

An investigation of the Canadian Longitudinal Study on Aging's data on influenza vaccine uptake among Canadian adults before and during the COVID-19 pandemic (CLSA)

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ABSTRACT

Understanding how influenza vaccine uptake changed during the 2020/2021 influenza season compared to past pre-pandemic seasons, as well as determining the link between prior influenza vaccination and willingness to get the COVID-19 vaccine, is a top objective. We studied data from a large, nationally representative cohort of Canadian citizens aged 50 and older three times between 2015 and 2020 to determine influenza vaccination status. Using logistic regression models, we looked at changes in self-reported influenza vaccine uptake, predictors of influenza vaccine uptake in 2020/2021, and the relationship between influenza vaccination history and self-reported COVID-19 vaccine willingness. Influenza vaccination rose with time among the 23,385 individuals assessed for goals 1–2: 14,114 (60.4 percent) in 2015–2018, 15,692 (67.1 percent) in 2019/2020, and 19,186

(82.0 percent) in 2020/2021 (combining those previously vaccinated and those expecting to acquire a vaccine). After accounting for multiple health and pandemic-related factors, history of influenza vaccination was most strongly associated with influenza vaccination in 2020/2021 (aOR 147.9 (95 percent CI: 120.9–180.9)). This association remained after accounting for multiple health and pandemic-related factors (aOR 140.3 (95 percent CI: 114.5–171.8)). Those who were most concerned about COVID-19 were also more likely to report influenza vaccination in autumn 2020, whereas those who said the pandemic had had a particularly negative impact were less likely to be vaccinated. Prior influenza vaccination was most strongly associated with willingness to get a COVID-19 vaccine (aOR 15.1 (95 percent CI: 13.5–16.8)) for those who had received influenza vaccine at all previous time points versus none) among 23,819 participants with information on COVID-19 vaccine willingness during the last quarter of 2020 (aim 3). The impact of prior immunization in promoting vaccine uptake and willingness is shown in this study. Efforts to boost influenza and COVID-19 vaccine coverage should focus on those who don't get immunizations on a regular basis, regardless of their demographics.

Key Words: COVID 19; Influenza; Vaccines

INTRODUCTION

Influenza is one of Canada's top 10 causes of mortality, accounting for about 12,200 hospitalizations and 3,500 fatalities per year. When compared to younger people, those 65 and older had a higher risk of severe illness, hospitalization, and mortality from influenza. In Canada, influenza vaccination is strongly recommended for seniors 65 and older, adults 18–64 with chronic medical conditions (CMC), and other vulnerable groups who are at risk of influenza-related complications or hospitalization. Furthermore, the Public Health Agency of Canada (PHAC) has set lofty targets to boost influenza vaccination uptake among these populations to 80% by 2025. According to the Seasonal Influenza Vaccination Coverage Survey, coverage among Canadian people 65 and older has remained reasonably consistent below the goal threshold (about 70%) throughout the seasons 2016–2017 and 2019–2020. With the spread of SARS-CoV-2 since the early months of 2020, even more, emphasis has been placed on the importance of influenza vaccination, particularly among those at risk of severe influenza outcomes, who are also at increased risk of severe disease, complications, and death due to SARS-CoV-2 infection both to prevent influenza and to reduce the burden on the healthcare system. The coronavirus disease 2019 (COVID-19) pandemic, on the other hand, has inspired a re-examination of how people perceive illness risk, how they engage with health services, including vaccination, and how they feel about current vaccinations and newly produced COVID-19 vaccines. There are also many unanswered uncertainties regarding how the pandemic may affect vaccination adoption for other infectious illnesses.

As a result, it's vital to assess how influenza vaccine uptake and desire to be vaccinated altered in the Northern Hemisphere during the 2020/2021 influenza season compared to previous pre-pandemic seasons. Furthermore, knowing if a person's past history of influenza vaccination over numerous

seasons is linked to their desire to get the COVID-19 vaccine might assist inform vaccine decision-making and identify people who are least likely to receive the vaccine. The pre-pandemic datasets from the Canadian Longitudinal Study on Aging (CLSA), as well as the 2020 CLSA COVID-19 Questionnaire Study data, provide an opportunity to answer these questions and identify those who would benefit the most from interventions to increase influenza vaccine, COVID-19 vaccine, or both vaccine uptake in order to inform vaccination efforts during the 2021/2022 influenza season and beyond, and optimally prevent morbidity and mortality caused by influenza. Our primary goals were to see if and how influenza vaccine uptake among Canadian adults (overall and across subgroups of interest) changed during the COVID-19 pandemic in the 2020/2021 influenza season compared to previous years, to look at factors associated with influenza vaccine uptake in the 2020/2021 influenza season, and to see if willingness to receive a COVID-19 vaccine during the same period was associated with prior influenza vaccination.

