Members Meeting

Friday, March 19, 2010
12:15 – 1:30 p.m.
Montreal/Vancouver Room

SAFER • HEALTHIER • PEOPLE™

Agenda

- Welcome, Introductions, Goals – Teresa Horan
- Outreach and Input – Dan Pollock
- NHSN Infrastructure Enhancements – Dan Pollock
- Use of Electronic Data Sources – Dan Pollock
- Surveillance Methodology – Scott Fridkin
- Analysis and Reporting – Scott Fridkin
- PNICE Study Update – Pat Stone
- PAICAP Recruitment – Grace Lee
- Open Discussion

NHSN Outreach and Input (1)

- NHSN Training and User support team
- NHSN State Users group
- New state HAI program funded through American Recovery and Reinvestment Act (ARRA) of 2009
- Collaborating with the Center for Medicare and Medicaid Services (CMS):
  - Quality Improvement Organization (QIO) program
  - Reporting Hospital Quality Data for the Annual Payment Update (RHQDAPU) program

NHSN Outreach and Input (2)

- Collaborating with the Agency for Healthcare Research and Quality (AHRQ):
  - Comprehensive Unit-based Safety Program (CUSP)
  - Patient Safety Organization (PSO) program
- Roll out of the U.S. Department of Health and Human Services Office of Public Health and Science on the HHS Action Plan for HAIs
  - Feedback from NHSN users at regional meetings n Chicago, Denver, Seattle
- Conferring regularly with the NHSN Steering Work Group

NHSN Outreach and Input (3)

NHSN Steering Work Group Members & Liaisons

NHSN sites – *Elise McKee, Teresa Accuntius, Connie Steed, Ellen Smith, Dana Trocino*

State Health Departments – *Rachel Stricof (NY), Steve Ostroff (PA), Neil Pascoe (TX)*

HICPAC – *Russ Olmstead*

CDC – *Chesley Richards, Joe Perz, Gautam Kesarinath, Ahmed Gomaa, Nancy Sonnenfeld*

CMS – *Barry Straube (or Paul McGann)*

AHRQ- *Bill Munier (or Amy Helwig)*

SHEA – *Henry Blumberg (or Lisa Maragakis, Jesse Jacob)*

APIC – *Patti Grant*

AHA – *Kathy Ciccone (or Mary Therriault*)

CSTE – *Marion Kainer*

ASTHO – James Kirkwood (or Belinda Haerum)

NHSN Performance and Infrastructure Enhancements

- Installed performance widgets on every NHSN web page to measure user wait times as a function of time of day, request type, location and server load
- Currently monitoring this dataset and have a baseline from which to measure progress.

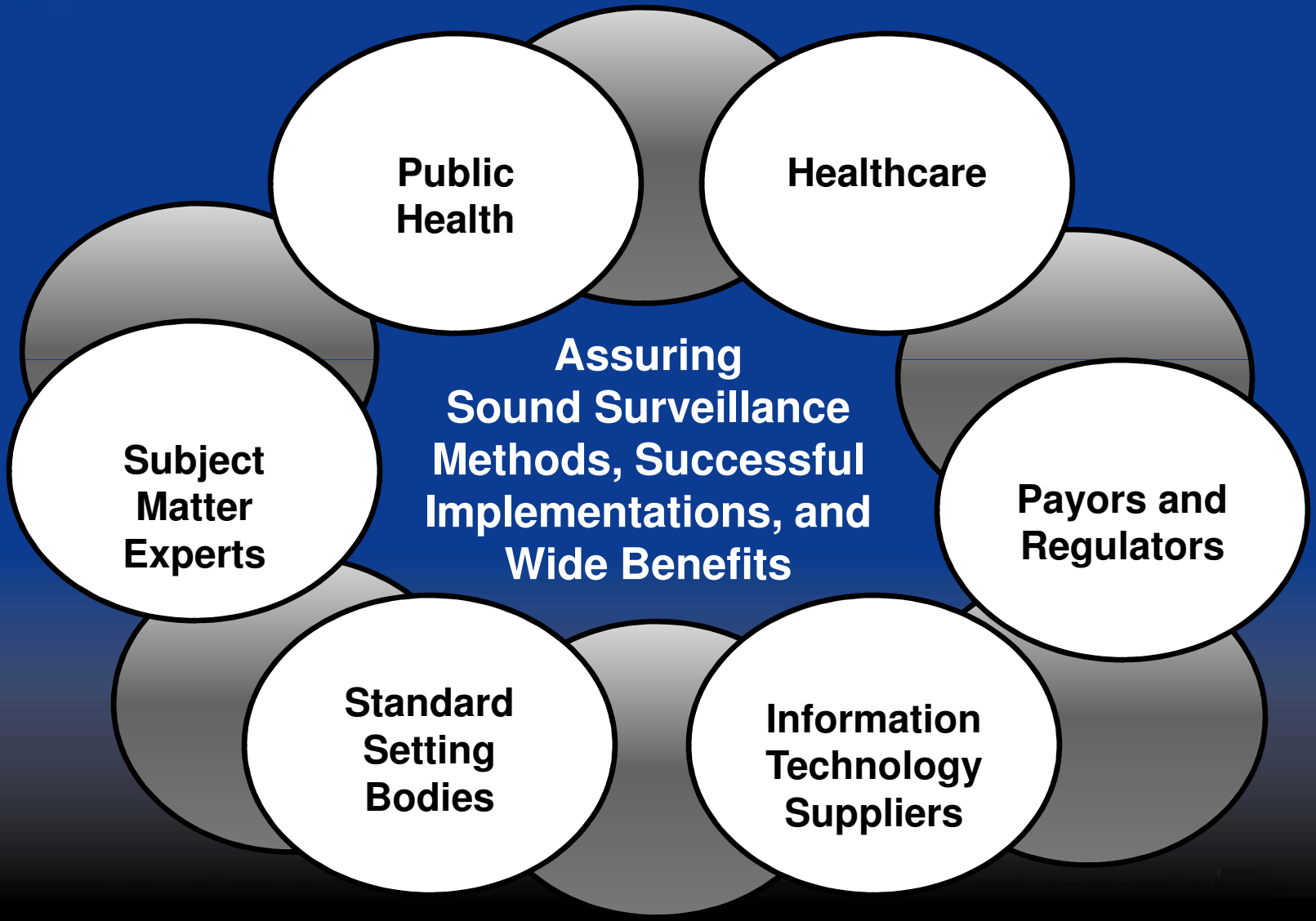
Performance Improvements
(to be completed in the coming months)

