

Attitudes towards COVID-19 and influenza vaccination in healthcare workers

K.I. Quintyne^{1,2}, C. Reilly¹, C. Carpenter¹, S. McNally¹, J. Kearney¹.

1. Public Health, Health Service Executive (HSE) Dublin and North-East, Dr Steeven's Hospital, Dublin 8, Ireland.
2. School of Population Health, Royal College of Surgeons in Ireland, Dublin 2, Ireland.

Abstract

Aim

Vaccination of healthcare workers (HCWs) is critical to curtailing the spread of COVID-19 and seasonal influenza. There is need to identify empirically supported strategies to increase uptake, especially as maintaining the health of HCWs is indispensable during influenza season. Herd immunity can only be appreciated therefore with high levels of vaccination, consequently supporting health service resilience, through reduction in workplace absenteeism and breaking possible transmission chains. The aim of the study was to assess attitudes, aversions, and advantages among HCWs in relation to COVID-19 and influenza vaccination.

Methods

From 19/09/2023 to 26/09/2023, an anonymous voluntary questionnaire was sent to the mailing list of the healthcare structures within Public Health, HSE Dublin and North-East. Data was collected through Smart Survey platform.

Results

A total of 595 HCWs responded to survey (217 (36%) were from Nursing; 192 (32%) were from other patient client care; 126 (21%) were from Health & Social care; and 60 (10%) were from Medical & Dental professionals).

Discussion

Overall, the respondents stated: that HCW vaccination was good example for patients (i.e. COVID-19 (528 (89%)); and Influenza (551 (93%)); they were confident around advising patients on vaccination (i.e. COVID-19 (413 (69%)); and Influenza (455 (76%)); the minority were concerned about serious vaccination side effects (i.e. COVID-19 (249 (42%)); and Influenza (102 (17%)); and with 313 (53%) preferring to have their vaccination on separate

days. There was difference in HCWs favouring mandatory vaccination (i.e. COVID-19 (43.70%); and Influenza (302 (51%)).

Discussion

The findings of this study provide an opportunity to understand HCWs attitudes to COVID-19 and influenza vaccination in Ireland, to improve vaccination uptake within this cohort especially among hesitant individuals.

There are no sources in the current document.

Introduction

Vaccination for healthcare workers (HCWs) serve a dual purpose: safeguarding HCWs themselves from occupational acquisition of infectious diseases, and shielding patients from potential nosocomial infections. In addition, it has the capacity to reduce vaccine preventable disease (VPD) related absenteeism, thereby ensuring the continuity of high quality healthcare.^{1,2} Among the catalogue of recommended vaccinations for HCWs, special emphasis is placed on the administration of COVID-19 and influenza vaccines due to requirement for repeated dosing, which is compounded by suboptimal uptake levels.³⁻⁵

The immunisation of HCW aligns with directives outlined in the national winter preparedness plans, as well as the annual recommendations for preventing COVID-19 and influenza.⁶ HCWs are uniquely identified as vulnerable demographic for whom COVID-19 and influenza vaccination is strongly endorsed. As such, a proactive approach is advocated, involving the annual provision of COVID-19 and influenza vaccination for HCWs in the lead-up to the influenza season (spanning from October to December). Notably a minimum vaccination coverage goal of 75% for both COVID-19 and influenza has been established to HCWs.⁽⁶⁾ By 30/06/2023, 98% of all HCWs had received a booster, 67% had received Booster 1, and 31% had received further boosters.⁷ Uptake among HCWs for influenza for 2022 – 2023 was 54.2% and 48.9% for those linked to hospitals and long-term care facilities respectively.⁸ Taking these into account, it is apparent that the protection of HCWs is crucial to ensure the essential levels of assistance needed as part of the annual winter preparedness in order to maintain direct and indirect patient care and support to operational services.^{9,10} In addition, HCWs play a key role in vaccine promotion and patient guidance: the literature reports a direct link between the favourable vaccine attitude of HCWs, and the vaccination coverage of their patients.¹¹⁻¹³ For that reason, the spread of concerns about vaccine efficacy and safety among HCWs can hinder the success of the vaccination campaign^{14,15}.

