

The Impact of the COVID-19 Pandemic on the Uptake of the Seasonal Influenza Vaccine

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Abstract

Aims

We sought to determine whether the COVID-19 pandemic has impacted the uptake of, and changed attitudes towards, the seasonal influenza vaccine.

Methods

A 12 item cross sectional survey was designed and distributed to 465 patients in an urban GP practice over a two-week period in October 2020.

Results

There was a 27.4% increase in uptake of the seasonal influenza vaccine in 2020 relative to 2019. Two hundred and thirty-three patients (76%) were more likely to take the vaccine this year due to the COVID-19 pandemic. This was dependant on age ($p=0.001$). The 13-30yrs group were 3.2 times less inclined to take the vaccine due to COVID-19 (95%CI: 1.71-6.01) than the other age groups. One hundred and forty-nine patients (48.9%) felt the vaccine is more important than they previously appreciated. One hundred and thirty-six (58.4%) of patients who were more inclined to receive the vaccine cited wanting to 'avoid seeing a doctor/needing to go to hospital this year in particular'. Fifty-two patients (22.3%) took the seasonal influenza vaccine in the belief it would 'offer some protection against COVID-19'.

Discussion

The COVID-19 pandemic has contributed to an increased uptake and increased appreciation of the importance of the seasonal influenza vaccine. Further research will be required to determine whether this will be sustained in the years to come.

Introduction

Influenza (flu) is a contagious viral disease that results in up to five million cases of severe illness and 650,000 deaths worldwide each year.¹ Influenza season in the Northern Hemisphere lasts from October until May. Influenza outbreaks usually last from 6 to 8 weeks and can impact people of all ages, especially the very young and the very elderly.² In Ireland the 2018/19 flu season resulted in high levels of hospitalisations for confirmed influenza cases resulting in a significant impact on the health system with sentinel GP consultation rates for influenza like illness of 53/100,000 at peak, 7,943 influenza cases notified to the Health Protection Surveillance Centre, 3,244 confirmed influenza cases hospitalised, 159 confirmed influenza cases admitted to ICU, and 97 deaths in notified influenza cases.³

The seasonal influenza vaccine (SIV) remains the best tool available to reduce influenza-associated morbidity and mortality.⁴ In Ireland, the SIV is made available free of charge to all adults aged 65 and over, pregnant women, children and adults over 6 months of age with certain chronic medical conditions, those with Downs Syndrome, those living in a nursing home or long-term care facility, carers, healthcare workers, those who work with pigs, poultry or waterfowl.⁵

There are many factors which impact vaccine acceptance. The World Health Organisation published a document in 2013 which highlighted the broad spectrum of factors which may impact vaccine uptake. They grouped these factors into contextual, individual and group influences. Examples include economic and political factors, the pharmaceutical industry, anti- or pro-vaccination lobbies, experience with past vaccinations, attitudes towards health and prevention, perceived risk/benefit and vaccination as a social norm.⁶

In 2020 the government of Ireland introduced changes to allow all of those in the HSE-defined at-risk groups, aged from 6 months to 69 years inclusive, to access the vaccine without charge. The quadrivalent live attenuated nasal flu vaccination was also made available to all children in Ireland aged from 2 to 12 years inclusive, free of charge for the first time in 2020.⁷ This policy change was introduced as Ireland was facing a major public health challenge in the form of the novel coronavirus – SARS CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2), resulting in the clinical condition COVID 19.⁸ Having originated in the Wuhan province of China in late 2019,⁸ the virus rapidly spread worldwide with 84 532 824 confirmed cases of COVID-19, including 1 845 597 deaths, as of week 53 2020.⁹

The SARS-CoV-2 virus and resultant COVID-19 pandemic has brought the threat posed to society from infectious disease into sharp focus. SARS-CoV-2 and seasonal influenza are completely separate entities. However, the two viruses have regularly been referenced together during the COVID-19 pandemic with the infectivity, mortality and morbidity of the novel SARS-CoV-2 regularly compared to seasonal influenza.^{10,11,12}

While there are similarities in terms of the symptomatology, one major difference between the viruses is that there are established safe and effective vaccines for seasonal influenza,¹ while up until late December 2020 there was no licenced COVID 19 vaccine available in Ireland.¹³

It is as of yet unclear whether this increased attention on infectious respiratory disease, and on vaccination as a public health measure, will have an impact on SIV uptake this year and in years to come.

