HHS Public Access

Author manuscript

Vaccine. Author manuscript; available in PMC 2021 February 18.

Published in final edited form as:

Vaccine. 2020 February 18; 38(8): 2045–2050. doi:10.1016/j.vaccine.2019.12.047.

Acceptability of seasonal influenza vaccines among health care workers in Vietnam in 2017

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Abstract

Introduction: A demonstration project in Vietnam provided 11,000 doses of human seasonal influenza vaccine free of charge to healthcare workers (HCWs) in 4 provinces of Vietnam. Through this project, we conducted an acceptability survey to identify the main reasons that individuals chose to be vaccinated or not to inform and improve future immunization activities.

Methods: We conducted a descriptive cross-sectional survey from May to August 2017 among HCWs at 13 selected health facilities. We employed logistic regression to determine the association between demographic and professional factors, and the decision to receive seasonal influenza vaccine. We performed post-hoc pairwise comparisons among reasons for and against vaccination using Chi square and Fisher's exact tests (for cell sizes <5).

Results: A total of 1,450 HCWs participated in the survey, with a higher proportion of females than males (74% versus 26%). The median age of the participating HCWs was 35 years (median range 25.8 – 44.2). Among those surveyed, 700 (48%) HCWs were vaccinated against seasonal influenza during the first half of 2017. Younger HCWs under 30 and 30–39 years old were less likely to get vaccinated against seasonal influenza than HCWs ≥50 years old (OR=0.5; 95%CI 0.4–0.8 and OR=0.6; 95%CI 0.4–0.8 respectively). Nurses and other employees were more likely to get seasonal influenza vaccination than physicians (OR=1.5; 95%CI 1.0–2.4 and OR=2.0; 95%CI 1.2–3.2 respectively). The most common reason for accepting vaccination was fear of getting influenza (66%) and the most common reason for not getting vaccinated was concern about vaccine side effects (23%).

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CONFLICTS OF INTEREST

We declare that we have no conflict of interests.

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Conclusion: Acceptability of seasonal influenza vaccines in this setting varied among HCWs by age group and job category. Interventions to increase acceptance of vaccine among HCWs in this setting where influenza vaccine is being introduced free for the first time should include targeted risk communication on vaccine safety and efficacy.

Keywords

Influenza vaccination; health care workers; acceptability

INTRODUCTION

Influenza is an acute viral disease that typically presents with fever, headache, myalgias, fatigue, coryza, sore throat and cough. It is usually mild or moderate, but can result in severe disease leading to hospitalization or death. High-risk groups for severe disease include adults 65 years and older, children 5 years and younger, pregnant women and persons with chronic diseases or immunodeficiency [1]. Annually 500 to 800 million people are infected globally, about 5 million develop severe disease and an estimated 291,243 to 654,832 die of seasonal influenza-associated respiratory disease [1, 2]. The highest mortality rates are among those in sub-Saharan Africa (2.8–16.5 per 100,000 individuals) and Southeast Asia (3.5–9.2 per 100,000 individuals) [2]. Vaccination is the most effective preventive measure to reduce morbidity and mortality from seasonal influenza viruses. Vaccine effectiveness (VE) is about 40–60% in years when the vaccine viruses match circulating viruses, with wide variability by year and by target group, with higher protection (51%, 95% CI 44–58%) in adults <65 years compared with adults ≥65 years (VE 37%, 95% CI 30–44%) [3]. Healthy HCWs are fundamental to the maintenance of healthcare services during influenza outbreaks; ill HCWs can transmit influenza to patients and family members [4]. Many studies, however, indicate a low level of influenza vaccine acceptance among HCWs [5–8].

