



National Health Care Safety Network

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Objectives

By the end of the presentation you should be able to:

- State the purposes of NHSN
- Describe the types of healthcare-associated infection (HAI) surveillance which can be accomplished through NHSN and the prescribed methodology
- Describe new NHSN surveillance activities



National Healthcare Safety Network (NHSN)



- NHSN is an internet-based surveillance system that integrates the surveillance systems previously managed separately in the Division of Healthcare Quality Promotion (DHQP) at CDC
 - National Nosocomial Infections Surveillance (NNIS) system
 - Dialysis Surveillance Network (DSN)
 - National Surveillance System for Healthcare Workers (NaSH)

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What is NHSN?

- Internet-based
- Voluntary (?)
- Secure
- System of surveillance for healthcare-associated infections (HAIs), process measures, and healthcare worker exposures and vaccinations



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NHSN Rapid Growth

August 2008

- 1707 facilities enrolled from 48 States
 - 32% had 201-500 beds (58% have \leq 200 beds)
 - 91% were general, acute-care hospitals
 - 62% were non-major teaching hospitals
- 18 States using or planning to use NHSN for mandatory reporting

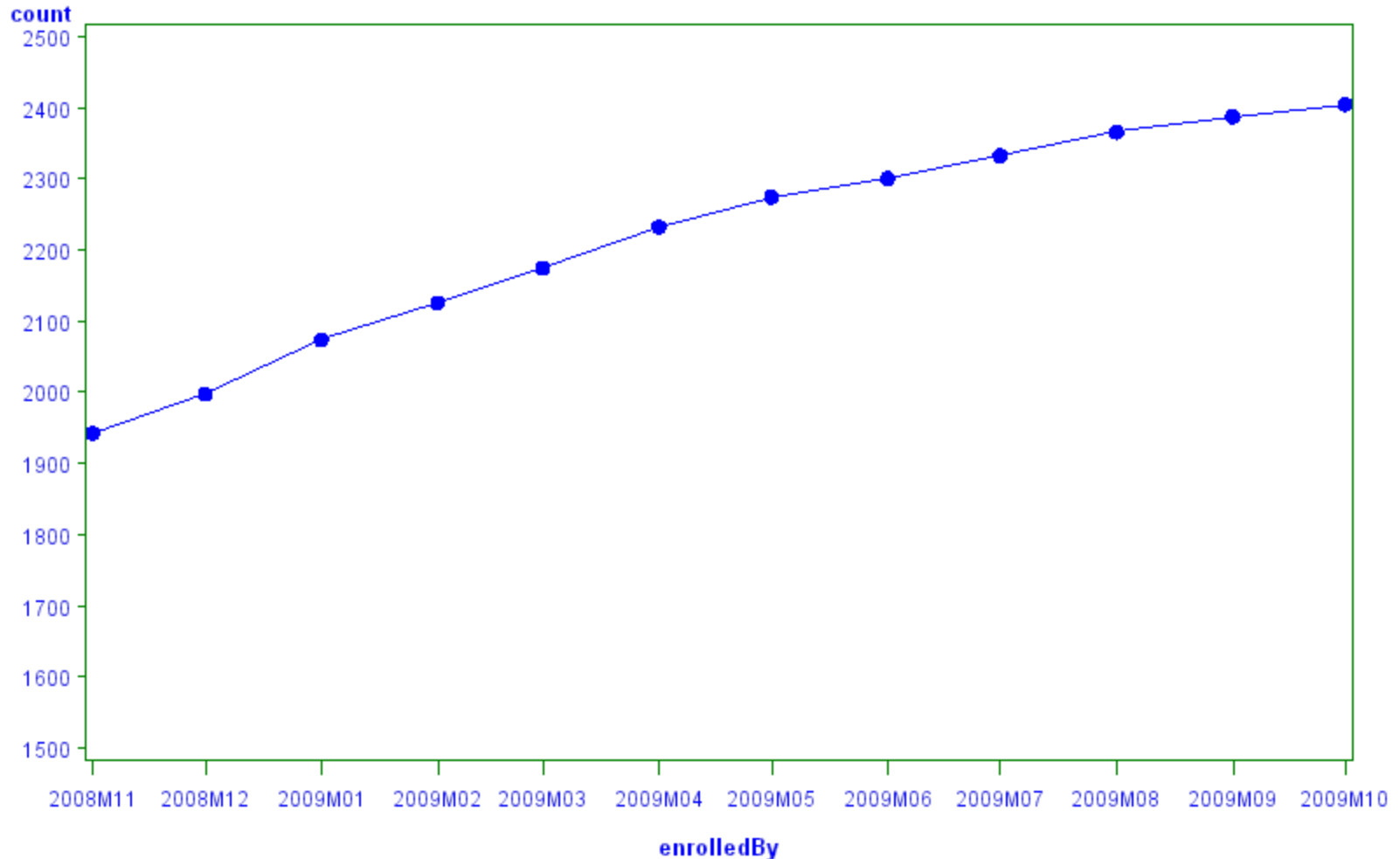
October 2009

- 2414 facilities enrolled from 50 States+Territories
 - 27% have 201-500 beds (67% have $<$ 200 beds)
 - 85% are general, acute care hospitals
 - 86% are non-major teaching hospitals
- 21 States using or planning to use NHSN for mandatory reporting

State of NHSN: Continued Growth (n=2414)



Number of Facilities Enrolled in NHSN by Month



As of 10/15/2009



What and When States Using NHSN are Reporting (n=21)



NY SC CT CA MD OK VA OR
VT CO TN PA DE MA WA IL NH NJ WV NV TX



	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>
CLABSI			CA, CO, CT, DE, IL, MA, MD, NH, NJ, NV, NY, OK, OR, PA, SC, TN, TX, VA, VT, WA, WV		
CAUTI			NJ, PA		
SSI			CO, MA, NH, NJ, NY, OR, PA, SC, TN, TX, VT		
VAP			NH, OK, PA, WA		
Dialysis events			CO		
CLIP			CA, NH		
MDRO			NJ, other states are considering its use		
