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## Brief Report

# Infection Prevention and Control Programs in US Nursing Homes: Results of a National Survey



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## A B S T R A C T

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**Keywords:**

Nursing homes  
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**Objectives:** The objectives of this study were to (1) obtain a national perspective of the current state of nursing home (NH) infection prevention and control (IPC) programs and (2) examine differences in IPC program characteristics for NHs that had and had not received an infection control deficiency citation. **Design:** A national cross-sectional survey of randomly sampled NHs was conducted and responses were linked with Certification and Survey Provider Enhanced Reporting (CASPER) and NH Compare data. **Setting:** Surveys were completed and returned by 990 NHs (response rate 39%) between December 2013 and December 2014. **Participants:** The person in charge of the IPC program at each NH completed the survey. **Measurements:** The survey consisted of 34 items related to respondent demographics, IPC program staffing, stability of the workforce, resources and challenges, and resident care and employee processes. Facility characteristics and infection control deficiency citations were assessed using CASPER and NH Compare data. **Results:** Most respondents had at least 2 responsibilities in addition to those related to infection control (54%) and had no specific IPC training (61%). Although many practices and processes were consistent with infection prevention guidelines for NHs, there was wide variation in programs across the United States. Approximately 36% of responding facilities had received an infection control deficiency citation. NHs that received citations had infection control professionals with less experience ( $P = .01$ ) and training ( $P = .02$ ) and were less likely to provide financial resources for continuing education in infection control ( $P = .01$ ). **Conclusion:** The findings demonstrate that a lack of adequately trained infection prevention personnel is an important area for improvement. Furthermore, there is a need to identify specific evidence-based practices to reduce infection risk in NHs.

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Health care–associated infections (HAI) are common in nursing homes (NHs) and contribute significantly to resident morbidity and mortality<sup>1,2</sup>; however, little is known regarding common practices related to HAI prevention in this setting. It is mandated that all skilled nursing facilities/NHs have an individualized infection prevention and control (IPC) program.<sup>3</sup> The Centers for Medicare and Medicaid Services (CMS) addresses these expectations during annual inspection surveys conducted for certification purposes; currently approximately 38% of US NHs receive an infection control deficiency citation each year.<sup>4,5</sup>

Guidelines for infection prevention in NHs provide recommendations on processes related to IPC program structure and function, resident care, and employees.<sup>3,6–9</sup> Previous researchers have found that most NHs lack professionals who are adequately trained<sup>10</sup> and

identified wide variation across NHs in personnel dedicated to infection prevention, the adoption of recommended activities, and the use of standardized infection surveillance definitions.<sup>5,10–12</sup> However, to date, most studies of infection control practices and processes in US NHs have had small sample sizes and limited geographic representation. There is a critical need to better understand practices related to HAI prevention in NHs. To gain insight in this area, the objectives of this study were to (1) obtain a national perspective of the current state of IPC programs in NHs and (2) examine differences in IPC programs for NHs that had and had not received an infection control deficiency citation.

## Methods

A cross-sectional survey of randomly sampled US NHs was conducted as part of the Prevention of Nosocomial Infections and Cost Effectiveness in Nursing Homes (PNICE-NH; R01NR013687) study. Eligible NHs were nonspecialized, free-standing facilities with between 30 and 900 beds identified in the Online Survey, Certification, and Reporting (OSCAR) data. Between December 2013 and December 2014, staggered mailings and a modified Dillman technique, including an initial mailing of the survey with an invitation letter, reminder postcards, and a last chance communication, were used for recruitment. The person in charge of the IPC program at each NH was invited to complete the survey. To increase participation, \$20 gift cards were sent with each survey and respondents had the opportunity to be entered into a raffle to win an Apple iPad.

The 34-item survey (available on request) included primarily closed-ended questions and was developed by adapting and modifying a survey used to evaluate IPC programs in acute care settings,<sup>13</sup> guidelines for infection control specific to NHs,<sup>3</sup> and results of a qualitative study of IPC programs in NHs.<sup>14</sup> Content validity was confirmed by our study team and advisory board that includes experts in the field, and infection control professionals in 3 NHs; the survey was pilot tested in 3 additional NHs. The survey included items related to respondent demographics and staffing of the IPC program, stability of the workforce, resources and challenges, and resident care and employee processes. Survey responses were linked with concurrent Certification and Survey Provider Enhanced Reporting (CASPER; formerly called OSCAR) data to evaluate facility characteristics and NH Compare data to evaluate staffing levels, infection control deficiency citations (F-tag 441), quality of care deficiency citations (F-tags 0309–0312, 0314, 0316–0319, 0321–0325, 0328–0330, 0333, and/or 0353), and quality measures.

