



## Qualitative motivators and barriers to pandemic vs. seasonal influenza vaccination among healthcare workers: A content analysis

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### ABSTRACT

**Introduction:** Influenza is a major concern across healthcare environments. Annual vaccination of healthcare workers (HCW) remains a key mode of influenza prevention in healthcare settings. Yet influenza vaccine coverage among HCWs continues to be below recommended targets, in pandemic and non-pandemic settings. Thus, the primary objective of this analysis is to identify motivators and barriers to pandemic (panINFLU) and seasonal influenza vaccination (sINFLU) through the qualitative analysis of HCW provided reasons driving HCW's personal vaccination decisions.

**Methods:** Data were collected from a multi-professional sample of HCWs via a cross-sectional survey study, conducted at a tertiary-care hospital in Ontario, Canada. HCW provided and ranked qualitative reasons for personal (1) panINFLU (pH1N1) and (2) sINFLU (2008/2009 season) vaccine uptake and avoidance were used to identify key vaccination motivators and barriers through content analysis methodology.

**Results:** Most HCW vaccination motivators and barriers were found to be similar for panINFLU and sINFLU vaccines. Personal motivators had the greatest impact on vaccination (panINFLU 29.9% and sINFLU 33.9%). Other motivators included preventing influenza in loved ones, patients, and community, and awareness of HCW role in influenza transmission. In contrast, concerns of vaccine safety and limited HCW knowledge of influenza vaccines (panINFLU 46.2% and sINFLU 37.3%).

HCW vaccination during the pandemic was motivated by panINFLU related fear, epidemiology, and workplace pro-vaccination policies. HCW perceptions of accelerated panINFLU vaccine development and vaccine safety compromises, negative views of external sources (i.e. media, pharmaceutical companies, and regulatory agencies) and pandemic management strategies were barriers specific to panINFLU vaccine.

**Conclusions:** HCW panINFLU and sINFLU vaccine coverage can increase if future vaccination programs (1) highlight personal vaccination benefits (2) emphasize the impact HCW non-vaccination on family members, patients and community, (3) address HCW vaccine related knowledge gaps, and (4) implement pro-vaccination workplace policies consistent with those in place at the study site during pH1N1.

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**Abbreviations:** panINFLU, 2009/2010 pandemic H1N1 influenza; sINFLU, 2008/2009 seasonal influenza.

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## 1. Introduction

The appearance of novel influenza strains such as H7N9 and the resurgence of H1N1 has added new emphasis on global influenza spread [1–3]. The 2009–2010 H1N1 pandemic (pH1N1) experience can offer insight into response strategies for future influenza pandemics, especially among at risk populations such as healthcare workers (HCW) [4–7].

Annual vaccination of HCWs is a key mode of influenza prevention within healthcare settings, yet HCW vaccine coverage remains

below recommended targets of 70–90% throughout pandemic and non-pandemic influenza seasons [7–10]. Despite the established effectiveness of influenza vaccination, there is wide variability (5–100%) in HCW vaccination coverage [6–10].

Many researchers have investigated HCW pandemic influenza (panINFLU) and seasonal influenza (sINFLU) vaccination behaviors to better understand vaccination barriers and motivators [6,11–14]. However much of the existing HCW panINFLU vaccination research has been largely quantitative, and to our knowledge no literature has simultaneously evaluated HCW panINFLU and sINFLU vaccination behaviors with a qualitative lens [7,12–14]. As a result, this research may be limited in its ability to appropriately capture the emotional and experiential nuances influencing HCW influenza vaccination decisions [7,12,15].

Qualitative research can provide additional insight into an individual's worldviews, perceptions, attitudes, beliefs, and rationales toward various health behaviors, including influenza vaccination [15–17]. Thus the primary objective of this study is to identify key motivators and barriers of HCWs to influenza vaccination in panINFLU and sINFLU settings, via the qualitative analysis of HCW self-reported reasons for personal vaccination decisions. A better understanding of key themes and rationales driving HCW vaccination can inform the development of future immunization programs that improve HCW influenza vaccine coverage.

## 2. Materials and methods

### 2.1. Study design and participants

A cross-sectional study was conducted at a large tertiary-care hospital, in Ontario Canada, during June 2010, following pH1N1 vaccination campaign's conclusion. The study was approved by the institution's Research Ethics Board.

All HCWs ( $N=10,464$ ) at the hospital (i.e. physicians, nurses, pharmacists, allied health workers, researchers, laboratory, administrative, facilities, logistics, and housekeeping) were invited to participate by completing a survey package, which included an informed consent form and mixed qualitative/quantitative questionnaire. HCWs willing to participate in the study completed and returned the survey to the hospital's Occupational Health and Safety Departments (OCHS).