HCW influenza vaccination			WV, other states are considering its use)		



Confidentiality in 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)).”



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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

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Data Collection and Reporting Requirements

1. Submit a Monthly Reporting Plan to inform CDC which, if any, of the patient safety modules will be used for that month
2. Adhere to the selected module's protocol(s) exactly as described in the *NHSN Manual*



Data Collection and Reporting Requirement

(continued)

3. Use surveillance methodology as described in the Protocol
4. Report events and appropriate summary or denominator data indicated on the Plan to CDC within 30 days of the end of the month



Data Collection and Reporting Requirements

(continued)

5. Submit data for at least one module for a minimum of 6 months of the calendar year
6. Complete an annual survey for your facility
7. Pass quality control acceptance checks that assess the data for completeness and accuracy



Data Collection and Reporting Requirements

(continued)

8. Agree to report to state health authorities adverse event outbreaks identified in the facility by the surveillance system and about which you are contacted by CDC.

Components of NHSN



**Patient
Safety**

**Healthcare
Personnel
Safety**

Biovigilance

**Research and
Development**

Patient Safety Component Modules

Device-associated

- CLABSI
- CLIP
- CAUTI
- VAP
- DE

Procedure-associated

- SSI
- PPP

Medication-associated



- AUR Pharmacy
- AUR Microbiology

MDRO/CDAD

- MDRO/CDAD Infection
- LabID
- Processes


Patient Influenza Immunization

- Method A
- Method B



PS Module: New Process Measure Options

- Central line insertion practices
 - Part of the Device-associated Module
 - Adherence to hand hygiene, protective sterile barriers, appropriate antiseptic skin prep, etc.
- High Risk Inpatient Influenza Vaccination (HRIIV) Module
 - Proportion of high risk patients getting vaccinated prior to discharge
 - Includes seasonal and non-seasonal influenza vaccination



PS Module: MDRO & CDAD Module (Mar 09)



