

*Perceived Experience in Social Circles with COVID-19 Injections and COVID-19 “Vaccine” Mandates: An Online Survey of the United States Population**

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Abstract

In response to the COVID-19 crisis, decision-makers in countries around the world adopted policies such as lockdowns, mask requirements, and once COVID-19 injections became available, “vaccine” mandates and “vaccine” passports. However, political polarization and differences in risk perceptions in the populous generated strong support for and opposition to such measures. This research identifies the factors associated with support for/against COVID-19 injection mandates and passports. An online survey of COVID-19 health experiences in the United States population was conducted to collect information regarding potential reasons why respondents might favor or oppose COVID-19 injection mandates and passports, including experiences with COVID-19 illness and COVID-19 injections by respondents and those in their social circles. Analysis using a Logit regression technique was conducted to identify factors influencing the likelihood of opposing COVID-19 injection mandates and passports. The survey was completed by 2,840 participants between December 18 and 23, 2021. Twenty-two percent (612 of 2,840) of respondents reported that they knew at least one person who had experienced a health problem following COVID-19 injection. Respondents who knew someone who experienced a health problem following COVID-19 injection were more likely to oppose injection mandates (OR: 2.040, 95% CI: 1.635-2.254, and passports (OR: 1.691, 95% CI: 1.361-2.101)) Perceptions of COVID-19 injection safety based on personal experiences appear to be an important determinant of opposition to injection mandates and passports.

Keywords: *COVID-19; COVID-19 injections, survey; vaccine mandate*

Introduction

In the fall of 2023, health authorities in the United States and across the globe reported that cases of severe acute respiratory syndrome coronavirus (COVID-19 or SARS CoV-2) were on the rise. Authorities also announced that updated COVID-19 boosters were available and urged the populous to receive booster shots. Earlier in the pandemic, private businesses, universities, hospitals,

and governments in the United States imposed COVID-19 injection mandates and, in some cases, required proof of injection for patrons and/or as a condition of employment. As concerns waned regarding the dangers of COVID-19, many entities lifted COVID-19 injection mandates. Although the COVID-19 crisis and associated policies remain highly politicized, tensions were reduced as the pandemic period appeared to end. However, with the recent rise of reported COVID-19 cases, health authorities may again consider reimplementing COVID-19 injection mandates and proof of injection for a significant portion of society.

Several research articles have examined factors associated with COVID-19 vaccine hesitancy/rejection, noting concerns regarding safety as a consideration (Skidmore, 2023a; Dubé *et al.*, 2020; Hyland *et al.*, 2021; Kreps *et al.*, 2021; Yoda and Katsuyama, 2021). Other factors such as age, education, political ideology, and misleading information have also been examined. For example, elderly people who are at greater risk of severe health effects from COVID-19 are potentially more likely to receive the COVID-19 injection. On the other hand, the historical medical experimentation on African Americans (Gamble, 1993) may dissuade this subpopulation from being injected. Where people obtain information about COVID-19 could also influence inoculation decisions. Recently, Tuuminen *et al.* (2023) conducted a survey in Finland to collect information on the potential adverse events resulting from the COVID-19 injection, where they reported a wide range of adverse events among survey participants. Importantly, ninety-two percent of respondents declined any further injections, though most were refused exemptions after the injury. Chauhan *et al.* (2022) offer an assessment of the research on COVID-19 vaccine hesitancy/rejection, concluding that insufficient attention to the concerns of vaccine recipients about informed consent is an important contributing factor.

It is also important to note that there are now more than 3500 peer reviewed case reports and studies of COVID-19 injection adverse events as reported in REACT (2023). These studies cover a diverse range of harms, including allergic reactions, autoimmune, cardiac, hematological, neurologic, pulmonary, renal problems, and many others. Santiago (2022) offers a detailed literature review and discussion of the linkages between the COVID-19 injection modified RNA and the human body, which are leading to a diversity of problems with clotting, cardiac, pulmonary, and neurological medical issues that were reported by survey respondents in the present study.

A less studied issue is the degree to which the populous supports/opposes COVID-19 injection mandates and passports. The decision to be injected is a personal choice, which is distinct from supporting the requirement that others also should be injected. Some recent studies across several countries have examined public support for COVID-19 injection mandates, which have focused on socio-demographic and psychological characteristics (Graeber, Schmidt-Petri, and Schröder, 2021), political leaning (Gagneux-Brunon *et al.*, 2022); information sources and information campaigns (Attwell, Ward, and Tomkinson, 2021; Jovanovic, 2023; Attwell, K., and Navin, 2019), safety concerns and degree of trust in healthcare authorities (Giannouchos, *et al.*, 2021), and use of coercion (McCoy, 2019).

