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## Major article

## State focus on health care-associated infection prevention in nursing homes

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**Background:** Despite increased focus on health care-associated infections (HAI), between 1.6 and 3.8 million HAI occur annually among the vulnerable population residing in US nursing homes (NH). This study characterized state department of health (DOH) activities and policies intended to improve quality and reduce HAI in NH.

**Methods:** We created a 17-item standardized data collection tool informed by 20 state DOH Web sites, reviewed by experts in the field and piloted by 2 independent reviewers (Cohen's  $\kappa$  .45-.73). The tool and corresponding protocol were used to systematically evaluate state DOH Web sites and related links.

**Results:** Three categories of data were abstracted: (1) consumer-directed information intended to increase accountability of and competition between NH, including mandatory HAI reporting and NH inspection reports; (2) surveyor training for federally-mandated NH inspections; and (3) guidance for NH providers to prevent HAI and monitor incidence. Only 5 states included HAI reporting in NH with differing HAI types and reporting requirements.

**Conclusion:** State DOH information and activities focused on NH quality and reducing HAI were inconsistent. Systematically characterizing state DOH efforts to reduce HAI in NH is important to interpret the effects of these activities.

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Health care-associated infections (HAI) are a major public health issue. Because of the high cost of this largely preventable problem, there is much attention and investment in the reduction of HAI.<sup>1</sup> Infections represent the leading cause of morbidity and mortality among the vulnerable elderly population residing in US nursing homes (NH).<sup>2</sup> An estimated 1.6 to 3.8 million infections occur in US NH each year, resulting in approximately 388,000 deaths<sup>3</sup> with estimated costs of \$38 to \$137 million for antimicrobial therapy and \$637 million to \$2 billion for hospitalizations.<sup>4</sup> Morbidity, mortality, and financial burden associated with HAI in NH is likely to increase as the population of residents is expected to grow from the current 1.7 million<sup>2</sup> to approximately 5.3 million in 2030.<sup>5</sup> Given that Umscheid et al found that approximately 55% to 70% of HAI are avoidable in other settings, effective infection control and

prevention resources as well as public policies aimed at NH are likely critical in reducing infections in NH.<sup>6</sup>

In 2009, the US Department of Health and Human Services (HHS) published its first National Action Plan to Prevent Health Care-Associated Infections, which identified preventing HAI in hospitals as the phase I priority; fortunately, some HAI rates have improved.<sup>7</sup> These improvements are likely a result of a myriad of interventions at the federal, state, and institutional level. For example, many states have mandated public reporting of some types of HAI.<sup>8</sup> To receive preventive health services block funds from the Centers for Disease Control and Prevention (CDC), states were required to submit HAI prevention plans to the HHS in 2010. As a result, each state now has an HAI coordinator who oversees implementation of HAI reduction infrastructure and associated activities as well as raises awareness of HAI in the state.<sup>9</sup> The 2013 updated HHS plan identifies long-term care as the next priority setting in which to reduce HAI.<sup>7</sup>

There are a number of ways in which a state department of health (DOH) may attempt to improve the quality of care in NH and

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focus efforts aimed at decreasing HAI. These efforts may be broadly characterized as actions and information targeted at consumers, providers, and surveyors, which may or may not be formally articulated in the state HAI prevention plan.

Consumer-directed information regarding NH quality may allow potential residents and their families to ensure that they select a high-quality facility that meets and continues to meet the potential residents' needs.<sup>10,11</sup> In this way, information regarding NH quality, including infection rates, can foster competition and accountability among NH. Theoretically, NH may wish to attract clients through appealing public quality measures, such as lowering rates of urinary tract infections in particular and adapting clinical practice to achieve better quality measures in general.<sup>12</sup> Information that may be useful to inform consumer decisions includes (1) a checklist and/or guidance materials developed for consumers when choosing a NH, (2) a venue to file complaints (ie, ombudsman), and (3) inspection report data, which may be compiled in a facility report card. Given the theoretical link between quality indicator availability and state DOH focus on NH, it is plausible that consumer information may indicate a focus by state DOH on infection reduction as a component of overall NH quality.

