

# Influenza vaccination in Alberta long-term care facilities

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## Abstract

**Background:** Canada's National Advisory Committee on Immunization recommends that both staff and residents of long-term care facilities be vaccinated against influenza. This paper describes the influenza vaccination policies and programs, as well as vaccination rates, for staff and residents of long-term care institutions in Alberta. Such data have not previously been reported.

**Methods:** Data were collected by means of an anonymous mail survey (with 2 reminders) sent to Alberta nursing homes and auxiliary hospitals in spring 1999.

**Results:** Of 160 facilities providing long-term care during the study period, 136 responded to the survey (85%). Of these, only 85 provided data on staff vaccination rates, whereas 118 provided data on resident vaccination rates. For institutions reporting this information, the median proportion of staff vaccinated was 29.9% and the median proportion of residents vaccinated was 91.0%. Only 2 facilities reported that staff vaccination was mandatory; however, only one of these had a written policy consistent with the self-report period. Using a travelling vaccination cart, offering vaccination on night shift, and monitoring and providing feedback about staff vaccination rates were infrequently employed as elements of staff vaccination programs, although all were positively correlated with staff vaccination rates. Standing orders for resident vaccination were reported by only 84 facilities. Fourteen institutions required written consent for vaccination from the resident or a relative. Facility requirements for consent to vaccinate from the resident or a relative were significantly associated with mean vaccine coverage: 90.5% coverage for institutions requiring verbal consent, 86.5% coverage for institutions requiring written consent and 95.0% for institutions not requiring written or verbal consent.

**Interpretation:** Staff vaccination rates in Alberta long-term care facilities are unacceptably low. Changes in staff vaccination programs may improve the situation even in the absence of mandatory vaccination or work exclusion rules. Requirements for written consent for vaccination of residents of long-term care facilities may be a barrier to immunization.

For elderly people residing in nursing homes, influenza vaccination can be 50% to 60% effective in preventing admission to hospital and pneumonia and 80% effective in preventing death.<sup>1,2</sup> Among healthy adults, such as the staff of long-term care facilities, vaccination may be 70% to 90% effective in preventing influenza,<sup>3</sup> and it reduces absenteeism from work.<sup>4</sup> Furthermore, vaccination of staff reduces the mortality rate among residents of long-term care facilities.<sup>5,6</sup> Therefore, annual influenza vaccination is recommended for both staff and residents of long-term care facilities.<sup>1,7</sup>

There are few published data on staff and resident influenza vaccination rates, policies and programs in Canadian long-term care facilities, and none are available specifically for Alberta facilities. This study was undertaken to determine the influenza vaccination rates, policies and programs of long-term care facilities in Alberta and to explore the correlates of those rates.

## Methods

In Alberta, long-term care facilities include both nursing homes and auxiliary hospitals. The Medical Officer of Health of each of the 17 Alberta regional health authorities provided

## Research

## Recherche

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a roster of the long-term care facilities that had at least one operational bed in the period Oct. 1 to Dec. 31, 1998. A questionnaire was mailed to each facility, with a request that it be completed by the person or persons in that facility who were most knowledgeable about facility policies and practices for influenza vaccination. Two reminders were sent at intervals of 3 to 4 weeks. The questionnaire included questions regarding the characteristics of the facility, the number and type of staff, the number of residents, vaccination policies, vaccination programs (including checklists of possible program elements), and numbers of staff and residents vaccinated in the 1998 influenza vaccination season. Respondents were asked to return with the completed questionnaire a copy of any written policies for vaccination of staff or residents. The questionnaire items were adapted from Nichol and associates<sup>8</sup> and were based on well-established practices for such questionnaires.

