

# Welcome!

**Office for State, Tribal, Local and Territorial Support  
presents...**

***CDC Vital Signs :***  
**Making Healthcare Safer:**  
**Stopping *Clostridium difficile* Infections**

March 13, 2012

2:00 pm – 3:00 pm (EDT)



Centers for Disease Control and Prevention  
Office for State, Tribal, Local and Territorial Support

# Agenda

<b>2:00 pm</b>	<b>Welcome &amp; Introduction</b>	<b>Judy Monroe, MD, FAAFP</b> Director, OSTLTS, CDC
<b>2:02 pm</b>	<b>Speaker Introductions</b>	<b>Amanda D. Miller, MA</b> Health Communication Specialist McKing Consulting for OSTLTS, CDC
<b>2:04 pm</b>	<b><i>Vital Signs</i> Overview</b>	<b>Clifford McDonald, MD</b> Senior Advisor for Science and Integrity, Division of Healthcare Quality Promotion, CDC
<b>2:10 pm</b>	<b>Presentations</b>	<b>Brian Koll, MD, FACP, FIDSA</b> Medical Director and Chief of Infection Prevention, Beth Israel Medical Center
		<b>Susanne Salem-Schatz, ScD</b> Program Director and Improvement Advisor, Massachusetts Coalition for the Prevention of Medical Errors
		<b>Chinyere Alu, MPH</b> CDC Public Health Prevention Service Fellow, Division of Patient Safety and Quality, Illinois Department of Public Health
<b>2:30 pm</b>	<b>Q&amp;A and Discussion</b>	<b>Amanda D. Miller</b>
<b>2:55 pm</b>	<b>Wrap-up</b>	<b>Judy Monroe</b>
<b>3:00 pm</b>	<b>End of Call</b>	



**CDC**  
**Vital**signs™ Teleconference  
to support STLT efforts and build  
momentum around the monthly  
release of CDC *Vital Signs*



# Making Health Care Safer: Stopping *Clostridium difficile* Infections

**L. Clifford McDonald, MD, FACP, SHEA**

Senior Advisor for Science and Integrity

Town Hall Meeting:

Office for State, Tribal, Local and Territorial Support

March 13, 2012

# Overview

- What are *Clostridium difficile* infections?
- Why are they important?
- Where do they occur and role of hospitals?
- How can they be prevented?
- What can be done?

**Vital signs™**  
CDC  
March 2012

## Making Health Care Safer

### Stopping *C. difficile* infections

People getting medical care can catch serious infections called health care-associated infections (HAIs). While most types of HAIs are declining, one – caused by the germ *C. difficile* – remains at historically high levels. *C. difficile* causes diarrhea linked to 14,000 American deaths each year. Those most at risk are people, especially older adults, who take antibiotics and also get medical care. When a person takes antibiotics, good germs that protect against infection are destroyed for several months. During this time, patients can get sick from *C. difficile* picked up from contaminated surfaces or spread from a health care provider's hands. About 25% of *C. difficile* infections first show symptoms in hospital patients; 75% home patients or in patients in doctors' offices infections cost at least care costs annually.

\**Clostridium difficile* (Clab-STRI)

To learn more about *C. difficile*

[www](#) [http://](#)

**3X**  
Hospital stays from *C. difficile* infections tripled in the last decade, posing a patient safety threat especially harmful to older Americans.

**94%**  
Almost all *C. difficile* infections are connected to getting medical care.

**20%**  
Hospitals following infection control recommendations lowered *C. difficile* infection rates by 20% in less than 2 years.

National Center for Emerging and Zoonotic Infectious Diseases  
Division of Healthcare Quality Promotion

Centers for Disease Control and Prevention

# MMWR

Early Release / Vol. 61

Morbidity and Mortality Weekly Report

March 6, 2012

## Vital Signs: Preventing *Clostridium difficile* Infections

### Abstract

**Background:** *Clostridium difficile* infection (CDI) is a common and sometimes fatal health-care-associated infection; the incidence, deaths, and excess health-care costs resulting from CDIs in hospitalized patients are all at historic highs. Meanwhile, the contribution of nonhospital health-care exposures to the overall burden of CDI, and the ability of programs to prevent CDIs by implementing CDC recommendations across a range of hospitals, have not been demonstrated previously.

**Methods:** Population-based data from the Emerging Infections Program were analyzed by location and antecedent health-care exposures. Present-on-admission and hospital-onset, laboratory-identified CDIs reported to the National Healthcare Safety Network (NHSN) were analyzed. Rates of hospital-onset CDIs were compared between two 8-month

# *Clostridium difficile* and Infection

- ❑ Anaerobic bacterium
- ❑ Not normal intestinal bacterium
- ❑ Fecal-oral spread
- ❑ Forms spores that persist
- ❑ Toxins produce colitis
  - Diarrhea
  - More severe disease, death
- ❑ **2 steps to infection**
  - Antibiotics result in vulnerability
  - New acquisition via transmission

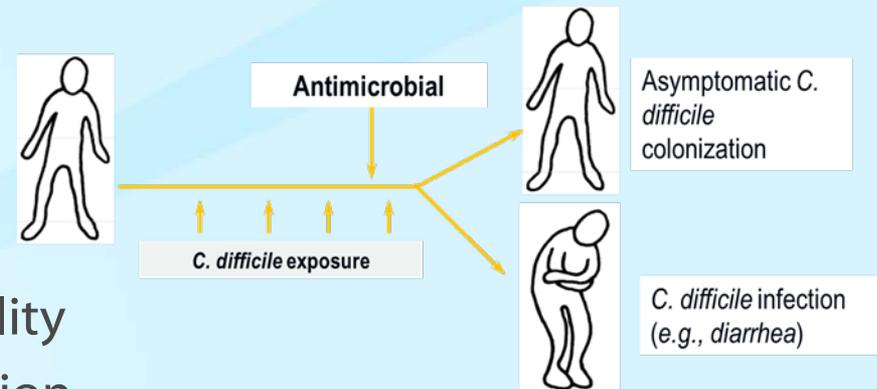
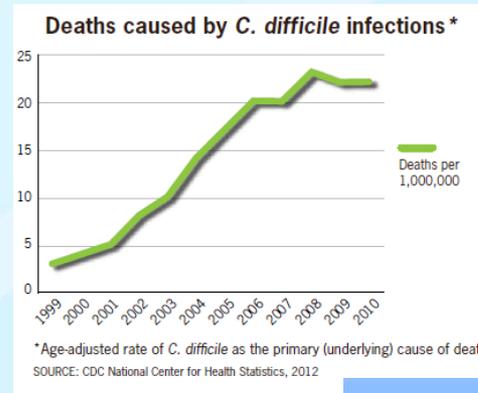


Figure courtesy of D. Gerding and S. Johnson

# *Clostridium difficile* Infections (CDIs) and Deaths Reach and Remain at Historic Highs

- ❑ **CDI hospitalizations**
  - Increased 3-fold 2000-2009
- ❑ **Deaths linked to CDI**
  - 14,000 in 2007
- ❑ **\$1 billion in medical costs**
  - CDIs in hospital patients only
- ❑ **Epidemic strain**
  - First emerged in 2000
  - Causes more cases and severity



Lucado J, et al, Available at <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb124.pdf>.

