An Examination of Political Orientation as a Determinant of Vaccination Outcomes and Health Mitigation Behaviours During the COVID-19 Pandemic

by

Alkarim Billawala

A thesis

presented to the University of Waterloo

in fulfilment of the

thesis requirement for the degree of

Master of Science

in

Public Health Sciences

Waterloo, Ontario, Canada, 2023

Author's Declaration

This thesis consists of material all of which I authored or co-authored: see Statement of Contributions included in the thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Statement of Contributions

This thesis is the work of Alkarim Billawala with the collaboration of his supervisor, Dr. Peter Hall, and advisory committee members, Dr. Mark Ferro, Dr. Geoffrey Fong, and Dr. Mark Oremus.

This thesis used data that was collected in the Canada COVID-19 Experiences Survey, as part of the Canada COVID-19 Experiences Project.

Abstract

Background: Vaccine hesitancy has been a longstanding challenge for public health. However, the COVID-19 pandemic brought a strong push to explore the issue with renewed vigor. Prior studies have identified social cognitive and demographic factors as determinants of vaccine hesitancy and mitigation behaviors more broadly. However, political factors seemed to be especially important during the COVID-19 pandemic. The literature examining political orientation as a predictor of COVID-19 vaccination and other mitigation behaviors focussed largely on the United States and the United Kingdom, with few studies exploring the issue within the Canadian context. This project utilized data from the Canadian COVID-19 Experiences Survey (CCES)—part of the Canadian COVID-19 Experiences Project (CCEP)—to assess the relationship between political orientation and COVID-19 mitigation outcomes in a national sample.

Specific Aims: The primary aim of this project was to test political orientation as a predictor of vaccination status and COVID-19 mitigation behaviour consistency, and to examine if this relationship differs by immunocompromised status (IC). The secondary aim was to examine the association between political orientation and reliance on a variety of information sources (e.g., social media, health professionals, family members). The third and final aim was to examine the association between political orientation and change in both vaccination status and mitigation behaviour frequency between Waves 1 and 2 of the survey. It was hypothesized that relatively more right leaning political orientation would be associated with lower likelihood of being vaccinated, lower consistency in mitigation behaviors, and more reliance on non-traditional information sources for information about COVID-19.

Methods: Data from Wave 1 (September 28th, 2021, to October 21st, 2021) and Wave 2 (March 3rd to March 21st, 2022) of CCES was used in a secondary analysis. Wave 1 had a total sample size of 1958, with 983 (50.2%) fully vaccinated, 848 (43.3%) unvaccinated, and 127 (6.5%) with 1 dose and no intent to finish. Wave 2 had a total sample size of 1848, with 1010 (54.7 %) fully vaccinated, 825 (44.6 %) vaccine hesitant, and 13 (7.0%) non-hesitant single-dose. Logistic regression was used to assess the association between political orientation and vaccination status. Multivariate general linear modelling was used to examine the association between political orientation, mitigation behaviour consistency and information source reliance. Likewise, multivariate general linear modelling was also used in prospective analyses to examine the

association between political orientation and change in vaccination status and mitigation behaviour consistency. Moderation by immunocompromised status—for vaccine uptake and mitigation behaviour consistency—and covariates (demographic factors, etc.) was also examined.

Results: Relatively right-leaning political orientation was identified as a significant predictor of reduced odds of being vaccinated in Wave 1 (fully adjusted model: OR=.35; 95% CI = .30, .41) and Wave 2 (fully adjusted model: OR=.33; 95% CI = .29, .39). Moderation by immunocompromised status was observed to be significant in Wave 1 (IC OR=.58; 95% CI = .33, 1.02; non-IC OR=.31; 95% CI = .26, .36), but not in Wave 2. Relatively right-leaning political orientation was also significantly associated with decreased mitigation behaviour consistency in Wave 1 (fully adjusted model: masking F=3.988, p <.001, η_p^2= .229; distancing F=3.494, p <.001, η_p^2= .206; hand hygiene F=1.767, p <.001, η_p^2= .116) and Wave 2. Moderation by immunocompromised status was significant for all three behaviours in Wave 1 for raw (masking F=5.463 (1, 1655), p =.0195; social distancing F=4.9329 (1, 1652), p =.0265; hand hygiene F=9.4275 (1, 1653), p =.0022) and partially adjusted models (only hand hygiene was significant in fully adjusted models). Stratifying by immunocompromised status revealed that effects were stronger for immunocompromised respondents than those who were not immunocompromised. In Wave 2, only masking was significantly moderated in unadjusted models, however the effect was stronger for non-immunocompromised respondents (Effect=.1065, p<.001) than for immunocompromised respondents (Effect=.0612, p=.0032). Reliance on all sources of information, except friends, was significantly predicted by relatively right-leaning political orientation in Wave 1. In Wave 2 only religion, print media, television, and other sources were significantly associated with relatively right-leaning political orientation. Lastly, prospective analyses indicated that relatively right-leaning political orientation was associated with significant decreases in masking, distancing, and hand hygiene between Waves 1 and 2 in raw and adjusted models (fully adjusted model: masking F=2.470, p <.001, η_p^2= .221; distancing F=1.451, p =.005, η_p^2= .143; hand hygiene F=1.280, p =.045, η_p^2= .128). However, change in vaccination was not significantly predicted by political orientation, across any model.

Conclusion: Relatively right-leaning political orientation was observed to be a significant predictor of numerous COVID-19 related health and behavioural outcomes. Relatively greater right-wing orientation was associated with significantly reduced odds of being vaccinated, and

reduced consistency of masking, social distancing, and hand hygiene. Immunocompromised status moderated these associations, in both expected and unexpected ways. The findings of this study were largely in line with existing literature, but provide important insight into the Canadian context, and may serve as a tool to guide future decision making for public health stakeholders.

Acknowledgements

This thesis is the result of the effort of numerous individuals without whom I could not have accomplished this work. Firstly, I need to thank my supervisor, Dr. Peter Hall for his guidance, mentorship, and leadership in creating an open and productive environment within the Prevention Neuroscience Lab, where I was allowed to pursue a project that reflected my interests and passions. I have been privileged to work alongside and learn from you and all the other members of our team.

I would like to sincerely express my gratitude to all members of the team who worked on the Canada COVID-19 Experiences Survey, that data source upon which this thesis was written. Reaching this milestone would not have been possible without all the efforts you have put forth.

I would like to thank my committee members, Dr. Mark Ferro, Dr. Geoffrey Fong, and Dr. Mark Oremus for their guidance, feedback, and support. Your incisive questioning and robust feedback have allowed me to become a better writer, a more focused researcher, and a more critical thinker. To my colleagues in the Prevention Neuroscience Lab: Anna, Nazmus, and Jess, thank you for your support and friendship during my time with the lab.

To my family and friends, I am more than lucky to have you present in my life. Your support, guidance and company has been invaluable along this journey and your presence has helped to keep me grounded and focused. To Bear, the best dog a man can have, thank you for helping give me perspective every day and reminding me about the whimsy of even the simplest or most mundane things in life.

To my physician mentors, Dr. Winson Cheung and Dr. Vanessa Krause, thank you for opening the first door for me, and allowing me to have some of the most formative experiences of my early adulthood. It has been instrumental in determining the path I have chosen to pursue.

Lastly, I would be remiss not to acknowledge the participant of CCES, whose willingness to engage in research with intention and honesty allow this work to continue.

Table of Contents

Author's Declaration ..... *ii*
Statement of Contributions ..... *iii*
Abstract ..... *iv*
Acknowledgements ..... *vii*
List of Figures ..... *x*
List of Tables ..... *xi*
List of Abbreviations ..... *xiii*
1. Background *1*
1.1 Introduction to Vaccine Hesitancy, History and Context **1**
1.2 COVID-19 Vaccine Hesitancy: Current State **2**
1.3 Political Orientation and Trust in Media and Government **5**
1.4 Political Orientation and Mitigation Behaviors **7**
1.5 The Influence of Health Status on COVID-19 Mitigation Behaviors **8**
1.6 Conclusion **9**
2. Purpose and Hypotheses *10*
2.1 Purpose **10**
2.2 Hypotheses **10**
2.2.1 Primary Hypotheses 10
2.2.2 Secondary Hypotheses 10
3. Methods *11*
3.1 Sample Frame **11**
3.2 Sample **12**
3.3 Ethics **12**
3.4 Measures **12**
3.4.1 Predictors 13
3.4.2 Primary Outcomes 15
3.4.3 Covariates and Moderators 17
3.5 Statistical Analysis **18**
3.5.1 Models 18
3.5.2 Assumptions 19
4. Summary of Hypotheses and Analytic Tests *20*
5. Results *22*
5.1 Political Orientation Predicting Vaccine Status and Moderating Effects **24**
5.2 Political Orientation Predicting Mitigation Behaviour Adoption and Moderating Effects **26**

5.3 Political Orientation Predicting Information Source Reliance **28**

5.4 Political Orientation Predicting Change in Vaccination Status and Mitigation Behaviours Maintenance **31**

5.5 Perceived Risk **33**

6. Discussion ***34***

6.1 Primary Hypotheses **34**

6.2 Secondary Hypotheses **35**

6.3 Strengths and Limitations **38**

7. Conclusion ***41***

References ***43***

Appendix A: Background and Sampling ***48***

Appendix B: CCES Survey Responses ***52***

Appendix C: Additional Results Tables ***66***

Political Orientation Predicting Vaccine Status and Moderating Effects **66**

Political Orientation Predicting Mitigation Behaviour Adoption and Moderating Effects **70**

Political Orientation Predicting Information Source Reliance **76**

Appendix D: Predictor Index Validation Tests & Observed Power ***81***

List of Figures

Appendix D

Figure D1:	Wave 1 Federal Political Orientation	Page 81
Figure D2:	Wave 1 Provincial Political Orientation	Page 81
Figure D3:	Wave 1 Self-Rated Political Orientation	Page 82
Figure D4:	Wave 1 Principal Component Analysis	Page 82
Figure D5:	Wave 1 Political Orientation Index Frequency Distribution	Page 83
Figure D6:	Wave 2 Political Orientation Index Frequency Distribution	Page 83

List of Tables

Table 1:	Sample Features, Demographic Characteristics, & Baseline Measures for Wave 1 and Wave 2 of CCES	Page 22
Table 2:	Political Orientation and Vaccine Status Main Effects, Summary Table, Wave 1 & 2	Page 24
Table 3:	Political Orientation and Vaccine Status, Immunocompromised Status Moderator Interactions, Wave 1	Page 24
Table 4:	Political Orientation and Vaccine Status, Stratified Fully Adjusted Effects, Wave 1	Page 25
Table 5:	Political Orientation and Mitigation Behaviour, Main Effects Summary Table, Wave 1 & 2	Page 26
Table 6:	Mitigation Behaviour Adoption Wave 1 – Moderation Effects, Fully Adjusted Model	Page 27
Table 7:	Information Source Reliance Wave 1 – Fully Adjusted Model	Page 28
Table 8:	Information Source Reliance Wave 2 – Fully Adjusted Model	Page 30
Table 9:	Vaccination Status Change – Fully Adjusted Model	Page 31
Table 10:	Mitigation Behaviour Change – Fully Adjusted Model	Page 32
Table 11:	Perceived Risk Descriptive Analyses for Immunocompromised Status and Political Orientation	Page 33
Table 12:	Perceived Risk Zero-Order Correlations for Immunocompromised Status and Political Orientation – Wave 1	Page 33
Appendix A		
Table A1:	Vaccine Hesitancy Matrix	Page 48
Table A2:	CCES Wave 1 Sample Vaccine Status Definitions	Page 48
Table A3:	CCE Wave 2 Sample Vaccine Status Definitions	Page 49
Table A4:	Wave 1 Cooperation and Response Rates	Page 50
Table A5:	Wave 2 Cooperation and Response Rates	Page 51
Appendix B		
Table B1:	CCES Selected Questionnaire Responses	Page 52
Appendix C		
Table C1:	Vaccine Status Wave 1 – Unadjusted Model	Page 66
Table C2:	Vaccine Status Wave 1 – Partially Adjusted Model	Page 66
Table C3:	Vaccine Status Wave 1 – Fully Adjusted Model	Page 66
Table C4:	Vaccine Status Wave 2 – Unadjusted Model	Page 67
Table C5:	Vaccine Status Wave 2 – Partially Adjusted Model	Page 67
Table C6:	Vaccine Status Wave 2 – Fully Adjusted Model	Page 68
Table C7:	Political Orientation and Vaccine Status, Immunocompromised Status Moderator Interactions, Wave 2	Page 69

Table C8: Mitigation Behaviour Adoption Wave 1 – Unadjusted Model Page 70
Table C9: Mitigation Behaviour Adoption Wave 1 – Partially Adjusted Model Page 70
Table C10: Mitigation Behaviour Adoption Wave 1- Fully Adjusted Model Page 70
Table C11: Mitigation Behaviour Adoption Wave 1 – Moderation Effects, Unadjusted Model Page 71
Table C12: Mitigation Behaviour Adoption Wave 1 – Moderation Effects, Partially Adjusted Model Page 72
Table C13: Mitigation Behaviour Adoption Wave 2 – Unadjusted Model Page 72
Table C14: Mitigation Behaviour Adoption Wave 2 – Partially Adjusted Model Page 73
Table C15: Mitigation Behaviour Adoption Wave 2 – Fully Adjusted Model Page 73
Table C16: Mitigation Behaviour Adoption Wave 2 – Moderation Effects, Unadjusted Model Page 74
Table C17: Mitigation Behaviour Adoption Wave 2 – Moderation Effects, Partially Adjusted Model Page 74
Table C18: Mitigation Behaviour Adoption Wave 2 – Moderation Effects, Fully Adjusted Model Page 75
Table C19: Information Source Reliance Wave 1 – Unadjusted Model Page 76
Table C20: Information Source Reliance Wave 1 – Partially Adjusted Model Page 76
Table C21: Information Source Reliance Wave 2 – Unadjusted Model Page 77
Table C22: Information Source Reliance Wave 2 – Partially Adjusted Model Page 78
Table C23: Vaccination Status Change – Unadjusted Model Page 79
Table C24: Vaccination Status Change – Partially Adjusted Model Page 79
Table C25: Mitigation Behaviour Change – Unadjusted Model Page 79
Table C26: Mitigation Behaviour Change – Partially Adjusted Model Page 80

Appendix D
Table D1: Wave 1 Inter-Item Correlation Matrix Page 84
Table D2: Wave 1 Component Matrix Page 84
Table D3: Wave 1 Item Total Statistics Page 84
Table D4: Observed Power Wave 1 Mitigation Behaviours Page 84

List of Abbreviations

Coronavirus Disease of 2019 (COVID-19)

COVID-19 Experiences Survey (CCES)

Immunocompromised status (IC)

Odds Ratio (OR)

Food and Drug Administration (FDA)

Trump voter share (TVS)

1. Background

1.1 Introduction to Vaccine Hesitancy, History and Context

During the COVID-19 pandemic, it became clear that vaccine hesitancy posed a threat to public health. Vaccine hesitancy can be defined as a delay or refusal of vaccination, despite wide availability, and may be one of the most pressing challenges public health practitioners have to contend with going forward (MacDonald et al., 2015). Hesitancy is complex, context specific, varies based on time and location, and can be under the influence of several factors (MacDonald et al., 2015). To fully understand vaccine hesitancy during the COVID-19 pandemic, it is illustrative to first examine the pre-pandemic literature on vaccine hesitancy (Salmon et al., 2015).

In the pre-pandemic literature, a major focus was infant and childhood immunizations (MMR, pertussis, etc.) (Dubé et al., 2013). In a prior review, Dube et al. observed that conformity, rather than knowledge, was a significant factor influencing parental decision-making regarding childhood vaccinations (Dubé et al., 2013). Parents with less exposure to vaccine-related media and information were more likely to vaccinate their children than those who actively sought out vaccine information (Dubé et al., 2013; Tickner et al., 2006). Further, prior negative experiences with health services, and feelings of pressure from providers were highlighted as key motivators of vaccine refusal (Busse et al., 2011; Dubé et al., 2013).

In the same review, Dube and colleagues reported that perceptions of vaccine importance, safety, and disease risk also influenced parental decision making (Dubé et al., 2013; Casiday, 2007; Paulussen et al., 2006;Poltorak et al., 2005). With respect to the latter, many parents lacked personal experience with the diseases that childhood vaccines prevent, and therefore, tended to underestimate the effectiveness of immunizations, risks of disease contraction, and the magnitude of disease severity, whilst overestimating the probability of vaccine-related harms (Dubé et al., 2013; Casiday, 2007; Paulussen et al., 2006;Poltorak et al., 2005). Feelings of trust in health institutions and support from health practitioners were also key factors that influenced vaccination likelihood (Brownlie & Howson, 2016; Dubé et al., 2013; Paulussen et al., 2006). Boulware et al. (2003) found that racial disparities, for example, undermined trust in physicians;

specifically, black Americans were less likely to trust physicians and were more worried about experimentation than their white American counterparts. Further, increased media coverage of vaccine controversy was strongly associated with lower trust in vaccines, health institutions and practitioners (François et al., 2005; Poland & Spier, 2010). Likewise, increased usage and participation in social media and the increasing propagation of social media groups centering around anti-vaccine sentiments were also risks for childhood vaccine hesitancy among parents (Sankaranarayanan et al., 2019).

Lastly, in the pre-pandemic literature, notions of social responsibility and subjective norms were strong drivers of vaccine uptake according to Dubé et al. (2013). Likewise, a systematic review by Quadri-Sheriff et al. (2012) found increased rates of childhood vaccination with parents who reported higher rates of peers and family members whose children were vaccinated, feelings of duty to ensure herd immunity and increased desires to protect their communities (Fournet et al., 2018; Ruijs et al., 2012).

MacDonald et al. (2015) developed a matrix (Appendix A, Table A1) which provides a structured framework to assess determinants of vaccine hesitancy, derived off the WHO's "3 C's" model of determinants of vaccine hesitancy: (i) confidence; (ii) complacency; (iii) convenience (SAGE Working Group, 2014). The matrix subdivides influences into contextual (political, socio-cultural, environmental, institutional, economic, etc.), individual and group (personal perceptions, social/peer influences, etc.), and vaccine specific factors (risk of vaccine harm vs benefit of inoculation, recency of vaccine development, administration, and costs) (MacDonald et al., 2015). This framework was used here to organize different aspects of COVID-19 vaccine hesitancy in the existing literature.

1.2 COVID-19 Vaccine Hesitancy: Current State

While many of the factors influencing vaccine hesitancy outlined in the WHO's "3Cs" matrix remained relevant during the COVID-19 pandemic, some further nuance is necessary to understand COVID-19 vaccine hesitancy (Lin et al., 2021; MacDonald et al., 2015). A systematic review of 126 studies by Lin et al. (2021) found variability in vaccine acceptance across countries, regions within countries, different population subgroups and over the course of

the pandemic. At the national level, high vaccine receptivity was common in nations with high trust in central governments, such as the United Kingdom, Denmark, Japan, and China—although rates of compliance in China specifically may be related to the coercive nature of COVID-19 policy enforcement seen under the "Zero COVID" approach adopted by Chinese governmental and health authorities—and lower receptivity was seen in nations such as Russia and France, which historically have lower trust in central governments and/or a history of government malfeasance (Lin et al., 2021; Salomoni et al., 2021; Tian, 2021).

