



Preventing Healthcare-Associated Infections

**Council of State and Territorial Epidemiologists
Sunday Workshop
June 7, 2009**

**Presented by:
Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention**

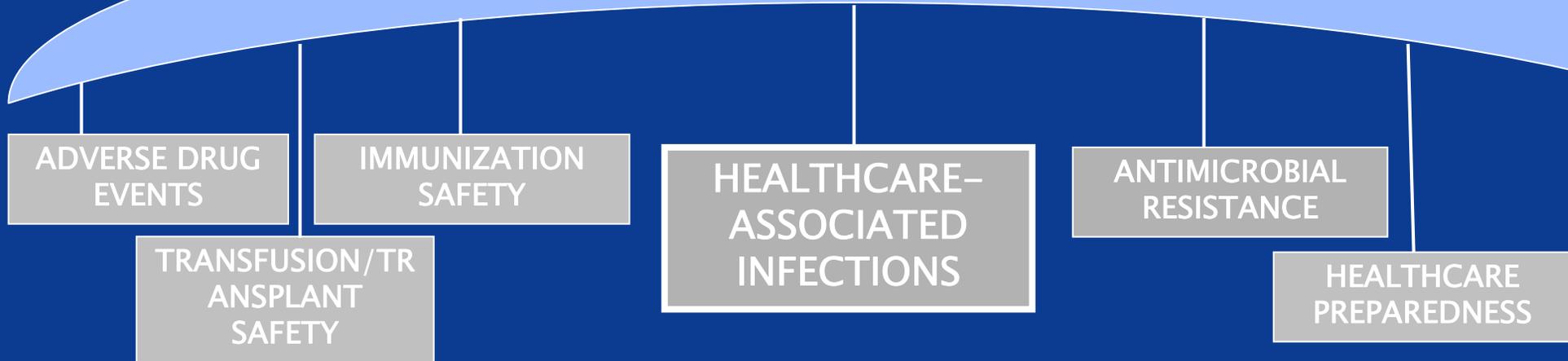


Agenda

- Welcome & Introduction
- Overview of HAI Prevention Activities
- Recovery Act Background and Intent
- State HAI Plans and Progress
- NHSN
- Prevention Collaboratives
- CDC Technical Support
- Questions



DHQP ACTIVITIES



Working through . . .

- Outbreak Investigations
- Surveillance
- Prevention Recommendations
- Intervention Implementation
- Laboratory Support and Research
- Collaborations and Partnerships



Burden of Healthcare-Associated Infections in the United States, 2002

- 1.7 million infections in hospitals
 - Most (1.3 million) were outside of ICUs
 - 9.3 infections per 1,000 patient-days
 - 4.5 per 100 admissions (1 out of 20 patients acquire an infection in US)
- 99,000 deaths associated with infections

Healthcare-Associated Outbreak Investigations by Healthcare Setting, 2004-2009



Increasing #s of outbreaks associated with outpatient care

- Wide range of settings (e.g., ambulatory surgery, cancer clinics, pain medicine, dialysis, long-term care, physician offices)
- Bacterial, fungal, viral and non-infectious adverse events
- Unsafe injections; foundation of basic safe care practices lacking



n = 55, as of March 2009

Changing World of Patient Safety



MRSA

**Multi-drug
resistant gram
negative bacteria**

C. difficile

Acinetobacter

**Increased use of
ambulatory care
settings**

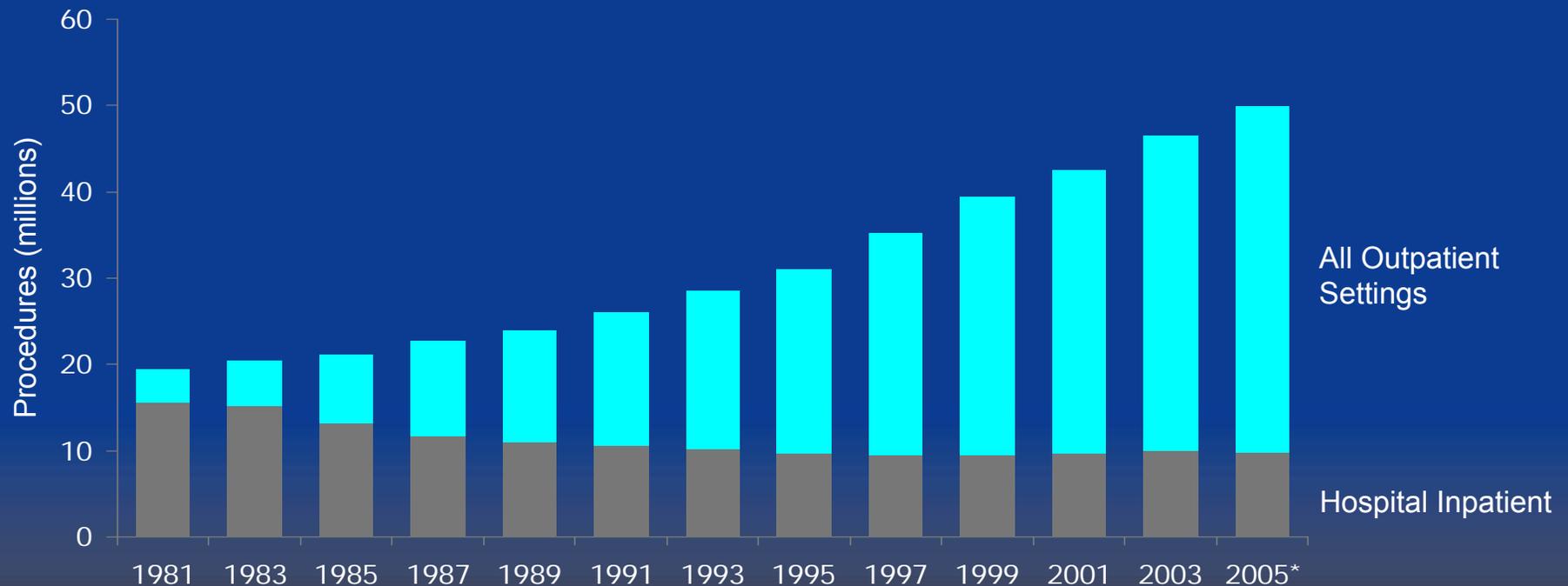
Antimicrobial resistance

Public reporting



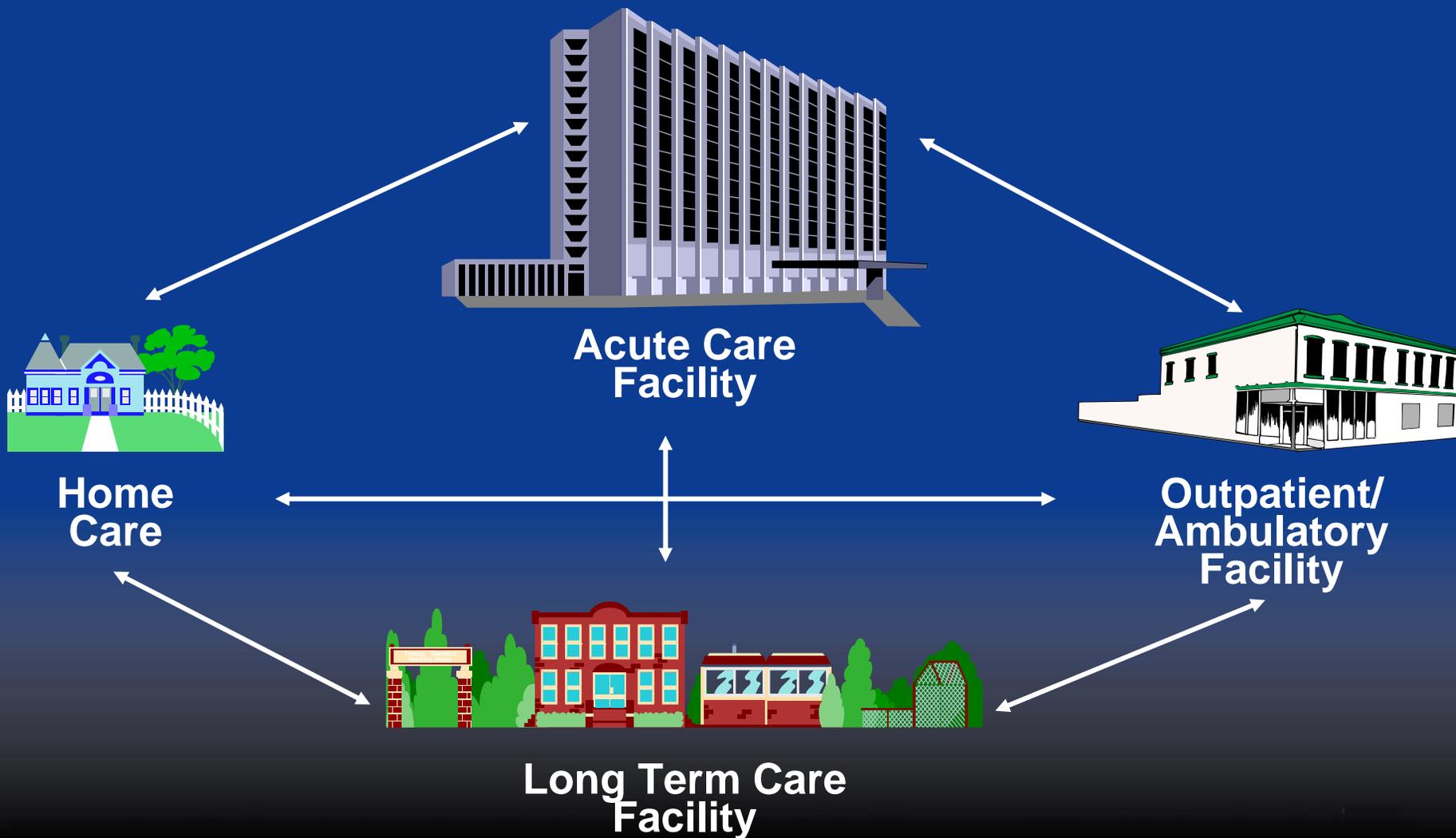
Increasing numbers of surgical procedures are moving from the inpatient to the outpatient setting.

Chart 1: Inpatient vs. Outpatient Surgery Volume, 1981-2005



Source: Avalere Health analysis of Verispan's Diagnostic Imaging Center Profiling Solution, 2004, and American Hospital Association Annual Survey data for community hospitals, 1981-2004.
*2005 values are estimates.

Increasing Needs and Opportunities for Public Health Approach Across the Continuum of Care



The time is right to focus on HAIs...



- Legislative actions:
 - CMS non-payment rules for hospital-acquired conditions includes some HAIs
 - Multiple bills introduced at Federal level on HAIs
 - Hearings on HAIs, GAO investigations
- Public reporting in States: >20 states require mandatory reporting
- IOM reports, private sector initiatives

Patients want to feel safe and assured that we are doing everything possible to eliminate infections



SAFE CARE CAMPAIGN.org

STOPPING HEALTH CARE AND COMMUNITY ACQUIRED INFECTIONS

Free Online Quick Reference Guide to **PREVENTING INFECTIONS**

Learn about important topics including MRSA & Clostridium difficile, VRE, VAP, UTI, SSI & CR-BSI.

Click HERE

Committed to Reduce Infectious Deaths - 15 Steps to...

rid

Home About RID RID's 15 Steps Infection Facts Cost of Infection Model Bill Press

Committee to Reduce Infection Deaths

15 STEPS YOU CAN TAKE TO REDUCE YOUR RISK OF A HOSPITAL INFECTION

These "15 Steps" are available in a color brochure. For more information or to place your order, please contact rid@hhs.gov

Innovative Product to Help Fight Infection

Preventing Infections Deaths by Orlan McGaughey

A four-part series on QuantiaMD plus other educational resources and recorded lectures on reducing hospital related infections.

QUANTIAMD®

What is MRSA? What does it look like? How can I learn how your next procedure

ConsumersUnion.org
Nonprofit Publisher of Consumer Reports

“...working for a fair, just and safe marketplace for all...”

...to go into the hospital some specific steps you can follow to from deadly hospital infections:

...staff clean their hands before ask visitors to clean their hands. The most important way to protect hospital. If you're worried about being ask remember your life could be at risk should clean their hands before hot-based hand cleaners are more effective than soap and water. Excuse me, but I can see you touch me, so I can see you're already contaminated before.

...doctor uses a stethoscope, ask that the flat surface) be wiped with alcohol and other dangerous bacteria.

- Health Care
- Food
- Phones & Media
- Money
- Product Safety
- Other
- En Español
- Campaigns
- Take Action

We want to hear your personal experience with health care.

Latest News

- TV drug ads should tell how to report side effects. New Consumer Reports poll finds most Americans know they should tell the FDA. 04/01/08
- More states debating MRSA screening program. New study shows screening patients for MRSA can dramatically reduce infection rates. 03/18/08
- Consumer groups endorse credit card reform. Consumers Union joins other groups in urging Congress support HR 5244 and S. 2753. 03/12/08
- OH Governor urged to rescind rule on milk labeling. The rule is not pro-consumer, restricts free speech of dairies, and interferes with free markets. 03/11/08

HEALTH CARE REFORM...
...is long overdue. Let's make it happen together!

GO

ConsumerReports.org Consumer Reports

For expert Ratings, buying advice



Preventability of Healthcare-Associated Infections

What proportion of healthcare infections are caused by errors... i.e. are preventable?



