HHS HAI Reporting Systems

Second Plenary

Co-Chairs:
David R. Hunt, MD, FACS
Hui-Hsing Wong, MD, JD

9:00 AM – 10:15 AM
Key Questions Addressed

3. With HHS analyzing and reporting HAI data acquired through a variety of programs and systems, each with its own methodology, and because these differences sometimes produce estimates of HAI scope, magnitude, or trends that are incongruent, what are the priorities of stakeholder groups as policies for HAI data reporting are being addressed?

4. What policies and standards are needed to facilitate consistent public reporting of the Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN) data at the state and federal levels and how should those policies be identified or developed or maintained?
Overview of Key HHS Data Sources: IMPAQ/RAND Evaluation Results

Daniel Weinberg, Ph.D.
IMPAQ International

Katherine Kahn, M.D.
RAND Corporation

For the IMPAQ/RAND Action Plan Evaluation Team
Background

• Work undertaken as part of the evaluation of the HHS Action Plan to Prevent HAIs

• Two tasks related to HAI data:
  – Inventory of HHS data systems that can be used to track HAIs
  – Presentation in a Baseline Assessment Report of HAI rates derived from HHS data systems

• Focus on the 6 HAIs named in the Action Plan
Relationship of Data Tasks to Action Plan

- Overlaps with Action Plan’s surveillance activities
  - Same HAIs
  - Some of the same data sources
  - Baseline information and tracking of progress
- Complements Action Plan’s surveillance activities
  - Additional data sources and metrics
  - Additional time periods
  - National, regional, and state levels
  - Juxtaposition of multiple data sources in a single compendium
Inventory of HHS Data Systems

- Identified the various HHS data systems available for HAI surveillance
- Characterized the data systems along several dimensions
- Analyzed the strengths and weaknesses of the data sources
- Researched and proposed HAI surveillance specifications for administrative data
- Recommended data for inclusion in the Baseline Assessment Report
### Data Systems Included in the Inventory and Data Report

<table>
<thead>
<tr>
<th>Data System (HAIs)</th>
<th>Data Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIP/ABCs (MRSA)</td>
<td>Hospitals and reference laboratories collect MRSA data in 9 surveillance areas (mostly metropolitan), capturing all positive MRSA cultures from within the surveillance areas. Data are publicly available for 2005 through 2009.</td>
</tr>
<tr>
<td>MPSMS (CAUTI, VAP, CDI, MRSA, CLABSI)</td>
<td>Rates based on the experiences of a representative sample of Medicare FFS (excluding Medicare Advantage) population (until 2009) or all payers’ discharges of four types (beginning 2009). The quality of the data depends on the accuracy with which patient information is documented.</td>
</tr>
<tr>
<td>Medicare FFS claims (all 6 HAIs)</td>
<td>Relies on Medicare FFS claims (excludes Medicare Advantage). Differences in how hospital staff assign diagnosis and procedure codes may result in inconsistent HAI reporting. Prior to FY2008, did not include info. on POA. Lack of clinical detail is a drawback.</td>
</tr>
<tr>
<td>HCUP (all 6 HAIs)</td>
<td>All payer. Relies on patient discharge data. Differences in how hospital staff assign diagnosis and procedure codes may result in inconsistent HAI reporting. Prior to FY2008, did not include info. on POA. Lack of clinical detail is a drawback.</td>
</tr>
</tbody>
</table>
10/07: POA indicator introduced

2008: No MPSMS data

10/08: HAC non-payment policy effective

3/08: GAO report released

2009: MPSMS sample expands from Medicare population to all payers and is restricted to HF, AMI, PNEU & SCIP procedures

6/09: AP released

Hospitals Reporting via NHSN

2006 2007 2008 2009 2010 2011

4000b

2473a

1749

1545

621

211

a Number of hospitals reporting denominator data for DA module (2010 data summary report)
b Approximate number of hospitals participating in IQR program.
Baseline Assessment

• Gathered HAI rates from several HHS data systems: NHSN, MPSMS, HCUP, Medicare claims, ABCs
• Organized and analyzed the data
• Examined rates across data systems and interpreted results in light of prior work and refined our interpretations through discussions with and presentations to data-holding HHS agencies
• Guiding principle: No single data system provides a comprehensive assessment of HAIs in the U.S.
• Presented findings in a report
Summary Information for CAUTI and CLABSI

