NHSN: Tracking Prevention, Protecting Patients

Denise Cardo, MD
Director
Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention
National Healthcare Safety Network

- Nation’s leading system to track and prevent healthcare-associated infections (HAI)
- Provides a single integrated system
- Vital for local, state, and national HAI prevention
- Utilized by more than 12,600 healthcare facilities in all 50 states to better protect patients
- Mandated in 31 states and Washington, D.C. for public reporting
NHSN: Ensures Targeted Prevention

- NHSN is utilized by:
  - **Healthcare facilities** to target prevention
  - **HHS** to track progress on national HAI priorities
  - **CMS** for quality initiatives and reporting on Hospital Compare
    - Quality-driven reimbursement
    - Targeted prevention in QIOs and HENs
  - **AHRQ** to accelerate prevention through hospital networks in CUSP initiative
  - **State health departments** to benchmark prevention success
  - **Consumers** to provide healthcare transparency and accountability (e.g., public reporting)
Progress reducing healthcare-associated infections

- **CLABSI**: Central line-associated bloodstream infection
- **MRSA**: Methicillin-resistant Staphylococcus aureus

- **CLABSI**: -44%
- **HAI-invasive MRSA**: -31%
- **Surgical site infections**: -20%
Upcoming HAI Progress Report

NATIONAL

Healthcare-associated infections (HAIs) are infections patients can get while receiving medical treatment in a healthcare facility. The standardized infection ratio (SIR) is a statistic used to track HAI prevention progress over time; lower SIRs indicate better progress. The infection data are collected through CDC’s National Healthcare Safety Network (NHSN). California requires hospitals to publicly report at least one HAI to NHSN, and HAI data for nearly all US hospitals are published on the Hospital Compare website.

CENTRAL LINE-ASSOCIATED BLOODSTREAM INFECTIONS

CLABSIs ↓ 44% DECREASE SINCE 2008

2012

State Name

Healthcare-associated infections (HAIs) are infections patients can get while receiving medical treatment in a healthcare facility. The standardized infection ratio (SIR) is a statistic used to track HAI prevention progress over time; lower SIRs indicate better progress. The infection data are collected through CDC’s National Healthcare Safety Network (NHSN). California requires hospitals to publicly report at least one HAI to NHSN, and HAI data for nearly all US hospitals are published on the Hospital Compare website.

CAUTIs ↑ 3% INCREASE SINCE 2009

Changes in CAUTI Since 2009

100%

SSIs: COLON SURGERY ↓ 20% DECREASE SINCE 2008

Surgical site infections; colon surgery and abdominal hysterectomy

When germs get into an area where surgery is or was performed patients can get a surgical site infection. Sometimes these infections involve the skin only. Other SSIs can involve tissues under the skin, organs, or implanted material.

5% of hospitals have a surgical site infection SIR significantly worse than the national SIR of 0.80.

US hospitals did not see a significant change in the number of SSIs following colon surgery between 2011 and 2012.

3,119 hospitals across the nation reported on colon surgery data in 2011.

286,362 colon surgeries were reported to NHSN in 2012.

SSIs: COLON SURGERY ↓ 10% DECREASE SINCE 2008

Surgical site infections; colon surgery and abdominal hysterectomy

When germs get into an area where surgery is or was performed patients can get a surgical site infection. Sometimes these infections involve the skin only. Other SSIs can involve tissues under the skin, organs, or implanted material.

5% of hospitals have a surgical site infection SIR significantly worse than the national SIR of 0.80.

US hospitals did not see a significant change in the number of SSIs following colon surgery between 2011 and 2012.

3,119 hospitals across the nation reported on colon surgery data in 2011.

286,362 colon surgeries were reported to NHSN in 2012.

