FACTORS AFFECTING VACCINE UPTAKE: CANADA AND THE UNITED STATES COMPARED

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INTRODUCTION[1]

When COVID-19 vaccination campaigns began in 2021, there were many questions regarding countries' rollout plans, eligibility, and vaccine safety (Christakis, 2020; Fafard et al. 2021). As vaccine rollout expanded over time, different provinces and states used different strategies and initiatives to encourage vaccination. In this paper, we briefly discuss vaccination rates in Canada and the United States as of August 2022, explore the demographics of who has been vaccinated and compare the two countries' rollout strategies. By doing this, we increase the understanding of how different factors affect vaccine uptake as well as vaccine hesitancy.

Additionally, this work contributes to future vaccination campaigns - as we know COVID-19 will not be the last pandemic.

VACCINATION RATES IN CANADA AND THE UNITED STATES

According to the Government of Canada (2022b), as of July 17, 81.9% of the total Canadian population has been fully vaccinated (received at least two doses or one dose depending on the vaccine type). When including only the Canadian population 5 years and older, the percentage rises to 86.2% due to older age groups having earlier access to vaccines (Government of Canada, 2022b; Government of Ontario, 2021). Among Canadian children 5 to 11 years old, 42.4% are fully vaccinated and this low percentage can be explained by children having later access to vaccines (Government of Canada, 2022b; Mervosh, 2021). In the United States, as of July 27, 2022, 67.2% of the total US population has been fully vaccinated (Centers for Disease Control and Prevention [CDC], 2022c). Among the US population 5 years and older, the percentage also increases slightly to 71.5% and decreases to 30.3% for children 5 to 11 years (CDC, 2022c). Based on these numbers, Canada has a higher percentage of its population fully vaccinated than the United States.

Canada also shows less variation in vaccination levels among its provinces and territories than the United States does among its states. The Canadian province or territory with the highest percentage of its population fully vaccinated is 92.6% while the lowest is 74.7% (Government of Canada, 2022b). The range between these two provinces/territories is just under 18.0%. In the United States, the state with the highest percentage of its population fully vaccinated is 84.5% while the lowest is 51.7% (CDC, 2022d). The range between these two states' vaccination levels is over 32.0%. This suggests that there is more variation in vaccination rates in the United States than in Canada. This result may be explained by greater political division in the United States than in Canada (Dimock & Wike, 2020).

DEMOGRAPHICS OF THE VACCINATED AND UNVACCINATED IN CANADA AND THE UNITED STATES

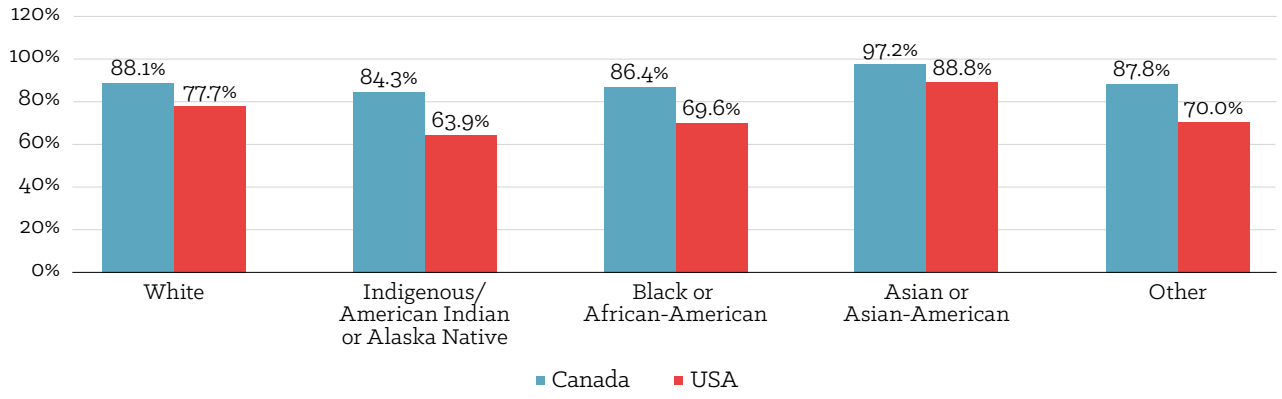
Looking at vaccine hesitancy by race/ethnicity and Indigeneity in Canada and the United States, some differences appear. Asian Canadians and Asian Americans were the most likely to indicate they are fully vaccinated (97.20% and 88.8% respectively), while Black Canadians, Black Americans and Indigenous peoples were the least likely to indicate they were vaccinated in both countries. For some racialized groups, the reported decrease in willingness to get vaccinated can be attributed to a long history of medical experimentation by the government and healthcare system, resulting in mistrust (McKenna, 2020; Twohey, 2021). However, these groups have a higher risk of severe illness from the virus (Mude et al., 2021; Mosby & Swindrowich, 2021). The largest disparity among one ethnicity in Canada as compared to the United States is Indigenous and American Indian or Alaska Natives with Indigenous respondents in Canada being over 20.0% more likely to be vaccinated than Indigenous respondents in the United States.

