The Use of NHSN in HAI Surveillance and Prevention

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Division of Healthcare Quality Promotion (DHQP)
Centers for Disease Control and Prevention (CDC)

January 12, 2010

Objectives

- What are healthcare associated infections (HAIs) and why are they important?
- What is the National Healthcare Safety Network (NHSN)?
  - Components and Modules
  - Surveillance methodology
- Who uses NHSN and what do they use it for?

Healthcare-associated Infections (HAIs)

Definition: Infections that patients acquire during the course of receiving treatment for other conditions within a healthcare setting

- 1.7 million HAIs
- 99,000 associated deaths
- $26-33 billion in excess costs
- Most common infections are:
  - bloodstream infections
  - urinary tract infections
  - pneumonias
  - surgical site infections

What is the National Healthcare Safety Network (NHSN)?

- A voluntary system for monitoring healthcare-associated events (e.g., infections or immunizations) and processes (e.g., hand washing)
- Integrates legacy systems for surveillance of nosocomial infections, healthcare worker safety, and hemodialysis into a single, secure, web-based system
- Combines facility-level clinical performance measurement with national-level public health surveillance
- Participating healthcare facilities use the NHSN application to enter, analyze, and share data

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

Components of NHSN

- Patient Safety
- Healthcare Personnel Safety
- Biovigilance
- Research and Development

The Patient Safety Component of NHSN

- **Patient Safety**
- Healthcare Personnel Safety
- Biovigilance
- Research and Development

Modules	Events (examples)
Device-Associated	Central line-associated bloodstream infection (CLABSI), Catheter-associated urinary tract infection (CAUTI)
Procedure-Associated	Surgical site infection (SSI)
MDRO and CDAD	Methicillin-resistant *Staphylococcus aureus* (MRSA) infection, adherence to active surveillance testing
HRIIV	Influenza vaccination (seasonal and/or H1N1) of patients

Using HAI Data to Drive Prevention

- The ultimate goal of collecting HAI data is to drive prevention efforts.
- HAI data can help identify:
  - Types of HAIs where attention is needed
  - Specific facilities where more prevention work might be needed
  - Specific locations within facilities where more prevention work might be needed

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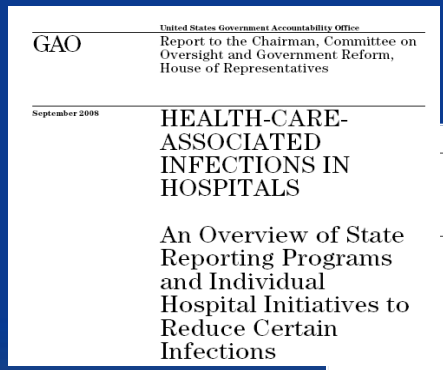
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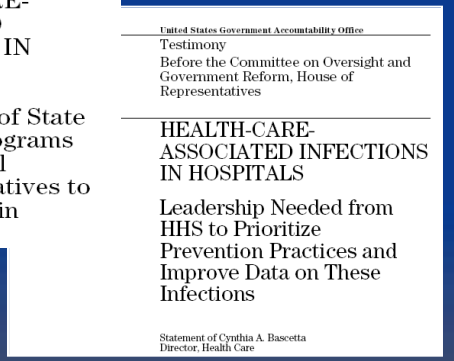
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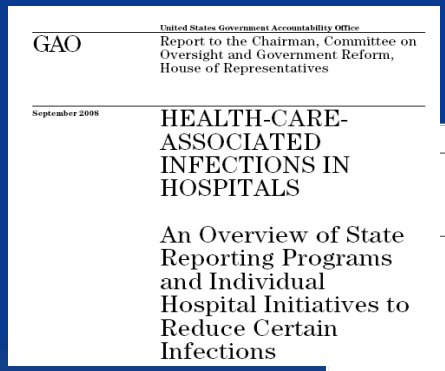
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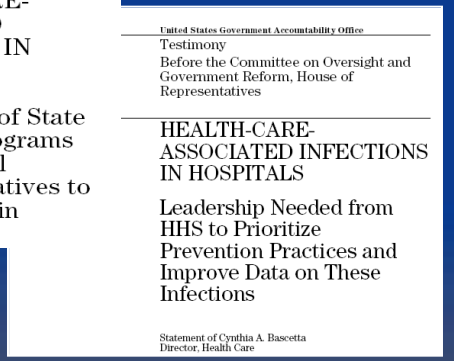
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Analysis: CLABSI Rate Tables