This study, promoted by Public Health, HSE Dublin and North-East (PHHSEDNE), explores HCW's attitudes, aversions, and advantages towards COVID-19 and influenza vaccination in

order to identify predictors of hesitancy that can be address for the success of the vaccination campaign among this heterogeneous workforce.

Methods

This study was based on cross-sectional survey conducted between 19/09/2023 and 26/09/2023. An email invitation containing the link to the anonymous voluntary questionnaire was sent to the 112 generic emails for the healthcare structures that interact with PHHSEDNE. The questionnaire was hosted electronically on SmartSurvey (SmartSurvey Ltd., Basepoint Business Centre, Oakfield Close, Tewkesbury, Gloucestershire, England, GL20 8SD). The survey questions were gathered from a National Health Service (NHS) template, which was reviewed by the Health Protection Team in PHHSEDNE to be more applicable to the Irish setting¹⁶. The survey comprised 35 questions that covered four domains pertaining to vaccination, which included: access, attitudes, aversions, and advantages. Dichotomous variables about hesitancy were included for COVID-19 and influenza; a participant was considered vaccine hesitant if they answered 'no' to confident advising patients about vaccination. If a respondent answered, 'yes' to one of these proposals, they were not considered to be 'vaccine hesitant'.

The anonymised data were compiled from the survey responses and were entered into Excel spread sheet (Microsoft Corp, Redmond, WA). The data were then collated and validated. The final data set was then imported into IBM SPSS Statistics Version 29.0 (IBM Corp, Armonk, NY). The cohort was analysed by applying descriptive statistics. Goodman and Kruskal's λ (G-K λ) was also run to determine whether related variables could better predict for vaccine hesitancy. For interpretation, 0–0.19 indicates a weak relationship, 0.2–0.39 indicates a moderate relationship and more than 0.4 means strong relationship¹⁷. (G-K λ) measure is more useful in attribute differential predictability than usual, non-transparent chi-square association statistics¹⁸.

Results

Five hundred ninety-five HCWs responded to the survey, with 45.54% (283/595) based in acute hospitals, and highest responses were from nurses (36.47%). Further details are shown in Table 1.

Table 1: Characteristic details for HCW responding to survey of COVID-19 and influenza vaccination

CHARACTERISTIC	VALID DENOMINATOR ^A	NUMBER	PERCENT
HCW Role	595		
Medical & Dental		60	10.08%
Nursing		217	36.47%

Health & Social Care	128	21.18%
Other	192	32.27%
HCW Setting	595	
Acute Hospital	283	47.56%
Long-term Care Facility	240	40.34%
CHO	43	7.23%
Other	41	6.89%
HCW Base	595	
Cavan	43	7.23%
Louth	149	25.04%
Meath	142	23.87%
Monaghan	29	4.87%
North Dublin	232	38.99%
HCW: Healthcare Worker		
CHO: Community Health Organisation		
^A Number of responses per question		

All the survey questions are shown in **Table 2**. For the access to vaccination questions, it revealed: most (90.92%; 541/595) HCWs found access easy; and the majority (82.35%; 490/595) felt that their line-managers provided good support. For the attitudes to vaccination questions, it highlighted that: slight majority (51.60%; 307/595) were not in favour of dual vaccination; consistent high proportions felt it was important in workplace (90.08%; 536/595) and (93.95%; 559/595) for COVID-19 and influenza respectively; heterogeneous responses for mandatory HCW vaccination of (43.70%; 260/595) and (50.76%; 302/595) for COVID-19 and influenza respectively; consistent majority about advising patients about vaccination (69.41%; 413/595) and (76.47%; 455/595) for COVID-19 and influenza respectively; and varying minorities were worried about side-effects of vaccination (41.85%; 249/595) and (17.14%; 102/595) for COVID-19 and influenza respectively.