In general, older age groups have higher vaccination rates than younger age groups. COVID-19 posed increased health risks to older individuals; therefore, when vaccines became available, older age groups received priority (CDC, 2022e; Government of Ontario, 2021). In Canada, 95.0% of individuals 50 years and older are fully vaccinated (Government of Canada, 2022b). For Canadians between the ages of 18–49, 87.4% are fully vaccinated and among those 12–17, 83.89% are fully vaccinated (Government of Canada, 2022b). In the United States, the same trend is seen but overall, with lower rates of full vaccination. For Americans 50 years and older, 87.1% are fully vaccinated, for those ages 18–49 it is 69.1%, and for children ages 12–17 it is 60.2% (CDC, 2022d).

The data we collected is consistent with the national data trends of vaccination rates overall being higher in Canada than in the United States and older age groups have higher vaccination rates than younger age groups. We also found that there were fewer disparities among the age groups in Canada than in the United States. In Canada, the reported rates of full vaccination by age group ranged from 82.3% to 91.0% creating a difference of under 9.0%. In the United States, the reported rates of full vaccination by age group ranged from 65.7% to 81.3% creating a gap of over 15.0%. The gap between the age groups with the highest and lowest rates of full vaccination was larger in the United States reported responses than in Canadian responses.

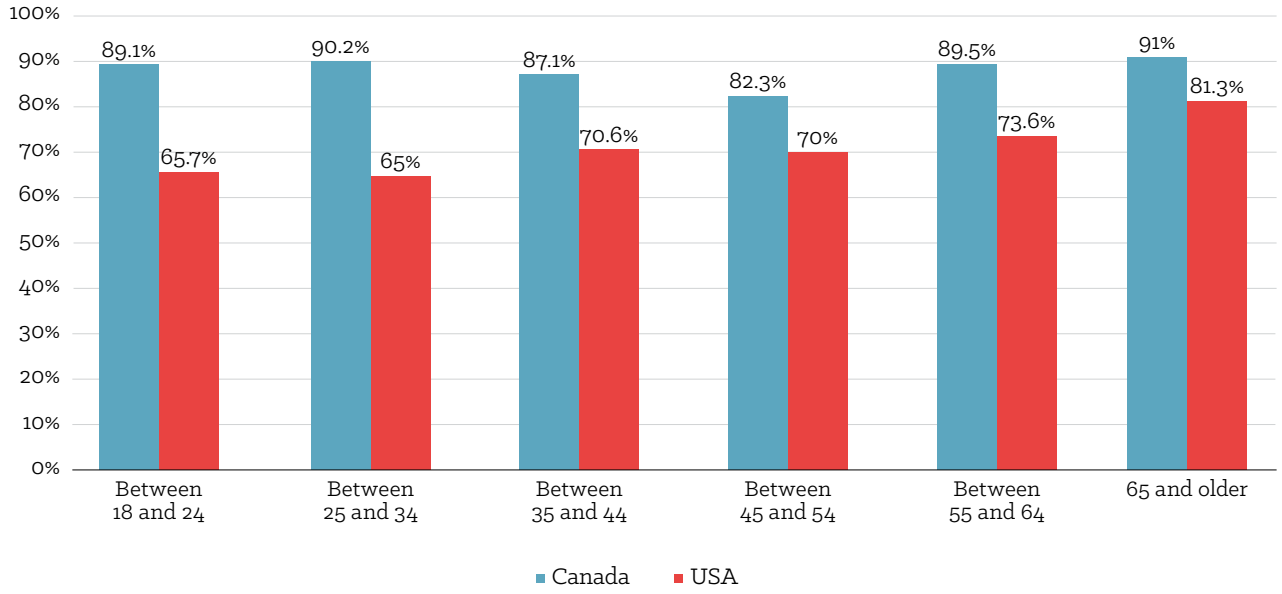
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FIGURE 1. VACCINATION RATES IN CANADA AND THE UNITED STATES BY ETHNICITY.



