

## Original Article

# Reported variability in healthcare facility policies regarding healthcare personnel working while experiencing influenza-like illnesses: An emerging infections network survey

Hilary M. Babcock MD, MPH<sup>1</sup>, Susan E. Beekmann RN, MPH<sup>2</sup> , Satish K. Pillai MD, MPH<sup>3</sup>, Scott Santibanez MD, MPHTM<sup>3</sup>, Leslie Lee MPH<sup>4</sup>, David T. Kuhar MD<sup>5</sup>, Angela P. Campbell MD, MPH<sup>6</sup>, Anita Patel PharmD, MS<sup>7</sup> and Philip M. Polgreen MD, MPH<sup>2</sup>

<sup>1</sup>Washington University School of Medicine, St Louis, Missouri, <sup>2</sup>University of Iowa Carver College of Medicine, Iowa City, Iowa, <sup>3</sup>Division of Preparedness and Emerging Infections, National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, <sup>4</sup>General Dynamics Information Technology, contracted to the Influenza Coordination Unit, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, <sup>5</sup>Division of Healthcare Quality Promotion, National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, <sup>6</sup>Influenza Division, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia and <sup>7</sup>Influenza Coordination Unit, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia

## Abstract

**Background:** Presenteeism, or working while ill, by healthcare personnel (HCP) experiencing influenza-like illness (ILI) puts patients and coworkers at risk. However, hospital policies and practices may not consistently facilitate HCP staying home when ill.

**Objective and methods:** We conducted a mixed-methods survey in March 2018 of Emerging Infections Network infectious diseases physicians, describing institutional experiences with and policies for HCP working with ILI.

**Results:** Of 715 physicians, 367 (51%) responded. Of 367, 135 (37%) were unaware of institutional policies. Of the remaining 232 respondents, 206 (89%) reported institutional policies regarding work restrictions for HCP with influenza or ILI, but only 145 (63%) said these were communicated at least annually. More than half of respondents (124, 53%) reported that adherence to work restrictions was not monitored or enforced. Work restrictions were most often not perceived to be enforced for physicians-in-training and attending physicians. Nearly all (223, 96%) reported that their facility tracked laboratory-confirmed influenza (LCI) in patients; 85 (37%) reported tracking ILI. For employees, 109 (47%) reported tracking of LCI and 53 (23%) reported tracking ILI. For independent physicians, not employed by the facility, 30 (13%) reported tracking LCI and 11 (5%) ILI.

**Conclusion:** More than one-third of respondents were unaware of whether their institutions had policies to prevent HCP with ILI from working; among those with knowledge of institutional policies, dissemination, monitoring, and enforcement of these policies was highly variable. Improving communication about work-restriction policies, as well as monitoring and enforcement, may help prevent the spread of infections from HCP to patients.

(Received 7 August 2019; accepted 7 October 2019; electronically published 14 November 2019)

Influenza is a major cause of morbidity and mortality.<sup>1–5</sup> Hospitalized patients are at risk of exposure to influenza from other patients, visitors, and also from healthcare personnel (HCP) working while ill with influenza.<sup>6–10</sup> To help prevent such exposures, the Centers for Disease Control and Prevention recommends that HCP should stay home until they are fever free for at least 24 hours after a febrile respiratory illness.<sup>11</sup> In addition, annual vaccination against influenza is recommended for all

HCP.<sup>11</sup> Even though vaccination rates have increased in recent years, vaccination against influenza is still not universal among HCP.<sup>12</sup> In addition, the effectiveness of the influenza vaccine varies considerably on an annual basis.<sup>13,14</sup> Thus, if HCP work with symptoms of influenza-like illness (ILI), influenza and other respiratory viruses might be transmitted to other HCP and patients under their care.