- Re-engineer the NHSN database
- Reduce page sizes so that pages will load faster
- Streamline data input screens so that entering data will be easier
- Move away from the use of digital certificates to passwords
- Increase our ability to receive electronic messages to reduce manual data entry burden

NHSN Performance Improvements: Initial Results

- Though most of the improvements are still in the testing phase, we have moved into production, new streamlined versions of our database queries for group reporting
- On average we have seen an overall reduction of the time it takes to perform a query by 28% and individual queries by as much as 83%

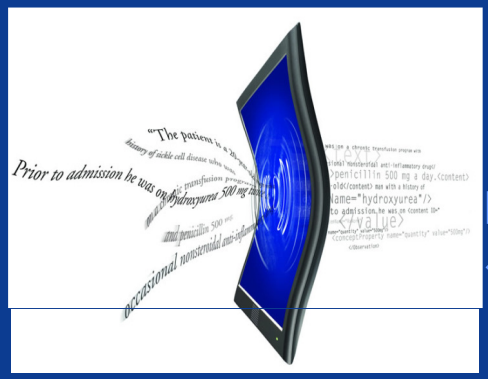
Use of Electronic Data Sources: Collaboration Needed



Where We Are Today: Dependent on Manual Processes

Paper records

Manual Processes
- Case finding
- Data collection
- Data entry



NHSN web interface – reporting, analysis, and data sharing

NHSN Servers

Disparate electronic data sources

Where We Want to Go Over the Next 10 Years

Electronic records

Automated Processes
- Case finding
- Data collection
- Data entry

NHSN data transfer

NHSN Servers

NHSN web interface – visualization, analysis, and data sharing

Interoperable Electronic Data Sources

Clinical Document Architecture (CDA): A Standards-Based Solution for Electronic Reporting to NHSN