In Vietnam, 1.6 to 1.8 million medically-attended influenza-like illness cases are reported by public facilities yearly [9]. In 2011, Ministry of Health (MOH) Vietnam issued seasonal influenza diagnosis and treatment guidelines that identify HCWs as being at higher risk of infection and recommending that they be vaccinated annually [10]. In 2014, a survey in some health facilities in Vietnam showed that only 12% HCWs got vaccinated through fee-based services [11]. In addition, prior 2017, there was no free national influenza vaccination program in Vietnam. Influenza circulates all year round in Vietnam, so both Southern and Northern hermisphere formulations are licensed. However, there is limited information regarding which seasonal influenza vaccine formulations are used. With support from the World Health Organization (WHO) and US Government, Vietnam now has a locally produced seasonal influenza vaccine that was licensed in January 2019.

In 2017, U.S. CDC funded a project with the General Department of Preventive Medicine (GDPM)-MOH supporting the introduction of seasonal influenza vaccine in Vietnam. Under this project, we conducted a demonstration project from January – May 2017 that provided 11,000 doses of human seasonal influenza vaccine free of charge for HCWs at registered hospitals, research institutes and provincial preventive medicine centers in the most crowded cities and provinces located in four regions of Vietnam, including Hanoi (north) and Ho Chi

Minh cities (south), and Khanh Hoa (central) and Dak Lak provinces (highland). Vaccines were provided to health facilities based on the number of registered HCWs. In parallel, an acceptability survey was conducted among staff in selected facilities to identify the main reasons that individuals chose to be vaccinated or not vaccinated in order to inform and improve future immunization activities. This report summarizes findings from the survey.

METHODS

Study design and participants

We conducted a descriptive cross-sectional survey from May to August 2017 at 13 of the 29 facilities in the influenza vaccination demonstration project. Criteria for facility selection included large hospitals (>1,000 HCWs to efficiently reach a large number of staff, one in each region), representation across all four regions of the country, and inclusion of a range of facility types including nine hospitals (district, provincial and national), one preventive medicine institute, two provincial preventive medicine centers and one district health center. All staff at the participating facilities, including those providing direct patient care (physicians, nurses, technicians) and others (service staff, security staff), were eligible to participate.

Sample size and sample selection

There is limited information about acceptability of seasonal influenza vaccine among HCWs within Vietnam, so we used the Slovin sample size calculation formula: $n= N/(1+Ne^2)$ where n = the number of people to be sampled, N = the total population and e = the error tolerance [12]. The total number of health care workers (N) at the 13 participating institutions was 15,415. The error tolerance was set at e = 0.03 and the confidence interval was set at 95%, so we calculated an estimated sample size of n = 1,037 subjects. The response rate of survey subjects was assumed to be 70% based on our experience from conducting another survey in this population [13]. Correcting for the assumed response rate, the target sample size was estimated to be 1,450 individuals. We compiled lists of health care workers for each of the 13 participating facilities and numbered workers consecutively. We selected every n^{th} individual to generate a systematic sample, with the number selected proportionate to the number of health care workers at that facility and totaling 1,450 for all sites combined.

Data collection

Trained surveyors used a structured questionnaire with both multiple choice and open-ended questions to ask basic demographic data and work history (including age, gender, education, seniority, position, and professional area), influenza vaccination history, and motivations for accepting or refusing vaccine. Those who received influenza vaccine through either fee-based immunization service or the campaign through January-May 2017 were asked about their reasons for accepting (10 questions), and those who did not get vaccinated through January-May 2017 were asked their reasons for refusing (19 questions). List of reasons/questions were generated in consultation with senior staff at GDPM and a guideline from WHO [14]. GDPM conducted site visits before the campaign and monitoring trips during data collection at each site.

Statistical analyses

Study staff entered data using EpiData software and analyzed the data using Stata 13 (Texas, USA). Descriptive statistics were used to describe sociodemographic characteristics of respondents. Multivariable logistic regression was conducted to determine the association between sociodemographic and professional factors and the decision to receive seasonal influenza vaccine either during the campaign or through fee-based services during 2017. The initial model included age group, gender, education level, specialization and work experience that were identified a priori as possibly related to the outcome variable. After exploring collinearity, the independent variables retained in the model were age group, gender, education level, and specialization. Post-hoc pairwise comparisons were also performed examining the reasons for and against vaccination against the categorical variables for specialization, age group and education level. These comparisons were conducted using Chi square and Fisher's exact test reserved for comparisons involving small cell sizes with p-value ≤ 0.05 indicating statistical significance. Participation in the survey was voluntary. The Government of Vietnam considered the survey as a part of the vaccine program; Institutional Review Board (IRB) approval was not required.