Hall AJ et al.. Presentation at the 49th Annual Meeting of the Infectious Disease Society of America; October 22, 2011; Boston, MA.

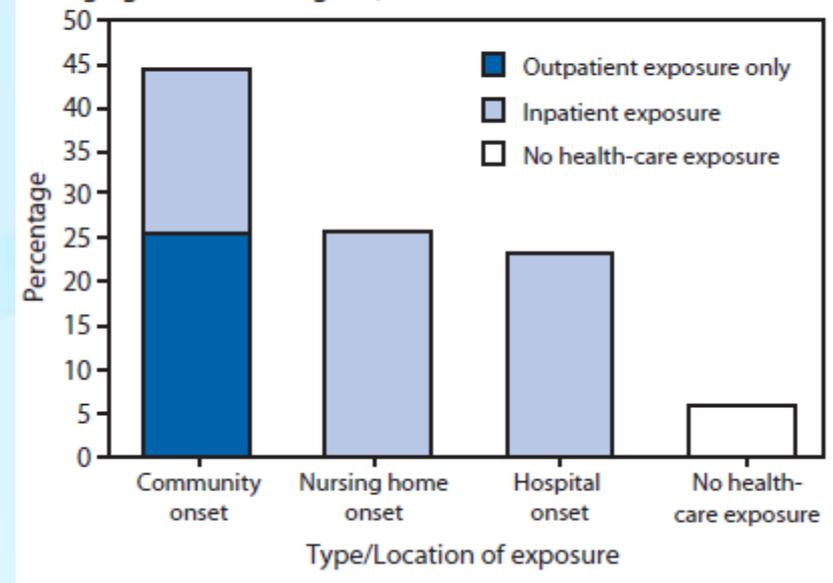
Dubberke ER et al. Clin Infect Dis 2008;46:497–504.

McDonald LC et al. N Engl J Med 2005;353:2433–41.

# CDIs Largely Health Care Related: Most Develop Symptoms Outside Hospitals

- ❑ **94% health care related**
- ❑ **75% of these outside hospitals**
  - Nursing home patients
  - Patients in community
    - Outpatient exposures only
    - Recent inpatient exposure
- ❑ **25% hospital inpatients**
- ❑ **Post-discharge CDI common**
  - Most potent antibiotics used in hospitals
  - Lasting effect on patients

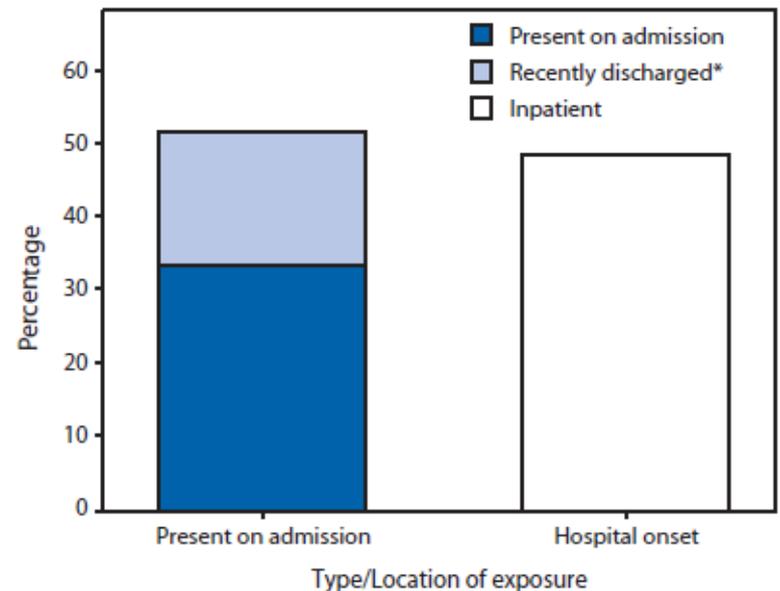
FIGURE 1. Percentage of *Clostridium difficile* infection (CDI) cases (N = 10,342), by inpatient or outpatient status at time of stool collection and type/location of exposures\* — United States, Emerging Infections Program, 2010



# Interdependence of Hospitals and Surrounding Facilities in Preventing CDI

- ❑ **52% of the CDIs diagnosed in hospitals are present on admission**
  - 36% (19% overall) recently discharged
- ❑ **48% hospital onset**
  - Likely result from inpatient care
- ❑ **CDIs present on admission**
  - Source for intra-hospital transmission

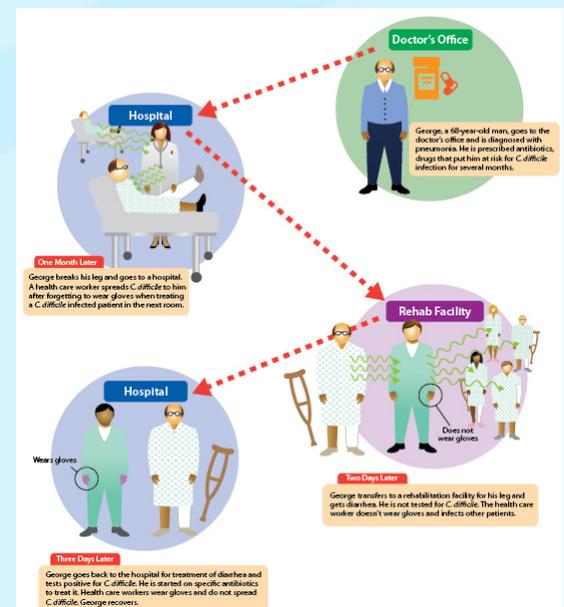
FIGURE 2. Percentage of laboratory-identified *Clostridium difficile* infections (N = 42,157), by hospitalization status at time of stool collection and type/location of exposure — United States, National Healthcare Safety Network, 2010



\* From reporting hospital during the preceding 4 weeks.

