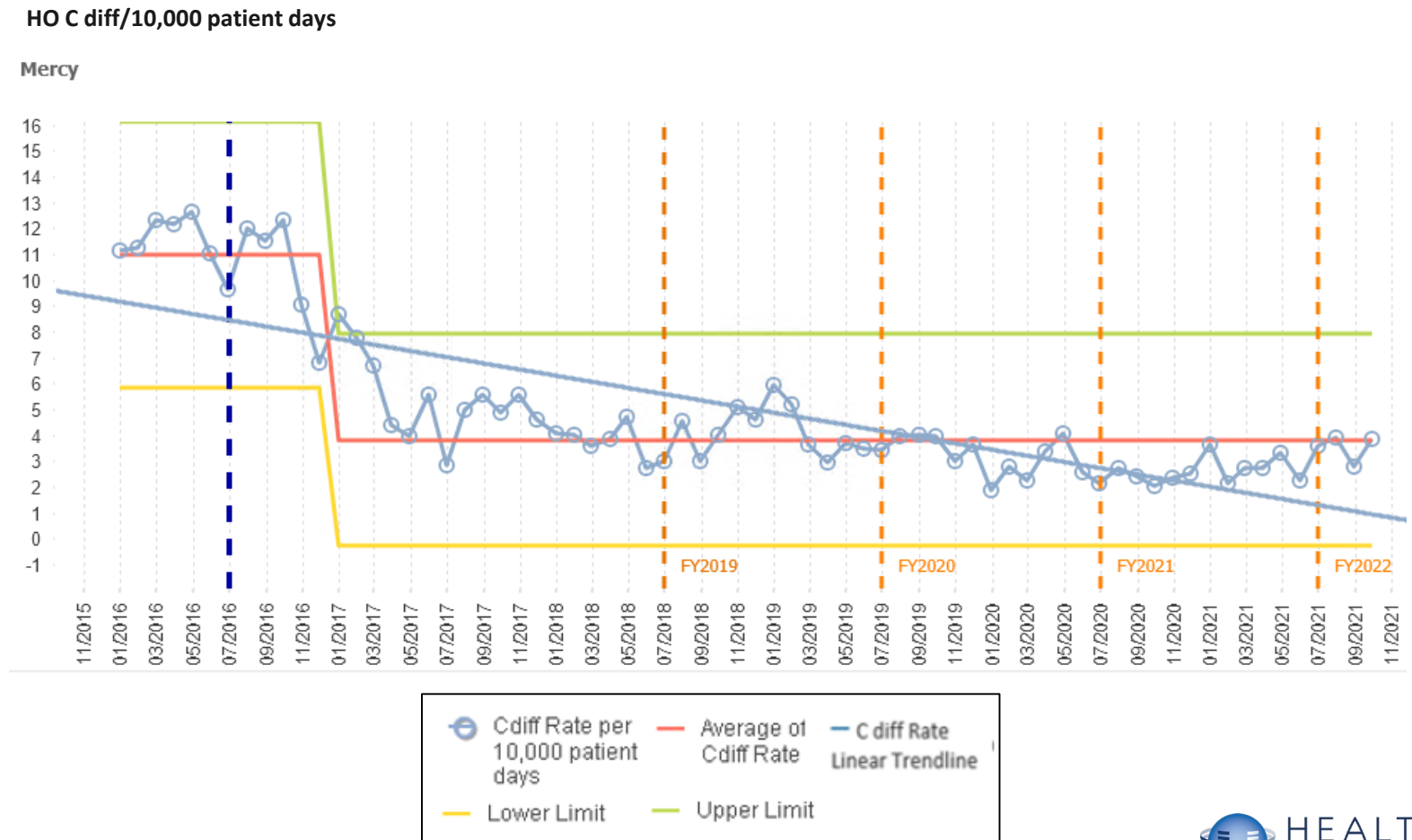
CDI Prevention Strategies



Mercy Ministry *Clostridioides difficile* rate

Where We Started

Clostridioides difficile Hospital Onset (HO) Mercy Acute Care Facilities (excludes CAH)