The proportions of staff and residents at each facility who had been vaccinated against influenza were calculated as follows. For each proportion, the total number of staff (excluding volunteers) or residents, respectively, who had been vaccinated (as reported by the facility) was used in the numerator. The denominator for calculating the proportion of staff who had been vaccinated was the sum of numbers of full-time, part-time and casual staff (excluding volunteers), as reported by the facilities. For facilities that provided both acute and long-term care, staff members who worked in both types of care were counted only once, and total staff for the facility (including those who worked only in acute care) was used in the denominator. The denominator for calculating the proportion of residents who had been vaccinated was the number of residents in each facility on Dec. 1, 1998.

The correlations between vaccination policies and programs for the facilities and staff vaccination rates were determined by means of analysis of variance, contingency tables with  $\chi^2$  statistics and Fisher's exact tests. Individual elements of staff vaccination programs (as mentioned in the questionnaire checklist) were scored as 0 if absent and 1 if present, and their relation to vaccination rates was explored by analysis of variance ( $\alpha = 0.10$ ). Elements that were significantly associated with vaccination rates were grouped according to themes, and a theme score was computed for each theme group by summing the scores of individual items. An overall score was computed by summing the scores across the theme groups. The relation between the theme groups and staff vaccination rates was further explored by analysis of variance. No corrections were made for multiple testing.

## Results

Of the 166 facilities to which questionnaires were mailed, 160 had provided long-term care in the interval Oct. 1 to Dec. 31, 1998. Of these, 136 (85%) returned questionnaires,

although not all respondents answered every item, which led to variability in the denominators for the data reported here. Most of the facilities (92/134 [68.7%]) were publicly owned. Many of the facilities (61/135 [45.2%]) had both acute and long-term care beds and are referred to here as mixed care facilities. The median number of long-term care beds was 35 for the mixed care facilities and 100 for the dedicated long-term care facilities (those with no acute care beds). In all of the mixed care facilities, many of the nurses, allied health professionals and support staff worked in both the acute and the long-term care units.

### Vaccination rates and vaccination policies

Staff vaccination rates were lower than resident vaccination rates and differed according to the type of facility (Table 1).

Of the 133 facilities that provided information on policies relating to staff influenza vaccination, 31 (23.3%) reported that they had written policies. Twenty of these facilities supplied a copy of the policy. There was variation in policies between facilities operated by the same organization: each of 4 facilities with the same owners supplied a unique staff vaccination policy. Only 2 facilities indicated in their questionnaire responses that staff vaccination was mandatory. Examination of the policies supplied validated the self-reports of voluntary vaccination; however, one of the facilities that reported mandatory staff vaccination had a written policy clearly stating that vaccination was voluntary.

One-third of the facilities (44/133 [33.1%]) reported that they had written policies on vaccination of residents. Most of the facilities providing information about consent for vaccination (77/130 [59.2%]) required verbal consent from residents or their relatives (or both), 14 (10.8%) required written consent, and 39 (30.0%) did not require any consent. Several facilities of the last group commented that they either obtained consent for annual vaccination at the time of admission or required residents to actively refuse rather than actively consent to vaccination.

### Vaccination programs

Most facilities (133/135 [98.5%]) had offered an influenza vaccination program for staff in fall 1998, the most

**Table 1: Influenza vaccination of staff and residents of Alberta long-term care facilities for the 1998 vaccination season**

| Type of facility         | Staff                            |                     | Long-term care residents         |                     |
|--------------------------|----------------------------------|---------------------|----------------------------------|---------------------|
|                          | No. of facilities reporting data | Median % vaccinated | No. of facilities reporting data | Median % vaccinated |
| Mixed care*              | 32                               | 18.9                | 55                               | 91.0                |
| Dedicated long-term care | 53                               | 36.8                | 63                               | 91.0                |
| Total                    | 85                               | 29.9                | 118                              | 91.0                |

\*Facilities with both acute and long-term care beds.

recent flu shot season. Physicians and volunteers were often not included in the staff vaccination programs (Table 2). Only 80 (59.7%) of 134 facilities monitored the proportion of staff who had been vaccinated. The classical travelling vaccination cart was used by only 23 (17.4%) of 132 facilities reporting on elements of staff vaccination programs, and reminder systems were used by only 22 (16.7%) of 132 facilities. Most staff vaccination programs (96/132 [72.7%]) included education for staff. Information on the side effects of the vaccine was presented more frequently (88/96 [92%]) than information on vaccine efficacy (77/96 [80%]) or on misconceptions regarding vaccination (74/96 [77%]).

