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Major Article

The National Healthcare Safety Network Long-term Care Facility Component early reporting experience: January 2013-December 2015

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Background: In 2012, the Centers for Disease Control and Prevention launched the Long-term Care Facility (LTCF) Component of the National Healthcare Safety Network (NHSN) designed for LTCFs to monitor *Clostridium difficile* infections (CDIs), urinary tract infections (UTIs), infections due to multidrug-resistant organisms, including methicillin-resistant *Staphylococcus aureus* (MRSA), and infection prevention process measures.

Methods: We describe characteristics and reporting patterns of facilities enrolled in the first 3 years of the surveillance system and rate estimates for CDI, UTI, and MRSA data submitted between 2013 and 2015.

Results: From 2013-2015, 279 LTCFs were enrolled and eligible to report to the NHSN with variability in reporting from year to year. Crude rate estimates pooled over these 3 years from reporting facilities were 0.98 incident LTCF-onset CDI cases per 10,000 resident days, 0.59 UTI cases per 1,000 resident days, and 0.10 LTCF-onset MRSA cases per 1,000 resident days.

Conclusions: These initial data demonstrate the capability of the NHSN LTCF Component as a national surveillance system for monitoring infections in LTCFs. Further investigation is needed to understand factors associated with successful enrollment and reporting. As participation increases, data from a larger group of LTCFs will be used to establish national baselines and track prevention goals.

BACKGROUND

In the United States, 15,600 nursing homes (NHs) provide care to >3 million people each year.[1,2] A frequently cited publication from 2000 estimates that between 1.6 and 3.8 million healthcare–associated infections (HAIs) occur in U.S. NHs in a single year.[3] A more recent publication estimated that 1.13-2.68 million infections occurred among NH residents in 2013; although the proportion of HAIs was not known.[4] In an effort to increase infection surveillance in NHs, in September 2012 the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NHSN) launched an infection reporting infrastructure designed specifically for use among long-term care facilities (LTCFs), including NHs, assisted living facilities, and other chronic care facilities.[5] The NHSN LTCF Component represents the first surveillance system for tracking infection incidence available to all LTCFs across the United States. Facilities enrolled in the system are able to monitor *Clostridium difficile* infections (CDIs), urinary tract infections (UTIs), and infections due to multidrug-resistant organisms (MDROs), such as methicillin-resistant *Staphylococcus aureus* (MRSA), and infection prevention process measures.

Availability of this system creates an opportunity to improve HAI awareness among LTCF leadership and staff, estimate HAI burden, and evaluate trends in rates over time. Unlike for hospitals, reporting to the NHSN is currently voluntary for most LTCFs. The Centers for Medicare & Medicaid Services (CMS) has not included HAI reporting to the NHSN as part of quality reporting or payment incentive programs for NHs. Therefore, focused efforts to promote facility enrollment and reporting to the NHSN will be critical to obtain data to understand the HAI epidemiology in this setting. In this article, we describe characteristics of LTCFs enrolled during the first 3 years of the NHSN LTCF Component, present reporting patterns of the

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enrolled facilities, and summarize crude infection rates using data from January 2013-December 2015.

METHODS

Facilities enrolled in the NHSN are required to submit an annual survey of facility characteristics, a reporting plan outlining the event(s) they plan to report for each month of participation, and event data and summary denominator data through passive surveillance each month for each event indicated on the plan.[5]

Inclusion and exclusion criteria

Facilities enrolled between January 1, 2013, and December 31, 2015, were considered eligible to report to the system. Facilities submitting at least 1 monthly reporting plan were included in the analysis of reporting patterns. Analysis of CDI, MRSA, and UTI rates included only completed months, defined as months where facilities submitted both numerator (events) and denominator (resident days) data for these events.

Definitions

The Laboratory-identified (LabID) Event module enables facilities to report CDIs and infections caused by antibiotic-resistant organisms, identified using a positive laboratory specimen. LabID events are classified as LTCF-onset, community-onset, or acute care transfer-LTCF-onset using admission date and specimen collection date. LTCF-onset events are defined as specimens collected >3 calendar days after the current facility admission date, whereas community-onset events are defined as specimens collected on the first 3 days of the current facility admission (ie, days 1, 2, or 3 of admission). Finally, acute-care transfer-LTCF-onset events are defined as LTCF-onset events where the specimen was collected ≤4 weeks after the resident's last transfer from an acute care facility. For CDI events, the surveillance system determines whether the event was an incident infection, defined as an event that is either the first CDI event reported for an individual, or a CDI event reported >8 weeks after an individual's previous CDI event.[6]