# Six Steps to Prevention of CDIs

- ❑ Prescribe and use antibiotics carefully
- ❑ Focus on an early and reliable diagnosis
- ❑ Isolate patients immediately
- ❑ Wear gloves and gowns for all contact with patient and patient care environment
- ❑ Assure adequate cleaning of the patient care environment, augment with EPA-registered *C. difficile* sporicidal disinfectant
- ❑ Notify facilities upon patient transfer



Source: CDC, 2012

## Prevention is Possible

- ❑ 71 hospitals in hospital-onset CDI prevention programs of three states (IL, MA, NY)
- ❑ Engagement of hospital leadership
- ❑ Implementation of prevention strategies
- ❑ Measurement and feedback of data
- ❑ 20% overall reduction in CDIs

20%



# What Can Be Done

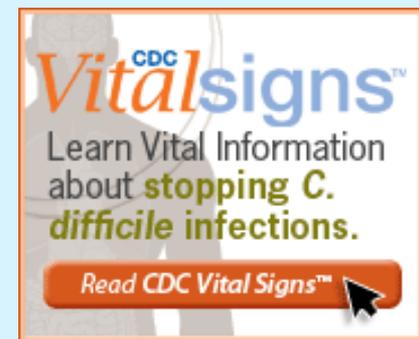
## □ Federal Government

- Tracking and reporting
- Promoting prevention through programs and recommendations
- Prevention expertise, outbreak and laboratory support



## □ States and Communities

- Encourage facilities to track and share data using NHSN
- Develop regional prevention projects across facility types
- Technical assistance to facilities
- Standardized patient transfer form



# What Can Be Done

## ❑ Health Care Facility Administrators

- Support better testing, tracking, and reporting
- Assure adequate environmental cleaning
- Notify other facilities on patient transfer
- Participate in regional prevention efforts

## ❑ Doctors and Nurses

- Prescribe antibiotics carefully, take an antibiotic 'time out'
- Order a *C. difficile* test in appropriate patient population
- Be aware of infection rates in facility or practice, follow infection control recommendations with every patient



# What Can Be Done

## □ Patients

- Antibiotics can be lifesaving but are not without risk, use only as directed by your doctor
- Tell your doctor if you have been on antibiotics and you develop diarrhea within a few months
- Wash your hands after using the bathroom
- Try to use a separate bathroom if you have diarrhea, or be sure the bathroom is cleaned well if someone with diarrhea has used it



# Acknowledgements

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- Abbigail Tumpey
- Denise Cardo

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- Lynn Sokler

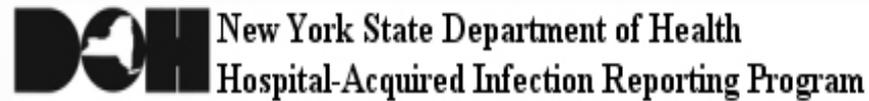
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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



# Using a Collaborative Intervention Model to Prevent Hospital-Onset *Clostridium difficile* Infection in the New York Metropolitan Region

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Medical Director and Chief, Infection Prevention  
Beth Israel Medical Center, New York, NY  
Professor, Clinical Medicine  
Albert Einstein College of Medicine, New York, NY  
*C. difficile* Collaborative Chair



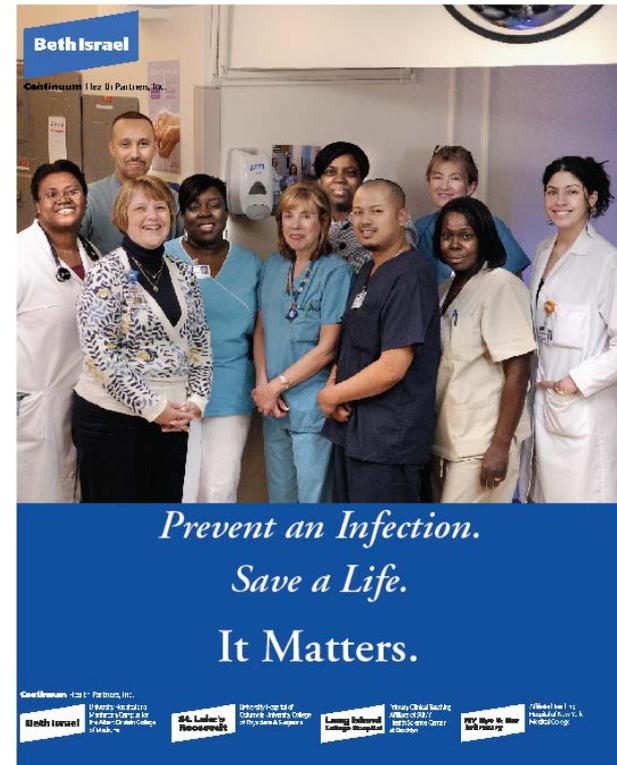
# *Clostridium difficile* (*C. difficile*) Collaborative Partners



- Trade association of nearly 250 hospitals and continuing care organizations
- Health services research and philanthropic organization
- Infection prevention demonstration projects
- 47 hospitals
  - 35 submitted sufficient data for analysis
    - 21 (60%) major teaching
    - 13 (37%) non-major teaching
    - 1 (3%) non-teaching

# *C. difficile* Collaborative Model

- Prior model for success – GNYHA/UHF CLABSI Collaborative\*
- Steering committee
- Physician expert chair
- Learning sessions
- Monthly teleconferences
- Site visits
- Timely feedback of data
- Support from executive leadership
- Interdisciplinary teamwork
- Data definitions\*\*
- Data collection
- Prevention bundle\*\*\*



\*Koll B, Straub T, Jalon H, Block R, Heller K, Ruiz R. *The JC Journal on Quality and Patient Safety*. 2008; 34(12):713-723

\*\*Based on definitions from: McDonald LC, Coignard B, Dubberke E, Song X, Horan T, Kuty PK. *Infect Control Hosp Epidemiol*. 2007; 28(2):140-145

\*\*\*Antimicrobial Stewardship was not the focus of the *C. difficile* Collaborative.

# C. difficile Prevention Bundle\*

- Soap and water for hand hygiene
- Contact precautions upon suspicion of *C. difficile*
- Monitor signage and availability of PPE
- Dedicated rectal thermometers
- Patient placement hierarchy
  - Private room vs. cohorting vs. shared
- Bathroom hierarchy/prioritization
  - Dedicated vs. shared vs. commode
- Transport precautions
- Environmental cleaning
  - Hypochlorite-based disinfectant
  - Checklist for daily and terminal cleaning

**GNYHA/UHF Clostridium Difficile Collaborative**  
Bundle Checklist

Version: October 28, 2008

**Instructions:**

- Observe 20 patients with suspected or confirmed Clostridium difficile (C. diff) for the reporting month. Try to observe approximately 5 patients per week, making sure that you are not observing the same patient more than once. If you had fewer patients with C. diff, observe all of them.
- To complete the data submission form, enter the appropriate data in the cells highlighted in yellow (to move the cursor, use the TAB key on the keyboard):
  - Select your facility and the reporting from the drop-down boxes
  - Enter the number of the patients you observed during the month.
  - Under the column labelled 'Yes', enter the number of times you answered 'yes' to the question shown under the Component column.
  - Under the column labelled 'No', enter the number of times you answered 'no' to the question shown under the Component column.
- When there are missing data or when the responses don't add up to the number of observed patients, the Bundle-Score column will alert you.