National Healthcare Safety Network

Rate Table for Central Line-Associated BSI Data for ICU-Other

As of: September 22, 2009 at 1:28 PM

Date Range: All CLAB_RATESICU

orgID=10018 loccdc=IN:ACUTE:CC:M

NHSN aggregate data
and comparative statistics

location	summaryYM	CLABCount	numCLDays	CLABRate	CLAB_Mean	IDR_pval	IDR_pctl	numPatDays	LineDU	LineDU_Mean	P_pval	P_pctl
MICU	2005M06	0	110	0.0	2.4	0.7714	10	299	0.37	0.58	0.0000	23
MICU	2005M07	0	266	0.0	2.4	0.5339	10	401	0.66	0.58	0.0004	78
MICU	2005M08	1	238	4.2	2.4	0.4296	80	494	0.48	0.58	0.0000	39
MICU	2005M09	0	288	0.0	2.4	0.5069	10	447	0.64	0.58	0.0030	58
MICU	2006M01	0	214	0.0	2.4	0.6036	10	439	0.49	0.58	0.0001	39
MICU	2006M02	1	302	3.3	2.4	0.5096	71	481	0.63	0.58	0.0168	58
MICU	2006M03	2	169	11.8	2.4	0.0612	100	401	0.42	0.58	0.0000	23
MICU	2006M11	0	100	0.0	2.4	0.7899	10	388	0.26	0.58	0.0000	13
MICU	2007M01	0	115	0.0	2.4	0.7624	10	330	0.35	0.58	0.0000	13
MICU	2007M02	0	219	0.0	2.4	0.5965	10	309	0.71	0.58	0.0000	78
MICU	2007M03	0	114	0.0	2.4	0.7642	10	385	0.30	0.58	0.0000	13

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Using CLABSI Data - Protecting Patients

Surveillance of CLABSIs is more than just counting infections and generating rates. Uses of CLABSI data include:

- Comparing CLABSI and Device Utilization (DU) Ratio data from your facility to aggregated, risk-adjusted NHSN rates.
- Comparing the location-specific CLABSI data to itself over time and identifying trends and "drill down" to determine the cause.
- Targeting infection prevention activities based on CLABSI data.
- Assessing the effectiveness of infection prevention interventions.
- Providing feedback to patient care staff who insert and maintain central lines.
- Promoting compliance with *Guidelines for the Prevention of Intravascular Bloodstream Infections*.