Medical Errors and Near-misses

Healthcare-associated Infections

CDC's SENIC Study-1970's



Preventability of Healthcare-Associated Infections

What proportion of healthcare infections are caused by errors... i.e. are preventable?



Goal: Best quality of patient care and elimination of preventable healthcare-associated infections



Keys for the Elimination of Healthcare-Associated Infections



- **Full adherence to recommendations**
 - Across care continuum
- **Collect data and disseminate results**
 - Communication with providers and consumers
 - Evaluate how we're doing
- **Identify and respond to emerging threats**
- **Improve science for prevention through research**
- **Recognize/ensure excellence**





Keys for the Elimination of Healthcare-Associated Infections



- **Full adherence to prevention recommendations (Accountability)**
 - **Success in regional initiatives**
 - **ARRA funds to expand to state health agencies**
 - **Needs extend across the care continuum**
 - **Oversight and monitoring**
- **Collection of data to assess prevention impact and dissemination of results to healthcare providers and consumers (Transparency and sustainability)**
 - **State reporting legislation**
 - **NHSN in 50 States, using data to move towards national targets**



Keys for the Elimination of Healthcare-Associated Infections (cont.)

- **Identify and respond to emerging threats**
 - **Outbreak investigations as a flag for emerging problems**
 - **Evidence base, strategies and guidelines to address new problems**
- **Finding new solutions for HAI prevention**
 - **Identifying and addressing knowledge gaps**
 - **Innovative ways to increase adherence to recommendations**
- **Ensuring excellence**
 - **CMS deficit reduction act, survey capacity**
 - **Promoting best practices, ARRA to increase inspections in ASCs**



Keys for the Elimination of Healthcare-Associated Infections (cont.)

- **New Knowledge**
 - **Identify and respond to emerging threats**
 - **Outbreak investigations as a flag for emerging problems**
 - **Strategies and guidelines to address new problems**
 - **Finding new solutions for HAI prevention**
 - **Identifying and addressing knowledge gaps**
 - **Innovative ways to increase adherence to recommendations**

News Release

FOR IMMEDIATE RELEASE
Tuesday, January 6, 2009

Contact: OPHS Press Office
(202) 205-0143

HHS Issues Action Plan to Prevent Health Care-Associated Infections

The U.S. Department of Health and Human Services (HHS) unveiled a plan that establishes a set of five-year national prevention targets to reduce and possibly eliminate health care-associated infections (HAIs).

Health care-associated infections are infections that patients acquire while undergoing medical treatment or surgical procedures. These infections are largely preventable.

The plan also outlines cross-agency efforts to save lives and reduce prevention efforts.

The department addresses this important public health and patient safety issue. "This collaborative interagency plan will help the nation build a

stronger health care system through key actions for enhancing and coordinating HHS-supported efforts. The plan marks prioritized recommended clinical practices, a coordinated information systems strategy and a national messaging plan.

The plan includes close collaboration with national, state, tribal and local organizations.

The plan also solicits public input and new recommendations for infection prevention. The public comments on the plan, can be found online at <http://www.hhs.gov/ophs>.

GAO

United States Government Accountability Office

Testimony

Before the Committee on Oversight and
Government Reform, House of
Representatives

For Release on Delivery
Expected at 11:00 a.m. EDT
Wednesday, April 15, 2009

HEALTH-CARE- ASSOCIATED INFECTIONS IN HOSPITALS

Leadership Needed from HHS to Prioritize Prevention Practices and Improve Data on These Infections

Statement of Cynthia A. Bascetta
Director, Health Care





Recovery Act Intent and Background



Recovery Act Intent and Background



- American Recovery and Reinvestment Act of 2009
 - signed into law February 17, 2009
- Primary Purpose = Economic Stimulus and down payment on Healthcare Reform.
- Unprecedented transparency and accountability
- Requires merit-based selection of recipients
 - Deliver programmatic results
 - Achieve economic stimulus
- Prevention and Wellness Fund
 - ↑ U.S. healthcare infrastructure, ↓ healthcare costs
 - \$40 million to CDC for HAI
 - **\$35.8M through ELC** / \$4M through EIP
 - Eligibility limited to “States”



HAI Prevention Program

- This aims to build and improve state health department workforce, training, and tools necessary to rapidly scale up to meet this new HAI prevention work.
- Support states that are just starting on HAI prevention activities or, in states that already have some HAI prevention activities, to expand into new HAI prevention areas.
- Support the ability for states to submit data on their progress toward the HHS HAI Prevention Targets.
- Create new state-level competencies and tools that will continue even after Recovery Act funding has expired and therefore leave behind a sustainable infrastructure for reporting on long-term progress toward meeting the HHS HAI Prevention Targets.



Activities – Epidemiology and Laboratory Capacity (ELC) Program



This Recovery Act supplement to ELC includes three activities outlined below.

- Activity A is the basic staffing and coordination to draft the State HAI Prevention Plan and establish the state's capacity to develop an HAI prevention program. In general, Activity A is aimed for state health departments that have little or no current activity or expertise on HAI prevention or reporting
- Activity B aims to increase facility participation in NHSN and use NHSN to establish baseline HAI data for the state.
- Activity C aims to support prevention collaboratives in the state to undertake prevention activities or initiatives.

States can apply for any combination of the activities listed above.



Timeline for ARRA Review

- **Application Deadline: June 26, 2009**
- Anticipated Award Date: August 30, 2009
- State HAI Plans due to HHS: January 1, 2010
- First Quarterly Report due to Recovery.gov: October 10, 2009



State HAI Plans and Progress



Block Grant Funds and HAI Plans

- To meet FY09 Omnibus Bill requirement for states receiving Preventive Health and Health Services Block Grant funds states must submit HAI Plans to HHS
 - “Blueprint” for state HAI reduction activities going forward
 - July 1, 2009 - States certify by that they will submit an HAI plan to CDC to receive Block Grant funding
 - January 1, 2010 – State plans due to HHS
- CDC has developed guidance to assist states in developing HAI plans



HAI Prevention Planning Guidance

- Develop a plan to build and improve health department workforce, training, and tools necessary to rapidly scale up to meet HAI prevention and control needs
- Assist states that are just starting on HAI prevention activities
- Create a path for existing HAI programs to expand into new HAI prevention areas
- Lay groundwork for new state-level competencies and tools for reporting on long-term progress toward meeting the HHS HAI Prevention Targets



HAI Prevention Planning Guidance (Cont.)

- Guidance template will help to ensure progress towards five-year national prevention targets as described in the HHS Action Plan in the following areas:
 1. Integration, Collaboration, and Capacity Building
 2. Reporting, Detection, Response, and Surveillance
 3. Prevention
 4. Evaluation, Oversight, and Communication



State HAI Prevention Plan Draft Template Example Elements



Integration, Collaboration, and Capacity Building

- Formation of multidisciplinary group
- State HAI prevention coordinator
- Coordination within state government
- Enhance data sharing mechanisms

Reporting, Detection, Response, Surveillance

- Improve outbreak detection and investigation
- Enhance laboratory capacity
- Identify surveillance targets ~ HHS Action Plan
- Surveillance training and validation



State HAI Prevention Plan Draft Template Example Elements



Prevention and Oversight

- Establish HAI prevention collaborative(s)
- Prevention training (e.g., certification, campaigns targeting public and providers)
- Promote adherence to HICPAC recommendations (e.g., improved oversight, standards, surveyor tools)

Evaluation and Communications

- Needs assessment / evaluation of state HAI program
- Communication plan
 - Prevention priorities / progress
 - Public and private stakeholders, including consumers



HAI Prevention Planning Timelines



- June 2009 – CDC distributes HAI planning Guidance
- July 2009 – Teleconferences on HAI planning to assist states
- July 1, 2009 - States sign and submit certification for submitting HAI plan to CDC - July 1, 2009
- July 30, 2009 – State and Local health department meetings on state HAI guidance in Chicago
- January 1, 2010 – State plans due to HHS for certification
- June 1, 2010 – Review of state plans by HHS due to Congress



National Healthcare Safety Network NHSN



NHSN as a Tool for State HAI Reporting Programs

Catherine Rebmann

NHSN Implementation Team Leader

Division of Healthcare Quality Promotion

Centers for Disease Control and Prevention

CSTE Annual Meeting

June 7, 2009



Target Audience

- This session is designed for state or local health department employees who want to use the National Healthcare Safety Network (NHSN) to collect HAI data from all or some of the healthcare facilities in their jurisdiction.





Objectives

- What is NHSN?
 - Purposes
 - Components and Modules
 - Surveillance methodology
- Who is using NHSN and what are they using it for?
- Use of the GROUP function in NHSN
 - What is a Group?
 - How to form a Group
 - Tips for the Group to get the data they need





CDC Surveillance for HAIs



- Voluntary system for monitoring nosocomial infections (1970 - 2004)
- Voluntary system for monitoring healthcare- associated events and processes (2005 -)
- Increasingly used to comply with State legislation that mandates reporting of HAI data (2007 -)
- Also being used as a tool for prevention collaboratives





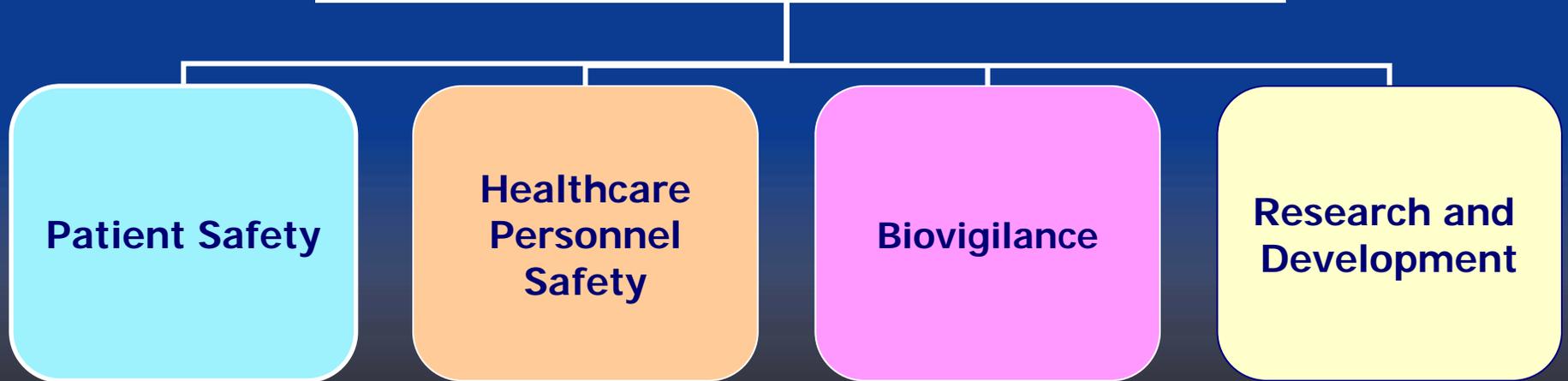
CDC Surveillance for HAIs: 2009

This Recovery Act supplement to ELC includes three activities outlined below.

- **Activity A** is the basic staffing and coordination to draft the State HAI Prevention Plan and establish the state's capacity to develop an HAI prevention program. In general, Activity A is aimed for state health departments that have little or no current activity or expertise on HAI prevention or reporting.
- **Activity B aims to increase facility participation in NHSN and use NHSN to establish baseline HAI data for the state.**
- **Activity C** aims to support prevention collaboratives in the state to undertake prevention activities or initiatives.



Components of NHSN



Patient Safety Component Modules



Device-associated

- CLABSI
- CAUTI
- DE
- CLIP
- VAP

Procedure-associated

- SSI
- PPP

Medication-associated

- AUR Pharmacy
- AUR Microbiology

MDRO/CDAD

- MDRO/CDAD Infection
- LabID
- Processes

Patient Influenza Immunization

- Method A
- Method B



Purposes of NHSN

- Collect data from a sample of US healthcare facilities to permit valid estimation of the
 - magnitude of adverse events among patients and healthcare personnel
 - adherence to practices known to be associated with prevention of healthcare-associated infections (HAI)
- Analyze and report collected data to permit recognition of trends



Purposes of NHSN

- Provide facilities with risk-adjusted data that can be used for inter-facility comparisons and local quality improvement activities
- Assist facilities in developing surveillance and analysis methods that permit timely recognition of patient and healthcare personnel safety problems and prompt intervention with appropriate measures
- Conduct collaborative research studies with members



NHSN Surveillance Methodology



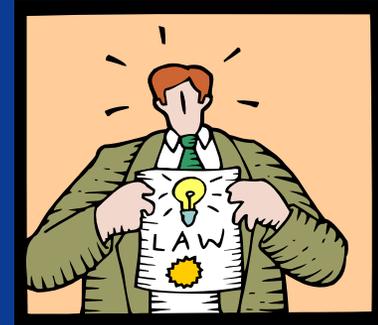
- **Active** (vs. passive)
 - Trained infection preventionists (IPs) look for and identify infections
 - Accumulate information from multiple data sources
- **Patient-based** (vs. laboratory-based)
 - Not based solely on laboratory data
 - Identification of risk factors, patient care procedures
- **Prospective** (vs. retrospective)
 - Monitor patients during their hospitalization when possible
- **Priority-directed** (vs. comprehensive)
 - Surveillance objectives are defined and focused on specific events, processes, organisms, populations



Authority and Confidentiality for NHSN



- Public Health Service Act (42 USC 242b, 242k, and 242m(d))
- Confidentiality Protection
 - Sections 304, 306, and 308(d) of the PHS Act



“The information contained in this surveillance system that would permit identification of any individual or institution is collected with a guarantee that it will be held in strict confidence, will be used only for the purposes stated, and will not be disclosed or released without the consent of the individual, or the institution in accordance with Sections 304, 306, and 308(d) of the Public Health Service Act (42 USC 242b, 242k, and 242m(d)).”



