

at HHC agencies. In this study, we investigated barriers and facilitators of effective IPC in HHC. **Methods:** In 2018, we conducted in-depth, telephone interviews with 41 staff from 13 agencies across the United States including administrators, IPC and quality improvement personnel, registered nurses and HHC aides. Interview transcripts were coded in NVivo v 12 software (QSR International), and themes were identified using content analysis. **Results:** We identified 4 themes: (1) IPC as a priority, (2) uniqueness of home health care, (3) importance of education, and (4) keys to success and innovation. When discussing the top priorities in the agency, participants described IPC as a big part of patient safety and as playing a major role in reducing rates of rehospitalization. Protection of patients and staff was described as a major motivator for compliance with IPC policies and procedures, and agencies placed specific focus on improving hand hygiene, bag technique, and disinfection of equipment. Almost all participants described the uniqueness of providing health care in a patient's home, which was often talked about as an unpredictable environment due to lack of cleanliness, presence of pets and/or pests, and family dynamics. Furthermore, the intermittent nature of HHC was described as affecting effective implementation of IPC procedures. Education was seen as a tool to improve and overcome patient, caregiver, and families' lack of compliance with IPC procedures. However, to be effective educators and role models, participants stated that they themselves needed to be properly educated on IPC policies and procedures. Several keys to success and innovation were discussed including (1) agency reputation as a key driver of quality; (2) agency focus on quality and patient satisfaction; (3) using agency infection data to improve the quality of patient care; (4) utilizing all available resources within and outside of the agency, and (5) a coordinated approach to patient care with direct, multimodal communication among all clinical disciplines. **Conclusions:** This qualitative work identified barriers to effective infection prevention and control in HHC and important facilitators that HHC agencies can use to improve implementation of policies and procedures to improve patient care.

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Challenges in Identification of *Candida auris* in Hospital Laboratories: Comparison Between HIC and LMIC

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Background: *Candida auris* is an emerging nosocomial fungal pathogen causing invasive illness and outbreaks worldwide. A major issue regarding *C. auris* is that it can be misidentified unless appropriate technology is used. We conducted a survey of available methods for identification of *C. auris* in 21 hospital laboratories in India regarding their protocols for prevention of *C. auris* infection. **Methods:** The survey was an adaptation of a similar survey conducted for the Connecticut Laboratory Response Network in 2017. We mailed the survey to 30 microbiologists and ID physicians, and 21 of them from 12 states responded. All respondents were from private acute-care and teaching hospitals. The responses were

Table 1. Comparison of Results of US and India Study

| <i>Candida auris</i> Identification | Acute-Care Hospitals in Connecticut (N = 21), No. (%) | Acute-Care Hospitals in India (N = 21), No. (%) |
|---|---|---|
| In-house | 17 (81) | 19 (90.5) |
| Automated systems | 21 (100) | 19 (90.5) |
| Speciation from sterile sites like blood | 16 (76.2) | 18 (85.7) |
| Speciation from other sites - Respiratory - Urinary | 9 (42.9) 11 (52.4) | 9 (42.9) 13 (61.9) |
| MALDI-TOF | 5 (23.8) | 1 (4.8) |
| PCR | 0 | 1 (4.8) |
| Antifungal susceptibility testing | 2 (9.5) | 19 (90.5) |

analyzed and compared to the Connecticut study. **Results:** Of 21 hospitals, 19 (90.5%) can identify *C. auris* in house. Also, 18 (85.7%) have identified *C. auris* in the past 18 months. Species level identification was done only for blood cultures in all hospitals. Only 5 (26%) laboratories speciated *Candida* spp isolated from other sites such as respiratory and urinary specimens. Automated systems were used like Vitek 2 in 16 (84.2%), Phoenix BD in 2(10.5%) and Microscan in 1(5.26%) laboratory. MALDI-TOF MS and PCR for identification were used in 2 laboratories. Antifungal susceptibility testing is done in-house in 19 (90.5%) laboratories. Only 10 (52.6%) responding hospitals from India had infection prevention protocols for *C. auris*, and 9 (47.4%) of them isolated patients. The major challenges for infection prevention with *C. auris* are absence of screening in high-risk patients (66.7%), misidentification by automated systems (84.2%), and inability to speciate from nonsterile sites underestimates the prevalence (100%). **Conclusions:** There is an urgent need to enhance the capacity of hospital laboratories to detect *C. auris* early, and to implement infection prevention measures. In both studies early detection is the key and as suggested by the US authors, challenges can be overcome through collaboration between hospitals and referral laboratories when resources are limited. This optimizes laboratory capacity and prevents global spread through colonized patients. The limitation of this study is that data from public hospitals are unknown and larger studies are needed.

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Changes in Regional Hospital-Identified *Clostridioides difficile* Infection, 2015–2018

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Background: Regional changes in United States *C. difficile* infection (CDI) are not well understood but important for targeting prevention strategies. **Methods:** Community-onset (CO) CDI was

Figure 1: Community-onset and Healthcare facility-onset *C. difficile* Infections and number of reporting hospitals located within hospital referral regions reporting to the National Healthcare Safety Network, July 1, 2015 – June 30, 2018.