- Two options
 - Multi-drug resistant organism (MDRO)
 - *C. difficile*-associated disease (CDAD)
- Includes choices for active surveillance testing (AST) and adherence to hand hygiene and gown and gloves use for those in Contact Precautions (process measures)
- Provides direct and proxy outcome measures
 - E.g., MDRO & CDAD healthcare-associated infection incidence rates
 - E.g., Prevalence and incidence rates based on AST



Patient Safety Component Key Terms

- Healthcare-associated Infection (HAI)
- Location
 - CDC Location
 - 80% Rule
- Attribution of HAI
 - Facility-level
 - Location-level for device-associated HAI
 - Procedure-level for procedure-associated HAI

NHSN Key Terms can be found in the *NHSN Manual: Patient Safety Component Protocol*



Healthcare-associated Infection (HAI)

- A localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s)
 - There must be no evidence that the infection was present or incubating at the time of admission
 - Occurs in a patient in a healthcare setting and
- When the setting is a hospital, meets the criteria for a specific infection (body) site as defined by CDC
- When the setting is a hospital, may also be called a nosocomial infection

HAI



- The following infections are not considered healthcare associated:
 - Infections associated with complications or extensions of infections already present on admission, unless a change in pathogen or symptoms strongly suggests the acquisition of a new infection
 - Infections in infants that have been acquired transplacentally & become evident \leq 48 hours after birth
 - Reactivation of a latent infection



HAI

- The following conditions are not infections:
 - Colonization (presence of microorganisms on skin, mucous membranes, in open wounds, or in excretions or secretions but are not causing adverse clinical signs or symptoms)
 - Inflammation that results from tissue response to injury or stimulation by noninfectious agents, such as chemicals

Use Surveillance Definitions Consistently

- Always use standard CDC/NHSN infection definitions and data field definitions
- NHSN definitions use a combination of the following:



Radiology



Laboratory



Signs and Symptoms

Clinical criteria (used by physician) may differ from surveillance definitions



Clinical Criteria

- individualized to the patient
- used for making therapeutic decisions

Surveillance Criteria

- population-based
- consistent between patients (applied exactly the same way every time)
- physician diagnosis alone is acceptable for some infections (not pneumonia)



Location

- In the Patient Safety Component, location is the area where a patient was assigned while receiving care in the healthcare facility
 - Inpatient location: Area where patients are housed overnight
- For DA Module surveillance of events, only inpatient locations where denominator data can be collected are eligible for monitoring (e.g., ICU, ward)
 - Examples of locations not eligible: operating room, interventional radiology, emergency department, etc
- For DA Module process measure surveillance, location is the area where the patient was assigned when the practice under surveillance was performed



Location

- Location is used to stratify device-associated infection rates
- A location may treat patients for more than one clinical service



CDC Locations

- A list of standard descriptions for patient care and other areas of healthcare facilities
 - List can be found in the *NHSN Resource Library*
- Each location under surveillance must be “mapped” to one standard CDC Location description
- The correct mapping to a CDC Location is determined by the type of patients receiving care
 - 80% Rule: 80% of the patients must be of a consistent type to classify the location as that specific type



CDC Location

80% Rule

Example

If 80% of patients on a ward are pediatric patients with orthopedic problems, the location is designated as an Inpatient Pediatric Orthopedic Ward.

EXCEPTION

For patient care areas where the mix of medical and surgical patients is approximately equal, use the combined medical/surgical location designation.

- For instructions on setting up locations in NHSN, click “Help” within NHSN.



Attribution of HAI

- Once an HAI is identified, the next step is to determine the level of attribution
- The three levels of attribution are:
 - Facility-Level
 - Location-Level
 - Procedure-Level



Attribution of HAI: Facility-Level

- When a patient is admitted to a facility with an HAI, determine whether or not to attribute the HAI to this facility.

Examples

Patient is discharged from Hospital A and returns 15 hours later to Hospital A with an HAI. This is an HAI for Hospital A.

