

# Attitudes amongst Australian hospital healthcare workers towards seasonal influenza and vaccination

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Accepted 13 October 2009. Published Online 24 November 2009.

**Background** Amongst healthcare workers (HCWs), compliance rates with influenza vaccination are traditionally low. Although a safe and effective vaccine is available, there is little Australian data on reasons for poor compliance, especially amongst allied health and ancillary support staff.

**Methods** Cross-sectional investigation of a sample of clinical and non-clinical HCWs from two tertiary-referral teaching hospitals in Sydney, Australia was conducted between June 4 and October 19, 2007. The self-administered questionnaire was distributed to hospital personnel from 40 different wards and departments. The main outcome measures were personal beliefs about influenza vaccination and self-reported vaccination status.

**Results** Respondents ( $n = 1079$ ) were categorized into four main groups by occupation: nurses (47.5%, 512/1079), physicians (26.0%, 281/1079), allied health (15.3%, 165/1079) and ancillary

(11.2%, 121/1079). When asked whether they felt the influenza vaccine was safe or effective, 81% (879/1079) and 68% (733/1079), respectively, replied in the affirmative. Participants felt that it was more important to get vaccinated to protect patients (74%, 796/1079) than family (68%, 730/1079) or self-protection (66%, 712/1079). However, only 22% (241/1079) of the HCWs who replied reported receiving the vaccine the year the survey was conducted.

**Conclusions** Although HCWs had an adequate level of knowledge towards influenza vaccination, only 22% of them were vaccinated. The approach to improving influenza vaccination rates amongst HCWs and to tackling misconceptions must be multifaceted, adaptable and must evolve regularly to increase coverage.

**Keywords** Healthcare worker, vaccination, influenza, hospital.

Please cite this paper as: Seale *et al.* (2009) Attitudes amongst Australian hospital healthcare workers towards seasonal influenza and vaccination. *Influenza and Other Respiratory Viruses* 4(1), 41–46.

## Introduction

Healthcare facilities are an ideal environment for the rapid spread of influenza and healthcare workers (HCWs) have been identified as the primary vectors for spreading influenza virus within these facilities.<sup>1,2</sup> Moreover, HCWs often continue to care for their patients even after they develop flu-like symptoms.<sup>3,4</sup> Nosocomial influenza is also associated with excess absenteeism and disruption of healthcare services.<sup>5</sup> HCWs constitute an important group for targeted immunization programs because of their potential as carriers.

Recommendations for HCW vaccination are common in developed countries. Both the USA Advisory Committee on Immunisation Practices and the Australian Technical Advisory Group on Immunisation recommends influenza vaccination to healthcare providers because of their contact with those at risk of complications from influenza.<sup>6,7</sup>

Despite these recommendations, only 36% of HCWs in the United States are vaccinated against influenza annually.<sup>8</sup> Other previous studies demonstrate a range of immunization rates for overseas doctors from 38% to 82%.<sup>9,10</sup>

A recently published Australian study in this area examined the extent of vaccination coverage across Victorian public hospitals in 2005. Investigators reported that an overall average of 38% of staff was vaccinated, with the highest rates of vaccination being among allied health (45%) and laboratory staff (42%).<sup>11</sup> The study also demonstrated that among clinical staff, medical staff had the lowest vaccination rates (29%), followed by nursing (35%).<sup>11</sup> A second study conducted in 2007 in a tertiary hospital in the Northern Territory found that only 28% of doctors received influenza vaccination in that year; and of the 72% not immunized, only 44% had received vaccination prior to 2007.<sup>12</sup>

Physicians are generally more receptive to influenza vaccination than nursing staff<sup>9</sup> or non-medical employees.<sup>1</sup> Healthcare workers appear to have many of the same misconceptions about influenza and influenza vaccine as patients with the most prevailing belief that one can get influenza-like symptoms from influenza vaccination.<sup>13</sup>

