METHODS
The current National and State Healthcare-Associated Infections Progress Report presents data reported to the National Healthcare Safety Network (NHSN) for the calendar year 2014. The healthcare-associated infection (HAI) data were reported in response to a mandate or voluntarily from hospitals in all 50 states, Washington, D.C., and Puerto Rico. Data included in the annual report use standard NHSN definitions\(^1-4\) for central line-associated bloodstream infections (CLABSIs), catheter-associated urinary tract infections (CAUTIs), surgical site infections (SSIs), and laboratory-identified (LabID) methicillin-resistant Staphylococcus aureus (MRSA) bacteremia (bloodstream infections) and Clostridium difficile (C. difficile) infections. To account for delayed reporting, 2014 data reported to NHSN through July 1, 2015 were included.

National data included in this report are shown separately for acute care hospitals (including critical access hospitals), long-term acute care hospitals (LTACHs), and inpatient rehabilitation facilities (IRFs). State-specific data include only those data reported from acute care and critical access hospitals.

The CLABSI and CAUTI data shown in this report are inclusive of data reported from all eligible locations within hospitals; however, CLABSI and CAUTI data are also stratified by location type (critical care units, neonatal critical care units, and inpatient wards as appropriate) in the Data Tables associated with this report. For this report, “wards” included step-down units and specialty care areas including hematology/oncology and bone marrow transplant units. The national SSI data are inclusive of all 39 specific procedure categories identified by NHSN; the 10 select procedures that approximate the procedures included in the Centers for Medicare & Medicaid Services (CMS) Surgical Care Improvement Project (SCIP) were shown separately. Only deep incisional and organ/space SSIs detected during the same admission as the inpatient procedure or upon readmission to the same hospital that performed the inpatient procedure were included in the report; superficial incisional SSIs and those identified on post-discharge surveillance were excluded. This report published state-specific SSI data following the two surgical procedures required by the CMS Hospital Inpatient Quality Reporting (IQR) program\(^5\) – colon surgery and abdominal hysterectomy surgery. MRSA bacteremia and C. difficile infections in this report included only cases classified as hospital-onset (i.e., occurred on or after day 4 of admission). Community-acquired cases are reported to NHSN and are included in the risk adjustment of LabID event data.

The standardized infection ratios (SIRs) published in this report compare the observed number of infections reported to NHSN during 2014 to the predicted number of infections based on the national aggregate data reported to NHSN during a baseline time
period, and are adjusted for key risk factors (see table below for baseline time periods). The risk adjustment methodology used to produce the CLABSI, CAUTI, SSI, MRSA bacteremia, and C. difficile SIRs are summarized in previous reports\(^6,7\) and have not changed. SSI data were risk adjusted using CDC’s Complex Admission/Readmission (A/R) model, and the LabID event SIRs were risk adjusted using a negative binomial regression model.\(^8,9\) A complete list of risk factors used in the calculation of all SIRs can be found in the technical Data Tables associated with this report.

### National SIR Baselines for each HAI and Facility Type

<table>
<thead>
<tr>
<th>HAI TYPE</th>
<th>NATIONAL BASELINE</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Acute Care Hospitals</td>
</tr>
<tr>
<td>CLABSI</td>
<td>2006–2008(^10)</td>
</tr>
<tr>
<td>CAUTI</td>
<td>2009(^11)</td>
</tr>
<tr>
<td>MRSA, C. difficile</td>
<td>2010–2011</td>
</tr>
<tr>
<td>SSI</td>
<td>2006–2008</td>
</tr>
</tbody>
</table>

Facility-specific SIRs were calculated if the facility had at least one predicted HAI for a given location category or surgical procedure. These facility-specific SIRs were used to create percentile distributions for each HAI if at least 20 facilities had sufficient data to calculate an SIR. Percentile distributions among the national data are shown in increments of 5, from 5% to 95%; SIRs at key percentiles are calculated for state-level data (10%, 25%, 50%, 75%, 90%). Additionally, the facility-specific SIRs were compared to the nominal value equal to the national SIR for each location or procedure category; if at least 10 facilities in each category had sufficient data to calculate an SIR, the percent of facilities with an SIR significantly higher or lower than the value of the national SIR was calculated both nationally and by state. If at least five facilities reported 2014 data in a state, the state-specific SIRs were then calculated for each HAI type, location category or surgical procedure by pooling 2014 data from all reporting facilities in the state.

Annual progress in preventing CLABSIs, CAUTIs, SSIs, MRSA bacteremia, and C. difficile infections was evaluated for acute care hospitals, both nationally and by state, by comparing 2014 and 2013 SIRs by HAI type and location or surgical procedure category. SIRs between the two years were compared for all reporting acute care hospitals in each state, and the change in SIRs was assessed for statistical significance using a mid-p exact test. For any state with a 2013 SIR of 0.00, the percent change was reflected as greater than 100 percent. State SIRs were compared to the national SIRs with the state’s data removed; significance was assessed using a two-tailed mid-p exact test.
In addition to the NHSN data used to produce the SIRs in this report, several external data sources were used to provide additional metrics. State health department HAI programs provided CDC with the status and specific requirements of state HAI reporting mandates to NHSN, previous efforts to validate 2014 HAI data, and prevention collaboratives that occurred, or are planned, in the state (either from the state health department or other organization) from January 2014 to December 2015. An indicator for a state mandate was provided for mandates enacted by either the state health department or the state’s hospital association. Validation efforts were classified into two categories for each HAI type: data checked for quality and additional in-depth data review. The following criteria were used to assign credit to states that performed data quality checks: state health department had access to 2014 NHSN data; performed regular data cleaning/quality checks on at least 6 months of 2014 data prior to July 1, 2015; and contacted hospitals if data errors, outliers, or missing information were found. A state received credit for additional in-depth data review if the state performed an audit of their hospitals’ medical or laboratory records prior to July 1, 2015, meaning the state health department reviewed hospital records to confirm proper case ascertainment and data entry into NHSN. Validation efforts should be taken into account when evaluating an individual state’s performance. States that perform more vigorous data validation activities are more likely to find hospital records of infections, and therefore these states may have higher SIRs compared to states that do not perform validation. Not all state health departments have access to NHSN data or have access to NHSN data from every hospital included in this report. Furthermore, some states may currently be involved in 2014 data validation efforts that are not reflected in this report due to the validation deadlines stated above. Data validation efforts were self-reported by state health departments to CDC and may vary between states.

The total number of acute care hospitals in each state was computed from the American Hospital Association (AHA) annual survey for fiscal year 2013, after excluding rehabilitation hospitals and long-term acute care hospitals (available at http://www.ahadataviewer.com/about/hospital-database/). Because of this methodology, these counts may differ slightly from counts provided by state regulatory authorities. The total number of acute care hospitals reporting to NHSN was calculated for each state, HAI type, location category, and surgical procedure. The counts displayed on the state factsheets and State Progress Landscape reflect the number of hospitals that reported at least one month of 2014 data to NHSN and were included in the SIR calculations (i.e., after SIR exclusion criteria were applied).
For complete data tables and a glossary of terms, please visit CDC’s HAI Progress Report website at www.cdc.gov/hai/progress-report.

REFERENCES


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