Demographic factors were also important determinants of COVID-19 vaccine receptivity. While higher education was associated with higher rates of vaccination, vaccine hesitancy or refusal was associated with non-college educated, rural location, lower-income, uninsured status —specifically in the United States— and large household size (Baack et al., 2021; Gatwood et al., 2021; Lin et al., 2021; Tram et al., 2021). Similarly, Ruiz & Bell (2021) found that men, older adults, white, college educated, and higher income individuals all had relatively higher intentions to obtain COVID-19 vaccinations. Further, Pennycook et al. (2022) demonstrated that cognitive sophistication—defined as a collection of attributes such as basic science knowledge, cognitive reflection, and numeracy—was a significant positive predictor of vaccine intentions. Further, age was associated with receptivity in a non-linear manner, such that the oldest (55-65+) and youngest (18-24 or 34) cohorts were observed to have higher vaccine receptivity and lower vaccine hesitancy, than middle age groups (Lin et al., 2021; Salomoni et al., 2021). Women refused vaccination more than men globally; however, the inverse was true in the United States (Lin et al., 2021; Salomoni et al., 2021). While the increased vaccine receptivity of the lowest age group was not found to be universal, as Baack et al. (2021) observed, older age groups consistently demonstrated increased vaccine receptivity across multiple reviews (Lin et al., 2021; Ruiz & Bell, 2021; Salmon et al., 2015). The presence of pre-existing, comorbid medical conditions was also associated with increased vaccination in Salomoni et al. (2021) and increased vaccine intentions in Ruiz & Bell (2021). Lastly, black respondents were 40% more likely to reject vaccination on the basis of mistrust or lack of confidence in providers compared to white respondents (Gatwood et al., 2021). On the other hand, Asian respondents (within the United States) had the highest rates of vaccine acceptance overall (Gatwood et al., 2021; Lin et al., 2021).

Similar trends arose when examining individual and vaccine-specific factors. Concerns about vaccine novelty, uncertainty of effectiveness and fear of side effects were fundamental barriers for vaccination identified by Lin et al. (2021) and Mattia et al. (2021). Underestimation of vaccine necessity, inadequate information, prior anti-vaccine sentiments, and incomplete/missing current vaccinations were similarly observed to be associated with increased vaccine hesitancy or refusal (Taylor et al., 2020; Mattia et al., 2021; Lin et al., 2021). Conversely, higher rates of national COVID-19 distress[1], fear of disease severity, increased perceptions of individual risk, prior history of vaccine completion, positive peer/family opinion of vaccines, and notions of social or ethical duty were all positive predictors of vaccine intent or uptake (Lin et al., 2021; Mattia et al., 2021; Pogue et al., 2020; Ruiz & Bell, 2021). Vaccine-specific differences, such as increased efficacy of disease prevention, increased duration of inoculation, increased access to testing results, and local vaccine development were the strongest positive predictors of increased vaccine willingness among American adults (Kreps et al., 2020; Pogue et al., 2020). Vaccines of foreign origin, vaccines with only emergency authorization—as opposed to full Food and Drug Administration (FDA) clearance—and endorsement by a political figure (President Trump) were all associated with decreased vaccine willingness (Kreps et al., 2020).

Contextual factors also play a role in vaccination and mitigation behaviour consistency. Primary concerns associated with COVID-19 vaccine hesitancy were expedited development and emergency authorization of the vaccine, the safety of fast-tracking, less rigorous testing, and unprecedented politicized and polarized discourse (Freeman et al., 2021; Lin et al., 2021; Tram et al., 2021). The propensity for certain political affiliations to coincide with higher rates of conspiracy thinking, skepticism, and lower trust in government further emphasized the political divides between those who were vaccine hesitant and vaccine accepting (Lin et al., 2021; Mattia et al., 2021; Taylor et al., 2020; Freeman et al., 2021). The separation between American Democrats (politically left) and Republicans (politically right) was evident across numerous key measures of vaccine receptivity such as: individual risk perception, the importance of clinical

[1] National COVID distress: when the rate of national COVID infection and hospitalizations exceeded health system capacity and/or increased rates of COVID-19 mortality (Lazarus et al., 2020; Malik et al., 2020).

trials, trust in health officials, fear of political interference in scientific processes, and resistance to government mandates (Lin et al., 2021; Pennycook et al., 2022) Additionally, Mattia et al. (2021) found that those who thought their health was controlled more by external factors—as opposed to internal factors—also had higher rates of conspiratorial thinking and generalized anti-vaccine attitudes. On the other hand, rejection of vaccine conspiracy, lack of reliance on social media for information, and choice of news source—liberal or mainstream (CNN/MSNBC) over conservative (Fox news)—were all found to be positively associated with increased vaccine intentions (Ruiz & Bell, 2021; Pennycook et al., 2022). However, Pogue et al. (2020) found no predictive association between political affiliation and vaccine attitudes, nor any significant association between any demographic factor and vaccine attitudes. While the impact of political orientation was not ubiquitous across all studies, it has become clear that political orientation and associated attitudes have percolated to the surface as having an outsized impact on the uptake COVID-19 vaccination, particularly in the United States (Pennycook et al., 2022; Tram et al., 2021).

1.3 Political Orientation and Trust in Media and Government

Political orientation has significant influence on an individual's trust in government, public health institutions, media, and reliance on information sources. As such, consumption of traditional media, positive notions of government handling of the pandemic, increased trust in experts, higher social trust, and increased trust in the media were observed as positive predictors of COVID-19 vaccine willingness (Jennings et al., 2021). Increased exposure to mainstream cable and print news was positively associated with up-to-date COVID-19 beliefs (lethality, risk of transmission, disease origins) and negatively associated with conspiratorial beliefs (weaponization of the virus, false theories of viral origin, etc.) (Jamieson & Albarracín, 2020; Pennycook et al., 2022). Whereas, increased online information consumption was generally associated with lower vaccine intentions (Jennings et al., 2021; Szilagyi et al., 2021). As such, American democrats tended to report higher knowledge of the increased lethality of COVID-19, relative to the flu, while republicans more often described this as politically motivated exaggeration (Jamieson & Albarracín, 2020).

Conspiratorial beliefs about the effectiveness of vaccines, disease origins, accuracy of case and death counts reporting, and distrust of policy motives, alongside a generalized mistrust of government, strong support for former president Trump and increased consumption of social media were all observed to attenuate vaccine willingness among American adults (Jennings et al., 2021). However, concordance between individual political orientation and current state-level governing party was associated with higher trust in government and increased adherence to state-level social distancing orders (Painter & Qiu, 2020). Increased usage of social media and online information aggregators as sources for COVID-19 information, were specifically associated with lower beliefs in the efficacy of preventative measures (i.e., mitigation behaviours) and higher beliefs in conspiratorial thinking (Jamieson & Albarracín, 2020; Pennycook et al., 2022). Exposure to fact-checks only showed ephemeral protection against COVID-19 misinformation, especially among those who were previously susceptible due to political orientation or higher mistrust of health and/or government institutions (Carey et al., 2022).

Those with decreased vaccine willingness also demonstrated strong alignment with negative characterizations of pandemic restrictions as coercive or a means of "population control" (Jennings et al., 2021). These groups also reported beliefs that demonstrated a common misunderstanding of herd immunity—stating that only those at risk should vaccinate and that the general population would achieve better immunity with exposure to COVID-19 (Jennings et al., 2021). Likewise, those who reported watching majority conservative media (Fox News, OANN, etc.) exhibited beliefs which attributed malicious intent to public health policy (Jamieson & Albarracín., 2020). The influence of media consumption on attitudinal characteristics was observed in multiple studies; right-wing media consumption often attenuated positive perceptions of health policies and mitigation behaviours, and lowered appraisals of benevolent actions and universalism (Ponizovskiy et al., 2022; Pennycook et al., 2022; Allcott et al., 2020). Similarly, those who ascribed to these beliefs also reported high levels of trust in former president Trump—which appeared to exhibit an inverse relationship with vaccination intentions (Pennycook et al., 2022; Szilagyi et al., 2021).

1.4 Political Orientation and Mitigation Behaviors

In prior research involving COVID-19, political orientation was often correlated with mitigation behaviour consistency and public health restriction compliance. For instance, state-level party orientation was found to be associated with vaccine hesitancy and compliance with health restrictions, although this was mediated by sociodemographic factors (Tram et al., 2021; Pennycook et al., 2022). Risk perception was also a key metric where partisan differences—denoted by Trump voter share (TVS)—were associated with likelihood to search COVID-19 information (Barrios et al., 2020). Barrios et al. (2020) observed an inverse association between TVS and COVID-19 information seeking during the early stages of the COVID-19 pandemic. The suppressive effect of TVS persisted, even when other factors associated with increased information seeking (such as: increased regional case count) were also present (Barrios et al., 2020).

Partisan differences were observed in COVID-19 mitigation behaviour consistency—where increased TVS was inversely associated with likelihood to social distance and reduce unnecessary trips, even when state level mandates were present—across multiple investigations (Painter & Qiu, 2020; Barrios et al., 2020). Differences in population density also influenced the magnitude of this effect (Painter & Qiu, 2020). However, high TVS counties began to approximate low TVS areas in social distancing and trip frequency measures after federal mandates were introduced (Barrios et al., 2020). Conversely, the positive association between risk perception and high-risk demographic characteristics (age, comorbidity, etc.) was muted in areas with high TVS, indicating that political orientation may have served to dampen the self-preservation instincts of high-risk individuals (Ponizovskiy et al., 2022; Barrios et al., 2020).

High trust in conservative news and distrust in mainstream news was observed to have an inverse association with mitigation behaviour consistency; even stronger than conservative political orientation (Pennycook et al., 2022). Republican party affiliation was associated with decreased distancing, increased frequency of recreational group gatherings, and decreased compliance with COVID-19 public health measures (Allcott et al., 2020; Leventhal et al., 2021). Similar findings regarding the link between political orientation, risk perceptions and mitigation behaviour consistency were observed by Wang et al. (2021), Allcott et al. (2020), and Pennycook

et al. (2022). However, Pedersen & Favero (2020) found a more moderate link between political orientation and COVID-19 mitigation behaviours, and suggested that attitudinal characteristics may provide greater predictive power for mitigation behaviour consistency (Pedersen & Favero, 2020).

1.5 The Influence of Health Status on COVID-19 Mitigation Behaviors

High risk individuals, specifically, were at a disproportionate risk of adverse health outcomes for COVID-19, such as individuals with immune deficiencies (e.g., cancer, autoimmune disorders) respiratory diseases (e.g., COPD) and cardiovascular disease, among others (Tsai et al., 2022). Across multiple investigations, individuals with high-risk comorbid conditions had higher rates of vaccination, were more consistent with mitigation behavior performance, and reported higher perceived risk and increased fear of severe disease (Barrière et al., 2021; Chun et al., 2021; Duly et al., 2022; Gaur et al., 2021; Mejri et al., 2022; Tsai et al., 2022; Villarreal-Garza et al., 2021). When vaccine hesitancy was observed in high-risk groups, it was associated with many of the same factors as the general population—such as perceptions of vaccine efficacy, conspiratorial thinking, middle age, lower education and income, and lower trust in healthcare organizations and physicians—but to a lesser degree (Barrière et al., 2021; Chun et al., 2021; Duly et al., 2022; Gaur et al., 2021; Mejri et al., 2022; Tsai et al., 2022; Villarreal-Garza et al., 2021). Safety concerns and potential contraindications were the most significant barriers for vaccination in this cohort, but this generally resulted in delayed vaccination rather than outright refusal (Duly et al., 2022). These concerns ranged from fear of side effects for those who were frail, false notions of contraindications of the vaccine with current treatments—observed in multiple studies involving cancer patients—and the potential impact of vaccines on current treatment outcomes (Chun et al., 2021; Duly et al., 2022; Mejri et al., 2022; Villarreal-Garza et al., 2021).

From these findings, it was evident that those with pre-existing comorbid conditions were sensitive to any risks which may worsen current disease, hinder the efficacy of active treatment regimes, or worsen disease outcomes; however, most tended to be more concerned about comorbid COVID-19-associated adverse outcomes and mortality (Barrière et al., 2021; Tsai et al., 2022). As such, they were generally more compliant and had higher rates of vaccination than

the general population (Barrière et al., 2021; Tsai et al., 2022). Therefore, it is possible that individual health risk took precedence over other influences of vaccine hesitancy in this population subgroup—contrary to the findings from Barrios et al. (2020) regarding the suppressive effect of TVS in high-risk groups.

1.6 Conclusion

It is evident that vaccine hesitancy and mitigation behaviour consistency can be influenced by political orientation on both an individual and regional level. Prior research, observed that the influence of political orientation occurred through multiple avenues—conventional media, news sources, and social media—and acted to lower trust in governments, health practitioners, and institutions. This likely potentiated conspiratorial thinking and skepticism in vaccines, their development, and ultimately undermined the fidelity of public health measures. The nature of this influence on vaccination and mitigation behaviour consistency necessitates further exploration. However, the vast majority of the current literature upon these conclusions is based is from the United States and western European nations (United Kingdom, France, etc.). There is relatively little literature on the association between political orientation, vaccination and mitigation behaviours in the Canadian context. While cultural similarities exist between Canada and the United States—given their geographical proximity—and political similarities exist between Canada and the United Kingdom—given similar systems of governance—there are nuances that must be explored. Differences between Canadian and American political and social contexts makes it tenuous for literature largely focused on American populations to generalize to Canadians. Relative to the United States, Canadian politics tends to be less polarized (Parkin, 2021; Pennycook et al., 2022). Furthermore, Canadian social norms tend to have higher levels of community orientation, higher trust in government, and, consequently, higher likelihood of compliance with government policy (Parkin, 2021). On the other hand, Canadian political discourse is less influenced by religion than in The United States (Parkin, 2021). Many regional and provincial differences exist across Canada, socially and politically, that may have informed why Canadians made certain choices regarding vaccination and mitigation behaviours during the COVID-19 pandemic. Many of these choices may have been under the influence of political orientation. The following investigation sought to reveal what role political orientation, and its associated factors, played in influencing those choices.

2. Purpose and Hypotheses

2.1 Purpose

To examine political orientation as a predictor of vaccination status and mitigation behaviour consistency among members of the Canadian public, and to examine the extent to which the strength of any predictive relationship differs between demographic and health status groups.

2.2 Hypotheses

2.2.1 Primary Hypotheses

H1: *Individual level political orientation will be associated with vaccination status, such that those who identify as being on the right of the political spectrum will be more likely to be unvaccinated, than those who are on the left of the political spectrum.*

H2: *Individual level political orientation will be associated with mitigation behaviour (masking, social distancing, hand hygiene) consistency, such that those who identify as being on the right of the political spectrum will be more likely to have lower behaviour consistency, than those who are on the left of the political spectrum.*

H3: *Individual objective risk—operationalized as immunocompromised status—will moderate the association between political orientation, and both vaccination status and mitigation behaviour consistency. Specifically, the magnitude of the association between political orientation, and the consistency of mitigation behaviours and odds of vaccination will be lower among those who are immunocompromised than those who are not.*

2.2.2 Secondary Hypotheses

H4: *Individual level political orientation will be associated with likelihood of reliance on certain information sources, such that those who identify as being on the right of the political spectrum will be more likely to rely on unofficial (social media) or non-mainstream (non-cable or print) sources of information, than those who are on the left of the political spectrum.*

H5: *Individual level political orientation will be associated with change in vaccination status and mitigation behaviour consistency. Specifically, those who identify as being on the left of the political spectrum will be more likely to change vaccination status (shift from unvaccinated to vaccinated) and more likely to maintain mitigation behaviour consistency (i.e., will have a lower decrease in behaviour maintenance), than those on the right of the political spectrum.*

3. Methods

The Canadian COVID-19 Experiences Survey (CCES) (Hall et al., 2022) was the data source for the below analyses. While CCES consists of multiple Waves of measurement, of interest to this study were Wave 1 (fall 2021) and Wave 2 (spring 2022) of Study 1– a national longitudinal cohort study– for which data was made recently available. The study cohort was designed to contrast differences between vaccinated (at time of data collection) and unvaccinated (partial or unvaccinated) respondents in a national sample, across a wide range of demographic, social, political factors, and health mitigation behaviours/attitudes. As such, the Wave 1 and 2 cohorts were recruited with the intention of representing a near equal proportion of fully vaccinated and vaccine hesitant Canadians.

3.1 Sample Frame

CCES surveys were conducted during two separate periods with Wave 1 being distributed to respondents between September 28th, 2021, and October 21st, 2021; Wave 2 going to respondents between March 3rd and March 21st, 2022. For both Waves (Wave 1, Wave 2 recontact and Wave 2 replenishment), participants were contacted via email and invited to participate in the respective survey, and a link was provided. After informed consent was obtained, all measures in each respective Wave were completed by respondents online. Given the objective to find a balanced sample of vaccinated and vaccine hesitant respondents, a quota target was established for each population sub-group of 50% vaccinated and 50% un-vaccinated. Within each population group, respondents were recruited across all 10 provinces via Leger Opinion. Leger used a demographic profile of existing panellists to inform who would be invited to participate out of Leger's existing web panel. Per Leger, the web panel "is an independent panel, built with no partner affiliations. It is built through probability-based methods and includes multifaceted recruitment tools such as word of mouth, social media, and refer-a-friend programs" (University of Waterloo, 2022). Further, Leger communicates that the panel undergoes the following quality controls: double opt-in process for panellists, bi-annual profile updates, profile email validation and deduping, and cheater and speeder identification.

Inclusion criteria for Wave 1 was: those who were aged 18-54, were either non-vaccinated or vaccinated at time of survey (Appendix A, Table 2, and Table 3 for definitions per Wave), and panellists were in line with quota sampling specifications. Exclusion criteria for

Wave 1 was: younger than 18 years old, older than 54 years old, those who exceeded quota sampling needs at time of survey, those identified as "speeders" (those who completed the surveys too quickly), and incomplete surveys. Further, those who indicated that they had received 1 dose of a 2 dose vaccine and intend to acquire a second dose (i.e., intend to fully vaccinate) were excluded from both Waves 1 and 2. Wave 2 inclusion criteria added that all Wave 1 panellists were recontacted, and a replenishment sample was also taken, using the same quota and demographic specifications as Wave 1, to account for attrition between Waves.

Wave 1 yielded a response rate of 13% and a cooperation rate of 94.8%. Wave 2 had a response rate of 9.5%, and a cooperation rate of 96.1%. The retention rate between Wave 1 and Wave 2 was 56.5% (1109/1958 participants from Wave 1 completed Wave 2) (Appendix A, Tables A4 andA5).

3.2 Sample

Wave 1 had a sample size of n = 1958, with mean age 36.85 (SD=10.40) years, 791 (39.5%) males and 1211(60.5%) females. Vaccination status for Wave 1 was 983 (50.2%) fully vaccinated, 848 (43.3%) unvaccinated, and 127 (6.5%) with 1 dose and no intent to finish. Wave 2 included a replenishment sample in order to compensate for non-follow up of some respondents from Wave 1. Wave 2 yielded similar results with total n = 1848, mean age of 38 (SD=10.2) years, 749 (40.5%) males, 1099 (59.5%) females. Vaccination status breakdown for Wave 2 was 1010 (54.7 %) fully vaccinated, 825 (44.6 %) vaccine hesitant, and 13 (7.0%) non-hesitant single dose.

3.3 Ethics

CCES and its encompassed studies were reviewed and given ethics clearance from the University of Waterloo's research ethics board. Given that the proposed investigation solely uses the data from this study, in line with the original intention of the CCES and original ethics clearance, no further ethics review was required.

3.4 Measures

There were a range of measures included within Wave 1 and Wave 2 of CCES: COVID-19 infection history, symptom severity, vaccine status, vaccine intentions to cognitive and executive indicators. Of interest to this investigation specifically were indicators which assess

the vaccine status, mitigation behaviour consistency, political orientation, comorbid characteristics, perceived risk, and information source reliance.