All survey packages were assigned unique identifiers prior to distribution to facilitate the verification of HCW participant's panINFLU vaccination via OCHS departmental records. Only questionnaires de-identified by OCHS, post vaccine status verification, were available to the research team.

### 2.2. Survey questionnaire measures

Data from survey measures on HCW (1) socio-demographics, (2) influenza vaccine history, and (3) qualitative reasons for panINFLU and sINFLU vaccination decisions are included in the analysis. HCWs self-reported and rank ordered their personal top 3 important reasons for (1) 2009/2010 pH1N1 and (2) 2008/2009 sINFLU vaccination or non-vaccination decisions.

HCW provided reasons for vaccination (i.e. vaccine uptake) are defined as vaccination motivators, and HCW provided reasons for non-vaccination (i.e. vaccine avoidance) as vaccination barriers. Each HCW provided qualitative reason was considered a single meaning unit [20].

### 2.3. Coding schema development

The preliminary schema development was informed by existing literature on HCW influenza vaccination behaviors [6,7,12–14,18,19], and revised according to a random subsample

**Table 1**  
HCW sample socio-demographics ( $N=3275$ ).

Characteristics	$N$ (%) <sup>a</sup>
<b>Sociodemographics</b>	
Mean Age	42.93 ± 11.23
Sex: Female	2608 (81.4%)
Ethnic background: Caucasian	2884 (89.3%)
Formal Religious belief <sup>b</sup>	2516 (76.2%)
Relationship status: in a relationship	2454 (75.9%)
Dependent children < 21 years of age	1556 (48.8%)
Type of work: full-time	2335 (71.7%)
<b>Occupation classification</b>	
Nursing	1153 (35.2%)
Physicians	172 (5.3%)
Allied HCWs	361 (11.0%)
Administrative/clerical	721 (22.0%)
Healthcare technicians	241 (7.4%)
Research and laboratory	276 (8.4%)
Facilities and logistics	216 (6.6%)
Other, non-clinical	135 (4.1%)
<b>Vaccination history</b>	
H1N1 influenza vaccination	2862 (87.4%)
2008/09 Seasonal influenza vaccination	2433 (74.3%)
2009/10 Seasonal influenza vaccination	1745 (53.8%)

<sup>a</sup> Cumulative percentage, accounts for missing data points/values.

<sup>b</sup> Includes self-report of belonging to any religious faith (e.g. Christian, Jewish, Muslim, Buddhist, etc.).

of meaning units ( $n=100$ ) in consultations with influenza vaccine research (AM/KC) and qualitative methodology (JS) experts. Revised schemas were then independently tested in a random subsample of meaning units ( $n=500$ ) by two coders (CP and CV), refined and finalized via consensus building discussions. Inter-coder reliability was measured by Cohen's Kappa ( $\kappa$ ) calculations to establish coding schema validity, and a log of all schema revisions was maintained for transparency and repeatability [20].

### 2.4. Content analysis

Content analysis methodology, described by Neuendorf et al., was used to code HCW qualitative reasons (i.e. meaning units) [20]. All meaning units ( $n$ ) were coded by the primary coder (CP) using finalized coding schemas on: (1) panINFLU vaccination motivators, (2) panINFLU vaccination barriers, (3) sINFLU vaccination motivators, and (4) sINFLU vaccination barriers. All coding and analysis processes were conducted using Microsoft Office Excel (version 2003) and SPSS for Windows (version 17.0).

Counts and proportions of key themes were calculated to determine the most frequently reported barriers and motivators to panINFLU and sINFLU vaccination.

## 3. Results

### 3.1. Study sample characteristics

10,464 survey packages were sent to all active HCW staff of the hospital and 3301 were returned (31.5% response rate); 3275 were completed and included in the analysis. Overall, 2862 (87.4%) HCW were vaccinated against panINFLU and 2433 (74.3%) against sINFLU. Demographics of the overall HCW sample are presented in Table 1.

A total of 15,755 HCW qualitative reasons (i.e. meaning units) were coded using the finalized coding schemas. 7380 meaning units from pH1N1 vaccinated HCWs were coded as panINFLU vaccination motivators, and 890 meaning units from HCWs NOT vaccinated for H1N1 were coded as panINFLU vaccination barriers. Inter-coder reliability via Cohen's Kappa ( $\kappa$ ) was 85% for panINFLU vaccination motivators and 73% for panINFLU vaccine barriers. With respect to sINFLU vaccination, 5963 meaning units were coded as sINFLU

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