Presenteeism, working while ill, is common among HCP,<sup>15–18</sup> even among those working with immunocompromised patients.<sup>19</sup> Although individual reports in different settings indicate high levels of presenteeism, the scale of the problem, contributing factors, and the potential threat to patients is difficult to measure. Institutional policies to prevent HCP from working while ill with ILI are not standardized and are set at the discretion

**Author for correspondence:** Hilary Babcock, Email: [hbabcock@wustl.edu](mailto:hbabcock@wustl.edu)

**Cite this article:** Babcock HM, et al. (2020). Reported variability in healthcare facility policies regarding healthcare personnel working while experiencing influenza-like illnesses: An emerging infections network survey. *Infection Control & Hospital Epidemiology*, 41: 80–85, <https://doi.org/10.1017/ice.2019.305>

**Table 1.** Practice Data for All 367 Respondents, Number (Column %), Infectious Diseases Society of America Emerging Infections Network, March 2018

Characteristic		# (%)
Infectious Diseases Practice	Adult	288 (78)
	Pediatric	79 (22)
US Census Bureau division	New England	23 (6)
	Mid Atlantic	61 (17)
	East North Central	65 (18)
	West North Central	36 (10)
	South Atlantic	60 (16)
	East South Central	13 (4)
	West South Central	23 (6)
	Mountain	18 (5)
	Pacific	66 (18)
	Canada	2 (0.5)
	Years of experience since infectious diseases fellowship	<5 y
5–14 y		116 (32)
15–24 y		84 (23)
≥25 y		130 (35)
Employment	Hospital/clinic	123 (34)
	Private/group practice	78 (21)
	University/medical school	142 (39)
	VA and military	22 (6)
	State government	2 (0.5)
Primary hospital type	Community	82 (22)
	Non-university teaching	110 (30)
	University	142 (39)
	VA hospital or DOD	23 (6)
	City/county	10 (3)

Note: DOD, US Department of Defense.

of each healthcare institution. This survey was undertaken to determine the range of institutional policies designed to prevent HCP from working with ILI.

## Methods

The Infectious Diseases Society of America (IDSA) Emerging Infections Network (EIN) is a sentinel network of infectious diseases physicians who care for adult and/or pediatric patients in North America and who volunteer to participate in the network.<sup>20</sup> In March 2018, the EIN conducted a mixed-methods survey of physician members who self-identify in the network as having hospital epidemiology responsibilities or interests (N = 728) to describe institutional experiences with and policies for HCP working with ILI. A 10-question survey was sent via an e-mailed web link or by facsimile, and an opt-out option was provided. Two reminders were sent to nonresponders at ~2-week intervals following initial survey. Members who had joined the EIN but had not yet responded to any surveys were excluded (N = 13), resulting in a denominator of 715 physician members.

The respondents were asked if their primary inpatient facility had occupational health policies regarding work restrictions for

HCP with influenza or ILI. They were asked when the work-restriction policy was communicated to HCP and how it was enforced for different groups: attending physicians vs physicians in training, such as residents and fellows, vs nonphysician staff. Participants were also asked about policies regarding employee sick days and whether illness tracking occurred for patients and for HCPs (employed physicians and staff vs independent, nonemployed physicians) was ascertained. We also asked about the availability of influenza testing and treatment for employees and any provision of antiviral prophylaxis. The survey is provided in Appendix 1 (online). Data were analyzed using SAS version 9.4 software (SAS Institute, Cary, NC).

Respondents could also write comments for several of the questions or in a general comments section. For thematic analysis of the write-in comments, categories<sup>21</sup> were developed through a data-driven process involving repeated examination of comments. Similar portions of text were identified and sorted so that commonalities could be determined. Labels were used to guide the sorting process.<sup>22</sup> A theme was a meaningful finding that emerged from the data.<sup>21</sup>