**CAUTI**

**CLABSI**
PfP HAC HAI Measurement Strategy

Noel Eldridge, MS
Center for Quality Improvement and Patient Safety
Agency for Healthcare Research and Quality
Partnership for Patients

• Nationwide campaign in US to reduce harm to patients over three years: 2011-2013
  – Launched April 2011 -- 2010 is “baseline” year
• Goals are to reduce:
  – Preventable hospital-acquired conditions by 40%
    • 44% established as overall preventable fraction of HACs
  – Hospital readmissions by 20%
• 2010 baselines measured by Program
  – 145 measured HACs per 1000 discharges (4.75M total)
  – 14.4% (30-day) readmissions
Two Key Elements of PFP Measurement Strategy

• National measurement strategy
  – Establish baselines and assess yearly progress using existing systems from AHRQ/CMS, CDC, and AHRQ
  – Employ sampling and extrapolation
    • >90% of measured HACs from Medicare Patient Safety Monitoring System (MPSMS - chart review method with 21 defined adverse events) that uses IQR charts (800 hospitals)

• Local measurement strategy
  – Rely on CMS-funded Hospital Engagement Networks (HENs) to select their own systems for quality improvement programs
  – Assess individual HEN performance
  – **No new Federal data submission mandates**
Nine “Targeted” Hospital Acquired Conditions (HACs)

- Adverse Drug Events (ADE)
- **Catheter-Associated Urinary Tract Infections (CAUTI)**
- **Central Line-Associated Bloodstream Infections (CLABSI)**
- Injuries from Falls and Immobility
- Obstetric Adverse Events
- Pressure Ulcers
- **Surgical Site Infections**
- Venous Thromboembolism (VTE)
- **Ventilator-Associated Pneumonia (VAP)**

These nine total to about 80 percent of measured 2010 HACs
# HAC Baseline and Goal (per 1,000 Admissions)

<table>
<thead>
<tr>
<th>PFP Hospital-Acquired Condition</th>
<th>Measured HACs per 1,000 Admissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse Drug Events</td>
<td>49</td>
</tr>
<tr>
<td>Pressure Ulcers</td>
<td>40</td>
</tr>
<tr>
<td>Catheter-Associated Urinary Tract Infections</td>
<td>12</td>
</tr>
<tr>
<td>Falls</td>
<td>8</td>
</tr>
<tr>
<td>Surgical Site Infections</td>
<td>3</td>
</tr>
<tr>
<td>Obstetric Adverse Events</td>
<td>3</td>
</tr>
<tr>
<td>Ventilator-Associated Pneumonia</td>
<td>1.2</td>
</tr>
<tr>
<td>Central Line-Associated Bloodstream Infections</td>
<td>0.5</td>
</tr>
<tr>
<td>Venous Thromboembolism</td>
<td>0.5</td>
</tr>
<tr>
<td>All Other HACs</td>
<td>27</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>145</strong></td>
</tr>
</tbody>
</table>
PFP-Measured HACs Pie Chart (2010)

Percent of Total Measured HACs – PFP 2010 Baseline (4.745M)

- Adverse Drug Events (57% Hypoglycemic Events & 42% Anticoagulant Drug Events)
- Pressure Ulcers
- Catheter-Associated Urinary Tract Infections
- Falls
- Surgical Site Infections
- Obstetric Adverse Events
- Ventilator-Associated Pneumonia
- Central Line-Associated Bloodstream Infections
- Venous Thromboembolism
- All Other HACs -- based on 14 other specific measures (from C diff Infection to Contrast Nephropathy)
Four “Targeted” HAI HACs Total 11.6 percent of Measured HACs

Percent of Total Measured HACs – PFP 2010 Baseline (4.745M)

- Adverse Drug Events (57% Hypoglycemic Events & 42% Anticoagulant Drug Events)
- Pressure Ulcers
- Catheter-Associated Urinary Tract Infections
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- Surgical Site Infections
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- Ventilator-Associated Pneumonia
- Central Line-Associated Bloodstream Infections
- Venous Thromboembolism
- All Other HACs -- based on 14 other specific measures (from C diff Infection to Contrast Nephropathy)
Four HAIs Measured Among “All-Other” HACs