Sources: Data collection: March 21, 2022. N = 6600.

FIGURE 2. VACCINATIONS BY AGE IN CANADA AND THE UNITED STATES.



Sources: Data collection: March 21, 2022. N = 6600.

BOOSTER UPTAKE IN CANADA AND THE UNITED STATES

The effectiveness of COVID-19 vaccines has shown to wane over time, therefore 3rd and 4th doses (i.e., boosters) have been recommended to increase immune protection against the virus and reduce severe illness (Ontario Ministry of Health, 2022). The percentage of Canadians between the ages of 18–49 years that have received their first booster dose is 44.5% (Government of Canada, 2022b). In the United States, the percentage of Americans between 18–49 years that have received their first booster dose is 27.3% (CDC, 2022d). For Canadians ages 50 and older, the percentage increases to 79.4% and for Americans, it also increases to 55.1% (Government of Canada, 2022b; CDC, 2022d). In terms of the second booster dose, the percentage of Canadians ages 50 and older who have received their second booster shot is 33.7% and for Americans, it is 18.35% (Government of Canada, 2022b; CDC, 2022d). These numbers indicate that uptake in booster doses in Canada and the United States is low compared to uptake for the two initial doses, but in Canada uptake in booster doses is higher than in the United States.

The low uptake in COVID-19 booster doses in Canada and the United States can be attributed to a few reasons. First, being "fully vaccinated" and having proof of vaccination was a

requirement in Canada and the United States for many workplaces, airlines, and other public places, however, booster doses were often only a recommendation (CDC, 2022a; Gollom, 2021; McKendrick, 2021; Ontario Ministry of Health, 2022). This may have caused people to feel reluctant to receive booster doses. The later approval and eligibility of vaccines for younger age groups also limited some from getting booster doses (Mervosh, 2021; Government of Ontario, 2021). While the CDC (2022b) now recommends a first booster dose to anyone 5 years and older, they only recommend a second booster dose to individuals 50 years and older and immunocompromised individuals. Regarding the first booster dose, younger age groups overall received their two initial doses comparatively later and may have not had enough time pass (at least 5–6 months between the initial doses and the first booster dose is recommended) to be eligible for their first booster dose (CDC, 2022b; Government of Canada, 2022a). For the second booster dose, while eligibility varies by region (in some places it is 18 years or older while in other places it is 50 years or older), many younger age groups are currently ineligible (Benchetrit, 2022).

VACCINE ROLLOUT IN CANADA AND THE UNITED STATES

Overall, vaccine rollout in both Canada and the United States was similar. While each province/territory and state created their rollout phases, vaccines were prioritized for frontline and healthcare workers, residents of long-term care facilities that have been subjected to COVID-19 outbreaks (Statistics Canada, 2021), individuals at risk due to their age, those who are immunocompromised and Indigenous communities (Chabin et al., 2021). Indigenous communities in both countries also organized vaccination clinics and vaccine rollouts for their communities (FNHA, 2021; Powder, 2021). Following the initial priority groups, eligibility expanded often by age group, although continuing the focus on the marginalized and immunocompromised populations (Chabin et al., 2021).