3.4.1 Predictors

Political orientation was conceptualized as a dimensional variable that varies across a wide spectrum, from very left to very right on the political spectrum. As such, to achieve a robust measure of political orientation three measures were used to glean individual political orientation. The three measures of political orientation that were utilized were recoded and aggregated to create a single, continuous index measure of political orientation. The three subcomponent measures are described below.

Federal Political Party Identification. Individual level federal party alignment was measured using the following item: "Which political party do you feel closest to at the federal level?" With responses being given as 1= "Liberal", 2= "Conservative", 3= "NDP", 4= "Bloc Québécois", 5= "Green", 6= "People's Party of Canada", 7= "Other", 8= "Refused", 9= "Don't know". Federal-level political party identification responses were recoded on a 4-point scale: 1= "very left", 2= "moderately left", 3= "moderately right", 4= "very right". Moreover, responses given as "Other" were manually reviewed and screened for written responses that may have corresponded to an existing party or a party that existed elsewhere (e.g., libertarian) and recoded to the corresponding position on the above 4-point scale. Those unable to be manually coded onto the above scale were coded as "Missing". Responses received as "Don't know" or "Refused" were recoded as "Missing" as well.

Provincial Political Party Identification. Individual level provincial party alignment was measured using the following item: "Which political party do you feel closest to at the provincial level?". With responses being given in a list of the results of the most recent provincial election in descending order (i.e., responses were displayed in order of provincial parliamentary seat proportion). Provincial responses were adapted to include provincial variations of related party names (e.g., Conservative versus United Conservative) as well as the addition of province-specific parties (e.g., Manitoba First), based on identified province of residence. Similar to federal level political party identification, provincial level political party identification responses

were recoded onto the above 4-point scale, responses of "Other" were manually assessed and recoded onto the scale or coded as "Missing". Responses for "Don't know" or "Refused" were coded as "Missing".

Self-Identification on Political Spectrum. Beyond party affiliation, individual level self-identification on a political spectrum was measured using the following item, "When it comes to politics, would you describe yourself as liberal, conservative, or neither liberal nor conservative?" and responses were: 1= "Extremely liberal", 2= "Moderately liberal", 3= "Slightly liberal", 4= "Neither liberal nor conservative", 5= "Slightly conservative", 6= "Moderately conservative", 7= "Extremely conservative", 8= "Refused", 9= "Don't know". The original 7-point scale was recoded into a 5-point scale, where the center 3 response options (3= "Slightly liberal", 4= "Neither liberal nor conservative", 5= "Slightly conservative") were collapsed into a middle value of 3= "center". The response 1= "Extremely liberal" was recoded as 1= "very left", 2= "Moderately liberal" was recoded as 2= "moderately left", 6= "Moderately conservative" was recoded as 4= "moderately right", and 7= "Extremely conservative" was recoded as 5= "very right". Again "8= Refused", and "9= Don't know" were recoded as "Missing".

Creation of Predictor Index. Once recoding of all three predictor variables was completed, a three-step process was undertaken to combine these separate measures of political orientation into a single index measure. First, the three recoded measures were standardized (z-scored) and then correlations between all three were calculated to ensure that there was a significant correlation between federal, provincial, and individual spectrum political orientations. Next, the internal consistency of the constituent items of the index measure were assessed (Cronbach's alpha) by treating each as a test item and subjecting them to reliability analyses; in this context, Cronbach's alpha, item-total correlations, and alpha-if-item-deleted were examined. Lastly, an exploratory principal component analysis was performed to confirm whether the variability between the standardized measures was due to one underlying factor (political orientation) or multiple factors; in order to evaluate the hypothesized single factor structure for the three political orientation items, a scree plot was examined for discontinuity. The factor loadings for each of the three measures in relation to the hypothesized single factor solution were

also examined. The scores on the three measures were at least moderately intercorrelated (*r*'s>.50), internally consistent (alpha>.70), and the scree plot and factor loadings indicated a single underlying factor (component) (Appendix D, Figure D4 and Tables D1 to D3). Therefore, the three component measures were averaged to form an index variable, reflecting political orientation. This variable was used as the single predictor in the regression analyses described above. The results of these tests for Wave 1 are detailed in Appendix D.

For the derived predictor variable, those on the left on the political spectrum have a political orientation index score less than 0, and those on the right have a score greater than 0.

3.4.2 Primary Outcomes

Vaccine Status. Vaccination status was measured using a series of questions, where initial vaccine status was measured by asking "Have you received any COVID-19 vaccine shots?" and responses were given the answers of 1= "I have NOT received any vaccine shot", 2= "Received ONE vaccine shot", 3= "Received TWO or more vaccine shots", 4= "Refused", 5= "Don't know". Those who indicated they had only received one vaccination shot were then recoded based on their intention to receive their next shot. This was assessed using "What best describes your intention to get your next shot?" Response options were as follows: "I have NO plan to get a second shot" [Hesitant-Decided], "I am unsure whether I will get the second shot" [Hesitant Undecided], "I plan to get the second shot, but have NOT yet scheduled an appointment", and "I am planning to get the second shot and have scheduled an appointment" [both together as Accepting]. These responses were used to categorize respondents into respective vaccine groups: vaccinated (received two shots of an approved COVID-19 two-dose vaccine), vaccine hesitant (received no COVID-19 vaccination; or, received one shot of a two-shot vaccination with no plan for, or being unsure about whether a second shot will be received), and non-hesitant single dose (no longer vaccine hesitant, but had not become fully vaccinated) (Appendix A, Tables A2 and A3). The vaccinated and non-hesitant single dose groups were combined into a single group of vaccinated respondents, resulting in a dichotomous variable for vaccine status (vaccinated and unvaccinated).

Mitigation Behaviors Consistency. Like political orientation, mitigation behaviour consistency was conceptualized as a dimensional variable where individual consistency of mitigation behaviours can exist on a spectrum of behavioural compliance. In order to assess individual mitigation behaviour consistency, three specific measures of behaviours that were often recommended by health authorities were utilized: "How consistently do you follow the recommendations by your local or provincial public health officials about social distancing?"; "How consistently do you follow the recommendations by your local or provincial public health officials about mask wearing?"; "How consistently do you follow the recommendations by your local or provincial public health officials about handwashing?". Responses were 1= "I go above and beyond the recommendations", 2= "I follow the recommendations all the time or nearly all the time", 3= "I follow the recommendations most of the time", 4= "I sometimes follow the recommendations", 5= "I rarely follow the recommendations", 6= "I do not follow the recommendations at all", 8= "Refused", 9= "Don't know". Mitigation behaviour responses were recoded such that 8= "Refused", and 9= "Don't know" were recoded as "Missing." All mitigation behaviours responses were then log transformed ($\log_{10}$). The transformed variables were treated as the outcome variables for multivariate analyses.

Information Sources. It is likely that individuals received and subsequently came to rely on a variety of sources for information regarding COVID-19. Pre-pandemic literature has suggested that choice of and degree of reliance on specific sources of information can be influenced by individual political orientation. Reliance on specific sources for COVID-19 information was measured with the following item: "How much, if at all, do you currently get information about COVID-19 from each of the following sources?", where source options were: "Friends", "Family", "Church/Religious Group", "Doctor", "Newspaper/Magazine", "Television" "Social Media", and "Other". Response options for each were: 1= "Not at all", 2= "A little", 3= "Somewhat", 4= "A lot", 5= "Refused", 6= "Don't know". Responses for 5= "Refused", and 6= "Don't know" were recoded as "Missing".

Change in Vaccination and Mitigation Behaviour. As the COVID-19 pandemic progressed, it was likely that individuals may have changed their vaccine uptake and mitigation behaviour maintenance, during the interval between Wave 1 and Wave 2 measurement periods.

Change in vaccination was measured using a derived variable, where for all respondents who participated in both Waves, change scores were calculated for vaccine status by measuring the difference in raw response scores for vaccination status between Wave 2 and Wave 1, such that a value of “1” indicated a shift from unvaccinated to vaccinated and a value of "0” indicated no change in vaccination status. Similarly, to derive mitigation behaviour maintenance, change scores were calculated for mitigation behaviour consistency across all three behaviours, between Waves 2 and 1, for all participants who were present in both Waves by calculating the difference in raw response scores, such that higher values indicated an increase in mitigation behaviour consistency. These change scores were then used as outcomes in the prospective analysis.

Perceived Risk. Perceived risk was captured using the following question, “How worried are you that you will get infected by COVID-19 (or be infected again if you have been infected in the past)?” Response options were 1= “Not at all worried”, 2= “Slightly worried”, 3= “Moderately worried”, 4= “Very worried”, 5= “Extremely worried”, 8= “Refused”, 9= “Don't know”. Responses 8 and 9 were recoded as “Missing”. Perceived risk was assessed descriptively to determine if there were differences in mean risk perception between those who were left-leaning and those who were right-leaning, and respondents who were immunocompromised and not immunocompromised. Likewise, zero-order correlations were used to assess if there were differences in risk perception across political orientation and immunocompromised status.

3.4.3 Covariates and Moderators

Demographic Factors. Demographic characteristics were also measured, such as: age, income band, gender, marital status, highest education level completed, ethnicity, and financial strain. COVID-19 infection history (if any), symptom severity and self-rated immunocompromised status—regarding both presence of current illness which may compromise immune system or intake of any medications which may compromise immune system—were all collected. For this investigation, gender, and age category were utilized as covariates in models which adjust for demographics. Income category and education level were used as covariates in models which adjusted for socioeconomic status. Immunocompromised status and its impact on the association between political orientation and the outcomes described above was the primary moderator which was assessed. Immunocompromised status was recoded such that only those

who responded 1= “Yes” and 2= “No” were used in the moderation analysis. Those who responded with options 3= “Not sure”, 4= “Refused”, 5= “Don't know” were recoded as “Missing”.

3.5 Statistical Analysis

To test the above hypotheses, a hierarchical analytical approach was adopted. First, a logistic regression analysis was performed on predictiveness of political orientation on vaccine status (Hypothesis 1). Secondly, multivariate linear regression[2] was used to look at the relationships between the political orientation index and all three mitigation behaviours simultaneously. Mitigation behaviours were assessed together as one group of dependant variables in all regression analysis (Hypothesis 2). The moderating effect of immunocompromised status was tested on both odds of vaccination and mitigation behaviour consistency to probe for significant interactions (Hypothesis 3). Multivariate regression was used to assess the association between political orientation and reliance on different sources for COVID-19 information (Hypothesis 4). These analyses also included age category and gender as covariates for partially adjusted models, and income category and education level were added in the fully adjusted models. Lastly, a prospective analysis was conducted on those who participated in both Wave 1 and Wave 2, to assess the predictiveness of political orientation on changes in both vaccination status and mitigation behaviour consistency across Waves (Hypothesis 5).

3.5.1 Models

Multivariate linear regression was performed as described above and were represented with the use of three models for each set of outcomes, for both Wave 1 and Wave 2. The first model assessed the unadjusted association between the political orientation index predictor and mitigation behaviours and information source reliance. The second model, “partially adjusted”, added demographic factors (age category and gender) as covariates for these associations. Lastly,

[2] Multivariate linear regression, in these analyses, refer to a model in which there are two or more dependant variables assessed in relation to a single independent variables (Hidalgo & Goodman, 2013). This is unlike multivariable/multiple linear regression modelling, which refers to models that have multiple predictor variables for a single outcome variable (Kalan et al., 2021).

the third model, “fully adjusted”, included demographic factors and socioeconomic factors (education level and income category) as covariates.

The moderating effect of immunocompromised status was tested using the PROCESS macro, where the conditional slopes predicting each outcome from the focal predictor were compared (Hayes, 2022). The PROCESS macro is a widely used statistical tool which was used to test whether or not each conditional beta weight differs significantly from each other and from 0 (Hayes, 2022). Computationally, the moderation effect is tested by standardizing the focal predictor and the moderator, computing an interaction term between the moderator and the focal predictor (z-scored political orientation by z-scored immunocompromised status), and examining the statistical significance of the interaction term over and above the main effects and any covariates. Simple slopes were computed for the target predictor at each level of the moderator and *p*-values were used to determine significance in relation to the null value, for descriptive purposes. The prospective analysis was conducted by deriving change score values for each outcome variable (vaccine status, mitigation behaviour) and performing linear or multivariate linear regression on the derived values.

3.5.2 Assumptions

The following assumptions were in place for the statistical analyses. For linear regression, it was assumed that the relationship between variables was linear, or approximately so. Further it was assumed that the distribution of the residuals did not deviate from normality; this normality assumption was partially addressed through transformations (e.g., loglinear) when necessary. Further, there was an assumption of homoscedasticity, such that the variance is the same for any given values of the predictor variable (Kleinbaum et al., n.d.).

For logistic regression the following assumptions were in place. Independence of observations, independence of errors, linearity between the independent variables and log-odds, and a lack of multicollinearity (Stoltzfus, 2011). Multicollinearity was assessed on a case-by-case basis and was addressed partially be the use of z-scores for the predictor variables.

4. Summary of Hypotheses and Analytic Tests

H1: *Individual level political orientation will be associated with vaccination status, such that those who identify as being on the right of the political spectrum will be more likely to be unvaccinated, than those who are on the left of the political spectrum.*

This hypothesis was tested by examining the association between the political orientation index predictor and vaccination, a binary outcome, with the use of logistic regression.

H2: *Individual level political orientation will be associated with mitigation behaviour (masking, social distancing, hand hygiene) consistency, such that those who identify as being on the right of the political spectrum will be more likely to have lower behaviour consistency, than those who are on the left of the political spectrum.*

This hypothesis was tested by examining the association between the political orientation index predictor and COVID-19 mitigation behaviours with the use of multivariate linear regression models, wherein all three mitigation behaviors were examined simultaneously as outcomes in the model.

H3: *Individual objective risk—operationalized as immunocompromised status—will moderate the association between political orientation, and both vaccination status and mitigation behaviour consistency. Specifically, the magnitude of the association between political orientation, and the consistency of mitigation behaviours and odds of vaccination will be lower among those who are immunocompromised than those who are not.*

Moderator effects for mitigation behaviours were explored using hierarchical linear regression models, testing the interaction between political orientation and immunocompromised status; this was explored using the PROCESS macro (Hayes, 2022). For vaccination, moderation effects were determined by assessing if there is significant interaction present between political orientation and immunocompromised status, and stratifying by immunocompromised status when a significant interaction was detected.

H4. *Individual level political orientation will be associated with likelihood of reliance on certain information sources, such that those who identify as being on the right of the political spectrum*

will be more likely to rely on unofficial (social media) or non-mainstream (non-cable or print) sources of information, than those who are on the left of the political spectrum.

This hypothesis was tested by examining the association between the political orientation index predictor and information source reliance with the use of multivariate linear regression models, wherein reliance on all information sources is examined simultaneously.

H5: *Individual level political orientation will be associated with change in vaccination and mitigation behaviour consistency. Specifically, those who identify as being on the left of the political spectrum will be more likely to change vaccination status (shift from unvaccinated to vaccinated) and more likely to maintain mitigation behaviour consistency (i.e., will have a lower decrease in behaviour maintenance), than those who are on the right of the political spectrum.*

This hypothesis was tested by examining the association between the political orientation index predictor and the change scores in mitigation behaviours with the use of multivariate linear regression models, wherein all three-mitigation behavior change scores were examined simultaneously. Change in vaccine status was also tested this way.

5. Results

Demographic characteristics of the samples in Wave 1 and Wave 2 can be seen in Table 1, alongside baseline measures for political orientation and mitigation behaviours.

Table 1

Sample Features, Demographic Characteristics, & Baseline Measures for Wave 1 and Wave 2 of CCES

Variables	Wave 1 *n*	% (Weighted)	Wave 2 *n*	% (Weighted)
Gender				
Male	791	38.7	749	40.5
Female	1211	59.3	1099	53.8
Age Group				
18-24	331	16.5	253	13.7
25-39	818	40.9	747	40.4
40-54	853	42.6	825	44.6
55+	—	—	23	1.2
Education				
Low	419	21.3	369	20.0
Moderate	717	36.5	725	39.4
High	831	42.2	748	40.6
Income				
Low	314	17.4	282	16.8
Moderate	452	25	412	24.5
High	1041	51	985	58.7
Immunocompromised Status				
Yes	138	7.3	136	7.6
No	1744	92.7	1651	92.4

Predictor & Behavioural Outcomes	**Wave 1**		**Wave 2**	
	Mean (95% CI)	***Standard Error***	**Mean (95% CI)**	***Standard Error***
Political Orientation – Individual (Unstandardized)	3.67 (3.57, 3.77)	0.051	3.89 (3.79, 4.00)	0.053
Political Orientation – Provincial (Unstandardized)	2.17 (2.12, 2.22)	0.025	2.27 (2.22, 2.32)	0.027
Political Orientation – Federal (Unstandardized)	2.22 (2.17, 2.27)	0.027	2.32 (2.26, 2.37)	0.029
Political Orientation Index	0.0125 (-0.0299, 0.0550)	0.02164	- 0.0123 (-0.0563, 0.0317)	0.02243
Masking (Log Transformed)	0.3221 (0.3121,0.3320)	0.00506	0.3550 (0.3439, 0.3661)	0.00567
Distancing (Log Transformed)	0.3589 (0.3488, 0.3690)	0.00513	0.3860 (0.3747, 0.3974)	0.00578
Hand Hygiene (Log Transformed)	0.3189 (0.3082, 0.3296)	0.00545	0.3557 (0.3439, 0.3674)	0.00598

5.1 Political Orientation Predicting Vaccine Status and Moderating Effects

Table 2 presents summary findings for the main effects of the logistic regression of political orientation on vaccine status, for both Waves 1 and 2, across all three model types (unadjusted, partially adjusted and fully adjusted) (full tables located in Appendix C, Tables C1-C6). Table 3 presents findings on the interaction between the moderator (immunocompromised status) and political orientation for Wave 1, across all three model types (Wave 2 moderator interaction effects in Appendix C, Table C7). Table 4 displays stratified fully adjusted effects for Wave 1.

Table 2

Political Orientation and Vaccine Status Main Effects, Summary Table, Wave 1 & 2

Political Orientation	**Wave 1**		**Wave 2**	
	OR	**95% CI**	***OR***	**95% CI**
Unadjusted	.379	0.333, 0.432	.357	.311, .409
Partially Adjusted	.365	.319, .419	.350	.303, .403
Fully Adjusted	.351	.303, .406	.333	.285, .388

Table 3

Political Orientation and Vaccine Status, Immunocompromised Status Moderator Interactions, Wave 1

Political Orientation X Immunocompromised Status	β	***p***	***OR***	**95% CI Lower**	**CI Upper**
Unadjusted	.830	<.001	2.292	1.468	3.580
Partially Adjusted	.796	<.001	2.216	1.400	3.506
Fully Adjusted	.805	.001	2.236	1.382	3.619

Table 4

Political Orientation and Vaccine Status, Stratified Fully Adjusted Effects, Wave 1

	β	***p***	***OR***	**95% CI Lower**	**Upper**
Immunocompromised Political Orientation	-.543	.057	.581	.333	1.016
Not Immunocompromised Political Orientation	-1.181	<.001	.307	.261	.361

Higher scores on the political orientation index reflect relatively more right-leaning orientation. As such, each unit increase in the political orientation index—a shift in from left to right—was associated with significantly reduced odds of being fully vaccinated in raw (OR=.379; 95% CI = .333, .432), partially adjusted (OR= .365; 95% CI = .319, .419) and fully adjusted (OR=.351; 95% CI = .303, .406) models. This corresponded to a reduction in odds of vaccination of 62%, 63%, and 65%, respectively, for each unit increase in the political orientation index. Next, the moderation effects of immunocompromised status were tested. Findings indicated the presence of a significant moderating effect, which was evident in raw, partially, and fully adjusted models. In line with the original hypothesis, political orientation was a weaker predictor of vaccination status among immunocompromised respondents (OR=.581; 95% CI = .333, 1.016), as compared to those who were not immunocompromised (OR=.307; 95% CI = .261).

