



Background

In 2012/13, British Columbia (BC) implemented the BC Influenza Prevention Policy which requires healthcare workers to be vaccinated against influenza or wear a mask in patient care areas during the influenza season. The policy was the first province-wide condition-of-service policy of its kind in Canada.

This study was the first survey of healthcare workers covered by the BC Influenza Prevention Policy and was designed to identify factors related to vaccination or mask wearing decisions during the 2015/16 influenza season. This study was one of the activities undertaken as part of a mixed-methods evaluation of the BC Influenza Prevention Policy developed when the policy was introduced.

Past research has found associations between healthcare worker attitudes towards influenza vaccination and vaccine receipt (1), including in the presence of vaccine or mask policies (2).

Objectives

To describe HCWs' knowledge, attitudes and practices regarding influenza infection, influenza immunization, and the BC Influenza Prevention Policy.

To describe factors associated with HCWs getting vaccinated against influenza, or wearing a mask in patient care areas during the influenza season.

Methods

We conducted a cross-sectional study of British Columbia health authority employees who worked during the 2015/16 influenza season. Invitations containing a link to an online knowledge, attitudes, practice and implementation questionnaire were sent to all-staff email distribution lists in April-May of 2016.

A de-identified extract from the Workplace Health Indicator Tracking and Evaluation (WHITE) database was obtained to describe the BC HCW population eligible to complete the survey.

Analysis

Survey responses were initially screened and non-employee responses were excluded. Incomplete surveys were retained if respondents answered all initial mandatory questions up to and including 2015/16 immunization status. Responses that violated the questionnaire skip patterns were recoded as valid skips.

To assess the representativeness of the survey sample we compared the distribution of demographic variables and influenza vaccination status among survey respondents to the corresponding information available from WHITE.

Knowledge and attitude questions were dichotomized prior to analyses. The outcome measure for masking compliance was defined as respondents indicating always masking both early and late in the influenza season.

Multivariable logistic regression models for (A) influenza vaccine receipt and (B) masking compliance were built using backwards model building (results of model B not shown). Demographic variables were included as well as factors associated with the respective outcome variables at P<0.01 in univariate regression.

We described free-text responses to open-ended questions using qualitative description and summarized the frequently occurring themes. Coding was stopped once new themes were no longer emerging from the data.

All data management and analyses were performed in StataSE 14 and QSR NVivo 9.

Results

- 18,579 eligible responses were included in analysis; the estimated response rate ranged from 10 to 18%.
- Respondents were largely comparable to the overall BC HCW population in age, health authority, occupational group, and reported influenza vaccination status. Casual employees were underrepresented.
- 84% (n=15,697) of survey respondents received the influenza vaccine in the 2015/16 influenza season.
- Among unvaccinated respondents who worked in patient care areas (PCA) (n=2,362), 46% (970 of 2,097) reported always wearing a mask while in PCAs throughout the influenza season.
- The overall policy attitudes results are displayed in Figure 1. Agreement with all six attitudinal factors was significantly different between vaccinated and unvaccinated staff. For example, 63% of vaccinated HCWs agreed with the statement "I support the Policy", compared to 19% of unvaccinated HCWs (χ^2 : 1700, p-value<0.001).

The top 5 reasons vaccinated HCW selected as the main reason for vaccinating were (n=15,617):

- to protect themselves (30%)
- the requirement to wear a mask if not vaccinated (17%)
- to protect patients (14%)
- manager or employer expectations (13%)
- vaccination feels like a requirement of their job (12%)

The top 5 reasons unvaccinated HCWs selected as the main reason for not vaccinating were (n=2,838):

- the vaccine is not effective (19%)
- disagree with the policy (18%)
- other reasons (17%)
- vaccine is not safe (10%)
- prefer to mask (9%)

Figure 1. HCW attitudes on the BC Influenza Prevention Policy

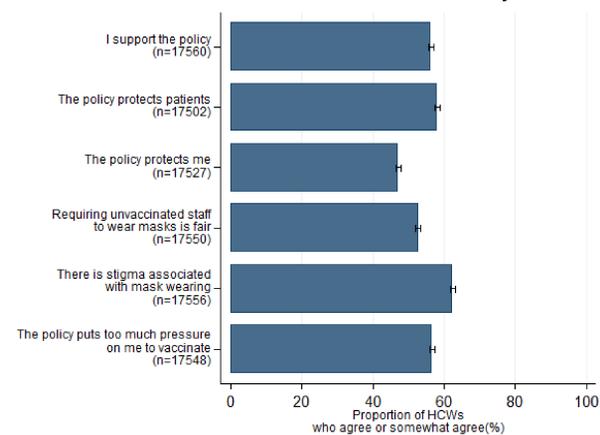


Table 1. Multivariable analysis of factors associated with 2015/16 influenza vaccine receipt among HCW survey respondents