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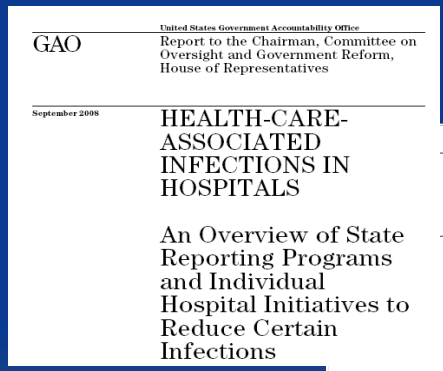
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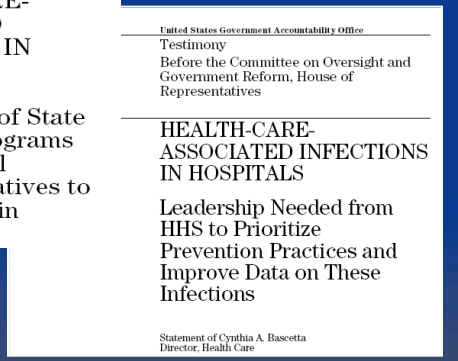
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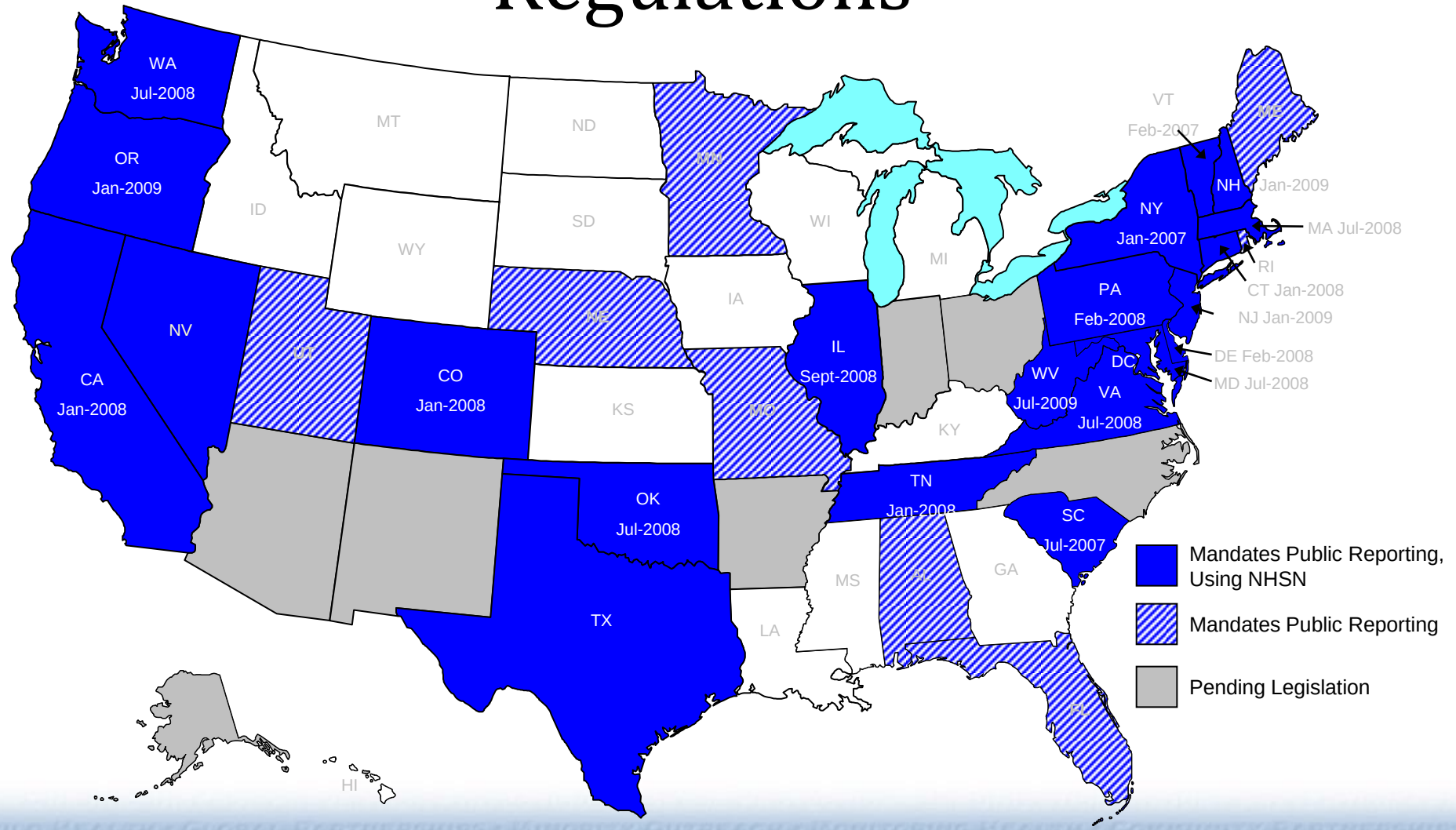
HAI Reporting Laws and Regulations