We constructed a composite variable that indicated whether individuals had received an influenza vaccine at any prior time point to explore the relationship between history of influenza vaccination and influenza vaccine uptake at T3 (never, only at T1, only at T2, at both time points). Prior influenza vaccination history was classified as "not vaccinated at any time point (T1 to T3)," "vaccinated at one Time point only (T1 or T2 or T3)," "vaccinated at two of three time points," "vaccinated at all three time points (T1 to T3)," or "data not available for one or more time points" to assess the relationship between prior influenza vaccination history and participants' willingness to receive a COVID-19 vaccine. We considered the following sociodemographic variables in each of our analyses: sex at birth (male or female), age group (50–54, 55–64, 65–74, 75 and older; years), race (white or other than white), highest education level (less than secondary school graduation, secondary school graduation no post-secondary education,

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some post-secondary education, post-secondary degree/diploma), annual household income (in Canadian dollars; \$20,000, \$20,000 to \$50,000, \$50,000 to \$100,000, \$100,000 and up) (urban or rural). Depending on the analysis, age categories were derived from the individuals' ages recorded at T1, T2, or T3. The CLSA baseline study visit (T0) provided data on sex, race, and education; the follow-up 1 study visit (T1) provided data on household income; and the COVID-19 baseline survey provided data on province and geographic region of residence (T2). These characteristics were believed to be rather constant in elderly persons throughout time.

Aside from the sociodemographic characteristics mentioned above, we looked at the link between the desired outcomes and important indicators of an individual's health state in 2020 as well as their experience with the pandemic. Having chronic conditions known to increase the risk of severe or fatal COVID-19, such as asthma, chronic obstructive pulmonary disease (COPD), other chronic lung disease, diabetes, hypertension, heart disease, cancer, heart/lung/kidney/liver/pancreas failure; autoimmune disorder, HIV infection; self-reported likelihood of SARS-CoV-2 infection (very worried). Finally, we looked at self-reported experience of the COVID-19 pandemic's impact on the participant and household, measured on a scale of 1 to 5 (very negative); this variable came from a question that was intentionally broad in scope, allowing participants to consider a wide range of experiences related to the pandemic and weigh the impact of those experiences in the context of their own lives. The COVID-19 baseline survey (T2) was used to gather data on self-reported chronic diseases, whereas the exit survey was used to collect data on all other variable(T3).

Canada has among of the highest influenza vaccination coverage rates among older persons, and prior polls have revealed that the clear majority of older Canadians feel immunizations are important [5]. Despite this, influenza vaccination uptake has remained below goal in recent years, especially among high-risk populations, owing to a low perception of influenza vulnerability. With the introduction of COVID-19, people's perceptions of health risks and vaccination attitudes are likely to have shifted. With the primary goal of better understanding influenza vaccination uptake during the 2020/2021 season, we undertook a detailed analysis of data from a large, nationally representative, and well-established population-based cohort of older Canadians. According to our findings, influenza vaccination uptake among

Canadians aged 50 and older rose during the 2020/2021 season compared to the previous year (from 67.1 percent [95 percent CI: 66.5–67.7] to 82.0 percent [95 percent CI: 81.6–82.5]), especially among those aged 50 to 64. When comparing these estimates, however, caution is advised because individuals who had not yet received an influenza vaccine but planned to do so during the 2020/2021 season were combined with those who had already been vaccinated, potentially overestimating influenza vaccine uptake if some respondents did not eventually follow through. Nonetheless, it's worth mentioning that a sizable majority of the study's participants stated that they planned to get an influenza vaccination.

CONCLUSION

With the influenza season of 2020/2021 coinciding with ongoing efforts to prevent COVID-19 and the relaxation of many social distancing, masking, and other public health prevention measures, optimizing vaccination campaigns and reaching those subgroups least likely to be vaccinated against both diseases remain top priorities. Our research sheds light on the main determinants of influenza vaccine uptake and willingness to get vaccinated during unprecedented times, and it could be used to inform and improve current approaches aimed at increasing influenza vaccine uptake among populations who do not receive influenza vaccination on a regular basis. The fact that having previously received an influenza vaccination is by far the most important predictor of influenza vaccine uptake as well as desire to acquire the COVID-19 vaccine demonstrates that additional efforts must be made to reach out to people who do not regularly engage with immunization programs. Rather than focusing on sociodemographic groupings, future initiatives focused at improving vaccine uptake and actively encouraging vaccination, particularly among those at high risk for catastrophic consequences, should look into ways to identify and interact with people who have never had immunization. When comparing these estimates, however, caution is advised because individuals who had not yet received an influenza vaccine but planned to do so during the 2020/2021 season were combined with those who had already been vaccinated, potentially overestimating influenza vaccine uptake if some respondents did not eventually follow through. Nonetheless, it's worth mentioning that a sizable majority of the study's participants stated that they planned to get an influenza vaccination.