	Adjusted OR* (95% CI)	P-value
Facility type most frequently worked in		
Acute care facility	Reference	
Office	0.56 (0.42-0.75)	<0.001
Home and community	1.04 (0.83-1.31)	0.706
Mental health and addiction services	1.22 (0.97-1.55)	0.093
Public health	1.29 (0.94-1.76)	0.111
Residential care facility	0.82 (0.64-1.04)	0.100
Other	0.69 (0.46-1.05)	0.084
Job type		
Full time	Reference	
Part-time	0.78 (0.67-0.89)	<0.001
Casual	0.79 (0.65-0.96)	0.020
Work in patient care area	1.87 (1.48-2.36)	<0.001
Influenza vaccine was accessible at work	1.63 (1.38-1.92)	<0.001
Influenza infection knowledge and attitudes		
Compared to the general population, hospitalized patients are more likely to become seriously ill or die if infected with influenza†	0.77 (0.64-0.93)	0.006
Influenza causes more deaths than any other vaccine preventable disease in Canada†	1.22 (1.07-1.38)	0.002
I have a high or very high likelihood of getting infected with influenza in a typical year	4.67 (3.58-6.09)	<0.001
Influenza vaccine attitudes‡		
The influenza vaccine is safe	2.16 (1.85-2.52)	<0.001
The influenza vaccine is effective	1.85 (1.50-2.29)	<0.001
Getting vaccinated against influenza is part of my duty of care to patients	6.01 (5.00-7.23)	<0.001
My manager, supervisor, or employer expects me to get vaccinated against influenza	4.36 (3.82-4.96)	<0.001
My doctor recommends I get vaccinated against influenza	1.56 (1.30-1.87)	<0.001
My friends and family think I should get vaccinated against influenza	2.17 (1.60-2.93)	<0.001
Policy attitudes‡		
I support the policy	1.23 (1.01-1.49)	0.041
Requiring unvaccinated staff to wear masks is fair	0.70 (0.60-0.82)	<0.001
There is stigma associated with wearing a mask	0.82 (0.72-0.94)	0.005

*Adjusted for age, gender, health authority, occupational classification, and all other variables in the table

†Those answering false or don't know is the referent group

‡Referent group for each attitudinal item is do not agree

Any additional comments about this survey or the BC Influenza Prevention Policy?

- 24% of survey respondents provided a free-text response to the final survey question; of these 2,259 (50%) free-text responses were coded and summarized into the themes in Table 2.
- Those who responded to this question were comparable to non-responders by health authority and occupational group. Respondents to this question were less supportive of the policy compared to survey respondents who did not answer this question.

Table 3. Summary of frequently occurring themes to the final survey question

Policy	Masking Option
Lack of enforcement for visitors and guests	Enforcement of masking as punishment, bullying or discrimination
General support for the policy	Stigma associated with mask wearing
Vaccination Option	Negative impact on patient care
Vaccine effectiveness concerns	Privacy and confidentiality issues with masking
Policy coerces staff into vaccinating because masking is not a suitable 'choice'	Whether all staff should be masking, considering suboptimal vaccine effectiveness
'Mandatory' vaccination as a violation of human rights	Masking compliance is suboptimal or inconsistent
Personal/anecdotal negative experiences of influenza vaccine	Lacking evidence of masking effectiveness
General support for influenza vaccination	Alternative or additional prevention measures
Evaluation activities	Policy distracts from hand hygiene and other prevention measures
Appreciation for the opportunity to provide feedback	More supportive sick leave culture and policies
Desire for evidence that the policy has been effective	Further education of staff, visitors and public

Conclusion

The BC Influenza Prevention Policy appears to influence HCWs' decision to be vaccinated against influenza, with 29% of vaccinated respondents indicating their main reason for vaccinating was related to the policy. HCWs' knowledge and attitudes towards influenza infection and vaccine are associated with vaccine receipt. Vaccine receipt was correlated with HCWs' perceptions of the severity of influenza, their own risk of contracting influenza, and their duty of care to patients. Vaccine receipt was also correlated with expectations and recommendations to be vaccinated from employers, health care providers and personal contacts, in addition to perceptions that influenza vaccine is safe and effective. Support for the policy was positively correlated with vaccine receipt, while HCWs who agreed that requiring unvaccinated staff to mask was fair, and those who felt there was a stigma associated with wearing a mask were less likely to be vaccinated.

The qualitative analysis identified concerns among subgroups of HCWs that may inform future policy communication materials. For example, strategies to address the stigma associated with masking should be considered, given that stigma against masking was reported by 62% of respondents and was a recurring theme in the qualitative findings.

Limitations

Despite reminders and a prize draw to incentivize participation, the survey response rate was low; therefore, the results presented may not be representative of all HCWs in BC. The generalizability of the qualitative findings is limited because the subset of survey respondents who chose to answer the final free-text question were not representative of all survey respondents.

References

1. Corace K, Prematunge C, McCarthy A, Nair RC, Roth V, Hayes T, et al. Predicting influenza vaccination uptake among health care workers: what are the key motivators?. American journal of infection control. 2013;41(8):679-84.
2. Edwards F, Masick KD, Armellino D. Impact of the flu mask regulation on health care personnel influenza vaccine acceptance rates. American journal of infection control. 2016;44(10):1154-57.

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