* Voluntary reporting using NHSN

Examples of State-specific Legislation

- **Colorado**
  - HB 06-1045 was signed into law on June 2, 2006. This law requires health facilities to collect data on infection rates for: 1) Cardiac Surgical Site Infections; 2) Orthopedic Surgical Site Infections; and 3) Central line related bloodstream infections. Facilities will report the infection data to the CDC National Healthcare Safety Network (NHSN). Data will be collected annually beginning July 31, 2007.

- **New Jersey**
  - P.L. 2007, Chapter 196, formerly S 147 and S 919, known at the "Health Care Facility-Associated Infection Reporting and Prevention Act", requires hospitals to report certain information concerning infection rates…Details of the reporting requirement are to be determined by regulations to be issued by the health commissioner. The regulations will establish standard methods for identifying and reporting HAIs; identify the major site categories for which infections shall be reported, …

Why use NHSN for HAI Reporting?

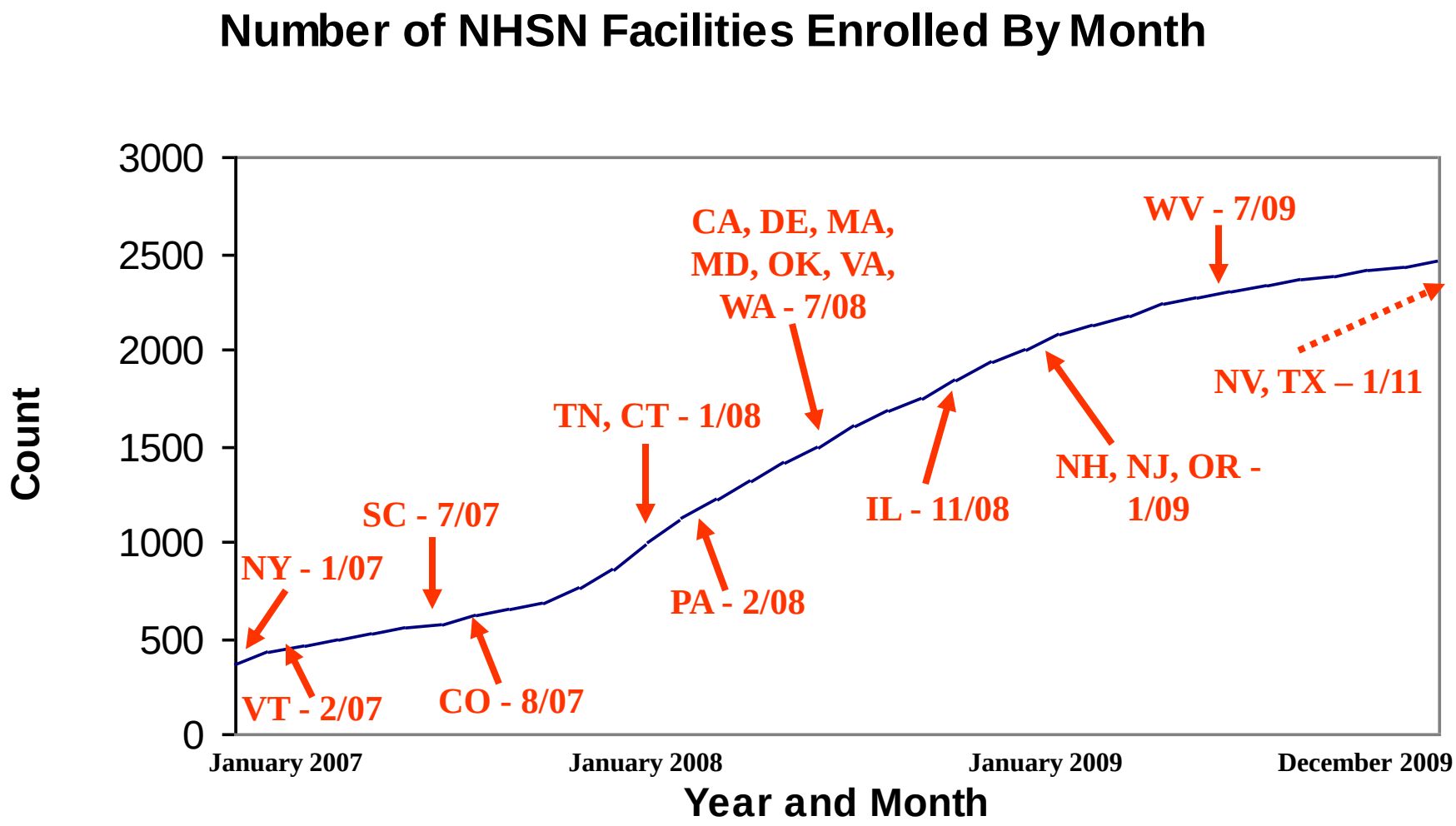
- Provides standard definitions, protocols and methodology
- Not just a reporting tool, comparative rates used for performance improvement
- Useful analysis tools are included
- CDC provides training and user support
- Use of the application is free
- Ability to share data with a Group