With the aversion to vaccination questions, no major aversions were seen. The advantage to vaccination questions revealed that consistent large proportions were aware of protection vaccination provided.

It was noted that large minority of HCW would attend work if unwell with influenza (32.77%; 195/595). This was further broken down by HCW role in **Figure 1**, and reveals that only medical and dental HCWs had a greater proportion who would attend work in unwell (55.00%; 33/60). A chi-square test of independence was performed to examine the relation between HCW role and attendance at work if unwell with influenza. The relation between these

variables was significant, $\chi^2(3, N= 595) = 25.4, p < 0.001$. Medical and dental staff were more likely to attend work if unwell with influenza.

Table 2: HCW responses to vaccination questions

QUESTIONS	REPLY: N (%)	
	YES	NO
ACCESS^A		
It was easy for you to get the COVID-19/flu vaccine where you work?	541 (90.92%)	54 (9.08%)
Getting appointment for COVID-19/flu vaccination is too much trouble for you?	71 (11.93%)	524 (88.07%)
Your line manager encouraged you to get COVID-19/flu vaccination?	490 (82.35%)	105 (17.65%)
Are you aware of the new HSEland e-learning module for healthcare workers about COVID-19 and flu?	384 (64.54%)	211 (35.46%)
Is there a plan in your workplace for staff to undertake HSEland module?	156 (26.22%)	81 (13.61%)
	Unknown: 358 (60.17%)	
ATTITUDES^A		
Would you be willing to getting both COVID-19 and flu vaccination at the same time?	288 (48.40%)	307 (51.60%)
ATTITUDES – COVID-19^A		
Having COVID-19 vaccination sets a good example to patients?	528 (88.74%)	67 (11.26%)
COVID-19 vaccination for staff is seen as important where I work?	536 (90.08%)	59 (9.92%)
You think that COVID-19 vaccination should be mandatory for HSE Staff?	260 (43.70%)	335 (56.30%)
Are you confident advising patients about COVID-19 vaccination?	413 (69.41%)	182 (30.59%)
The COVID-19 vaccination will make you unwell?	193 (32.44%)	402 (67.56%)
People working in healthcare should have the COVID-19 vaccination every year?	365 (61.34%)	230 (38.66%)
The COVID-19 vaccine will protect you from getting the COVID-19?	335 (56.30%)	260 (43.70%)
You are at risk of getting COVID-19 as a healthcare worker?	552 (92.77%)	43 (7.23%)
You worry that COVID-19 vaccination will cause serious side effects?	249 (41.85%)	346 (58.15%)
It is important to help colleagues by not being off work with COVID-19?	419 (70.42%)	176 (29.58%)
ATTITUDES – FLU^A		

Having flu vaccination sets a good example to patients?	551 (92.61%)	44 (7.39%)
Flu vaccination for staff is seen as important where I work?	559 (93.95%)	36 (6.05%)
You are likely to come to work even if you are unwell?	195 (32.77%)	400 (67.23%)
You think that flu vaccination should be mandatory for HSE Staff?	302 (50.76%)	293 (49.24%)
Are you confident advising patients about flu vaccination?	455 (76.47%)	140 (23.53%)
The flu vaccination will make you unwell?	99 (16.64%)	496 (83.36%)
People working in healthcare should have the flu vaccination every year?	500 (84.03%)	95 (15.97%)
The flu vaccine will protect you from getting the flu?	421 (70.76%)	174 (29.24%)
You are at risk of getting flu as a healthcare worker?	536 (90.08%)	59 (9.92%)
You worry that flu vaccination will cause serious side effects?	102 (17.14%)	493 (82.86%)
It is important to help colleagues by not being off work with flu?	420 (70.59%)	175 (29.41%)
AVERSIONS^A		
You are put off having COVID-19/flu vaccination by fear of needles?	41 (6.89%)	554 (93.11%)
You cannot have COVID-19/flu vaccination because you are allergic?	27 (4.54%)	568 (95.46%)
ADVANTAGES^A		
The COVID-19/flu vaccine will protect my family from getting COVID-19/flu?	458 (76.97%)	137 (23.03%)
The COVID-19/flu vaccine will protect patients from getting COVID-19/flu?	472 (79.33%)	123 (20.67%)
<p>N: Number %: Percent Flu: Influenza HSE: Health Service Executive ^A Valid denominator for all questions: 595</p>		