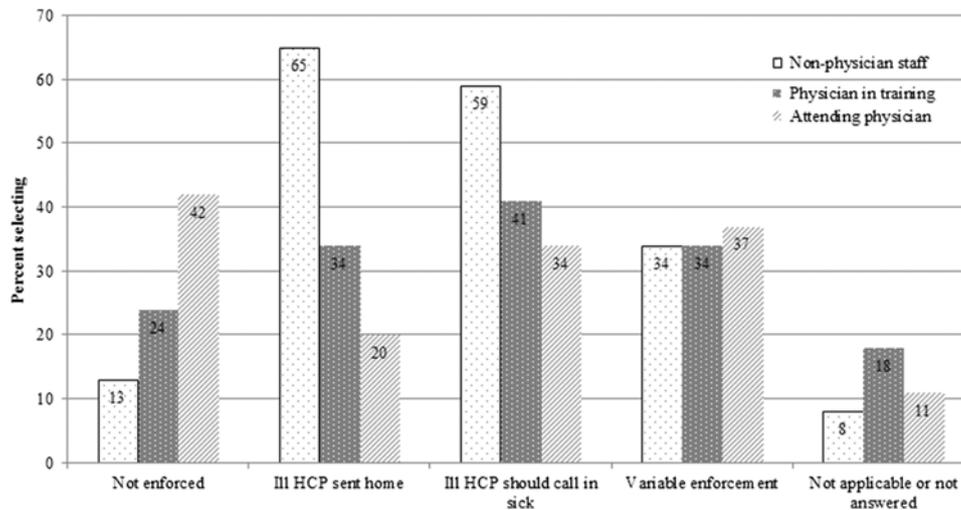
## Results

Of 715 infectious diseases physicians surveyed, 367 (51%) responded (Table 1). All regions of the United States were well represented. Respondents represented a full range of practices and hospital types, as well as years of experience in infectious diseases. Of 367 respondents, 135 (37%) were not aware of policies at their facility and opted out of the rest of the survey. Of the remaining 232 respondents, 206 (89%) reported that their inpatient facility had institutional policies regarding work restrictions for HCP with influenza or ILI. When asked when this policy was communicated, 145 (63%) answered that they received annual reminders either before and/or during influenza season, and 26 (11%) stated only that the policy was communicated on hire and the remainder (61, 26%) were not sure or did not answer the question.

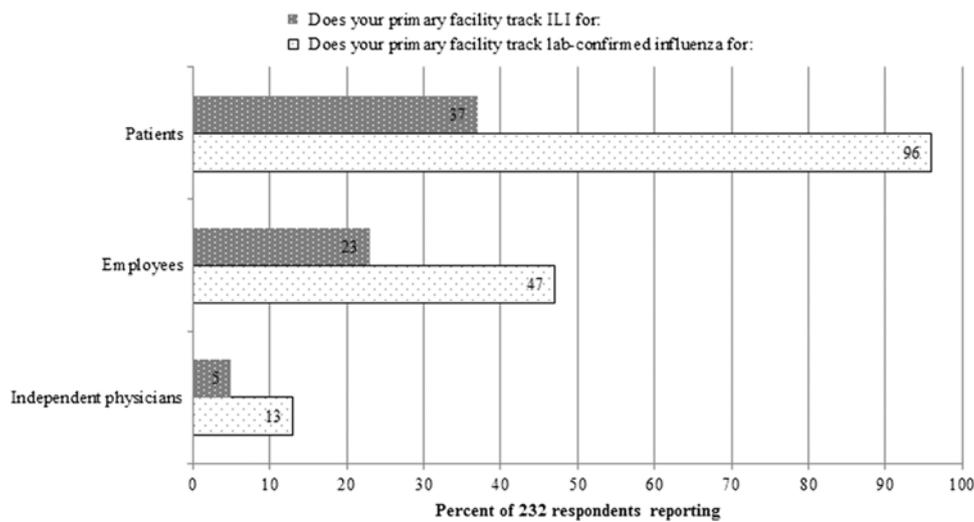
The most commonly reported work-restriction enforcement strategies for nonphysician staff were sending HCP with ILI home and encouraging them to call in sick if necessary (reported by 119, 51%). Lack of enforcement of work restrictions was reported by 24% for physicians-in-training and by 42% for attending physicians but only by 13% for nonphysician staff (Fig. 1). Most respondents (124, 53%) reported that adherence to work restrictions was not being monitored, and 35 (15%) reported that adherence was monitored and 73 (32%) were not sure.