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).

Growth in NHSN Participation Due Mainly to Public Reporting Mandates

(as of 1/8/2009 there are 2477 NHSN facilities)



Data for Action

Healthcare-associated Infections in New York State, 2008
A State Report Utilizing CDC's National Healthcare Safety Network

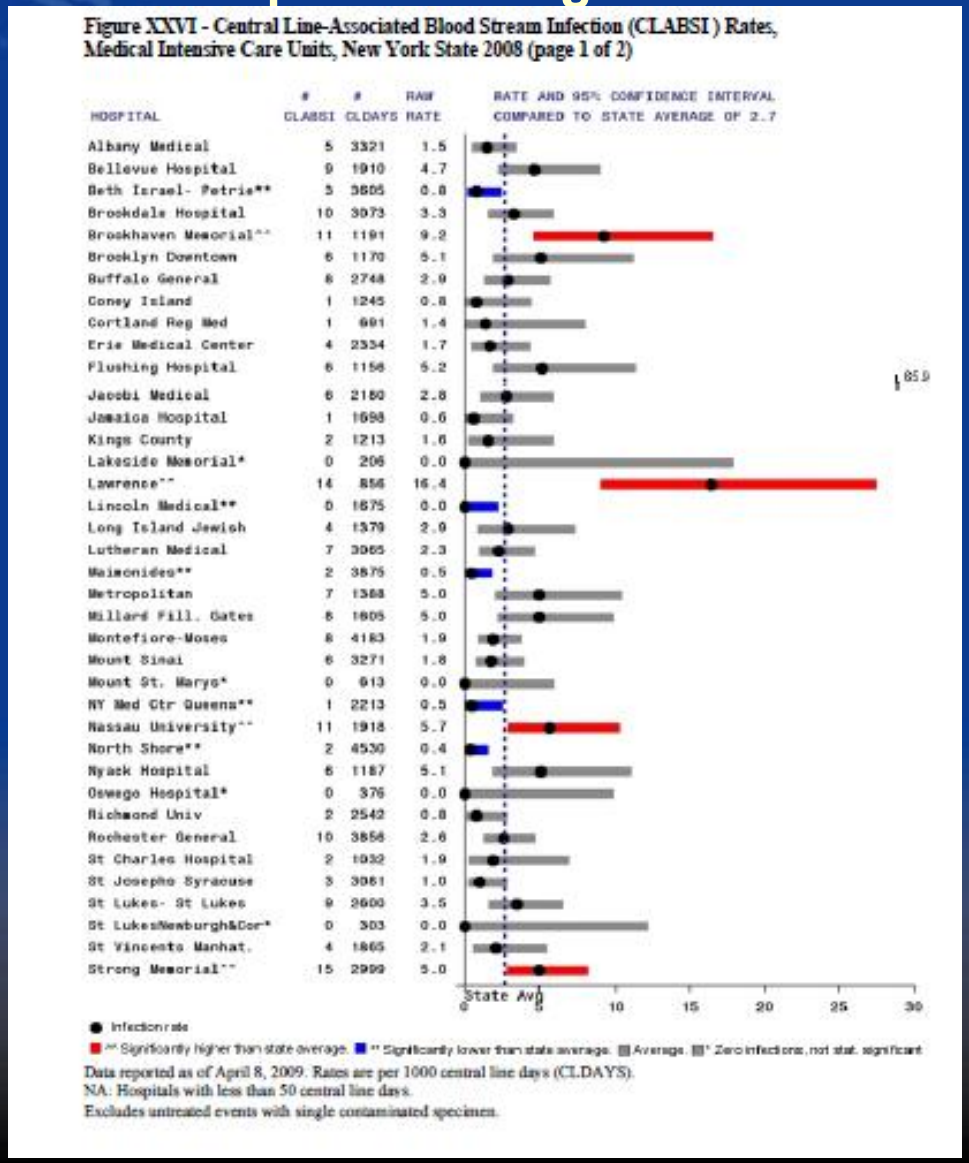


Figure XXVI - Central Line-Associated Blood Stream Infection (CLABSI) Rates, Medical Intensive Care Units, New York State 2008 (page 1 of 2)

HOSPITAL	# CLABSI	# CLDAYS	RAW RATE
Albany Medical	5	3321	1.5
Bellevue Hospital	9	1910	4.7
Beth Israel- Petrie**	5	3805	0.8
Brookdale Hospital	10	3073	3.3
Brookhaven Memorial^^	11	1191	9.2
Brooklyn Downtown	6	1170	5.1
Buffalo General	8	2748	2.9
Coney Island	1	1245	0.8
Cortland Reg Med	1	691	1.4
Erie Medical Center	4	2334	1.7
Flushing Hospital	6	1156	5.2
Jacobi Medical	6	2180	2.8
Jamaica Hospital	1	1698	0.6
Kings County	2	1213	1.6
Lakeside Memorial*	0	206	0.0
Lawrence^^	14	856	16.4
Lincoln Medical**	0	1675	0.0
Long Island Jewish	4	1379	2.9