Patient is admitted to Hospital B with an infection which was determined to be attributed to Hospital A. This is an HAI for Hospital A, not Hospital B.



Attribution of Device-associated HAI: Location-Level

- A device-associated HAI is attributed to the inpatient location where the patient was assigned on the date the HAI was identified

Example

Patient has a central line inserted in the Emergency Department and then is transferred to the MICU. Within 24 hours of admission to the MICU, patient meets criteria for BSI. This is reported to NHSN as a CLABSI for the MICU.

Attribution of Device-associated HAI: Location-Level

- **EXCEPTION:** Transfer Rule
 - If a device-associated HAI develops within 48 hours of transfer from one inpatient location to another in the same facility, the HAI is attributed to the transferring location.

Example

Patient with a central line is transferred from the surgical ICU to an orthopedic ward and develops a BSI within 24 hours. This CLABSI is attributed to the surgical ICU.



Attribution of Procedure-associated HAI

Procedure-associated HAIs
are attributed to the procedure
NOT the location



NHSN Surveillance Methodology

- Active
- Patient-based
- Prospective
- Priority-directed
- Risk-adjusted rates
- Incidence rates



NHSN Surveillance Methodology

ACTIVE vs. PASSIVE

- **ACTIVE** Trained personnel use standard definitions and a variety of data sources to identify events
- **PASSIVE** Personnel, such as staff nurses, not trained to do surveillance report events



NHSN Surveillance Methodology

PATIENT-BASED vs. LABORATORY-BASED

- **PATIENT-BASED** Monitoring patients for events, risk factors, and procedures and practices related to patient care
 - Visit patient care areas
 - Review patient charts
 - Discuss with caregivers
- **LABORATORY-BASED** Case-finding based solely on positive lab findings



NHSN Surveillance Methodology

PROSPECTIVE vs. RETROSPECTIVE

- **PROSPECTIVE** Monitoring patients while still in the institution; includes post-discharge period for SSI
- **RETROSPECTIVE** Case-finding based solely on chart review after patient discharged



NHSN Surveillance Methodology

PRIORITY-DIRECTED vs. COMPREHENSIVE

- **PRIORITY-DIRECTED** Objectives for surveillance are defined and focused on specific events, processes, organisms, and/or patients/populations
- **COMPREHENSIVE** Continuous monitoring of all patients for all events and/or processes



NHSN Surveillance Methodology

RISK-ADJUSTED vs. CRUDE RATES

- **RISK-ADJUSTED** Rates are controlled for variations in the distribution of major risk factor(s) associated with an event's occurrence
 - Comparison of rates is useful
- **CRUDE** Rates assume equal distribution of risk factors for all events
 - Comparison of rates not recommended

NHSN Surveillance Methodology



INCIDENCE RATES vs. PREVALENCE RATES

■ **INCIDENCE (I)**

New events in a population occurring during some defined time period

$$I = \frac{\text{new events}}{\text{population during time period}}$$

■ **PREVALENCE (P)**

All events in a population occurring at either a point in time (P_{point}) or during some defined time period (P_{period}).

$$(P_{\text{point}}) = \frac{\text{new and existing events}}{\text{population at a point in time}}$$

$$(P_{\text{period}}) = \frac{\text{new and existing events}}{\text{population during time period}}$$

