



13-ID-02

Committee: Infectious Disease
Subcommittee: Healthcare-associated Infections Subcommittee

Title: Healthcare-Associated Infections Data Presentation and Reporting Standardization

I. Statement of the Problem:

Executive Summary

The National Healthcare Safety Network (NHSN) is a secure, internet-based surveillance system that collects healthcare-associated infection (HAI) process and outcome data. As of December 2012, over 11,300 healthcare facilities are enrolled in the system. The data submitted by those healthcare facilities are used to improve patient safety at the local and national levels. The Centers for Disease Control and Prevention (CDC) analyzes and publishes the surveillance data to estimate and characterize the national burden of HAIs. At the local level, participating facilities and user groups (such as state health departments) can access the data to generate reports and graphs that compare individual facility rates or state rates with national aggregate data.

As participation in NHSN increases and availability of HAI data extends to a variety of governmental and non-governmental organizations, it is imperative to outline some parameters for appropriate analysis and presentation of HAI data. Although individual states may have legislative or regulatory stipulations on how HAI data are to be displayed and shared, development of a standardized approach to data presentation that can serve as a model for best practices can fill a gap in the current practice of public reporting of HAI data analyses.

Background

Over the past decade, states have passed legislation and/or regulation to collect and report healthcare-associated infection (HAI) data. Federal agencies such as the CDC and the Centers for Medicare and Medicaid Services (CMS) as well as consumer groups (e.g., Consumers Union, the Leapfrog Group) also use these data for a variety of purposes including informing policy development, evaluating progress toward infection reduction targets, and aiding consumers in making decisions about health care. Although the multiple stakeholder groups use the same data source (NHSN), differing methods, time periods, populations, and presentation strategies can lead to conflicting results and different conclusions. This can cause confusion for consumers who are trying to use the information to make educated decisions.

Policymakers and healthcare providers also are key stakeholders that use and interpret publicly reported HAI data. According to Edmond and Bearman (2007), theoretically, there are four ways that public reporting can improve quality: (1) remediation (hospitals make a concerted effort to improve quality); (2) restriction (licensing and accreditation organizations use the data to restrict provision of care by poor performers); (3) removal (poor performers discontinue providing services); or (4) competition between providers on the basis of improving quality to improve market share. However, to improve quality, the data must be presented in a way that is meaningful and able to be readily understood by the intended audiences.

Prior CSTE position statements (10-ID-28, 10-SI-05, 11-SI-03, 12-ID-06) have made efforts toward standardizing HAI surveillance methods and promoting the complete and accurate reporting of HAIs but have not specifically addressed data presentation methods. As public reporting systems have matured and grown organically within states, so too have the individual approaches to the presentation of HAI statistics and measures in published reports and online data dashboards. Although consensus groups like the Healthcare

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Infection Control Practices Advisory Committee have published standards on essential elements of an HAI reporting system, most of the focus to date has been on the specific measures that are collected and reported and not on the manner in which the data are displayed.

HAI data analyses are complex, and need to be displayed in ways that are accessible to different audiences with varied levels of mathematical sophistication, and in summary form for casual audiences, with access to details for those who want them. A variety of process and outcome measures exist for assessing facility performance, and many of them have complex underpinnings. Populations at risk vary between measures and infection types (e.g., urinary catheter days for catheter-associated urinary tract infections, surgical procedures for surgical site infections, patient days for *Clostridium difficile* infections). Some measures are compared to a reference population, such as the standardized infection ratio (SIR), which compares the observed number of infections to a predicted number based on a reference population, and are risk-adjusted. Others, like infection rates, may be crude, stratified, or risk-adjusted, and may or may not be compared to another population. Another challenge influencing the establishment of data presentation standards is the fact that different states may have regulations or legislation that prescribe how and when data are to be published and in what format.

As the science and practice of public reporting of HAI measures has progressed, some states and regions have involved consumer and stakeholder input to identify the data elements and presentation strategies that are of greatest interest to different groups and that maximize comprehension of the data. Some examples from state HAI programs include:

- **Maryland:** Prior to creating web-based public reports of HAI data, conducted two focus groups – one of consumers and one of healthcare professionals. After identifying differences in the audiences' ability to understand and interpret the presentation options presented, two websites were produced, each with a report tailored to the intended audience. The consumer site has number of observed and predicted infections and a SIR symbol noting comparison between the facility and the baseline national experience, while the report for healthcare professionals contains more data and is available at a more granular level.
- **New Mexico:** As part of a regional collaborative on HAI website design, held four focus groups with the general public to gather information on their interest in and current familiarity with HAI data, preferences for information on an HAI website, and get feedback on several possible displays of HAI data. Despite preferring a visualization that was thought to be simple, consumers still did demonstrate understanding of the data they were viewing and did not use the data that were reported.
- **Virginia:** Involved numerous stakeholder groups including infection preventionists, members of the multidisciplinary statewide HAI Advisory Committee, and a patient/consumer advocacy group to gather input on the development of a new central line-associated bloodstream infection report for healthcare providers and the general public. The patients/consumers were interested in highlighting the hospitals that achieved zero infections during the time period. Advisory Committee members and health department epidemiologists stressed the importance of including confidence intervals with the reported data to show statistical significance. Infection preventionists favored a color scheme where facilities that were statistically similar to the national experience were in blue while consumers preferred the “stoplight” colors of red, yellow, and green where red indicated that a hospital had statistically more infections than predicted and green indicated the hospital observed statistically fewer infections than predicted.
- **Washington:** Engaged in a variety of studies, collaborations, and research projects to examine the evidence behind public reporting of hospital performance data. A paper published by Birnbaum et al. (2010) explains an approach to improving the usage and impact of hospital comparison websites that involved developing prototype reports based on design principles to address issues related to poor usage and impact, and conducting focus group evaluations to test the prototypes. Research by Amini and colleagues (2013) examines the credibility and user-friendliness of state websites that publicly report hospital infection rates.