Early evidence in the UK suggests the COVID-19 pandemic has positively influenced SIV uptake.¹⁴ However, our literature review did not find any published studies on this issue in an Irish population to date.

The aim of this study was to determine whether the COVID-19 pandemic has impacted the uptake of, and attitudes towards, the seasonal influenza vaccine.

Methods

This was a qualitative original questionnaire-based study conducted in a four doctor, urban, GP practice in the south of Ireland during the 2020 'flu season'. The questionnaire was distributed to 465 patients who attended during a two-week period in October 2020, after the SIV had been made available. Patients were invited to partake in the study by completing an anonymised questionnaire. Three hundred and seven patients completed the questionnaire. A parent or guardian was asked to complete the questionnaire for children or for adults with cognitive impairment.

The questionnaire contained questions on demographics in addition to factors influencing previous and current uptake of the SIV. Exclusion criteria included age under two years, lack of fluency in English (and no translator present), and patients requiring emergency treatment. Initial analysis of anonymised data was performed in Microsoft Excel.

Exploring associations of interest between predictor variables and dependent ones was carried out using SPSSv26. Chi-square statistics were calculated as is appropriate for comparison of categorical variables. Odds ratios were computed for statistically significant associations. The significance level chosen below which p-values would be considered statistically significant was $p < 0.05$.

Ethical approval was received from the Irish College of General Practitioners Research and Ethics Committee.

Results

Table 1. Characteristics and opinions of the study population.

		Number	Percentage
Age	2-12 years	40	13.0
	13-18 years	12	3.9
	19-30 years	40	13.0
	31-50 years	93	30.3
	51-70 years	90	29.3
	>70 years	30	9.8
	Missing	2	
Gender	Male	130	42.3
	Female	177	57.7
'At risk' group	Yes	122	39.7
	No	184	59.9
	Missing	1	

Previous COVID-19 test	Yes	64	20.9
	No	243	79.1
Consider the flu a threat	Yes	115	37.5
	No	191	62.2
	Missing	1	
Perception of flu vaccine safety	Very safe	143	46.6
	Safe	102	33.2
	Unsafe	8	2.6
	Very unsafe	3	1.0
	Don't know	48	15.6
	Missing	3	
Have gotten/will get flu vaccine this year	Yes	223	73.0
	No	83	27.0
	Missing	1	
Got the flu vaccine last year	Yes	140	45.6
	No	166	54.0
	Missing	1	
If no, what was the reason? (participants had the option of choosing more than one option)	Not advised	79	47.6
	Too expensive	1	0.6
	Not enough time	9	5.4
	Worried they would get flu	19	11
	Worried about side effects	27	16.3
	Didn't believe at risk of contracting flu	49	30
Has COVID-19 made you more inclined to take the flu vaccine?	Yes	233	76
	No	73	24
	Missing	1	
If yes, which is applicable to you? (participants had the option of choosing more than one option)	Reduce the risk of needing to see a doctor/go to hospital	136	58.4
	I feel the flu vaccine will give me some protection against COVID-19	52	22.3
	Reduce the chances to undergo COVID-19 testing and isolation	60	25.9
	Protect family/friends	104	44.6
	Advised to get the flu vaccine this year for the first time	24	10.3
	Available to me free of charge this year for the first time	23	9.9
	Missing		
Has your perception of the flu vaccine changed following the outbreak of COVID-19?	No	142	46.6
	Yes – flu vaccine is more important	149	48.9
	Yes – flu vaccine is less important	0	0%
	Don't know	14	4.6
	Missing	2	0.6%

Population characteristics

Three hundred and seven patients completed the questionnaire during the two-week study period. This represented 66% of all patients who attended the surgery in this period.

