Epidemiology and Surveillance

Last Updated 2015
Objectives

• Discuss basic principles of epidemiology and how they apply to healthcare-associated infection (HAI) surveillance

• Review recommended surveillance practices: data collection, recording, analysis, interpretation, and communication of surveillance findings

• Describe surveillance outcome and process measures for infection prevention
Epidemiology

- Definition: Study of disease factors affecting populations
  Clinical care: focus on the individual
  vs
  Epidemiology: focus on the group

- Healthcare epidemiology answers questions such as:
  - What factors contribute to increased HAI rates?
  - What populations are at higher risk for developing HAI?
  - How have HAI changed over time?

- Assessment of trends over time
Infection Prevention and Healthcare Epidemiology

- Goal is HAI prevention
- Number of professional societies, including:
  - Association for Professionals in Infection Control and Epidemiology (APIC)
  - Society for Healthcare Epidemiology of America (SHEA)
  - Infectious Diseases Society of America (IDSA)
- Epidemiologic research and surveillance underlies HAI prevention
  - “Data for Action”
Epidemiologic Surveillance

• The ongoing, systematic collection, recording, analysis, interpretation, and dissemination of data

• Reflects rate of disease onset or current health/disease status of a community or population (e.g., healthcare patients)

• Aims to identify risk factors for disease

• Used for public health action to reduce morbidity and mortality, and to improve health
Surveillance

A surveillance system is an information loop that starts and ends with communication and action.

Flow of Surveillance Data

- Collection
- Dissemination and utilization
- Analysis and interpretation
- Collation and recording (reporting)
Key Tenets of HAI Surveillance

• A **written plan** serves as the foundation
  – What HAI am I tracking? Why?
  – How will data be used?
  – Where are opportunities to prevent HAI in my facility?

• The **intensity** of surveillance efforts need to be maintained over time

• **Stay consistent** over time; always apply same surveillance definitions
APIC Recommended Practices

Recommended practices for surveillance: Association for Professionals in Infection Control and Epidemiology (APIC), Inc.

Terrie B. Lee, RN, MS, MPH, CIC, Ona G. Montgomery, RN, MSHA, CIC, James Marx, RN, MS, CIC, Russell N. Olmsted, MPH, CIC, and William E. Scheckler, MD

Surveillance in public health is defined as “the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health.” Infection control professionals apply this definition to both reduce and prevent health care–associated infections (HAIs) and enhance patient safety. Surveillance, as part of infection prevention and control programs in health care facilities, contributes to meeting the problems related to HAIs. Although the goal of contemporary infection prevention and control programs is to eliminate HAIs, epidemiologic surveillance is still required for accurate quantification of events and demonstration of performance improvement.

Although there is no single or “right” method of surveillance design or implementation, sound epidemiologic principles must form the foundation of effective systems and be understood by key participants in the field.
Recommended Practices for Surveillance

1. Assess the population
2. Select the outcome or process for surveillance
3. Use surveillance definitions
4. Collect surveillance data
5. Calculate and analyze infection rates
6. Apply risk stratification methodology
7. Report and use surveillance information

AJIC Am J Infect Control 2007; 35:427-40
Recommended Practice: Assess the Population

Do you know...

- What infections occur most commonly?
- What infections are likely to occur?
- Where are the greatest opportunities to prevent infections?
- What are our most frequently performed surgical or procedures?
- What types of patients increase liability or costs for our facility?
Recommended Practice: Select Outcome or Process Measures

• Outcome measure: measures the result of care or performance
  – Infection event
  – Length of stay
  – Patient satisfaction

• Process measure: measures adherence to polices and recommended practices
  – Immunization
  – Central line insertion practices (CLIP)
  – Hand hygiene
Outcome Measure Examples

- CLABSI per 1,000 central line days
- MRSA and VRE BSI per 1,000 patient days
- CDI per 10,000 patient days
- SSI risk per procedure
Process Measure Examples

- CAUTI prevention: percent urinary catheters with appropriate indication
- CLABSI prevention: percent adherence to CLIP bundle (all or none)
- CDI prevention: thoroughness of environmental cleaning
- HAI prevention: percent adherence to hand hygiene
Outcome Metrics

**Incidence**
- Number of persons in a population who develop a disease or condition within a specified period of time
- Measure of new infections

**Prevalence**
- Proportion of persons in a population who have a disease or condition at a given point in time
- Measure of infections that are present
Incidence

Incidence measures the frequency of disease onset (i.e., rate). Answers: ‘What is the risk of X occurring?’