While concerns about the COVID-19 disease and COVID-19 injection risks are cited as factors in studies of “vaccine” hesitancy/rejection and preferences for mandates, little research has been conducted on the role that personal experiences with the COVID-19 illness and COVID-19 injection adverse events play in the decision to be injected or support for mandates. Skidmore (2023a) shows that experiences in survey respondent social circles regarding health problems following COVID-19 illness and COVID-19 injection are important factors in whether to accept an

injection or not. Specifically, health problems associated with the COVID-19 illness in respondent social circles increased the likelihood of being injected whereas perceived health problems in social circles following COVID-19 injection reduced the likelihood of being inoculated.

The main goal of the present research is to examine how health experiences with the COVID-19 disease and COVID-19 injection among friends and family influence opposition to COVID-19 injection mandates and passports using data collected from the National Survey of COVID-19 Health Experiences that was administered in December 2021. Given that the survey was administered more than two years ago, an explanation for the lag between the survey rollout and the appearance of this study is needed.

A different research article by Skidmore (2023a) that examined the factors that influence whether or not to accept a COVID-19 injection was written in 2022 and published in January 2023 in *BMC Infectious Diseases* (Skidmore, 2023b). The publication of this article sparked controversy because it included an estimate of fatalities resulting from the COVID-19 injections in the United States in the first year of the COVID-19 injection rollout; fatalities were estimated to be about 278,000. News of the study went viral when medical professionals and scientists who had been warning of the potential dangers of the COVID-19 injections shared the finding on social media. According to Almetric, Skidmore (2023b) has been consistently ranked the number one article for attention received throughout the history of the journal *BMC Infectious Diseases*. However, complaints also came to both the journal editors and to Skidmore's employer, Michigan State University. These complaints triggered a re-review of the article by the journal and an investigation of allegations of ethical misconduct by the University. After a three-month re-review, the journal's editorial board retracted the article. Following a seven-month investigation by the University regarding the alleged ethical violations, it was concluded that no ethical misconduct had occurred.

Another challenge was a concern by some within Michigan State University administration that Skidmore's use of his discretionary endowed chair funds to cover the \$11,000 survey expense was improper. The expressed concern was that the chair resources are to be used to further work in the state and local government finance and policy arena, and not to fund what was viewed as an epidemiological study. Skidmore believed that the funds were appropriately used because the survey informed the most significant health policy decisions made in a generation, to mandate the COVID-19 injections by federal, state, and local governments across the nation, including public institutions of higher education. When Skidmore shared this issue in a meeting with several professionals and medical scientists, Catherine Austin Fitts offered to reimburse the survey expense through a non-tax-deductible contribution to Skidmore. The unusual nature of the donation triggered a review by the Michigan State University Office of Audit, Risk, and Compliance. After a three-month investigation, it was determined that the donation was appropriate and could be accepted by the University.

In summary, there was a delay in producing the present manuscript because Skidmore felt it was prudent to withhold any new information emerging from the survey until the investigations were completed. Also, more delays occurred because the present study had been submitted to seven other "mainstream" peer reviewed health/policy journals. In each submission, the paper was desk rejected by the editor without being sent out for peer review. No specific reasons were given for the desk rejections. The authors are therefore especially grateful that the editor of the *International Journal of Vaccine Research, Theory and Practice* was willing to consider the study for publication.

Despite these delays, Skidmore (2023a), which was republished in *Science, Public Health Policy and the Law* and the present study are complementary, relevant, and prescient. Skidmore (2023a, 2023b)

accurately predicted that as more people observed injuries from the COVID-19 injections among family and friends, the rate of COVID-19 injection uptake would fall. The present study shows that opposition to COVID-19 injection mandates increases as more people observe harm among family and friends that is perceived to have resulted from the COVID-19 injections. As of February 2024, COVID-19 booster uptake among adults is just 22% and 11% for children (Collins, 2024), and COVID-19 injection mandates have been dropped by most employers and public institutions.

