

# Seasonal influenza vaccination in Australian hospital health care workers: a review

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**H**ealth care workers (HCWs) are an occupational group at increased risk of exposure to influenza and other infectious diseases. Vaccinating HCWs can protect them from infectious diseases that they may be exposed to during their patient-related activities, and reduce the risk of transmission of these agents to other staff and the patients in their care. Vaccination can therefore be considered as not only an employee health measure but also an important component of infection control and occupational health and safety activities, which could reduce the risk of nosocomial infections.

The World Health Organization, the Canadian National Advisory Committee on Immunization, the United States Centers for Disease Control and Prevention (CDC), and 19 European countries strongly recommend annual influenza vaccination for HCWs.<sup>1–5</sup> The *Australian immunisation handbook* recommends that all HCWs (including all workers and students directly involved in patient care or the handling of human tissues) have the influenza vaccination annually.<sup>6</sup> While numerous recommendations and programs (such as the use of mobile carts or declination forms) have been implemented to increase uptake, there is still resistance among staff towards occupational influenza vaccination.<sup>7</sup>

Here, we review the studies conducted in Australian hospitals to date that have examined the uptake of seasonal influenza vaccination among staff.

## Methods

We identified potentially eligible reports by searching the MEDLINE (January 1950 to present) and EMBASE (1988 to present) databases with the OvidSP interface in September 2010. We also independently searched five journals — *Infection Control and Hospital Epidemiology*, *Australian and New Zealand Journal of Public Health*, *Australian Journal of Advanced Nursing*, *Medical Journal of Australia* and *Vaccine* — and hand-searched bibliographies of relevant reports for additional studies. Our search terms included: influenza, flu, vaccines, vaccination, immunisation, influenza vaccination, health personnel, healthcare personnel, healthcare worker, healthcare provider, healthcare practitioner, health employee, medical staff, doctor, nurse, hospital personnel, hospital staff, hospital worker and hospital.

Any study examining seasonal influenza vaccination (uptake, attitudes and/or programs) among Australian hospital HCWs was included. Studies relating to uptake of the pandemic (H1N1) 2009 influenza vaccine were excluded, as were studies that reported uptake rates in other types of health care facility (eg, aged care facility). There were no restrictions on the study design or date of

## Abstract

**Objective:** To review the uptake of seasonal influenza vaccination among hospital health care workers (HCWs) in Australia to date.

**Data sources:** We searched MEDLINE and EMBASE (up to September 2010) and bibliographies of relevant reports for studies examining seasonal influenza vaccination (uptake, attitudes and/or programs) among Australian hospital HCWs. Studies relating to pandemic (H1N1) 2009 influenza vaccination or other types of health care facilities were excluded.

**Study selection:** 15 articles were assessed, of which 10 met inclusion criteria.

**Data synthesis:** The 10 studies were conducted between 1997 and 2008 and reported vaccination rates of hospital HCWs of 16.3%–58.7%. Two of three studies documenting uptake rates of > 50% were associated with active implementation of vaccination policies or interventions. Uptake rates by occupational group ranged from 29% to 58.3% for physicians, 19% to 56.4% for nurses, 23% to 57.7% for allied health professionals, and 18% to 66.7% for ancillary or support staff. Coverage rates in hospitals that provided the vaccine free of charge to staff (with or without an informational campaign) were no higher than in other hospitals.

**Conclusion:** While seasonal influenza vaccination uptake was higher in hospitals with documented intervention programs, coverage is still low and does not appear to be affected by the provision of free vaccine to staff. State or institutional policies or mandates are likely needed to increase HCW uptake of seasonal influenza vaccination.

publication. We used the CDC's simple definition of HCWs: all medical and non-medical personnel in contact with patients, including all non-remunerated and/or temporary staff, as well as persons exposed to human samples.<sup>8</sup>

## Results

The full texts of 15 articles were retrieved and assessed for eligibility. Of these, five were excluded: three did not document data on uptake of influenza vaccination among staff, one was a study conducted in an aged care facility, and one documented the uptake of influenza vaccination 1 month after the implementation of a new vaccine policy.<sup>9</sup> As this latter study was one of a series of papers published, we opted to include only the baseline and 1-year follow-up articles.

The 10 included studies were conducted between 1997 and 2008 (Box).<sup>7,10–18</sup> We identified no studies from the Australian Capital Territory, South Australia or Tasmania. Overall HCW vaccination coverage varied between 16.3% and 58.7%. The highest rate was obtained in a small study

### Overview of included studies of seasonal influenza vaccination uptake among Australian hospital health care workers (HCWs)