- PFP 2010 Baseline

- These four HAIs (MRSA, VRE, C diff, and Post-op Pneumonia) are 4.5% of the measured HACs.
- The four targeted HAIs (11.6%) combined with these four HAIs total to 16.1% of measured HACs.
- About one-half of the measured HAIs are CAUTIs.
## Eight HAIs Included in PFP Measures

<table>
<thead>
<tr>
<th>PFP HAI</th>
<th>Pre-launch Estimate</th>
<th>2010 Measured Baseline</th>
<th>2013 Goal (-17.6%*)</th>
<th>Comment on Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI</td>
<td>40,000</td>
<td>18,000</td>
<td>14,800</td>
<td>1.1% of pts w/new CL(s)**</td>
</tr>
<tr>
<td>CAUTI</td>
<td>530,000</td>
<td>400,000</td>
<td>330,000</td>
<td>Physician diagnosed &amp; Rx</td>
</tr>
<tr>
<td>SSI (NHSN***)</td>
<td>110,000</td>
<td>96,000</td>
<td>79,100</td>
<td>SCIP (12) + 5 operations</td>
</tr>
<tr>
<td>VAP</td>
<td>40,000</td>
<td>38,000</td>
<td>31,300</td>
<td>Physician diagnosed &amp; Rx</td>
</tr>
<tr>
<td>C. difficile</td>
<td>NA</td>
<td>87,000</td>
<td>71,700</td>
<td>Positive assay &gt;2 days</td>
</tr>
<tr>
<td>Post-op Pneumonia</td>
<td>NA</td>
<td>97,000</td>
<td>79,900</td>
<td>Physician diagnosed &amp; Rx</td>
</tr>
<tr>
<td>MRSA</td>
<td>NA</td>
<td>15,000</td>
<td>12,400</td>
<td>Sterile sites only****</td>
</tr>
<tr>
<td>VRE</td>
<td>NA</td>
<td>13,000</td>
<td>10,700</td>
<td>Sterile sites only ****</td>
</tr>
</tbody>
</table>

* At launch, goals varied from minus 7% (SSI) to minus 25% (CLABSI)

** Percent from raw data from 4-condition MPSMS sample

*** Special CDC NHSN-based calculation for PFP use

**** Including all apparently new cases identified would increase total 4 to 8-fold
Counting the “40% of Preventable (44% of) HACs” -- Nationwide Goals for 2013

Measured Events to Prevent in 2013 Compared to 2010

HAIs that need to be reduced among measured HACs total to ~135,000 (about half are CAUTIs)
Take-Home Points

• Partnership for Patients Program has “targeted” 4 HAIs among 9 HACs for focused work to reduce their occurrences

• PFP is measuring 8 HAIs in the national measurement (4 targeted HAIs and 4 others)
  – in 2010 HAIs are about one-sixth of total measured HACs
  – overall goal is to get from 145 to 119 measured HACs per 1,000 admissions – 2010 to 2013

• PFP HENs and affiliated hospitals are measuring HACs (including HAIs) their own ways

(Time for discussions in acute-care breakout session this afternoon)
Or email: noel.eldridge@ahrq.hhs.gov, phone: 301-427-1156
Provider Perspective: Resource requirements for surveillance HAIs and other patient safety metrics

Russell N. Olmsted, MPH, CIC
Director, Infection Prev. & Control Services
Saint Joseph Mercy Health System, Ann Arbor, MI
Power of the Consumer: Growth in State-based Legislation on HAI Reporting Mandates

Reporting of CLABSI in ICUs, 2011; Colon surg + Abd. Hyst, & CAUTIs 2012
On the Horizon: Inpatient Quality Reporting