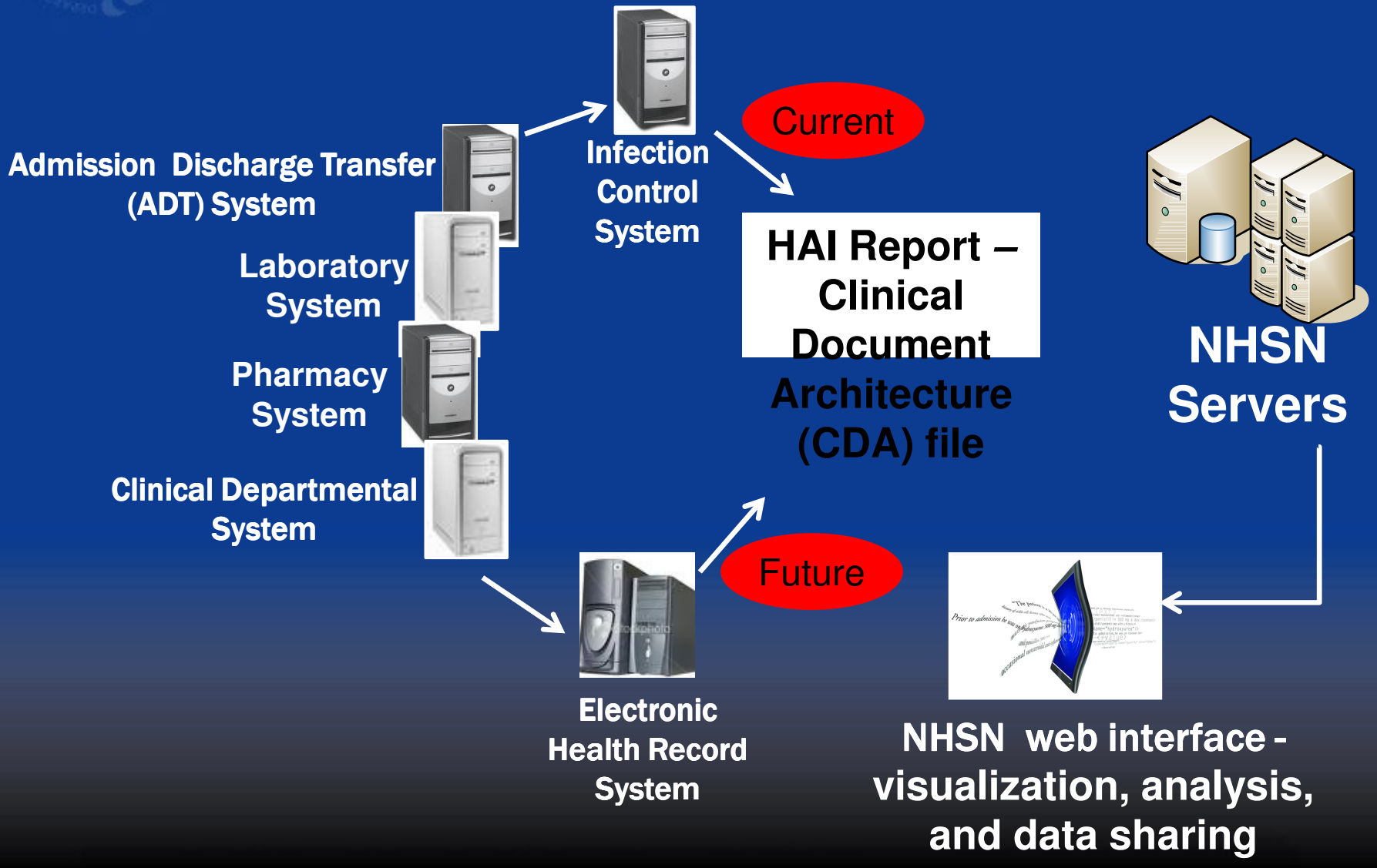
Initial use beginning December 2009

- Bloodstream infections and summary denominator
- Surgical Site Infection and procedure denominator

Future use beginning 2010

- Urinary tract infections
- Central line insertion practices
- Laboratory-identified multi-drug resistant organism (MDRO) or *Clostridium difficile*-associated disease (CDAD) events
- MDRO or CDAD infections
- Pneumonia

Sending Sites use ADT, Lab, and Clinical Data to Detect Cases and Submit Electronic Reports



Use of Electronic Data Sources: Guiding Principles

- Work closely with IT vendors
- Collect only the minimum necessary data for use in the NHSN application
- Use standards-based Clinical Document Architecture CDA approach
  - Much of the processing and denominator calculations occur within the IT vendor software at the sending facility

NHSN Surveillance Methodology Developments

- Algorithmic detection
- EIP NHSN Network
- Antimicrobial Use/Resistance Module
- PNEU
- Areas of Attention
  - SSI Procedure specific denominator data
  - Pediatrics
  - Long Term Care
  - Hemodialysis
  - Ambulatory Surgery

Traditional Steps in CLABSI Detection

Administrative Steps (Detection)