One hundred and thirty-five facilities had held influenza vaccination programs for long-term care residents in fall 1998. Of 124 facilities that provided the information, 82 (66.1%) stated that they vaccinated new residents on admission. Seventy-four (57.4%) of 129 facilities provided education on influenza vaccination to residents or to their families. Facility-wide standing orders for influenza vaccination were used by 49 (38.6%) of 127 facilities, and individual physician standing orders were used by 35 (27.6%). About one-third of the facilities (43/127 [33.9%]) did not use standing orders at all.

### Correlates of vaccination rates

Having a written policy for staff vaccination or a reminder or recall system were not associated with staff vaccination rates. However, several other facility, policy and program variables were correlated with staff vaccination rates (Table 3). Of the 5 themes of staff vaccination pro-

grams that were analysed (passive access, physical access, temporal access, education and posting goal with progress reports), facilities with above-median staff vaccination rates used a median of 3 components, whereas facilities with lower rates used a median of 2 components ( $p < 0.001$ ). Those with above-median vaccination rates also used a greater number of media (mean 3.0) to communicate the message about influenza vaccination than did other facilities (mean 2.0).

The following variables were not associated with resident vaccination rates: type of facility (dedicated long-term

**Table 2: Staff groups offered influenza vaccination by Alberta long-term care facilities**

| Staff group  | No. (and %) of facilities (n = 133*) |
|--|--------------------------------------|
| Physicians   | 75 (56.4)                            |
| RNs and LPNs providing direct care                                 | 133 (100.0)                          |
| PCAs providing direct care   | 132 (99.2)                           |
| Other professionals providing direct care (e.g., physiotherapists) | 128 (96.2)                           |
| Housekeepers   | 128 (96.2)                           |
| Dietary staff  | 127 (95.5)                           |
| Other staff providing direct care                                  | 120 (90.2)                           |
| One or more groups of staff providing direct care                  | 133 (100.0)                          |
| One or more groups of staff providing indirect care                | 128 (96.2)                           |
| Volunteers (n = 129)   | 56 (43.4)                            |

Note: RN = registered nurse, LPN = licensed practical nurse, PCA = personal care attendant. \*Except where indicated otherwise.

**Table 3: Comparison of Alberta long-term care facilities with high (above median) and low (median or lower) staff vaccination rates**

| Characteristic   | No. (and %) of facilities*        |                                  | p value† |
|--|-----------------------------------|----------------------------------|----------|
|  | High rate of vaccination (n = 41) | Low rate of vaccination (n = 44) |          |
| Mixed care   | 21 (51)                           | 10 (23)                          | <0.001   |
| Public ownership   | 12 (29)                           | 16 (36)                          | 0.04     |
| Self-reported mandatory vaccination policy   | 2 (5)                             | 0                                | <0.001   |
| Passive access to vaccination (staff given information on who to approach for vaccination and when to get vaccinated)                            | 29 (71)                           | 21 (48)                          | 0.05     |
| Physical access to vaccination (nurse takes vaccination cart to work stations, cafeteria, pharmacy, and other locations and administers vaccine) | 22 (54)                           | 13 (30)                          | <0.001   |
| Temporal access to vaccination (vaccination was offered to staff during night shift)   | 33 (80)                           | 18 (41)                          | <0.001   |
| Program included education for staff   | 21 (51)                           | 43 (98)                          | <0.001   |
| Communications media‡  | Mean score 3.0                    | Mean score 2.0                   | <0.001   |
| Goal with progress reports§  | 11 (27)                           | 0                                | <0.001   |

\*Except where indicated otherwise.