<table>
<thead>
<tr>
<th>HAI Event</th>
<th>Facility Type</th>
<th>Reporting Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MRSA Bacteremia Lab ID</strong></td>
<td>Acute Care Hospitals – facility wide</td>
<td>January 2013</td>
</tr>
<tr>
<td><strong>C. difficile LabID Event</strong></td>
<td>Acute Care Hospitals – facility wide</td>
<td>January 2013</td>
</tr>
<tr>
<td><strong>HCW Influenza Vaccination</strong></td>
<td>Acute Care Hospitals</td>
<td>January – March 2013</td>
</tr>
<tr>
<td><em>(aggregate data will be allowed; updates to NHSN HCP module underway)</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Lab ID = reports positive cultures detected > day 3 of hospitalization

CMS 2012 IPPS final rule released; August 18 2011 Federal Register 76 (no. 160)
<table>
<thead>
<tr>
<th>TOPIC</th>
<th>METRIC &amp; TARGET</th>
<th>Progress Report</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central line-assoc. bloodstream infection (CLABSI)</strong></td>
<td>CLABSI Std Infection Ratio (SIR); 50% drop</td>
<td>18% drop in 2009&lt;br&gt;32% drop in 2010!</td>
</tr>
<tr>
<td><strong>CLABSI Insert. Bundle</strong></td>
<td>Proportion of insertions using bundle; 100% adherence</td>
<td>Sample of Hospitals = 92% - on target, 2009</td>
</tr>
<tr>
<td><strong>C. difficile Infection (CDI)</strong></td>
<td>Rate/1000 discharges; 30% reduction</td>
<td>8.9 in 2009; 9.4 in 2010 – not likely to meet target</td>
</tr>
<tr>
<td><strong>Catheter-assoc. UTI (CAUTI)</strong></td>
<td>CAUTI rate ; 25% reduction</td>
<td>Estimate in ’08 = 5% reduction&lt;br&gt;3-10 % reduction, 2010</td>
</tr>
<tr>
<td><strong>MRSA</strong></td>
<td>Rate invasive MRSA/100k pop.; 50% reduction</td>
<td>22.72 in 2009 = 13.4% drop compared to ’07-’08&lt;br&gt;18% reduction, HA-MRSA, 2010</td>
</tr>
<tr>
<td><strong>SSI</strong></td>
<td>SIR; 25% reduction</td>
<td>5% reduction SSIs, 2009&lt;br&gt;8% reduction, 2010</td>
</tr>
<tr>
<td><strong>SSI</strong></td>
<td>Proportion SCIP measures; 95% adherence</td>
<td>&gt; 92% in 2009 – on target</td>
</tr>
</tbody>
</table>
### At-A-Glance: Patient Safety Care Improvement Projects; SJMH, 2012

<table>
<thead>
<tr>
<th>Category</th>
<th>Collaborative</th>
<th>Registry/Institute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Society of Thoracic Surgeons database</td>
<td>MI Surg. Quality Collaborative</td>
<td>Tumor Registry</td>
</tr>
<tr>
<td>National CV Registry: endarterectomy</td>
<td>Peripheral Vascular Initiative</td>
<td>BCBSM Vascular Interventions Consortium</td>
</tr>
<tr>
<td>BCBSM Cardiology Interventions</td>
<td>Pneumonia Collaborative Series</td>
<td>Leapfrog</td>
</tr>
<tr>
<td>Implantable defibrillator Registry</td>
<td>SCCM Project Impact</td>
<td>MHA Hosp Engagement Network [HEN]</td>
</tr>
<tr>
<td>MHA Keystone Surgery</td>
<td>Vermont Oxford Network: neonates</td>
<td>ACS Care Registry</td>
</tr>
<tr>
<td>MHA Keystone ICU: CLABSI, VAP*</td>
<td>MI Care Improvement Registry</td>
<td>Mi Dept of Comm Health SHARP Proj.</td>
</tr>
<tr>
<td>MHA HAI: CAUTI, Hand Hygiene</td>
<td>Payer-Specific Patient Registry</td>
<td>Trinity Health Patient Care Improvement Projects</td>
</tr>
<tr>
<td>MI Breast Oncology Initiative</td>
<td>CDC NHSN: SSI, CLABSI, VAP, CAUTI, MRSA, C. difficile infection</td>
<td>Core Measures: incl. SCIP,</td>
</tr>
<tr>
<td>ACS NSQIP</td>
<td>NDNQI</td>
<td>Culture of Safety Training &amp; Surveys</td>
</tr>
<tr>
<td>Medication Safety: pain mgmt, anti-coag., reconciliation, glycemic control, sedation safety</td>
<td>Others: patient falls &amp; pressure ulcers, use of VTE prophylaxis</td>
<td>Readmissions and transitions of care: between units and physician handoffs</td>
</tr>
</tbody>
</table>