Materials and Methods

NATIONAL SURVEY OF COVID-19 HEALTH EXPERIENCES

The survey and recruitment protocol of the National Survey of COVID-19 Health Experiences received an exemption determination from the Institutional Review Board (IRB) of the Michigan State University Human Research Protection Program (file number: STUDY00006960, date of exemption determination: November 17, 2021). The research was conducted in accordance with pertinent guidelines and regulations. Dynata, the world's largest first-party data platform and one that is representative of the US American population (Shupp, 2020) obtained the survey sample. The Dynata sample is based on opt-in sampling where respondents provide high-quality information and have honesty and accuracy as community norms (Tsai *et al.*, 2018). The survey was available to the Dynata panel until the needed number of responses was compiled from each category of the stratification based on age, sex, and income, to obtain a balanced set of responses. The opt-in sampling approach does not generate a response rate as defined in classical survey research.

DEVELOPMENT OF QUESTIONNAIRE AND PRE-TEST

The questionnaire was created in November 2021. The survey was validated by a medical doctor and a survey research specialist. The survey structure was generally based on Shupp *et al.* (2020). Of greatest interest in this study are questions that ask respondents about the health status of people in their social circles. Shupp *et al.* (2020) included similar survey questions but in reference to prescription drug abuse. During December 6-9, 2021, a pre-test with 1,110 respondents was administered. Feedback from the pre-test was used to finalize the survey.

The survey included four sets of questions: 1) questions regarding respondent experiences with the COVID-19 disease and COVID-19 vaccination¹, 2) questions regarding experiences with COVID-19 illness and COVID-19 vaccination in the respondent social circles, and 3) questions to collect socioeconomic data, political ideology, approximate size of social network, and 4) views on COVID-19 policies, such as vaccine mandates and vaccine passports. The survey is included in the appendix as Supplementary Material 1.

STATISTICAL ANALYSIS OF THE SURVEY DATA

Means and standard deviations for continuous variables and absolute numbers (percentages in parenthesis) for categorical variables are provided. A comparison between the socioeconomic characteristics of survey participants and data from the United States (US) Census and the US

¹ In most portions of the paper, the term “injection” is used to describe COVID-19 “vaccination” because the contents of the COVID-19 injectables are not vaccines according to traditional definitions. However, the survey uses the term “vaccine” because most respondents understand the COVID-19 injectables to be vaccines.

American Housing Survey (United States Census Bureau (n.d.b); United States Census Bureau (n.d.c), Gramlich, 2020) is made after adjustment for age and gender.

Logistic regression analysis² is used to identify variables associated with opposition to COVID-19 injection mandates and passports. The two independent variables are: 1) disagreement with the statement “vaccine mandates should be implemented across the nation”; and 2) disagreement with the statement “digital vaccine passports should be used to track COVID-19 vaccine status and enforce mandates”. In order to isolate the effect of health circumstances observed in social circles, it is important to include a set of potential confounders/covariates in the regression analyses: COVID-19 illness status, COVID-19 vaccination status, age, income, gender, political leaning (Democrat, Republican, Independent), urbanization using respondent self-assessments of whether they live in urban, suburban, or rural areas, race (Caucasian, African American, Hispanic, Asian, Native American/Pacific Islander, Other), educational attainment as per the US Census (United States Census Bureau, n.d.a), information sources about COVID-19 (mainstream news, alternative news/other, peer-reviewed scientific literature, official government sources), reported COVID-19 illness problems in social circles, and reported COVID-19 vaccine adverse events in social circles. In the survey, social circles include “family, friends, church, work colleagues, and social networks”. Among those in social circles who are reported to have experienced health problems, respondents were asked to describe what happened to the person they know best.

The survey data and Stata code³ are available from the authors upon request.

Results

CHARACTERISTICS OF SURVEY RESPONDENTS AND SURVEY REPRESENTATIVENESS

The National Survey of COVID-19 Health Experiences was administered online between December 18 and 23, 2021. A total of 2,813 participants completed the survey after deleting the 216 respondents (6.5%) who did not consent to participate, 60 missing responses for age which are used to weigh the data (1.9%), and 105 incomplete surveys (3.2%). 27 additional respondents did not answer the question about race. There was a negligible item non-response for the following variables: 1.9% (age), 0.9% (race), and 0.28% (size of social circles). Responses to other questions used in this evaluation were complete with no missing information.