Case/Isolate finding

Episode grouping

De duplication

Assessment of location

Classification Steps

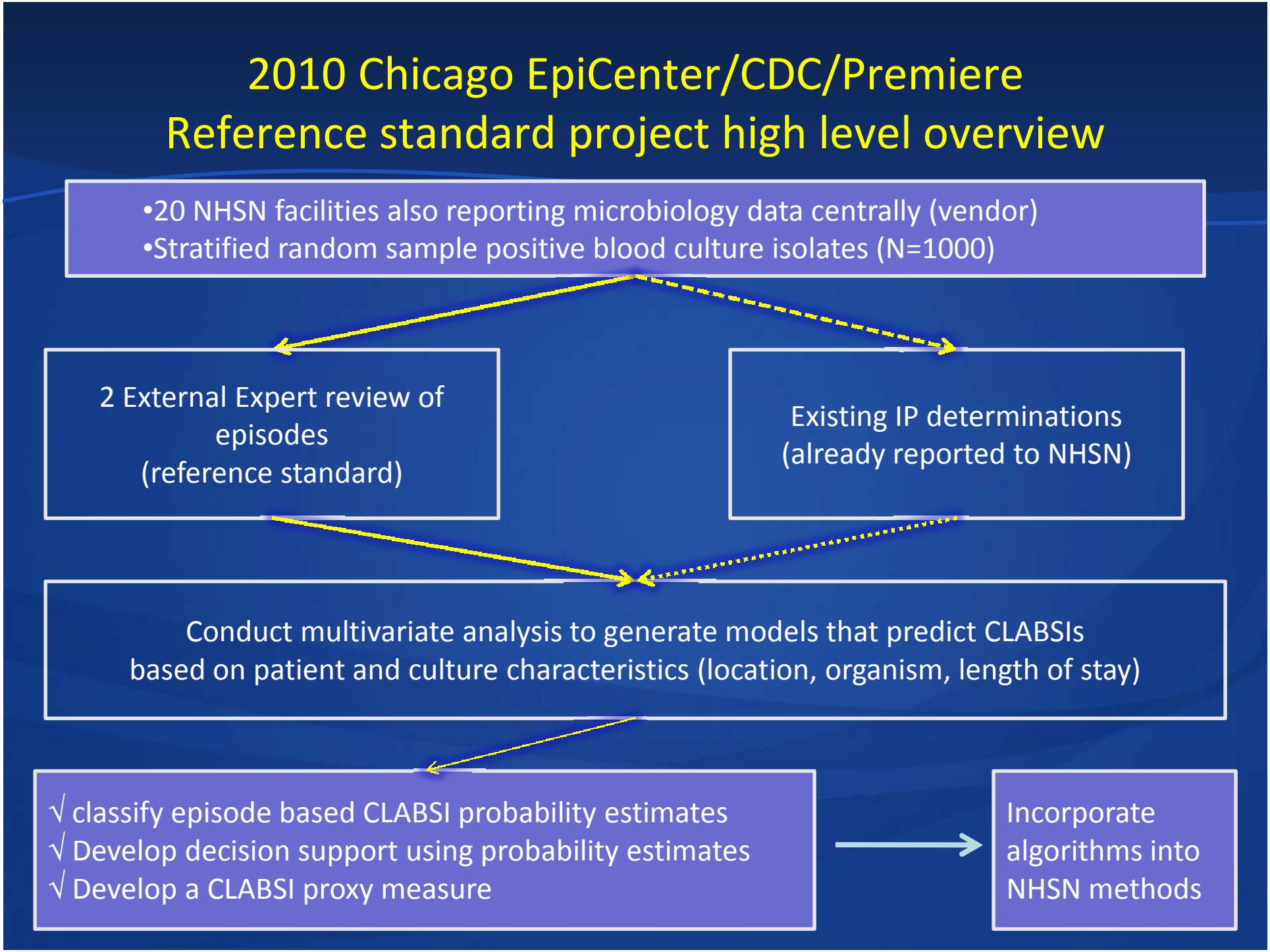
Classification as contaminant v. infection

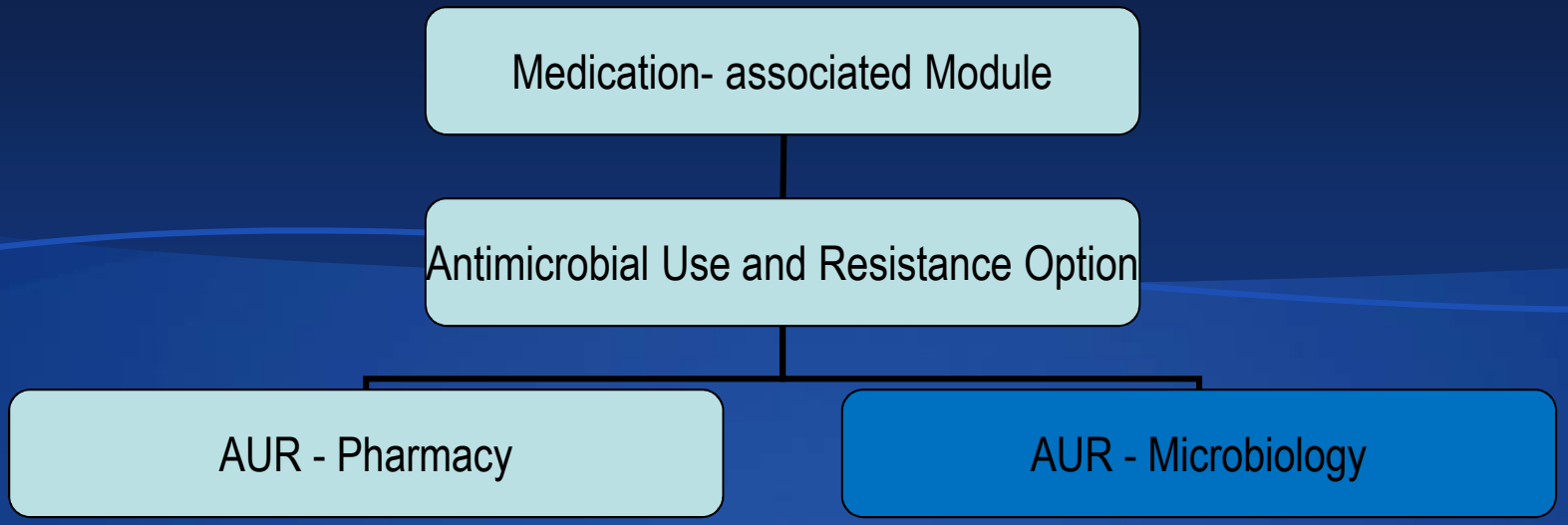
Classification as primary v. secondary

Assessment of location

- Use of electronic health records offers the opportunity to automate detection and classification of CLABSIs
  - Better, automated detection of eligible events
  - More reliable classification of CLABSIs through decision support