Respondents were provided a series of select-all-that-apply options to define their understanding of their facilities' human resources policy for employee sick days. One hundred (43%) respondents reported that their facility employees had a defined number of sick days available per year, and 102 (44%) respondents reported that available days off for both vacation and illness were taken from the same pool. In addition, 45 respondents (19%) were unsure of their facility's human resources policy for employee sick days, and 20 (9%) respondents reported an "other" policy. Also, 9 (4%) respondents also reported that additional sick days were made available during influenza season, with 3 stating that the leave was paid, 5 stating that it was unpaid, and 1 stating that pay status was not specified.

Laboratory-confirmed influenza is tracked by facilities most frequently for patients (223, 96% respondents), of which most (204 respondents) reported tracking all patients and a small number (19 respondents) reported tracking only nosocomial cases



**Fig. 1.** Respondents' perception of how work restriction policies are enforced for different types of HCP experiencing influenza-like illness. Infectious Diseases Society of America Emerging Infections Network, March 2018.



**Fig. 2.** Does your facility track ILI or lab-confirmed influenza for patients, employees and independent physicians (not employed by the facility)? Infectious Diseases Society of America Emerging Infections Network, March 2018.

(Fig. 2). Smaller numbers of respondents reported tracking laboratory-confirmed influenza in employees (109, 47%), and only 13% (30 respondents) reported tracking influenza in independent physicians (those not employed by the facility).

Influenza-like illness (ILI) in patients was tracked by the facilities of 85 (37%) respondents, with 58 tracking ILI for all patients and 27 tracking only inpatient nosocomial ILI. ILI in employees was tracked by the facilities of 53 (23%) respondents. ILI in independent physicians was tracked by the facilities of only 11 (5%) respondents. (Fig. 3a and 3b).

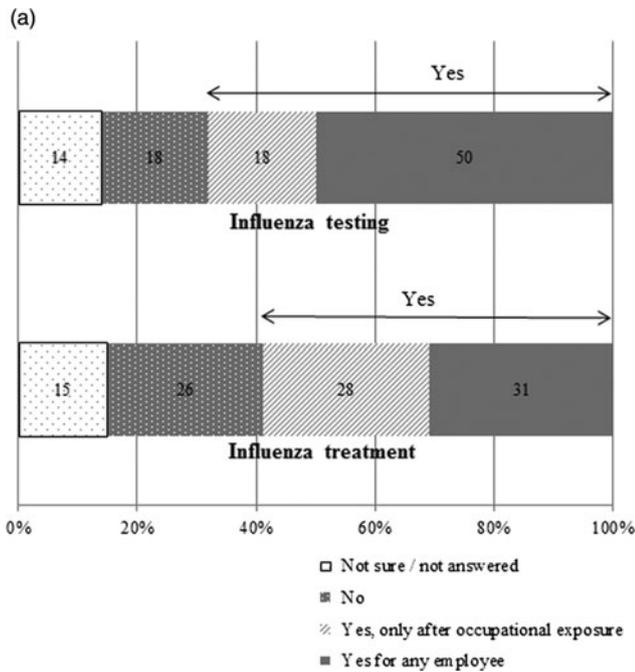
Tracking of either ILI or lab-confirmed influenza was reported to be accomplished primarily by employee visits to occupational health (reported by 50 respondents in open-text field), using a call-in telephone line (reported by 29 respondents), and by laboratory/microbiology testing (reported by 23 respondents). In addition, 4 respondents reported use of an online or paper report form, and 9 stated that it is the manager or supervisor's responsibility to report ILI to occupational health.

In another open-text field asking how tracking data were used, most respondents ( $n = 46$ ) reported that the data were reviewed by or reported to either infection prevention or occupational health. A minority of respondents ( $n = 24$ ) reported that an action was taken, including updating policies and practices, enforcing policies,