Descriptive statistics for the survey sample with a comparison to data from the US Census (Gramlich, 2020) and the American Housing Survey (Bucholtz, 2020) are provided in Table 1. Overall, differences between the survey sample and the general population are negligible. For the survey participants and the US population, 48% were male. The average age of respondents was 46.9 (CI 95% \pm 0.640) years. There were also small differences in political leaning, race, urbanization, and education between the survey sample and the US population. The degree of urbanicity is similar to data from the American Housing Survey (Bucholtz, 2020) with small differences in percent urban (30.8% vs. 27%), percent suburban (46.7% vs. 52%), and percent rural (22.5% vs. 21%). In terms of education, the survey had a higher percentage of “some college” (35.4% vs. 27.6%), a lower percentage of “college graduates” (18.9% vs. 22.1%), and a higher percentage with “more than a college degree” (14.2 vs. 12.7).

² A logistic statistical model estimates the probability of an event occurring based on a set of explanatory variables.

³ Stata is the statistical software package used to conduct the data analysis.

Table 1: Demographic characteristics of survey respondents compared to the US Census and the American Housing Survey 2020*

Variable	Adjusted Survey	US Census/AHS
Age in adult population (years)	46.9	47.6
Sex (male)	48.7%	49.2%
Political affiliation		
Democrat	32.7%	33%
Republican	32.1%	29%
Independent	35.3%	34%
Race		
Caucasian	68.3%	71.0%
African American	15.4%	14.2%
Hispanic	7.1%	18.7%
Asian	3.5%	5.9%
Native American/Pacific Islander	2.4%	0.9%
Other/Two or More Races	3.3%	2.3%
Urbanization		
Urban	30.8%	27%
Suburban	46.7%	52%
Rural	22.5%	21%
Education		
Some College/2-Year Degree	35.4%	27.6%
College Degree	18.9%	22.1%
College Above Bachelors	14.2%	12.7%

*This table adds “Hispanic/Latino, Asian, Native American/Pacific Islander, and Other/Two or More Races” to the demographic data under “Race” published in Skidmore (2023a). The Hispanic/Latino percent in the survey is not strictly comparable to that reported for the US Census data which used a different descriptor.

To reiterate, in this evaluation, we focus on the two questions regarding whether the respondent knows someone who they perceive to have experienced problems with COVID-19 illness and the COVID-19 injection. Descriptions of problems in social circles with regard to the COVID-19 illness and the COVID-19 vaccine as reported by survey participants are provided in Supplementary Material 2 and Supplementary Material 3, which are available from Skidmore (2023a). It is important to recognize that even though a respondent reports that someone they know experienced problems from the COVID-19 illness or the COVID-19 injection, it does not necessarily mean that their perception is accurate. The problems they reported may have been coincidental with the COVID-19 illness or with recent COVID-19 inoculation, and therefore not causal. For some cases of COVID-19 vaccine injury, Supplementary Material 3 shows that a person the respondent knows had heart problems after being vaccinated, though the reported heart problems could have been unrelated to

inoculation. Nevertheless, these perceptions/experiences can influence policy respondent preferences.

DESCRIPTIVE STATISTICS FOR PRIMARY VARIABLES

Summary statistics for the relevant questions answered by respondents are presented in Table 2. About 23% of survey participants indicated having had the COVID-19 disease, of which 28% reported ongoing health issues; most of these respondents reported ongoing respiratory/breathing or taste/smell issues. About 51% of survey participants indicated that they had been injected, and of those respondents 15% reported that they had a health problem afterward. Comments from respondents describing the nature of health issues from the COVID-19 illness and COVID-19 injection adverse events are available from the corresponding author upon request.

Thirty-four percent (959 of 2,840) of respondents indicated that they knew at least one person in their social circles who had problems linked to the COVID-19 illness. These reports include 165 deaths after the survey weighting adjustment. A word-cloud⁴ of respondent descriptions along with respondent comments are provided in Supplementary Material 2 published in Skidmore (2023a) and not included here. The descriptions of problems include ongoing pulmonary issues, taste, and fatigue. Further, 23% of survey participants reported that they knew at least one person who experienced a COVID-19 injection adverse event, including 57 people who are reported to have died following the injection. The health issues reported ranged from serious problems such as cardiac arrests and other heart-related problems, blood clots and other circulatory problems, to neurological issues, as well as milder effects such as feeling sick, headache, fever, etc.⁵ A word cloud and comments for reported COVID-19 injection problems in respondent social circles are provided in Supplementary Material 3 available in Skidmore (2023a).