2010 Chicago EpiCenter/CDC/Premiere
Reference standard project high level overview





Obstacles to useful surveillance

- Manual data entry not sustainable
- Limited ability to expand antimicrobial list
- Advancing science of measurement
  - DDD problematic for benchmarking
  - Source of data not standard

Steps taken to enhance AUR

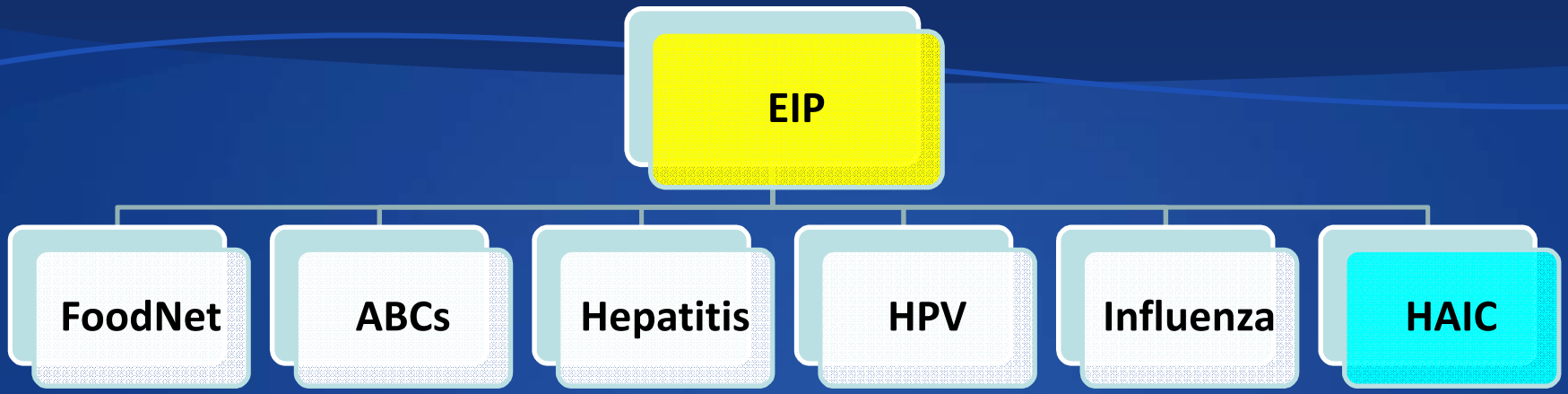
- Hired 80% Pharmacoepidemiologist
- Experts Meeting to
  - Prioritize utility of surveillance
  - Define best metrics
  - Refine best methods

http://www.cdc.gov/nhsn/psc_ma.html

Pharmacy Option

Milestone	Decision and Direction
Prioritize Goal	Measure inpatient antimicrobial usage to provide risk-adjusted inter- and intra-facility comparisons
Metric	Days of therapy/1000 patient-days at risk
Data Source	Electronic medication administration record (eMAR) or bar code medication administration (BCMA)
Reporting Method	Implementation of CDA. Partner with commercial infection surveillance systems and electronic health record vendors

CDC Emerging Infections Program



- Cooperative Agreement/Collaborative with 10 State Health Departments
- Core surveillance for food borne, respiratory, and select other issues
- Added Healthcare-Associated Infections – Community Interface in 2009/2010 (HAIC EIP Activity)

EIP-HAIC NHSN-Related Focus Areas

- NHSN networks
  - Each site to recruit facilities to join NHSN
  - Facilities will share data for the purpose of performing surveillance innovation and other EIP HAIC projects
  - 7 of 10 states have some mandates, expect about 200 facilities across 10 states
- HAI surveillance innovation
  - Use EIP NHSN network facilities to perform projects aimed at reducing the burden of data collection and reporting
  - First effort = simplification of CLABSI denominator data collection

Analysis and Reporting

- Facility use/reporting
  - SSI Risk Models over NNIS Risk Index
  - Enhancements
- Reporting data from CDC
  - State Summary HAI data
  - Validation issues
  - Access of data to inform prevention among hospital groups

Planned NHSN Improvements
(based on identified reporting and analysis issues)

Timeline: ■ Q2 ■ Q3 ■ Q4 or later

- Adding ability to confer rights beyond 2010
- CBGB and CBGC procedures cannot both be entered for same day
- CLIP form revised for faster data entry
- New patient-care locations defined for mixed acuity bed areas
- LabID Event form changed for standardization and CDA implementation
- Facility-wide locations defined more clearly for LabID Event reporting
- Enhancements to speed of application (page refresh, dataset generation)
- Creating alerts for missing denominators and zero events/numerators
- Removing forced regeneration of datasets
- Developing audit log for tracking user edits
- Adding ability to analyze by State
- Updating Custom Fields for easier utilization
- Required fields for denominator for Procedures under review