What and When States Using NHSN are Reporting (n=20)

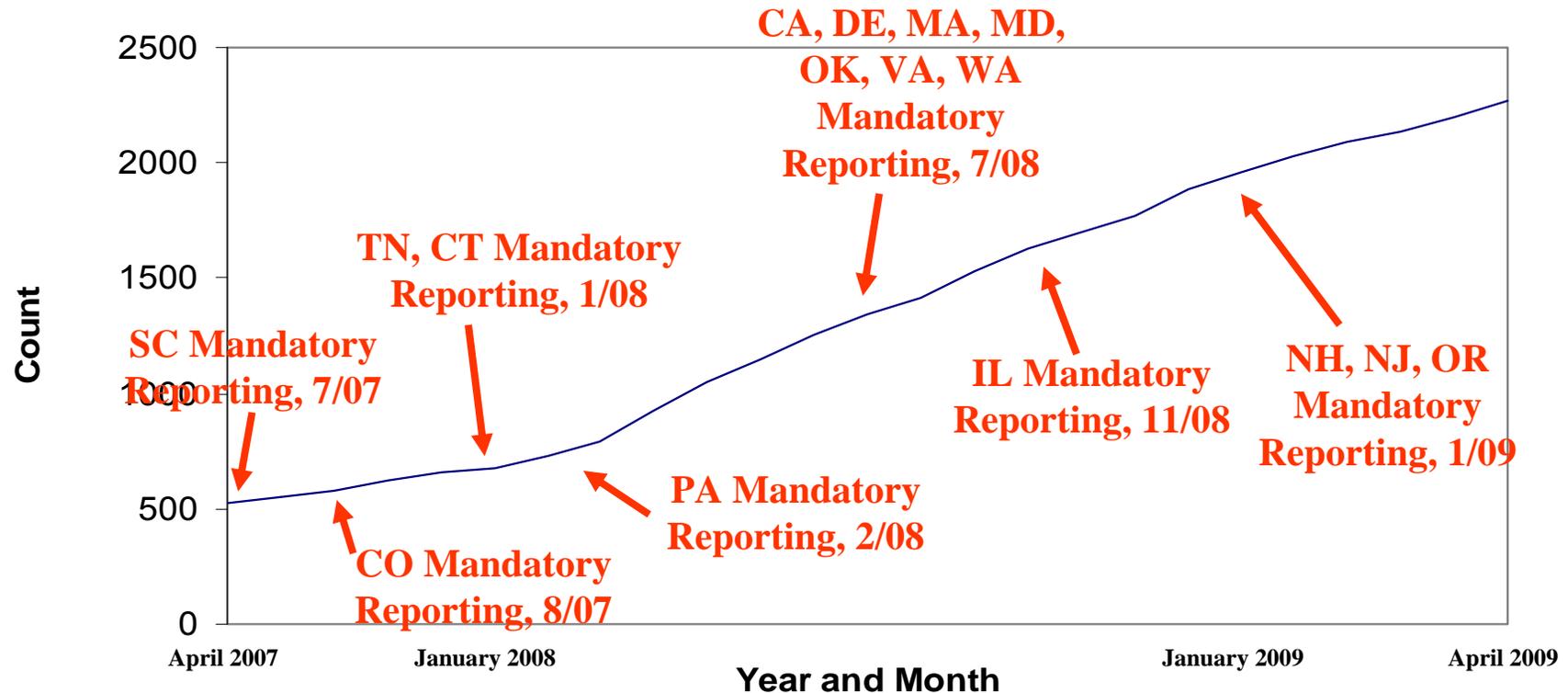


CLABSI	CO, CT, DE, IL, MA, MD, NH, NJ, NY, OK, OR, PA, SC, TN, VA, VT, WA, WV
CAUTI	PA
SSI	CO, MA, NH, NJ, NY, OR, PA, SC, TN, VT
VAP	NH, OK, PA, WA
Dialysis events	CO
Process measures	CA, DE, MD, NH, NJ, PA, VT, WV



State of NHSN: Continued Growth (n=2306)

Number of NHSN Facilities Enrolled By Month





Why use NHSN for HAI Reporting?



- Provides standard definitions, protocols and methodology
- Not just a reporting tool, comparative rates used for performance improvement
- Useful analysis tools are included
- CDC provides training and user support
- Use of the application is free
- Ability to share data with a Group



What is a Group in NHSN?

- A Group is a collection of facilities that have joined together within the NHSN framework to share some or all of their data at a single (Group) level for a mutual purpose (e.g., performance improvement, state and/or public reporting).



Steps to form a Group in NHSN

1. Complete required reading and training for the Group Administrator or Group User
2. An NHSN facility “nominates” the Group
3. The Group Administrator obtains a digital certificate
4. The Group Administrator adds additional users to the group and sets a Group joining password.
5. The Group Administrator sends the Group ID and Group joining password to facilities and invites them to join the Group
6. Facilities join the Group and confer some/all rights to data



1. Materials and Training for Group Users

- The NHSN Group Administrator Guide
- The NHSN Patient Safety Component Manual AND accompanying materials:
 - Tables of Instructions
 - Data Collection Forms

<http://www.cdc.gov/NHSN>

The screenshot shows the CDC website for the National Healthcare Safety Network (NHSN). The main heading is "National Healthcare Safety Network (NHSN)". A left sidebar contains a navigation menu with items like "About NHSN", "Communication Updates", "Enrollment Requirements", "Patient Safety Component", "Healthcare Personnel Safety Component", "Biovigilance Component", "Data Collection Forms", and "NHSN Training". The "NHSN Training" section is expanded to show "FAQs About NHSN Training", "Data & Statistics", "Resource Library", and "Contact NHSN".

The main content area is titled "Webcast training lectures" and includes the following text: "These training sessions are available for those who need to fulfill the training requirements of the NHSN, or for those who need a refresher on a particular topic." and "The NHSN requires that each of its users is thoroughly trained before enrolling in or using the system. The training requirements differ depending on the role of the NHSN user."

Under the "Enrollment" section, there are three links:

- [NHSN Enrollment & Facility Start-up](#)
Required for: All new NHSN Facility Administrators
- [Overview of NHSN, Device-associated module \(CLABSI, VAP, CAUTI\)](#)
Audience: All NHSN users including Facility Administrators and Group Administrators.
- [Conferring Rights to Groups](#)
Audience: Group Users, Facility administrators already joined to a group or interested in joining a group and conferring rights
- [Confer Rights to Group How-to Guide](#)
Audience: Group Users, Facility administrators already joined to a group or interested in joining a group and conferring rights

On the right side of the page, there is an "On This Page" section with a list of links: Enrollment, Data Entry, Surveillance, Analysis, Patient Safety Component, Healthcare Personnel Safety Component, and Biovigilance Component. Below this are utility links for "Text size", "Email page", "Print page", and "Bookmark and share". There is also a "Get email updates" section with a text input field and a "Submit" button. At the bottom right, there is a "Contact NHSN" section with the CDC logo and address: "Centers for Disease Control and Prevention, National Healthcare Safety Network, MS-A24".



2. An NHSN Facility “Nominates” the Group

- Selects Nominate from the Group section of NHSN Nav Bar
- Enters the name and type of Group
- Enters the information about the Group Administrator
- Nominating a group does not automatically join the facility to the group
- ⚠ Only ONE facility should do the group nomination
- ⚠ Provide the nominator with your correct e-mail address, it
- ⚠ MUST match your digital certificate



[NHSN Home](#)

[Reporting Plan](#)

[Patient](#)

[Event](#)

[Procedure](#)

[Summary Data](#)

[Analysis](#)

[Surveys](#)

[Users](#)

[Facility](#)

[Group](#)

[Confer Rights](#)

[Join](#)

[Leave](#)

[Nominate](#)

[Log Out](#)

Logged into DHQP MEMORIAL HOSPITAL (ID 10018) as MAGGIE.
Facility DHQP MEMORIAL HOSPITAL (ID 10018) is following the PS component.

Nominate Group



Note: This form should be used for nominating organizations that serve as groups. If the proposed administrator for the group is already a user in the NHSN system, check the **Use Existing NHSN User** option below. For that case you will be prompted to enter the unique e-mail address of that person.

If the proposed administrator does not already exist, check the **Create New NHSN User** option. For that case you will be prompted to provide a User ID and initial password for that user along with the person's name, email address, and phone number.

Enter group data

Mandatory fields marked with *

Group Name*:

Type of Group*:

If group type is **Other**, enter type here:

Group Administrator Information*

Use existing NHSN user Create new NHSN user

Note: To specify a new user as the administrator of this group, enter that person's name, email address, and phone number, and then hit the **Submit** button. The new group administrator will be notified when the group has been added, and will supply potential member facilities with the information necessary to join the group including the joining password.



3. The Nominated Group Administrator...

- Receives an email notification from NHSN containing the Group ID and instructions about obtaining a digital certificate
 - If you already have a digital certificate, you don't need a new one
 - Just request a new program/activity:
 - Program: National Healthcare Safety Network (NHSN)
 - Activity: NHSN Reporting
- Groups do not enroll and do not require an enrollment number





4. The Group Administrator Adds Users and Sets a Password

- Logs in to NHSN Reporting, adds other Group users, and sets Group joining password
- Shares the Group ID and joining password with those NHSN facilities that should join the group

 The Group ID is a 5-digit number assigned by NHSN, not the Group Name.

 The Group joining password is case sensitive and special characters are not recommended.



Setting the Group Joining Password





Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network

Logged into Maggie's Test Group (ID 11933) as MAGGIE.
All Facilities Selected.

Memberships

Facilities whose data can be accessed by this group

Set joining password for this group

New Password:

Verify New Password:

Enter and verify the joining password.
Click "Set Password."

- NHSN Home
- Reporting Plan
- Patient
- Event
- Procedure
- Summary Data
- Analysis
- Surveys
- Users
- Organization
 - Organization Info
 - Find
 - Joining Password**
 - Evict Members
- Log Out



5. The Group Administrator Invites Facilities to Join

- From the Group section of NHSN Nav Bar, the Facility Administrator selects Join
- Enters the Group ID
- Enters the Group Joining Password

 A facility can join as many groups as they want to or need to.



Join a Group



Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network

[NHSN Home](#) | [My Info](#) | [Contact us](#) | [Help](#) | [Log Out](#)

[NHSN Home](#)

[Reporting Plan](#)

[Patient](#)

[Event](#)

[Procedure](#)

[Summary Data](#)

[Analysis](#)

[Surveys](#)

[Users](#)

[Facility](#)

[Group](#)

[Confer Rights](#)

[Join](#)

[Leave](#)

[Nominate](#)

[Log Out](#)

Logged into DHQP Memorial Hospital (ID 10000) as CATHY.
Facility DHQP Memorial Hospital (ID 10000) is following the PS component.

Memberships

Groups that have access to this facility's data

- Cathy's test group (14220)
- Georgi
- Group
- Group2
- Maggie

Confer

[? HELP](#)

[? HELP](#)

Windows Internet Explorer



The decision to confer rights to a group is a decision made by a facility administrator. Existence of a group organization in NHSN should not be construed as a recommendation from CDC to join the group. CDC cannot be held accountable for how group users use data access granted to the group by a facility.

OK

Enter

Group Joining Password:

Join Group

[? HELP](#)

Back



6. Facilities Confer Rights to the Group

- Facility gives access rights to certain pieces of its data to the Group
- Group can analyze the data of its member facilities
- NHSN facilities in the Group cannot see one another's data
- Facilities can confer rights
 - By Component
 - By Plan status
 - By Location
 - By Date Range
 - By Procedure/Setting
 - By Event

Confer Rights to a Group

The screenshot shows the NHSN web application interface. At the top, the CDC logo and the text 'Department of Health and Human Services Centers for Disease Control and Prevention' are visible. Below this, the NHSN logo and 'NHSN - National Healthcare Safety Network' are displayed. A navigation bar includes links for 'NHSN Home', 'My Info', 'Contact us', 'Help', and 'Log Out'. The user is logged in as 'CATHY' at 'DHQP Memorial Hospital (ID 10000)'. The main heading is 'Confer Rights-Patient Safety'. A message states: 'Please select the rights that group 'Cathy's test group' should have to facility 'DHQP Memorial Hospital''. There are two tabs: 'Patient Safety' (selected) and 'Biovigilance'. A 'HELP' button is present. The 'General' section contains a table with columns for 'Patient', 'Monthly Reporting Plan', 'Data Analysis', 'AUR Microbiology Laboratory Data', and 'AUR Pharmacy Data'. The 'View Options' section shows 'With Identifiers' and 'Without Identifiers' radio buttons, with 'Without Identifiers' selected. The 'Surveys' section has a table with columns for 'Year', 'Year', and 'Survey Type'. The first row shows '2008' in the first 'Year' column, an empty 'Year' column, and 'Facility Survey Data' in the 'Survey Type' column. There are 'Add Row' and 'Clear All Rows' buttons at the bottom.

Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network | NHSN Home | My Info | Contact us | Help | Log Out

Logged into DHQP Memorial Hospital (ID 10000) as CATHY.
Facility DHQP Memorial Hospital (ID 10000) is following the PS component.