RESULTS

General information of participants

The response rate of the 1,450 initially selected health care workers was not recorded systematically. When the pre-selected staff could not be found or declined to be interviewed, other health care workers at the same site were asked to participate until 1,450 had been interviewed. The highest proportion of surveyed HCWs were aged 30 to 39 (36%), followed by those ≤30 (29%), 40 to 49 (22%), and ≥50 (12%). Forty-five percent of HCWs were university graduates, 35% had junior college degrees, 13% had post-graduate education, and 7% received only high school or lower level of education. Nurses accounted for the greatest proportion (42%) of HCWs, followed by physicians (16%), midwives (12%), technicians (11%), administrative office worker (8%) and others (11%). More than 40% had worked in the healthcare sector less than 10 years, 38% had 10–20 years, and 18% had 20 years or more experience. The median number of working years as HCW was 10 (median range 1.1 – 18.9). (Table 1)

Acceptance of seasonal influenza vaccination among healthcare workers

Of the 1,450 participating HCWs, 700 (48%) answered that they had been vaccinated against seasonal influenza during the first half of 2017. Of these, 654 (93%) were vaccinated against seasonal influenza as part of the free vaccination campaign, and 46 (7%) paid for the vaccine themselves. Among the 750 HCWs who did not receive influenza vaccine in 2017, 64 (8.5%) reported receipt of the vaccine through routine fee-based immunization services in 2016.

Multivariate logistic regression indicated that younger HCWs (under 30 and 30–39 years old) were less likely to get vaccinated against seasonal influenza than HCWs 50 years old and older (OR=0.5; 95%CI 0.4–0.8 and OR=0.6; 95%CI 0.4–0.8 respectively). Nurses and

other employees were more likely to get seasonal influenza vaccination than physicians (OR=1.5; 95%CI 1.0–2.4 and OR=2.0; 95%CI 1.2–3.2 respectively). (Table 2)

The most common reason for accepting vaccination among health care workers was fear of getting influenza (66%) and the most common reason for not getting vaccinated was concern about vaccine side effects (23%) (Figure 1,2_suppl material). Among those who paid for vaccine, similar reasons were reported. A pairwise analysis for the reasons of vaccinated and non-vaccinated stratified by specialization, age group and education level were performed; the reasons with significant differences across groups (p-value <0.05) are presented in tables 3, 4, and 5, respectively.

When asked about the reasons for receiving vaccine, midwives receiving vaccine were most likely to answer they did not want to transmit influenza to their patients or their family; technicians were most likely to indicate that vaccination protects themselves against influenza while office workers were most likely to respond that it was because their colleagues recommended (table 3). Table 4 shows there were no significant differences across age groups in reported reasons for receiving vaccine, while table 5 indicates post-graduate participants were most likely to report having had influenza previously as a reason for receiving influenza vaccination.

In describing reasons not to get vaccinated, nurses were most likely to cite concern about side effects of the vaccine, while physicians invoked a lack of time to get vaccination (table 3). 30–39 year olds were more likely than other age groups to think that contracting the disease is better than getting vaccinated, that they could still contract influenza after vaccination, and that the annual shot is costly. Participants over 50 who did not get vaccinated reported skepticism about the duration of protection from the vaccine, a lack of time to get vaccinated and that they acquired immunity due to the nature of their work (table 4). Results from across educational groups show unvaccinated survey participants with junior-college education reported their main concern as the side effects of the vaccine, while those with high-school education listed their main reason for not getting vaccinated as never having influenza before. (table 5_suppl material)

DISCUSSION

In this survey, nearly half of HCWs received seasonal influenza vaccine in 2017; almost all received their vaccination during the government-funded campaign. Older HCWs and nurses were most likely to accept seasonal influenza vaccine. Primary reasons for accepting vaccination among health care workers were fear of getting influenza, belief that vaccination protects from influenza, and fear of transmission of influenza to their family members and patients. Reasons provided for the decision not to receive vaccine varied by age groups and job category. Concerns about vaccine safety were typically reported by non-physicians, while physicians were more likely to report lack of time for vaccination.