Study, year conducted	Influenza vaccination coverage and comments
Ballestas et al, <sup>10</sup> 2008	Before vaccination campaign: < 55% (range, 29%–51%); after campaign: >55% in all but one hospital (range, 49%–77%) (6387/11501) Physicians, 51.9%; nurses, 49.6%; allied health professionals, 57.7%; patient support services, 48.6% (all ≥ 0.5 FTE); HCWs < 0.5 FTE, 58.8% Disparities in collection of vaccination data between years; precampaign coverage rates may be less accurate; may be overestimating coverage
Kaufman et al, <sup>11</sup> 2007	Overall: 28% (42/150) Rate derived from self-reported data; data from one hospital and one occupational group (doctors) only
Seale et al, <sup>7</sup> 2007	Overall: 22% (241/1079) Physicians, 29%; nurses, 19%; allied health professionals, 23%; ancillary and hospital support staff, 18% Rates derived from self-reported data; data only available for two hospitals; no information on non-responders
Osman, <sup>12</sup> 2007	Overall: 58.7% (37/63) Physicians, 58.3%; nurses, 56.4%; clerical staff and wardsmen, 66.7% Rates derived from self-reported data; data from one hospital only
Bull et al, <sup>13</sup> 2005	Overall: 38% (24 065/63 330) Physicians, 29%; nurses, 35%; allied health professionals, 45%; other, 50%; non-clinical, 37%; laboratory, 41% (data from 67/74 hospitals/health services) Variations in methods/quality/accuracy of data collection between hospitals; may be over- or underreported as some staff may work at multiple sites or may have been privately vaccinated
Campos and Jalaludin, <sup>14</sup> 2001	Overall: 23% reported being vaccinated in the past (53/232) Rate derived from self-reported data; data from one hospital and one occupational group (nurses) only
Smithers et al, <sup>15</sup> 2001	Overall: 54% (146/272) Rate derived from self-reported data; campaign awareness may have had a positive impact on HCW attitudes, knowledge, and influenza vaccination
Cooper and O'Reilly, <sup>16</sup> 2000	Before intervention (1996): 8.3%; after intervention (2000): 49% (sample size not reported) Data only available for staff vaccinated as part of intervention program
Murray and Skull, <sup>17</sup> 2000	Overall: 48% (129/269) Rate derived from self-reported data; may be overestimated
Thomson et al, <sup>18</sup> 1997	Overall: 16.3% (748/4592) Data on uptake only available for staff vaccinated at the hospital clinic; may be underestimated

FTE = full-time equivalent. ◆

that included only emergency department staff.<sup>12</sup> Information on the use of vaccination campaigns or policies and provision of the vaccine was not provided for this study. Two of the three studies that reported uptake rates of >50% were associated with active implementation of specific policies or interventions. Coverage rates in hospitals where the vaccine was reportedly provided free of charge to staff ranged from 16.3% to >55%. For the four studies in which information on vaccine provision was not available,<sup>12,13,15,17</sup> uptake ranged from 38% to 58.7%.

Rates of uptake by occupational group ranged from 29% to 58.3% for physicians, 19% to 56.4% for nurses, 23% to 57.7% for allied health professionals, and 18% to 66.7% for ancillary or support staff.

## Discussion

Despite recommendations for annual influenza vaccination, this review demonstrates that there has been little change in levels of uptake among Australian HCWs since 1997. Only three of the 10 studies reported vaccination coverage of >50%.<sup>10,12,15</sup>

In US studies, coverage rates in hospitals where the vaccine is provided free to staff (with or without informa-

tional campaigns) range from 2.1% to 82%,<sup>19,20</sup> and are higher than in hospitals without free vaccine or campaigns.<sup>21</sup> Other studies have documented uptake from 12% to 25% in Europe<sup>22</sup> and 26% to 61% in Canada.<sup>2</sup>

In Australia, the provision of free influenza vaccine to HCWs is a policy decision for each hospital or jurisdiction, and is not uniform across the country. A New South Wales survey of infection control and occupational health coordinators reported that, among those who responded, 76% of public hospitals (138/182) and 46% of private hospitals (36/79) provided annual influenza vaccination to their staff (the study did not ascertain if the vaccine was freely available).<sup>23</sup> While the vaccine may be available, it is often anecdotally reported that clinics are only accessible for limited periods on selective days, and that there are prolonged waiting times. Murray and Skull calculated that, based on the current hospital roster and the opening hours of the staff clinic, a quarter of the HCWs in their study (67/269) were unable to access the clinic within 7 days, and 19% (51/269) remained unable to access it within 14 days.<sup>17</sup> In a survey that asked doctors in a Victorian hospital what might facilitate and encourage more doctors to receive influenza vaccination, 50 of 112 (45%) suggested that the vaccination service needed to be more convenient, and 25 (22%) suggested there needed to be more reminders about when vaccination was available.<sup>11</sup>

Our review has some limitations. First, there were large variations in sample sizes, populations, data collection methods and the accuracy of data between the studies. Therefore, we were unable to undertake any meaningful statistical comparisons. Second, some studies evaluated the implementation of an intervention to improve vaccination uptake, and the coverage rates reported may not have been sustained. Lastly, some studies relied on the use of self-report of vaccination status. Adults tend to overestimate their own influenza vaccination status, with studies demonstrating a positive predictive value of between 63% and 88%, and high sensitivity but lower specificity.<sup>24,25</sup>

In NSW, annual influenza vaccination is “strongly recommended” by the state health department for all health care staff, but it is not a mandatory requirement to work in a hospital.<sup>26</sup> A similar situation exists in Victoria and Queensland.<sup>27,28</sup> Given the continued low levels of influenza vaccination uptake highlighted in this study, there is some interest in the feasibility of making influenza vaccination mandatory. Recently published reports have highlighted successful implementation of mandatory influenza vaccination policies, with one from a hospital in the US recording an uptake rate of 98% following the introduction.<sup>29</sup> However, the same level of success may not transpire in Australia. A recent Australian study examined the attitudes of hospital staff towards a policy directive with compulsory provisions for staff to be vaccinated against certain infectious diseases (not including influenza).<sup>7</sup> When the authors proposed the addition of influenza vaccination to the policy directive, there was a substantial decline in the level of support among the survey respondents.

Strong leadership support for these policies, the use of champions to promote and encourage uptake, and a solid infrastructure for timely and consistent communication

may assist the introduction of influenza vaccination into established policy directives. Governments and institutions need to now look beyond educational or promotional programs for increasing coverage and investigate the use of these mandates to bolster uptake of influenza vaccination.

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