Confer Rights-Patient Safety

Please select the rights that group 'Cathy's test group' should have to facility 'DHQP Memorial Hospital'

[HELP](#)

Patient Safety | **Biovigilance**

General

	View Options
Patient	<input checked="" type="checkbox"/> <input type="radio"/> With Identifiers <input checked="" type="radio"/> Without Identifiers
Monthly Reporting Plan	<input checked="" type="checkbox"/>
Data Analysis	<input checked="" type="checkbox"/>
AUR Microbiology Laboratory Data	<input type="checkbox"/>
AUR Pharmacy Data	<input type="checkbox"/>

Surveys

Year	Year	Survey Type
<input type="button" value="X"/> 2008	to	Facility Survey Data

- Confer rights to patient data, with or without identifiers
- Conferring rights to the Annual Hospital Survey will allow the Group to see the Facility's name, address, phone, and facility type

Confer Rights to a Group



Infections and other Events (Not specific to MDRO/CDAD)

Plan	Month	Year	Month	Year	Event
In	1	2008	to		BSI - Bloodstream Infection (CLA)
Location type:		Location:			
(ALL)		MICU - MEDICAL ICU			

Plan	Month	Year	Month	Year	Event
In	1	2008	to		SSI - Surgical Site Infection
Procedure:		Setting:			
HPRO - Hip prosthesis		In			

Add Row Clear All Rows Copy Locations to Summary Data Copy Procs to Denominator data

Summary Data for Events

Plan	Month	Year	Month	Year	Location Type	Location
In	1	2008	to		(ALL)	MICU - MEDICAL ICU

Add Row Clear All Rows

Denominator Data for Events

Plan	Month	Year	Month	Year	Procedure	Setting
In	1	2008	to		HPRO - Hip prosthesis	In

- Can copy all locations to the Summary Data section
- Can copy all procedures to the Denominator Data section



After Facilities Join the Group

The screenshot shows the NHSN Landing Page with the following elements:

- Header: CDC logo, Department of Health and Human Services, Centers for Disease Control and Prevention, NHSN - National Healthcare Safety Network, Contact us
- Section: **Welcome to the NHSN Landing Page**
- Text: Select a facility and component, then click Submit to go to the Home Page.
- Form fields:
 - Select facility/group from dropdown list: Gp: Cathy's test group (ID 14220)
 - Select facility within the above group: All Facilities (dropdown menu)
 - Select component: All Facilities, DHQP Memorial Hospital (1 0000), NHSN TestMedical Clinic#3 (14352)
- Submit button
- Footer: Adobe Reader logo and link: [Get Adobe Acrobat Reader for PDF files](#)

- The Group users will be able to access data from all their member facilities or they can select a single facility.

After Facilities Join the Group



Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network

Logged into Cathy's test group (ID 14220) as CATHY.
All Facilities Selected.

NHSN Home | My Info | Contact us | Help

Reporting Plan
Patient
Event
Procedure
Summary Data
Analysis
Generate Data Sets
Output Options
Surveys
Users
Organization
Log Out

Patient Safety Component

Analysis Output Options

Expand All Collapse All

- Device-Associated Module
 - All Device-Associated Events
 - Central Line-Associated BSI
 - CDC Defined Output
 - Line Listing - All CLAB Events
 - Frequency Table - All CLAB Events
 - Bar Chart - All CLAB Events
 - Pie Chart - All CLAB Events
 - Rate Table - CLAB Data for ICU-Other
 - Control Chart - CLAB Data for ICU-Other
 - Rate Table - UCAB/CLAB Data for NICU
 - Control Chart - UCAB/CLAB Data for NICU
 - Rate Table - CLAB Data for SCA
 - Control Chart - CLAB Data for SCA
 - Ventilator-Associated PNEU
 - Urinary Catheter-Associated UTI
 - Central Line Insertion Practices
 - Dialysis Events
 - Procedure-Associated Module
 - Medication-Associated Module
 - MDRO/CDAD Module - Infection Surveillance

- Many analysis options are available to the Group users from within NHSN



After Facilities Join the Group and Confer Rights



National Healthcare Safety Network

Line Listing for All Device-Associated Events

As of: June 5, 2009 at 1:53 PM

Date Range: DA_EVENTS admDateYr 2008 to 2009

orgID	patID	dob	gender	admitDate	eventID	eventDate	eventType	centralLine	location	locCDCDesc	spcEvent
10000	134655	09/22/1956	F	10/02/2008	1478627	10/14/2008	BSI	Y	MICU	Medical Critical Care	LCBI
10000	MD-4050	03/12/1963	F	03/03/2009	1756275	03/12/2009	BSI	Y	MICU	Medical Critical Care	LCBI
10000	MD-4060	02/03/1954	F	03/15/2009	1808572	03/26/2009	BSI	Y	MICU	Medical Critical Care	LCBI
10000	MD-3005	06/05/1946	F	03/22/2009	1913748	03/30/2009	BSI	Y	MICU	Medical Critical Care	LCBI
10000	CA123	01/01/1970	F	01/01/2009	1985653	01/05/2009	BSI	Y	MICU	Medical Critical Care	LCBI

Sorted by eventType

Data contained in this report were last generated on June 5, 2009 at 1:40 PM.

National Healthcare Safety Network

Rate Table for All Device-Associated Data

As of: June 5, 2009 at 1:43 PM

Date Range: All DA_RATES

Device-Associated Rates

orgID=10000 loccdc=IN:ACUTE:CC:M location=MICU

eventType	inf	numddays	rate	NHSN_mean	IDR_pval	IDR_pctl
CLAB (central line assoc BSI)	1	200	5.0	2.4	0.3761	87

Source of aggregate data: NHSN Report, Am J Infect Control 2008;36:609-26

Data contained in this report were last generated on June 5, 2009 at 1:40 PM.



After Facilities Join the Group

Department of Health and Human Services
Centers for Disease Control and Prevention

NHSN - National Healthcare Safety Network | NHSN Home | My In

Logged into Cathy's test group (ID 14220) as CATHY.
All Facilities Selected.

Export Output Options

Exporting data set CLAB_Events: Select data export format

- Microsoft Access table (*.mdb)
- Microsoft Access table (*.mdb)
- Microsoft Access 97 table (*.mdb)
- delimited file (comma-separated values) (*.csv)
- delimited file (tab-delimited values) (*.txt)
- Excel spreadsheet (*.xls)
- Excel 5.0 or 7.0 (95) spreadsheet (*.xls)
- dBASE 5.0, IV, III+, III, and II files (*.dbf)**
- SAS for Windows V7/8/9 (*.sas7bdat)

Export Back

- Data sets can be exported to various other programs for review and analysis.



Summary of the NHSN Group Function

- Any entity can form a group in NHSN
- An NHSN facility “nominates” the group
- Facilities join the group and confer some/all rights to data
- The Group can analyze the data of its member facilities
- Facilities within the Group cannot see each other’s data
- Facilities can join as many groups as they like



CDC Support for the Group-Level User

- Consultation on experience from other States
- Presentations to Advisory Groups
- Collaboration with CSTE, SHEA, APIC, IDSA, other Federal agencies including CMS and AHRQ
- Access to “test” facilities
- NHSN State Users Group
 - Conference calls monthly
 - Web Board to share materials
- Consultation on analysis, HAI comparison metrics



NHSN Team Members

- Protocols and definitions support
 - Kathy Allen-Bridson
 - **Gloria Morrell**
 - Maggie Dudeck
- Technical support
 - Yvonne Smith
 - **Tiffany Dozier**
- State and other Groups support
 - Cathy Rebmann
 - **Paul Malpiedi**
 - **Alexis Harvey**
- Reports and statistics support
 - Jonathan Edwards
 - Yi Mu



<http://www.cdc.gov/NHSN>
nhsn@cdc.gov



National Healthcare Safety Network (NHSN)

The National Healthcare Safety Network (NHSN) is a voluntary, secure, internet-based surveillance system that integrates and expands legacy patient and healthcare personnel safety surveillance systems managed by the Division of Healthcare Quality Promotion (DHQP) at CDC. NHSN also includes a new component for hospitals to monitor adverse reactions and incidents associated with receipt of blood and blood products. Enrollment is open to all types of healthcare facilities in the United States, including acute care hospitals, long term acute care hospitals, psychiatric hospitals, rehabilitation hospitals, outpatient dialysis centers, ambulatory surgery centers, and long term care facilities. For more information, click on the topics below.



MDRO

Stay Updated! »

Biovigilance

Text size: [S](#) [M](#) [L](#) [XL](#)

[Email page](#)

[Print page](#)

[Bookmark and share](#)

Get email updates

To receive email updates about NHSN, enter your email address:

[What's this?](#)

Topics

About NHSN

Overview, Confidentiality, How data is used...

Enrollment Requirements

Eligibility, How to enroll, Training, System Requirements, Security...

Resource Library

Reports, Manuals, Newsletters, Forms...

Data Collection Forms

Forms provided for routine data collection including customizable forms to meet specific needs...

Patient Safety Component

Procedure, Device (Dialysis Event), Medication-associated, MDRO, & HRIIV Modules

Healthcare Personnel Safety Component

Overview, Blood/Body Fluids Exposure; & Influenza Vaccination

Biovigilance Component

Overview, Hemovigilance Module Publications...

NHSN Training

Training webcast, corresponding slidesets, and materials...

Data & Statistics

States with Facilities Using NHSN (total=2186)



CDC currently supports more than 2000 hospitals that are using NHSN and 19 states require hospitals to report HAI's using NHSN.

[More Data & Statistics »](#)

Contact NHSN:

Centers for Disease Control and Prevention
National Healthcare Safety Network
MS-A24
1600 Clifton Rd
Atlanta, GA 30333

nhsn@cdc.gov

[More contact info »](#)



Prevention Collaboratives



Establishing HAI Prevention Collaboratives using ARRA Funds

SAFER • HEALTHIER • PEOPLE™



Establish a Prevention Collaborative

- Activity C in Funding Opportunity Number: CI07-70402ARRA09
- “Establish multicenter evidence-based HAI prevention collaboratives among acute care hospitals within the state”
- “Make measurable progress toward the National Prevention Targets outlined in the HHS Action Plan to Prevent Healthcare-Associated Infections”



Why a Prevention Collaborative?

- Rethinking the preventable fraction
 - Prevention successes
- Organizational theory
 - Healthcare facilities as complex adaptive systems likely to benefit from collaboration
- Evidence for collaboratives in other disciplines



What is the Preventable Fraction of Healthcare-Associated Infections?



What is the Preventable Fraction of Healthcare-Associated Infections?

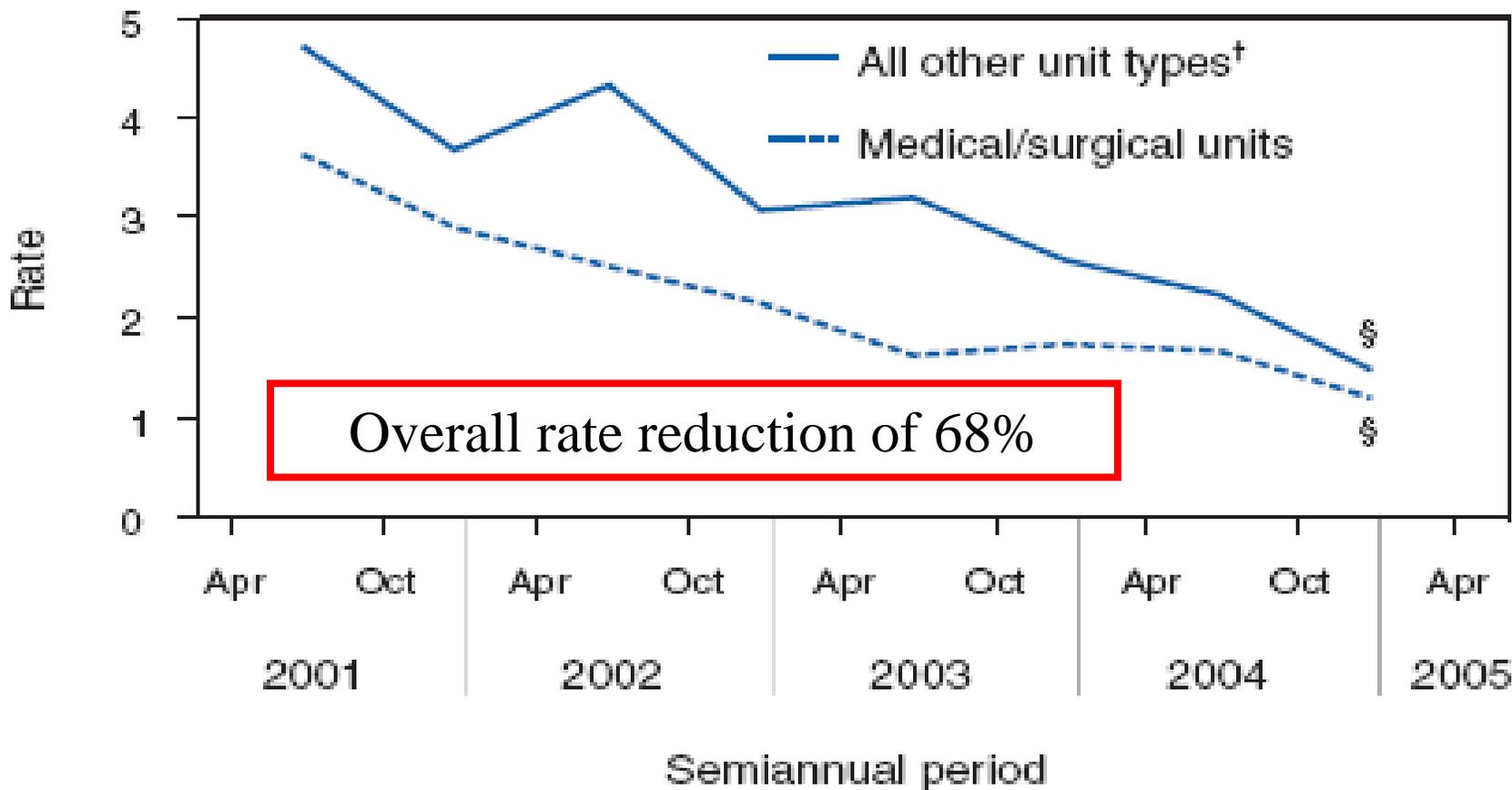
- Study on the Efficacy of Nosocomial Infection Control (SENIC) study results
 - 1971-1976
 - Suggested 6% of all nosocomial infections could be prevented by minimal infection control efforts, 32% by “well organized and highly effective infection control programs
- Harbarth et al: at least 20% of infections are preventable J Hosp Infection 2003;54:258



What is the Preventable Fraction of Healthcare-Associated Infections?