Reasons for influenza vaccination by age and job categories are similar to those from other surveys conducted among HCWs in China, which showed that physicians aged ≥ 45 years were more likely to be vaccinated with seasonal influenza vaccine than younger physicians

[15]. A 2012 meta-analysis of 13 studies found belief that influenza is highly contagious also associated with higher vaccine uptake [16]. These and other surveys also found self-protection and protection of family and patients were the most common reasons to receive influenza vaccination [15–22].

On the other hand, results of interviewing 750 unvaccinated staff in our survey show the most common reasons for not getting vaccinated were concern about vaccine side effects (23%), and fear of getting influenza even if vaccinated (15%). A number of other studies also described HCWs concerns about vaccine side effects and its efficacy as dominant reasons for not being vaccinated [18,20, 23–26].

In addition, lack of time for vaccination accounted for 14% of responses among those not getting vaccinated in our study, with physicians and HCWs ≥50 years most likely to provide this response (22% and 19% respectively), although vaccines were provided at health facilities where HCWs working daily. Similarly, studies in Qatar, India, and China found a lack of time common to 12 – 24% of healthcare workers not getting vaccinated [23, 27–28]. Hence, hospitals and clinics could increase vaccine uptake among this target group by ensuring vaccination sites and times are the most convenient for most of the HCWs.

This survey has several limitations including recall bias among participants, and self-report and social desirability bias of vaccination status among participants, which may have resulted in misclassification between survey groups. Another challenge was the use of convenience sampling for replacement of pre-selected participants who could not be found on the interview day, particularly at the two largest facilities. This modification of the protocol may have skewed responses to represent on-site, available staff, somewhat limiting our ability to generalize results to all health care workers at those hospitals. Given the reported vaccination uptake in the survey population (48%) versus uptake across the entire 2017 vaccination campaign (57%) [29], we know that these results over-represent those who did not receive vaccine as well as those from larger hospitals. However, we feel that this distribution of HCW vaccination in our survey allows for sufficient sample size of both those that did and did not get vaccination during 2017 campaign, thereby providing valuable insight into the vaccination campaign nonetheless.

CONCLUSION

Health care workers are often exposed to patients ill with influenza and can infect patients if they work while ill, so they are a high priority group for seasonal influenza vaccination. Our results provide key insights into the attitudes and behaviors of Vietnamese health care workers towards seasonal influenza vaccine. Several interventions can be implemented to increase acceptance of vaccine among HCWs in this setting, and could be especially directed at younger staff and physicians. First, educational materials should be targeted to address the identified concerns of this target group including HCWs and medical students, particularly vaccine effectiveness and safety. Second, physicians and other public opinion leaders should be recruited to endorse annual human seasonal influenza vaccine for HCWs. Finally, vaccines should be made readily available at either no or low cost to this important group.

ACKNOWLEDGEMENTS

The authors would like to thank all of the individuals from GDPM, all implementing health facilities and health care workers who participated in the vaccination campaign and other colleagues supporting us in reviewing this paper. Specifically, we would like to recognize Lauren Beacham, Rachael Porter and Philip Gould from U.S. CDC Atlanta for their advice in statistics and manuscript review. Financial support for this work came from the U.S. CDC via Influenza Division's cooperative agreement with GDPM, IP000821.