FACTORS RELATED TO OPPOSITION TO COVID-19 INJECTION MANDATES AND PASSPORTS

Table 3 reports the Logit regressions for opposition to “vaccine” mandates and “vaccine” passports, with the odds ratios and their confidence intervals. Unweighted data are used in the regressions due to the inclusion of socio-economic controls used by Dynata to recruit a balanced sample. Beginning with health status, having had the COVID-19 illness is not associated with injection mandate preferences, but those who have been injected are much less likely to oppose injection mandates than are the those that did not receive the injection (OR: 0.376, 95% CI: 0.305-0.460). Turning to socioeconomic factors, age is positively associated with opposition to injection mandates (OR: 1.015, 95% CI: 1.009–1.022). While income and gender are not associated with preferences for injection mandates, race is a strong predictor with minorities being less inclined to oppose mandates

⁴ A word cloud is an image that shows words in different sizes, depending on how often the words are used.

⁵ Caution is warranted in interpreting respondent descriptions of health problems. As non-professionals, most respondents will describe problems using language with which they are familiar. It is important to realize that technical diagnostic terms may or may not be applied appropriately in those descriptions.

Table 2: Covid-19 Health Survey Summary Statistics

Variable	Obs	Mean	St Dev	Min	Max
COVID-19 Factors					
Opposed to vaccine mandate (yes = 1, no = 0)	2,813	1.80	0.87	1	3
Opposed to vaccine passport (yes = 1, no = 0)	2,813	1.85	0.86	1	3
COVID-19 illness (yes = 1, no = 0)	2,813	0.24	0.43	0	1
COVID-19 illness problem (yes = 1, no = 0)*	682	0.27	0.45	0	1
COVID-19 vaccinated (yes = 1, no = 0)	2,813	0.48	0.50	0	1
COVID-19 vaccination health problem (yes = 1, no = 0)	1,353	0.15	0.36	0	1
Social Circle Health Issues After COVID (yes = 1, no = 0)	2,813	0.34	0.47	0	1
Social Circle Health Issues After Vaccine (yes = 1, no = 0)	2,813	0.23	0.42	0	1
General					
Age	2,813	43.24	16.90	21	90
Average Income	2,813	59,027	50,391	10,000	200,000
Gender (male = 1, female = 0)	2,813	0.46	0.50	0	1
Political Affiliation					
Democrat (yes = 1, no = 0)	2,813	0.33	0.47	0	1
Republican (yes = 1, no = 0)	2,813	0.31	0.46	0	1
Independent/Other (yes = 1, no = 0)	2,813	0.37	0.48	0	1
Urbanicity					
Urban (yes = 1, no = 0)	2,813	0.32	0.47	0	1
Suburban (yes = 1, no = 0)	2,813	0.46	0.50	0	1
Rural (yes = 1, no = 0)	2,813	0.22	0.42	0	1
Race					
White/Caucasian (yes = 1, no = 0)	2,813	0.65	0.48	0	1
African American (yes = 1, no = 0)	2,813	0.17	0.38	0	1
Hispanic (yes = 1, no = 0)	2,813	0.08	0.27	0	1
Asian (yes = 1, no = 0)	2,813	0.04	0.19	0	1
Native American/Pacific Islander (yes = 1, no = 0)	2,813	0.03	0.16	0	1
Other/more than one race (yes = 1, no = 0)	2,813	0.04	0.19	0	1
Education					
Less Than High School (yes = 1, no = 0)	2,813	0.04	0.20	0	1
High School/GED (yes = 1, no = 0)	2,813	0.29	0.45	0	1
Some College (yes = 1, no = 0)	2,813	0.24	0.43	0	1
2-year College degree (yes = 1, no = 0)	2,813	0.11	0.31	0	1
4-year College degree (yes = 1, no = 0)	2,813	0.18	0.39	0	1
Master's Degree (yes = 1, no = 0)	2,813	0.09	0.29	0	1
Doctoral Degree (yes = 1, no = 0)	2,813	0.02	0.13	0	1
Professional Degree (JD, MD) (yes = 1, no = 0)	2,813	0.03	0.16	0	1
Information Sources About COVID-19					
Mainstream News Sources (yes = 1, no = 0)	2,813	0.58	0.49	0	1
Alternative News Sources (yes = 1, no = 0)	2,813	0.36	0.48	0	1
Peer Reviewed Scientific Literature (yes = 1, no = 0)	2,813	0.19	0.39	0	1
Official Gov't Sources Such as CDC (yes = 1, no = 0)	2,813	0.38	0.49	0	1