Lutheran Medical	7	3065	2.3
Maimonides**	2	3875	0.5
Metropolitan	7	1388	5.0
Millard Fill. Gates	8	1605	5.0
Montefiore-Moses	8	4183	1.9
Mount Sinai	6	3271	1.8
Mount St. Marys*	0	613	0.0
NY Med Ctr Queens**	1	2213	0.5
Nassau University^^	11	1918	5.7
North Shore**	2	4530	0.4
Nyack Hospital	6	1187	5.1
Oswego Hospital*	0	376	0.0
Richmond Univ	2	2542	0.8
Rochester General	10	3856	2.6
St Charles Hospital	2	1032	1.9
St Josepho Syracuse	3	3061	1.0
St Lukes- St Lukes	9	2600	3.5
St LukesNewburgh&Cor*	0	303	0.0
St Vincents Manhat.	4	1865	2.1
Strong Memorial^^	15	2999	5.0

RATE AND 95% CONFIDENCE INTERVAL COMPARED TO STATE AVERAGE OF 2.7

85.9

State Avg

0 5 10 15 20 25 30

● Infection rate

^^ Significantly higher than state average. ** Significantly lower than state average. Average. * Zero infections, not stat. significant

Data reported as of April 8, 2009. Rates are per 1000 central line days (CLDAYS).
NA: Hospitals with less than 50 central line days.
Excludes untreated events with single contaminated specimen.