In Canada, the province of Ontario's vaccine rollout plan was divided into three broad phases (Government of Ontario, 2021). Phase 1 began with getting "high-risk populations" vaccinated. High-risk populations included healthcare workers, Indigenous adults, and adults 80 years and older. Phase 2 added people with certain health conditions, people whose jobs demanded they work in person and individuals 55 years old and older. Finally, phase 3 included all others who were not previously eligible. Vaccines were delivered through many means such as hospital site clinics, mass vaccination clinics and pop-up clinics (Government of Ontario, 2021).

In the United States, the Californian county of San Diego's vaccine rollout plan was divided into two phases with the first phase broken up into lettered phases (Government of San Diego County, 2021). Phase1A aimed at vaccinating hospital staff, homecare providers and other medical staff. Phase 1B added those 75 years and older, then 65 and older and people at risk due to their occupation. Phase 1C included those with certain medical conditions and disabilities that would put them at risk, people living in congregated settings (i.e., correctional settings) and public transit workers. Phase 2 in Spring 2021 was added for those 50 and older, then 16 and older and later 12 and older (Government of San Diego County, 2021).

VACCINATION CAMPAIGNS, AND OTHER FACTORS AFFECTING VACCINATION RATES

Prior research into vaccination efforts indicates that financial incentives are a moderately effective method to increase vaccination rates (Duong, 2021; Labos, 2021). However, they remain a questionable approach as vaccination should be seen as an effort to increase herd immunity rather than increase the material gain (Campos-Mercade et al., 2021). Each country approached vaccine rollout differently, and even within some countries, different strategies produced different results. In the US, vaccine lotteries were created in several states and President Biden encouraged states to award $100 to individuals who received COVID-19 vaccinations (Labos, 2021). In Canada, several provinces, including Manitoba, Alberta and Quebec created vaccine lotteries to encourage vaccination (Jonas, 2021; Province of Manitoba, 2021; Dubé et al., 2022). These lotteries include monetary awards and scholarships to encourage the younger population to get vaccinated (Province of Manitoba, 2021).

Monetary incentives, however, were not the only type of incentives used to increase COVID-19 vaccinations. Some states had even more creative solutions. In New York, receiving the vaccine led to free tickets to baseball games and free transit for a week (Boynton, 2021). In New Jersey, a campaign called "Shot and a Beer" was held where receiving one dose of a COVID-19 vaccine led to a free beer at participating businesses and in Maine, the "Shot to Get Outdoors" campaign gave vaccinated individuals a free hunting and fishing license at their parks (Boynton, 2021). Additionally, many places offered free transportation to vaccination sites through arrangements with transport companies (Boynton, 2021; MacLean, 2020). Non-monetary incentives were also present in Canada where getting vaccinated led to freebies and discounts (Deschamps, 2021).

In Canada, the enactment of vaccination mandates doubled vaccination appointments in British Columbia, Ontario, and Quebec, especially when they became required for access to indoor public spaces and travel (Duong, 2021). In Manitoba, many indicated that receiving information regarding the vaccine was a significant factor in their decision to receive the vaccine (Duong, 2021).

CONCLUSION

The comparison of Canada and the United States allows for the examination of how the two countries' vaccination efforts and uptake resemble and differ from one another. Overall, our research found that vaccine uptake is higher in Canada than in the United States, there is less variation in vaccine uptake in Canada than in the United States, and there are differences across demographic factors such as age, race/ethnicity, and Indigeneity. Our findings are consistent with existing literature on vaccine hesitancy regarding the racialized groups who are most and least likely to be vaccine-hesitant. The groups that are more likely to be vaccine-hesitant (Black Canadians/Americans and Indigenous/American Indians) are also at a higher risk of being infected with COVID-19 and have higher mortality rates than general populations (Mude et al., 2021; Mosby & Swindrowich, 2021). Efforts to vaccinate vulnerable populations in supportive and understanding ways should continue while future research should focus on additional factors that affect vaccine uptake, including the role of geographical location, political affiliation, and income markers.