- Some may have interpreted these data to mean that most healthcare-associated infections are inevitable
 - What impact has this had on the psychology of prevention?
- How has this influenced the way infection control programs operate?
 - Difficult to define success when achievable results unknown-what should the goal be?

FIGURE. Central line–associated bloodstream infection rate* in 66 intensive care units (ICUs), by ICU type and semiannual period — southwestern Pennsylvania, April 2001–March 2005

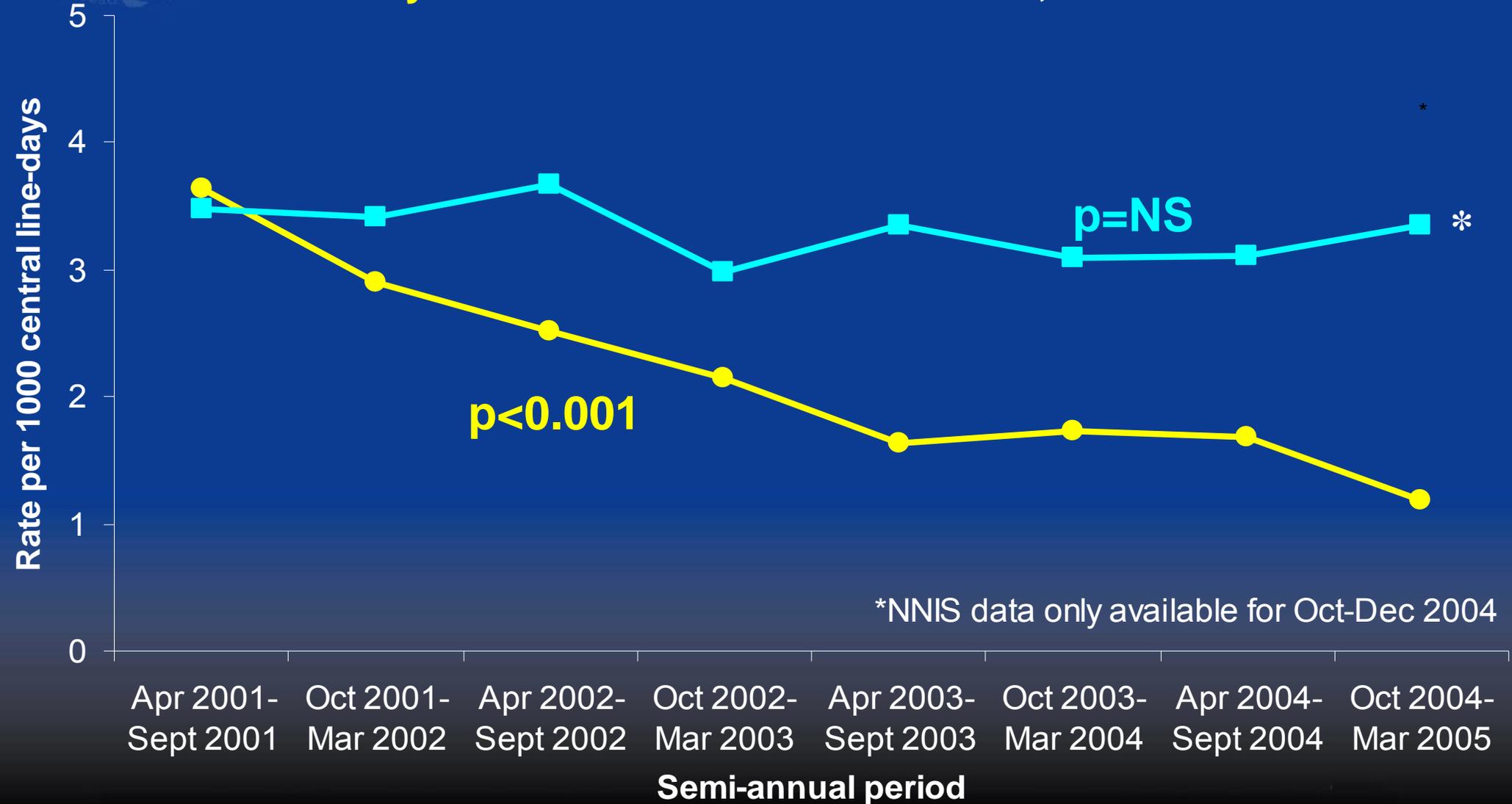


* Pooled mean rate per 1,000 central line days.

[†] Includes cardiothoracic, coronary, surgical, neurosurgical, trauma, medical, burn, and pediatric ICUs.

[§] $p < 0.001$.

Semi-Annual Central Line-associated Bloodstream Infection Rates in Medical-Surgical Intensive Care Units Participating in the Southwest Pennsylvania Collaborative and NNIS, 2001-2005





Michigan Keystone ICU Project

Table 3. Rates of Catheter-Related Bloodstream Infection from Baseline (before Implementation of the Study Intervention) to 18 Months of Follow-up.*

Study Period	No. of ICUs	No. of Bloodstream Infections per 1000 Catheter-Days				
		Overall	Teaching Hospital	Nonteaching Hospital	<200 Beds	≥200 Beds
<i>median (interquartile range)</i>						
Baseline	55	2.7 (0.6–4.8)	2.7 (1.3–4.7)	2.6 (0–4.9)	2.1 (0–3.0)	2.7 (1.3–4.8)
During implementation	96	1.6 (0–4.4)†	1.7 (0–4.5)	0 (0–3.5)	0 (0–5.8)	1.7 (0–4.3)†
After implementation						
0–3 mo	96	0 (0–3.0)‡	1.3 (0–3.1)†	0 (0–1.6)†	0 (0–2.7)	1.1 (0–3.1)‡
4–6 mo	96	0 (0–2.7)‡	1.1 (0–3.6)†	0 (0–0)‡	0 (0–0)†	0 (0–3.2)‡
7–9 mo	95	0 (0–2.1)‡	0.8 (0–2.4)‡	0 (0–0)‡	0 (0–0)†	0 (0–2.2)‡
10–12 mo	90	0 (0–1.9)‡	0 (0–2.3)‡	0 (0–1.5)‡	0 (0–0)†	0.2 (0–2.3)‡
13–15 mo	85	0 (0–1.6)‡	0 (0–2.2)‡	0 (0–0)‡	0 (0–0)†	0 (0–2.0)‡
16–18 mo	70	0 (0–2.4)‡	0 (0–2.7)‡	0 (0–1.2)†	0 (0–0)†	0 (0–2.6)‡

* Because the ICUs implemented the study intervention at different times, the total number of ICUs contributing data for each period varies.

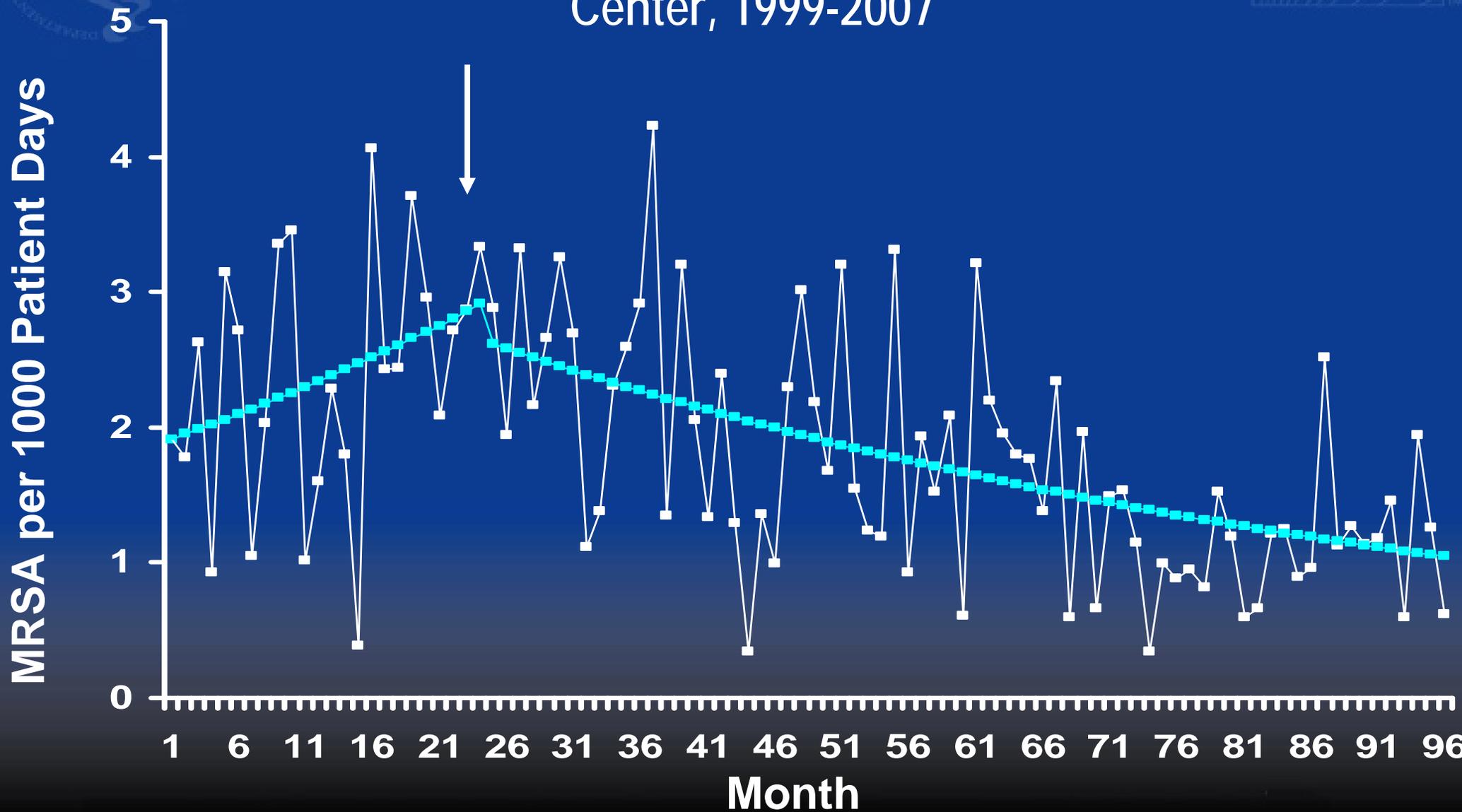
Of the 103 participating ICUs, 48 did not contribute baseline data. P values were calculated by the two-sample Wilcoxon rank-sum test.

† P≤0.05 for the comparison with the baseline (preimplementation) period.

‡ P≤0.002 for the comparison with the baseline (preimplementation) period.