Select your hospital:

Select reporting period:

Enter number of observed patients:

Submit

Component	Not Applicable	Yes	No	Bundle-Score
Patient placed on CONTACT PRECAUTIONS per hospital's policy?				
SIGN PLACED at infected patient's room per hospital's policy?				
PPE readily available?				
Dedicated Rectal thermometer?				
HAND HYGIENE observed per hospital's policy?				
<b>PATIENT PLACEMENT:</b>				
Patient placed in PRIVATE ROOM?				
For Patients in Shared Room:				
a) Patient COHORTED with other patients suspected or known to have C. diff.		Yes	No	
b) For patients sharing rooms with patients without C. diff.		Yes	No	
c) Bathroom shared between patients?		Yes	No	
Overall Patient Placement Score				
Overall Bundle-Score				

**GNYHA/UHF Clostridium Difficile Collaborative**  
Environmental Checklist

Version: October 28, 2008

**For Daily and Terminal Cleaning - Room Observations:**

Cleanse **all** high touch surfaces per month (to be observed about two cleanings per week) and **all** terminal cleaning per month. Report your results in the cells highlighted in yellow.

Select your hospital:

Select reporting period:

Enter number of routine cleanings:

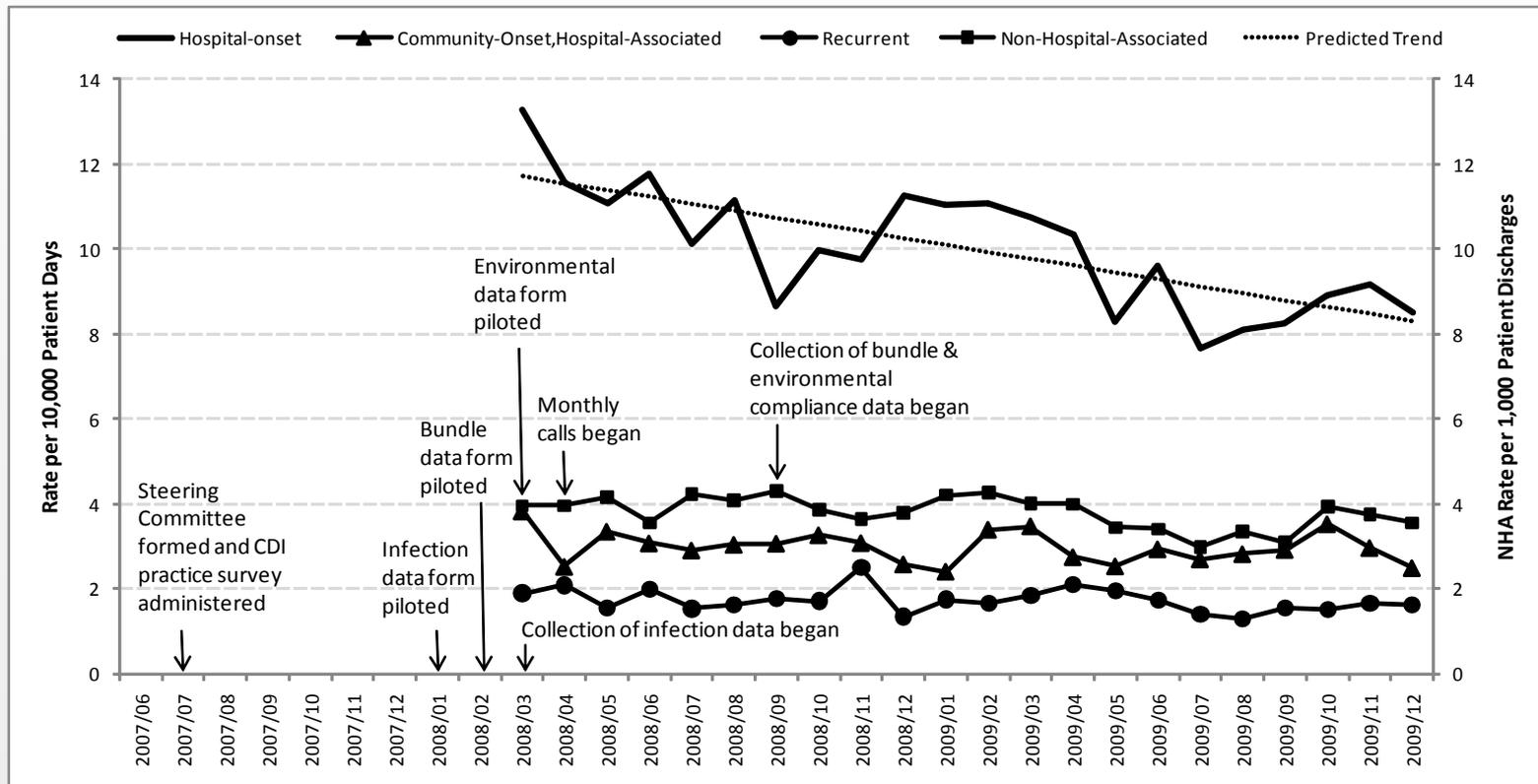
Enter number of terminal cleanings:

Total cleanings:

Observation	Component	# of Times Task Performed	# of Times Task NOT Performed	# of Times Not Applicable	Bundle-Score
<b>EXIT ROOM AFTER CLEANING IS COMPLETE</b>					
<b>EXIT ROOM WITH SUPPLIES AND EQUIPMENT AS NEEDED</b>					
<b>After Daily Cleaning (Practice as needed):</b>					
BE ENTERED WITH PPE - GOWN & GLOVES	Hand hygiene				
a) Hand hygiene performed before entering room					
b) Hand hygiene performed after exiting room					
c) Hand hygiene performed after touching high touch surfaces					
d) Hand hygiene performed after touching door handle					
e) Hand hygiene performed after touching bed rails					
f) Hand hygiene performed after touching call light					
g) Hand hygiene performed after touching telephone					
h) Hand hygiene performed after touching computer monitor					
i) Hand hygiene performed after touching IV pole					
j) Hand hygiene performed after touching over-the-bed table					
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# Timeline and Results

Figure 1. Collaborative Hospitals' *C. difficile* Rates Over Time



- Mean incidence of Hospital-onset CDI decreased 20% from 10.7 to 8.6 per 10,000 patient days ( $p < 0.001$ )
- *C. difficile* Prevention Bundle: Mean scores ranged between 77% and 96% compliance
- *C. difficile* Environmental Protocol: Mean scores ranged between 85% and 98% compliance

# Lessons Learned and Next Steps

- Lessons learned
  - Regional effort: “Strength in numbers”
  - Focus on “what is controllable”: Reduce variability of infection prevention, environmental and disinfection practices
    - Consistent use and monitoring of infection prevention practice bundles and timely reporting back of data to end users
  - Administrative and clinical senior leadership support
  - “Buy-in” and support of front-line staff
    - Environmental Services
    - Transporters and other ancillary staff
  - Importance of an interdisciplinary “team effort”
    - Teach
    - Monitor and enforce practices
    - Problem-solve
    - Share and spread best practices
- Next Steps
  - GNYHA/UHF Antimicrobial Stewardship Project funded by NYSDOH
    - October 2009 – April 2010; Antimicrobial Stewardship Toolkit available
  - NYSDOH *C. difficile* Collaborative focused on prevention in long term care facilities

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212-420-2853

Special thanks to the *C. difficile* Collaborative hospital participants, the Steering Committee, and Rachel Stricof, formerly from NYSDOH.