CDI Prevention Strategies

In 2016, Mercy created a multidisciplinary team to address high *Clostridium difficile* rates

- Infectious Disease physicians
- Hospitalists
- Gastroenterology physicians
- Infection Prevention
- Clinical Pharmacy
- Nursing
- Environmental Services

Isolate and initiate contact precautions for suspected or confirmed CDI

- Create nurse-driven protocols to facilitate rapid isolation of patients with suspected or confirmed CDI
- Place symptomatic patients on contact precautions, in a single-patient room with a dedicated toilet

| Best Practice Alerts (BPA)

Nursing BPA #1

- BPA#1: Will fire on day 1 of admission for patients who meet 2 of the 4 risk factors below
 - History of *C. diff* in the last 12 months
 - Antibiotics within the last 3 months
 - Any hospitalization or admission to a skilled nursing facility (SNF) or long-term acute care (LTAC) hospital within the last 90 days
 - Current proton pump inhibitor (PPI) use (added 2/2020)
 - Exclusion: Patient on *C. diff* treatment and no *C. diff* test ordered
 - Patient history is pulled from electronic health record (EHR)
- Actions
 - If the patient is symptomatic, RN to order testing and isolation
 - If the patient is asymptomatic, RN to acknowledge BPA
 - If dismissed, will continue to fire every hour

Best Practice Alerts, *continued*

Nursing BPA #1

Your patient has been identified as being at risk for C. diff.
⚠️ If your patient has had 3 or more liquid, loose, or watery stools in the last 24 hours. If so, then please select and order, both the Enteric Contact Isolation and C. diff orders listed below. Document last BM and stool consistency.

Order	Do Not Order	👤 ENTERIC CONTACT ISOLATION
Order	Do Not Order	👤 C. DIFF

The following actions have been applied: _____

✓ Added: ▼ High Risk For C. diff

Acknowledge Reason _____

Patient is asymptomatic

✓ Accept Dismiss

Hospitalizations and Medications —

Have you been on oral —
or IV antibiotics in the
last 90 days? _____

Have you been —
hospitalized
somewhere else in the
last 90 days? _____

Requires Nursing to
answer admission
navigator questions

Best Practice Alerts, *continued*

Nursing BPA #2

- BPA#2: Will fire when a patient identified as high risk has documented loose stool in the first 3 calendar days of admission (day 1 = admission date)
 - 2016 – alerted after 3 documented type 6/7 stools
 - 2019 – changed to alert after 1 documented type 6/7 stool
 - Exclusion criteria
 - Patient on C. diff treatment
 - Cdiff test already ordered
 - Patient has a discharge order
- Actions
 - RN to order Cdiff testing and isolation orders
 - If the BPA is cancelled, it will continue to appear every hour until appropriate action is taken

Your patient has documentation reflecting 1 or more liquid, loose or watery stools in the last 24 hours.
Please place the patient on enteric contact isolation, obtain a stool sample, select the order for C. diff below, and send to lab immediately.