Risk Models Provide Improved Risk Adjustment over NNIS Risk Index

- Risk index relies on three risk factors only
  - Allow all available factors to be considered
- These same risk factors must differentiate risk for all types of procedures
  - Allow the set of risk factors to be procedure-specific
- The relative contribution of these factors are constrained to be equal
  - Allow each factor's contribution to vary according to it's significant association with risk
- What can be done to improve risk adjustment?
  - Build logistic regression models

Summary of SSI Risk Index Use

- CDC develops unique logistic regression model for each procedure (J Edwards, Sunday 2:00 SSI symp)
- NHSN Application changed
  - Probability for infection calculated for every operation (with denominator data)
  - Report generates
    - "Expected" (E) infections by Procedure, surgeon, date range, etc.
    - "observed" (O) infections (entered by IP)
    - Standardized Infection Ratio: O/E
  - Uses 2006-2008 NHSN data for reference comparison
    - <1.0 then fewer infections than predicted given the risks of all patients
  - Data can be aggregated at various levels

State-Summary Report of HAI Data Reported to NHSN

Standardized Infection Ratio:
No. expected / no. observed

United States, January-June 2009.

State Obscured

Source of Data: The National Healthcare Safety Network (NHSN) *<link to full report, when available>*

Population Covered: Acute care hospitalized patients

State	No. of Facilities Reporting	SIR	95% CI for SIR Lower	95% CI for SIR Upper	Graphic Representation of SIR 0 1.0 2.0
CA	118	0.83	0.753	0.911	
CO	50	0.68	0.523	0.867	
CT V	30	0.94	0.722	1.193	
DE	8	0.59	0.361	0.913	
IL	140	0.90	0.804	1.011	

- Public report limited to states with mandate
- Sharing summary data with state officials
- Encouraging all facilities to work with state officials

Possible NHSN Validation Initiatives

Validation Initiative	Examples
State-based validation	Provide states with validation toolkit: data collection form, database, sampling scheme of facilities
Facility-based validation	Provide facility with self-validation toolkit
Training of expert reviewers	Training at CDC, and audits by reviewers at a sample of sites
Proficiency testing of NHSN users	Use of standardized cases
Comparison of NHSN data with external data systems	Medical Provider Analysis Review (MEDPAR)
Isolate testing	Collection of a sample of isolates from EIP sites
Informatics approaches	Audits built into system, thresholds and systematic check of outliers

Prevention of Nosocomial Infections and Cost-Effectiveness Analysis (PNICE Study)

Funded by the National Institute of Nursing Research Grant #R01NR010107

Conducted in collaboration by investigators and consultants from Columbia University School of Nursing, RAND, CDC, IHI, Joint Commission, Southwestern Medical Center, Harvard, University of Pittsburgh, University of Maryland, and the University of Illinois in Chicago

Patricia Stone, Principal Investigator
Phone : 212 305-1738
Fax : 212 305-6937
E-mail: ps2024@columbia.edu

Monika Pogorzelska, Project Coordinator
Phone: 212 305-3431
Fax : 212 305-6937
E-mail : mp2422@columbia.edu

Prevention of
Nosocomial
Infections &
Cost
Effectiveness

The P-NICE Study

Columbia University School of Nursing

RAND CORPORATION

National Institute of Nursing Research

Prevention of
Nosocomial
Infections &
Cost
Effectiveness

The P-NICE Study

Study Aims

- To describe infection control staffing and resource allocation
- To describe infection control activities in ICUs
- To estimate long-term health and cost outcomes attributable to healthcare associated infections
- To investigate the cost effectiveness of infection control practices

Prevention of
Nosocomial
Infections &
Cost
Effectiveness

The P-NICE Study

Phase I (ended in spring of 2008)

- Survey of eligible NHSN hospitals
- 289 hospitals participated (415 ICUs)
- 66% response rate

Phase II (data collection ended in Fall of 2009)

- Collection of data from subsample of NHSN hospital
  - Medicare and HAI data for 2007
  - Patient Census
  - RN Staffing Data
- 46 NHSN hospitals enrolled

AJIC major articles

Staffing and structure of infection prevention and control programs

Patricia W. Stone, PhD, RN, FAAN, MPH,[a] Andrew Dick, PhD,[b] Monika Pogorzelska, MPH,[a] Teresa C. Horan, MPH,[c] E. Yoko Furuya, MD, MS,[d] and Elaine Larson, RN, PhD, FAAN, CIC[a]

New York, New York, Pittsburgh, Pennsylvania, and Atlanta, Georgia

Background: The nature of infection prevention and control is changing; however, little is known about current staffing and structure of infection prevention and control programs.

Methods: Our objectives were to provide a snapshot of the staffing and structure of hospital-based infection prevention and control programs in the United States. A Web-based survey was sent to 441 hospitals that participate in the National Healthcare Safety Network.

