

Healthcare-associated infection differences within Hospital Referral Regions in Georgia, 2019

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INTRODUCTION

Healthcare-associated infections (HAI) contributes to poor outcomes for patients and costs up to \$30 billion each year to the US healthcare system.¹ In addition, HAI is the fifth leading cause of death in acute-care facilities.² Device-associated infections include central line-associated bloodstream infection (CLABSI), catheter associated urinary tract infection (CAUTI), ventilator associated pneumonia, and surgical site infection (SSI). Other HAIs can result from prolonged or inappropriate antibiotic use such as Clostridium difficile infection (CDI) and methicillin-resistant Staphylococcus aureus (MRSA) bloodstream infection. Unfortunately, these infections are risks of necessary healthcare interventions. Fortunately, these are infections that are preventable through best practices in infection control such as early foley urinary catheter removal protocol,³ antibiotic stewardship,⁴ and use of antiseptic at surgical site.⁵

In an initiative to improve hospital quality, the Center for Medicare and Medicaid Service (CMS) began withholding reimbursement for HAI to hospitals in 2008.^{3,6} Using data from the National Healthcare Safety Network (NHSN), CMS provides facility-level data to healthcare consumers for comparing hospitals based on various metrics including HAI.⁷ However, cases of HAIs are low and not all facilities have available data. This calls into question the reliability of HAI rates as a metric for comparing hospitals.

OBJECTIVE

The aim of this study is to determine the effectiveness of HAI data as a proxy to differentiate acute-care hospitals in Georgia based on 2019 data from NHSN. The aim is further subdivided into the following objectives:

- (1) For each HAI, describe the proportions of acute-care hospitals that reports data on a specific HAI
- (2) Describe the percentage of Hospital Referral Regions (HRR) in Georgia with at least 50% of its hospitals reporting a specific HAI
- (3) Highlight Standard Infection Ratios (SIR) across acute-care hospitals for each HAI

MATERIAL AND METHODS

Secondary analysis was done using data from the NHSN. Data from 1/1/2019 – 12/31/2019 was provided as Standard Infection Ratio (SIR) through Hospital Compare at CMS. SIRs are calculated by dividing the number of observed infections by the predicted number of infections for that hospital. Predicted values for each hospital are determined by previous values from the 2015 benchmark.⁷ SIRs are used because it uses indirect standardization to adjust for differences among hospitals.¹⁰ SIRs for 6 HAIs (CAUTI, CLAPSI, CDI, SSI Abdomen, SSI Colon, MRSA) were accessed across and within Hospital Referral Regions (HRR) in Georgia.

Data was obtained for acute-care facilities in Georgia as defined by hospital referral region (HRR), which are regions with at least one hospital that performs major cardiovascular procedures and neurosurgery.¹¹ HRRs are commonly used in health service research as regional boundaries rather than county or state boundaries. HRR sometimes expand over state borders.

HAI data is not available for all facilities due to low incidence density or failure to meet reporting criteria by NHSN. Due to the scarcity of data, comparison based on SIR is implausible for some HRRs. Therefore, proportions of HRR with at least 50% of its facilities reporting SIR were determined. All facilities were included in this part of the analysis.

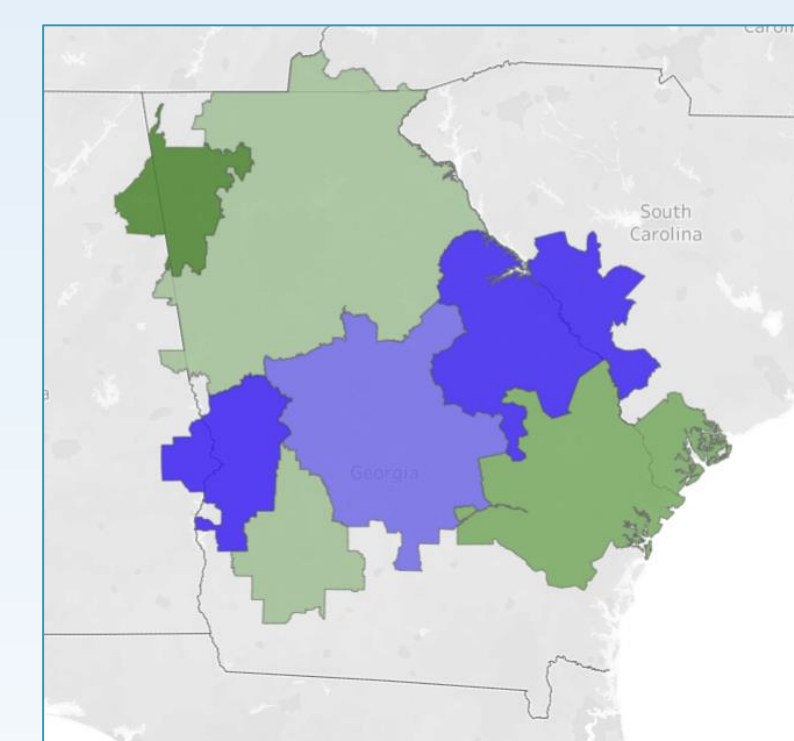


Figure 1: Hospital Referral Regions in Georgia*
*<https://www.dartmouthatlas.org/interactive-apps/primary-care-access-quality-measures/#state>

HAI	Number of HRR	No.	Percent (%)
CAUTI	11	5	45.5
Clostridium difficile	11	10	90.9
CLABSI	11	3	27.3
MRSA	11	2	18.2
SSI Abdominal Hysterectomy	11	0	0.0
SSI Colon Surgery	11	4	36.4

Table 1: Percentage of Hospital Referral Regions in Georgia where an HRR has at least 50% of its Hospitals Reporting an HAI

RESULTS

Out of 129 acute-care hospitals in Georgia, 51.94% reported SIRs for CAUTI, 45.74% for CLABSI, 72.87% for CDI, 42.64% for MRSA, 25.58% for SSI Abdomen, and 42.64% for SSI Colon.