In Wave 2, every unit increase towards right-wing political orientation on the index was associated with significantly reduced the odds of being fully vaccinated in raw (OR=.357; 95% CI = 0.311, 0.409), partially adjusted (OR= .350; 95% CI = .303, .403) and fully adjusted (OR=.333; 95% CI = .285, .388) models. This corresponded to a reduction in odds of vaccination of 64%, 65%, and 67%, respectively, for each unit increase in the political orientation index. However, when the moderation effects of immunocompromised status were tested, results did not indicate the presence of a significant moderating effect in any of the raw, partially, or fully adjusted models. This result is contrary to the initial hypothesis.

5.2 Political Orientation Predicting Mitigation Behaviour Adoption and Moderating Effects

Table 5 presents summary findings for multivariate regression of political orientation on COVID-19 mitigation behaviours consistency for Wave 1 and 2, (full tables – Appendix C, Tables C8-C10, C13-C15). Table 6 contains fully adjusted moderation effects of immunocompromised status for Wave 1 (raw and partially adjusted – Appendix C, Tables C11 and C12; Wave 2 Appendix C, Tables C16 – C18).

Table 5

Political Orientation and Mitigation Behaviour, Main Effects Summary Table, Wave 1 & 2

Political Orientation	Mitigation Behaviour (Log)	Wave 1		Wave 2	
		p	η_p^2	*p*	η_p^2
Unadjusted	Masking	<.001	.216	<.001	0.253
	Distancing	<.001	.203	<.001	0.133
	Hand Hygiene	<.001	.112	<.001	0.266
Partially Adjusted	Masking	<.001	.221	<.001	0.260
	Distancing	<.001	.210	<.001	0.136
	Hand Hygiene	<.001	.113	<.001	0.276
Fully Adjusted	Masking	<.001	.229	<.001	0.248
	Distancing	<.001	.206	<.001	0.139
	Hand Hygiene	<.001	.116	<.001	0.261

Tests of the unadjusted effect of political orientation on mask wearing (F=3.879, p <.001, η_p^2= .216), distancing (F=3.588, p <.001, η_p^2= .203) and hand hygiene (F=1.772, p <.001, η_p^2= .112) were all significant. The same was true in partially adjusted models (mask wearing: (F=3.984, p <.001, η_p^2= .221); distancing: (F=3.736, p <.001, η_p^2= .210); hand hygiene: (F=1.785, p <.001, η_p^2= .113)), and fully adjusted models ((masking: (F=3.988, p <.001, η_p^2= .229); distancing: (F=3.494, p <.001, η_p^2= .206); hand hygiene: (F=1.767, p <.001, η_p^2= .116)). Findings from Wave 2 were similar (Appendix C, Tables C13 – C15). In this multivariate analysis, η_p^2 indicates the proportion of total variance seen in the respective mitigation behaviour associated with political orientation, when excluding variance from other predictors. If the size of η_p^2 is greater than 0.01, this indicates a small effect size, whereas η_p^2 greater than 0.06 and 0.14 indicate moderate and large effect sizes, respectively.

Table 6

Mitigation Behaviour Adoption Wave 1 – Moderation Effects, Fully Adjusted Model

Behaviours					
Masking	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0019	3.3535	1.0000	1520.0000	.0673
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.1157	.0198	5.8398	<.001	.0769 - .1546
Non-immunocompromised	.0780	.0059	13.1771	<.001	.0664 - .0896
Distancing	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0017	3.0456	1.0000	1518.0000	.0812
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.1165	.0204	5.6999	<.001	.0764 - .1566
Non-immunocompromised	.0794	.0060	13.2338	<.001	.0677 - .0912
Hand Hygiene	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0044	7.1606	1.0000	1518.0000	.0075
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.1034	.0223	4.6313	<.001	.0596 - .1472
Non-immunocompromised	.0412	.0066	6.2180	<.001	.0282 - .0543

Tests of the unadjusted moderation effect of immunocompromised status on mask wearing (Appendix C Table C11) were significant (F=5.463 (1, 1655), p=.0195). Conditional effects suggested that the effect of political orientation was stronger for immunocompromised (Effect=.1252, SE=.0197, t=6.3684, p<.001) than for non-immunocompromised (Effect=.0774, SE=.0056, t=13.7309, p<.001). Moderation effects for social distancing were also significant (F=4.9329 (1, 1652), p=.0265). Conditional effects suggested that the effect of political orientation was stronger for immunocompromised (Effect=.1258, SE=.0202, t=6.2422, p<.001) than for non-immunocompromised (Effect=.0793, SE=.0057, t=13.9134, p<.001). For hand hygiene, moderation was also significant, (F=9.4275 (1, 1653), p=.0022). Conditional effects suggested that the effect of political orientation was stronger for immunocompromised (Effect=.1093, SE=.0221, t=4.9346, p<.001) than for non-immunocompromised (Effect=.0385, SE=.0063, t=6.1004, p<.001). These patterns held for partially adjusted models (Appendix C Table 12), although retained statistical significance only for hand hygiene in the fully adjusted model.

For Wave 2, tests of the unadjusted moderation effect of immunocompromised status (Appendix C Table 16) on mask wearing were significant (F=4.4050 (1, 1567), p=.0360). Conditional effects suggested that the effect of political orientation was stronger for non-immunocompromised (Effect=.1065, SE=.0061, t=17.4882, p<.001) than for immunocompromised (Effect=.0612, SE=.0217, t=2.9544, p=.0032). Moderation effects for social distancing were not significant and conditional effects were not tested. Likewise, hand hygiene, was not significantly moderated by immunocompromised status and conditional effects were not tested. These patterns held for partially adjusted models, although borderline statistical significance for social distancing was seen in the fully adjusted model (Appendix C Tables 17 and 18).

5.3 Political Orientation Predicting Information Source Reliance

Findings for the ability of political orientation to predict information source reliance in fully adjusted models is shown in Tables 7 and 8 for Waves 1 and 2, respectively (Waves 1 and 2, raw and partially adjusted models – Appendix C, Tables C19 - C22).

Table 7

Information Source Reliance Wave 1 – Fully Adjusted Model

	Information Source	*F*	*p*	η_p^2
Political Orientation	Friends	1.206	0.090	0.091
	Family	1.374	0.011	0.102
	Religion	2.083	<.001	0.147
	Doctors	1.664	<.001	0.121
	Print Media	1.727	<.001	0.125
	Television	2.411	<.001	0.166
	Social Media	1.659	<.001	0.121
	Other	1.328	0.021	0.099
Age Group	Friends	10.640	0.001	0.009
	Family	24.631	<.001	0.020
	Religion	15.377	<.001	0.013
	Doctors	0.002	0.963	0.000
	Print Media	5.396	0.020	0.004
	Television	2.930	0.087	0.002
	Social Media	25.319	<.001	0.021
	Other	0.135	0.713	0.000
Gender	Friends	0.339	0.560	0.000
	Family	0.045	0.832	0.000

	Religion	10.001	0.002	0.008
	Doctors	0.171	0.679	0.000
	Print Media	8.074	0.005	0.007
	Television	3.197	0.074	0.003
	Social Media	1.357	0.244	0.001
	Other	1.478	0.224	0.001
Education Level	Friends	7.588	0.006	0.006
	Family	5.341	0.021	0.004
	Religion	11.303	0.001	0.009
	Doctors	10.108	0.002	0.008
	Print Media	10.717	0.001	0.009
	Television	6.894	0.009	0.006
	Social Media	0.000	0.990	0.000
	Other	7.972	0.005	0.007
Income Level	Friends	0.273	0.601	0.000
	Family	0.646	0.422	0.001
	Religion	0.019	0.889	0.000
	Doctors	1.133	0.287	0.001
	Print Media	0.118	0.732	0.000
	Television	0.314	0.576	0.000
	Social Media	3.077	0.080	0.003
	Other	0.841	0.359	0.001
Intercept	Friends	201.853	<.001	0.144
	Family	195.831	<.001	0.140
	Religion	152.028	<.001	0.113
	Doctors	70.704	<.001	0.056
	Print Media	86.792	<.001	0.068
	Television	115.941	<.001	0.088
	Social Media	204.534	<.001	0.146
	Other	91.719	<.001	0.071

Table 8

Information Source Reliance Wave 2 – Fully Adjusted Model

	Information Source	*F*	*p*	η_p^2
Political Orientation	Friends	1.231	0.079	0.087
	Family	1.086	0.281	0.077
	Religion	2.135	<.001	0.141
	Doctors	1.255	0.062	0.088
	Print Media	1.922	<.001	0.129
	Television	2.576	<.001	0.166
	Social Media	1.195	0.113	0.084
	Other	1.715	<.001	0.117
Age Group	Friends	2.785	0.095	0.002
	Family	1.393	0.238	0.001
	Religion	5.967	0.015	0.005
	Doctors	0.000	0.996	0.000
	Print Media	0.995	0.319	0.001
	Television	10.608	0.001	0.009
	Social Media	28.810	<.001	0.025
	Other	0.037	0.848	0.000
Gender	Friends	0.134	0.714	0.000
	Family	4.982	0.026	0.004
	Religion	2.687	0.101	0.002
	Doctors	0.452	0.502	0.000
	Print Media	1.969	0.161	0.002
	Television	4.467	0.035	0.004
	Social Media	3.023	0.082	0.003
	Other	0.202	0.653	0.000
Education Level	Friends	1.665	0.197	0.001
	Family	2.472	0.116	0.002
	Religion	2.000	0.158	0.002
	Doctors	0.962	0.327	0.001
	Print Media	6.545	0.011	0.006
	Television	0.565	0.452	0.000
	Social Media	0.696	0.404	0.001
	Other	3.833	0.051	0.003
Income Level	Friends	0.306	0.580	0.000
	Family	0.041	0.840	0.000
	Religion	2.492	0.115	0.002
	Doctors	2.156	0.142	0.002
	Print Media	1.607	0.205	0.001
	Television	0.148	0.701	0.000
	Social Media	1.021	0.313	0.001
	Other	2.642	0.104	0.002
Intercept	Friends	122.384	<.001	0.097
	Family	93.008	<.001	0.075
	Religion	169.041	<.001	0.129
	Doctors	63.331	<.001	0.053
	Print Media	71.927	<.001	0.059
	Television	79.266	<.001	0.065
	Social Media	146.880	<.001	0.114
	Other	57.904	<.001	0.048

In looking at political orientation as a predictor of reliance certain information sources, unadjusted findings (Appendix C Table C19) indicated that nearly all sources of information ("Family", "Religion", "Doctors", "Print Media", "Television", "Social Media", and "Other") were significantly associated with political orientation ($p < 0.05$), with friends being observed as marginally significant ($p = 0.059$). This pattern continued across partially (Appendix C Table C20) and fully adjusted models in Wave 1. However, information source reliance changes were evident by Wave 2, and in the fully adjusted model only "Religion", "Print Media", "Television", and "Other" remained significant. Raw and partially adjusted models for Wave 2 (Appendix C Tables C21 and C22) revealed similar findings.

5.4 Political Orientation Predicting Change in Vaccination Status and Mitigation Behaviours Maintenance

Results for prospective analysis are displayed in Tables 9 and 10 showing findings for fully adjusted change in vaccination from Wave 1 to Wave 2, and fully adjusted change in mitigation behaviour from Wave 1 to Wave 2 (raw and partially adjusted for Waves 1 and 2 – Appendix C, Tables C23 - C26).

Table 9

Vaccination Status Change – Fully Adjusted Model

	F	***p***
Political Orientation	0.926	0.676
Age Group	2.728	0.099
Gender	8.829	0.003
Education Level	0.111	0.739
Income Level	0.324	0.569
Intercept	2.346	0.126

Table 10

Mitigation Behaviour Change – Fully Adjusted Model

	Mitigation Behaviour	*p*	η_p^2
Political Orientation	Masking	<.001	0.221
	Distancing	0.005	0.143
	Hand Hygiene	0.045	0.128
Age Group	Masking	0.359	0.001
	Distancing	0.132	0.003
	Hand Hygiene	0.725	0.000
Gender	Masking	0.498	0.001
	Distancing	0.922	0.000
	Hand Hygiene	0.697	0.000
Education Level	Masking	0.286	0.001
	Distancing	0.597	0.000
	Hand Hygiene	0.576	0.000
Income Level	Masking	0.748	0.000
	Distancing	0.686	0.000
	Hand Hygiene	0.662	0.000
Intercept	Masking	0.139	0.003
	Distancing	0.013	0.008
	Hand Hygiene	0.145	0.003

Raw, partially (Appendix C Tables C23 and C24) and fully adjusted models revealed no significant effect of political orientation on changes in vaccination (from unvaccinated to fully vaccinated). Tests of the effect of relatively right-wing political orientation on changes in mask wearing (F=2.457, p <.001, η_p^2= 0.214), changes in distancing (F=1.435, p = .005, η_p^2= .137) and changes in hand hygiene (F=1.256, p =.054, η_p^2= .122) were all significant in unadjusted models (Appendix C Table C25). Similarly, partially adjusted models also indicated that relatively right-wing political orientation was a significant predictor for changes in mask wearing (F=3.984, p <.001, η_p^2= .214), changes in distancing (F=3.736, p =.005, η_p^2= .138) and marginally significant for changes in hand hygiene (F=1.785, p =.059, η_p^2= .121) (Appendix C Table C26). Fully adjusted models revealed significant effects of relatively right-wing political orientation on all three mitigation behaviours: mask wearing (F=2.470, p <.001, η_p^2= .221), distancing (F=1.451, p =.005, η_p^2= .143) and hand hygiene (F=1.280, p =.045, η_p^2= .128).

5.5 Perceived Risk

Table 11

Perceived Risk Descriptive Analyses for Immunocompromised Status and Political Orientation

Perceived Risk	**Wave 1**		**Wave 2**	
	Mean (95% CI)	***Standard Error***	**Mean (95% CI)**	***Standard Error***
IC = Yes	2.66 (2.43, 2.89)	.12	2.65 (2.43,2.87)	.11
IC = No	2.25 (2.20, 2.30)	.03	1.97 (1.92, 2.02)	.03
Left Leaning (Index < 0)	2.62 (2.55, 2.70)	.04	2.42 (2.34, 2.50)	.04
Right Leaning (Index > 0)	1.93 (1.85, 2.00)	.04	1.70 (1.63, 1.77)	.04

Table 12

Perceived Risk Zero-Order Correlations for Immunocompromised Status and Political Orientation – Wave 1

Correlations		**Political Orientation (Pearson)**	**Immunocompromised Status (Spearman)**	**Perceived Risk**
Perceived Risk	Correlation	-.322**	-.077**	1
	Sig. (2-tailed)	< 0.01	< 0.01	
	N	1749	1861	1975

** Correlation is significant at the 0.01 level (2-tailed).

A descriptive analysis of perceived risk showed that across both Waves, those who were immunocompromised had higher mean perceived risk (2.66, 2.65) than those who were not immunocompromised (2.25, 1.97). Similarly, those who were left leaning (had a political orientation index score <0) had a mean perceived risk higher (2.62, 2.42) than those who were right leaning (had a political orientation index score >0) (1.93, 1.70) across both Waves. Furthermore, zero-order correlations showed significant associations between political orientation and perceived risk, as well as immunocompromised status and perceived risk.

6. Discussion

The purpose of the present investigation was to examine whether political orientation predicts vaccination status and other COVID-19 mitigation behaviors in a national sample of Canadian adults, and whether the predictive power depends on immunocompromised status. It was hypothesized that relatively more right-leaning political orientation would predict lower likelihood of being fully vaccinated and less consistent implementation of other mitigation behaviors. Furthermore, we hypothesized that individual objective risk—i.e., immunocompromised status—would moderate associations between political orientation and vaccination status, as well as other mitigation behaviours.

6.1 Primary Hypotheses

In line with this hypothesis, findings indicated that relatively more right leaning political orientation was associated with significantly reduced odds of being vaccinated across raw and adjusted models in both CCES survey Waves. Likewise, the hypothesized moderation effects involving immunocompromised status were observed in all models in Wave 1. Specifically, political orientation was a weaker predictor of vaccination status among immunocompromised respondents, relative to non-immunocompromised respondents. However, it should be noted, that despite significant interaction, there was still overlap of the confidence intervals in the stratified effects of immunocompromised respondents. This may suggest that while the moderation effects were statistically significant, they may not be clinically significant. Moderating effects were not evident in Wave 2, which also speaks to the need for replication of the observed moderating effects in other samples.

Similar effects were observed for consistency of COVID-19 mitigation behaviours, where relatively right-wing orientation was a significant predictor for the decreased consistency of all three behaviours (masking, social distancing, and hand hygiene) in both Waves 1 and 2, across raw and adjusted models. Models testing moderation effects for mitigation behaviours in Wave 1 indicated that there was a significant interaction between immunocompromised status and political orientation for all three behaviours, across unadjusted and partially adjusted models. Fully adjusted models indicated marginal significance for masking and social distancing, while

hand hygiene remained significant. However, the size of the effect for political orientation was larger among those who were immunocompromised, when compared to those were not immunocompromised. This is the opposite of the initially predicted direction, which posited that effect sizes would be larger among those who were not immunocompromised, compared to those who are. Wave 2 moderation effects showed that only masking was significantly moderated by immunocompromised status across raw and adjusted models—however, the direction of moderation was in line with initial expectations.

In terms of Wave 1 findings, the moderation effects may have been observed only because immunocompromised individuals had decided on vaccination solely based on their heightened mortality risk, regardless of political orientation. In Wave 2, after some threat had passed and many Canadians were fully vaccinated, only then did political orientation matter to those who were immunocompromised, however even in this instance, only for masking. There are a number of potential explanations as to why changes occurred between measurement periods such as, new respondents which were added in the Wave 2 replenishment may have differed in their vaccination status and behaviours, relative to their immunocompromised status, than those in the initial Wave 1 response group. Further, the second Wave may have occurred at a time when vaccine and mitigation behaviours had crystallized—that is, those who were more likely to be fully vaccinated due to their vulnerable health status had already done so by this time—or the later timing of the second Wave corresponded with overall higher vaccinations rates in the Canadian population at large, thereby reducing the visibility of this association (Mathieu et al., 2021).

6.2 Secondary Hypotheses

In terms of secondary findings, we predicted that political orientation would impact the likelihood of reliance on certain information sources; specifically right-leaning respondents would be more likely to rely on unofficial or non-mainstream sources, than those who were relatively left-leaning. Lastly, given the early stage of the pandemic—with vaccines only recently introduced and with many individuals still unvaccinated—we anticipated that the temporal stability of unvaccinated status would be stronger for those who were relatively more right-wing. In other words, we predicted that initially unvaccinated right-leaning respondents

would be less likely to shift toward full vaccination or to maintain mitigation behaviors, compared to left-leaning respondents.

Regarding information source reliance, findings in Wave 1 indicated that increasingly right-wing political orientation predicted significant reliance on all information sources, except "Friends", in raw and adjusted models. In Wave 2 fully adjusted models, "Religious Groups", "Print Media", "Television" and "Other" sources remained significantly associated with political orientation, while "Family", "Doctors" and "Social Media" were less influential and did not retain significance. This shift may be a result of several factors, such as the solidification of views regarding pandemic-related health measures (i.e., vaccination and mitigation behaviours) resulting in more narrowly focused and self-confirming information environments. Alternatively, the observed changes may be associated with generally lower engagement with pandemic-related information as provincial and federal governments began easing public health measures and restrictions during the period when Wave 2 measurements were taken. The findings here offer partial confirmation of the initial hypothesis, but the association between political orientation and information source reliance merits further exploration in future studies.