The 31-50-year-old age category was the largest group in the study 30.3% (n=93), see Table 1. Children under 12 and the over 70s accounted for 13% (n=40) and 9.8% (n=30) respectively. Males represented 42.3% (n=130) of the study participants.

One hundred and twenty-two patients (39.7%) self-identified as being in the 'at risk' group for influenza (i.e. pregnancy, co-morbidities). Sixty-four patients (20.9%) had been tested for COVID-19.

Attitudes towards flu virus and flu vaccine

One hundred and fifteen patients (37.5%) in the study considered the influenza virus a threat to their health. Two hundred and forty-five patients (79.8%) felt that the influenza vaccine was safe or very safe. Forty-eight patients (15.6%) answered "don't know" regarding safety.

Two hundred and thirty-three patients (73.0%) had already received or were planning to get the SIV for the 2020/2021 influenza season. In comparison, approximately 45.6% (n=140) of the study participants had gotten the SIV in the 2019/2020 influenza season.

Impact of COVID-19

Two hundred and thirty-three patients (76.0%) felt that the COVID-19 pandemic had made them more likely to take the SIV this year. This result was dependent on age (p-value=0.001). When the 13-18yrs and 19-30yrs groups were combined, the 13-30yrs group were 3.2 times less inclined to take the SIV due to COVID-19 (95%CI: 1.71-6.01) than the other age groups.

Being more inclined to get SIV this year due to COVID-19 was associated with whether they intended to get/or got the SIV this year ($p < 0.05$, OR= 8.55 (4.74-15.43)), but not associated with whether they received their 2019 SIV ($p = 0.116$).

The inclination to take the SIV this year due to COVID-19 was not associated with gender (p-value=0.091), underlying medical conditions (p-value=0.174), and of having had a COVID-19 test (p-value=0.454).

The reasons listed by those more inclined to take the flu vaccine due to the COVID-19 pandemic cross-tabulated with age is displayed below in Table 2 (note patients had the option of choosing more than one option).

One hundred and forty-nine patients (48.9%) stated they now felt the flu vaccine was more important than they had thought prior to the outbreak of COVID-19. This was independent of age group when all groups were considered ($p=0.889$).

Table 2. Factors associated with increased tendency to take the SIV in the wake of the COVID-19 pandemic

Age	Don't want to see a doctor/go to hospital this year	Want to protect friends and family from illness	Want to avoid COVID-19 test/self-isolating	Feel the SIV will protect against COVID -19	Advised to get the SIV for the first time this year	SIV free of charge for the first time this year
2-12yrs (n=35)	20 (57.1%)	21 (60.0%)	7 (20.5%)	10 (28.6%)	7 (20.0%)	5 (14.3%)
13-18yrs (n=7)	4 (57.1%)	2 (28.6%)	2 (33.3%)	1 (14.3%)	2 (28.6%)	1 (14.3%)
19-30yrs (n=2)	10 (45.5%)	9 (40.9%)	3 (13.6%)	5 (22.7%)	1 (4.5%)	2 (9.1%)
31-50yrs (n=67)	43 (64.2%)	25 (37.3%)	24 (35.8%)	15 (22.4%)	5 (7.5%)	4 (6.0%)
51-70yrs (n=90)	40 (53.3%)	32 (42.7%)	15 (20.0%)	16 (21.3%)	7 (9.3%)	7 (9.3%)
71yrs & older (n=75)	17 (68.0%)	13 (52.0%)	9 (36.0%)	5 (20.0%)	2(8.0%)	4 (16.0%)
Total ticked YES	134 (58.0%)	102 (44.2%)	60 (26.1%)	52 (22.5%)	24 (10.4%)	23 (10.0%)
Chi-square statistic	4.181*	6.310*	8.612*	1.160*	7.624*	3.135*
p-value	0.524	0.277	0.126	0.949	0.178	0.679

*tabs with less than five answers – interpret with caution

Discussion

This study demonstrated increased uptake in the SIV in the study population in 2020. Two hundred and thirty-three patients (73.0%) had already received (or planned to get) the SIV in 2020, which was an increase from 2019 (45.6%). This increase was shown to be influenced by the COVID-19 pandemic with 76% of patients stating they were more inclined to accept the flu vaccine in 2020 due to the COVID-19 pandemic.

