



HHS Public Access

Author manuscript

Infect Control Hosp Epidemiol. Author manuscript; available in PMC 2016 December 01.

Published in final edited form as:

Infect Control Hosp Epidemiol. 2015 December ; 36(12): 1475–1476. doi:10.1017/ice.2015.214.

Nursing Homes in States with Infection Control Training or Infection Reporting Have Reduced Infection Control Deficiency Citations

Catherine C. Cohen, PhD(c), BS, RN,

630 West 168th Street, Mail Code 6, Columbia University School of Nursing, Center for Health Policy, New York, NY, USA, Phone: (212) 305-3431, Fax: (212) 305-3639

John Engberg, PhD,

RAND Corporation, Pittsburgh, PA, USA

Carolyn T.A. Herzig, PhD, MS,

Columbia University School of Nursing, Department of Epidemiology, Columbia University Mailman School of Public Health, New York, NY, USA

Andrew W. Dick, PhD, and

RAND Corporation, Boston, MA, USA

Patricia W. Stone, PhD, RN, FAAN

Columbia University School of Nursing, Center for Health Policy, New York, NY, USA

Catherine C. Cohen: chc2144@columbia.edu

Keywords

nursing homes; healthcare-associated infections; public policy; facility regulation and control

It is estimated that 1.6–3.8 million infections occur among U.S. nursing home (NH) residents each year,¹ although healthcare-associated infections (HAI) may be largely preventable.² To reduce HAI, the Centers for Medicare and Medicaid Services (CMS) monitors NH infection control (IC) practices as part of the annual inspection survey that determines certification eligibility. Non-compliant NHs are issued a citation (i.e., F-tag or “deficiency”). State Departments of Health (DOH) have also responded to these problems through a variety of activities, information and policies, which include IC training resources for NH providers, advisories, formal working groups, or collaboratives to advise NH providers regarding IC and mandatory or voluntary HAI reporting by NHs to the DOH.³ To our knowledge, the effects of these activities have not been evaluated. Hence, our objective was to determine associations between specific state DOH activities with NH IC citation rates.

Correspondence to: Catherine C. Cohen, chc2144@columbia.edu.

The authors have no conflicts of interest to report.

Information regarding state activities to reduce infections in NHs was systematically collected from 50 states and the District of Columbia's DOH websites between November 2012 and January 2013. Details regarding data collection were previously described.³ Data from the Certification and Survey Provider Enhanced Reporting (CASPER) system from 2013 (93.9%) or 2014 (6.1%) were used, as were data from the Area Health Resource File (AHRF). CASPER contains information collected during CMS annual NH inspections, including citations and facility characteristics.⁴ AHRF contains county-level socioeconomic, demographic and health descriptions.⁵

Multivariable logistic regression with regional and urbanicity fixed-effects and state clustering was used to test associations between IC-related citations and the presence of the following state DOH activities: 1) voluntary or mandatory reporting of NH infections; 2) an advisory board, working group or collaborative focused on reducing infections in NHs; and 3) IC training available through the DOH website (excluding inspection-related information). The models included covariates to control for facility, resident population and market characteristics similarly to other studies.^{6,7} Relationships between overall care quality citations and DOH activities were also evaluated to assess specificity. A significance level of 5% was set a priori. All analyses were conducted using Stata 13 statistical software.

Data were available from 14,276 NHs; 91.3% of facilities were in states that provided IC training, 70.4% were in states with an advisory group or collaborative, and 9.7% were in states with mandatory or voluntary HAI reporting. In this sample, 37.6% and 64.3% of facilities received an IC-related or a care quality citation, respectively. In the multivariable analyses, NHs in states that had mandatory or voluntary HAI reporting were less likely to receive IC-related citations (OR: 0.61; 95% CI: 0.49, 0.75) or overall care quality citations (OR: 0.75; 95% CI: 0.55, 0.95). NHs in states that provided IC training were less likely to receive IC-related citations (OR: 0.67; 95% CI: 0.48, 0.86), and training was not related to overall care quality citations. The presence of a state advisory or collaborative was not associated with either IC-related or care quality deficiency citations (see Table).

The association between provider access to IC training and fewer IC-related citations was specific and strong. Using qualitative methods, we previously found the need for increased training opportunities for NH staff members, particularly for those in charge of IC programs.⁸ It is logical that state DOH-provided IC training would improve IC and result in an inverse relationship with IC-related citations.