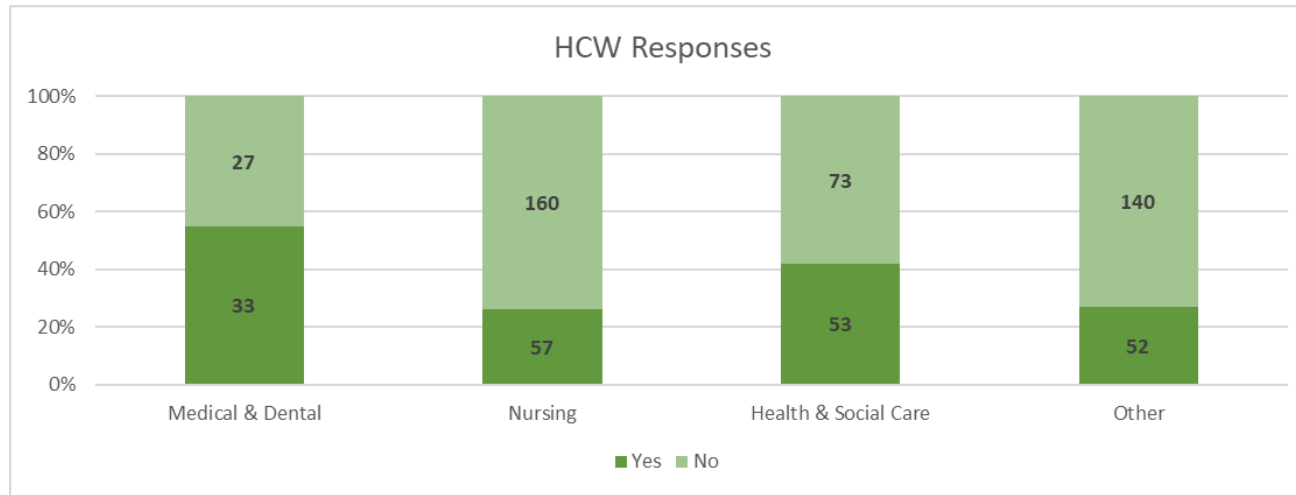


Figure 1: Responses to question about coming to work if unwell with influenza by HCW role

Table 3: Analysis of model for prediction of 'vaccination hesitancy' by HCW characteristics

INDEPENDENT VARIABLE: COVID-19 Vaccination Hesitancy				
DEPENDENT VARIABLES	Value	Asymptotic Standard Error^A	Approximate T^B	Approximate Significance
HCW Role	0.113	0.028	3.802	< 0.001
HCW Setting	0.061	0.025	2.355	0.019
HCW Base	0.003	0.003	1.001	0.317
HCW awareness of HSEland e-learning module	0.108	0.060	1.704	0.088
HCW willingness to have dual vaccination	0.090	0.067	1.280	0.201
HCW acceptance of mandatory vaccination	0.130	0.073	1.675	0.094
COVID-19 vaccine will make you unwell	0.005	0.005	1.001	0.317
COVID-19 vaccine will have serious S/E	0.044	0.053	0.814	0.416
INDEPENDENT VARIABLE: Influenza Vaccination Hesitancy				
DEPENDENT VARIABLES	Value	Asymptotic Standard Error^A	Approximate T^B	Approximate Significance
HCW Role	0.158	0.023	6.471	< 0.001
HCW Setting	0.036	0.027	1.287	0.198
HCW Base	0.003	0.003	1.001	0.317
HCW awareness of HSEland e-learning module	0.080	0.054	1.434	0.152
HCW willingness to have dual vaccination	0.007	0.074	0.094	0.925
HCW acceptance of mandatory vaccination	0.221	0.036	5.617	< 0.001
Influenza vaccine will make you unwell	0.010	0.010	1.001	0.317
Influenza vaccine will have serious S/E	0.010	0.010	1.001	0.317
HCW: Healthcare worker				