- **Report includes**
  - **Bloodstream infections in intensive care unit (ICU) patients**
  - **Surgical site infections**

http://www.health.state.ny.us/statistics/facilities/hospital/hospital_acquired_infections/

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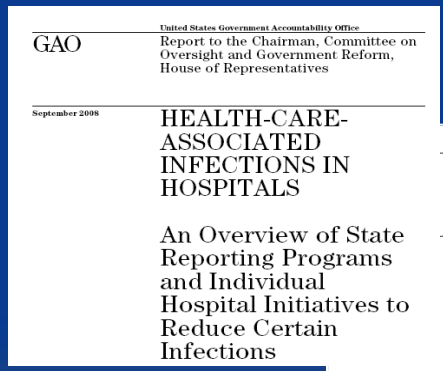
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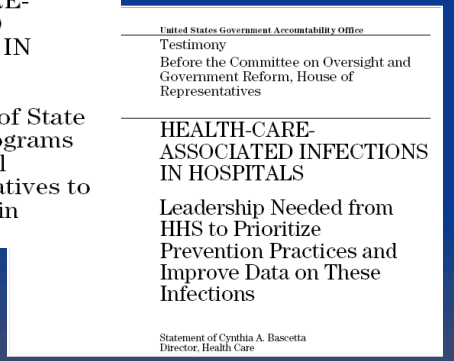
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Prevention Collaboratives

- Use the “group” function of NHSN to collect and analyze data from participating facilities
  - Measure impact of an intervention
- Examples include the Comprehensive Unit-Based Safety Program (CUSP) to prevent BSIs in ICUs.
- ARRA funding will support additional state and regional prevention collaboratives.

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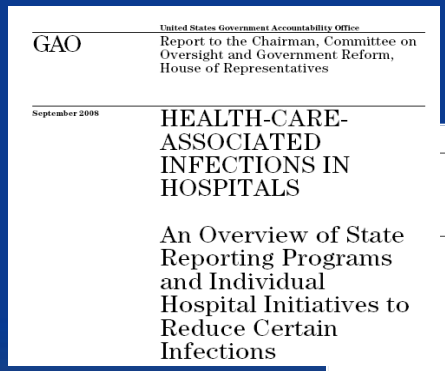
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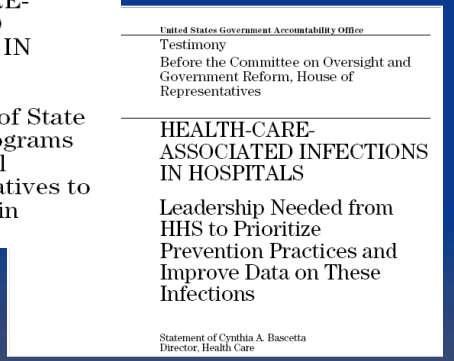
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HHS Action Plan for HAI Prevention
National 5 Year Goals

http://www.hhs.gov/ophs/initiatives/hai/actionplan/index.html

Metric	Source	National 5-Year Prevention Target	Coordinator
Bloodstream infections	NHSN	50% reduction	CDC
Adherence to central-line insertion practices	NHSN	100% adherence	CDC
Clostridium difficile (hospitalizations)	NHDS HCUP	30% reduction	CDC/AHRQ
Clostridium difficile infections	NHSN	30% reduction	CDC
Urinary tract infections	NHSN	25% reduction	CDC
MRSA invasive infections (population)	EIP	50% reduction	CDC
MRSA bacteremia (hospital)	NHSN	25% reduction	CDC
Surgical site infections	NHSN	25% reduction	CDC
Surgical Care Improvement Project Measures	SCIP	95% adherence	CMS

NHSN=National Healthcare Safety Network
NHDS=National Hospital Discharge Survey
HCUP=Healthcare Cost and Utilization Project
EIPs=Emerging Infections Program
SCIP=Surgical Care Improvement Project