**Are we at a Tipping Point in PI Collaboratives R/T Capacity?**

* Collaboratives or benchmarking projects that include HAI data
Meaningful Use: The *Promise* of Functional Electronic Medical Records

537-bed community teaching hospital; member of Trinity Health (one of the largest Catholic health systems in the U.S.)

Electronic medical record {Cerner}
- Powerchart (main EMR platform)
- FirstNet (emergency department)
- Inet/Iview (pulls in data from devices such as vent., monitors)
- PharmNet (medications); PathNet (LIS)
- RadNet (Imaging – incl. archive/retrieval system)
- SurgiNet (surgery services)
- Supply chain (Lawson)
- Scheduling System
Examples of Provider Support

Tools in EMR Systems

- For Contact Precautions and Contact Precaution-C there is a drop down box for selecting the organism and an order for the Patient Education / Teaching.
The Resource Intensity of HAI Surveillance

- IPs surveyed from 222/224 acute care hospitals, NY
- Scope of responsibility for “average IP” 1.0 FTE:
  - 151 pt. Beds
  - 1.3 ICUs
  - 21 LTCF beds
  - 0.6 Dialysis ctrs
  - 0.5 ASC
  - 4.8 Amb. Care
  - 1.3 PCP offices

Table 4. Percent ICP work time dedicated to specific activities/responsibilities, New York State acute care hospitals (n = 221*), 2007

<table>
<thead>
<tr>
<th>Activity/ responsibility</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Number (%) reporting no responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection surveillance</td>
<td>45.1</td>
<td>10</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Staff education</td>
<td>12.5</td>
<td>0</td>
<td>35</td>
<td>7 (3.2%)</td>
</tr>
<tr>
<td>Quality assurance</td>
<td>9.2</td>
<td>0</td>
<td>50</td>
<td>21 (9.5%)</td>
</tr>
<tr>
<td>Employee health/ occupational</td>
<td>8.5</td>
<td>0</td>
<td>75</td>
<td>24 (10.9%)</td>
</tr>
<tr>
<td>Emergency/ bioterrorism</td>
<td>8.5</td>
<td>0</td>
<td>50</td>
<td>19 (8.6%)</td>
</tr>
<tr>
<td>Construction/ renovation</td>
<td>5.0</td>
<td>0</td>
<td>25</td>
<td>25 (11.3%)</td>
</tr>
<tr>
<td>Central supply/ general processing</td>
<td>3.6</td>
<td>0</td>
<td>37</td>
<td>46 (20.8%)</td>
</tr>
<tr>
<td>Risk management</td>
<td>3.2</td>
<td>0</td>
<td>50</td>
<td>72 (32.6%)</td>
</tr>
</tbody>
</table>

Stricof RL, et al. AJIC 2008
HAI Data: The Infection Preventionist’s Lament!

The Good News: Everybody wants HAI data

The Bad News: Everybody wants HAI data
Gap Analysis: Current Capacity of EMR vs Ideal

- **Weak Signal:Noise ratio**
  - Lots of unfulfilled potential to tap EMR for HAI surveillance
  - Need studies on algorithmic detection of HAIs
  - Low proportion of enterprise-wide EHR currently in place

- **Critical need**: engage EMR vendors - infrastructure to facilitate HAI surveillance, e.g. device denominators, mapping surgical procedures to ICD codes, enterprise-wide data warehouse
  - Opportunities with meaningful use initiative?

- **Advanced analytical tools**, e.g. data mining, are helpful but are they cost effective?

- **The Holy Grail**: real time clinical decision support (CDS)
  - Antimicrobial stewardship
  - More precise application of HAI prev. strategies at adm.
  - Immunization against vaccine prev. diseases
State Perspective of Different HAI Reporting Systems

Stephen M. Ostroff, MD
Director, Bureau of Epidemiology
PA Department of Health
“Confidence is a very fragile thing.”