Results: The response rate was 66% (n = 289); data were examined on 821 professionals. Infection preventionist (IP) staffing was significantly negatively related to bed size, with higher staffing in smaller hospitals ($P < .001$). Median staffing was 1 IP per 167 beds. Forty-seven percent of IPs were certified, and 24 percent had less than 2 years of experience. Most directors or hospital epidemiologists were reported to have authority to close beds for outbreaks always or most of the time (n = 225, 78%). Only 32% (n = 92) reported using an electronic surveillance system to track infections.

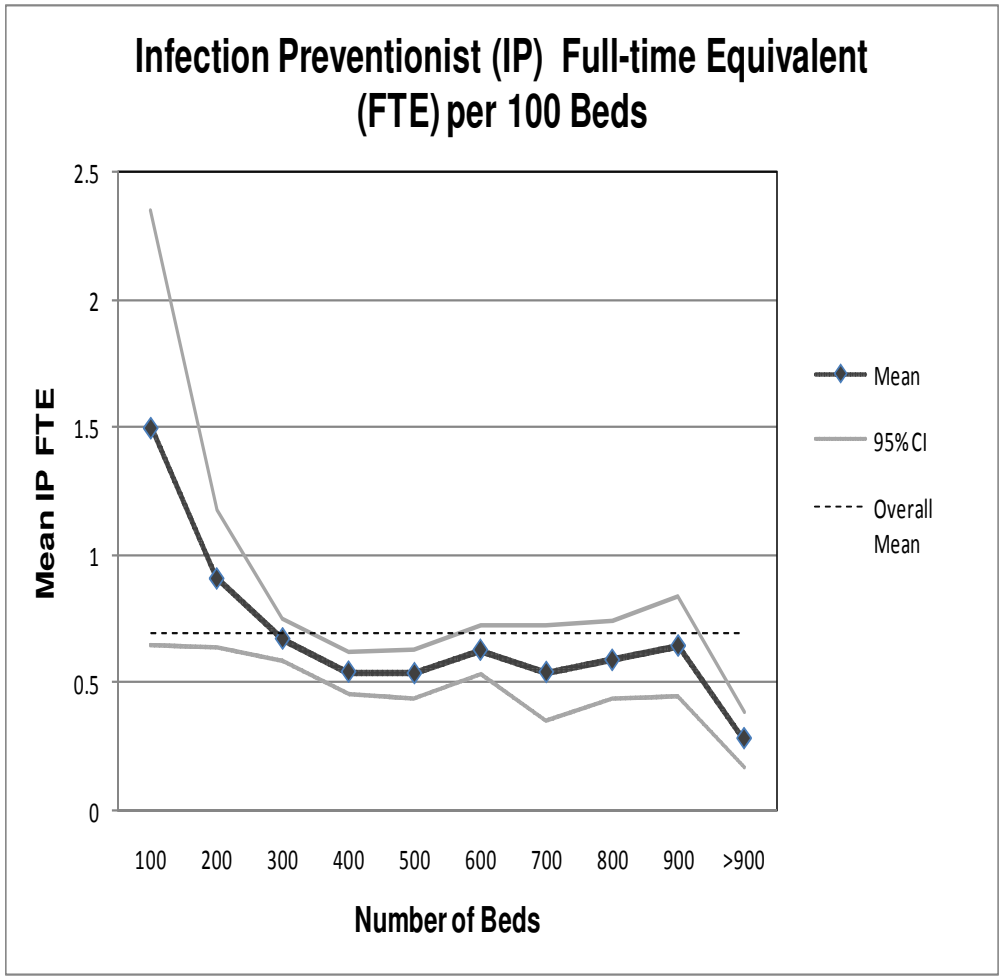
Conclusion: This study is the first to provide a comprehensive description of current infection prevention and control staffing, organization, and support in a select group of hospitals across the nation. Further research is needed to identify effective staffing levels for various hospital types as well as examine how the IP role is changing over time.

(Am J Infect Control 2009;37:351-7.)

Decreased IP Staffing in 2008

Prevention of Nosocomial Infections & Cost Effectiveness

The P-NICE Study



- IP Staffing significantly related to hospital size with higher staffing in smaller hospitals ($p < 0.001$)
- IP FTE staffing was 0.69 (sd +/- 0.54) per 100 beds
  - 1 IP per 144 beds
- NNIS hospitals in 1999
  - I IP per 115 beds

Prevention of Nosocomial Infections & Cost Effectiveness

The P-NICE Study

Presentation at the Decennial

- *Central Line Bundle Implementation and Impact on Infection Rates in US Intensive Care Units (ICUs).*

  Furuya EY, Dick A, Perencevich EN, Pogorzelska M, Goldmann D, Stone PW.