New Components

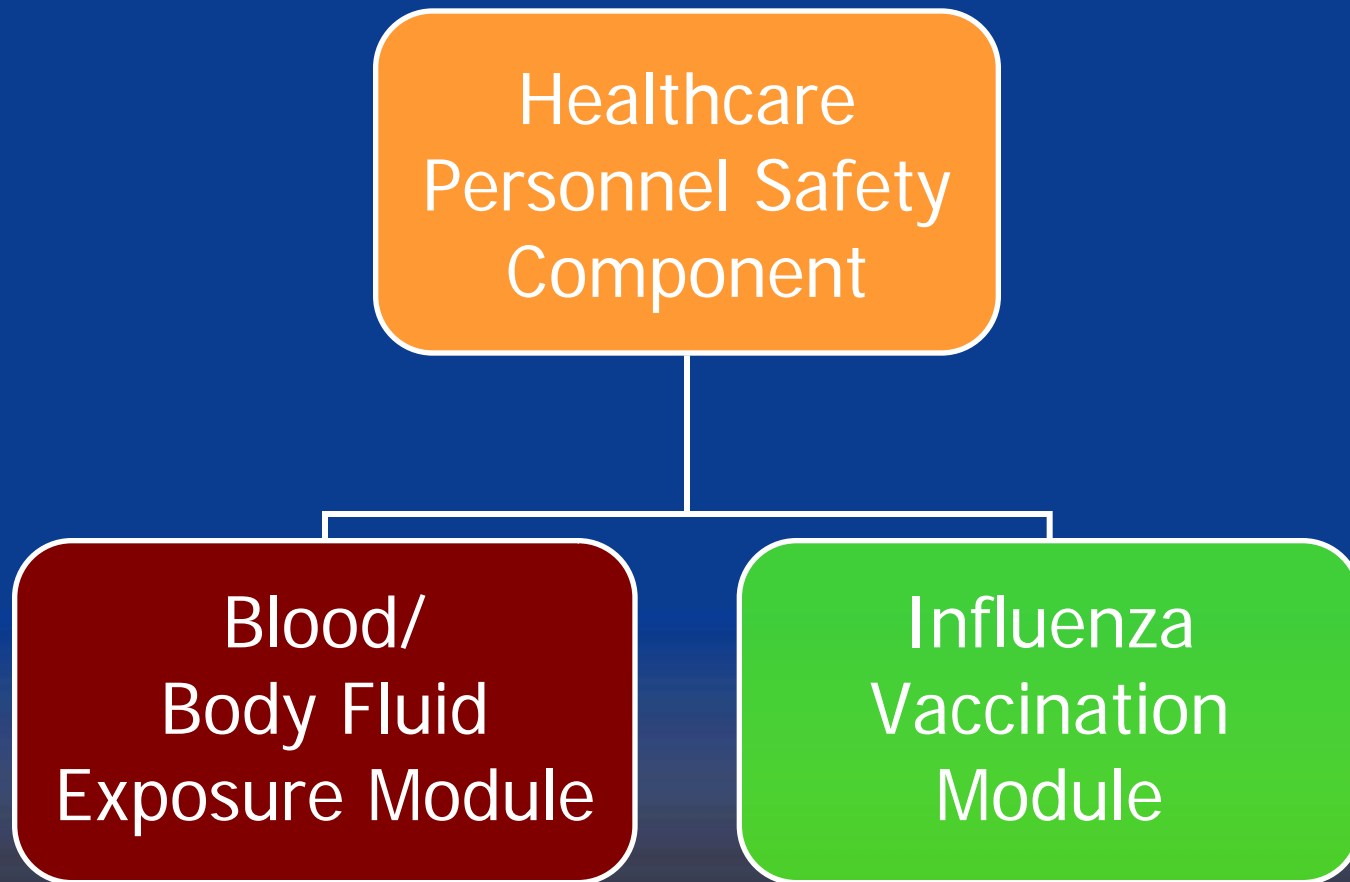



**Patient
Safety**

**Healthcare
Personnel
Safety**

Biovigilance

National Healthcare Safety Network





Purposes of NHSN Healthcare Personnel Safety Component



- Continuation and expansion of the previous National Surveillance System for Healthcare Workers (NaSH)
- Collect data from sample of US healthcare facilities to
 - estimate the severity and magnitude of adverse events among healthcare personnel
 - estimate healthcare personnel participation in seasonal flu vaccine campaigns
- Work toward prevention strategies to improve adverse events in healthcare personnel



Staffing Requirements for Participating in the Healthcare Personnel Safety Component