In terms of change over time, we found that political orientation was not a significant predictor of change in vaccination between Waves 1 and 2. This was the case in all raw and adjusted models. It is possible the stability of vaccination status could be a result of the relatively short gap between Waves, or that each Wave of measurement occurred at a time where vaccine intentions had already crystallized for the majority of the sample. On the other hand, political orientation was a significant predictor of changes in COVID-19 mitigation behaviours. Relatively right-wing political orientation predicted greater reductions in the consistency of masking and distancing between Waves 1 to 2. The same pattern was evident for hand hygiene, but the effect of political orientation was only marginally significant.

Lastly, when looking at the descriptive analysis of perceived risk, findings were largely consistent with *a-priori* thinking. Mean risk perception was higher for those who were immunocompromised than those who were not; risk perception was also different between left-leaning and right leaning respondents, where mean risk perception for left leaning respondents

was higher than right leaning respondents in both Waves of measurement. Likewise, an analysis of zero-order correlations between perceived risk, immunocompromised status, and political orientation further supports *a-priori* thinking.

Our primary findings were largely consistent with other published studies. For example, the finding that right-leaning people were less likely to be vaccinated and consistently engage in mitigation behaviors during the COVID-19 pandemic was reported by at least 4 prior studies (Albrecht, 2022; Hao & Shao, 2022; Pennycook et al., 2022; Tram et al., 2021). Further, with respect to mitigation behaviours, existing literature is largely consistent with our findings, with numerous prior studies reporting that right-wing political orientation was associated with lower consistency of mitigation behaviours such as, masking, social distancing, and hand hygiene (Allcott et al., 2020; Barrios et al., 2020; Leventhal et al., 2021; Painter & Qiu, 2020; Wang et al. (2021).

Existing literature regarding immunocompromised status and vaccination broadly found that those who were immunocompromised were more likely to be vaccinated (Barrière et al., 2021; Chun et al., 2021; Duly et al., 2022; Gaur et al., 2021; Mejri et al., 2022; Tsai et al., 2022; Villarreal-Garza et al., 2021). However, much of the existing literature assessed vaccine uptake as an outcome and immunocompromised status as a predictor, and not a moderator—as was the case in this study. Therefore, the results of this study provide a different perspective on the nature of the relationship between these elements. Existing literature also demonstrated that those who were immunocompromised had higher consistency of mitigation behaviours (Barrière et al., 2021; Chun et al., 2021; Duly et al., 2022; Gaur et al., 2021; Mejri et al., 2022; Tsai et al., 2022; Villarreal-Garza et al., 2021). Similarly, most prior studies did not examine immunocompromised status as a moderating factor, but instead often conceptualized it as a predictor of mitigation behaviour consistency. As such, examining the association in this manner was rather novel. Our findings demonstrated that political orientation had a larger effect on mitigation behaviour consistency among the immunocompromised than those who were not immunocompromised, clearly indicating the presence of a moderating effect. These findings were unique in that they described the impact of political orientation on mitigation behaviours within the context of immunocompromised status.

With respect to our secondary findings, there were few comparable other studies. Looking at the association of political orientation and information source reliance, the propensity of right-leaning individuals to engage more with social media specifically as a source for COVID-19 information—as seen in Wave 1—was observed in numerous investigations (Jennings et al., 2021; Jamieson & Albarracín, 2020; Pennycook et al., 2022, Szilagyi et al., 2021). While the significance of religious groups as a source of information was not well-discussed in literature, religiosity was examined in some investigations as a measure of how it may influence vaccine acceptance (Milligan et al., 2022). Lastly, looking at how political orientation influences change in vaccination and mitigation behaviours consistency over time, longitudinal studies by Fridmanid et al. (2021) and Naeim et al. (2021) found that right-leaning respondents had more negative initial vaccine perceptions, that these perceptions became even more negative during the course of study, and that right-leaning respondents had lower mitigation behaviour consistency. However, these studies did not directly examine the impact of political orientation on change in vaccination status or mitigation behaviour maintenance. As such, our findings present potentially new information about how political orientation may influence the malleability of mitigation behavior maintenance and vaccination uptake among relatively right-wing respondents.

6.3 Strengths and Limitations

Strengths of the current investigation include the use of a broad and national sample, and the approximately equal number of vaccinated and unvaccinated respondents in both waves. This sample characteristic, achieved through quota sampling, allowed for maximal statistical power when examining vaccination status as an outcome. Further, multiple waves of measurement enabled prospective analysis for the association between political orientation and change in vaccination status and mitigation behaviour frequency. Moreover, the robustness of the political orientation measure (i.e., a combination of three measures) allows for a more comprehensive representation of political orientation than has been accomplished in many other studies which often rely on a single measure of orientation, such as state or federal party affiliation. Further, the broad range of outcome and covariate measures collected and analyzed

allows for a more comprehensive assessment of the impact of political orientation across a broad collection of related factors.

Limitations of this study include reliance on self-reporting for the surveys, which may be subject to recall bias. This may have influenced the accuracy of responses, where respondents may not have been able to accurately quantify their mitigation behaviour adherence, which could in theory produce non-differential misclassification and potentially bias the results towards the null. Conversely, desirability bias also has the potential to influence how accurately those who were disinclined to adopt mitigation behaviours self-report their behaviour consistency, which may have supressed the magnitude of the association that was observed between political orientation and mitigation behaviour consistency. The use of Leger Opinion panel meant that respondents were those who had voluntarily enrolled into a marketing panel, which may have resulted in selection bias. Further, quota sampling, as opposed to true random sampling, also has the potential to lead to selection bias. Specifically, the increased proportion of unvaccinated respondents present in the study sample, relative to the general population, may have increased or supressed the strength of some observed associations, such as the lack significant change in vaccination status over time seen in the prospective analysis. However, in this case, quota sampling was useful in order to achieve the ideal statistical power needed to compare vaccinated and not fully vaccinated respondents.

Further, attrition between survey Waves limited the subset of respondents which were included in prospective analysis, relative to the cross-sectional analysis within each wave. This may have resulted in attenuated temporal associations. Likewise, having only 2 measurement waves (as opposed to perhaps 4 over the course of a year), and the relatively short spacing between waves may have reduced the ability to detect temporal trends in the context of wave specific variability in any given outcome variable. The number of respondents which were immunocompromised in each wave was relatively small (n=138, 136) and may have potentially limited our ability to pick up reliable moderating effects of such variables, and reduced the power of any moderation analysis. There were several primary and secondary hypotheses, which some may argue should result in a statistical adjustment, such as a p value correction (such as Bonferroni or family wise error adjustment). However, all the hypotheses for this investigation

were *a-priori* and the investigation was not exploratory in nature. Likewise, the number of analyses and hypotheses tests for a study of this nature would not typically obligate the use of *p* value corrections based on reports that appear in the published research literature. If the *p* value were adjusted from .05 to .01, for example, it would result in the loss of significance in some of the findings, such as the moderation of vaccine status in Wave 1 or the moderation of social distancing in Wave 1, but most of the primary analyses would remain unaffected. Lastly, there was a decision made early on in recoding the data to code all responses of "Don't Know" and "Refused" as "Missing" While this may have resulted in the loss of some responses that could be analyzed, this was an appropriately conservative strategy rather than speculating as to the hypothesized "true" value of the response and imputing it.

7. Conclusion

In conclusion, we examined the predictive power of political orientation for two primary outcomes: vaccination and mitigation behaviour consistency. We further examined moderation of primary outcome effects by immunocompromised status. Our findings suggest that there was a strong and reliable link between political orientation and vaccination status, as well as between political orientation and mitigation behaviour performance, as significant associations were observed in both Waves across raw and adjusted models. Moderation by immunocompromised status for vaccination was also significant in Wave 1 but the effect dissipated by Wave 2. Moderation of mitigation behaviours was significant in Wave 1; however, the direction was the opposite of what was initially hypothesized. By Wave 2, the link between political orientation and masking was moderated by immunocompromised status—however the direction of the moderation was in line with our initial predictions.

The predictive power of political orientation for secondary outcomes was also assessed: information source reliance and change in either of the primary outcomes between Wave1 and Wave 2. Our findings indicated that initially (Wave 1), relatively right-leaning orientation was significant predictor of reliance across all sources of information, except “Friends”. However, as the pandemic progressed, respondents were narrowing their reliance on sources and by Wave 2, relatively right-wing political orientation was a significant predictor of reliance on “Religious Groups”, “Print Media”, “Television”, and “Other” sources. Lastly, while there was no significant association found between political orientation and changes in vaccination status, relatively right-wing political orientation was a significant predictor for decreases in masking and distancing across waves in raw and adjusted models.

The importance of political orientation as a factor influencing vaccine uptake and behavioural outcomes is evident based on the findings of this study. The entanglement between politics and public health has deepened over recent years and has come to the forefront during the COVID-19 pandemic. Our findings indicate that should another public health emergency arise in the future, policy makers and public health practitioners would benefit from giving substantial consideration to how individuals’ political inclinations may influence the successful implementation of health measures, the uptake of any potential future vaccines, or similar

medical interventions. The politicization of public health measures during the COVID-19 pandemic, in contrast to, for example, how the discourse surrounding cancer is structured, is indicative that significant work needs to be done to depoliticize health-related information, health communication and public health overall. This could be accomplished a variety of ways, such as with public information campaigns, and educational programs for health literacy in schools, among others. What is clear is that public health practitioners cannot be unprepared and must be cognizant of the potential for political orientation to interfere with the success of public health measures when the next public health emergency arises in Canada.

Future research would benefit from taking a more longitudinal approach spanning years rather than months. This may provide greater context into the influence of political orientation on vaccination and behavioural outcomes as they unfold over time, and the relative durability of some of the effects observed here. Lastly, findings regarding information source reliance suggest that future work should seek to further explore these relationships within the context of how political orientation may influence information environments. Use of other country contexts and population datasets would be beneficial in this respect, and provide important information as to the replicability of the current findings around the world.

References

Albrecht, D. (2022). Vaccination, politics and COVID-19 impacts. *BMC Public Health*, *22*(1), 1–12.

Allcott, H., Boxell, L., Conway, J., Gentzkow, M., Thaler, M., & Yang, D. (2020). Polarization and public health: Partisan differences in social distancing during the coronavirus pandemic. *Journal of Public Economics*, *191*, 104254.

Baack, B. N., Abad, N., Yankey, D., Kahn, K. E., Razzaghi, H., Brookmeyer, K., Kolis, J., Wilhelm, E., Nguyen, K. H., & Singleton, J. A. (2021). COVID-19 Vaccination Coverage and Intent Among Adults Aged 18–39 Years — United States, March–May 2021. *MMWR Recommendations and Reports*, *70*(25), 928–933.

Barrière, J., Gal, J., Hoch, B., Cassuto, O., Leysalle, A., Chamorey, E., & Borchiellini, D. (2021). Acceptance of SARS-CoV-2 vaccination among French patients with cancer: a cross-sectional survey. *Annals of Oncology*, *32*(5), 673–674.

Barrios, J. M., Hochberg, Y. v, thank Lauren Cohen, W., Dingel, J., Fisman, R., Hassan, T., Jayachandran, S., Leuz, C., McLure, C., Sapienza, P., Shleifer, A., Shue, K., Tsoutsoura, M., Weber, M., Yannelis, C., & Hochberg, Y. (2020). *Risk Perception Through the Lens of Politics in the Time of the COVID-19 Pandemic*.

Boulware, L. E., Cooper, L. A., Ratner, L. E., LaVeist, T. A., & Powe, N. R. (2003). Race and trust in the health care system. *Public Health Reports*, *118*(4), 358–365.

Brownlie, J., & Howson, A. (2016). 'Leaps of Faith' and MMR: An Empirical Study of Trust: *39*(2), 221–239

Busse, J. W., Walji, R., & Wilson, K. (2011). Parents' experiences discussing pediatric vaccination with healthcare providers: a survey of Canadian naturopathic patients. *PloS One*, *6*(8).

Carey, J. M., Guess, A. M., Loewen, P. J., Merkley, E., Nyhan, B., Phillips, J. B., & Reifler, J. (2022). The ephemeral effects of fact-checks on COVID-19 misperceptions in the United States, Great Britain and Canada. *Nature Human Behaviour*, *6*(2), 236–243.

Casiday, R. E. (2007). Children's health and the social theory of risk: insights from the British measles, mumps and rubella (MMR) controversy. *Social Science & Medicine (1982)*, *65*(5), 1059–1070.

Chun, J. Y., Kim, S. I., Park, E. Y., Park, S. Y., Koh, S. J., Cha, Y., Yoo, H. J., Joung, J. Y., Yoon, H. M., Eom, B. W., Park, C. M., Han, J. Y., Kim, M., Lee, D. W., Kim, J. W., Keam, B., Lee, M., Kim, T. M., Choi, Y. J., … Lim, M. C. (2021). Cancer patients' willingness to take covid-19 vaccination: A nationwide multicenter survey in korea. *Cancers*, *13*(15).

Dubé, E., Laberge, C., Guay, M., Bramadat, P., Roy, R., & Bettinger, J. (2013). Vaccine Hesitancy: An Overview. *Http://Dx.Doi.Org/10.4161/Hv.24657*, *9*(8), 1763–1773.

Duly, K., Farraye, F. A., & Bhat, S. (2022). COVID-19 vaccine use in immunocompromised patients: A commentary on evidence and recommendations. *American Journal of Health-System Pharmacy*, *79*(2), 63–71

Duan, L., Shao, X., Wang, Y., Huang, Y., Miao, J., Yang, X., & Zhu, G. (2020). An investigation of mental health status of children and adolescents in china during the outbreak of COVID-19. Journal of affective disorders, 275, 112-118.

Fournet, N., Mollema, L., Ruijs, W. L., Harmsen, I. A., Keck, F., Durand, J. Y., Cunha, M. P., Wamsiedel, M., Reis, R., French, J., Smit, E. G., Kitching, A., & van Steenbergen, J. E.

(2018). Under-vaccinated groups in Europe and their beliefs, attitudes and reasons for non-vaccination; Two systematic reviews. *BMC Public Health*, *18*(1).

François, G., Duclos, P., Margolis, H., Lavanchy, D., Siegrist, C. A., Meheus, A., Lambert, P. H., Emiroğlu, N., Badur, S., & van Damme, P. (2005). Vaccine safety controversies and the future of vaccination programs. *The Pediatric Infectious Disease Journal*, *24*(11), 953–961.

Freeman, D., Loe, B. S., Chadwick, A., Vaccari, C., Waite, F., Rosebrock, L., Jenner, L., Petit, A., Lewandowsky, S., Vanderslott, S., Innocenti, S., Larkin, M., Giubilini, A., Yu, L. M., McShane, H., Pollard, A. J., & Lambe, S. (2021). COVID-19 vaccine hesitancy in the UK: The Oxford coronavirus explanations, attitudes, and narratives survey (Oceans) II. *Psychological Medicine*.

Fridmanid, A., Gershon, R., & Gneezy, A. (2021). *COVID-19 and vaccine hesitancy: A longitudinal study*.

Gatwood, J., McKnight, M., Fiscus, M., Hohmeier, K. C., & Chisholm-Burns, M. (2021). Factors influencing likelihood of COVID-19 vaccination: A survey of Tennessee adults. *American Journal of Health-System Pharmacy*, *78*(10), 879–889.

Gaur, P., Agrawat, H., & Shukla, A. (2021). COVID-19 vaccine hesitancy in patients with systemic autoimmune rheumatic disease: an interview-based survey. *Rheumatology International*, *41*(9), 1601–1605.

Greenland, S. (2000). Principles of multilevel modelling. *International Journal of Epidemiology*, *29*(1), 158–167.

Hall, P. A., Fong, G. T., Hitchman, S. C., Quah, A. C. K., Agar, T., Meng, G., Ayaz, H., Dore, B. P., Sakib, M. N., Hudson, A., & Boudreau, C. (2022). The Canadian COVID-19 Experiences Project: Design and Protocol. *MedRxiv*, 2021.12.24.21268387.

Hao, F., & Shao, W. (2022). Understanding the influence of political orientation, social network, and economic recovery on COVID-19 vaccine uptake among Americans. *Vaccine*, *40*(14), 2191–2201.

Hayes, A. F. (2022). *Introduction to Mediation, Moderation, and Conditional Process Analysis* (3rd Edition).

Hidalgo, B., & Goodman, M. (2013). Multivariate or Multivariable Regression? *American Journal of Public Health*, *103*(1), 39.

Jamieson, K. H., & Albarracín, D. (2020). The relation between media consumption and misinformation at the outset of the SARS-CoV-2 pandemic in the US. *Harvard Kennedy School Misinformation Review*, *1*(3).

Jennings, W., Stoker, G., Bunting, H., Valgarõsson, V. O., Gaskell, J., Devine, D., McKay, L., & Mills, M. C. (2021). Lack of Trust, Conspiracy Beliefs, and Social Media Use Predict COVID-19 Vaccine Hesitancy. *Vaccines*, *9*(6), 593.

Kalan, M. E., Jebai, R., Zarafshan, E., & Bursac, Z. (2021). Distinction Between Two Statistical Terms: Multivariable and Multivariate Logistic Regression. *Nicotine & Tobacco Research*, *23*(8), 1446–1447.

Kleinbaum, D. G., Kupper, L. L., Nizam, A., & Rosenberg, E. S. (n.d.). *Applied regression analysis and other multivariable methods*. 1051.

Kreps, S., Prasad, S., Brownstein, J. S., Hswen, Y., Garibaldi, B. T., Zhang, B., & Kriner, D. L. (2020). Factors Associated With US Adults' Likelihood of Accepting COVID-19 Vaccination. *JAMA Network Open*, *3*(10), e2025594.

Lazarus, J. v., Ratzan, S. C., Palayew, A., Gostin, L. O., Larson, H. J., Rabin, K., Kimball, S., & El-Mohandes, A. (2020). A global survey of potential acceptance of a COVID-19 vaccine. *Nature Medicine 2020 27:2*, *27*(2), 225–228

Leventhal, A. M., Dai, H., Barrington-Trimis, J. L., McConnell, R., Unger, J. B., Sussman, S., & Cho, J. (2021). Association of Political Party Affiliation With Physical Distancing Among Young Adults During the COVID-19 Pandemic. *JAMA Internal Medicine*, *181*(3), 399–403.

Lin, C., Tu, P., & Beitsch, L. M. (2021). Confidence and Receptivity for COVID-19 Vaccines: A Rapid Systematic Review. *Vaccines*, *9*(16).

MacDonald, N. E., Eskola, J., Liang, X., Chaudhuri, M., Dube, E., Gellin, B., Goldstein, S., Larson, H., Manzo, M. L., Reingold, A., Tshering, K., Zhou, Y., Duclos, P., Guirguis, S., Hickler, B., & Schuster, M. (2015). Vaccine hesitancy: Definition, scope and determinants. *Vaccine*, *33*(34), 4161–4164.

Malik, A. A., McFadden, S. A. M., Elharake, J., & Omer, S. B. (2020). Determinants of COVID-19 vaccine acceptance in the US. *EclinicalMedicine*, *26*.

Mathieu, E., Ritchie, H., Ortiz-Ospina, E., Roser, M., Hasell, J., Appel, C., Giattino, C., & Rodés-Guirao, L. (2021). A global database of COVID-19 vaccinations. *Nature Human Behaviour 2021 5:7*, *5*(7), 947–953.

Mattia, G., Anna, I., Alice, B., Riccardo, M., Stefania, C., & Alessandra, G. (2021). Who is willing to get vaccinated? A study into the psychological, socio-demographic, and cultural determinants of COVID-19 vaccination intentions. *Vaccines*, *9*(8).