†Calculated using Fisher's exact test for all characteristics except communications media (for which the p value was calculated using the F statistic).

‡Media used to publicize vaccination policy: posters, messages sent with paycheques, newsletters, form letters, personalized letters, talks, films, question and answer sessions, role models and testimonials by vaccinated staff. Score reflects the number of different media used.

§Facility regularly posted, in prominent places, both its goal for vaccination of staff and reports of progress toward that goal.

care or mixed care), number of beds, type of ownership (public or private), provision of education about influenza vaccination to residents or their families, having a written policy on resident vaccination and use of standing orders for vaccination. The mean proportion of vaccinated residents was 90.5% for the 77 facilities requiring verbal consent, 86.5% for the 14 facilities requiring written consent and 95.0% for the 39 facilities that did not require consent ( $p = 0.01$ ). Facilities with above-median staff vaccination rates also had higher resident vaccination rates ( $p = 0.006$ ).

## Interpretation

The staff vaccination rates for Alberta long-term care facilities for the 1998 vaccination season were substantially lower than rates reportedly associated with reductions in mortality rate among long-term care residents (50% to 60%)<sup>5,6</sup> but were similar to rates observed elsewhere in Canada.<sup>9</sup> They were also lower than the rate reported for an individual Canadian teaching hospital (38.4%), which estimated coverage from self-reports of vaccination status.<sup>10</sup> The staff vaccination rates reported here may represent overestimations of the real rates, given that they are based upon self-reported numerators and denominators for which no validation was performed. Furthermore, staff vaccination data were available for only 85 (53.1%) of the 160 facilities providing long-term care during the study period, which suggests response bias, probably in the direction of overestimation. Facilities were not asked to specify how they obtained data on the number of staff who had been vaccinated. If this information was based only on vaccine doses administered by the facilities themselves, the numbers of vaccinated staff might have been underestimated, as some staff members might have been vaccinated elsewhere.

It appears that progress has been made over the past decade in terms of resident vaccination rates: the median proportion of long-term care residents vaccinated in Alberta in 1998 was 91.0%, a substantial improvement over the approximately 83% vaccinated in 1990,<sup>11</sup> but there remains considerable room for improvement. The National Advisory Committee on Immunization<sup>3</sup> has recommended that at least 90% of long-term care residents be vaccinated against influenza, and 39.8% (47/118) of the responding facilities did not achieve this goal. A validation study of vaccine coverage of long-term care residents<sup>11</sup> found that institutional reports of vaccine coverage tend to be inflated, so actual coverage may have been less than reported here.

The lack of an association between having a written policy on staff vaccination and staff vaccination rates is perhaps not surprising, given that almost all of the policies indicated that vaccination was voluntary. Unlike Ontario,<sup>12</sup> Alberta does not have a protocol requiring influenza vaccination of staff and residents each fall and the exclusion of unvaccinated staff from work if they do not take antiviral prophylaxis during an outbreak. Since the issuance of this

protocol on Nov. 1, 1999, staff vaccination rates in Ontario have substantially improved.<sup>13</sup> It is interesting that self-reporting of a policy of mandatory staff vaccination was correlated with higher staff vaccination rates (Table 3); however, the 2 facilities reporting mandatory staff vaccination also had more intensive staff vaccination programs than the other facilities.

Programs that are based upon combined interventions (e.g., education plus other program elements such as improvements in access) are associated with better vaccination coverage, whereas individual elements alone (e.g., education, expanded clinic hours or improvements in access) are not.<sup>14</sup> Alberta's long-term care facilities should therefore focus their efforts on providing multi-element staff vaccination programs that include education, improvements in physical and temporal access, and use of targets (with monitoring of and feedback on progress toward those targets) and that use multiple communications media to reach staff. Even in the absence of workplace exclusion policies, such efforts should substantially improve staff vaccination coverage.