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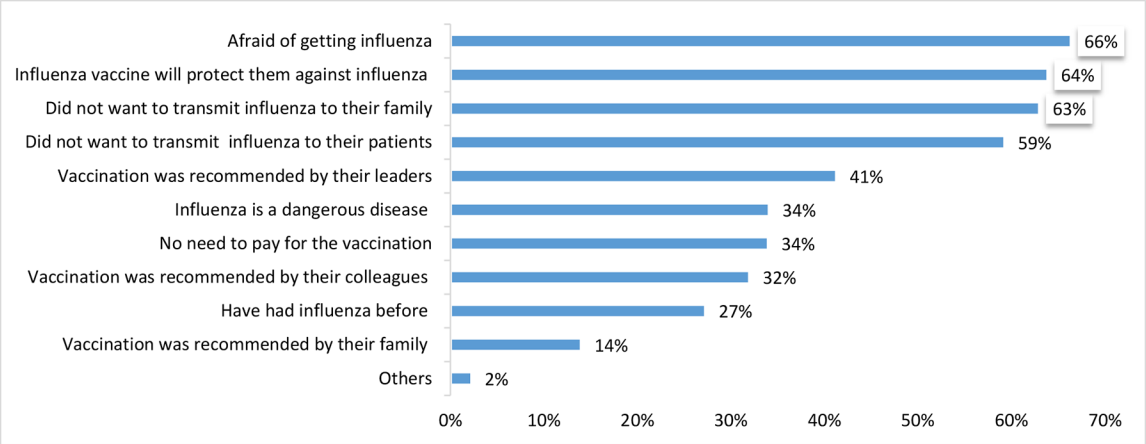

Figure 1.
Health Care Workers' reasons for accepting influenza vaccination

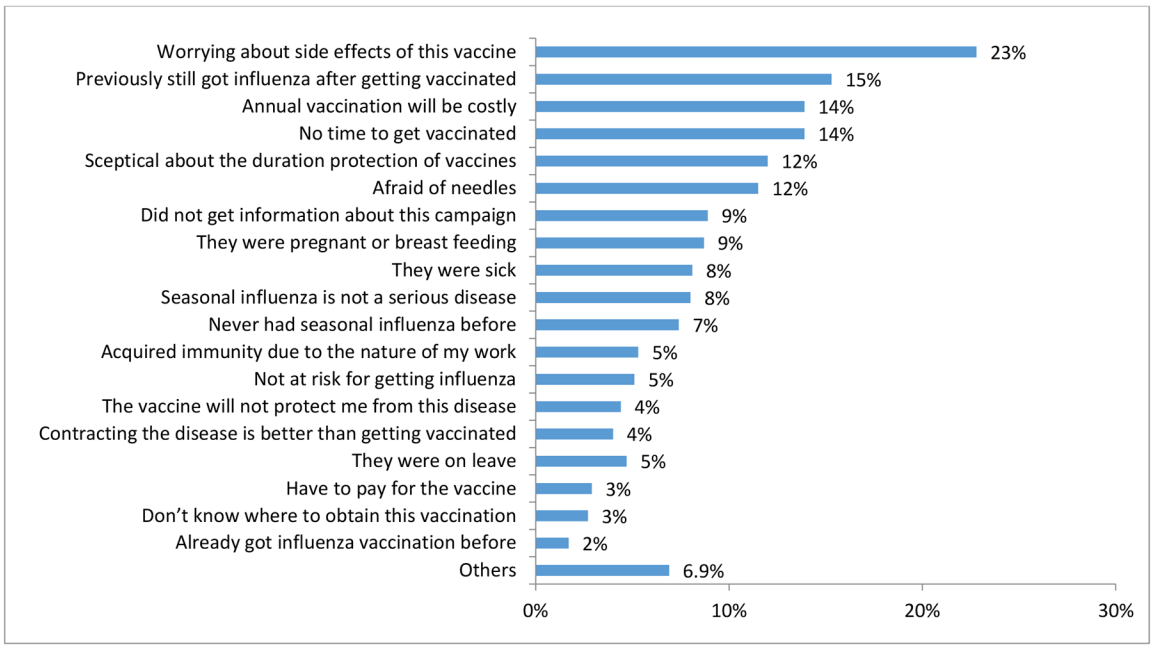

Figure 2.
Health care workers' reasons for refusing influenza vaccination

Table 1.