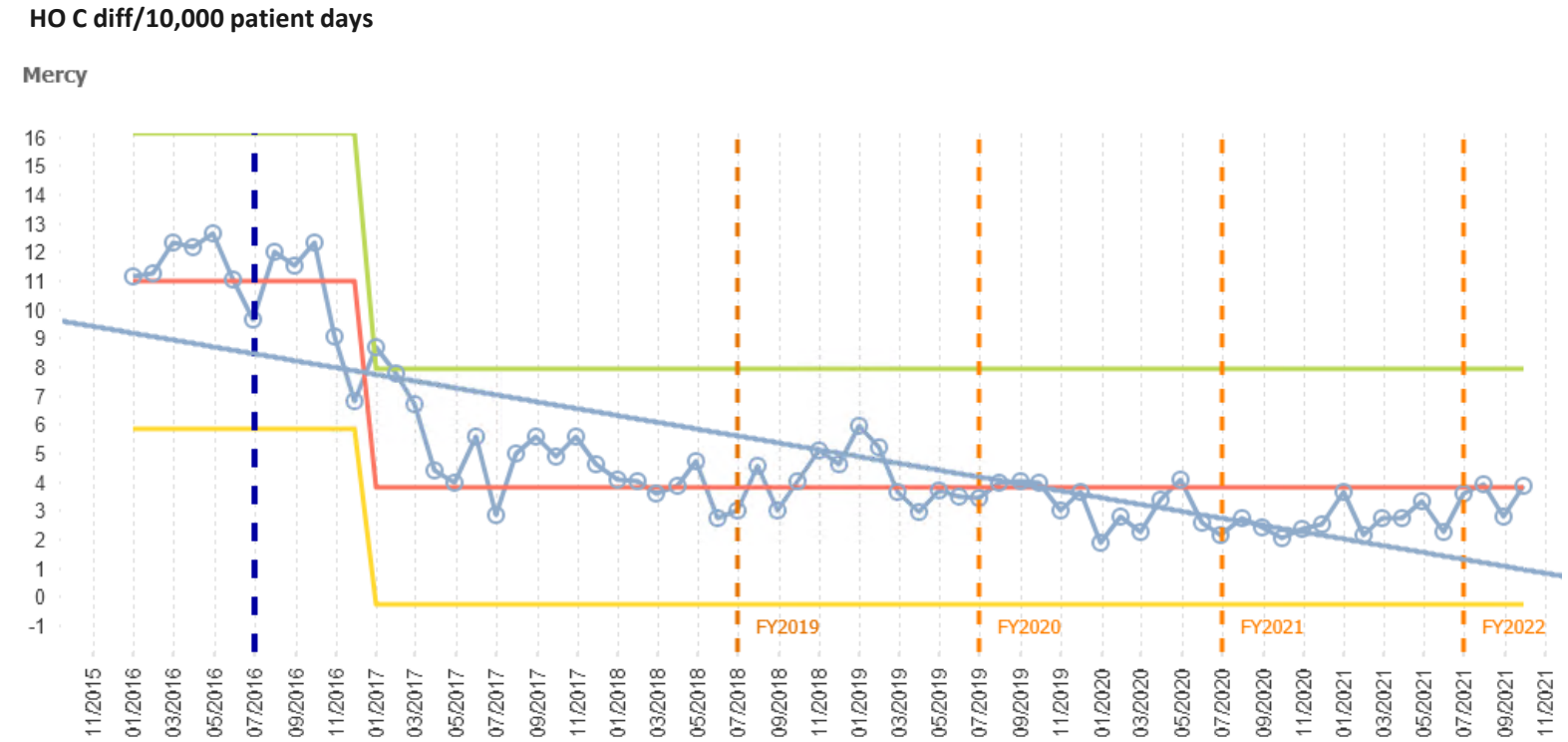
<input checked="" type="button" value="Order"/>	<input type="button" value="Do Not Order"/>	<input checked="" type="checkbox"/> ENTERIC CONTACT ISOLATION
<input checked="" type="button" value="Order"/>	<input type="button" value="Do Not Order"/>	<input checked="" type="checkbox"/> C. DIFF

The following actions have been applied:

✓ Added: ▼ High Risk For C. diff

Mercy Ministry *Clostridioides difficile* rate

Clostridioides difficile Hospital Onset (HO) Mercy Acute Care Facilities (excludes CAH)



**C. diff
BPAs
Started**



Best Practice Alerts, *continued*

BPA#1 changes

- BPA lockout
 - April 2021 Changed lockout from every hour to every 2 hours
 - Dramatically reduced to number of times the BPA fired without impacting clinical outcomes

Data: 46,064 alerts/month 101.78 hours/month

Time Saved: 76.56 hours/month 33,615 fewer alerts/month

- December 2021 Changed the lockout to 4 hours and will not alert in first 2 hours of admission