HCW Role: Medical & Dental; Nursing; Health & Social Care; and Other

HCW Setting: Acute Hospital; Long-term Care Facility; Community Health Organisation; and Other

S/E: side effects

^A Not assuming the null hypothesis

^B Using the asymptotic standard error assuming the null hypothesis

The Goodman and Kruskal's λ was also run to determine whether eight related variables could better predict COVID-19 and influenza vaccination hesitancy, and the findings are shown in **Table 3**. The results indicate that there are some proportional reduction in errors in predicting the dependent variables while taking into account vaccination hesitancy as an independent variable. However, the only consistent statistically significant decrease in proportion of errors due to the tested dependent variable of HCW role (i.e. Medical & Dental more than other HCW roles) as predictor of both COVID-19 and influenza vaccination hesitancy. In addition, there were statistically significant decreases in proportion of errors: due to the tested dependent variable of HCW setting as a predictor for COVID-19 vaccination hesitancy; and due to the tested dependent variable of HCW acceptance of mandatory vaccination serving as a predictor of influenza vaccination hesitancy.

Discussion

The aim of this study was to evaluate, through a national cross-sectional survey, access, attitudes, aversions, and advantages among HCWs in relation to COVID-19 and influenza vaccination.

The characteristic details of the survey highlighted the heterogeneity of respondents in the healthcare sector. This finding is not unexpected, given the requirements for diversity in skill set to keep the healthcare infrastructure operational. The proportions reported were in keeping with the Health Service Personnel Census report²⁷. The generalisability of these findings are limited by the sample size, the short duration of the survey, and requirements of respondents to use a web-based platform.

The responses to the access to vaccination questions highlight: the majority of HCW were aware of workplace vaccination (90.92%); and with a minority reporting difficulty in securing an appointment (11.93%). In addition, there was good managerial support for accessing these services (82.35%). These results were comparable to previously completed survey with marginal improvements in the current survey¹¹⁻¹³. Most HCW were aware of e-learning module/resource for vaccination (64.54%); however, the majority of HCW were unsure of its relevance with respect to winter preparedness (60.17%). Overall, the responses show great awareness and support for HCW vaccination, and provide partial reassurance that HSE campaign is reaching all grades of HCW. In addition, these findings are reported in literature as major drivers for ensuring HCW vaccination; furthermore, adopting digital strategies might be challenging, but once embedded are shown to be useful adjunct to provide HCW vaccination update^{19,20}.

Most of the respondents were in favour of having COVID-19 and influenza vaccinations separately. This is in keeping with the multifaceted phenomena of vaccine co-administration

hesitancy, which has been noted to be higher than the acceptable of either vaccine administered separately recent published reports^{21,22}.