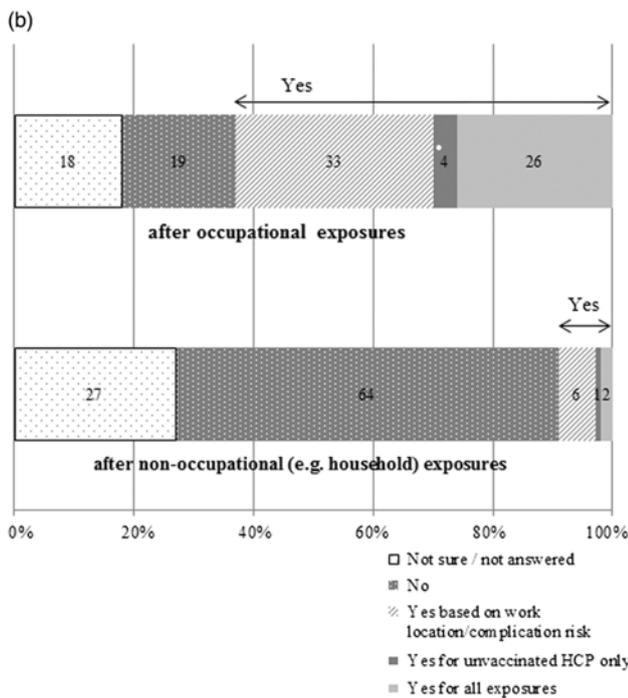
offering prophylaxis or requiring wearing of masks by staff, and beginning investigations of potential clusters.

Overall, 63% reported that antiviral prophylaxis was provided to at least some employees after occupational exposures, although 9% reported provision of antiviral prophylaxis after nonoccupational (eg, household) exposures.

The survey contained several open-ended questions. Responses varied widely among the 169 respondents who described their institution's occupational health policies regarding work restrictions. For example, some stated only that they have a policy ( $n = 45$ ); others said the policy specified fever and a time period (usually 24 hours) to be afebrile off antipyretics ( $n = 79$ ) before returning to work. For 12 respondents, a specific number of days exclusion were cited, (typically 5–7 days after illness onset), and 12 required approval from employee health to return to work. Interestingly, 20 reported combinations of the preceding criteria and other requirements. For example, 7 mentioned wearing a mask if respiratory symptoms were present, 3 specified additional restrictions for those working with immunocompromised patients such as in a NICU or transplant unit, and 6 described several time intervals (eg, total days of illness, days since illness onset, or days since resolution of fever without antipyretics) and stated that they would select whichever of these was longest.



**Fig. 3a.** Does your facility provide influenza testing and/or treatment for employees? Infectious Diseases Society of America Emerging Infections Network, March 2018.



**Fig. 3b.** Does your facility provide antiviral prophylaxis after occupational exposure and/or on request after nonoccupational (eg, household exposure), Infectious Diseases Society of America Emerging Infections Network, March 2018.

**Qualitative analysis of comments**

Three other general themes were reflected among 51 respondents who provided additional comments. First, HCP had a perception that they were encouraged to work while ill. For example, one respondent noted, “Employees are penalized for using time off when ill even though it’s the policy that they stay home. ...

Comments from staff often speak to pressure (indirect or direct, internal or external) to come to work unless significantly ill.”

Second, several respondents described reasons for lack of compliance among physicians. “Presenteeism” is most prevalent among doctors, for whom there is not a large pool of backups during the flu season, and many are uncomfortable asking others to fill in for them,” a physician noted, “And then there’s the inflated sense of self-importance.” Another commented, “It has been difficult with physicians or surgeons who do procedures and/or have busy outpatient clinics because of (the) need to cancel patients and/or inconveniences. There is no buffer in the system for another qualified provider to fill in.” Some described similarities in medicine and nursing, such as “Nurses and doctors work when sick. The reality is that if we didn’t—there would be very critical shortages of care givers during flu season. It’s unfortunate.”

The third theme related to potential loss of pay or vacation time related to policy structure (eg, having to use vacation time in lieu of sick leave). One respondent noted, “Lumping together ‘sick time’ and ‘vacation time’ is a significant contributing factor to presenteeism.” Others commented on sick leave impacting bonus structures because sick days are counted as days of work missed and noted that if sick days are unpaid, the financial element of not coming to work needs to be factored in. A respondent summarized it this way: “If they really wanted people to stay home when ill they would have dedicated sick time.”