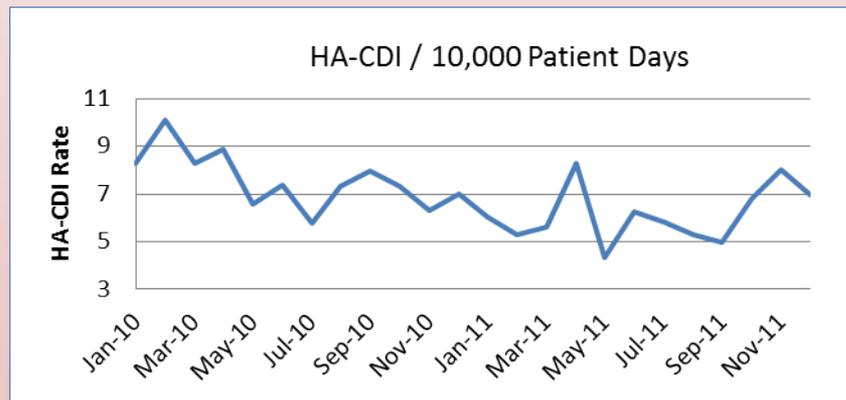


# Preventing *C. difficile* in Massachusetts Hospitals with a Mixed Methods Learning Collaborative

Massachusetts Department of Public Health

Massachusetts Coalition for the Prevention of Medical Errors

Funding from CDC through the American Recovery and Reinvestment Act



Program Materials available at [www.macoalition.org](http://www.macoalition.org)

For additional information contact: [Susanne Salem-Schatz@hcqi.com](mailto:Susanne.Salem-Schatz@hcqi.com) or Eileen McHale  
[eileen.mchale@state.ma.us](mailto:eileen.mchale@state.ma.us)

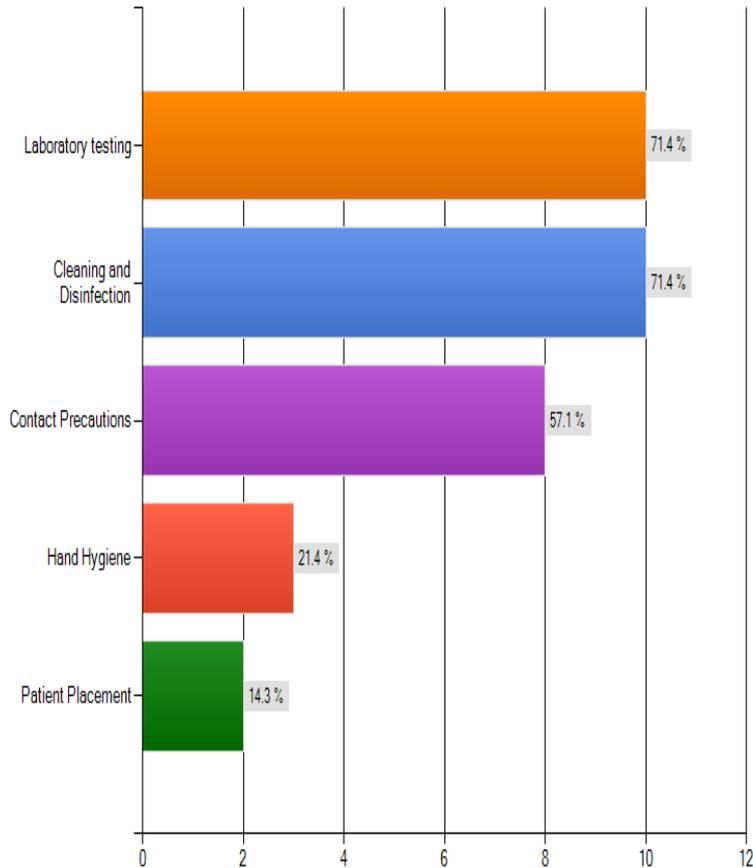
# MA CDI Prevention Collaborative 2010-2011:

## Key features

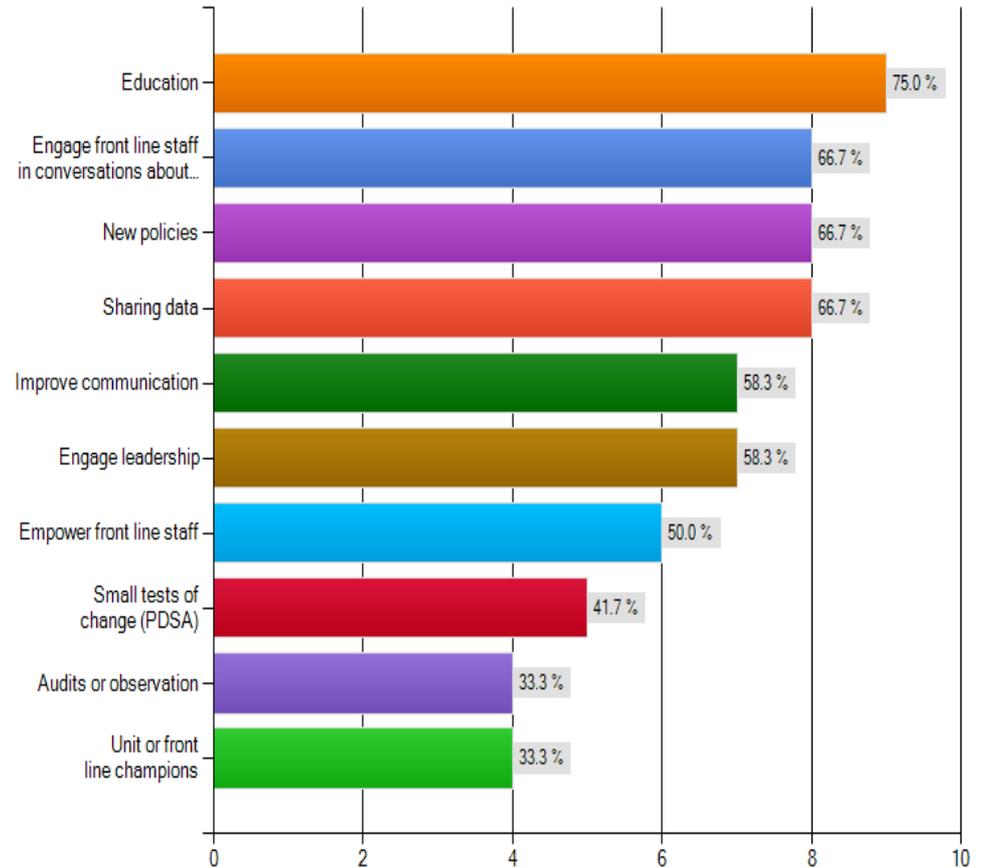
- ☑ **Statewide partnership** and collaboration
- ☑ **Multidisciplinary teams** including representatives from infection prevention, quality, clinical leadership, microbiology, pharmacy and environmental services
- ☑ **A common set of practice recommendations** in the areas of surveillance testing, isolation policies, hand hygiene, contact precautions, and environmental cleaning and disinfection; with additional support for antibiotic stewardship
- ☑ 3 statewide, full day learning and sharing workshops and regional workshops featuring **expert presentations**, highlighting accomplishments of **Collaborative participants**, and teaching /practicing **staff engagement strategies**
- ☑ **Improvement frameworks** including the **Model for Improvement** (including PDSA, or small tests of change), and **culture change strategies** such as Positive Deviance to support staff engagement
- ☑ **Common measurement** and reporting tools in Excel based on NHSN HAI definitions