Prior to Change (11/23-12/17)

Alert was triggered: 71,318

Orders entered: 85

Patient FYI added: 14,943

Cancellation Rate: 93%

$15,028/71,318 = 21\%$ is the action taken percentage

After Change (12/23-1/16)

Alert was triggered: 22,374

Order Entered: 21

Patient FYI added: 6,559

Cancellation Rate: 85%

$6,580/22,374 = 29\%$ is the action taken percentage

Best Practice Alerts, *continued*

BPA Changes

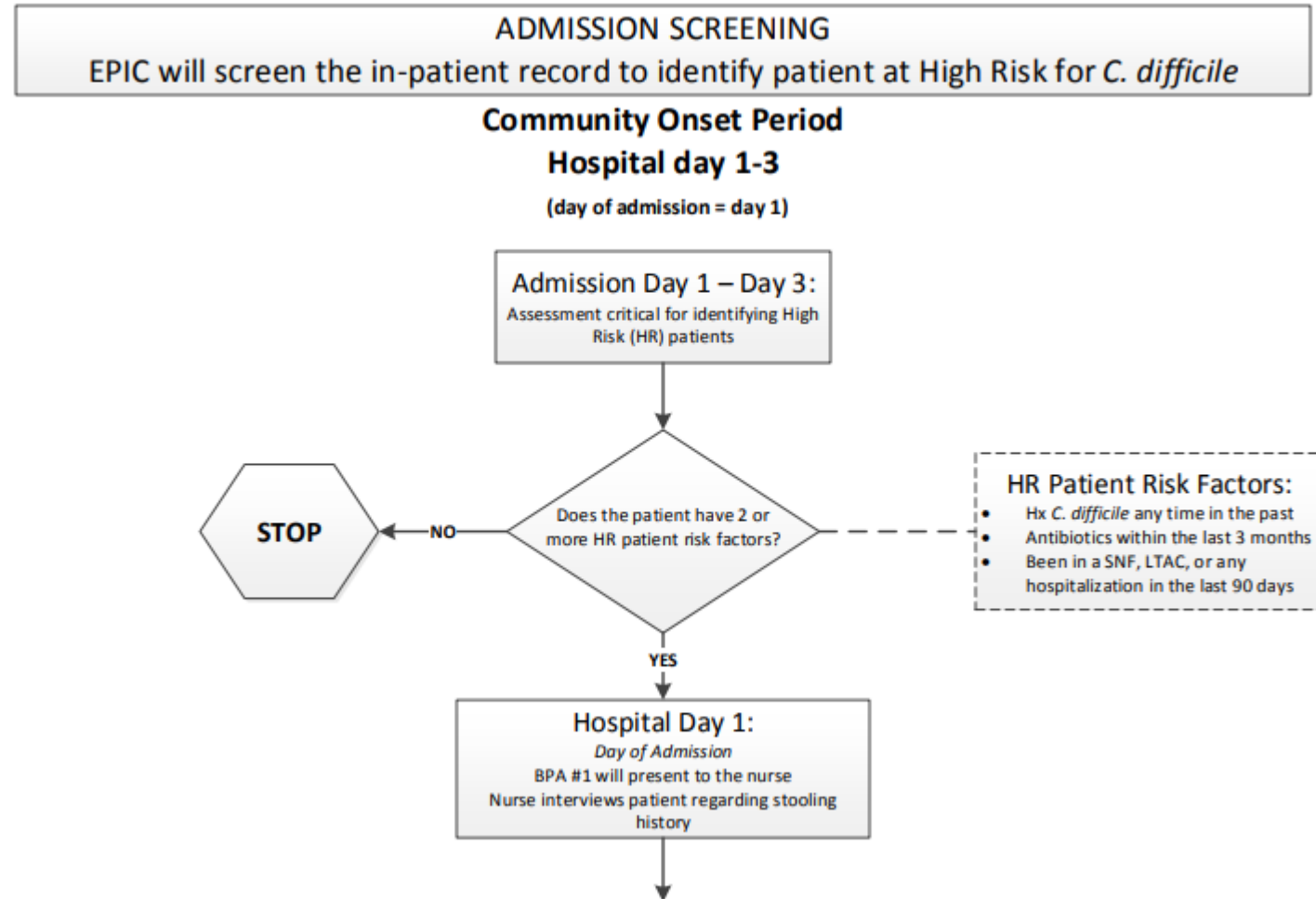
- BPA #1
 - Jan 2019 physician patient advisory: Alert to physician that the patient has been identified as high risk for *C. diff* on admission
 - *“This patient has been identified as high-risk for C. diff. If antibiotics are indicated, please use them judiciously and with prompt de-escalation and consider the use of probiotics”*
 - Laxative list was expanded to include over 1,000 preparations
- BPA #1
 - Jan 2019 change criteria to trigger alert from ≥ 3 loose BMs/day to ≥ 1 loose BM/day
- Changes in progress
 - Default selection changed to “order”
 - Considering adding language regarding physician approval not needed
 - Will only fire to RNs in patient care
 - Alert to unlicensed assistive personnel (UAPs) when
 - Order for *C. diff* testing placed
 - Documentation of loose stool in high-risk patient (no ordering functions)

