Ability of Healthcare-Associated (HAI) Data to Differentiate Hospitals Nationwide

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Abstract

Background: Hospital quality measure for 6 different types of healthcare-associated infections (HAIs) are reported publicly on Centers for Medicare and Medicaid Services' (CMS) Hospital Compare website. A primary goal of public reporting of these data is to allow the public to compare hospitals based on these measures. We analyzed national HAI data to determine the frequency of missing data and whether the data allowed for meaningful comparisons among hospitals in the same geographic area.

Methods: We analyzed national HAI data for calendar year 2013, comparing hospitals within 306 hospital referral regions (HRRs) as defined by the Dartmouth Atlas. Within each HRR, for each of the six reported HAIs, we assessed two criteria:
1. Data availability: The proportion of hospitals in each HRR where data for the HAI are available (i.e., where data exist that can be used for comparing hospitals).
2. HAI performance diversity: The percentage of hospitals in each HRR where at least one pair of hospitals had statistically different standardized infection ratios (SIR) for the HAI (non-overlapping 95% CIs).

Results: Data were analyzed for 4,561 hospitals in 306 HRRs during 2013, with a median of 11 hospitals per HRR (IQR=11). Data availability differed by HAI: 82% of HRRs had at least half of constituent hospitals reporting *C. difficile* data, compared with only 4% for surgical site infections (SSI) for hysterectomy data. HAI performance diversity also differed by HAI: 57% of HRRs had at least one pair of hospitals with statistically different SIRs for *C. difficile* data, compared to only 4% for SSI (hysterectomy) data.

Conclusions: The value of HAI data for comparing hospitals in geographic regions differs by type of HAI, but is generally useful when comparing hospitals in many geographic areas using hospital search tools such as CMS Hospital Compare.

Background

- Healthcare-associated infections (HAI) are reported to the CDC and then displayed on the CMS website.
- A goal of CMS is to allow patients to compare hospitals' HAI rates and other outcomes when choosing a hospital within a geographic area.
- It is not known if the data on the CMS website allows patients to differentiate hospitals based on their HAI rates.

Objective

- Analyze national HAI data on the CMS website to:
    1. determine the frequency of missing data, and
    2. determine whether the data allowed for meaningful comparisons among hospitals in the same geographic area.

Methods

- We analyzed national HAI data for calendar year 2013, comparing hospitals within 306 hospital referral regions (HRRs) as defined by the Dartmouth Atlas using publically available data.

- Two criteria were assessed:
    1. Data availability: The proportion of hospitals in each HRR where data for the HAI are available (i.e., where data exist that can be used for comparing hospitals).

    2. HAI performance diversity: The percentage of hospitals in each HRR where at least one pair of hospitals had statistically different standardized infection ratios (SIR) for the HAI (non-overlapping 95% CIs). This represented that hospitals were different in their performance.

    For example, if two hospitals in the results for one simulated search (i.e., one HRR) have 95% CIs that do not overlap, then the HAI data differentiates these hospitals for this simulated search.

Results

Table 1. Percentage of HRRs that have at least 50% of hospitals reporting data for each HAI.

	# Fitting Criteria	Total #	%
CAUTI	144	306	47
C. difficile	250	306	82
CLABSI	115	306	38
MRSA	117	306	38
SSI (Hysterectomy)	12	306	4
SSI (Colon)	131	306	43

Results, cont.

- Compared 4,561 hospitals in 306 healthcare referral regions
- Patients in an average healthcare referral region would be comparing amongst 11 hospitals
- Criteria 1 highlights (see Table 1): 82% of HRRs had at least half of constituent hospitals reporting C. difficile data, compared with only 4% for surgical site infections for hysterectomy data
- Criteria 2 highlights (see Table 2): 57% of HRRs had at least one pair of hospitals with statistically different SIRs for C. difficile data, compared with only 4% for SSI

Table 2. Percentage HRRs that have at least one pair of hospitals with non-overlapping 95% standardized infection ratios (SIR) confidence intervals (CIs) for a given healthcare-associated infection (HAI), indicating a statistically significant difference in SIR between the pair of hospitals.

	# Fitting Criteria	Total #	%
CAUTI	119	303	39
C. difficile	175	306	57
CLABSI	67	303	22
MRSA	43	293	15
SSI (Hysterectomy)	8	228	4
SSI (Colon)	54	300	18

Conclusions

- The value of HAI data for comparing hospitals in geographic regions differs by type of HAI, but is generally useful when comparing hospitals in many geographic areas using hospital search tools such as CMS Hospital Compare.
- Other issues such as patient understanding, better risk adjustment still need to be explored relative to the optimal method of presenting HAI data to the public.

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