Inverse correlations between the presence of HAI reporting and both general care quality citations and IC-related citations may indicate that HAI reporting impacts quality generally. At the time of data collection, only five states had HAI reporting, of which three implemented reporting within the previous year.³ Other factors coinciding with NH HAI reporting in those states and that were not accounted for in our study may have affected care quality citations. Furthermore, the relationship was stronger with IC citations suggesting specificity. Future research should reassess these relationships.

It was surprising that there was no association between presence of advisory groups or collaboratives and citations. As these groups may be initiated by an entity other than the

state DOH (e.g., county-led), they may not have been identified on the state DOH website and therefore were not accounted for in the current analysis. Further research regarding regional initiatives to reduce infections in NHs would be helpful to interpret the impact of these initiatives as well as isolate effects of state policies.

We found a IC-related citations rate similar to Ye et al. (2015),⁹ which was higher than previously reported.⁷ A factor contributing to this difference is that previously there were five IC-related citations (441–445) that were combined into one citation (441) in September 2009. Another factor may be that the rate of NHs receiving IC citations rose 12.87–17.31% from 2000–2007.⁷ It is plausible that this trend continued to increase through data used in this study.

Given these findings, clinicians may wish to seek out NH-specific IC training as a means to improve practice and reduce IC citations. As IC training resources generated by state DOH and HAI reporting is different across states, further research should determine which training methods are most effective and whether HAI reporting improves care. Policymakers and state DOHs should provide or increase IC training to NH providers.

Acknowledgments

Financial support. Funding for this study was generously provided by the National Institute of Nursing Research (NINR, R01 NR013687). CCC was also supported by NINR (F31 NR015176).

References

1. Strausbaugh LJ, Joseph CL. The Burden of Infection in Long-Term Care. *Infect Control Hosp Epidemiol.* 2000; 21:674–679. [PubMed: 11083186]
2. Umscheid CA, Mitchell MD, Doshi JA, Agarwal R, Williams K, Brennan PJ. Estimating the proportion of healthcare-associated infections that are reasonably preventable and the related mortality and costs. *Infect Control Hosp Epidemiol.* 2011; 32:101–114. [PubMed: 21460463]
3. Cohen CC, Herzig CT, Carter EJ, Pogorzelska-Maziarz M, Larson EL, Stone PW. State focus on health care-associated infection prevention in nursing homes. *Am J Infect Control.* 2014; 42:360–365. [PubMed: 24679560]
4. What is OSCAR Data?. American Health Care Association; http://www.ahcancal.org/research_data/oscar_data/Pages/WhatisOSCARData.aspx. Published 2013 [Accessed September 13, 2013]
5. Area Resource File (AHRF). U.S. Department of Health & Human Services; <http://www.arf.hrsa.gov/faqs.htm#1>. Published 2013 [Accessed October 12 2013]
6. Castle N, Wagner L, Ferguson J, Handler S. Hand Hygiene Deficiency Citations in Nursing Homes. *J Appl Gerontol.* 2012
7. Castle NG, Wagner LM, Ferguson-Rome JC, Men A, Handler SM. Nursing home deficiency citations for infection control. *Am J Infect Control.* 2011; 39:263–269. [PubMed: 21531271]
8. Stone PW, Herzig CT, Pogorzelska-Maziarz M, et al. Understanding infection prevention and control in nursing homes: A qualitative study. *Geriatr Nurs.* 2015
9. Ye Z, Mukamel DB, Huang SS, Li Y, Temkin-Greener H. Healthcare-Associated Pathogens and Nursing Home Policies and Practices: Results From a National Survey. *Infect Control Hosp Epidemiol.* 2015; 36:759–766. [PubMed: 25797334]

Associations between state Department of Health policies and activities and deficiency citations in nursing homes

Table

Policy/Activity	Infection control citations			Care quality citations		
	OR	95% CI	p-value	OR	95% CI	p-value
Advisory group or collaborative	0.91	0.70, 1.12	0.434	1.19	0.85, 1.54	0.231
Infection control training or materials	0.67	0.48, 0.86	0.006	0.80	0.45, 1.45	0.333
Mandatory or voluntary HAI reporting	0.61	0.49, 0.75	<0.001	0.75	0.55, 0.95	0.036

Note. Estimates produced using logistic regression models with regional and urbanicity fixed-effects and state clustering, adjusting for facility, resident population and market characteristics similar to other studies.^{6,7} OR = Odds Ratio; CI = Confidence Interval; HAI = Healthcare Associated Infection.