Incidence = \(rac{\text{(# of new cases)} \text{during a specified time period}}{\text{(size of population at risk)}}\)

Example:

\[
\frac{5 \text{ SSI}}{97 \text{ Kidney Surgeries}} = 0.5 \text{ new infections per kidney surgery, During the time period of Jan-Dec 2012}
\]
Prevalence

Prevalence measures disease status in a population at a particular time. Answers: ‘How common is X?’

Prevalence = \( \frac{\text{(# of existing cases) during a specified time period}}{\text{(size of population at risk)}} \)

Examples:

\[
\frac{30 \text{ employees got flu shot}}{100 \text{ employees}} = 0.3 = 30\% \text{ of employees had flu shot as of Mar 31, 2012}
\]

\[
\frac{2 \text{ patients colonized with MRSA}}{10 \text{ patients admitted on Mar 31, 2012}} = 0.2 = 20\% \text{ of patients admitted on Mar 31, 2012 are colonized}
\]
Incidence Density Rate

Incidence density accounts for variation in the time each person is at risk for the event.

Incidence density rate =

\[
\frac{\text{(\# of new cases)}}{\text{(person-time at risk)}}
\]
during a specified time period

Examples:

\# hospital onset CDI \#CLABSI
\# of patient days \# central line days
### Quiz

**Incidence, prevalence of incidence density rate?**

<table>
<thead>
<tr>
<th>Measure Example</th>
<th>Metric Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI per 1,000 CL days, 1 Jan – 31 Dec 2014</td>
<td></td>
</tr>
<tr>
<td>CDI cases at admission per 100 admissions, April 2014</td>
<td></td>
</tr>
<tr>
<td>VRE BSI per 10,000 patient days, 1 Jan – 31 Dec 2014</td>
<td></td>
</tr>
<tr>
<td>SSI risk per procedure, 1 Jan – 31 Dec 2014</td>
<td></td>
</tr>
</tbody>
</table>
### Quiz - CLABSI

Incidence, prevalence of incidence density rate?

<table>
<thead>
<tr>
<th>Measure Example</th>
<th>Metric Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI per 1,000 CL days, 1 Jan – 31 Dec 2014</td>
<td>Incidence Density</td>
</tr>
<tr>
<td>CDI cases at admission per 100 admissions, April 2014</td>
<td></td>
</tr>
<tr>
<td>VRE BSI per 10,000 patient days, 1 Jan – 31 Dec 2014</td>
<td></td>
</tr>
<tr>
<td>SSI risk per procedure, 1 Jan – 31 Dec 2014</td>
<td></td>
</tr>
</tbody>
</table>
Quiz - CDI

Incidence, prevalence of incidence density rate?

<table>
<thead>
<tr>
<th>Measure Example</th>
<th>Metric Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI per 1,000 CL days, 1 Jan – 31 Dec 2014</td>
<td>Incidence Density</td>
</tr>
<tr>
<td>CDI cases at admission per 100 admissions, April 2014</td>
<td>Prevalence</td>
</tr>
<tr>
<td>VRE BSI per 10,000 patient days, 1 Jan – 31 Dec 2014</td>
<td></td>
</tr>
<tr>
<td>SSI risk per procedure, 1 Jan – 31 Dec 2014</td>
<td></td>
</tr>
</tbody>
</table>
Quiz – VRE BSI

Incidence, prevalence of incidence density rate?

<table>
<thead>
<tr>
<th>Measure Example</th>
<th>Metric Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI per 1,000 CL days, 1 Jan – 31 Dec 2014</td>
<td>Incidence Density</td>
</tr>
<tr>
<td>CDI cases at admission per 100 admissions, April 2014</td>
<td>Prevalence</td>
</tr>
<tr>
<td>VRE BSI per 10,000 patient days, 1 Jan – 31 Dec 2014</td>
<td>Incidence Density</td>
</tr>
<tr>
<td>SSI risk per procedure, 1 Jan – 31 Dec 2014</td>
<td></td>
</tr>
</tbody>
</table>
Quiz - SSI

Incidence, prevalence of incidence density rate?