Over the last two decades, healthcare authorities have developed guidelines and programs to reduce nosocomial spread of infectious diseases and protect staff.<sup>14,15</sup> However, many of the intervention programs to date have had limited success in encouraging and maintaining HCW vaccination levels.<sup>16</sup> Those reporting success have used comprehensive campaigns aimed at promotion and increasing availability such as mobile carts.<sup>17–19</sup>

We choose to explore the attitudes and beliefs of a range of different hospital staff including doctors, nurses, allied health staff and ancillary staff because they all have the potential to introduce and spread influenza around the hospital. The study was conducted in two hospitals in Sydney, NSW, Australia, during the introduction of a state government policy directive mandating vaccination for healthcare workers. Influenza vaccination was not included within the mandatory requirements. The study was broadly focused on three major areas: HCW pandemic influenza preparedness, attitudes to mandates and attitudes to seasonal influenza vaccination.<sup>20,21</sup> Results for latter are the focus of this report.

## Methods

Between June 4 and October 19, 2007, we conducted a cross-sectional survey in two major referral teaching hospitals (one adult and one paediatric) to determine HCWs knowledge and attitudes towards seasonal influenza. A detailed report of the methods is published elsewhere.<sup>21</sup>

We developed an anonymous two-page survey that assessed the following characteristics of participants: (i) demographic characteristics, family situation and specialty; (ii) their attitudes towards the influenza vaccine; and (iii) uptake of the influenza vaccine. Participants returned the survey to us immediately or by interoffice mail. The questionnaire was also available on the intranet, which was available to staff in the paediatric hospital only. Access to the electronic questionnaire depended on the hospital staff (from all four categories) having access to the hospital computer system. Four groups were surveyed: doctors (staff specialists, registrars, medical students, etc.), nurses (registered nurses, nurse unit managers, enrolled nurses, etc.), allied health personnel (physiotherapists, occupational therapists, psychologists, etc.) and ancillary staff (domestic services, administration, computer specialists, etc.). The latter group also included any staff member who was deemed to not have direct patient contact includ-

ing academic staff and other public health professional staff.

The survey was distributed via wards and/or departments within each hospital where patients were considered to be at high risk for influenza or its effects. Surveys were distributed via the manager of the department/unit. Managers were asked to estimate the number of surveys needed to cover staff currently working in the ward/department. At each hospital, the influenza vaccine was provided free of charge at onsite vaccination clinics.

## Results

During the period of June to October, 2007, 40 wards were approached with all agreeing to distribute the survey. Twelve hundred surveys were distributed with 894 being returned (74.5%). A further 185 questionnaires were submitted electronically from staff at the paediatric hospital, resulting in a total of 1079 completed questionnaires. We received 559 surveys (52%) from the paediatric and 520 surveys (48%) from the adult hospital. Respondents were categorized into four main groups by occupation: nurses (47.5% (512/1079), doctors (26.0%, 281/1079), allied (15.3%, 165/1079) and ancillary staff (11.2%, 121/1079). Participant's occupational and demographic characteristics are summarized in Table 1.

With regard to influenza vaccine uptake, 241/1079 (22%) replied that they had received it the year the survey was conducted (2007). Doctors reported the highest levels (OR: 1.7, CI 95: 1.23–2.34,  $P = 0.05$ ), followed by the allied health staff (OR: 1.05, CI 95: 0.69–1.58,  $P = 0.8$ ), nurses (OR: 0.70, CI 95: 0.52–0.95,  $P = 0.01$ ) and ancillary staff (OR: 0.75, CI 95: 0.45–1.25,  $P = 0.24$ ). Low levels of vaccination were reported for staff members from highest risk patient areas (Neonatal: 15% and Intensive care: 10%).

When examining beliefs about the influenza vaccine, 81% (870/1079) felt it was safe and 68% thought it was effective (733/1079). Of the staff who stated they felt the influenza vaccine was safe and effective, only 23.5% (207/1079) and 23.9% (184/1079), respectively, reported receiving it (Table 2). Doctors were more likely to agree that the vaccine was effective (OR: 2.68, CI 95: 1.63–4.45,  $P \leq 0.01$ ), safe (OR: 4.09, CI 95: 1.82–9.54,  $P \leq 0.01$ ) and that it decreased time lost from work (OR: 3.46, CI 95: 2.29–5.25,  $P \leq 0.01$ ), than nurses. The attitudes of staff towards influenza and vaccination by vaccination status are shown in Table 2.