# What Hospitals Did and How

During the Collaborative, which areas did you make changes in? (check all that apply)



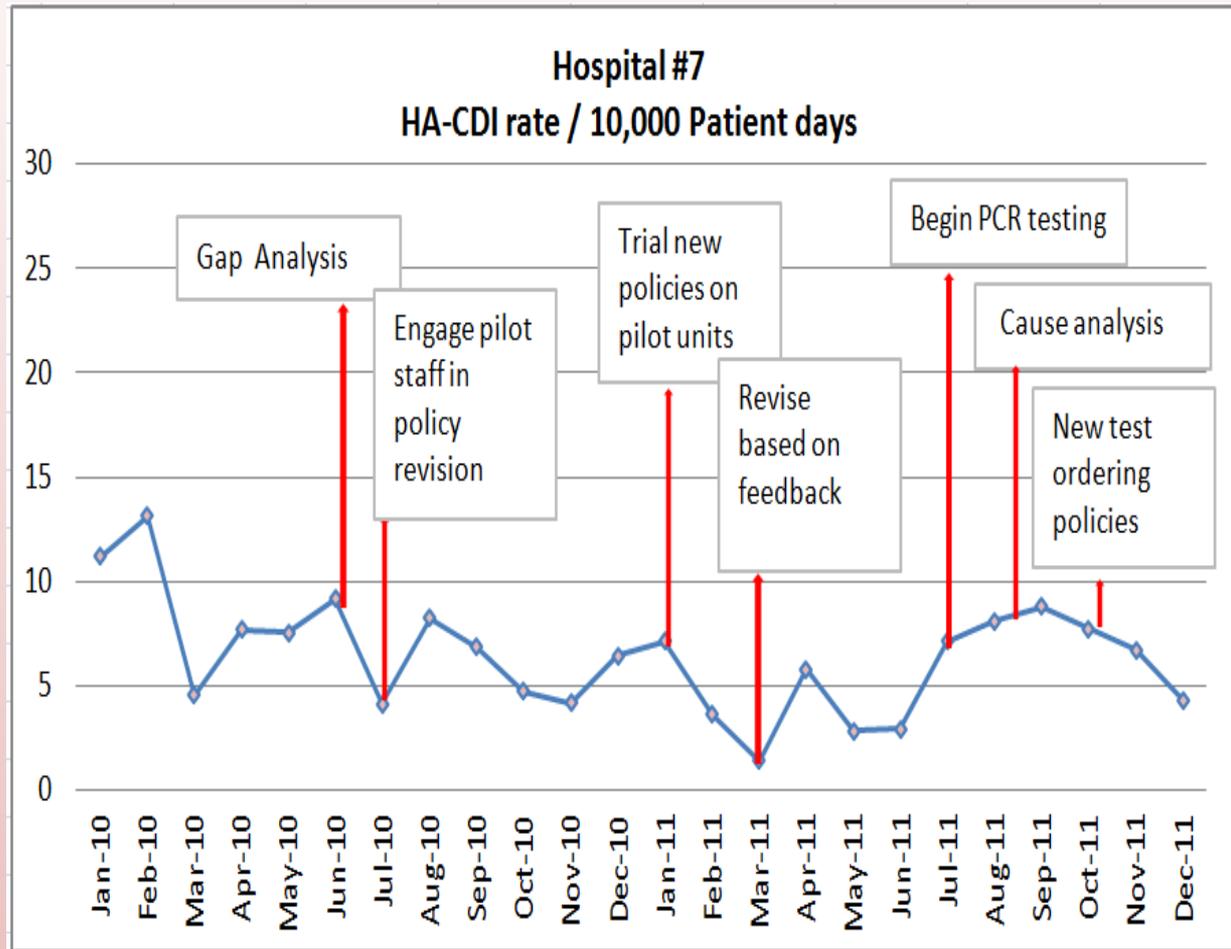
During the Collaborative, which change strategies did you use? (check all that apply)



# HA-CDI Reduction in MA Collaborative

CHANGE IN HA-CDI / 10,000 Patient Days			
	Baseline	Last 4 months	% DECREASE
	Jan-April '10	Sept-Dec '11	
<b>CASES</b>	356	259	
<b>PT DAYS</b>	401123	386629	
<b>RATE</b>	8.88	6.70	25%

# One of 27 Stories



This team engaged frontline staff in developing and testing new prevention policies, which resulted in decreases over time. Infection rates appeared to increase after June 2011 which coincided with the implementation of PCR testing.

Cause analysis led to the discovery that tests were sometimes ordered without sufficiently ruling out other causes of diarrhea, and the more sensitive test was identifying colonized patients without active infection. Change in ordering policies began in November and it appears their numbers are heading back down.



# Lessons Learned

**Massachusetts Coalition  
for the  
Prevention of Medical Errors**

**MASSPRO**



**MHA** MASSACHUSETTS HOSPITAL ASSOCIATION

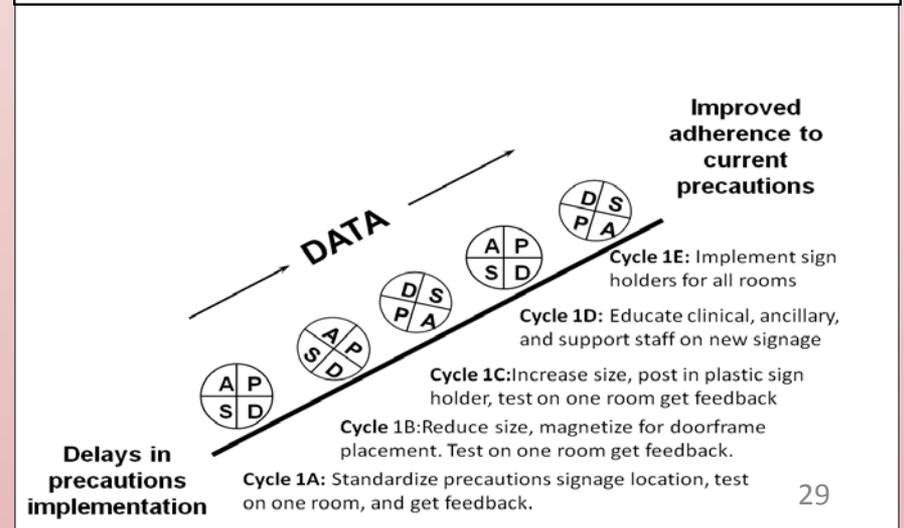
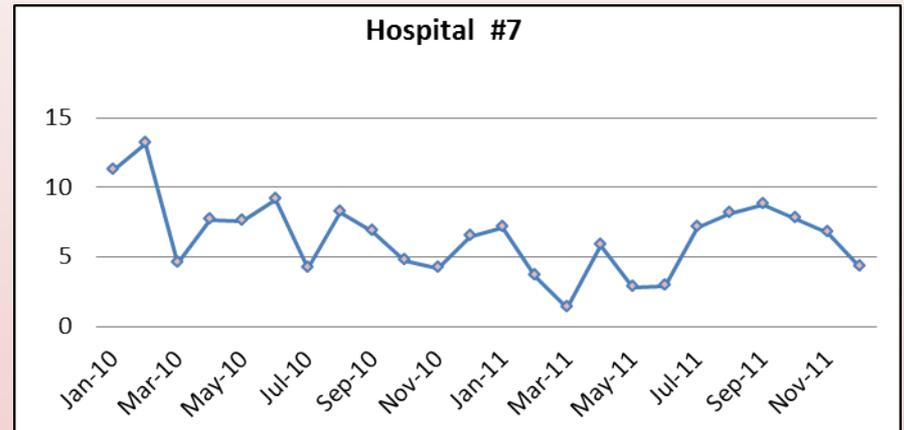
The leading voice for hospitals.