REFERENCES

Benchetrit, J. (2022, July 13). "Who is eligible for a 4th COVID-19 vaccine dose? A province-by-province breakdown." CBC News. www.cbc.ca/news/canada/fourth-dose-eligibility-1.6518082

Boynton, S. (2021, May 12). "From free beer to $1 million: What U.S. states are offering for COVID-19 vaccinations." Global News. https://globalnews.ca/news/7857642/us-covid-vaccine-incentives

Campos-Mercade, P., Meier, A., Schneider, F., Meier, S, Pope, D., & Wengström, E. (2021). *Monetary incentives increase COVID-19 vaccinations. Science, 374*(6569), 879–882. 10.1126/science.abm0475

Centers for Disease Control and Prevention. (2022a, July 12). "Your CDC COVID-19 vaccination record and vaccination card." www.cdc.gov/coronavirus/2019-ncov/vaccines/vaccination-card.html

Centers for Disease Control and Prevention. (2022b, July 20). "COVID-19 vaccine boosters." www.cdc.gov/coronavirus/2019-ncov/vaccines/booster-shot.html

Centers for Disease Control and Prevention. (2022c, July 28). "COVID-19 vaccinations in the United States." https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-count-total

Centers for Disease Control and Prevention. (2022d, August 11). "COVID-19 vaccinations in the United States." https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-people-fully-percent-total

Centers for Disease Control and Prevention. (2022e, August 11). "Factors that affect your risk of getting sick from COVID-19." www.cdc.gov/coronavirus/2019-ncov/your-health/risks-getting-very-sick.html

Chabin, J., Fasanella, C., Deidan, F., & Canava, I. (2021). "Vaccination progress in Canada, Mexico and the United States [Infographic]." Wilson Center. www.wilsoncenter.org/article/resource-infographic-vaccination-progress-canada-mexico-and-united-states

Christakis, N. A. (2020). *Apollo's arrow: The profound and enduring impact of coronavirus on the way we live.* Little, Brown Spark.

Deschamps, T. (2021, May 9). "Canadian companies offer freebies, discounts to customers vaccinated against COVID-19." Global News. https://globalnews.ca/news/7846879/canadian-companies-discounts-vaccinated

Dimock, M., & Wike, R. (2020, November 13). "America is exceptional in the nature of its political divide." Pew Research Center. www.pewresearch.org/fact-tank/2020/11/13/america-is-exceptional-in-the-nature-of-its-political-divide/

Dubé, È., Dionne, M., & Rochette, L. (2022). "Exploring the impact of Quebec's vaccine lottery and vaccine passports on COVID-19 vaccination intention: Findings from repeated cross-sectional surveys." *Human Vaccines & Immunotherapeutics*, 2100168. https://doi.org/10.1080/21645515.2022.2100168

Duong, D. (2021). "Closing Canada's COVID-19 vaccination gap." *Canadian Medical Association Journal, 193*(38), E1505–06. https://doi-org.uml.idm.oclc.org/10.1503/cmaj.1095963

Fafard, P., Cassola, A., MacAuley, M., & Palkovits, M. (2021). "The politics and policy of Canada's COVID-19 response. In Greer, S. L., King E. J., Fonseca, E. M., & Peralta- Santos, A." (Eds.), *Coronavirus politics: The comparative politics and policy of COVID-19* (pp. 460–477). University of Michigan Press. https://doi.org/10.3998/mpub.11927713

First Nations Health Authority. (2021, March 31). "COVID-19 vaccine clinics now open to all Indigenous People 18+." www.fnha.ca/about/news-and-events/news/covid-19-vaccine-clinics-now-open-to-all-indigenous-people-18-and-over

Gollom, M. (2021, September 20). "Why vaccine passports may be an important tool in boosting vaccination rates." CBC News. www.cbc.ca/news/health/vaccine-passports-vaccination-boost-provinces-1.6178203?fbclid=IwAR0Eh9kISqlS-Dgt0xQstl6b9xDmME4l4ORaED85ZPTPxC5uYKwraXJy6IpQ