Joe Montana
Why do we measure HAIs?

• Public Health
  – measure progress or lack thereof
  – target resources to maximize prevention opportunities

• Public
  – to make informed healthcare decisions
HHS Action Plan

• Set core Phase 1 conditions
• Defined metric for each condition
• Specified data source for each condition
• HHS has not waived from these metrics over the 5-year plan
• Priorities and metrics for other segments of healthcare system
Concerns

• Attempts to produce & present measures using alternative data sources
  – CLABSIIs through HCUP data
  – CDI through NHSN
• National measures vs. state measures vs. facility-specific measures
• Data reliability for measuring trends
Concerns

• National measures vs. state measures vs. facility-specific measures
  – State-specific CLABSI/CAUTI/SSI through NHSN
  – State-specific CDI through HCUP
  – Hospital Compare data by CMS
Concerns

• Data reliability for measuring trends
  – Audits
  – Rapid expansion of NHSN
  – Quarterly outputs in Hospital Compare
Concerns

• Incompatibility of measures between federal and state systems
Example

• Hospital Compare
  – CLABSI in ICUs
  – Standardized Infection Ratios
    • Compared to 2006-2008 baseline
  – Quarterly data (Jan-Mar 2011)

• NY State Department of Health
  – Reports rates/1000 central line days
  – Each ICU individually
  – Annual data (2010)
## Result

<table>
<thead>
<tr>
<th>Facility</th>
<th>Hospital Compare</th>
<th>NYSDOH ICU A</th>
<th>NYSDOH ICU B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital A</td>
<td>Better (SIR 0.62)</td>
<td>No different</td>
<td>No different</td>
</tr>
<tr>
<td>Hospital B</td>
<td>Better (SIR 0.72)</td>
<td>No different</td>
<td>No different</td>
</tr>
<tr>
<td>Hospital C</td>
<td>Worse (SIR 2.22)</td>
<td>Worse</td>
<td>Better</td>
</tr>
</tbody>
</table>
Example

• Virginia
  – CLABSI adult ICUs
  – Reported quarterly (Jan-Mar 2011)
  – Rates (per 1000 CLD)

<table>
<thead>
<tr>
<th>Facility</th>
<th>Hospital Compare</th>
<th>Virginia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital A</td>
<td>Better</td>
<td>Worse</td>
</tr>
<tr>
<td>Hospital B</td>
<td>Worse</td>
<td>Worse</td>
</tr>
<tr>
<td>Hospital C</td>
<td>No infections</td>
<td>No infections</td>
</tr>
</tbody>
</table>
Example

- Pennsylvania
  - Housewide
  - Standardized Infection Ratio
  - Annual (2010)

<table>
<thead>
<tr>
<th>Facility</th>
<th>Hospital Compare</th>
<th>Interpretation</th>
<th>PA 2010 Report</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital A</td>
<td>0.59</td>
<td>Better</td>
<td>0.2</td>
<td>Better</td>
</tr>
<tr>
<td>Hospital B</td>
<td>0.27</td>
<td>Better</td>
<td>1.7</td>
<td>Worse</td>
</tr>
<tr>
<td>Hospital C</td>
<td>0.74</td>
<td>Better</td>
<td>1.4</td>
<td>No different</td>
</tr>
</tbody>
</table>
Example

- Tennessee
  - All ICUs
  - Standardized Infection Ratios
  - Annual

<table>
<thead>
<tr>
<th>Facility</th>
<th>Hospital Compare</th>
<th>Interpretation</th>
<th>Tennessee 2010</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital A</td>
<td>Too few to measure</td>
<td>x</td>
<td>5.5</td>
<td>Worse</td>
</tr>
<tr>
<td>Hospital B</td>
<td>0.53</td>
<td>Better</td>
<td>0.1</td>
<td>Better</td>
</tr>
<tr>
<td>Hospital C</td>
<td>0.53</td>
<td>Better</td>
<td>1.3</td>
<td>Same</td>
</tr>
</tbody>
</table>
Hospital Compare