The Healthcare Associated Infection Surveillance module enables facilities to report UTIs defined using the revised McGeer definitions[7] and classified as either symptomatic UTI (SUTI) if the resident has signs and symptoms as described in the module protocol in addition to a positive urine culture or catheter-associated SUTI (CA-SUTI) if the SUTI occurred in the presence of an indwelling urinary catheter. The catheter utilization ratio, a measure of residents' exposure to indwelling urinary catheters, is defined as total urinary catheter days divided by the total resident days.[8]

Data analyses

Geographic patterns were analyzed among all eligible facilities. Facility characteristics from the annual facility survey were summarized using frequencies for categorical variables and medians and interquartile ranges for continuous variables. Reporting patterns, determined from monthly reporting plans and summary data for January 2013-December 2015, were analyzed. The frequency of selected events and percent completion were summarized for all monthly reporting plans. Data were defined as complete for the month if the facility reported both numerator and denominator data, which was specific to the event selected. Reporting for UTIs, MDROs, or CDIs was defined as complete if the facility reported event count and resident days data. Reporting for hand hygiene was defined as complete if the facility reported number of observed contacts where a health care provider performed hand hygiene and number of observed contacts where hand hygiene was indicated. Reporting for gown and glove use was defined as complete if the facility reported number of observed contacts where gown and gloves were used and number of observed contacts where gown and gloves were indicated.

Reporting patterns for each year were examined for all events combined and for CDI, MRSA, and UTI specifically. When looking at all events combined, if facilities selected >1 event on their reporting plan, reporting only needed to be completed for at least 1 event for that month to be considered complete. Facilities were categorized as a consistent reporter if they completed at least 6 months of reporting within a calendar year. The number of consecutive reporting months within a calendar year was calculated as the sum of the number of months completed in succession after the first month of completed data.

Rate data were analyzed for CDI, MRSA, and UTI. We calculated the overall (all facilities) pooled 3-year crude rate for incident LTCF-onset CDI, LTCF-onset MRSA, total UTI, SUTI, and CA-SUTI and the percentile distribution of facility-level rates for these events. Similarly, an overall catheter utilization ratio and facility-level distribution of catheter utilization ratio were calculated. We excluded extreme outliers from rate calculations, defined as facilities with <100 total resident days reported for the 3-year time period. All analyses were conducted using SAS version 9.4 (SAS Institute, Cary, NC).

RESULTS

Facility characteristics

A total of 279 LTCFs were enrolled in the NHSN LTCF Component on or before December 31, 2015, and eligible to report between January 2013 and December 2015. These facilities represented 40 states and Washington, DC (Fig 1).

Most facilities were nonprofit (57%), 91% were Medicare and Medicaid dual certified, and 38% were independent. The median number of beds was 102, and median occupancy was approximately 92%. Only 21% of facilities had their own laboratory for testing of specimens (Table 1).

All but 2 enrolled facilities were NHs; these 2 facilities did not submit any reporting plans or data during the 3-year period. The results that follow are for the 277 NHs.

Reporting patterns

Based on the enrollment date for each facility, the maximum number of months of reporting for the 277 NHs was 6,104, and a total of 2,717 (45%) monthly reporting plans were submitted. Most (216) NHs submitted at least 1 monthly reporting plan during the 3-year period and selected to report 8 different event types and 2 infection prevention process measures (Table 2). The reporting patterns and data for only the 3 most common event types selected for reporting are summarized further.

Between 2013 and 2015, 216 (78%) of 277 unique NHs submitted at least 1 monthly reporting plan. During the 3-year period, 147 unique NHs completed at least 1 month of CDI reporting, 84 unique NHs completed at least 1 month of MRSA reporting, and 114 unique NHs completed at least 1 month of UTI reporting. Reporting patterns for each year are presented in Table 3. In 2013, 85% of 110 NHs completed reporting for at least 1 event type, and among those NHs, 75% were consistent reporters. In 2014, the percent of consistent reporters dropped to 47%, but increased to 76% in 2015. Similarly, the median number of consecutive months was 6.5 in 2013, dropped to 4 months in 2014, and increased to 6 months in 2015. Regardless of event type (CDI, MRSA, or UTI), 3 overall reporting patterns emerged over the 3-year period. First, the number of NHs