Considering the poorer clinical outcomes in elderly COVID-19 patients, compared to younger patients;¹⁵ it is unsurprising that age had a strong influence on whether the COVID-19 pandemic had made patients more inclined to take the SIV. With regards SIV uptake, the 13-30 year-old age group was 3.2 times less likely than the other age groupings to have been positively influenced by the COVID-19 pandemic. This suggests that those who deemed themselves to be less at risk from COVID-19 were less likely to be influenced by the COVID-19 pandemic with regards to SIV uptake, notwithstanding the fact that the SIV is not routinely recommended in this age group.⁵

Offering the SIV free of charge had only a modest impact on SIV vaccine uptake. Only 14% of those more inclined to take the SIV in 2020 due to COVID-19 listed the SIV being available to them free of charge for the first time as a reason for this. Furthermore, only 0.6% of participants refused the SIV in 2019 due to cost.

Not being advised by their doctor to get the SIV was a much more important factor for not taking the SIV in 2019 (47.6%). Of those who felt the flu vaccine was unsafe, only 18% were more inclined to get the SIV due to the COVID-19 pandemic and only 9% now felt the SIV was more important than they had previously believed. This suggests that those who had safety concerns had a more fixed mindset in relation to the SIV.

A desire to 'protect friends and family from illness' was listed by 44.6% of patients more inclined to take the SIV this year (and 60% of the 2-12 year-old age group in this category), which is largely consistent with previous studies in the area.^{16,17} However, nearly half of the patients now felt the SIV is more important than they had previously thought. This indicates that the COVID-19 pandemic has highlighted the importance of SIV but has not caused a paradigm shift in the factors influencing vaccine acceptance or refusal.

Wanting to avoid engaging with the acute services this year in particular, (58.4%), and a belief that the SIV would offer protection against COVID-19 (22.4%) were two common reasons participants were more inclined to take the SIV this year. It remains to be seen whether these factors will positively influence SIV uptake in the post-pandemic era.

The limitations of this study include being a single site study. It is possible local factors such as the incidence of COVID-19 in the locality, local economic factors and the degree in which SIV was encouraged within the practice, could have influenced the findings making them less generalisable to the population as a whole. As we used an original questionnaire, our study tool was not validated. There is a potential selection bias related to the timing of the study. As the two-week period in which the questionnaires were distributed coincided with the first two weeks in which the SIV was available, it is possible that there was an over-representation of patients who were positively disposed towards getting the SIV as they would have attended during this period with the express purpose of getting the SIV. As the survey was anonymous, we do not have data on non-responders. As such, we cannot rule out demographic differences between responders and non-responders which could equate to a selection bias.

The authors are unaware at this time of any other studies which investigate the impact of COVID-19 on the uptake of, and attitudes towards the SIV in Ireland. In the respondents of our survey, 76% of patients had become more inclined to take the SIV due to the COVID-19 pandemic. This pattern was also seen globally following the 2009 H1N1 pandemic but increases in SIV uptake were not maintained in the years following.¹⁷ While general public health concerns were a factor in the increased uptake (44.2% wanted to protect friends and family from illness), it cannot be assumed that the increased uptake of SIV this year will be sustained in the years coming. 22.4% received the SIV this year in the belief that it would offer some protection against COVID-19. With a COVID-19 vaccine now available¹³ we cannot say this factor will be relevant in years to come. Further research is required to determine whether the increased uptake of SIV is sustained in future years.

Declaration of Conflicts of Interest:

No author has any conflict of interest to declare.

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