  Presented in The Cutting Edge of Infection Prevention: The Top Four Submitted Scientific Papers of the 2010 Decennial

  Saturday, 8:30 – 9:30 am in the Centennial Ballroom (Hyatt Regency Atlanta)

New Funding: Prevention of Nosocomial Infections and Cost-Effectiveness Refined (PNICER) Study

Aim 1: Use a qualitative approach to describe the phenomena of infection prevention, surveillance and control in hospitals

Aim 2: Assess the impact of intensity of infection control processes on device associated and organism specific HAI rates in ICUs across the U.S.

Aim 3: Determine the impact of state regulated mandatory reporting on infection control processes and HAI rates

PNICER Timeline

Phase I:

- Summer/Fall 2010
- Qualitative in-depth interviews in 12 hospitals that participated in PNICE
  - Interviews with multiple personnel including IPs, HEs, hospital administrators, nurses and ancillary service personnel
  - $1000 honorarium per hospital ($100 per participant)

Phase II:

- Summer 2011
- Web-based survey of eligible NHSN hospitals
  - Collect up to 6 years of ICU specific NHSN data (2006-2011)

P-NICE Study Website

Prevention of Nosocomial Infections & Cost Effectiveness

The P-NICE Study

http://cumc.columbia.edu/studies/pnice/

THE PAICAP PROJECT

Conducted by Harvard Medical School and Harvard Pilgrim Health Care Institute

Preventing Avoidable Infectious Complications by Adjusting Payment (PAICAP)

Grace M. Lee, MD MPH

Harvard Medical School & Harvard Pilgrim Healthcare Institute

AHRQ-R01HS018414-01

Goal

To assess the impact of Medicare's policy of nonpayment for preventable complications (NPPC) on health outcomes and costs in U.S. hospitals.

Specific Aims

1. To evaluate the impact of NPPC on HAI rates reported by Medicare (i.e. “billing” rates)
2. To evaluate the impact of NPPC on HAI rates reported by NHSN (i.e. “true” infection rates)
3. To explore whether NPPC has the intended impact of reducing both “billing” and “true” infection rates
4. To assess whether reduced reimbursement for HAIs disproportionately affects hospitals that care for a high proportion of poor and minority patients

To Participate

- Hospitals that report to NHSN are eligible
- Please let us know you are interested!
  - Sign-up sheet, website, email, phone

Time Commitment

- 15-20 min in total to join the NHSN PAICAP group

We are committed to protecting confidentiality

No patient identifiers needed

Your hospital will NOT be identified in any presentations or publications

Benefits

Participants will receive regular updates on study findings over the next 4 years

You can play a key role in helping policymakers shape future healthcare decisions

The PAICAP Project

Conducted by Harvard Medical School and Harvard Pilgrim Health Care Institute

Policy Advisory Board

Scott Fridkin (CDC)

Don Goldmann (IHI)

Denise Graham (APIC)

John Jernigan (CDC)

William Kassler (CMS)

Infection Prevention Advisory Board

Vicky Fraser (Wash U)

Teresa Horan (CDC)

Susan Huang (UC Irvine)

John Jernigan (CDC)

Jeanmarie Mayer (Utah)

Kurt Stevenson (OSUMC)

Bob Weinstein (Rush/Stroger)

Deborah Yokoe (HMS/BWH)

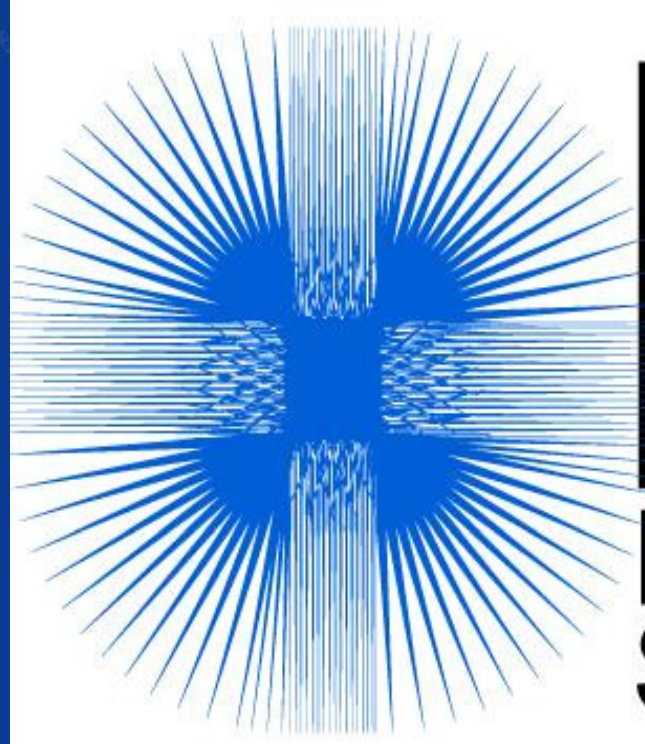
Contact Us

www.PAICAP.org

Email us at PAICAP@hphc.org

1-877-97-PAICAP (1-877-977-2422)

www.APIC.org to link to the PAICAP website



NHSN

National Healthcare Safety Network

www.cdc.gov/ncidod/dhqp/nhsn.html