- Likely same experience will occur with
  - CAUTI
  - SSIs

- State-specific data
  - State reports of CDI
    - States using completely different methods than AHRQ for measure
CDC State Specific reports

- Measures of state performance using SIR
- CLABSI, CAUTI, SSIs
- Compared to 2006-2008 baseline
- High variability due to
  - Mandates vs non-mandates
  - Variable hospital participation by state
- This problem should improve with higher participation due to CMS IPPS
- Variable approaches to validation will continue to produce limitations
Conclusions

• Early in evolution of HAI monitoring and reporting, variable approaches not so bad
•Limits ability to meaningfully monitor trends by public health, use data by consumers
• Important need to define outputs at each level of system (national, state, local)
• Need to standardize inputs and outputs to make maximal use of information
CDC National Healthcare Safety Network

Dawn M. Sievert, PhD, MS
Epidemiologist
Lead, NHSN Protocol and Public Reporting Team
Surveillance Branch
Division of Healthcare Quality Promotion, NCEZID, CDC
CDC National Healthcare Safety Network

• Open to all types of US healthcare facilities
• Allows for timely data collection and sharing
• Maintains security, integrity, and confidentiality
• Uses specifically defined criteria and definitions
• Establishes guidance to eliminate subjectivity
• Implements internal business rules and edit checks to maintain accuracy of data
Extent of Current NHSN Use

Percent of AHA Facilities Enrolled in NHSN by State

Map showing the extent of current NHSN use across the United States, with states color-coded based on the percent of AHA facilities enrolled, ranging from 100.0 - 100.0 to 29.4 - 51.9.
Variation in NHSN Reporting

- CMS and State requirements differ by:
  - Facility type
  - HAI type
  - Location type
Standardized Infection Ratio (SIR)

- Summary measure used to track HAIs at a national, state, or local level over time
- Adjusts for several risk factors within a facility found to be significantly associated with differences in infection incidence
Data File Exports from NHSN to CMS

- Files to CMS
  - Data aggregated by participating facility for reporting quarter
  - Currently sending CLABSI, CAUTI, SSI (COLO and HYST)

<table>
<thead>
<tr>
<th>orgid</th>
<th>summaryYQ</th>
<th>infCount</th>
<th>numExp</th>
<th>numCLDays</th>
<th>SIR</th>
<th>SIR_pval</th>
<th>SIR95CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>10312</td>
<td>2011Q3</td>
<td>2</td>
<td>0.484</td>
<td>225</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>
Table 3a. State-specific Standardized Infection Ratios (SIRs) and facility-specific percentiles, NHSN facilities reporting during 2010:

Central Line-associated Bloodstream Infections (CLABSI), All Locations

<table>
<thead>
<tr>
<th>State</th>
<th>No. of Facilities Reporting</th>
<th>No. of Infections</th>
<th>95% CI for SIR</th>
<th>Facility-specific SIRs at Key Percentiles</th>
<th>10%</th>
<th>25%</th>
<th>Median (50%)</th>
<th>75%</th>
<th>90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>69</td>
<td>280</td>
<td>254.957</td>
<td>1.098</td>
<td>0.973</td>
<td>1.235</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Alaska</td>
<td>1-4</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arizona</td>
<td>24</td>
<td>168</td>
<td>195.617</td>
<td>0.859</td>
<td>0.734</td>
<td>0.999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arkansas</td>
<td>22</td>
<td>91</td>
<td>159.006</td>
<td>0.572</td>
<td>0.461</td>
<td>0.703</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>California</td>
<td>365</td>
<td>2910</td>
<td>4,516.662</td>
<td>0.644</td>
<td>0.621</td>
<td>0.668</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorado</td>
<td>60</td>
<td>204</td>
<td>308.068</td>
<td>0.662</td>
<td>0.574</td>
<td>0.760</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connecticut</td>
<td>30</td>
<td>100</td>
<td>146.003</td>
<td>0.685</td>
<td>0.557</td>
<td>0.833</td>
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<td></td>
</tr>
</tbody>
</table>
West Virginia—State CLABSI Aggregate Rates by ICU Type