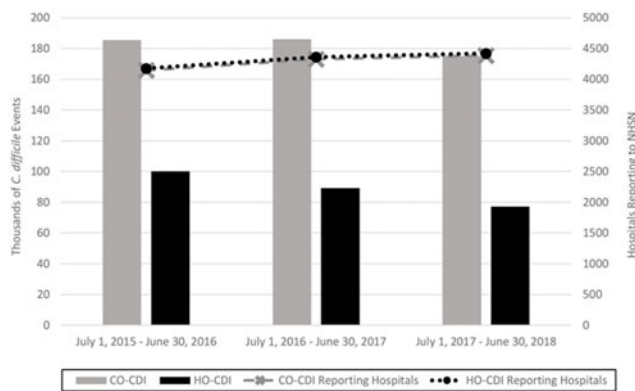


Fig. 1.

Figure 2: Hospital-identified (community-onset and hospital-onset) *C. difficile* infection reported to the National Healthcare Safety Network by hospital referral region standardized infection ratios over 3 consecutive years: July 1, 2015 – June 30, 2016

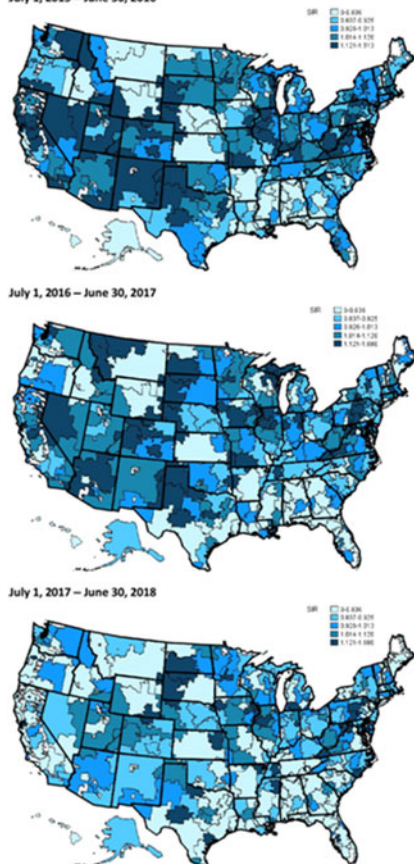


Fig. 2.

defined as positive *C. difficile* stool tests collected on or before hospital day 3 (where admission was day 1), reported by acute-care hospitals to the CDC NHSN over 3 years: year 1, July 1, 2015–June 30, 2016; year 2, July 1, 2016–June 30, 2017; year 3, July 1, 2017–June 30, 2018. Healthcare facility-onset CDI (HO-CDI) was similarly defined but with stool collection after hospital day 3. Hospital referral regions (HRRs) were defined by the *Dartmouth Atlas of Health Care*, and they represent 306 healthcare

markets. Standardized infection ratios (SIRs) were calculated using separate multivariable models for (1) CO-CDI events in an emergency department/observation unit (ED/Obs), (2) CO-CDI events among inpatients, and (3) HO-CDI, accounting for facility-level factors. They resulted in ratios of observed to predicted infections, similar to established methods. SIRs were pooled within each facility to create a hospital-identified SIR by summing observed and predicted events for CO-CDI events in both testing locations and HO-CDI events, then pooled by HRR by summing all facility observed and predicted events within the region. Data from facilities not within an HRR were excluded. **Results:** Total CO-CDI (ED/Obs and inpatient) and HO-CDI events decreased, even as the number of reporting facilities slightly increased over the 3-year period (Fig. 1). Among 306 HRRs in year 3, the median number of hospitals was 10 (IQR, 6–17), with a median of 526 (IQR, 272–1,002) hospital-identified CDI events per HRR. Variables significantly associated with CDI incident rate and included in SIR models 1–3 included *C. difficile* test type, hospital type, teaching affiliation, hospital bed size, and presence of an ED/Obs unit. Intensive care unit capacity was included in models 2 and 3, and the ratio of hospital admissions to emergency department encounters in model 1. Pooled mean HRR hospital-identified *C. difficile* SIRs decreased each year (0.972, 0.914, and 0.838), and decreases also varied by HRR (Fig. 2). **Conclusions:** National decreases in a combined hospital-identified *C. difficile* SIR are widespread but may be more aggregated in particular regions. Although SIR adjustments were limited to facility-level factors, aggregation of CDI SIR by HRR may be useful for infection preventionists and public health authorities to further understand regional CDI patterns.

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Changes in the Characteristics of Hospitals Participating in the National Healthcare Safety Network (NHSN), 2008–2018

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Background: The NHSN is the nation's most widely used health-care-associated infection surveillance system. Nearly all acute-care hospitals reporting to the NHSN do so in fulfillment of state mandates and/or as required for participation in the CMS Quality Reporting program, since 2011. All NHSN-participating acute-care hospitals (ACHs) reporting in the Patient Safety Component are required to complete an annual survey and to self-report on the hospital's general characteristics, including hospital size and type, and patient volume. Due to the compulsory nature of the survey, the NHSN receives nearly a 100% completion rate each year. Furthermore, hospital-level characteristics are often used by the CDC to develop risk-adjusted summary measures and national benchmarks. This study is the first to evaluate ACH characteristics over an 11-year period. **Methods:** All ACHs that completed an annual survey during 2008–2018 were included. The data were divided into subsets to evaluate consistent reporters, defined as facilities that were enrolled in 2008 and completed surveys through 2018. Medical teaching status is defined as a facility that trains either medical students, nursing students, residents and fellows. Medical teaching status is grouped into 3 categories: (1) undergraduate facility that