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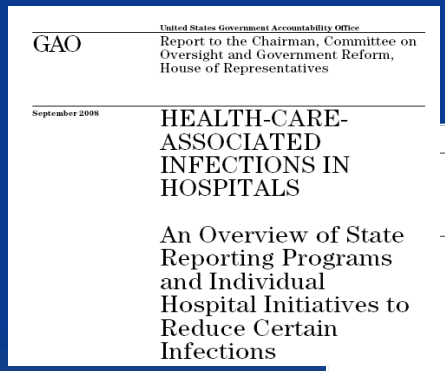
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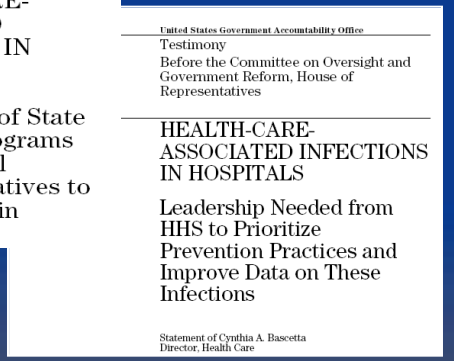
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Index for HR3962: Affordable Health Care for America Act

DIVISION B — MEDICARE AND MEDICAID IMPROVEMENTS.

TITLE IV — QUALITY.

SUBTITLE E — PUBLIC REPORTING ON HEALTH CARE-ASSOCIATED INFECTIONS.

A BILL

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SEC. 1461. REQUIREMENT FOR PUBLIC REPORTING BY HOSPITALS AND AMBULATORY SURGICAL CENTERS ON HEALTH CARE-ASSOCIATED INFECTIONS.

(a) IN GENERAL.—Title XI of the Social Security Act is amended by inserting after section 1138 the following section:

"SEC. 1138A. REQUIREMENT FOR PUBLIC REPORTING BY HOSPITALS AND AMBULATORY SURGICAL CENTERS ON HEALTH CARE-ASSOCIATED INFECTIONS.

"(a) REPORTING REQUIREMENT.—

"(1) IN GENERAL.—The Secretary shall provide that a hospital (as defined in subsection (g)) or ambulatory surgical center meeting the requirements of titles XVIII or XIX may participate in the programs established under such titles only if, in accordance with this section, the hospital or center reports such information on health care-associated infections that develop in the hospital or center (and such demographic information associated with such infections) as the Secretary specifies.

"(2) REPORTING PROTOCOLS.— Such information shall be reported in accordance with reporting protocols established by the Secretary through the Director of the Centers for Disease Control and Prevention (in this section referred to as the 'CDC') and to the National Healthcare Safety Network of the CDC or under such another reporting system of such Centers as determined appropriate by the Secretary in consultation with such Director.

"(3) COORDINATION WITH HIT.—The Secretary, through the Director of the CDC and the Office of the National Coordinator for Health Information Technology, shall ensure that the transmission of information under this subsection is coordinated with systems established under the HITECH Act, where appropriate.

"(4) PROCEDURES TO ENSURE THE VALIDITY OF INFORMATION.—The Secretary shall establish procedures regarding the validity of the information submitted under this subsection in order to ensure that such information is appropriately compared across hospitals and centers. Such procedures shall address failures to report as well as errors in reporting.

"(5) IMPLEMENTATION.—Not later than 1 year after the date of enactment of this section, the Secretary, through the Director of CDC, shall promulgate regulations to carry out this section.

"(b) PUBLIC POSTING OF INFORMATION.—The Secretary shall promptly post, on the official public Internet site of the Department of Health and Human Services, the information reported under subsection (a). Such information shall be set forth in a manner that allows for the comparison of information on health care-associated infections—

"(1) among hospitals and ambulatory surgical centers; and

"(2) by demographic information.

Summary

- NHSN is a secure, web-based application for HAI surveillance
- The ultimate goal of collecting HAI data is to drive prevention efforts
- NHSN is used by:
  - Healthcare facilities for local quality improvement
  - State health departments to comply with state legislative mandates, to obtain baseline HAI data, and to target prevention efforts
  - Prevention collaboratives to measure impact
  - CDC to provide aggregate data and to monitor trends

http://www.cdc.gov/NHSN

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