- Trained Occupational Health or Infection Control Professional, or Hospital Epidemiologist should oversee the occupational health surveillance program
- Other personnel can be trained to
 - Screen for events (e.g., exposures, vaccinations)
 - Collect denominator data
 - Collect exposure management/vaccination data
 - Enter data
 - Analyze data



HCP Safety Surveillance (Fall '09)

- Blood and body fluid exposure
 - Blood and body fluid exposure alone
 - Blood and body fluid exposure with follow up monitoring (laboratory, post-exposure prophylaxis, etc.)
- HCW Vaccination
 - Influenza immunization
 - Seasonal and Novel types



Potential Expansion of NHSN Capabilities

- Immunization to other vaccine-preventable diseases
- Immune status and prospective tracking of recommended vaccination series, e.g., hepatitis B, MMR, pertussis
- Tracking of non-infectious injuries to healthcare personnel*
- Baseline exposures and seroconversions to infectious diseases, i.e., tuberculosis*

***Working with NIOSH and CDC TB Division to expand during next 2 years**



Now Available for HPS Component

- HPS Protocols
- Forms and Tables of Instructions
- Trainings for
 - Introduction to HPS
 - HPS Facility Set-up
 - Blood/body fluid exposure
 - HCW influenza vaccination

New Components



**Patient
Safety**

**Healthcare
Personnel
Safety**

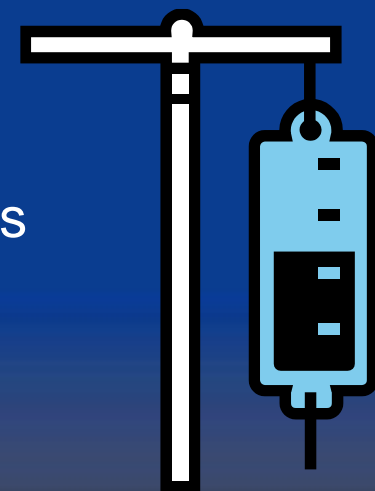
Biovigilance



NHSN Biovigilance Component



- Hemovigilance Module
 - AABB & CDC collaboration
 - Begun August 2007
 - Monthly reporting of:
 - Transfusion-associated adverse reactions
 - Incidents associated with blood products
 - Pilot in 9 hospitals for 6 months
 - Available early 2010



New NHSN Website

www.cdc.gov/NHSN

CDC Home



Centers for Disease Control and Prevention
Your Online Source for Credible Health Information

SEARCH

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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
Multidrug-resistant Organism

MDRO »

Gov Delivery

GO» Biovigilance

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[More contact info »](#)

Topics

About NHSN

Overview, Confidentiality, How data is used...

Patient Safety Component

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

Enrollment Requirements

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

Healthcare Personnel Safety Component

Overview, Blood/Body Fluids Exposure; & Influenza Vaccination

Resource Library

Reports, Manuals, Newsletters, Forms...

Biovigilance Component

Overview, Hemovigilance Module Publications...

Data Collection Forms

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

NHSN Training

Training webcast, corresponding slidesets, and materials...

Data & Statistics

Facilities Enrolled in NHSN, by State (total=2142)



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 »](#)

Communication Updates

[E-mail updates](#)

[NewsLetters](#)



NHSN Report 2008 NHSN Report, data summary for 2006 through 2007



National Healthcare Safety Network (NHSN)

NHSN

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More Related Links

[FAQs About Enrollment](#)[FAQs About Security](#)[FAQs About Digital Certificates](#)[NHSN > Patient Safety Component](#)

Procedure-Associated (PA) Module

Patients undergoing surgical procedures are at an increased risk of infectious complications. Surgical Site Infections (SSIs) following operative procedures are well documented sequelae, and can result in extended hospital stays, increased morbidity, and increased healthcare costs. In one publication, it was estimated that over 8% of the HAIs that were associated with deaths in US were SSIs.¹

Post Procedure Pneumonias (PPPs) can also develop in patients postoperatively. Postoperative reduction in lung inflation, challenge to a patient's immune system, and side effects of prescribed medications can all impact a patient's ability to resist infection and a PPP can result in the same negative consequences of illness, increased cost and death.