Slightly more staff stated that it was important to get vaccinated against influenza for the protection of patients (74%, 796/1079) than family (68%, 730/1079) or for self-protection (66%, 712/1079). For staff who felt it was important to vaccinate for the protection of patients and family, only around 23.4% (186/798) and 24% (172/697) reported

**Table 1.** Demographic characteristics of healthcare workers in two NSW teaching hospitals according to self-reported influenza vaccination status in 2007

Characteristic (n = 1079)	Vaccinated in year of survey (self-report) (%)	Total (%)
Hospital		
General	113 (22)	520
Paediatric	128 (23)	559
Occupational group		
Nurses	98 (19)	512 (47)
Doctors	83 (29)	281 (26)
Allied health	38 (23)	165 (15)
Ancillary/hospital support	22 (18)	121 (11)
Sex		
Female	177 (22)	807 (75)
Male	59 (24)	245 (23)
Not specified	5 (19)	27 (2.5)
Age group (years)		
18–30	76 (22)	338 (31)
31–40	63 (23)	280 (26)
41–50	58 (23)	247 (23)
51+	40 (22)	186 (17)
Not specified	4 (14)	28 (2.6)
Living arrangement		
Live with partner/spouse and children	106 (24)	446 (41)
Live with partner/spouse	54 (20)	267 (24)
Live in shared accommodation	36 (27)	132 (12)
Live alone	23 (21)	108 (10)
Other/not specified	22 (17)	126 (12)

The group of 'Other' is made up of hospital research staff, technologists, pathology and laboratory staff and medical imaging staff.

receiving the vaccine respectively. For participants who felt the vaccine was important for self-protection, only 11.4% (81/704) reported they were vaccinated. Three quarters of respondents agreed that getting vaccinated would decrease time lost from work (59%, 636/1079). Only 47% (240/512) of nurses believed that vaccine would decrease sick leave.

Thirty three per cent (359/1079) agreed with the statement 'I am at low risk of catching flu'; 52% (556/1079) agreed with the statement 'the flu vaccine can cause flu in some people'; whilst a further 20% (216/1079) were unsure and 28% (307/1079) disagreed. This pattern was not so clear for the next statement on whether the 'flu vaccine contains live virus' with an equal number agreeing and disagreeing and a further 37% (402/1079) being unsure. Nurses were significantly more likely to agree that the flu vaccine contains live virus than doctors (OR: 0.50, CI 95: 0.33–0.76,  $P \leq 0.01$ ). 51% (62/121) of ancillary staff were

**Table 2.** Attitudes towards influenza and vaccination by vaccination status in two NSW teaching hospitals in 2007

	Vaccinated n = 241 (%)	Unvaccinated n = 838 (%)	Total n = 1079 (%)
The flu vaccine is safe			
Agree	207 (86)	672 (80)	879 (81)
Disagree	17 (7)	63 (8)	80 (7)
Unsure	17 (7)	103 (12)	120 (12)
The flu vaccine is effective			
Agree	184 (76)	549 (66)	733 (68)
Disagree	22 (9)	119 (14)	141 (13)
Unsure	35 (15)	170 (20)	205 (19)
Getting vaccinated is important to protect*			
Patients	186 (77)	610 (73)	796 (74)
Myself	182 (76)	530 (63)	712 (66)
My family	198 (82)	532 (63)	730 (68)
Getting vaccinated will decrease my time lost from work			
Agree	162 (67)	447 (53)	609 (56)
Disagree	46 (19)	229 (27)	275 (25)
Unsure	33 (14)	162 (19)	195 (19)
Flu vaccination is easily accessible			
Agree	220 (91)	729 (87)	949 (88)
Disagree	10 (4)	50 (6)	60 (6)
Unsure	11 (5)	59 (7)	60 (6)
I am at low risk of catching flu			
Agree	79 (33)	280 (33)	359 (33)
Disagree	123 (51)	339 (40)	462 (43)
Unsure	39 (16)	159 (19)	198 (18)
Not specified	0	60 (7)	60 (6)
The flu vaccine can cause the flu in some people			
Agree	113 (47)	443 (53)	556 (52)
Disagree	76 (32)	231 (28)	307 (28)
Unsure	52 (22)	164 (20)	216 (20)
The flu vaccine contains live virus			
Agree	73 (30)	269 (32)	342 (32)
Disagree	84 (35)	251 (30)	335 (31)
Unsure	84 (35)	318 (38)	402 (37)