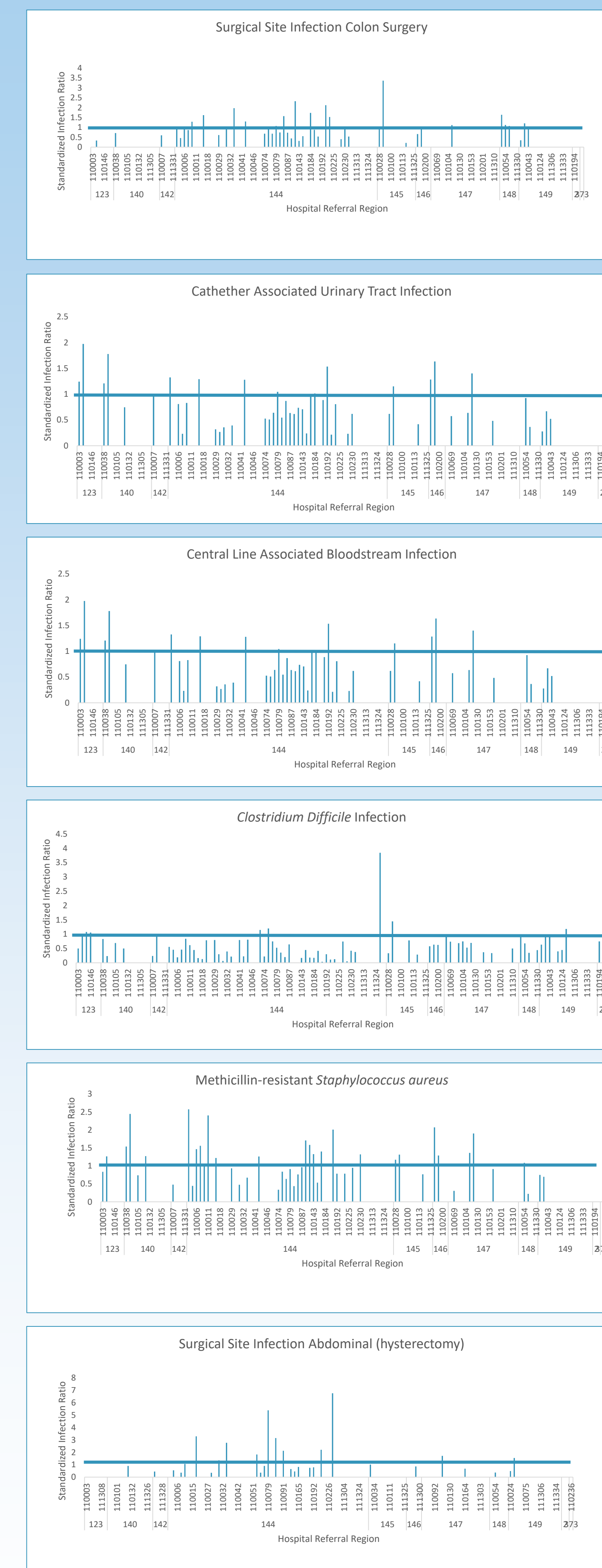


Figure 2: Distribution of Standardized Infection Ratios (SIRs) across Hospitals within Hospital Referral Regions (HRR) in Georgia. SIRs of each healthcare-associated infection (HAI) is shown above among acute-care facilities in the state of Georgia. Facilities with missing or "Not Available" SIR were not included in this figure. Horizontal axis displays HRRs in GA with different facilities ID shown above it. The dark horizontal line shown in each graph represents an SIR equals 1. SIR value above the line represents an SIR > 1. SIR value below the line represents SIR < 1. Empty data points represent an SIR = 0.

CONCLUSION

HAI rates are subject to public reporting in many states. The purpose is to allow healthcare consumers to make decisions based different hospital metrics. Hospital utilization rates in the US are highly localized.¹¹ Certain HRRs encompasses many HRRs such as GA-Atlanta and GA-Savannah. This does offer healthcare consumers choices. To make these choices, the data must be reliably available for those facilities. There is not sufficient differentiation in HAI SIRs among acute-care hospitals for useful comparison of facilities by health care consumers expect for CDI. Underreporting or lack of incidence may be the source of insufficiency.

This study utilized facility-level data from 1 state instead of nation-wide data used in other studies.⁸ Only acute-care facilities were included in this study. This allows for a more focused comparison due to other associated risks with other facilities. This study attempted to avoid direct comparison of indirectly standardized infection ratios which suffers from residual confounding.

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