II. Statement of the desired action(s) to be taken:

CSTE requests that CDC convene a multidisciplinary committee to develop a toolkit that describes best practices and recommended methods of presenting HAI measures and statistical information, including analytic standards. This committee shall be co-chaired by representatives from CSTE and CDC. Members of this committee shall possess expertise in areas including but not limited to epidemiology, statistics, health communication, health literacy, and cultural competency and shall represent state/territorial health departments, CDC, and other relevant stakeholder groups and organizations. The document developed by the committee shall include the structure and preferred content of an HAI public information report as well as a template for a visual display that embodies the recommended best practice options. Domains of HAI data presentation and analytic standards to be addressed in the proposed HAI data presentation toolkit are outlined in Appendix 1.

Following the publication of the toolkit, where possible, CDC, states, and other agencies and organizations reporting and disseminating HAI data from the National Healthcare Safety Network should adopt the framework proposed in the toolkit for their HAI public information reports.

The toolkit will address an immediate need to create a more standardized approach to HAI data presentation and analysis. However, concurrently, additional research is required to understand the optimal approaches to presenting HAI data to various stakeholder groups. Funding agencies are encouraged to devote resources to continue to build the evidence base on this issue.

III. Public health Impact:

- Improves the ability for public health to meaningfully monitor trends in the HAI data.
- Improves stakeholders' capacity to understand and use HAI data.
 - Ensures that all recipients of HAI data are provided with adequate information about the importance, meaning, and interpretation of specific measures.
 - Helps to avoid common pitfalls that lead to misinterpreting the data.
 - Provides data users with guidance and support in using the information.
 - Increases healthcare providers' and consumers' trust in the data by using a consistent data presentation framework.
 - Facilitates provider understanding of and comfort with the data, and therefore encourages providers to more actively study and use the information to improve the quality of care in the facility.
 - Deepens consumers' understanding of HAI measures and statistical information by removing some of the confusion and conflicting results that exist currently.
 - Consistency of reporting and improved understanding may engage and motivate consumers to explore and use reports.
 - If consumers use the information to make informed choices, it may be likely that they will obtain high-quality health care for themselves and their family members.
 - Collectively, many consumers making informed choices may stimulate quality improvement among providers.

IV. References

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Agency for Healthcare Quality and Research. Best Practices in Public Reporting No. 2: Maximizing Consumer Understanding of Public Comparative Quality Reports: Effective Use of Explanatory Information: <http://www.ahrq.gov/qual/pubrptguide2.htm>

Agency for Healthcare Quality and Research. Best Practices in Public Reporting No. 3: How To Maximize Public Awareness and Use of Comparative Quality Reports Through Effective Promotion and Dissemination Strategies: <http://www.ahrq.gov/qual/pubrptguide3.htm>

Agency for Healthcare Quality and Research. Model Public Reporting Elements: A Sampler. August 2010. <http://www.ahrq.gov/qual/value/pubrptsampler.htm>

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CSTE Position Statement 10-SI-05. Healthcare-Associated Infection Reporting. Available through <http://www.cste.org>.

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COUNCIL OF STATE AND TERRITORIAL EPIDEMIOLOGISTS

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Ostroff S. "State Perspectives of Different HAI Reporting Systems". Oral presentation. Department of Health and Human Services Healthcare-Associated Infections Data Summit. Kansas City, MO. May 2012.



V. Coordination

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Agencies for Information:

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VII. Appendices

Appendix 1. Domains of HAI Data Presentation to be Addressed in the CSTE HAI Data Presentation Toolkit

- A. Analytic conventions
 - 1. Use standardized definitions
 - 2. Assure data presented are statistically reliable
 - 3. Risk adjust data appropriately
- B. Display and communication considerations
 - 1. Describe the report
 - i. Purpose
 - ii. Audience
 - iii. Methodology
 - iv. Intended uses of the data
 - 2. Describe the dataset(s) analyzed
 - i. HAI type(s)
 - ii. Facility type(s)
 - iii. Place
 - iv. Time
 - v. Source
 - 3. Label charts, graphs, and tables
 - 4. Aid the reader in consuming HAI information by summarizing, interpreting, highlighting meaning, and narrowing options
 - i. Language
 - ii. Colors
 - iii. Symbols
 - 5. Tailor report to the audience
 - 6. Provide a mechanism for users to evaluate the report by providing feedback



Attachment I. Additional Agencies for Response and Information

Agencies for Response

- 4) Consumers Union
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