SSIs: ABDOMINAL HYSTERECTOMY ↓ 40% DECREASE SINCE 2008
NHSN Data for Action

NHSN Data
Over 4,700 hospitals currently reporting CAUTI data

Target 1,000 hospitals with highest rate of infections

Technical Assistance
• QIOs
• HENs
• CUSP
• Health Departments
• Other partners

Targeted assessment for prevention (TAP) strategy
Antibiotic Resistance Threat

Estimated minimum number of illnesses and deaths caused by antibiotic resistance*:

At least 2,049,442 illnesses, 23,000 deaths

*bacteria and fungus included in this report
The strategy

In 2013, CDC identified four core actions to help fight antibiotic resistance:

1. **Detect and track patterns of antibiotic resistance**
   - [Image of clipboard with checklists]

2. **Respond to outbreaks involving antibiotic-resistant bacteria**
   - [Image of people with icons of antibiotic-resistant bacteria]

3. **Prevent infections from occurring and resistant bacteria from spreading**
   - [Image of virus and bacteria icons]

4. **Discover new antibiotics and new diagnostic tests for resistant bacteria**
   - [Image of pills and DNA strands]
CDC Recommends All Hospitals Implement Antibiotic Stewardship Programs

- Leadership commitment
- Accountability
- Drug expertise
- Action
- Tracking
- Reporting
- Education
Detect and Protect Against Antibiotic Resistance Initiative

The FY 2015 President’s Budget requests $30 million for 5 years to:

- Speed-up outbreak detection through regional labs and support development of new antibiotics and diagnostics
- Improve infection prevention and antibiotic prescribing
Taking aim: 7 antibiotic-resistant threats

- C. difficile
- CRE
- MDR N. gonorrhoeae
- ESBL
- MDR Salmonella
- MRSA
- MDR Pseudomonas
NHSN Proposed Budget Increase

The FY 2015 President’s Budget requests an additional $14 million for NHSN to:

• Implement the Antibiotic Use and Resistance (AUR) modules to rapidly detect AR threats
  - Extend participation through electronic reporting in the AU module
  - Support implementation of AR module through electronic reporting
  - Refine AUR measures for National Quality Forum review

• Initiate HAI prevention efforts in ambulatory surgery centers

• Drive innovation and applied research through CDC’s Prevention EpiCenters program
NHSN Users: Critical to our Success

- Local data for local action
- Targeted prevention at the local, state, and national levels
- Tracking emerging threats
- Progress in prevention
“Significant changes have been occurring in the field of HAIs, which have now become a public issue. Infections are better known and understood by the medical community. Countries have developed various policies to prevent HAIs, relying on a wide array of tools and procedures. Among these, the publication of HAI rates is important, both to increase awareness on the part of decision-makers and to measure the efficacy of recommendations”

Healthcare-Associated Infection (HAI) Surveillance: The U.S. Environment

Current Landscape - The advent of public reporting and the adoption of data-driven performance incentives as tools for influencing healthcare quality have transformed the question of whether HAIs will be added to pay-for-performance to when and how many HAIs will be included.

On the Horizon - Pay-for-performance will include an increasing number of HAI events, adding to expectations that HAI surveillance is complete, reliable, and valid and can be used to compare healthcare facilities across multiple event types.

What is At Stake - Assuring that (1) individuals responsible for HAI surveillance are fully trained and supported, (2) methods and systems for HAI surveillance are well developed and maintained, and (3) HAI data quality is assessed systematically and actively improved as needed.
Defining Terms

Public reporting - Public disclosure of practitioner or healthcare facility performance measurements with the intention of improving transparency and accountability in healthcare or motivating improvements in quality

Pay for reporting – Financially rewarding practitioners or healthcare facilities for collecting and submitting performance data to a quality measurement program

Pay for Performance – Financially rewarding practitioners or healthcare facilities for scoring well on performance measurements
A Short History of Public Reporting, Pay for Reporting, and Pay for Performance in the U.S.

1986 – Health Care Financing Administration (HCFA), publicly reports Medicare inpatient mortality rates
1987 – U.S. Healthcare, now known as Aetna, initiates large-scale use of pay-for-performance for primary care physicians
Early 1990s – Several states publicly report mortality rates for hospitals performing cardiac surgery
2002 – National Quality Forum (NQF) issues quality measure specifications for use in public reporting programs
2003 – CMS launches pay-for-performance demonstration project
2005 – CMS initiates pay for reporting and publicly reports hospital process-based measures at the Hospital Compare website
2005 – Pennsylvania publicly reports hospital HAI data
2010 – Affordable Care Act includes pay-for-performance
2012 – CMS posts HAI data reported to NHSN on Hospital Compare
2013 – CMS includes CLABSIIs in Hospital Value Based Purchasing
Policy Shift in Patient Safety and Quality of Care: From Publicly Reporting Serious Adverse Events to Broad Use of Report Cards for Payment Purposes