Improvement requires hard work, time, & is supported by building on long-term relationships and collaboration

Value of shared data to track improvement and solve problems

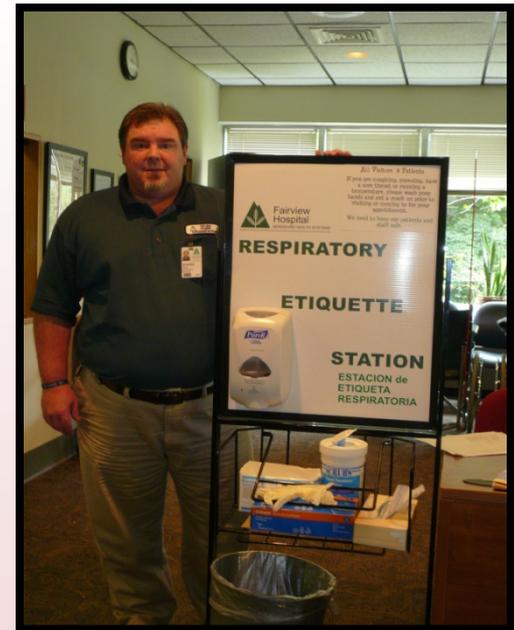
Value of an improvement framework: aims, measures and small tests of change



# Lessons Learned

Engaged front line staff make changes happen!

Adapt changes locally



Balance serious messages with creative approaches to engage staff and support culture of quality



# Collaborating to Prevent *Clostridium difficile* Infections in Illinois Hospitals

Chinyere Alu, MPH

March 13, 2012



# Illinois *Clostridium difficile* Prevention Collaborative

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- *Clostridium difficile* infections (CDI) rates doubled in Illinois hospitals from 4.5 to 9.2 cases per 1,000 discharges between 1999 and 2009
- Illinois Department of Public Health (IDPH) implemented Collaborative jointly with the Illinois Quality Improvement Organization, IFMC-IL
- Two cohorts
  - Metro Chicago: March 2010–September 2011  
11 hospitals, bed size = 134–739
  - Central/ southern Illinois: October 2010–September 2011  
9 hospitals, bed size = 145–616

# Goals

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	<b>Target</b>
Hospital onset CDI incidence rate (metro Chicago cohort)	20% decrease
Hospital onset CDI incidence rate (central/southern IL cohort)	15% decrease
Hand hygiene	90% adherence rate
Gown and glove	90% adherence rate
Environmental cleaning	85% adherence rate

# Approach

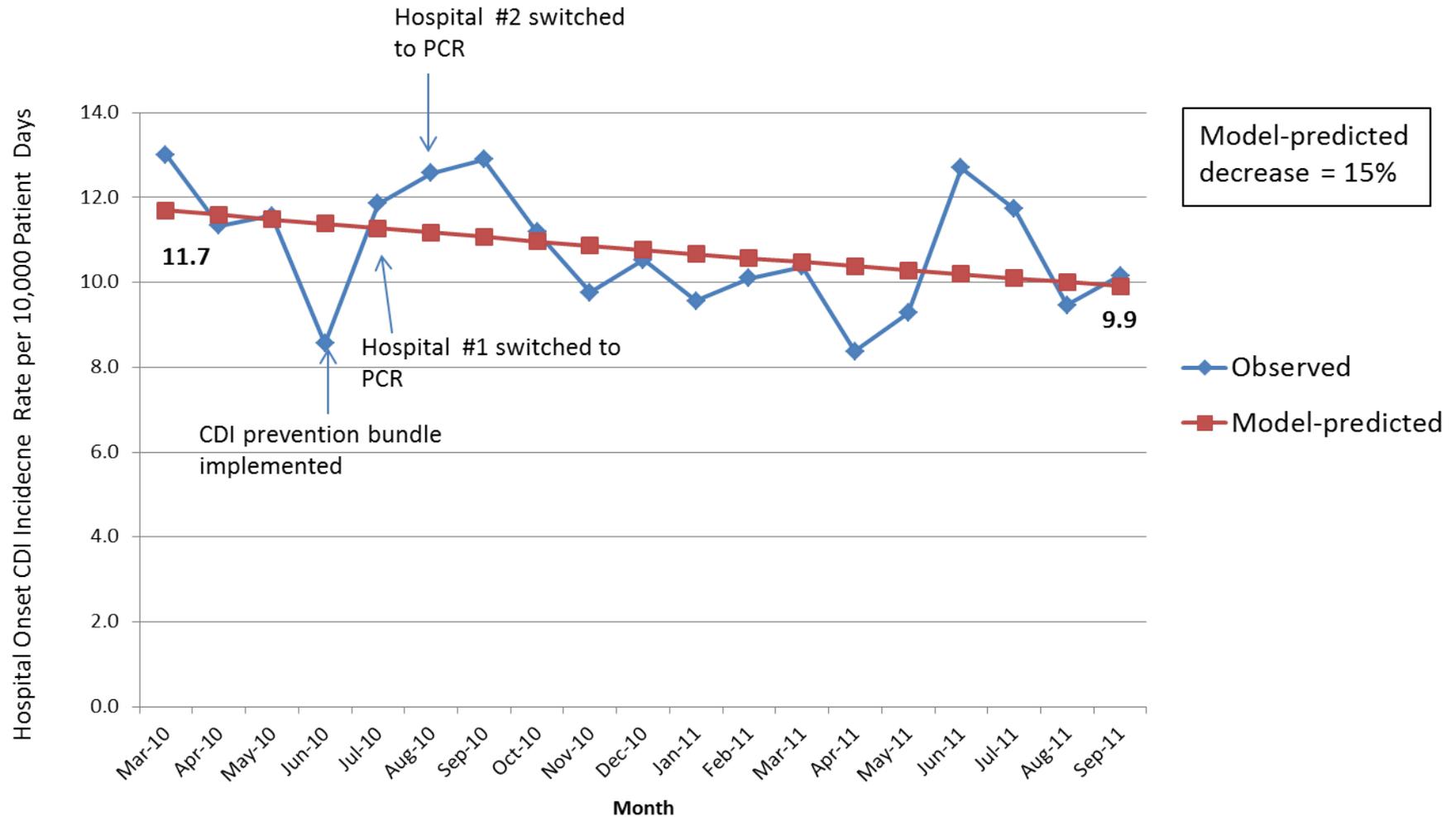
34

- Leadership support and multidisciplinary teams
- CDI prevention bundle
  - Hand hygiene
  - Contact precautions
  - Laboratory-based alerts
  - Education
  - Environmental cleaning
- Activities
  - Site visits, sharing calls, webinars, in-person meetings
- Data collection
  - National Healthcare Safety Network (NHSN)
  - CDI Prevention Practices Assessment Tool (pre- and post-)
  - Evaluation