<table>
<thead>
<tr>
<th>Measure Example</th>
<th>Metric Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI per 1,000 CL days, 1 Jan – 31 Dec 2014</td>
<td>Incidence Density</td>
</tr>
<tr>
<td>CDI cases at admission per 100 admissions, April 2014</td>
<td>Prevalence</td>
</tr>
<tr>
<td>VRE BSI per 10,000 patient days, 1 Jan – 31 Dec 2014</td>
<td>Incidence Density</td>
</tr>
<tr>
<td>SSI risk per procedure, 1 Jan – 31 Dec 2014</td>
<td>Incidence</td>
</tr>
</tbody>
</table>
Recommended Practice: Use Surveillance Definitions

- Case definition (surveillance definition)
  - the clinical and laboratory characteristics that a patient must have to be counted as an event or case for surveillance purposes
  - Time, place, & person (e.g., age, sex)
  - Universal case reporting
  - A surveillance system in which all cases of a disease are to be reported
Recommended Practice: Use Surveillance Definitions - 2

• Laboratory-based reporting
  – A surveillance method in which the reports of cases come from clinical laboratory data only (forgoing case review/symptomatology)
Recommended Practice: Use Surveillance Definitions - 3

• Always refer to written definitions to ensure accuracy of applying case definitions
  – Use standardized, published, validated definitions where available
  – When not available, prepare written definitions to ensure intra-facility standardization

• For accurate and valid comparisons, use the same definitions
  – If definitions change, the comparability of rates over time will be compromised
NHSN Infection Surveillance Definitions

Refer to [CDC’s NHSN](http://www.cdc.gov/nhsn) website for updates (www.cdc.gov/nhsn)
Recommended Practice: Collect Surveillance Data

- Data collectors should include IP staff and others with responsibility or interest
- Limit collection to only what is needed
- Be involved in efforts when creating or revising the electronic health record required data
Prospective Surveillance

• Initiated when patient is still under the care

• Advantages
  – Ability to capture information in real time
  – Can interview caregivers
  – Can gather findings not recorded in patient record
  – Easier to demonstrate temporality (e.g., before and after observations) and therefore make causal inferences
Retrospective Surveillance

• Closed record review after patient has been discharged
• Advantages:
  – Allows for comprehensive review of sequential events
  – Efficient
• Disadvantage:
  – Does not allow for prompt intervention
  – Important/relevant information may be missing
• Avoid sole reliance administrative data (i.e., abstracted billing)
  – may be useful for identifying possible HAI
  – not reliable or valid for HAI surveillance on its own
Numerator Data Collection

- Numerator = number of instances of the “event” being measured
- Examples:
  - HAIs identified through active surveillance: CLABSI, CAUTI, SSI, VAP
  - HAIs identified by laboratory finding alone: CDI, MRSA BSI, VRE BSI
  - Care practices, processes, observations: CLIP, hand hygiene compliance
- Record point in time or time period.
Denominator Data

- Denominator = number of patients or procedures being followed, the population size, or person-time at risk (patient or line days)
- Examples: procedures, patient census, patient encounters, or number of patient days

\[
\frac{5 \text{ SSI}}{300 \text{ APPY Procedures}} = 0.67
\]
\[
\frac{2 \text{ CLABSI}}{1500 \text{ line days}} = 1.33
\]
\[
\frac{90 \text{ CLIP w/100% adherence}}{100 \text{ line insertions}} = 0.09 \text{ or } 90\%
\]
**Additional Data**

- Data collection may involve collection of risk factor data necessary for risk adjustment

<table>
<thead>
<tr>
<th>HAI</th>
<th>Factors in Risk Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDI</td>
<td>Test Type; Community admission prevalence; Facility bed size; Facility major teaching status</td>
</tr>
<tr>
<td>CLABSI</td>
<td>Number of patients with central lines; ICU vs ward</td>
</tr>
<tr>
<td>MRSA BSI</td>
<td>Community admission prevalence; Facility bed size; Facility major teaching status</td>
</tr>
<tr>
<td>SSI</td>
<td>Age, ASA score; Wound classification (contaminated or dirty); Procedure duration; General anesthesia; Emergency procedure; Gender; BMI; Diabetes Trauma association; Endoscope; Type of surgery (primary, revision); Blood loss; Approach; Spine Level; Facility bed size Facility major teaching status</td>
</tr>
</tbody>
</table>
Recommended Practice: Calculate and Analyze Infection Rates

Calculate Rates and Ratios by Denominator type
• Total population at risk, or time at risk
• Used to calculate raw rate or incidence density rate:

Examples:

\[
\frac{\text{5 SSI}}{300 \text{ APPY Procedures}} = 0.67
\]

\[
\frac{\text{2 CLABSI}}{1500 \text{ line days}} = 1.33
\]

\[
\frac{\text{218 patient days with central line}}{360 \text{ patient days}} = 0.61
\]
Mean

• Measure of central tendency used to describe a data set
• The average value of a set of numbers
• Most affected by outliers
• To calculate, add the values in the data set
• Divide by total number of variables

Example:
0+0+2+0+0+3+7
+2+12+0+0+1=27

27/12 = 2.25
Median

- Another measure of central tendency used to describe a data set
- The midpoint of a distribution of values
- Same number of values above the median as below it
- To calculate:
  - Order the values in the data set (e.g., low to high)
  - Identify middle value

Example:
0,0,0,0,0,0,1,2,2,3,7,12
0.5
Procedure-Associated Risk

- Infection risk varies by type of procedure, and risk index (ASA score, wound class, and procedure duration)

Table 22. SSI rates* by operative procedure and risk index category, PA module, 2006 through 2007

<table>
<thead>
<tr>
<th>Procedure code</th>
<th>Operative procedure description</th>
<th>Duration cut point (min)</th>
<th>Risk index category</th>
<th>No. of procedures</th>
<th>No. of SSI</th>
<th>Pooled mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>Abdominal aortic aneurysm repair</td>
<td>225</td>
<td>0,1</td>
<td>881</td>
<td>16</td>
<td>1.82</td>
</tr>
<tr>
<td>AAA</td>
<td>Abdominal aortic aneurysm repair</td>
<td>225</td>
<td>2,3</td>
<td>288</td>
<td>15</td>
<td>5.21</td>
</tr>
<tr>
<td>APPY</td>
<td>Appendix surgery</td>
<td>81</td>
<td>0,1</td>
<td>2691</td>
<td>40</td>
<td>1.49</td>
</tr>
<tr>
<td>APPY</td>
<td>Appendix surgery</td>
<td>81</td>
<td>2,3</td>
<td>372</td>
<td>13</td>
<td>3.49</td>
</tr>
<tr>
<td>AVSD</td>
<td>Arteriovenostomy for renal dialysis</td>
<td>111</td>
<td>0,1,2,3</td>
<td>606</td>
<td>6</td>
<td>0.99</td>
</tr>
<tr>
<td>BILI</td>
<td>Bile duct, liver or pancreatic surgery</td>
<td>330</td>
<td>0,1</td>
<td>422</td>
<td>37</td>
<td>8.77</td>
</tr>
<tr>
<td>BILI</td>
<td>Bile duct, liver or pancreatic surgery</td>
<td>330</td>
<td>2,3</td>
<td>202</td>
<td>33</td>
<td>16.34</td>
</tr>
<tr>
<td>BRST</td>
<td>Breast surgery</td>
<td>202</td>
<td>0</td>
<td>997</td>
<td>8</td>
<td>0.80</td>
</tr>
<tr>
<td>BRST</td>
<td>Breast surgery</td>
<td>202</td>
<td>1</td>
<td>914</td>
<td>25</td>
<td>2.74</td>
</tr>
<tr>
<td>CARD</td>
<td>Cardiac surgery</td>
<td>300</td>
<td>0,1</td>
<td>10,382</td>
<td>121</td>
<td>1.17</td>
</tr>
<tr>
<td>CARD</td>
<td>Cardiac surgery</td>
<td>300</td>
<td>2,3</td>
<td>3396</td>
<td>58</td>
<td>1.71</td>
</tr>
<tr>
<td>CBGB</td>
<td>Coronary bypass w/chest and donor incision</td>
<td>300</td>
<td>0</td>
<td>1003</td>
<td>3</td>
<td>0.30</td>
</tr>
<tr>
<td>CBGB</td>
<td>Coronary bypass w/chest and donor incision</td>
<td>300</td>
<td>1</td>
<td>47,296</td>
<td>1399</td>
<td>2.96</td>
</tr>
</tbody>
</table>
Patient, Hospital, or Care-Level Risk Factors

• Infection risk varies by patient-specific risk factors (age, sex, diabetes status, etc.)

• Infection rates vary by patient care unit (bed size, medical school association, etc.)