Mejri, N., Berrazega, Y., Ouertani, E., Rachdi, H., Bohli, M., Kochbati, L., & Boussen, H. (2022). Understanding COVID-19 vaccine hesitancy and resistance: another challenge in cancer patients. *Supportive Care in Cancer*, *30*(1), 289–293.

Milligan, M. A., Hoyt, D. L., Gold, A. K., Hiserodt, M., & Otto, M. W. (2022). COVID-19 vaccine acceptance: Influential roles of political party and religiosity. Psychology, Health & Medicine, 27(9), 1907-1917.

Naeim A, Baxter-King R, Wenger N, Stanton A, Sepucha K, Vavreck L
Effects of Age, Gender, Health Status, and Political Party on COVID-19–Related Concerns and Prevention Behaviors: Results of a Large, Longitudinal Cross-sectional Survey JMIR Public Health Surveill 2021;7(4):e24277

Painter, M. O., & Qiu, T. (2020). Covid Economics Vetted and Real-Time Papers Political beliefs affect compliance with Covid-19 social distancing orders. In *Covid Economics* (Vol. 4).

Parkin, A. (2021). *Democracy and Political Polarization in Canada and the U.S.*

Paulussen, T. G. W., Hoekstra, F., Lanting, C. I., Buijs, G. B., & Hirasing, R. A. (2006). Determinants of Dutch parents' decisions to vaccinate their child. *Vaccine*, *24*(5), 644–651.

Pedersen, M. J., & Favero, N. (2020). Social Distancing during the COVID-19 Pandemic: Who Are the Present and Future Noncompliers? *Public Administration Review*, *80*(5), 805–814.

Pennycook, G., McPhetres, J., Bago, B., & Rand, D. G. (2022). Beliefs About COVID-19 in Canada, the United Kingdom, and the United States: A Novel Test of Political Polarization and Motivated Reasoning. *Personality and Social Psychology Bulletin*, *48*(5), 750–765.

Pogue, K., Jensen, J. L., Stancil, C. K., Ferguson, D. G., Hughes, S. J., Mello, E. J., Burgess, R., Berges, B. K., Quaye, A., & Poole, B. D. (2020). Influences on attitudes regarding potential covid-19 vaccination in the united states. *Vaccines*, *8*(4), 1–14.

Poland, G. A., & Spier, R. (2010). Fear, misinformation, and innumerates: how the Wakefield paper, the press, and advocacy groups damaged the public health. *Vaccine*, *28*(12), 2361–2362.

Poltorak, M., Leach, M., Fairhead, J., & Cassell, J. (2005). "MMR talk" and vaccination choices: an ethnographic study in Brighton. *Social Science & Medicine (1982)*, *61*(3), 709–719.

Ponizovskiy, V., Grigoryan, L., & Hofmann, W. (2022). Why is right-wing media consumption associated with lower compliance with COVID-19 measures? *Journal of Media Psychology: Theories, Methods, and Applications*, *undefined*(undefined), undefined.

Quadri-Sheriff, M., Hendrix, K. S., Downs, S. M., Sturm, L. A., Zimet, G. D., & Finnell, S. M. E. (2012). The role of herd immunity in parents' decision to vaccinate children: a systematic review. *Pediatrics*, *130*(3), 522–530. https://doi.org/10.1542/PEDS.2012-0140

Ruijs, W. L. M., Hautvast, J. L. A., van Ijzendoorn, G., van Ansem, W. J. C., van der Velden, K., & Hulscher, M. E. (2012). How orthodox protestant parents decide on the vaccination of their children: a qualitative study. *BMC Public Health*, *12*(1). https://doi.org/10.1186/1471-2458-12-408

Ruiz, J. B., & Bell, R. A. (2021). Predictors of intention to vaccinate against COVID-19: Results of a nationwide survey. *Vaccine*, *39*(7), 1080–1086.

SAGE Working Group. (2014). SAGE Working Group On Vaccine Hesitancy. *World Health Organization*.

Salmon, D. A., Dudley, M. Z., Glanz, J. M., & Omer, S. B. (2015). Vaccine hesitancy: Causes, consequences, and a call to action. *Vaccine*, *33*, D66–D71.

Salomoni, M. G., di Valerio, Z., Gabrielli, E., Montalti, M., Tedesco, D., Guaraldi, F., & Gori, D. (2021). Hesitant or not hesitant? A systematic review on global covid-19 vaccine acceptance in different populations. *Vaccines*, *9*(8).

Sankaranarayanan, S., Jayaraman, A., & Gopichandran, V. (2019). Assessment of Vaccine Hesitancy among Parents of Children between 1 and 5 Years of Age at a Tertiary Care Hospital in Chennai. *Indian Journal of Community Medicine : Official Publication of Indian Association of Preventive & Social Medicine*, *44*(4), 394.

Stoltzfus, J. C. (2011). Logistic regression: a brief primer. *Academic Emergency Medicine : Official Journal of the Society for Academic Emergency Medicine*, *18*(10), 1099–1104.

Szilagyi, P. G., Thomas, K., Shah, M. D., Vizueta, N., Cui, Y., Vangala, S., Fox, C., & Kapteyn, A. (2021). The role of trust in the likelihood of receiving a COVID-19 vaccine: Results from a national survey. *Preventive Medicine*, *153*.

Taylor, S., Landry, C. A., Paluszek, M. M., Groenewoud, R., Rachor, G. S., & Asmundson, G. J. G. (2020). A Proactive Approach for Managing COVID-19: The Importance of Understanding the Motivational Roots of Vaccination Hesitancy for SARS-CoV2. *Frontiers in Psychology*, *11*.

Tian, W. (2021). How China Managed the COVID-19 Pandemic. *Asian Economic Papers*, *20*(1), 75–101.

Tickner, S., Leman, P. J., & Woodcock, A. (2006). Factors underlying suboptimal childhood immunisation. *Vaccine*, *24*(49–50), 7030–7036.

Tram, K. H., Saeed, S., Bradley, C., Fox, B., Eshun-Wilson, I., Mody, A., & Geng, E. (2021). Deliberation, dissent, and distrust: understanding distinct drivers of COVID-19 vaccine hesitancy in the United States. *Clin Infect Dis*, *74*(8), 1429–1441.

Tsai, R., Hervey, J., Hoffman, K., Wood, J., Johnson, J., Deighton, D., Clermont, D., Loew, B., & Goldberg, S. L. (2022). COVID-19 Vaccine Hesitancy and Acceptance Among

Individuals With Cancer, Autoimmune Diseases, or Other Serious Comorbid Conditions: Cross-sectional, Internet-Based Survey. *JMIR Public Health Surveill 2022;8(1):E29872*

University of Waterloo. (2022, July). *Canadian COVID-19 Experiences Project Survey Waves 1 and 2 Technical Report*. University of Waterloo, Waterloo, Ontario, Canada.

Villarreal-Garza, C., Vaca-Cartagena, B. F., Becerril-Gaitan, A., Ferrigno, A. S., Mesa-Chavez, F., Platas, A., & Platas, A. (2021). Attitudes and Factors Associated with COVID-19 Vaccine Hesitancy among Patients with Breast Cancer. *JAMA Oncology*, *7*(8), 1242–1244.

Wang, D., Marmo-Roman, S., Krase, K., & Phanord, L. (2021). Compliance with preventative measures during the COVID-19 pandemic in the USA and Canada: Results from an online survey. *Social Work in Health Care*, *60*(3), 240–255.

Appendix A: Background and Sampling

Table A1

Vaccine Hesitancy Matrix (MacDonald et al., 2015)

Working Group on Vaccine Hesitancy Determinants Matrix.

Contextual influences Influences arising due to historic, socio-cultural, environmental, health system/institutional, economic or political factors	a. Communication and media environment b. Influential leaders, immunization programme gatekeepers and anti- or pro-vaccination lobbies c. Historical influences d. Religion/culture/gender/socio-economic e. Politics/policies f. Geographic barriers g. Perception of the pharmaceutical industry
Individual and group influences Influences arising from personal perception of the vaccine or influences of the social/peer environment	a. Personal, family and/or community members' experience with vaccination, including pain b. Beliefs, attitudes about health and prevention c. Knowledge/awareness d. Health system and providers – trust and personal experience e. Risk/benefit (perceived, heuristic) f. Immunization as a social norm vs. not needed/harmful
Vaccine/vaccination – specific issues Directly related to vaccine or vaccination	a. Risk/benefit (epidemiological and scientific evidence) b. Introduction of a new vaccine or new formulation or a new recommendation for an existing vaccine c. Mode of administration d. Design of vaccination programme/Mode of delivery (e.g., routine programme or mass vaccination campaign) e. Reliability and/or source of supply of vaccine and/or vaccination equipment f. Vaccination schedule g. Costs h. The strength of the recommendation and/or knowledge base and/or attitude of healthcare professionals

Table A2

CCES Wave 1 Sample Vaccine Status Definitions (University of Waterloo, 2022)

Subsample (quota) group	**Definition**	**Target (*n*)**	**Valid (*n*)**
Non-Vaccinated	Having received no COVID-19 vaccination; or, Having received one shot of a two-shot vaccination with no plan for, or being unsure about whether a second shot will be received.	1000	975
Vaccinated	Having two shots of an approved COVID-19 two-dose vaccine.	1000	983
	Total	**2000**	**1958**

Table A3

CCE Wave 2 Sample Vaccine Status Definitions (University of Waterloo, 2022)

Subsample (quota) group	Definition	Valid (*n*)
Non-Vaccinated (Recontact)	Retained Wave 1 respondents. Having received no COVID-19 vaccination; or, Having received one shot of a two-shot vaccination with no plan for, or being unsure about whether a second shot will be received.	397
Non-Vaccinated (Replenishment)	New Wave 2 respondents. Having received no COVID-19 vaccination; or, Having received one shot of a two-shot vaccination with no plan for, or being unsure about whether a second shot will be received.	414
Vaccinated (Recontact)	Retained Wave 1 respondents. Having two shots of an approved COVID-19 two-dose vaccine.	735
Vaccinated (Replenishment)	New Wave 2 respondents. Having two shots of an approved COVID-19 two-dose vaccine.	260
Non-hesitant Single Dose (Recontact)	No longer vaccine hesitant, but had not become fully vaccinated.	13
	Total	**1819**

Table A4

Wave 1 Cooperation and Response Rates (University of Waterloo, 2022)

	Frequency	%
A – Interviewed		
Total Interviewed	2003	2.1
B – Eligible but not interviewed.		
Refusal/ breaks off.	109	0.1
Other	0	0.0
Total	**109**	**0.1**
C – Unknown if eligible (not interviewed)	701	0.7
Logged into system to start survey (once or more)	110	0.1
Estimated number of eligible and quota not full	591	0.6
Estimated number of not eligible or quota full	83911	88.3
Never logged into system to start survey.	13154	13.8
Estimated number of eligible and quota not full	70757	74.4
Estimated number of not eligible or quota full	**84612**	**89.0**
Total		
D – Not eligible		
Out of sample	3	0.0
Respondent is not eligible	852	0.9
Quota full	7488	7.9
Other	0	0.0
Total	**8343**	**8.8**
Total Sample with Final Disposition	**95067**	**100**
Estimated eligibility rate	**71.3%**	
Estimated proportion for which quota was full	**78.0%**	
Response rate	**12.0%**	
Cooperation rate	**94.8%**	

Table A5

Wave 2 Cooperation and Response Rates (University of Waterloo, 2022)

	Frequency	%
A – Interviewed		
Total Interviewed	690	0.9
B – Eligible but not interviewed.		
Refusal/ breaks off.	28	0.0
Other	0	0.0
Total	**28**	**0.0**
C – Unknown if eligible (not interviewed)	327	0.4
Logged into system to start survey (once or more)	31	0.0
Estimated number of eligible and quota not full	296	0.4
Estimated number of not eligible or quota full	68076	90.6
Never logged into system to start survey.	6544	8.7
Estimated number of eligible and quota not full	61532	81.9
Estimated number of not eligible or quota full	**68403**	**89.0**
Total		
D – Not eligible		
Out of sample	8	0.0
Respondent is not eligible	86	0.1
Quota full	5952	7.9
Other	0	0.0
Total	**6046**	**8.0**
Total Sample with Final Disposition	**75167**	**100**
Estimated eligibility rate	**89.3%**	
Estimated proportion for which quota was full	**89.2%**	
Response rate	**9.5%**	
Cooperation rate	**96.1%**	

Appendix B: CCES Survey Responses

Table B1

CCES Selected Questionnaire Responses

Question	Available Responses
What is your gender?	1. Female 2. Male 3. Intersex 4. Other 5. Refused 6. Don't know
What province do you currently live in?	1. Alberta 2. British Columbia 3. Manitoba 4. New Brunswick 5. Newfoundland & Labrador 6. Nova Scotia 7. Ontario 8. Prince Edward Island 9. Quebec 10. Saskatchewan 11. Other 12. Refused 13. Don't know
Please enter the first THREE alphanumerics of your postal code (e.g. A1C).	_ _ _ (Typed Text)
What is the highest level of formal education that you have completed?	1. Grade school/ some high school 2. Completed high school 3. Technical/ trade school or community college 4. Some university, no degree 5. Completed university degree 6. Post-graduate degree 7. Refused 8. Don't know

Have you received any COVID-19 vaccine shots?	1. I have NOT received any vaccine shot 2. Received ONE vaccine shot 3. Received TWO or more vaccine shots 4. Refused 5. Don't know
What best describes your intention to get your next shot?	1. I have NO plan to get a second shot 2. I am unsure whether I will get the second shot 3. I plan to get the second shot, but have NOT yet scheduled an appointment 4. I am planning to get the second shot and have scheduled an appointment 5. Refused 6. Don't know
Have you received a [second/third] COVID-19 vaccine shot, also known as a COVID-19 vaccine booster shot?	1. Yes 2. No 3. Refused 4. Don't know
What best describes your intention to get an additional vaccine shot in the future (i.e., a booster shot) [once you have received your second dose? You have . . .	1. No intention to get to get an additional vaccine shot in the future 2. A very low intention 3. A low intention 4. A moderate intention 5. A strong intention 6. A very strong intention 7. Refused 8. Don't know
How severe were the side effects from your FIRST shot?	1. Not at all severe 2. Slightly severe 3. Moderately severe 4. Very severe 5. Extremely severe 6. Refused 7. Don't know
What side effects did you experience from your FIRST shot?	1. Chills 2. Fatigue 3. Joint and/ or muscle pain. 4. Headache. 5. Fever. 6. Rash. 7. Swollen arm. 8. Diarrhea or other stomach or intestinal problems. 9. Shortness of breath or difficulty breathing.

	10. Other (specify).
Did your reaction to the FIRST shot lead to any of the following?	1. I contacted a doctor or other health professional. 2. I went to a hospital or clinic (including emergency rooms). 3. I stayed in a hospital for one or more days (more than 24 hours). 4.
Are you immunocompromised, meaning that you have an underlying medical condition (for example, cancer) or you are taking medications which lower the immune system (for example, chemotherapy)?	1. Yes 2. No 3. Not sure 4. Refused 5. Don't know
When did you receive your SECOND shot? (If received a 2 dose vaccine)	1. March 2022 2. February 2022 3. January 2022 4. December 2021 5. November 2021 6. October 2021 7. September 2021 8. August 2021 9. July 2021 10. June 2021 11. May 2021 12. April 2021 13. March 2021 14. Before March 2021 15. Refused 16. Don't know
When did you receive your booster (second/third) shot?	1. March 2022 2. February 2022 3. January 2022 4. December 2021 5. November 2021 6. October 2021 7. September 2021 8. August 2021 9. July 2021 10. June 2021 11. May 2021 12. April 2021 13. March 2021 14. Before March 2021 15. Refused 16. Don't know

What best describes YOUR experience with COVID-19 infection?	1. I have NOT been infected 2. I have been infected 3. Refused 4. Don't know
How severe was your COVID-19 infection?	1. Not at all severe 2. Slightly severe 3. Moderately severe 4. Very severe 5. Extremely severe 6. Refused 7. Don't know
Which of the following symptoms did you have?	1. Chills 2. Fever. 3. Fatigue. 4. Headache. 5. Joint and/ or muscle pain. 6. Dry cough. 7. Shortness of breath or difficulty breathing. 8. Difficulty concentrating or thinking ("brain fog"). 9. Loss or change of taste and/ or smell. 10. Diarrhea or other stomach or intestinal problems. 11. Blood clots. 12. Heart problems. 13. Occasional rattling or crackling sound in your chest. 14. Other (specify).
How consistently do you follow the recommendations by your local or provincial public health officials about social distancing?	1. I go above and beyond the recommendations 2. I follow the recommendations all the time or nearly all the time 3. I follow the recommendations most of the time 4. I sometimes follow the recommendations 5. I rarely follow the recommendations 6. I do not follow the recommendations at all 7. Refused 8. Don't know

Social distancing is an effective way to prevent the spread of COVID-19.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused
Social distancing has been impossible to enforce.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused
Social distancing is important to protect those who cannot be vaccinated (e.g., children under 5).	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused
Social distancing has been terrible for my mental health.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused
Social distancing has been terrible for the mental health of my friends and family.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused
All things considered, how effective is social distancing in preventing COVID-19?	1. Not at all effective 2. Slightly effective 3. Moderately effective 4. Very effective 5. Extremely effective 6. Refused 7. Don't know
How consistently do you follow the recommendations by your local or provincial public health officials about mask wearing?	1. I go above and beyond the recommendations 2. I follow the recommendations all the time or nearly all the time 3. I follow the recommendations most of the time 4. I sometimes follow the recommendations 5. I rarely follow the recommendations

	6. I do not follow the recommendations at all 7. Refused 8. Don't know
If worn properly, masks can protect the wearer from getting infected by COVID-19.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
If worn properly, masks can protect other people from getting infected by COVID-19.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Wearing a mask is inconvenient.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Everyone should be wearing a mask when they cannot socially distance.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Wearing masks is important to protect those who cannot be vaccinated (e.g., children under 5).	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know

All things considered, how effective are masks in preventing COVID-19?	1. Not at all effective 2. Slightly effective 3. Moderately effective 4. Very effective 5. Extremely effective 6. Refused 7. Don't know
Being fully vaccinated is an effective way of preventing serious infection and death from COVID-19.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Being fully vaccinated is important to protect those who cannot be vaccinated (e.g., children under the age of 5).	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
COVID-19 vaccines cause serious side effects.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
COVID-19 vaccines may lead to negative health effects in the future.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
COVID-19 vaccines have not been properly tested for safety.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know

COVID-19 vaccines have not been properly tested for effectiveness.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
COVID-19 vaccines have killed many people.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
COVID-19 vaccines are not an effective way to build up immunity compared to getting infected by COVID-19.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
It is important that we give the COVID-19 vaccines to children.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Healthcare workers and other professionals who work with high-risk individuals (such as long-term care workers) should be required to be vaccinated.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
All things considered, how effective is being fully vaccinated in preventing infection from COVID-19?	1. Not at all effective 2. Slightly effective 3. Moderately effective 4. Very effective 5. Extremely effective 6. Refused 7. Don't know

All things considered, how effective is being fully vaccinated in preventing transmission and spread of COVID-19?	1. Not at all effective 2. Slightly effective 3. Moderately effective 4. Very effective 5. Extremely effective 6. Refused 7. Don't know
Restricting non-essential businesses and leisure activities, such as restaurants, theatres, sporting events, and other public indoor gatherings to fully vaccinated people is an effective way of preventing the transmission of COVID-19.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Vaccine passports are important to protect those who cannot be vaccinated (e.g., children under the age of 5).	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Vaccine passports have had a positive impact on the economy.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Vaccine passports have created significant harm and divisiveness in society.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Vaccine passports are discriminatory/ a violation of human rights.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know