General information of participants in the influenza vaccine campaign in 13 selected health units in Vietnam in 2017

Contents	Total (n=1,450)	Vaccinated (n=700)		Not Vaccinated (n=750)	
	n (%)	n	%	n	%
Gender					
Male	378 (26%)	186	51%	192	49%
Female	1,072 (74%)	514	52%	558	48%
Age group					
Under 30	422 (29%)	183	43%	239	57%
30 – 39	528 (36%)	247	47%	281	53%
40 – 49	322 (22%)	165	51%	157	49%
50 and above	178 (13%)	105	59%	73	41%
Median (age)	35 ± 9.2	35 ± 9.5		34 ± 8.9	
Education level					
Secondary school or lower	15 (1%)	8	53%	7	47%
High school	88 (6%)	45	51%	43	49%
Junior College	503 (35%)	244	49%	259	51%
University	652 (45%)	309	47%	343	53%
Post-graduate	192 (13%)	94	49%	98	51%
Specialization					
Physician	233 (16%)	102	44%	131	56%
Nurse	603 (42%)	298	49%	305	51%
Technician	164 (11%)	73	45%	91	55%
Office worker	123 (8%)	64	52%	59	48%
Midwife	166 (12%)	70	42%	96	58%
Others *	161 (11%)	93	58%	68	42%
Work experience					
Under 10 years	644 (44%)	277	43%	367	57%
10 – 20 years	549 (38%)	282	51%	267	49%
25 years and above	257 (18%)	141	55%	116	45%
Median (year of working experiences)	10 (1.1 – 18.9)	11 (1.8 – 20.2)		10 (1.4 – 18.6)	

* all other employees, including pharmacists, engineers, researchers, guards, and service staff.

Table 2.

Multivariable logistic regression analysis related to vaccination status through the campaign in Vietnam.

		Univariate analysis		Multivariate analysis	
	Vaccinated	**OR**	**95% CI**	**Adjusted OR**	**95% CI**
Age group	**under 30**	**0.5**	**0.4 – 0.8**	**0.5**	**0.4 – 0.8**
	30 –39	0.6	0.4 – 0.9	**0.6**	**0.4 – 0.8**
	40 – 49	0.7	0.5 – 1.1	0.7	0.5 – 1.1
	≥50	Reference	-	Reference	-
Sex	male	0.9	0.8 – 1.2	0.9	0.7 – 1.2
	female	Reference	-	Reference	-
Education level	secondary school or lower	1.2	0.4 – 3.4	0.8	0.3 – 2.4
	high school	1.1	0.7 – 1.8	0.7	0.4 – 1.3
	junior college	1.0	0.7 – 1.4	0.9	0.6 – 1.4
	university	0.9	0.7 – 1.3	0.9	0.6 – 1.4
	post-graduate	Reference	-	Reference	-
Specialization	**Others** *	**1.8**	**1.2 – 2.6**	**2.0**	**1.2 – 3.2**
	Midwives	0.9	0.6 – 1.4	1.1	0.7 – 1.9
	Office worker	1.4	0.9 – 2.2	1.6	1.0 – 2.7
	Technician	1.0	0.7 – 1.5	1.2	0.7 – 2.0
	Nurse	1.3	0.9 – 1.7	**1.5**	**1.0 – 2.4**
	Physician	Reference	-	Reference	-

* all other employees, including pharmacists, engineers, researchers, guards, and service staff.

Significant differences are marked in bold

Table 3.