Workflows Vary

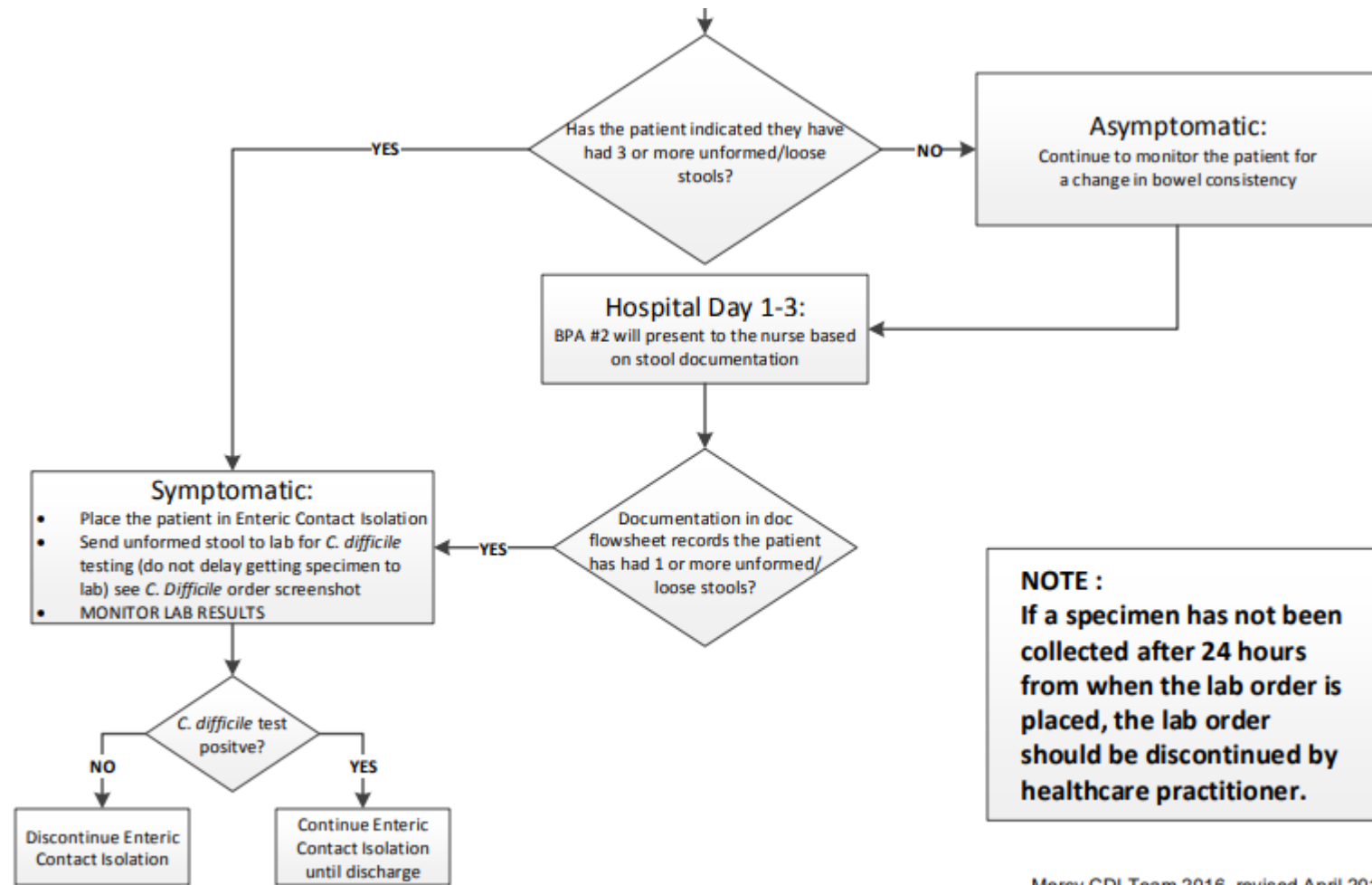
IP workflow differs in different facilities –