Non-essential businesses and leisure activities, such as restaurants, theatres, sporting events, and other public indoor gatherings, should be open to all people regardless of vaccination status.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
All things considered, vaccine passports do more harm than good.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
All things considered, how effective are vaccine passports at preventing infection from COVID-19?	1. Not at all effective 2. Slightly effective 3. Moderately effective 4. Very effective 5. Extremely effective 6. Refused 7. Don't know
All things considered, how effective are vaccine passports at preventing transmission and spread of COVID-19?	1. Not at all effective 2. Slightly effective 3. Moderately effective 4. Very effective 5. Extremely effective 6. Refused 7. Don't know
How much, if at all, do you currently get information about COVID-19 from each of the following sources? Response Scale per source: 1. Not at all 2. A little 3. Somewhat 4. A lot 5. Refused 6. Don't know	1. Friends 2. Family members. 3. Church/ religious group. 4. Your doctor. 5. Newspapers and/or magazines (print and online). 6. Television (network and/or cable/satellite). 7. Social media (Facebook, Twitter, Instagram, YouTube, chat rooms). 8. Other sources.
We can trust science to find the answers that explain the natural world.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know

There are other perspectives besides science to uncover the truth.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
We can trust scientists to find solutions to major problems.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Scientists work to help people.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Scientific findings often contradict each other so it's hard to figure out what is true.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
Scientists are honest and ethical in their work.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
We cannot trust scientists because their findings are often driven by their desire to advance their careers.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know

Scientists are arrogant.	1. Strongly agree 2. Agree 3. Neither agree nor disagree 4. Disagree 5. Strongly disagree 6. Refused 7. Don't know
How much do you trust the information you are getting about COVID-19 from: 1. Health authorities in your province? 2. Health authorities at the national level? 3. Scientists working on vaccines? 4. Political leaders in your province (e.g., the Premier)? 5. Political leaders at the national level (e.g., the Prime Minister)? 6. Friends? 7. Family members? 8. Church/ religious group? 9. Your doctor? 10. Newspapers and/or magazines (print and online)? 11. Television (network and/or cable/satellite)? 12. Social media (Facebook, Twitter, Instagram, YouTube, chat rooms)?	1. Not at all 2. Slightly 3. Moderately 4. Very much 5. Refused 6. Don't know
Thinking about the current measures that your provincial government has put in place to fight COVID-19, are they:	1. Much too weak 2. Too weak 3. About right 4. Too strong 5. Much too strong 6. Refused 7. Don't know
The COVID-19 pandemic has had several waves. Governments have responded with periods of restrictions and with periods of opening up. How good or bad has your provincial government been in changing the level of restrictions in response to the ups and downs of COVID-19 infection rates over the PAST 4 MONTHS?	1. Very good 2. Moderately good 3. Slightly good 4. Neither good nor bad 5. Slightly bad 6. Moderately bad 7. Very bad 8. Refused 9. Don't know

Which political party do you feel closest to at the federal level?	1. Liberal 2. Conservative 3. NDP 4. Bloc Québécois 5. Green 6. People's Party of Canada 7. Other 8. Refused 9. Don't know
Which political party do you feel closest to at the provincial level?	*Responses adapted based on identified province of residence, in descending order, based on the results of the most recent provincial election.*
When it comes to politics, would you describe yourself as liberal, conservative, or neither liberal nor conservative?	1. Extremely liberal 2. Moderately liberal 3. Slightly liberal 4. Neither liberal nor conservative 5. Slightly conservative 6. Moderately conservative 7. Extremely conservative 8. Refused 9. Don't know
What is your marital status?	1. Married 2. Living with partner/ common law 3. Widowed 4. Separated 5. Divorced 6. Single, never married 7. Refused 8. Don't know
Which of the following categories best describes your ANNUAL household income, that is the total income before taxes, or gross income, of all persons in your household combined, for one year?	1. Under $10,000 2. $10,000-29,999 3. $30,000-44,999 4. $45,000-59,999 5. $60,000-74,999 6. $75,000-99,999 7. $100,000-149,999 8. $150,000 and over 9. Refused 10. Don't know

In the last 30 days, because of a shortage of money, were you unable to pay any important bills on time, such as electricity, telephone or rent bills?	1. Yes 2. No 3. Refused 4. Don't know
People in Canada come from many racial and cultural groups. Choose the group or groups that apply to you.	1. White 2. Chinese 3. South Asian (for example, East Indian, Pakistani, Sri Lankan, etc.) 4. Black 5. Filipino 6. Latin American 7. Southeast Asian (for example, Cambodian, Indonesian, Laotian, Vietnamese, etc.) 8. Arab 9. West Asian (for example, Afghan, Iranian, etc.) 10. Japanese 11. Korean 12. Indigenous peoples: First Nations, Métis, or Inuit 13. Other racial or cultural group (specify)
How worried are you that you will get infected by COVID-19 (or be infected again if you have been infected in the past)?	1. Not at all worried 2. Slightly worried 3. Moderately worried 4. Very worried 5. Extremely worried 8 Refused 9. Don't know

Appendix C: Additional Results Tables

Political Orientation Predicting Vaccine Status and Moderating Effects

Table C1

Vaccine Status Wave 1 – Unadjusted Model

			Odds Ratio	95% CI for	e^{β}
	β	*p*	e^{β}	Lower	Upper
Political Orientation	-.970	<.001	.379	0.333	0.432
Constant	0.65	.205	1.067	-	-

Table C2

Vaccine Status Wave 1 – Partially Adjusted Model

			Odds Ratio	95% CI for	e^{β}
	β	*p*	e^{β}	Lower	Upper
Political Orientation	-1.007	<.001	.365	.319	.419
Age – Lowest (18-24)	-	<.001	-	-	-
Age – Middle (25-39)	-1.181	<.001	.307	.223	.422
Age – Older (40-54)	-0.600	<.001	.549	.400	.753
Gender (Female = 1)	-0.587	<.001	.566	.450	.687
Constant	1.145	<.001	3.144	-	-

Table C3

Vaccine Status Wave 1 – Fully Adjusted Model

			Odds Ratio	95% CI for	e^{β}
	β	*p*	e^{β}	Lower	Upper
Political Orientation	-1.048	<.001	.351	.303	.406
Age – Lowest (18-24)	-	<.001	-	-	-
Age – Middle (25-39)	-1.456	<.001	.233	.164	.332

Age – Older (40-54)	-.782	<.001	.458	.323	.648
Gender (Female = 1)	-.567	<.001	.567	.453	.710
Education – Lowest	-	.003	-	-	-
Education – Middle	.452	.005	1.572	1.143	2.162
Education – Highest	.547	<.001	1.728	1.251	2.387
Income – Lowest	-	<.001	-	-	-
Income – Middle	.175	.343	1.192	.829	1.712
Income – Highest	.921	<.001	2.513	1.786	3.535
Constant	.321	.148	1.379	-	-

Table C4

Vaccine Status Wave 2 – Unadjusted Model

			Odds Ratio	**95% CI for**	**e^{β}**
	β	***p***	**e^{β}**	**Lower**	**Upper**
Political Orientation	-1.031	<.001	.357	0.311	0.409
Constant	0.310	<.001	1.364	-	-

Table C5

Vaccine Status Wave 2 – Partially Adjusted Model

			Odds Ratio	**95% CI for**	**e^{β}**
	β	***p***	**e^{β}**	**Lower**	**Upper**
Political Orientation	-1.051	<.001	.350	.303	.403
Age – Lowest (18-24)	-	<.001	-	-	-
Age – Middle (25-39)	-0.820	<.001	.440	.304	.638
Age – Older (40-54)	-0.541	.004	.582	.401	.845
Age – Oldest (55+)	-0.279	.583	.757	.280	2.048

Gender (Female = 1)	-0.614	<.001	.541	.433	.677
Constant	1.255	<.001	3.508	-	-

Table C6

Vaccine Status Wave 2 – Fully Adjusted Model

			Odds Ratio	95% CI for	e^{β}
	β	p	e^{β}	Lower	Upper
Political Orientation	-1.100	<.001	.333	.285	.388
Age – Lowest (18-24)	-	<.001	-	-	-
Age – Middle (25-39)	-1.085	<.001	.338	.224	.511
Age – Older (40-54)	-.719	<.001	.487	.323	.736
Age – Oldest (55+)	-0.218	.682	.804	.284	2.276
Gender (Female = 1)	-.581	<.001	.560	.441	.710
Education – Lowest	-	<.001	-	-	-
Education – Middle	.247	.140	1.280	.922	1.777
Education – Highest	.819	<.001	2.269	1.606	3.205
Income – Lowest	-	<.001	-	-	-
Income – Middle	.387	.042	1.473	1.013	2.141
Income – Highest	.898	<.001	2.455	1.726	3.491
Constant	.384	.140	1.468	-	-

Table C7

Political Orientation and Vaccine Status, Immunocompromised Status Moderator Interactions, Wave 2

Political Orientation X Immunocompromised Status	β	*p*	**Odds Ratio e^{β}**	**95% CI for e^{β} Lower**	**Upper**
Unadjusted	.147	.560	1.158	.707	1.898
Partially Adjusted	.191	.454	1.210	.734	1.993
Fully Adjusted	.173	.521	1.189	.701	2.019

Political Orientation Predicting Mitigation Behaviour Adoption and Moderating Effects

Table C8

Mitigation Behaviour Adoption Wave 1 – Unadjusted Model

	Mitigation Behaviour (Log)	***F***	***p***	η_p^2
Political Orientation	Masking	3.879	<.001	.216
	Distancing	3.588	<.001	.203
	Hand Hygiene	1.772	<.001	.112
Intercept	Masking	1111.152	<.001	.407
	Distancing	1239.610	<.001	.434
	Hand Hygiene	752.190	<.001	.317

Table C9

Mitigation Behaviour Adoption Wave 1 – Partially Adjusted Model

	Mitigation Behaviour (Log)	***F***	***p***	η_p^2
Political Orientation	Masking	3.984	<.001	.221
	Distancing	3.736	<.001	.210
	Hand Hygiene	1.785	<.001	.113
Age Group	Masking	1.671	.196	.001
	Distancing	13.226	<.001	.008
	Hand Hygiene	1.829	.176	.001
Gender	Masking	23.131	<.001	.014
	Distancing	11.337	<.001	.007
	Hand Hygiene	32.572	<.001	.020
Intercept	Masking	325.383	<.001	.168
	Distancing	374.609	<.001	.188
	Hand Hygiene	259.325	<.001	.138

Table C10

Mitigation Behaviour Adoption Wave 1- Fully Adjusted Model

	Mitigation Behaviour (Log)	***F***	***p***	η_p^2
Political Orientation	Masking	3.988	<.001	.229
	Distancing	3.494	<.001	.206
	Hand Hygiene	1.767	<.001	.116
Age Group	Masking	1.972	.160	.001
	Distancing	15.231	<.001	.010
	Hand Hygiene	2.170	.141	.001

Gender	Masking	24.484	<.001	.016
	Distancing	12.833	<.001	.009
	Hand Hygiene	34.878	<.001	.023
Education Level	Masking	3.756	.053	.003
	Distancing	5.314	.021	.004
	Hand Hygiene	4.285	.039	.003
Income Level	Masking	1.913	.167	.001
	Distancing	6.284	.012	.004
	Hand Hygiene	3.964	.047	.003
Intercept	Masking	224.741	<.001	.132
	Distancing	243.573	<.001	.141
	Hand Hygiene	177.389	<.001	.107

Table C11

Mitigation Behaviour Adoption Wave 1 – Moderation Effects, Unadjusted Model

Behaviours					
Masking	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0029	5.4631	1.0000	1655.0000	.0195
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.1252	.0197	6.3684	<.001	.0867 - .1368
Non-immunocompromised	.0774	.0056	13.7309	<.001	.0664 - .0885
Distancing	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0026	4.9329	1.0000	1652.0000	.0265
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.1258	.0202	6.2422	<.001	.0863 - .1653
Non-immunocompromised	.0793	.0057	13.9134	<.001	.0681 - .0905
Hand Hygiene	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.005	9.4275	1.0000	1653.0000	.0022
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.1090	.0221	4.9346	<.001	.0657 - .1523
Non-immunocompromised	.0385	.0063	6.1004	<.001	.0261 - .0508

Table C12

Mitigation Behaviour Adoption Wave 1 – Moderation Effects, Partially Adjusted Model

Behaviours					
Masking	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0027	5.1385	1.0000	1653.0000	.0235
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.1262	.0196	6.4541	<.001	.0879 - .1646
Non-immunocompromised	.0801	.0057	14.1159	<.001	.0690 - .0913
Distancing	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0024	4.6340	1.0000	1650.0000	.0315
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.1284	.0200	6.4052	<.001	.0890 - .1677
Non-immunocompromised	.0836	.0057	14.5608	<.001	.0723 - .0948
Hand Hygiene	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0052	9.1288	1.0000	1651.0000	.0026
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.1093	.0219	4.9923	<.001	.0664 - .1523
Non-immunocompromised	.0406	.0063	6.4127	<.001	.0282 - .0530

Table C13

Mitigation Behaviour Adoption Wave 2 – Unadjusted Model

	Mitigation Behaviour (Log)	***F***	***p***	η_p^2
Political Orientation	Masking	5.210	<.001	0.253
	Distancing	2.366	<.001	0.133
	Hand Hygiene	5.577	<.001	0.266
Intercept	Masking	1018.400	<.001	.407
	Distancing	831.437	<.001	.434
	Hand Hygiene	1152.592	<.001	.317

Table C14

Mitigation Behaviour Adoption Wave 2 – Partially Adjusted Model

	Mitigation Behaviour (Log)	*F*	*p*	η_p^2
Political Orientation	Masking	5.399	<.001	0.260
	Distancing	2.425	<.001	0.136
	Hand Hygiene	5.854	<.001	0.276
Age Group	Masking	13.878	<.001	0.009
	Distancing	4.416	0.036	0.003
	Hand Hygiene	25.121	<.001	0.017
Gender	Masking	10.506	0.001	0.001
	Distancing	22.548	<.001	0.009
	Hand Hygiene	0.830	0.363	0.003
Intercept	Masking	292.629	<.001	0.164
	Distancing	249.926	<.001	0.143
	Hand Hygiene	299.905	<.001	0.167

Table C15

Mitigation Behaviour Adoption Wave 2 – Fully Adjusted Model

	Mitigation Behaviour (Log)	*F*	*p*	η_p^2
Political Orientation	Masking	4.864	<.001	0.248
	Distancing	2.370	<.001	0.139
	Hand Hygiene	5.185	<.001	0.261
Age Group	Masking	19.671	<.001	0.014
	Distancing	5.076	0.024	0.004
	Hand Hygiene	29.781	<.001	0.021
Gender	Masking	13.217	<.001	0.009
	Distancing	24.230	<.001	0.017
	Hand Hygiene	1.972	.160	0.001
Education Level	Masking	0.922	0.337	0.001
	Distancing	1.091	0.296	0.001
	Hand Hygiene	5.830	0.016	0.004
Income Level	Masking	0.039	0.844	0.000
	Distancing	0.435	0.510	0.000
	Hand Hygiene	6.067	0.014	0.004
Intercept	Masking	210.464	<.001	0.132
	Distancing	166.754	<.001	0.108
	Hand Hygiene	199.268	<.001	0.126

Table C16

Mitigation Behaviour Adoption Wave 2 – Moderation Effects, Unadjusted Model

Behaviours					
Masking	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0023	4.4050	1.0000	1567.0000	.0360
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.0612	.0207	2.9544	.0032	.0206 - .1018
Non-immunocompromised	.1065	.0061	17.4882	.0000	.0946 - .1185
Distancing	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0013	2.5192	1.0000	1552.0000	.1127
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	-	-	-	-	-
Non-immunocompromised	-	-	-	-	-
Hand Hygiene	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0000	.0027	1.0000	1553.0000	.9582
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	-	-	-	-	-
Non-immunocompromised	-	-	-	-	-

Table C17

Mitigation Behaviour Adoption Wave 2 – Moderation Effects, Partially Adjusted Model

Behaviours					
Masking	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0021	3.9877	1.0000	1565.0000	.0460
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.0666	.0207	3.2232	.0013	.0261 - .1071
Non-immunocompromised	.1095	.0061	17.8615	.0000	.0975 - .1215
Distancing	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0011	2.1859	1.0000	1550.0000	.1395
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	-	-	-	-	-
Non-immunocompromised	-	-	-	-	-
Hand Hygiene	**Effect**	***F***	***df*1**	***df*2**	***p***

Political Orientation x Immunocompromised Status	.0000	.0239	1.0000	1551.0000	.8772
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	-	-	-	-	-
Non-immunocompromised	-	-	-	-	-

Table C18

Mitigation Behaviour Adoption Wave 2 – Moderation Effects, Fully Adjusted Model

Behaviours					
Masking	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0030	5.4669	1.0000	1461.0000	.0195
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.0574	.0210	2.7270	.0065	.0161 - .0987
Non-immunocompromised	.1086	.0064	17.0939	.0000	.0961 - .1210
Distancing	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0019	3.4448	1.0000	1447.0000	.0637
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	.0685	.0212	3.2301	.0013	.0269 - .1101
Non-immunocompromised	.1095	.0064	17.0148	.0000	.0969 - .1221
Hand Hygiene	**Effect**	***F***	***df*1**	***df*2**	***p***
Political Orientation x Immunocompromised Status	.0000	.0420	1.0000	1449.0000	.8376
	Effect	***SE***	***t***	***p***	**95% CI**
Immunocompromised	-	-	-	-	-
Non-immunocompromised	-	-	-	-	-

Political Orientation Predicting Information Source Reliance

Table C19

Information Source Reliance Wave 1 – Unadjusted Model

	Information Source	*F*	*p*	η_p^2
Political Orientation	Friends	1.238	0.059	0.090
	Family	1.303	0.026	0.094
	Religion	2.229	<.001	0.151
	Doctors	1.811	<.001	0.127
	Print Media	2.050	<.001	0.141
	Television	2.793	<.001	0.183
	Social Media	1.516	0.001	0.108
	Other	1.252	0.049	0.091
Intercept	Friends	1679.942	<.001	0.564
	Family	1646.528	<.001	0.559
	Religion	1001.017	<.001	0.435
	Doctors	1018.203	<.001	0.439
	Print Media	1135.986	<.001	0.466
	Television	1349.367	<.001	0.509
	Social Media	1199.209	<.001	0.480
	Other	872.453	<.001	0.402

Table C20

Information Source Reliance Wave 1 – Partially Adjusted Model

	Information Source	*F*	*p*	η_p^2
Political Orientation	Friends	1.268	0.040	0.092
	Family	1.357	0.012	0.098
	Religion	2.172	<.001	0.148
	Doctors	1.778	<.001	0.125
	Print Media	1.982	<.001	0.137
	Television	2.686	<.001	0.177
	Social Media	1.614	<.001	0.114
	Other	1.255	0.048	0.091
Age Group	Friends	9.185	0.002	0.007
	Family	23.387	<.001	0.018
	Religion	13.272	<.001	0.010
	Doctors	0.201	0.654	0.000
	Print Media	5.375	0.021	0.004
	Television	2.552	0.110	0.002
	Social Media	29.647	<.001	0.022
	Other	0.012	0.913	0.000
Gender	Friends	0.221	0.638	0.000
	Family	0.135	0.714	0.000
	Religion	9.703	0.002	0.007
	Doctors	0.086	0.770	0.000