To Err is Human

November 1999

The Patient Protection & Affordable Care Act

March 2010
CDC’s Surveillance System for Healthcare-Associated infections (HAIs)

- State and federal requirements account for growth from ~300 hospitals in 2005 to >5000 hospitals in 2014
- HAI data includes numerators and denominators; outcomes are risk adjusted; and HAI measures are endorsed by the National Quality Forum (NQF)
- Data are used for internal quality improvement, required external reporting, and national surveillance
- System is used by 32 states and Washington, D.C. for HAI reporting mandates and by CMS for pay-for-reporting programs and value based purchasing
- Technical design enables manual data entry or electronic reporting via an industry-standard file format
<table>
<thead>
<tr>
<th>Measure</th>
<th>NQF Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Central line-associated bloodstream infections (CLABSI)*</td>
<td>Endorsed</td>
</tr>
<tr>
<td>2. Catheter-associated urinary tract infections (CAUTI)*</td>
<td>Endorsed</td>
</tr>
<tr>
<td>3. Surgical site infections (SSI) – Colon surgeries, Abdominal hysterectomies</td>
<td>Endorsed</td>
</tr>
<tr>
<td>4. Healthcare worker influenza vaccination coverage</td>
<td>Endorsed</td>
</tr>
<tr>
<td>5. <em>Clostridium difficile</em> laboratory identified events</td>
<td>Endorsed</td>
</tr>
<tr>
<td>6. MRSA Bacteremia laboratory identified events</td>
<td>Endorsed</td>
</tr>
</tbody>
</table>

*NQF measure maintenance in 2014
<table>
<thead>
<tr>
<th>Year</th>
<th>State(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>AK, AL, AR, CA, CO, CT, DC, DE, GA, HI, IL, IN, MA, MD, MS, NC, NH, NJ, NM, NV, NY, OK, OR, PA, SC, TN, TX, UT, VA, VT, WA, WV</td>
</tr>
<tr>
<td>2007</td>
<td>AK, AL, AR, CA, CO, CT, DC, DE, GA, HI, IL, IN, MA, MD, MS, NC, NH, NJ, NM, NV, NY, OK, OR, PA, SC, TN, TX, UT, VA, VT, WA, WV</td>
</tr>
<tr>
<td>2008</td>
<td>AK, AL, AR, CA, CO, CT, DE, GA, HI, IL, IN, MA, MD, MS, NC, NH, NJ, NV, NY, OR, PA, SC, TN, TX, UT, VT, WA, WV</td>
</tr>
<tr>
<td>2009</td>
<td>AK, AL, AR, CA, CT, DE, GA, HI, IN, MS, NC*, NH, NJ, PA, TN, UT, WV</td>
</tr>
<tr>
<td>2010</td>
<td>AK, AR, CA, CT, DC, DE, GA, HI, IL, ME, MS, NC, NJ, NM, NV, NY, OR, PA, SC, TN, UT, WV</td>
</tr>
<tr>
<td>2011</td>
<td>AR, CO, CT, GA, HI, MS, TN, UT</td>
</tr>
<tr>
<td>2012</td>
<td>AR, CT, GA, HI, MS, NV, OR, PA, SC, TN, UT, WV</td>
</tr>
<tr>
<td>2013</td>
<td>CA, NH</td>
</tr>
<tr>
<td>2014</td>
<td>CA, NH</td>
</tr>
</tbody>
</table>
### Hospital Reporting to CMS via NHSN – Current and To Be Determined Requirements