The response to attitudes to COVID-19 and influenza vaccination respectively reveal that: most respondents thought that vaccination was a good example for patients (88.74% vs 92.61%); majority acknowledged it was an important workplace measure (90.08% vs 93.95%); and greater proportions felt it was important not to be off sick with COVID-19 or influenza (70.42% vs 70.59%). These findings were comparable to reports in the literature, and suggestive high level of HCW awareness about respiratory diseases^{21,22}. However, it was noted that considerable small proportions were still likely to attend work if unwell (32.77%). Medical doctors and dentists were the HCWs that were most likely to attend work (55.00%; 33/60). This rate is beyond the range of 20–46%, which is in published reports, but reinforces that HCWs are trying to maintain workplace continuity, despite the consequent overall disruption of medical care due to nosocomial outbreaks. In addition, most respondents were confident on advising patients about vaccination (69.41% vs 76.47%); majority were aware that HCW were at risk of respiratory illnesses (92.77% vs 90.08%); and many supported annual vaccination (61.34% vs 84.03%). These findings were consistent with literature, which highlight HCWs having good knowledge around requirements for vaccination^{12,13,23}. However, it was also noted that sizeable small proportions that: vaccination would make the unwell (32.44% vs 16.64%); vaccination will cause serious side effects (41.85% vs 17.14%); and support mandatory HCW vaccination (43.70% vs 50.76%). These findings highlight misconceptions about HCW vaccination, and are consistent with other published works^{23,24}.

The responses to the aversions to vaccination questions showed that most HCWs have no fear of needles (93.11%), and the majority had no known allergies to vaccination (95.46%). These findings were comparable to those in the literature²³. The responses to the advantages to vaccination questions highlighted that respondents were aware that vaccination protected their families and patients from vaccine-preventable respiratory illnesses (76.97% and 79.33%). These findings were consistent with earlier results in attitudes to vaccination questions.

The combined results to this survey highlight the potential challenges to COVID-19 and influenza vaccination in HCWs, and suggest that any strategies to improve uptake rates should be multipronged. These may include: increasing ease of access/convenience of vaccination for HCW (i.e. increased appointments or further roll-out of peer-vaccination initiatives), while addressing attitudes and beliefs around the adverse effects and effectiveness of vaccines. When applied in tandem, these might all additionally help in improving uptake among HCWs.

It was noted that HCW role and HCW setting were weak predictors for COVID-19 vaccination hesitancy, while HCW role was also a weak predictor for influenza vaccination hesitancy. However, HCW acceptance of mandatory vaccination was a moderate predictor for influenza vaccination hesitancy. There is no clear explanation for these findings. Reports from the literature do highlight: doctors had lower vaccine refusal rates when compared to nurses and non-clinical HCWs; and patient facing HCW were less hesitant than those that do not interact with patients^{25,26}.

This survey is associated with some limitations. The first limitation is related to the survey duration for collection, which did not allow for a larger sample size collection. The short duration might have limited the number of responses and the diversity of participants. Considerations for extending the survey period for future survey could allow for more comprehensive understanding. However, the preliminary findings are however a good measure of regional attitudes and beliefs related to vaccination and were not considerably different to reports in the literature^{12,13,23}. Furthermore, the breakdown by HCW role was comparable to the most recent HSE census. The second limitation is connected to the validity of the questionnaire used. These were based on items that had been identified in a larger United Kingdom based survey on HCW attitudes to vaccination; and in the absence of an Irish equivalent, it was more suitable to adapt a validated and previously used tool for use in the Irish setting. A third limitation is related to reliance of self-reported data. The reliance on self-reported data can introduce biases, such as social desirability bias, where respondents might provide answers, they believe are expected rather than their true feelings. The final limitation is related to contextual factors. External factors such as media coverage, public health campaigns, and recent events related to COVID-19 and influenza might have influenced the respondents' attitudes and perceptions. The ongoing drive for HCW vaccination might have provided some contextual influence for HCWs and highlights the importance of having engaging communication campaigns. This has been heavily reported in published reports^{12,13,23}.

Declarations of Conflicts of Interest:

None declared.

Corresponding author:

Keith Ian Quintyne,
Public Health, HSE Dublin and North-East,
Dr Steeven's Hospital,
Dublin 8,
Ireland.
E-Mail: keithi.quintyne@hse.ie

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