Consent policies related to resident vaccination may be a problem. As was found in the Canadian national survey,<sup>11,15</sup> requirements for written consent or for consent to be obtained annually represented barriers to vaccination in the Alberta long-term care facilities. In the present study there was no association between resident vaccination rates and standing order programs for vaccination. However, such programs are recommended for residents of long-term care facilities and are effective in improving vaccination rates.<sup>16</sup>

In summary, staff vaccination rates in Alberta long-term care facilities are unacceptably low. Changes in staff vaccination programs may improve the situation even in the absence of mandatory vaccination or work exclusion rules. Long-term care facilities might improve the vaccination rates for their residents by ending the requirements for annual written consent for influenza vaccination.

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## References

1. Advisory Committee on Immunization Practices. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Morb Mortal Wkly Rep* 1998;47(RR-6):1-26.
2. Nichol KL, Margolis KL, Worenma J, Von Sternberg T. The efficacy and cost effectiveness of vaccination against influenza among elderly persons living in the community. *N Engl J Med* 1994;331(12):778-84.
3. National Advisory Committee on Immunization. Statement on influenza vaccination for the 1999-2000 season. *Clin Pediatr* 1999;25(2):1-15.
4. Campbell DS, Rumley MH. Cost effectiveness of the influenza vaccine in a healthy working-age population. *J Occup Environ Med* 1997;39(5):408-14.
5. Potter J, Stott DJ, Roberts MA, Elder AG, O'Donnell B, Knight PV, et al. Influenza vaccination of health care workers in long-term-care hospitals reduces the mortality of elderly patients. *J Infect Dis* 1997;175(1):1-6.
6. Carman WF, Elder AG, Wallace LA, McAulay K, Walker A, Murray GD, et al. Effects of influenza vaccination of health-care workers on mortality of elderly peo-

ple in long-term care: a randomised controlled trial. *Lancet* 2000;355(9198):93-7.

7. National Advisory Committee on Immunization. Statement on influenza vaccination for the 1998-1999 season. *Can Commun Dis Rep* 1998;24(ACS-2):1-13.
8. Nichol KL, Grimm MB, Peterson DC. Immunizations in long-term care facilities: policies and practice. *J Am Geriatr Soc* 1997;44:349-55.
9. Bannerman B, Schram K. Influenza immunization program in long term care facilities. *Can J Infect Control* 1992;7(1):13-5.
10. Watanakunakorn C, Ellis G, Gemmel D. Attitude of healthcare personnel regarding influenza immunization. *Infect Control Hosp Epidemiol* 1993;14:17-20.
11. McArthur MA, Simor AE, Campbell B, McGeer A. Influenza and pneumococcal vaccination and tuberculin skin testing programs in long-term care facilities: Where do we stand? *Infect Control Hosp Epidemiol* 1995;16:18-24.
12. Abraham E. Disease control service comment. In: *Public health and epidemiology report Ontario*. Toronto: Ministry of Health and Long-Term Care; 1999;10(8). Available: [www.gov.on.ca/health/english/program/pubhealth/phero/phero\\_199908.html](http://www.gov.on.ca/health/english/program/pubhealth/phero/phero_199908.html) (accessed 9 Apr 2001).
13. Naus M, Stirling R, Henry B, Tamblay S, Ontario Influenza Study Working Group. The impact of influenza vaccination policies on coverage among staff

in long-term care facilities. Options for the control of influenza 4; 2000 Sept 23-28; Hersonissos (Greece).

14. Shefer A, Briss P, Rodewald L, Bernier R, Strikas R, Yusuf H, et al. Improving immunization coverage rates: an evidence-based review of the literature. *Epidemiol Rev* 1999;21(1):96-142.
15. McArthur MA, Simor AE, Campbell B, McGeer A. Influenza vaccination in long-term-care facilities: structuring programs for success. *Infect Control Hosp Epidemiol* 1999;20(7):499-503.
16. Advisory Committee on Immunization Practices. Use of standing orders programs to increase adult vaccination rates. *MMWR Morbid Mortal Wkly Rep* 2000;49(RR01):15-26.

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