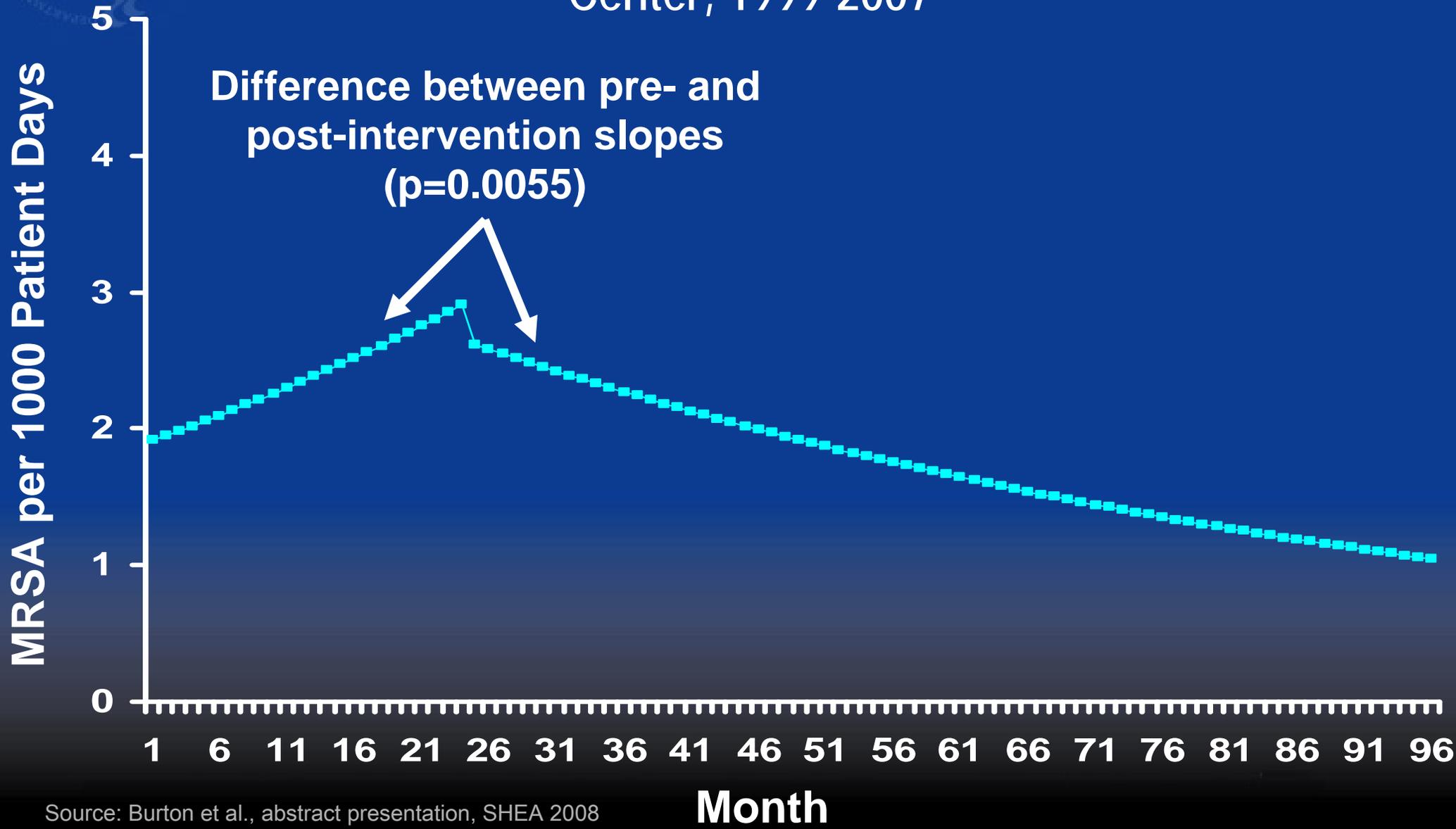
MRSA Incidence, Veterans Affairs Pittsburgh Medical Center, 1999-2007



Source: Ellingson et al., abstract presentation, SHEA 2008



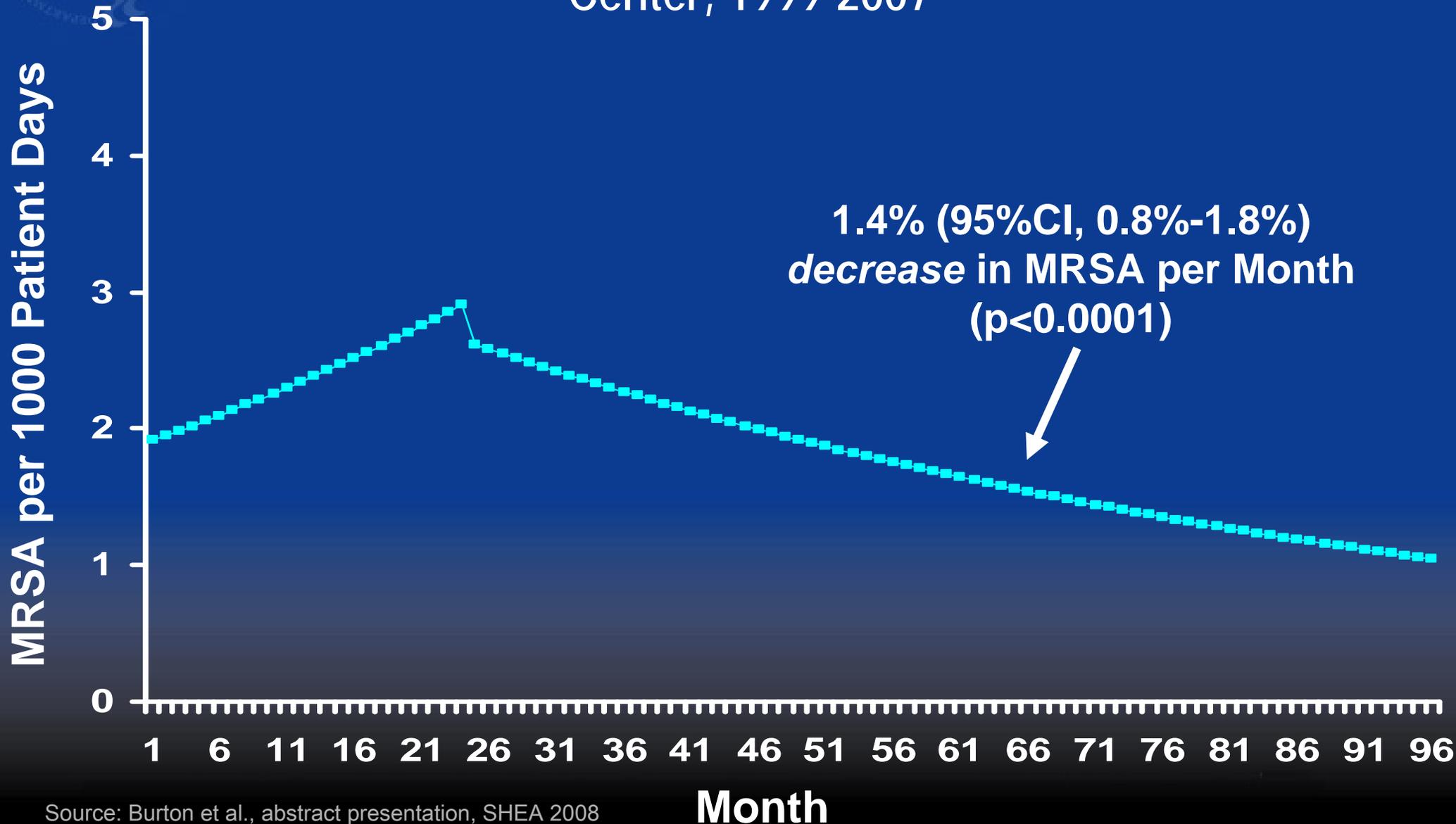
MRSA Incidence, Veterans Affairs Pittsburgh Medical Center, 1999-2007



Source: Burton et al., abstract presentation, SHEA 2008

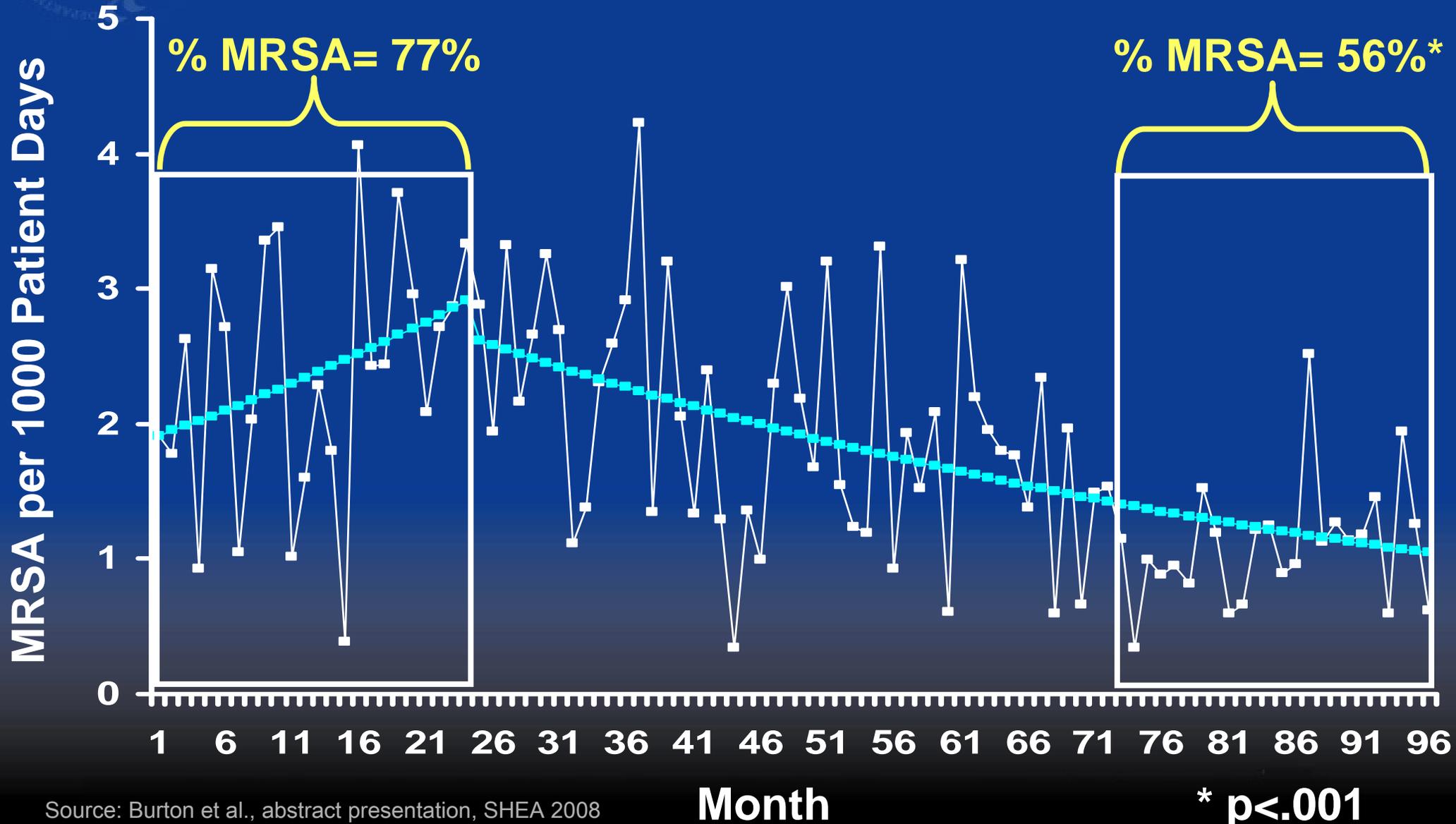


MRSA Incidence, Veterans Affairs Pittsburgh Medical Center, 1999-2007



Source: Burton et al., abstract presentation, SHEA 2008

MRSA Incidence, Veterans Affairs Pittsburgh Medical Center, 1999-2007

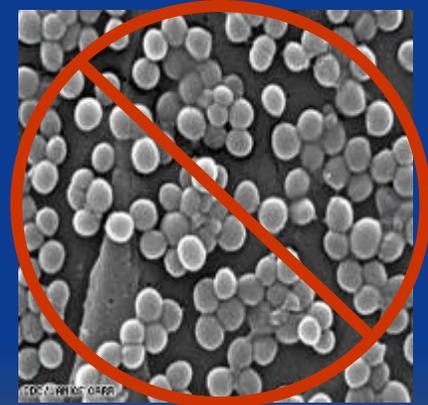


Source: Burton et al., abstract presentation, SHEA 2008

* p < .001

Positive Deviance MRSA Prevention Collaborative

- In 2006 three hospitals partnered with the Plexus Institute and CDC to implement MRSA prevention programs in acute care settings
- Began in early 2007
 - Positive Deviance approach
 - Hand hygiene
 - Contact precautions
 - Active Surveillance in ICUs only
- Hospitals agreed to share electronic data for objective evaluation of the intervention





Interrupted Time Series Analysis of MRSA Incidence



Effect	Hospital	Incidence Rate Ratio	p-value
Pre vs. Post Intervention Trend (β_3)	A	0.978	0.29
	B	0.951	<0.0001
	C	0.986	0.05
	Pooled	0.977	0.0008
Post Intervention Trend per Month ($\beta_1 + \beta_3$)	A	0.980	0.02
	B	0.949	<0.0001
	C	0.986	0.05
	Pooled	0.978	<0.0001

**Aggregate Post-Intervention % Decreases:
26%(A), 31%(B), 62%(C)**

Interrupted Time Series Analysis of Proportion of *S. aureus* Isolates Resistant to Methicillin