	Print Media	11.368	0.001	0.009
	Television	4.048	0.044	0.003
	Social Media	1.199	0.274	0.001
	Other	1.557	0.212	0.001
Intercept	Friends	364.798	<.001	0.219
	Family	384.513	<.001	0.229
	Religion	298.116	<.001	0.187
	Doctors	171.100	<.001	0.116
	Print Media	215.109	<.001	0.142
	Television	239.228	<.001	0.156
	Social Media	292.477	<.001	0.184
	Other	169.709	<.001	0.116

Table C21

Information Source Reliance Wave 2 – Unadjusted Model

	Information Source	***F***	***p***	η_p^2
Political Orientation	Friends	1.212	0.092	0.082
	Family	1.110	0.232	0.076
	Religion	1.995	<.001	0.129
	Doctors	1.307	0.032	0.088
	Print Media	2.104	<.001	0.135
	Television	2.811	<.001	0.172
	Social Media	1.307	0.032	0.088
	Other	1.683	<.001	0.111
Intercept	Friends	1308.096	<.001	0.516
	Family	1281.623	<.001	0.510
	Religion	1209.060	<.001	0.496
	Doctors	846.731	<.001	0.408
	Print Media	1106.962	<.001	0.474
	Television	1013.156	<.001	0.452
	Social Media	1053.121	<.001	0.461
	Other	923.427	<.001	0.429

Table C22

Information Source Reliance Wave 2 – Partially Adjusted Model

	Information Source	*F*	*p*	η_p^2
Political Orientation	Friends	1.207	0.097	0.082
	Family	1.131	0.195	0.077
	Religion	1.972	<.001	0.128
	Doctors	1.301	0.034	0.088
	Print Media	2.051	<.001	0.132
	Television	2.752	<.001	0.169
	Social Media	1.313	0.030	0.089
	Other	1.675	<.001	0.110
Age Group	Friends	2.355	0.125	0.002
	Family	3.120	0.078	0.003
	Religion	5.405	0.020	0.004
	Doctors	0.004	0.952	0.000
	Print Media	0.669	0.414	0.001
	Television	8.438	0.004	0.007
	Social Media	31.869	<.001	0.025
	Other	0.001	0.973	0.000
Gender	Friends	0.121	0.728	0.000
	Family	5.316	0.021	0.004
	Religion	1.919	0.166	0.002
	Doctors	0.659	0.417	0.001
	Print Media	2.141	0.144	0.002
	Television	3.599	0.058	0.003
	Social Media	4.293	0.038	0.003
	Other	0.003	0.956	0.000
Intercept	Friends	218.059	<.001	0.151
	Family	186.249	<.001	0.132
	Religion	248.287	<.001	0.168
	Doctors	139.229	<.001	0.102
	Print Media	176.333	<.001	0.126
	Television	138.154	<.001	0.101
	Social Media	225.511	<.001	0.155
	Other	139.969	<.001	0.102

Political Orientation Predicting Change in Vaccination Status and Mitigation Behaviours Maintenance

Table C23

Vaccination Status Change – Unadjusted Model

	F	***p***
Political Orientation	0.846	0.854
Intercept	29.028	<.001

Table C24

Vaccination Status Change – Partially Adjusted Model

	F	***p***
Political Orientation	0.870	0.809
Age Group	2.612	0.106
Gender	7.066	0.008
Intercept	2.054	0.152

Table C25

Mitigation Behaviour Change – Unadjusted Model

	Mitigation Behaviour	***F***	***p***	η_p^2
Political Orientation	Masking	2.457	<.001	0.214
	Distancing	1.435	0.005	0.137
	Hand Hygiene	1.256	0.054	0.122
Intercept	Masking	10.054	.002	0.011
	Distancing	17.237	<.001	0.019
	Hand Hygiene	13.533	<.001	0.015

Table C26

Mitigation Behaviour Change – Partially Adjusted Model

	Mitigation Behaviour	*F*	*p*	η_p^2
Political Orientation	Masking	3.984	<.001	0.214
	Distancing	3.736	0.005	0.138
	Hand Hygiene	1.785	0.059	0.121
Age Group	Masking	1.226	0.268	0.001
	Distancing	1.067	0.302	0.001
	Hand Hygiene	0.055	0.815	0.000
Gender	Masking	0.616	0.433	0.001
	Distancing	0.021	0.884	0.000
	Hand Hygiene	0.093	0.761	0.000
Intercept	Masking	1.931	0.165	0.002
	Distancing	4.334	0.038	0.005
	Hand Hygiene	2.800	0.095	0.003

Appendix D: Predictor Index Validation Tests & Observed Power

Figure D1

Wave 1 Federal Political Orientation

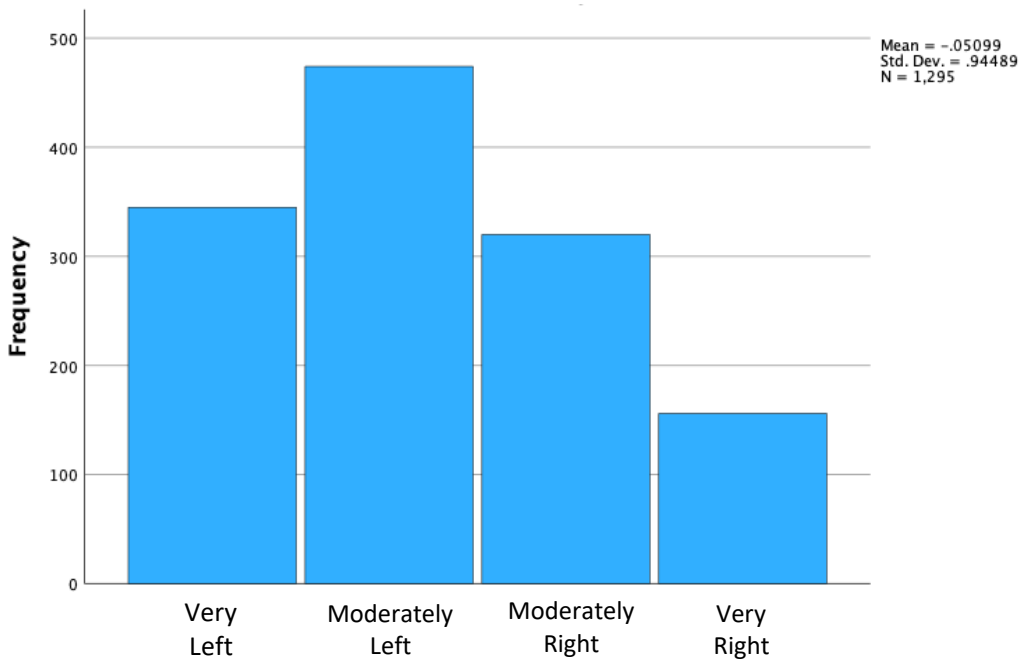

Figure D2

Wave 1 Provincial Political Orientation

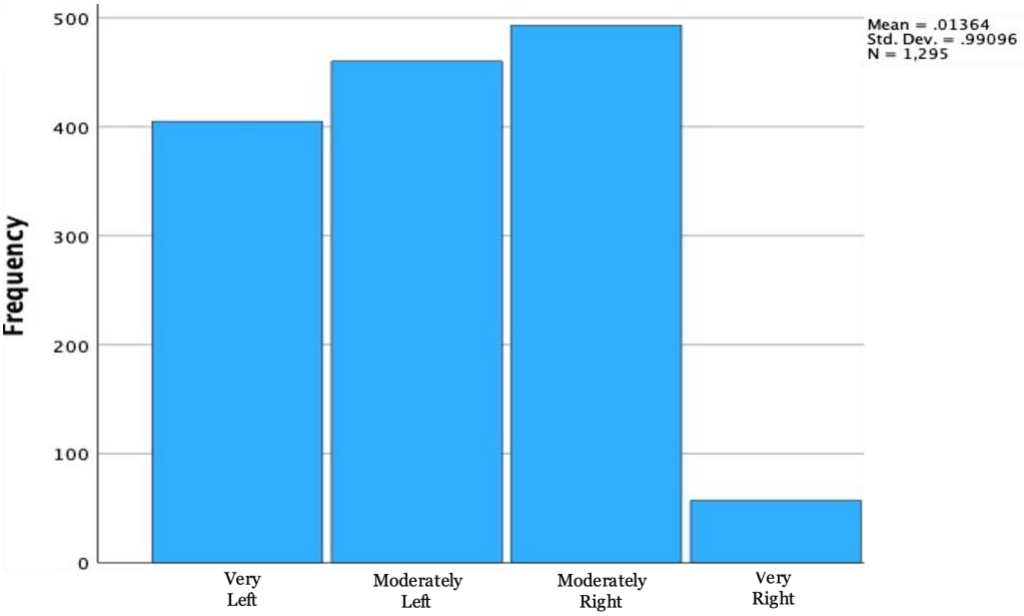

Figure D3

Wave 1 Self-Rated Political Orientation

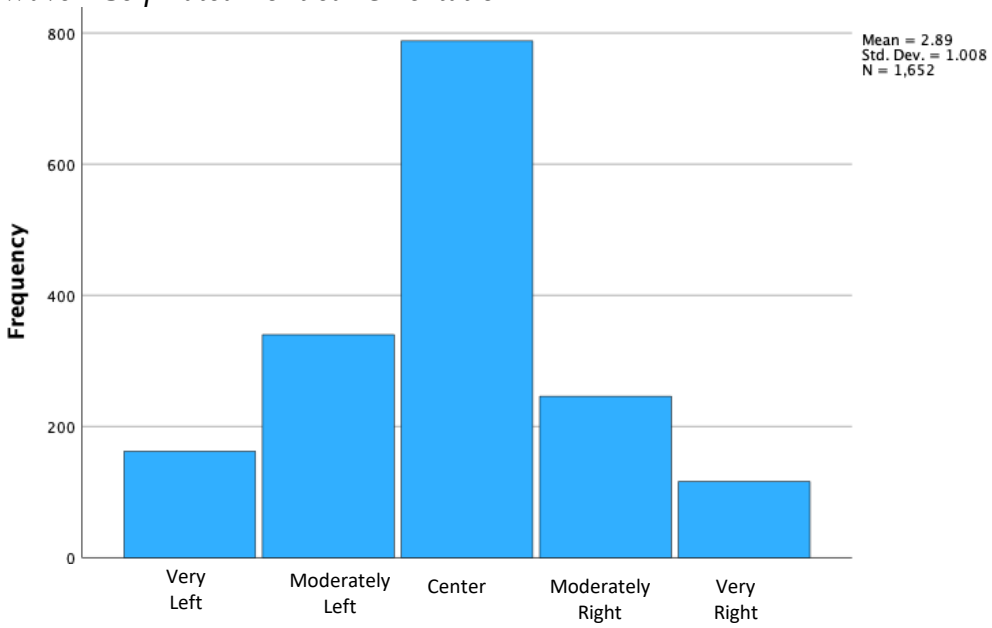

Figure D4

Wave 1 Principal Component Analysis

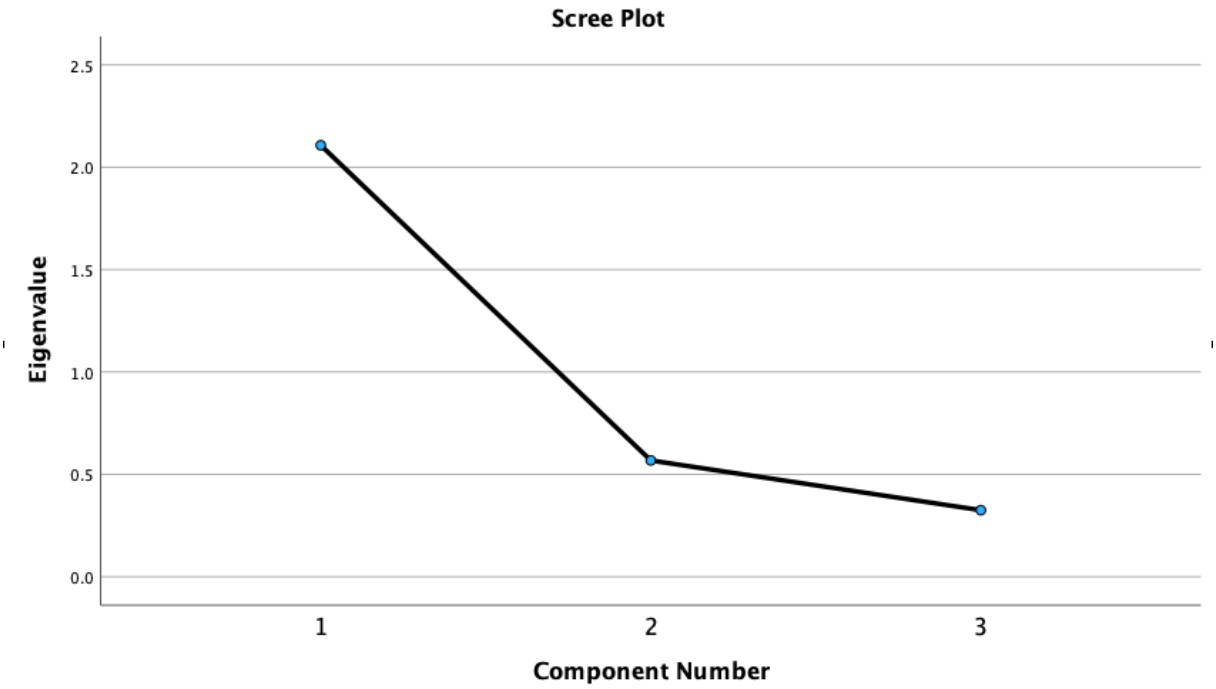

Figure D5

Wave 1 Political Orientation Index Frequency Distribution

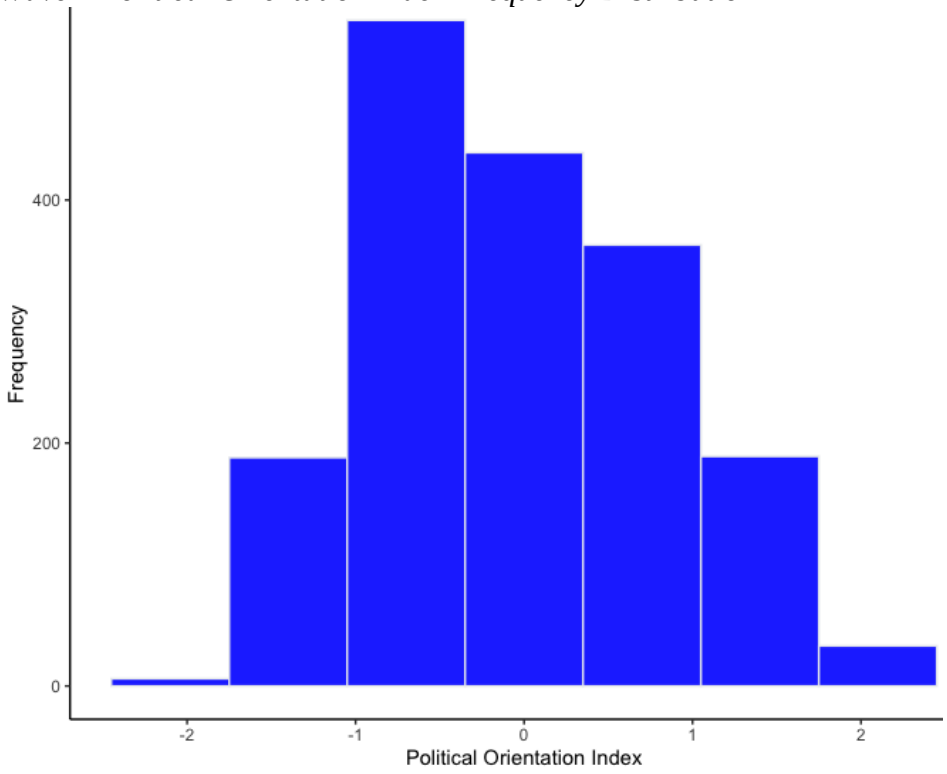

Figure D6

Wave 2 Political Orientation Index Frequency Distribution

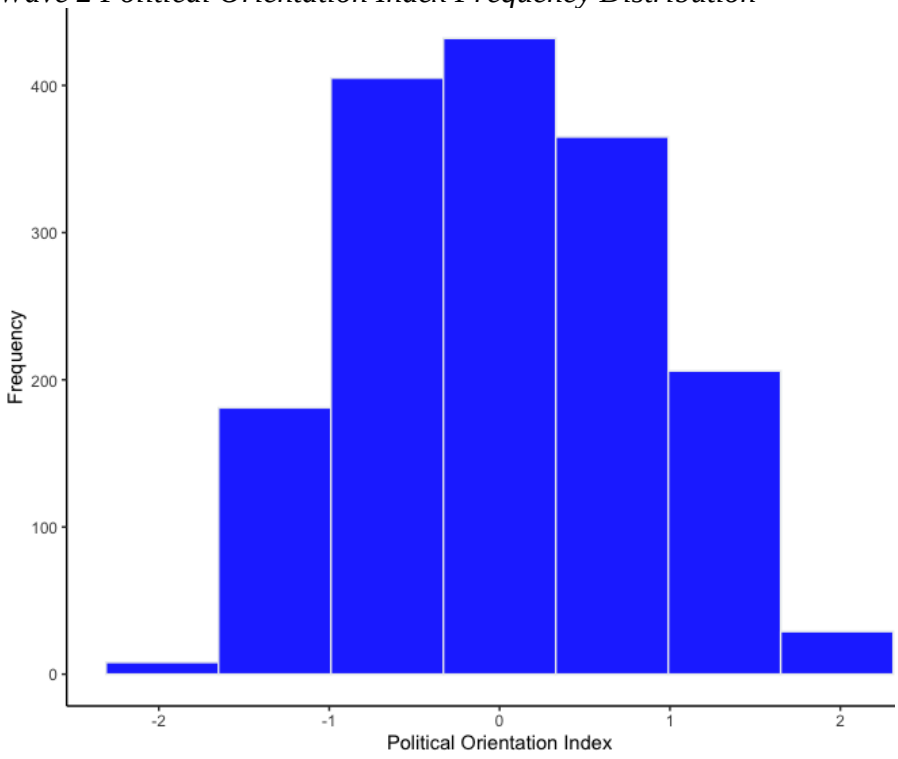

Table D1

Wave 1 Inter-Item Correlation Matrix

	Self-Rated	Provincial	Federal
Self-Rated	1.000	0.457	0.531
Provincial	0.457	1.000	0.666
Federal	0.531	0.666	1.000

Table D2

Wave 1 Component Matrix

	Component 1
Self-Rated	1.000
Provincial	0.457
Federal	0.531

Table D3

Wave 1 Item Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Self-Rated	-0.0373	3.123	0.540	0.301	0.799
Provincial	-0.0963	3.036	0.636	0.459	0.691
Federal	-0.0317	3.024	0.699	0.509	0.627

Table D4

Wave 1 Observed Power Mitigation Behaviours

	Mitigation Behaviour	**Observed Power**
Unadjusted Political Orientation	Masking	1.000
	Distancing	1.000
	Hand Hygiene	1.000
Unadjusted Immunocompromised Status	Masking	.737
	Distancing	.535
	Hand Hygiene	.220
Unadjusted Political Orientation X Immunocompromised Status	Masking	.948
	Distancing	.978
	Hand Hygiene	.985
Fully Adjusted Political Orientation	Masking	1.000
	Distancing	1.000
	Hand Hygiene	1.000
Fully Adjusted Immunocompromised Status	Masking	.677
	Distancing	.628
	Hand Hygiene	.081
Fully Adjusted Political Orientation X Immunocompromised Status	Masking	.883
	Distancing	.912
	Hand Hygiene	.973