Reasons for choosing or rejecting influenza vaccine among health care workers in Vietnam, by specialization

Beliefs (for vaccinated, n=700)	**Physician (n=102)**	**Nurse (n=298)**	**Technician (n=73)**	**Office worker (n=64)**	**Midwives (n=70)**	**Other (n=93)**	**P across groups**
Influenza vaccine will protect them against influenza	68 (67%)	**171 (57%)**	53 (73%)	42 (66%)	46 (66%)	67 (72%)	0.050
Did not want to transmit influenza to their patients	**61 (60%)**	**177 (59%)**	**47 (64%)**	**25 (39%)**	57 (81%)	**48 (52%)**	<0.001
Did not want to transmit influenza to their family	**65 (64%)**	**173 (58%)**	**50 (68%)**	**36 (56%)**	60 (86%)	**57 (61%)**	0.001
Vaccination was recommended by their colleagues	**22 (21%)**	**89 (30%)**	30 (41%)	29 (45%)	29 (41%)	**27 (29%)**	0.001
Beliefs (for non-vaccinated, n=750)	**Physician (n=131)**	**Nurse (n=305)**	**Technician (n=91)**	**Office worker (n=59)**	**Midwives (n=96)**	**Other (n=68)**	**P across groups**
Never had seasonal influenza before	8 (6%)	**16 (5%)**	4 (4%)	4 (7%)	12 (13%)	12 (18%)	0.004
Worrying about side effects of this vaccine	**15 (11%)**	84 (28%)	18 (20%)	15 (25%)	27 (28%)	**12 (18%)**	0.005
Afraid of needle	9 (7%)	35 (11%)	10 (11%)	12 (20%)	16 (17%)	**4 (6%)**	0.035
No time to get vaccinated	29 (22%)	**35 (12%)**	12 (13%)	**9 (15%)**	**5 (5%)**	**14 (21%)**	0.003

*the highest % is the reference group underlined, those significant differences are marked in bold resulting from 2x2 table of the reference group with others on the same row.

Table 4.

Reason of non-vaccinated seasonal influenza vaccines among health care workers in Vietnam, by age groups

Beliefs (for non-vaccinated, n=750)	Under 30 (n=239)	30 – 39 (n=281)	40 – 49 (n=157)	>50 (n=73)	P across groups
Contracting the disease is better than getting vaccinated	9 (4%)	18 (6%)	**2 (1%)**	1 (1%)	0.035
Previously still got influenza after getting vaccinated	**30 (13%)**	58 (21%)	**14 (9%)**	13 (18%)	0.005
Acquired immunity due to the nature of my work	**9 (4%)**	**14 (5%)**	**6(4%)**	11 (15%)	0.001
Annual vaccination is costly	**24 (10%)**	51 (18%)	22 (14%)	7 (10%)	0.039
Sceptical about the long-term health effects of vaccines	**23 (10%)**	38 (14%)	**14 (9%)**	15 (21%)	0.039
No time to get vaccinated	42 (18%)	35 (13%)	**13 (8%)**	14 (19%)	0.029

* the highest % is the reference group underlined, those significant differences are marked in bold resulting from 2x2 table of the reference group with others on the same row.

Table 5.

Reason of vaccinated and non-vaccinated seasonal influenza vaccines among health care workers in Vietnam, by education level

Beliefs (for vaccinated, n=700)	**Secondary or lower (n=8)**	**High school (n=45)**	**Junior college (n=244)**	**University (n=309)**	**Post-graduate (n=94)**	**P across groups**
Have had influenza before	0	**8 (18%)**	**63 (26%)**	**83 (27%)**	37 (39%)	0.016
Beliefs (for non-vaccinated, n=750)	**Secondary or lower (n=7)**	**High school (n=43)**	**Junior college (n=259)**	**University (n=343)**	**Post-graduate (n=98)**	**P across groups**
Never had seasonal influenza before	0	8 (19%)	24 (9%)	**18 (5%)**	6 (6%)	0.016
Worrying about side effects of this vaccine	1 (14%)	9 (21%)	66 (25%)	86 (24%)	**9 (9%)**	0.012

*the highest % is the reference group underlined, those significant differences are marked in bold resulting from 2x2 table of the reference group with others on the same row.