\*Each selection was ranked separately by the participant.

unsure if the vaccine contains a live virus, while a further 42% (51/121) believed it did. 58% (297/512) of nurses and 58% (96/165) of allied health staff believed that the vaccine caused the flu in some people.

## Discussion

Of the respondents who replied from the two institutions, only 22% (241/1079) reported being vaccinated against influenza. Like ours, most studies on attitudes of HCWs towards influenza vaccination find many have misperceptions on vaccine effectiveness, side effects, protective value and the role of HCWs in transmission of influenza to patients.<sup>9,22–24</sup> Despite general perceptions of safety, false

belief that the vaccine can cause influenza persisted among half of the respondents. This result is comparable to other studies that have reported frequencies from 30% to 45%.<sup>25,26</sup> In our study we found that only 13% of respondents perceived that the vaccine was ineffective, whereas in a study by Goldstein *et al.* 67% of hospital respondents agreed with a statement that the vaccine was ineffective.<sup>27</sup> This may relate to the level of information available to the HCWs in our hospitals.

Our study found that high percentages of participants agreed with the importance of getting vaccinated. To protect patients appeared to be the strongest motivation even amongst non-vaccinated individuals. The protection of their families was a secondary motivation in most cases. This is in contrast to the results published in a literature review carried out by Hofmann *et al.* that found self-protection as the leading reason for HCW vaccination followed by protection of patients.<sup>22</sup> Healthcare workers who see personal protection as the main purpose of vaccination often do not consider the consequences for patients, thereby limiting the number of healthcare professionals willing to undertake annual vaccination.

In our study, we found that nurses were consistently less certain about the vaccine's safety, efficacy and importance compared with than physicians and allied health professionals. Nurses were also more likely to falsely believe that the vaccine could cause flu in people and that the vaccine contained live virus. In corroboration, a study from the United States also reported that concerns about becoming ill as a result of being vaccinated were cited as the second most common reason by HCWs (23% of respondents) for declining to undergo influenza vaccination.<sup>28</sup> Previous studies have also documented differences in the level of knowledge about the effectiveness of the vaccine<sup>16</sup> and the recognition of the seriousness of influenza<sup>29</sup> between nurses and physicians. In these previous studies, as with ours, nurses had lower uptake rates for the influenza vaccine.<sup>16,29</sup> Nurses are also less likely (compared with physicians) to 'convert' from non-vaccine recipients to vaccine recipients and may require more intensive interventions.<sup>30</sup>

There are a number of limitations to this study including the sample and use of self-report for immunization status. Adults tend to overestimate their own influenza vaccination status with studies demonstrating a positive predictive value of between 63% and 88%, high sensitivity but lower specificity.<sup>31,32</sup> With regards the sample, we were unable to compare the demographics of the respondents versus non-respondents to examine representativeness. However, based on manager estimates for each ward/department, we had a good response rate (894/1200, 74.5%). There may also be limitations with generalizability since we included only two hospitals in a single Australian city. Nevertheless, this study

provides baseline information at a key phase in the evolution of healthcare worker vaccination policy in NSW.