Providers, which include NH clinicians, infection preventionists, and administrators, may benefit from state-provided trainings, guidelines, and collaboratives that directly address techniques to monitor and reduce HAI in NH. For example, Maryland's Department of Health and Mental Hygiene offered a 3-day basic training course regarding infection control in non-hospital settings.<sup>13</sup> Although infection preventionists may also seek information from other Web sites that specialize in infection control and prevention, such as the CDC's Web site, the information shown on a state DOH Web site (see [Appendix](#)) may be beneficial to raise awareness of resource availability.

State DOH may offer training and other resources to NH surveyors beyond that provided by Centers for Medicare and Medicaid (CMS). Given that these surveyors perform on-site inspections of NH in accordance with CMS regulations, additional training or materials may increase the efficiency and consistency of the annual inspection process, which includes evaluation of infection control and prevention policies and practices.<sup>14</sup>

Considering the current high levels of HAI rates in NH settings, it is likely that activities, information, and public policies regarding infection control and prevention in NHs can be improved.<sup>15</sup> Therefore, the aim of this study was to survey state DOH Web sites with regard to information, resources, and quality indicators regarding HAI prevention in NH. Previous researchers have evaluated whether availability of Medicare's Nursing Home Compare Web site is associated with infection rates.<sup>16,17</sup> However, our study includes a much broader array of quality indicators, directed at different audiences. Furthermore, although previous researchers have reviewed Internet-based NH quality indicators<sup>10,18</sup> and infection control and prevention resources that may affect clinical practices in NHs,<sup>19</sup> to our knowledge, no investigator has described the diversity of state DOH activities and information focused on reducing HAI in NH across states.<sup>10,18,19</sup> Such information could be useful to infection preventionists, especially those working as infection prevention coordinators in NH, to effectively use these resources. Furthermore, this information may be useful to state DOH HAI advisory board members and DOH staff in state HAI programs, both of which include infection preventionists.

## METHODS

This original investigation was conducted as part of Prevention of Nosocomial Infections and Cost Effectiveness in Nursing Homes study (National Institutes of Nursing Research, R01NR013687),

which was previously approved by the Institutional Review Board of Columbia University Medical Center.

### *Tool development*

We created a standardized data collection tool, which was informed by review of 20 state DOH Web sites, to determine the types and breadth of infection control and prevention activities directed at NH. To assure content validity, the tool was reviewed by experts in the field, each with extensive publications regarding geriatric care and/or infection control. The initial tool was refined through an iterative piloting process by 2 independent raters. Pilot testing was conducted with 5 state DOH Web sites. The final 17-item tool had fair to excellent reliability (Cohen's  $\kappa$  0.45-0.73).

A data collection protocol was created to ensure consistent abstraction of data from state DOH Web sites and interpretation of the tool items by data abstractors. The protocol contained operational definitions of state activities, information, and policies related to HAI focus. The protocol also provided an outline for navigating state DOH Web sites and documenting abstracted information.

### *Tool items*

Items were organized by target audience of activities that focus on NH quality: consumers, providers, and surveyors. The tool also included a section regarding state policies specific to HAI in NH. Consumer information included checklists and guidance materials used to choose a NH, a venue for complaints against facilities (ombudsman), and inspection data, ie, inspection reports, report cards, and links to Medicare's Nursing Home Compare. We noted the format in which NH quality indicators were presented, ie, on a report card or in another format.

Provider-directed information included data or descriptions of collaboratives or advisory boards focused on HAI reduction in NH and training or guidance materials for appropriate infection control and prevention practices in this setting. Surveyor-focused information contained training materials to complete NH inspections. Public policy items identified HAI reporting laws in NH and determined whether the state HAI prevention plan addressed long-term care.

### *Data collection*

Data were systematically abstracted from 50 state and District of Columbia DOH Web sites. If a first reviewer found it difficult to identify activities and information related to state DOH focus on NH, for example, when links of interest had low visibility within the DOH Web site, when these links were organized with unrelated information or finding them required multiple key word searches within the Web site, a second reviewer also independently abstracted data from the Web site ( $n = 11$ ). In cases of disagreement, Web site content was reviewed and discussed to reach consensus. Establishing whether states required HAI reporting in NH and distinguishing between state mandatory reporting and notifiable conditions was particularly difficult. For example, state HAI reporting forms for providers available on the DOH Web site may list the conditions of interest and request case information without explicitly stating the type of reporting for which the form should be used. Hence, state HAI coordinators in 23 states were contacted by telephone and e-mail to provide clarification. All data were collected and compiled between November 2012 and January 2013.

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