NHSN allows facilities to categorize surgical patients by the National Nosocomial Infection Surveillance (NNIS) System SSI risk- stratification method. This method accounts for the patient's pre-surgical medical status, length of surgery compared to similar surgeries and a extent of contamination of the surgical wound. Using this information, facilities are able to categorize their patients, calculate risk-stratified rates, and compare those rates against national risk stratified rates. A variety of comparison percentiles and statistical analysis options are offered including line listings, frequency tables, rates, and control charts and can be used to better inform quality improvement decisions.

Protocols which outline the mechanisms and methods of surveillance are included for the following NHSN Events:

- SSI-Surgical site infection
- PPP-Post procedure pneumonia

¹Klebens RM, Edward JR, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. Public Health Reports 2007;122:160-166.

Corresponding Materials

Protocol and Instructions

- ↓ NHSN Manual: SSI Protocol
Guidelines and procedures for monitoring SSI. Dec. 2008. PDF (236 KB/ 29 pages)
- ↓ NHSN Manual: PPP Protocol

Training

- > Procedure-associated module (SSI, PPP), Medication-associated module Training Course

On This Page

- Protocol and Instructions
- Training
- Forms

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National Healthcare Safety Network (NHSN) Report, data summary for 2006 through 2007, issued November 2008

Jonathan R. Edwards, MStat, Kelly D. Peterson, BBA, Mary L. Andrus, BA, RN, CIC, Margaret A. Dudeck, MPH, Daniel A. Pollock, MD, Teresa C. Horan, MPH, and the National Healthcare Safety Network Facilities
Atlanta, Georgia

This report is a summary of device-associated and procedure-associated module data collected and reported by hospitals participating in the National Healthcare Safety Network (NHSN) from January 2006 through December 2007 as reported to the NHSN by

- Estimation of the magnitude of HAIs;
- Discovery of HAI trends;
- Facilitation of inter- and intrahospital comparisons with risk-adjusted data that can be used for local

Edwards JR et al. Am J Infect Control 2008;36:609-626.

Next Report: December, 2009

Save the Date

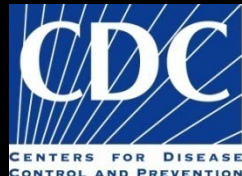
Fifth Decennial International Conference on Healthcare-Associated Infections

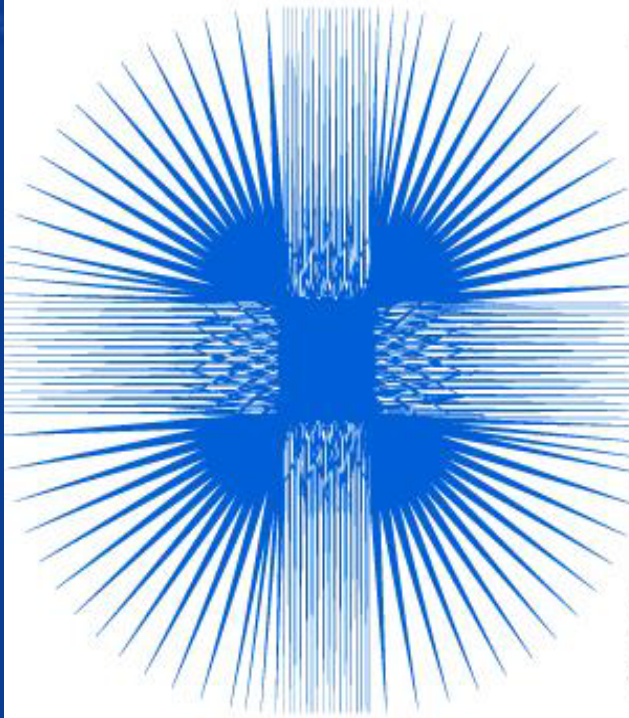
March 18-22, 2010

Hyatt Regency Atlanta
Atlanta, Georgia

www.decennial2010.com

Co-organized by:





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

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