It is clear that mere education on the benefits of vaccination is not sufficient to promote influenza vaccine uptake.<sup>33</sup> As emphasized by Ofstead *et al.*, the provision of education does not ensure comprehension.<sup>34</sup> Studies agree that one cannot rely on one method to increase influenza vaccination rates, instead a 'bundle' strategy should be used, whereby they include various methods to improve vaccination rates, such as the provision of free and readily accessible vaccination, education with a focus on the patient safety aspect of HCW vaccination and regular assessment of the program. For our study population, there needs to be emphasis placed on the rational and logic for vaccination i.e. the necessity to be vaccinated to protect patients from nosocomial influenza infection and also for self-protection.

The next phase in the improvement of influenza vaccination rates among HCWs involves making vaccination a requirement to some degree. Mandatory influenza immunization programs have already been introduced in some countries. The province of Ontario, Canada, introduced regulations in 2004 requiring annual influenza immunizations for workers in long term care.<sup>35</sup> In the United States, there are at least four states which have policies required influenza immunizations of workers in hospitals, nursing homes or both, unless the workers has a medical, religious or philosophical reason for exemption.<sup>36</sup> Investigators from the CDC,<sup>37</sup> recently concluded that requirements for vaccination 'that are properly implemented and enforced should be an effective tool in future efforts to reduce healthcare-associated infections and increase overall quality of care'. However, they warned that these requirements are unlikely to be fully adopted without legal requirement.

Previous studies have reported support for mandatory policies from HCWs. Poland *et al.* found that 56% of surveyed nurses stated that mandatory influenza vaccination was appropriate for HCWs and 59.4% reported that they would support a policy required annual influenza vaccination for HCWs (with direct patient contact) that allowed informed declination.<sup>38</sup> In a second study, Lester *et al.* reported that 44% of 670 physicians surveyed believed that influenza vaccination should be mandatory, including 29% of those who had chosen to not receive vaccination.<sup>39</sup>

Recently, interest has focused on mandatory programs coupling a requirement for immunization and the use of a form to document the HCWs decision to immunize or not. The use of a signed declination (or refusal) form has been promoted to ensure that HCWs are appropriately informed about the rationale for influenza vaccination. Key facets of the declination form should include: (i) the message to which the HCW is attesting, (ii) the ramifications of failure to sign the declination and (3) the emphases and

expectations of the surrounding institutional leadership.<sup>40</sup> A survey of infectious diseases specialists noted that vaccination rates were significantly higher at institutions that required signed declination forms, compared with institutions that did not, although this was not the strongest predictor.<sup>41</sup> It appears that in our study's context, institutional changes such as the use of a declination form, to ensure staffs receive vaccines may pave the way for increasing influenza vaccination uptake prospectively. Our survey was undertaken at the commencement phase of a policy mandating immunization and screening for vaccines not including influenza. As 44% (474/1079) of respondents falsely believed influenza vaccination was incorporated within the mandatory requirements, it is possible that vaccination rates increased the following year when influenza vaccination was recommended (March to June).

Three messages emerge from our data: (i) even though the staff feel the vaccine is safe and effective, the misconceptions that the vaccine causing the 'flu' and that it contains 'live virus' outweighs the positive response; (ii) there is variation in responses across the different streams of staff which suggests a need to tailor an intervention program at different levels; and (iii) state or institutional policies and practices are likely needed to increase employee uptake of this vaccine. Different health professional groups require different approaches according to their professional culture and access to existing knowledge on influenza vaccination.

## Acknowledgements

We would like to thank the CEO of both hospitals for allowing us to undertake the survey, as well as the staff from every department and wards who participated. Thanks also go to Pamela Cheung, Myra Parsons and Kylee Gibbins for their assistance with the data collection.

## Declaration

Julie Leask is an investigator on a grant which is part funded by Sanofi Pasteur. C. Raina MacIntyre receives funding from influenza vaccine manufacturers GSK and CSL Biotherapies for investigator-driven research. Holly Seale declares that she has no competing interests. National Centre for Immunisation Research and Surveillance is supported by the Australian Government Department of Health and Ageing, the NSW Department of Health and The Children's Hospital at Westmead. Ethical approval was sought and granted from both of the hospitals.

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