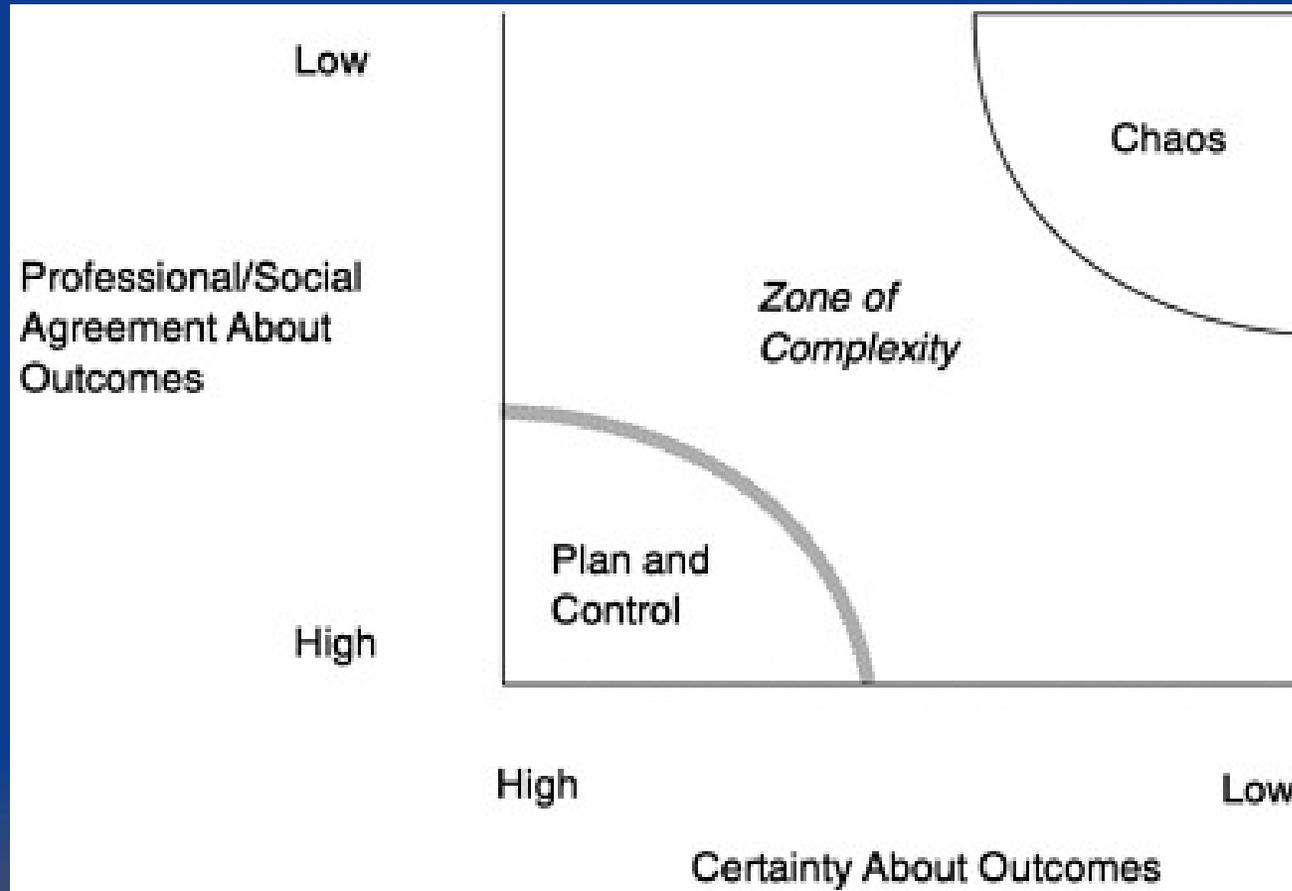
Effect	Hospital	Odds Ratio	p-value
Pre vs. Post Intervention Trend (β_3)	A	1.009	0.74
	B	0.972	0.15
	C	0.986	0.21
	Pooled	0.985	0.11
Post Intervention Trend per Month ($\beta_1 + \beta_3$)	A	0.990	0.44
	B	0.972	0.09
	C	0.983	0.11
	Pooled	0.983	0.02

**Aggregate Post-Intervention % Decreases:
7%(A), 15%(B), 28%(C)**



Different Organizational Theories of Healthcare Delivery

- Traditional Organizational Theories
 - Healthcare facilities viewed as machine-like, replaceable parts, if each part doing its job things will go smoothly
 - “well oiled machine”
- Organizational theory based on complexity science
 - Healthcare facilities viewed as dynamic, living, social systems, or “Complex Adaptive Systems”



**Stacey R.D. *Complexity and Creativity in Organizations.*
San Francisco, CA: Berrett-Koehler, 1996**



Complex Adaptive Systems

- Definition by Ralph Stacey:
 - CASs consist of a network of agents that interact with each other according to a set of rules that require them to examine and respond to each other's behavior to improve their behavior and thus the behavior of the system they comprise.



Complex Adaptive Systems

- Diverse fields of science have found value in complexity theory
 - Chemistry, Physics, Physiology, Mathematics, Sociology, Economics, Meteorology
- Examples of systems that have been studied as a Complex adaptive systems:
 - immune system
 - Human brain
 - a colony of social insects such as termites or ants
 - the stock market
 - almost any collection of human beings



Complex Adaptive Systems

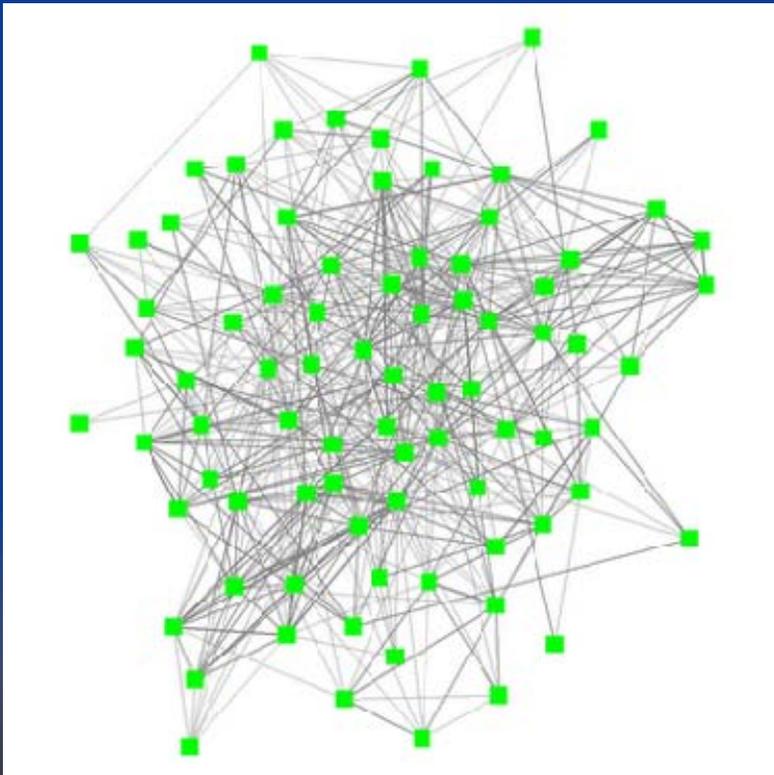
- **System implies:**
 - Multiple Agents
 - Agents are Interdependent and Connected
- **Complex implies:**
 - Diversity
 - Many Elements
 - Large Number of Connections
- **Adaptive implies:**
 - Capacity to Alter or Change



Complex adaptive systems depend upon interconnection to adapt, change, and transform

If healthcare facilities behave like complex adaptive systems, then they should benefit greatly from collaboration

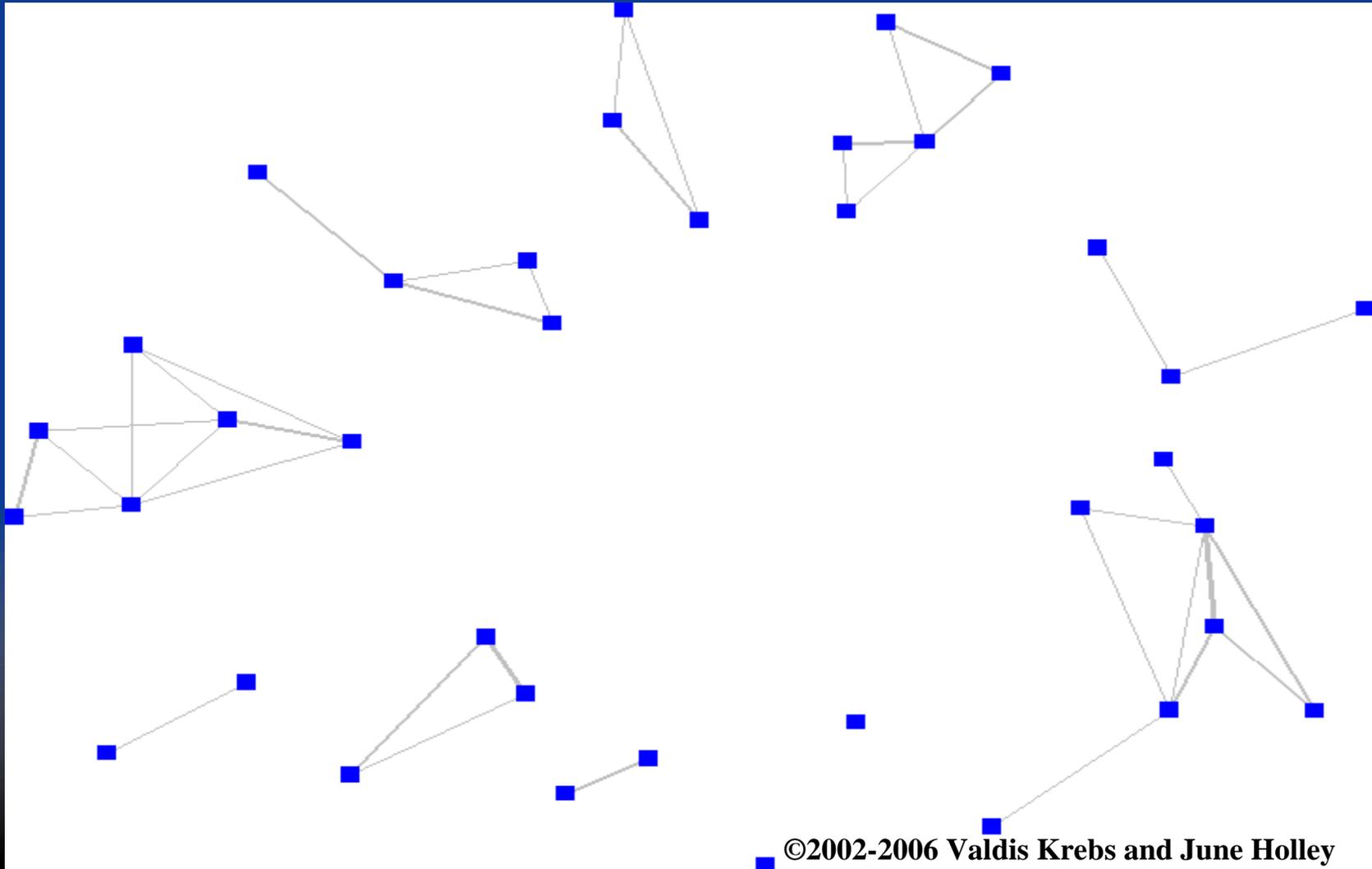
Social Network Mapping



- In building a “healthy” collaborative, groups generally emerge through 4 distinct phases:
 - Scattered Fragments
 - Single hub-and-spoke
 - Multi-hub network
 - Core/periphery