NHSN 2009 Data Summary, published 2011

<table>
<thead>
<tr>
<th>Central line-associated BSI rate*</th>
<th>No. of locations+</th>
<th>No. of CLABSI</th>
<th>Central line-days</th>
<th>Pooled mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Location</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Critical Care Units</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burn</td>
<td>33</td>
<td>193</td>
<td>36,355</td>
<td>5.3</td>
</tr>
<tr>
<td>Medical Major teaching</td>
<td>135 (134)</td>
<td>740</td>
<td>335,840</td>
<td>2.2</td>
</tr>
<tr>
<td>Medical All other</td>
<td>191 (183)</td>
<td>461</td>
<td>293,177</td>
<td>1.6</td>
</tr>
<tr>
<td>Medical Cardiac</td>
<td>252 (246)</td>
<td>556</td>
<td>330,123</td>
<td>1.7</td>
</tr>
<tr>
<td>Medical/Surgical Major teaching</td>
<td>192</td>
<td>760</td>
<td>446,751</td>
<td>1.7</td>
</tr>
<tr>
<td>Medical/Surgical All other &lt;= 15 beds</td>
<td>837 (771)</td>
<td>982</td>
<td>693,747</td>
<td>1.4</td>
</tr>
<tr>
<td>Medical/Surgical All other &gt; 15 beds</td>
<td>324 (323)</td>
<td>1,111</td>
<td>871,750</td>
<td>1.3</td>
</tr>
<tr>
<td>Neurologic</td>
<td>23</td>
<td>67</td>
<td>36,414</td>
<td>1.8</td>
</tr>
<tr>
<td>Neurosurgical</td>
<td>79 (78)</td>
<td>194</td>
<td>129,732</td>
<td>1.5</td>
</tr>
<tr>
<td>Pediatric Cardiotoracic</td>
<td>21</td>
<td>161</td>
<td>65,419</td>
<td>2.5</td>
</tr>
<tr>
<td>Pediatric Medical</td>
<td>15 (13)</td>
<td>36</td>
<td>13,823</td>
<td>2.6</td>
</tr>
<tr>
<td>Pediatric Medical/Surgical</td>
<td>142 (135)</td>
<td>504</td>
<td>228,206</td>
<td>2.2</td>
</tr>
</tbody>
</table>
Calculating SIR

• Standardized infection ratio

\[
\text{SIR} = \frac{\text{Observed HAI}}{\text{Predicted HAI}}
\]

Example:
Hospital A has 4 MRSA BSI over 23,500 patient days.
National data predicted 2.5 MRSA BSI.

\[
\text{SIR} = \frac{4}{2.5} = 1.6
\]
Recommended Practice: Apply Risk Stratification Methodology

- **CLABSI and CAUTI**: Infection risk specific to location
- **SSI**: Probability of infection calculated for each patient; varies by surgery
- **CDI & MDRO (LabID)**: Infection risk accounts for disease burden (community prevalence), testing method (for CDI), and facility characteristics
Applying Risk Adjustment Methods

Improving Risk-Adjusted Measures of Surgical Site Infection for the National Healthcare Safety Network

Yi Mu, PhD; Jonathan R. Edwards, MStat; Teresa C. Horan, MPH; Sandra I. Berrios-Torres, MD; Scott K. Fridkin, MD

(See the commentary by Moehring et al, on pages 987–989.)

BACKGROUND. The National Healthcare Safety Network (NHSN) has provided simple risk adjustment of surgical site infection (SSI) rates to participating hospitals to facilitate quality improvement activities; improved risk models were developed and evaluated.

METHODS. Data reported to the NHSN for all operative procedures performed from January 1, 2006, through December 31, 2008, were analyzed. Only SSIs related to the primary incision site were included. A common set of patient- and hospital-specific variables were evaluated as potential SSI risk factors by univariate analysis. Some ific variables were available for inclusion. Stepwise logistic regression was used to develop the specific risk models by procedure category. Bootstrap resampling was used to validate the models, and the c-index was used to compare the predictive power of new procedure-specific risk models with that of the models with the NHSN risk index as the only variable (NHSN risk index model).

RESULTS. From January 1, 2006, through December 31, 2008, 847 hospitals in 43 states reported a total of 849,659 procedures and 16,147 primary incisional SSIs (risk, 1.90%) among 39 operative procedure categories. Overall, the median c-index of the new procedure-specific risk was greater (0.67 [range, 0.59–0.85]) than the median c-index of the NHSN risk index models (0.60 [range, 0.51–0.77]); for 33 of 39 procedures, the new procedure-specific models yielded a higher c-index than did the NHSN risk index models.