Descriptive statistics were computed using  $\chi^2$ , Fisher's exact, *t*, or Wilcoxon-Mann-Whitney tests, as appropriate. Characteristics of NHs that responded to the survey were compared with those of non-respondents. Additionally, differences in IPC program characteristics for NHs that had and had not received an infection control deficiency citation were evaluated. A significance level of .05 was set a priori and all analyses were conducted using SAS version 9.3 (SAS Institute, Cary, NC). All research procedures were approved by our institutional review boards.

## Results

The survey was sent to 2514 NHs and 990 completed surveys were returned (39% response rate). Approximately 39% and 65% of sampled facilities had received infection control and quality of care citations, respectively. Responding and nonresponding NHs did not differ based on number of beds, occupancy, metropolitan setting, or chain affiliation. However, responding NHs had lower levels of licensed practical nurse staffing and percent Medicare residents, were more likely to be nonprofit and located in the northeast, and were less likely to have received infection control or quality of care citations. Respondents and nonrespondents also differed on several quality measures (Table A1).

## Nursing Home Infection Prevention and Control Program Staffing

Respondent demographics, IPC program staffing, and stability of the workforce are presented in Table A2. Respondents in 84% of NHs were registered nurses and, on average, had 11 years of experience conducting infection control–related work in any NH and 5 years in their current facility; fewer years of experience in their current NH was associated with receiving an infection control citation ( $P = .01$ ). Most respondents (54%) had at least 2 responsibilities in addition to infection control, most commonly nursing administration, staff education, and employee health. Most respondents (61%) had no specific training in infection control and lack of training was associated with receiving a citation ( $P = .02$ ). Training included taking a state or local course (26%), a national Association for Professionals in Infection Control and Epidemiology (APIC) course (9%), and Certification in Infection Control (3%).

On average, respondents reported spending 29% of their time on infection control activities; the most time-consuming were infection surveillance, tracking antibiotic use, and staff education. NHs with infection control citations spent more time on vaccination and immunization ( $P = .05$ ) and less time on infection control policy development ( $P = .006$ ). Regarding turnover, 41%, 42%, and 39% of NHs reported having at least 3 people fill the roles of infection control professional, director of nursing, and NH administrator, respectively, during the previous 3 years; NHs with citations had higher director of nursing and NH administrator turnover ( $P = .03$  and  $.04$ , respectively).

## Nursing Home Infection Prevention and Control Program Resources and Challenges

IPC program resources and challenges are listed in Table A3. Most NHs had an infection control committee that met regularly and most included a nurse administrator, NH administrator, and a medical director; facilities with infection control citations were less likely to have a staff physician as a committee member ( $P = .04$ ). One-third of NHs were involved in an infection prevention collaborative (ie, group focused on reducing HAIs in NHs by implementing reduction strategies, tracking progress, and providing feedback). Facilities with citations were more likely to be in a collaborative focused on reducing methicillin-resistant *Staphylococcus aureus* ( $P = .04$ ) and less likely to be in one focused on reducing hospitalizations ( $P = .04$ ). Finally, urinary tract infections (96%), pneumonia/upper respiratory tract infections (83%), and skin and soft tissue infections (35%) were ranked as the 3 greatest infection challenges.

## Nursing Home Infection Prevention and Control Program Processes

Table A4 summarizes resident care and employee processes. Lists of residents with infections were most frequently maintained in a log-book and/or as a paper list (76%); other methods included keeping an electronic spreadsheet or database (40%) and using a graphical map (25%). There was variation in the types of information used to determine when a resident has an infection. Most NHs used clinical or laboratory cultures and physician/nurse practitioner diagnosis (69%); many also used the updated McGeer criteria (41%), Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (31%), and/or Minimum Data Set (24%) definitions. NHs with infection control citations were less likely to use the CDC definitions ( $P = .007$ ). Respondents were most frequently notified about potentially infected residents through the daily report (81%); new antibiotic prescription reports were also a common method of notification (49%) and their use was associated with receiving a citation ( $P = .01$ ). Most NHs monitored environmental cleaning practices and hand hygiene compliance via direct observation. In 77% of NHs in which hand

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