**Discussion**

Our results demonstrate a wide range of reported facility-level policies for managing healthcare professionals with ILI. We found substantial differences in reported approaches for capturing presenteeism across hospitals and across different types of HCP. Most hospitals described by respondents do track influenza infection in patients, but they do not routinely track ill employees or independent physicians. In the absence of mechanisms to effectively track illness in HCP, it is difficult to enforce a policy specifying work restrictions. In general, illness, either laboratory-confirmed influenza or ILI, is tracked the least frequently for physicians, especially those not directly employed by the hospital. Some hospitals track only laboratory-confirmed influenza cases among HCP, whereas other hospitals were reported to track employees with ILI. Hospital policies are intended to prevent healthcare professionals from working with ILI. However, the reported enforcement of such policies was highly variable, and it may be limited by the frequently reported lack of effective tracking of illnesses. Finally, respondents reported substantial barriers, which may limit the ability of hospitals to monitor presenteeism. For example, many hospitals do not differentiate between sick days and vacation days, which limits the ability to determine whether absent healthcare workers are ill.

Presenteeism is not unique among healthcare professionals.<sup>23-26</sup> The practice of professionals working while ill has been associated with lower levels of productivity and higher levels of errors and work-related injuries. Some reports estimate the cost of presenteeism, in general, to exceed the cost of absenteeism.<sup>27</sup> Presenteeism for people with ILI in the general workforce can also increase the spread of disease.<sup>23,25</sup> Influenza is a major cause of health-related absences.<sup>28,29</sup> In simulation studies, presenteeism substantially increases the number of influenza cases at a population level.<sup>23</sup> Although similar studies are lacking in healthcare settings, the contribution of presenteeism may be substantial especially if

influenza vaccination rates for healthcare professionals are low or if the efficacy of the annual influenza vaccination is low.

Causes of presenteeism noted in the literature include a sense of loyalty to colleagues, professional responsibility to patients, and feeling irreplaceable.<sup>15,17,30,31</sup> Individuals who feel indispensable in their jobs are more likely to work while ill.<sup>32</sup> Although we did not ask specifically about causes in this query, the comments support these points. Some evidence shows that vaccination against influenza may be associated with higher levels of presenteeism, possibly because vaccinated healthcare professionals may think that they are less likely to have influenza or to transmit it to their patients.<sup>15</sup> Other causes of presenteeism include fear of negative consequences from both administrators and colleagues, and, for many healthcare professionals, there may be financial consequences. Some of the respondents gave specific examples of financial consequences for missing work, for example, missing bonuses for absences regardless of the cause. More commonly, our results suggested that many institutions combine paid vacation and sick days. Thus, by claiming a sick day, a worker may lose a vacation day, creating a perverse incentive for presenteeism.

An effective approach to reducing presenteeism is having policies in place that support paid, dedicated sick leave,<sup>33</sup> including for influenza.<sup>25</sup> People with paid time off for illness are much less likely to work while ill. In contrast, the requirement for a “doctor’s note” for approved time off increases presenteeism.<sup>32</sup> Combining sick days with vacation may seem more efficient in terms of human resource management practices, but it may result in putting patients and coworkers at risk when HCP come to work ill. Given that the influenza season is limited, it may be possible to implement strategies to minimize presenteeism during influenza season (eg, not exchanging sick days for vacation days during these months or providing additional ‘flu days’ during that time). Other approaches could include providing designated back-ups or alternative staffing mechanisms during the influenza season to help reduce the professional pressure for working while ill. Finally, enforcing existing or mandatory sick policies may be an important component of decreasing presenteeism. Further studies to test the impact of these interventions are needed. Having surveillance systems for detecting HCP illness and presenteeism in place may help to enforce current policies and measure existing compliance as well as to assess the effectiveness of interventions designed to reduce presenteeism.