CONCLUSIONS. A set of new risk models developed using existing data elements collected through the NHSN improves predictive performance, compared with the traditional NHSN risk index stratification.
Recommended Practice: Report and Use Surveillance Information

- NHSN published data can help you interpret your HAI data


NHSN 2006-2008 Summary Data (referent period), published Dec 2009
# Tables and Line Lists

## National Healthcare Safety Network

**Line Listing for All Central Line-Associated BSI Events**

<table>
<thead>
<tr>
<th>patID</th>
<th>dob</th>
<th>gender</th>
<th>admitDate</th>
<th>eventID</th>
<th>eventDate</th>
<th>eventType</th>
<th>spcEvent</th>
<th>location</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/19/1955</td>
<td>M</td>
<td></td>
<td>12/10/2014</td>
<td>17210545</td>
<td>01/07/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>ICU</td>
</tr>
<tr>
<td>06/27/1961</td>
<td>M</td>
<td></td>
<td>02/03/2015</td>
<td>17402254</td>
<td>02/15/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>ICU</td>
</tr>
<tr>
<td>02/22/1929</td>
<td>M</td>
<td></td>
<td>01/28/2015</td>
<td>17458450</td>
<td>02/22/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>CMU NEW</td>
</tr>
<tr>
<td>06/21/1949</td>
<td>F</td>
<td></td>
<td>02/09/2015</td>
<td>17835156</td>
<td>02/24/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>ICU</td>
</tr>
<tr>
<td>11/02/1939</td>
<td>F</td>
<td></td>
<td>12/22/2014</td>
<td>17922119</td>
<td>02/05/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>6 SURG</td>
</tr>
<tr>
<td>05/06/1967</td>
<td>F</td>
<td></td>
<td>01/21/2015</td>
<td>17948502</td>
<td>01/24/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>6 SURG</td>
</tr>
<tr>
<td>12/04/1969</td>
<td>F</td>
<td></td>
<td>02/14/2015</td>
<td>17948502</td>
<td>02/27/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>6 SURG</td>
</tr>
<tr>
<td>01/31/1947</td>
<td>M</td>
<td></td>
<td>05/03/2015</td>
<td>18359747</td>
<td>05/06/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>5 MED</td>
</tr>
<tr>
<td>03/06/1955</td>
<td>M</td>
<td></td>
<td>04/22/2015</td>
<td>18359845</td>
<td>04/27/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>CMU NEW</td>
</tr>
<tr>
<td>08/24/1950</td>
<td>F</td>
<td></td>
<td>04/05/2015</td>
<td>18360142</td>
<td>04/27/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>5 MED</td>
</tr>
<tr>
<td>02/01/1924</td>
<td>M</td>
<td></td>
<td>04/21/2015</td>
<td>18405173</td>
<td>05/12/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>CMU NEW</td>
</tr>
<tr>
<td>08/24/1945</td>
<td>F</td>
<td></td>
<td>05/14/2015</td>
<td>18697335</td>
<td>05/24/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>6 SURG</td>
</tr>
<tr>
<td>01/05/1938</td>
<td>F</td>
<td></td>
<td>05/11/2015</td>
<td>18697565</td>
<td>05/17/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>6 SURG</td>
</tr>
<tr>
<td>12/12/1926</td>
<td>M</td>
<td></td>
<td>06/03/2015</td>
<td>18726273</td>
<td>06/07/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>5 MED</td>
</tr>
<tr>
<td>08/30/1930</td>
<td>F</td>
<td></td>
<td>05/31/2015</td>
<td>18726499</td>
<td>06/06/2015</td>
<td>BSI</td>
<td>LCBI</td>
<td>CCU</td>
</tr>
</tbody>
</table>
Bar Charts

CLABSI cases

ICU
NICU
CCU

1st Quarter 2nd Quarter 3rd Quarter 4th Quarter
Reporting and Using Surveillance Data

“The demonstrable power of surveillance is in sharing findings with those who need to know and who can act on the findings to improve patient safety.”

AJIC Am J Infect Control 2007; 35:427-40

• Plan for distribution of findings
• Report to health care providers most able to impact patient care
• Report in a manner to stimulate process improvement
• Use visual displays of data (e.g., charts, graphs, tables)
Line Graphs and Histograms

CLABSI, 2009-2011

CLABSI cases

January, March, May, July, September, November
Line Graphs and Histograms - 2

CLABSI, 2009-2011

CLABSI cases

Central line days

Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov
References


Questions?

For more information, please contact any HAI Liaison Team member.

Thank you.