Figure 1
CLABSI Rates by ICU Type, July 2009 – June 2010

- Medical Teaching: 1.4* / 2.6
- Medical Non-Teaching: 1.0 / 1.9
- Surgical Teaching and Non-Teaching: 2.3 / 2.6
- Medical/Surgical Teaching: 2.3 / 2.1
- Medical/Surgical Non-Teaching: 1.2 / 1.5
- TOTAL: 1.5* / 1.9

Rate per 1,000 CL Days


* WV rate is significantly lower than the NHSN rate.
# Pennsylvania—CLABSI Adjusted SIRs

## Table 16 - Hospitals with 15 - 29.99 Predicted Infections

<table>
<thead>
<tr>
<th>Hospital</th>
<th>NHSN No.</th>
<th>OBS.</th>
<th>PRED.</th>
<th>SIR</th>
<th>SIR AND 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excela Health Westmoreland Regional Hospital</td>
<td>11637</td>
<td>6</td>
<td>15.8</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>UPMC Hamot</td>
<td>11725</td>
<td>7</td>
<td>18.1</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Pinnacle Health Hospitals</td>
<td>10122</td>
<td>11</td>
<td>25.9</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>UPMC Presbyterian Shadyside</td>
<td>10118</td>
<td>12</td>
<td>27.4</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>UPMC Mercy</td>
<td>10384</td>
<td>15</td>
<td>19.8</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>St. Luke's Hospital Bethlehem</td>
<td>11716</td>
<td>24</td>
<td>25.9</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>Coneaugh Valley Memorial Hospital</td>
<td>10280</td>
<td>16</td>
<td>16.5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>York Hospital</td>
<td>10108</td>
<td>16</td>
<td>16.5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Milton S Hershey Medical Center</td>
<td>11747</td>
<td>26</td>
<td>20.6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Reading Hospital And Medical Center</td>
<td>12375</td>
<td>22</td>
<td>20.4</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Abington Memorial Hospital</td>
<td>11838</td>
<td>18</td>
<td>15.9</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Geisinger Medical Center</td>
<td>11775</td>
<td>25</td>
<td>18.5</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Aria Health</td>
<td>11388</td>
<td>25</td>
<td>17.4</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Hahnemann University Hospital</td>
<td>11437</td>
<td>25</td>
<td>17</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Crozer Chester Medical Center</td>
<td>11839</td>
<td>26</td>
<td>15.6</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>Children's Hospital of Pittsburgh of UPMC</td>
<td>11640</td>
<td>33</td>
<td>16.6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Albert Einstein Medical Center</td>
<td>10585</td>
<td>34</td>
<td>15.9</td>
<td>2.1</td>
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</tr>
<tr>
<td>Children's Hospital Of Philadelphia</td>
<td>10306</td>
<td>48</td>
<td>16.7</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td>Temple University Hospital</td>
<td>12382</td>
<td>79</td>
<td>22</td>
<td>3.6</td>
<td></td>
</tr>
</tbody>
</table>

Obs. = observed number of CLABSI
Pred. = statistically predicted number of CLABSI; based on statewide model
SIR = Standardized Infection Ratio (observed number/statistically predicted number of CLABSI)

<table>
<thead>
<tr>
<th>Hospital name</th>
<th>Bloodstream infections</th>
<th>Surgical-site infections</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York Downtown Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York, NY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lenox Hill Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York, NY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memorial Sloan-Kettering Cancer Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York, NY</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Legend:**
- BETTER: < < < < > > > >
- WORSE:
Hospital Compare

Central Line Associated Blood Stream Infections (CLABSI)

- Georgia: 0.55
- Atlanta Medical Center: 0.64
- Northside Hospital: 1.03
- Southern Regional Medical Center: 1.32

Standardized Infection Ratio (SIR)
National Benchmark = 1

Better than the U.S. National Benchmark
Worse than the U.S. National Benchmark
Worse than the U.S. National Benchmark
Work in Progress

• Need governance processes in collaboration with:
  – CMS
  – CSTE - HAI Standards Committee
  – Consumers Union

• Goal is to achieve standardized reporting and harmonized presentation of data for public display

• Moving closer to a consistent message but still work ahead and challenges to overcome
Thank you!
Questions & Answers