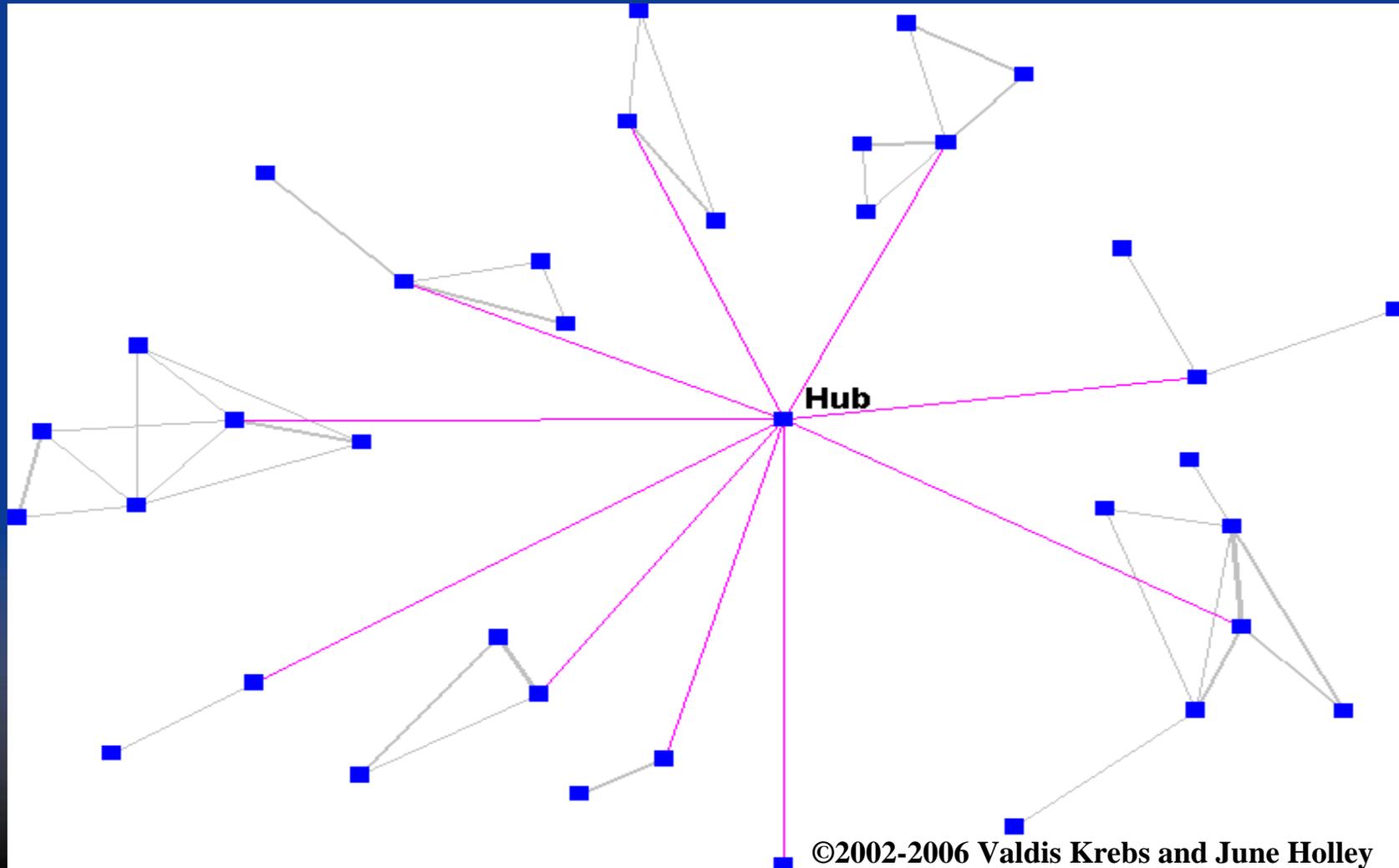


Scattered Fragments Network

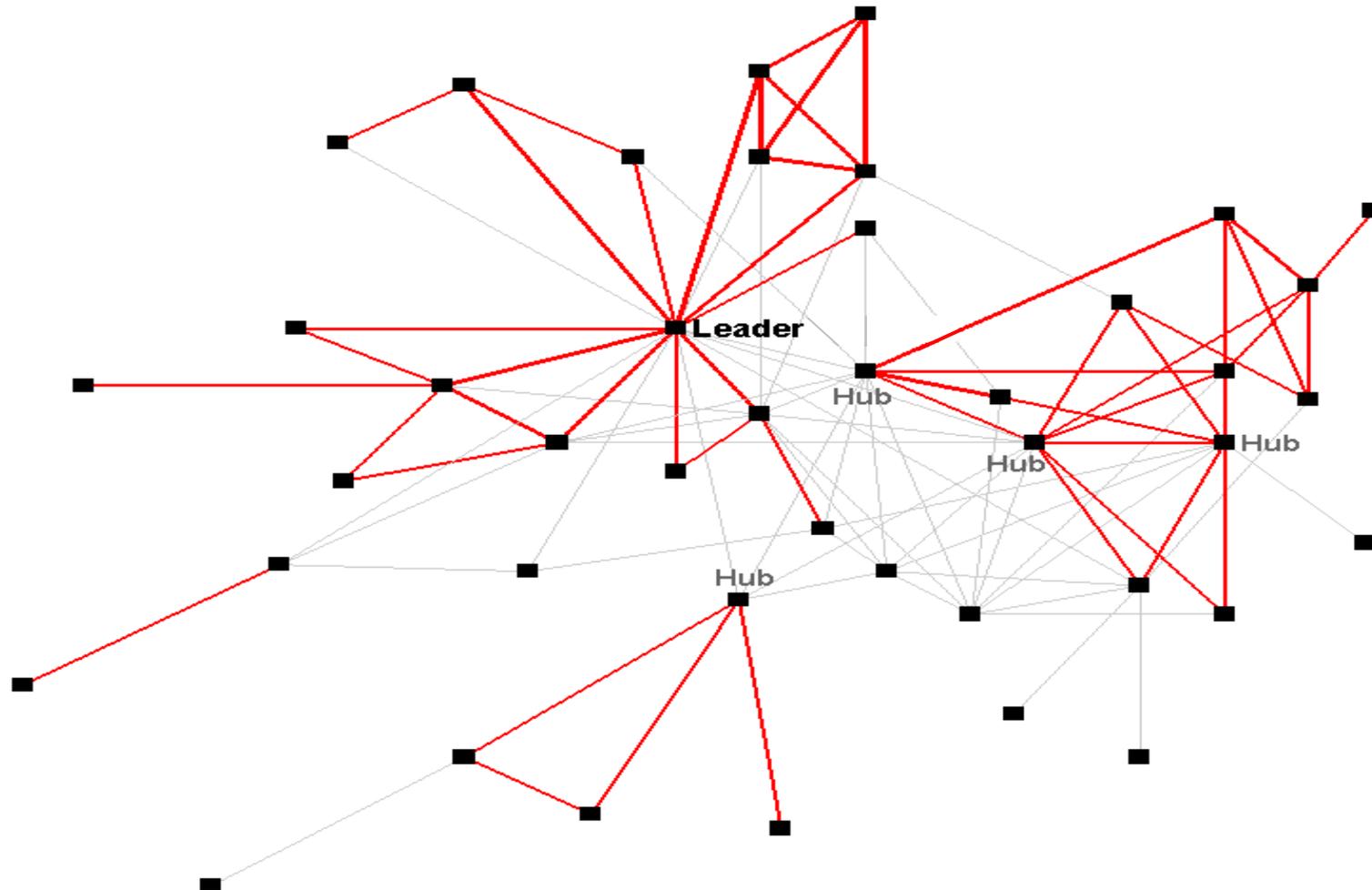


©2002-2006 Valdis Krebs and June Holley

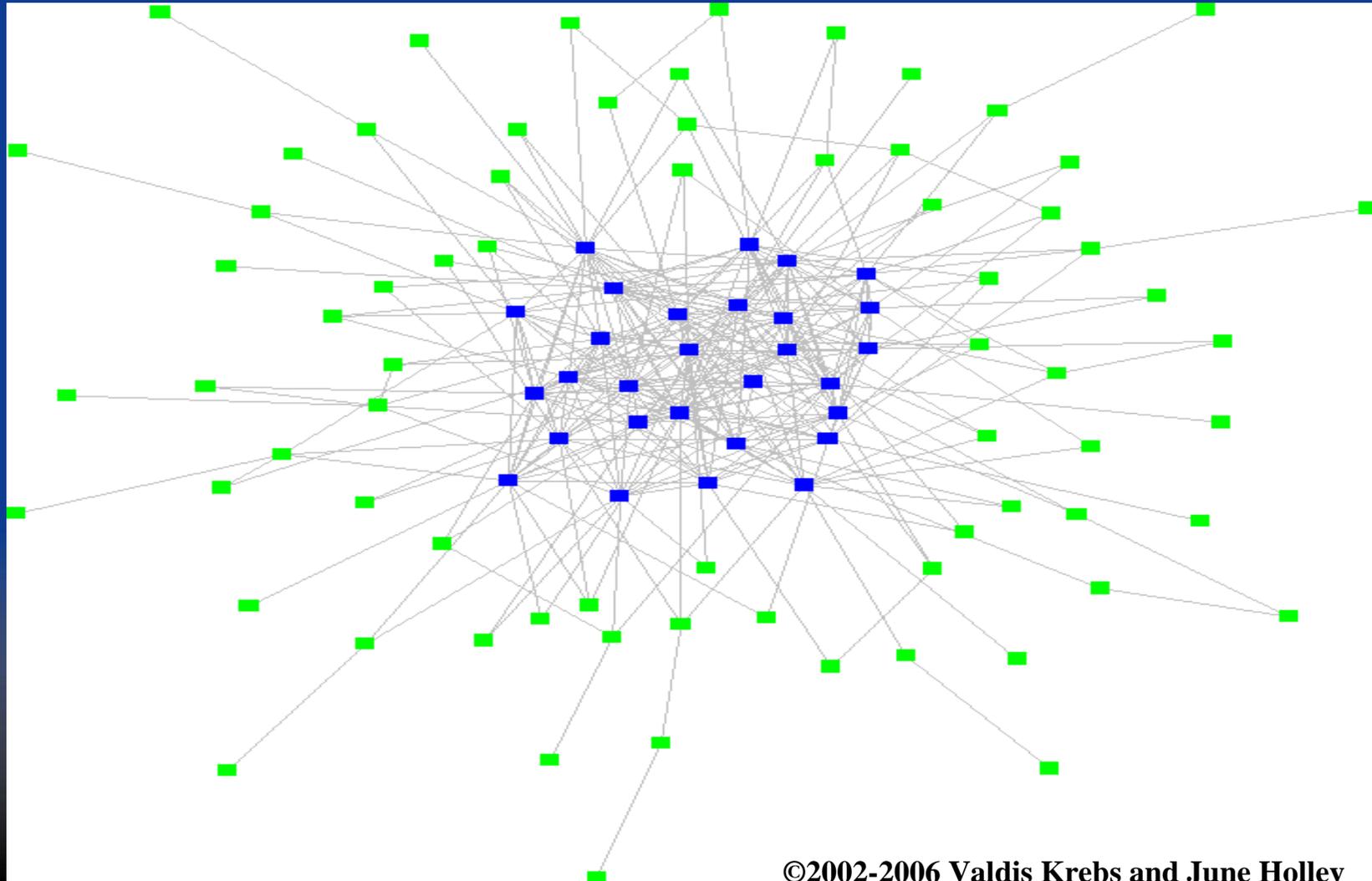
Single Hub-and-Spokes Network



Multi-hub Network



Core/Periphery Network





Quality Improvement Collaboratives Are Popular

- Northern New England Cardiovascular Disease Study Group
- SunHealth Alliance Internal Group Benchmarking Projects
- UniHealth's Collaborative on Joint Replacement
- Vermont-Oxford Neonatal Network
- Institute for Healthcare Improvement Breakthrough Collaboratives
- Pittsburgh Regional Healthcare Initiative
- Michigan Keystone
- Veteran's Health Affairs
- Health Disparities Collaborative (HRSA)
- United Kingdom's National Health Service
- Institute for Clinical Systems Improvement
- Rochester Health Commission
- Wisconsin Collaborative on Healthcare Quality



Evidence for Impact of Quality Improvement Collaboratives

- Limitations of the evidence base
 - Demand-induced bias
 - Most often published in management- and practitioner-oriented journals whose mission and readership attract practical guidance and insight from successful efforts
 - Methodologic Weakness
 - Commonly uncontrolled pre-post test analyses
 - Measures of process and outcome often rely on participant's unvalidated self-reports, lack of standardized surveillance methods/definitions
 - Often measured for short periods of time immediately following the intensive collaborative period

Mittman BS Ann Intern Med 2004;140:897-901



Evidence for Impact of Quality Improvement Collaboratives

- Recent Systematic Review (Loes et al. *BMJ* 2008;36;1491-1494)
 - Systematic review of published literature
 - Only 9 controlled studies
 - 7 studies reported an effect on some of selected outcome measures
 - 2 studies showed no significant effect
 - Conclusion
 - “The evidence underlying quality improvement initiatives is positive, but limited”



Why the Heterogeneity of Results?

- Possibilities:
 - Collaboration has no (or only modest) benefit
 - Effects are unpredictable
 - Intervention (i.e. effective collaboration) incorrectly or incompletely implemented in some cases
- Even if the collaboration itself is not responsible for improvement, the demonstrating improvement across a large group of healthcare facilities may be an important strategy for stimulating global changes in practice



Characteristics of Effective Collaboration

- Active support of leaders
 - Engagement of experts
- Free flow of information
 - informal
 - Formal
 - Use standardized, valid methodology for measuring outcomes
- Multiple individuals within a unit/facility interact and develop meaningful working relationships with those in other units/facilities
- Make use of the peripheries of individuals/organizations to draw in new ideas (i.e. diverse participation, involve the “unusual suspects”)



Characteristics of Effective Collaboration

- Support self organizing behavior
 - Encourage and coach individuals/facilities to form projects and test out ideas for improvement (even very small projects)
 - provide opportunities to share with the larger collaborative
- View collaborative as longer term commitment
- Regional collaboration may have special advantages



Objectives for Activity C in ARRA Funding

- Need an objective, standardized measure of outcomes
 - Use of NHSN: recommended
 - Consistency with NHSN definitions: required
- Constitute and convene a multidisciplinary advisory group
- Collaborate with ongoing activities in hospitals, hospital associations, others



Objectives for Activity C in ARRA Funding

- Identify/define participating hospitals
- At least three face-to-face meetings over the two years
- Establish multicenter evidence-based HAI prevention collaboratives
- Demonstrate progress toward reaching at least two HHS HAI Prevention Targets



Establishing a Multidisciplinary Oversight/Advisory Group

- Should involve multiple stakeholders
 - e.g. health department, healthcare facilities, payors, purchasers, consumers, hospital associations, professional organizations).
- Provides project leadership and guidance, including initial selection of targets for HAI prevention initiatives and ongoing project oversight



Establishing a Multidisciplinary Oversight/Advisory Group

- Examples of proposed metrics of activity
 - Letters of commitment from steering group members
 - Face to face meetings
 - Selection of targets for prevention collaborative (i.e. which HAIs will be targeted in the prevention collaborative?)
 - Selection of specific prevention goal
 - Regular feedback of outcomes to Steering group



What are the Staff Needs?

- Project coordination (managing logistics, coordinating meetings, coordinating communications, tracking progress, etc.)
- Expertise and/or training in healthcare infection control
- Expertise and/or training in coordinating multicenter collaborative prevention projects



How will You Facilitate Sharing of Information

- Successful prevention collaboratives are dependent upon mechanisms to facilitate sharing of information and data among participating facilities
 - face-to-face meetings
 - regularly scheduled teleconferences between face-to-face meetings
 - other supportive communication infrastructure for regular sharing between participants (web sites, listservs, etc.)



How will You Measure and Present Outcomes?

- Successful prevention collaboratives have standardized and uniform outcome measures that allow sharing of progress among participants and tracking aggregate group progress
 - Select measurement system (e.g. NHSN)
 - Establish willingness of facilities to participate in measurement system and share data with central coordinator
 - Demonstrate regular feedback of outcome data to participating facilities, to include a comparison of their individual performance to aggregate performance of others.



CDC Technical Support



Questions



Thank you!

CDC's Division of Healthcare Quality Promotion
<http://www.cdc.gov/ncidod/dhqp/>

Technical assistance specific to the Recovery Act project:

Telephone: (404) 639-4000

Email: DHQPHAIARRA@cdc.gov

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