- St. Louis
 - 10+ orders /day – no approval from IP needed to run sample
 - Utilize reports to identify uncollected samples (if >24 hours then order is cancelled)
- Jefferson
 - Lab calls IP or ID provider for approval for specimen on day 4 or greater
 - 1 – 2 calls/week
- Joplin
 - Lab calls IP when stool is received to review c diff and GI pathogen panel when greater than 3 days from admission
 - Calls received daily
- Springfield
 - Ips look at cdiff tests M-F and decide if patient meets testing criteria
- South
 - Lab calls IP for any specimen that is on day 4 or greater
 - High call volume at first but now mostly during business hours
- Oklahoma City
 - Lab batched testing twice daily at 0800 and 1500 seven days/week.
 - Lab holds test and email IP list for review
 - IP approve or consult ID physician on call. ID will approve or contact attending for further discussion
- Rogers/Arkansas
 - Lab calls IP when specimen submitted after day 3.
 - 1-2 times/week

Identification of Patients High Risk for *C. difficile*



Identification of Patients High Risk for *C. difficile*



Mercy CDI Team 2016, revised April 2019

CDI Prevention Strategies

Laboratory Policies

C. diff testing

- No repeat testing
 - 7 days following a negative initial test
 - For 14 days following an initial positive test
 - Microbiology lab has protocol to cancel
- No testing for cure
- Only formed stool will be tested
- Can test stool mixed with urine