# Results

## Hospital Onset CDI Rates, March 2010 - September 2011 Metro Chicago Cohort (n=11)

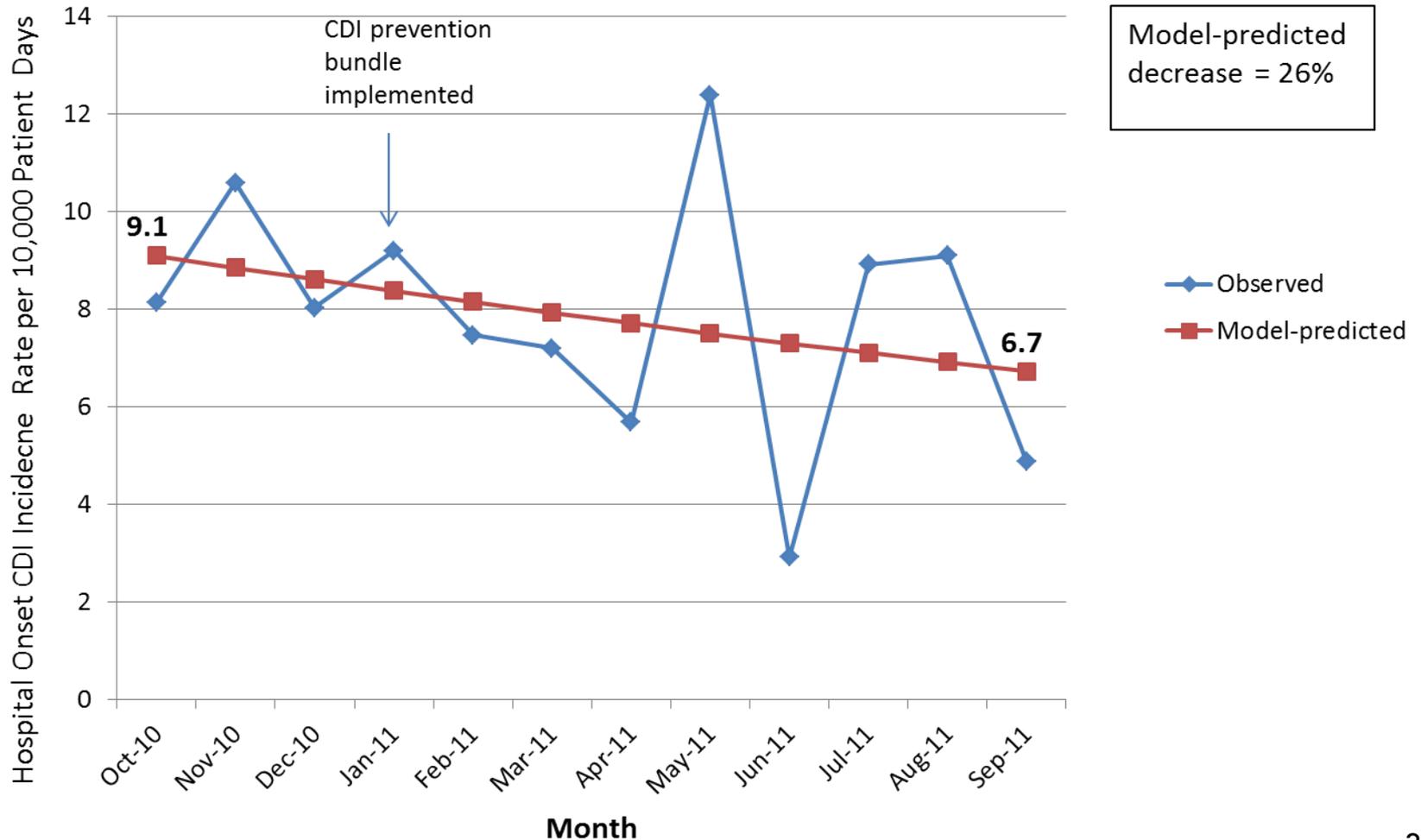
35



# Results

## Hospital Onset CDI Rates, March 2010 - September 2011 Central/Southern Illinois Cohort (n=8)

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# Results

## Prevention Practices

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- Not regularly reported
  
- Increase in hand hygiene and gown and glove adherence rates by the end of the Collaborative period
  
- Average adherence rates
  - Highest for hand hygiene (93%)
  - Lowest for environmental cleaning (78%)

# Lessons Learned

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- Having multidisciplinary teams is key
  - Production of video, *Not Just A Maid Service*, to highlight role of environmental service workers in preventing CDI  
<http://www.notjustamaidservice.com>
  
- Having leadership support (hospital and IDPH) is important
  
- Need to consider how to sustain and further success beyond the collaborative period

# Acknowledgments

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- Illinois CDI Prevention Collaborative Hospitals
- Brandi Jordan
- IDPH team (Lauren Gallagher, Kathie Doliszny, Barbara Fischer, Erica Abu-Ghallow, Mary Driscoll)
- IFMC-IL
- CDC's DHQP (Cliff McDonald, Jason Snow, Katherine Ellingson)

# **CDC *Vital Signs* Electronic Media Resources**

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**Follow us on Twitter:**

**<http://twitter.com/cdcgov/>**

**Syndicate *Vital Signs* on your website:**

**<http://tools.cdc.gov/register/cart.aspx>**

***Vital Signs* interactive buttons and banners:**

**<http://www.cdc.gov/vitalsigns/SocialMedia.html>**

# Public Health Practice Stories from the Field

- Stories about the implementation of public health practices in the field



[www.cdc.gov/stltpublichealth/phpracticestories](http://www.cdc.gov/stltpublichealth/phpracticestories)

**Provide feedback on this teleconference:**  
**[OSTLTSFeedback@cdc.gov](mailto:OSTLTSFeedback@cdc.gov)**



Please mark your calendars  
for the next **OSTLTS Town  
Hall Teleconference:**  
**April 17, 2012**  
**2:00 pm – 3:00 pm (EDT)**

**For more information, please contact Centers for Disease Control and Prevention.**

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The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



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