Our study has several limitations. First, respondents had varying levels of information about presenteeism policies at their institution. Findings represent respondents’ perception or understanding of their institution’s policies. We did not survey healthcare administration or employee health, thus, a policy or practice (eg, monitoring) may have been in place of which the respondent was unaware. The EIN members were first asked about their awareness of presenteeism policies at their institutions; 63% (232 respondents) responded that they were aware of their facility policies and were asked to continue the survey. Thus, only the EIN members with specific knowledge about their institutions’ policies completed the survey. Second, the EIN is not a random sample of providers. Physicians who participate in the EIN may not necessarily represent the opinions of all infectious diseases physicians. In addition, EIN physicians who are specifically involved in policies or implementation and tracking of presenteeism might have been more likely to respond to this survey than others. However, the response rate for this survey (51%) was similar to other EIN queries, and we obtained responses from physicians in all sizes and types of hospitals and all US Census Bureau divisions. Third, this

survey contained institutional-level questions, and some physician respondents may have represented the same institutions.

Despite the limitations, our results demonstrate a wide variation in the ability to measure HCP presenteeism with influenza and ILI and the policies designed to prevent it, as reported by survey respondents. Additional research to measure HCP illness and the frequency of working while ill is needed to ensure that facilities can best define progress in this important patient-safety issue. Such research should consider approaches to improve the ability to measure ILI among healthcare professionals that show up for work, which will help inform thoughtful and pragmatic policies designed to prevent presenteeism.

**Supplementary material.** To view supplementary material for this article, please visit <https://doi.org/10.1017/icc.2019.305>

**Acknowledgments.** The authors would like to acknowledge and thank Dr Marie A. de Perio and Dr Sophia Chiu, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, for their review of and comments on this manuscript. The contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

**Financial support.** This publication was supported by the CDC (cooperative agreement no. 1 U50 CK000477). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

**Conflict of interest.** P.M.P. reports travel and lodging support from 3M to present at a research meeting and personal fees from Eli Lilly for case adjudication for a clinical trial. All other authors report no conflicts.

## References

1. Monto AS. Influenza: quantifying morbidity and mortality. *Am J Med* 1987;82:20–25.
2. Molinari N-AM, Ortega-Sanchez IR, Messonnier ML, *et al*. The annual impact of seasonal influenza in the United States: measuring disease burden and costs. *Vaccine* 2007;25:5086–5096.
3. Thompson M, Shay D, Zhou H, *et al*. Estimates of deaths associated with seasonal influenza—United States, 1976–2007. *Morb Mortal Wkly Rept* 2010; 59:1057–1062.
4. Thompson WW, Shay DK, Weintraub E, *et al*. Influenza-associated hospitalizations in the United States. *JAMA* 2004;292:1333–1340.
5. Bresee J, Reed C, Kim K, *et al*. Estimated influenza illnesses and hospitalizations averted by influenza vaccination—United States, 2012–13 influenza season. *Morb Mortal Wkly Rept* 2013;62:997.
6. Horcajada JP, Pumarola T, Martinez JA, *et al*. A nosocomial outbreak of influenza during a period without influenza epidemic activity. *Eur Respir J* 2003;21:303–307.
7. Malavaud S, Malavaud B, Sandres K, *et al*. Nosocomial outbreak of influenza virus A (H3N2) infection in a solid organ transplant department. *Transplantation* 2001;72:535–537.
8. Stott DJ, Kerr G, Carman WF. Nosocomial transmission of influenza. *Occup Med (Oxford, Engl)* 2002;52:249–253.
9. Graman PS, Hall CB. Nosocomial viral respiratory infections. *Semin Respir Infect* 1989;4:253–260.
10. Goins WP, Talbot HK, Talbot TR. Healthcare-acquired viral respiratory diseases. *Infect Dis Clin N Am* 2011;25:227–244.
11. Prevention strategies for seasonal influenza in healthcare settings. Centers for Disease Control and Prevention website. <https://www.cdc.gov/flu/professionals/infectioncontrol/healthcaresettings.htm>. Accessed October 15, 2019.
12. Black CL. Influenza vaccination coverage among health care personnel—United States, 2015–16 influenza season. *Morbidity Mortal Wkly Rept* 2016; 65:1026–1031.