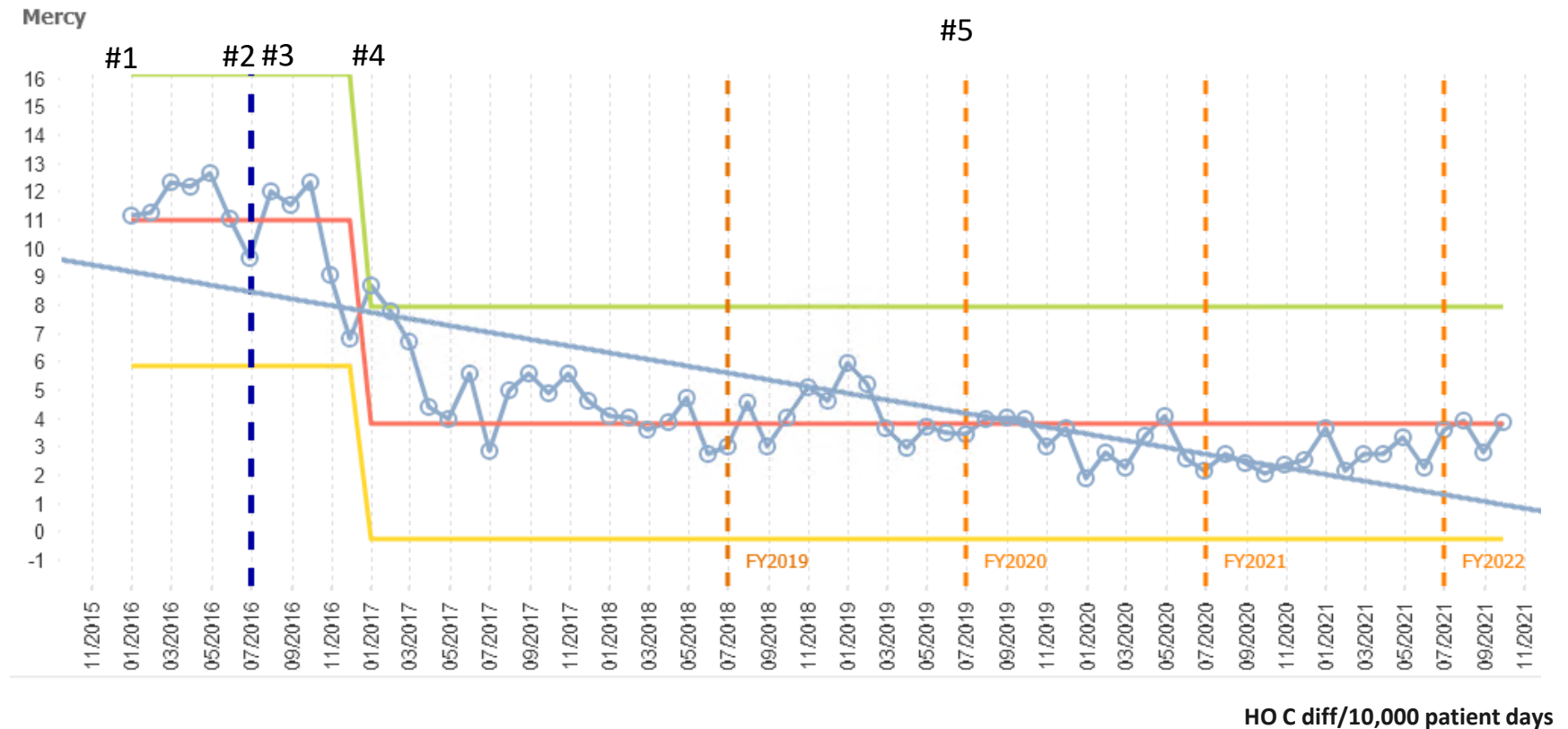
| CDI Reduction Strategies

Laboratory Policies

Gastrointestinal pathogen panel testing

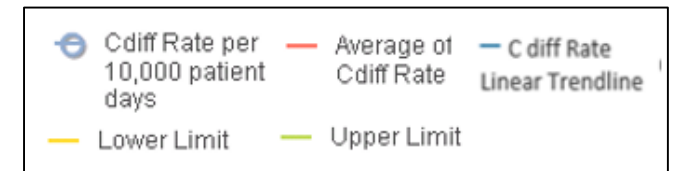
- Only available the first 24 hours of admission
- Testing will not be performed:
 - Patients that have been admitted >24 hours without laboratory medical director approval
 - Formed stool
 - Patients with a previous positive within 14 days
 - Duplicative specimens submitted within a 7-day period
 - Endoscopy stool aspirates
 - Stools submitted in fixative
 - Stool transport media other than Cary Blair

Clostridioides difficile Hospital Onset (HO) Mercy Acute Care Facilities (excludes CAH)



General Summary of Interventions

1. 1/2016 MW *C. diff* team initiated
2. 7/2016 *C. diff* BPAs started
3. 9/2016 Environmental cleaning assessments and use of bleach in *C. diff* rooms and all discharges
4. 2017 fusion bleach cleaner introduced to some facilities
5. 7/2019 GI pathogen restrictions after 24-hours admission



References

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Thank you...

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