<table>
<thead>
<tr>
<th>Event</th>
<th>Facility Type</th>
<th>Reporting Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI</td>
<td>Acute Care Hospitals</td>
<td>January 2011</td>
</tr>
<tr>
<td></td>
<td>Adult, Pediatric, and Neonatal ICUs</td>
<td></td>
</tr>
<tr>
<td>CAUTI</td>
<td>Acute Care Hospitals</td>
<td>January 2012</td>
</tr>
<tr>
<td></td>
<td>Adult and Pediatric ICUs</td>
<td></td>
</tr>
<tr>
<td>SSI</td>
<td>Acute Care Hospitals</td>
<td>January 2012</td>
</tr>
<tr>
<td></td>
<td>Colon surgery and abdominal hysterectomy</td>
<td></td>
</tr>
<tr>
<td>CLABSI</td>
<td>Long Term Care Hospitals *</td>
<td>October 2012</td>
</tr>
<tr>
<td>CAUTI</td>
<td>Long Term Care Hospitals *</td>
<td>October 2012</td>
</tr>
<tr>
<td>CAUTI</td>
<td>Inpatient Rehabilitation Facilities</td>
<td>October 2012</td>
</tr>
<tr>
<td>MRSA Bacteremia LabID Event</td>
<td>Acute Care Hospitals</td>
<td>January 2013</td>
</tr>
<tr>
<td>C. difficile LabID Event</td>
<td>Acute Care Hospitals</td>
<td>January 2013</td>
</tr>
<tr>
<td>HCW Influenza Vaccination</td>
<td>Acute Care Hospitals</td>
<td>January 2013</td>
</tr>
<tr>
<td></td>
<td>Ambulatory Surgery Centers</td>
<td>October 2014</td>
</tr>
<tr>
<td>SSI and other outcomes</td>
<td>Ambulatory Surgery Centers and Hospital Outpatient Departments</td>
<td>TBD</td>
</tr>
</tbody>
</table>

* Long Term Care Hospitals are called **Long Term Acute Care Hospitals** in NHSN
### HAI Surveillance in the Current U.S. Environment and the Implications for NHSN

<table>
<thead>
<tr>
<th>NHSN at Launch - 2005</th>
<th>NHSN at Age 9 - 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>~ 300 hospitals</td>
<td>&gt; 5000 hospitals</td>
</tr>
</tbody>
</table>

#### Environment
- Public reporting
- Pay for reporting
- Pay for performance

#### Implications
- Changes in NHSN's purposes, infrastructure, and operations
- New scrutiny of HAI case criteria
- Increasing attention to data quality
- Pressure to simplify HAI definitions and move to electronic HAI detection and reporting

1. Purely voluntary and confidential system
2. Healthcare facilities initially enrolled had all participated in legacy CDC system(s)
3. Primary motivation for facilities is internal quality of care improvement
4. Expectation that facilities are motivated to submit data to CDC that are high quality and complete

1. Predominantly mandatory and public reporting system
2. Vast majority of healthcare facilities enrolled had not participated in legacy CDC system(s)
3. Primary motivation for facilities is compliance with reporting requirements
4. Uncertainties about quality and completeness of data submitted to CDC
Implications of Public Reporting, Pay for Reporting, and Pay for Performance for NHSN

Changes in NHSN’s purposes, infrastructure, and operations
> Revision of NHSN Agreement to Participate and Consent Form
> Enhanced infrastructure to improve system performance
> New operational capabilities for reporting to states and CMS

New scrutiny of HAI case criteria
> Updates of case criteria in response to concerns that some events are misclassified as HAIs when NHSN criteria are used

Increasing emphasis on data quality
> Assistance to states and CMS for data quality assessments

Pressure to simplify HAI definitions and data requirements and move to electronic HAI detection and reporting
> Revise definitions in ways that reduce complexity, maintain clinical relevance, and avoid potential case misclassification
> Accelerate use of computer-based detection algorithms and use of electronic healthcare data for HAI surveillance purposes
Positive change in clinical performance is most likely to occur if quality measurement data is:

- Actionable
- Complete, reliable, and valid
- Robust to criticism from hospitals and care teams being assessed
- Understood in broad terms by the public and policymakers

Concerns are most likely to be allayed by safeguards against:

- Unacceptably burdensome reporting requirements
- Gaming the data by providers
- Inappropriate focus on what is measured and incentivized at the expense of other important aspects of healthcare
- Distortions of clinical priorities or practices
Summing Up

- HAI public reporting, pay for reporting, and pay for performance programs are part of a larger trend toward more transparency and accountability in healthcare.
- CDC’s NHSN has emerged as the primary surveillance system used for HAI reporting mandates at the state and federal levels.
- For NHSN, the main opportunities and challenges are to meet the rising expectations for HAI reporting in ways that maximize benefits for patient care and public health while mitigating risks of unintended, adverse consequences.
Thank You!

Please contact me at dpollock@cdc.gov

For More Information about NHSN:
http://www.cdc.gov/nhsn/