13. Flannery B, Chung JR, Belongia EA, *et al.* Interim estimates of 2017–18 seasonal influenza vaccine effectiveness—United States, February 2018. *Morb Mortal Wkly Rept* 2018;67:180–185.
14. Flannery B, Chung JR, Thaker SN, *et al.* Interim estimates of 2016–17 seasonal influenza vaccine effectiveness—United States, February 2017. *Morb Mortal Wkly Rept* 2017;66:167–171.
15. Chiu S, Black CL, Yue X, *et al.* Working with influenza-like illness: presenteeism among US healthcare personnel during the 2014–2015 influenza season. *Am J Infect Control* 2017;45:1254–1258.
16. Ablah E, Konda K, Tinius A, Long R, Vermie G, Burbach C. Influenza vaccine coverage and presenteeism in Sedgwick County, Kansas. *Am J Infect Control* 2008;36:588–591.
17. Szymczak JE, Smathers S, Hoegg C, Klieger S, Coffin SE, Sammons JS. Reasons why physicians and advanced practice clinicians work while sick: a mixed-methods analysis. *JAMA Pediatr* 2015;169:815–821.
18. Jena AB, Baldwin DC, Jr., Daugherty SR, Meltzer DO, Arora VM. Presenteeism among resident physicians. *JAMA* 2010;304:1166–1168.
19. Mossad SB, Deshpande A, Schramm S, Liu X, Rothberg MB. Working despite having influenza-like illness: results of an anonymous survey of healthcare providers who care for transplant recipients. *Infect Control Hosp Epidemiol* 2017;38:966–969.
20. Pillai SK, Beekmann SE, Santibanez S, Polgreen PM. The Infectious Diseases Society of America emerging infections network: bridging the gap between clinical infectious diseases and public health. *Clin Infect Dis* 2014;58:991–996.
21. Morse JM. Confusing categories and themes. *Qualitat Health Res* 2008;18:727–728.
22. DeCuir-Gunby JT, Marshall PL, McCulloch AW. Developing and using a codebook for the analysis of interview data: an example from a professional development research project. *Field Meth* 2011;23:136–155.
23. Kumar S, Grefenstette JJ, Galloway D, Albert SM, Burke DS. Policies to reduce influenza in the workplace: impact assessments using an agent-based model. *Am J Publ Health* 2013;103:1406–1411.
24. Edwards CH, Tomba GS, de Blasio BF. Influenza in workplaces: transmission, workers' adherence to sick leave advice and European sick leave recommendations. *Eur J Publ Health* 2016;26:478–485.
25. Piper K, Youk A, James AE, 3rd, Kumar S. Paid sick days and stay-at-home behavior for influenza. *PloS One* 2017;12(2):e0170698.
26. Rousculp MD, Johnston SS, Palmer LA, Chu BC, Mahadevia PJ, Nichol KL. Attending work while sick: implication of flexible sick leave policies. *J Occupat Environ Med* 2010;52:1009–1013.
27. Whysall Z, Bowden J, Hewitt M. Sickness presenteeism: measurement and management challenges. *Ergonomics* 2018;61:341–354.
28. Molinari NA, Ortega-Sanchez IR, Messonnier ML, *et al.* The annual impact of seasonal influenza in the United States: measuring disease burden and costs. *Vaccine* 2007;25:5086–5096.
29. Tsai Y, Zhou F, Kim IK. The burden of influenza-like illness in the US workforce. *Occupat Med (Oxford, Engl)* 2014;64:341–347.
30. Giaeffer F, Lohmann-Lafrenz S, Lovseth LT. Why hospital physicians attend work while ill? The spiralling effect of positive and negative factors. *BMC Health Serv Res* 2016;16:548.
31. Chow EJ, Mermel LA. More than a cold: hospital-acquired respiratory viral infections, sick leave policy, and a need for culture change. *Infect Control Hosp Epidemiol* 2018;39:861–862.
32. Bockerman P, Laukkanen E. Predictors of sickness absence and presenteeism: does the pattern differ by a respondent's health? *J Occupat Environ Med* 2010;52:332–335.
33. DeRigne L, Stoddard-Dare P, Quinn L. Workers without paid sick leave less likely to take time off for illness or injury compared to those with paid sick leave. *Health Affairs (Project Hope)* 2016;35:520–527.