Government of Canada. (2022a, June 29). "Interim guidance on planning considerations for a fall 2022, COVID-19 vaccine booster program in Canada." www.canada.ca/en/public-health/services/immunization/national-advisory-committee-on-immunization-naci/guidance-planning-fall-2022-covid-19-vaccine-booster.html

Government of Canada. (2022b, July 26). "COVID-19 vaccination in Canada." https://health-infobase.canada.ca/covid-19/vaccination-coverage

Government of Ontario. (2021, September 14). "Ontario's COVID-19 vaccination plan." https://covid-19.ontario.ca/ontarios-covid-19-vaccination-plan

Government of San Diego County. (2022, July 26). "COVID-19 vaccination phases. Coronavirus disease 2019." www.sandiegocounty.gov/content/sdc/hhsa/programs/phs/community_epidemiology/dc/2019-nCoV/vaccines/phases.html

Jonas, S. (2021, July 26). "Quebec's vaccine lottery kicks off to boost lagging vaccination rates ahead of return to school." CBC News. www.cbc.ca/news/canada/montreal/vaccine-lottery-underway-quebec-boost-lagging-rates-1.6116942

Labos, C. (2021, August 6). "Do vaccine incentives actually work?: The short answer, research suggests, is a qualified yes." McGill. www.mcgill.ca/oss/article/covid-19-health/do-vaccine-incentives-actually-work

MacLean, C. (2020, October 15). "Free rides offered to Winnipeg COVID-19 test sites, but many unaware of service." CBC News. www.cbc.ca/news/canada/manitoba/wrha-covid-19-ride-service-1.5762466

McKendrick, D. (2021, June 8). "Manitoba unveils immunization cards for fully vaccinated people." CTV News. https://winnipeg.ctvnews.ca/manitoba-unveils-immunization-cards-for-fully-vaccinated-people-1.5460924

McKenna, M. (2020, November 2). "Winning Trust for a Vaccine Means Confronting Medical Racism." Wired. www.wired.com/story/winning-trust-for-a-vaccine-means-confronting-medical-racism

Mervosh, S. (2021, September 20). "'I Just Got My Vaccine': U.S. Rollout Expands to Children Ages 12 to 15." The New York Times. www.nytimes.com/2021/05/13/us/coronavirus-vaccine-children-ages-12-15.html

Mosby, I., & Swidrovich, J. (2021). "Medical experimentation and the roots of COVID-19 vaccine hesitancy among Indigenous Peoples in Canada." *Canadian Medical Association Journal, 193*(11), E381–E383. https://doi.org/10.1503/cmaj.210112

Mude, W., Oguoma, V. M., Nyanhanda, T., Mwanri, L., & Njue, C. (2021). "Racial disparities in COVID-19 pandemic cases, hospitalizations, and deaths: A systematic review and meta-analysis." *Journal of Global Health, 11*, 05015. https://doi.org/10.7189/jogh.11.05015

Ontario Ministry of Health. (2022, July 22). "COVID-19 vaccine booster recommendations." www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/docs/vaccine/COVID-19_vaccine_third_dose_recommendations.pdf

Powder, J. (2021, August 5). "Keys to the Navajo Nation's COVID-19 Vaccination Success." John Hopkins. https://publichealth.jhu.edu/2021/keys-to-the-navajo-nations-covid-19-vaccination-success

Province of Manitoba. (2021, June 9). "New vaccine lottery to encourage immunizations for all eligible Manitobans." https://news.gov.mb.ca/news/index.html?item=51427

Statistics Canada (2021, June 10). "COVID-19 outbreaks in nursing and seniors' homes associated with certain facility characteristics." https://www150.statcan.gc.ca/n1/daily-quotidien/210610/dq210610c-eng.htm

Twohey, M. (2021, May 14). "Who gets a vaccine first? U.S. considers race in coronavirus plans." The New York Times. www.nytimes.com/2020/07/09/us/coronavirus-vaccine.html