than Caucasians (African American OR: 0.534, 95% CI: 0.397-0.717; Hispanic OR: 0.497, CI: 0.337-0.732; Asian OR: 0.347, CI: 0.189-.636). Political identity is also important: Compared to Democrats, those who self-identify as Republicans are more likely to oppose mandates (OR: 5.049, 95% CI: 0.3865-6.595). Those who identify as Independent also tend to oppose injection mandates (OR: 3.521, 95% CI: 2.716-4.565). There are also urban-rural differences, where rural residents are more likely to oppose mandates (OR: 1.433, 95% CI: 1.110-1.849). While education is generally not a significant determinant of preferences for injection mandates, information sources are correlated with mandate preferences. Those reporting reliance on mainstream news and official government sources are more likely to oppose injection mandates (OR: 1.320, 95% CI: 1.078-1.616) and those who rely on alternative news sources are even more inclined to do so (OR: 1.729, 95% CI: 1.421-2.103). Reliance on official government information and peer-reviewed scientific research are, in this survey data, unassociated with injection mandate preferences.

With regard to the main hypotheses, reported health problems within respondent social circles have a significant influence on injection mandate preferences. While knowing someone who experienced a significant health issue from the COVID-19 disease is unassociated with injection mandate preferences, knowing someone who is perceived to have had a health problem following a COVID-19 injection increases the likelihood of opposition to injection mandates (OR: 2.033, 95% CI: 1.629-2.538).

The second set of regression results in Table 3 reports regression findings for opposition to COVID-19 injection passports. However, those findings closely match the injection mandate estimates presented above and are therefore not discussed.

Discussion

The contribution of this study to the literature is to shed light on the role that perceived health experiences within social circles may play in preferences for/against policies such as COVID-19 “vaccine” mandates and passports. The finding that knowing someone who experienced a COVID-19 vaccine adverse event influences health policy preference formation is important. Further, there are a relatively large number of COVID-19 injection adverse events within respondent social circles in the survey, indicating that these perceptions must be regarded as relevant to the formation of health policy preferences.

In line with prior work, the analysis shows that respondent characteristics are associated with vaccine hesitancy/rejection and support for or opposition to vaccine mandates. As summarized by Nguyen *et al.* (2011) and Prematunge *et al.* (2012), several studies have examined vaccine hesitancy/rejection in the context of influenza. In these studies, vaccination status is influenced by beliefs regarding vaccine safety, effectiveness in infection prevention, and the gravity of the illness that might be prevented. As highlighted earlier, several studies examine support for COVID-19 “vaccine” mandates, focusing on political inclination (Gagneux-Brunon *et al.*, 2022), information sources and information campaigns (Attwell, Ward, and Tomkinson, 2021; Jovanovic, 2023; Attwell, K., and Navin, 2019), safety concerns, and degree of trust in healthcare authorities (Giannouchos, 2021), and use of coercion (McCoy, 2019; Tuuminen, *et al.*, 2023). The present study adds to this body of research by showing that perception of experiences within social circles regarding potential COVID-19 injection injury is associated with opposition to COVID-19 injection mandates and passports.

Table 3. Logit Regressions—Opposition to COVID-19 Vaccine Mandate and Vaccine Passport

	Opposed to Vaccine Mandate (yes = 1, no = 0)					Opposed to Vaccine Passport (yes = 1, no = 0)				
	OR	SE	95% CI		<i>p</i>	OR	SE	95% CI		<i>p</i>
COVID-19 illness No	REF [†]	REF	REF	REF	REF	REF	REF	REF	REF	REF
COVID-19 illness Yes	1.201	0.130	0.971	1.485	0.091	1.187	0.126	0.965	1.461	0.105
COVID-19 vaccinated No	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF
COVID-19 vaccinated Yes	0.375 ^{***}	0.0395	0.305	0.460	0	0.442 ^{***}	0.0452	0.362	0.540	0
Social circle health issues after COVID N ₁	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF
Social circle health issues after COVID V _{acc}	0.917	0.0932	0.752	1.119	0.396	0.964	0.0954	0.794	1.170	0.712
Social circle health issues after vaccine No	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF
Social circle health issues after vaccine Yes	2.033 ^{***}	0.230	1.629	2.538	0	1.685 ^{***}	0.187	1.357	2.094	0
Age	1.015 ^{***}	0.00324	1.009	1.022	0	1.012 ^{***}	0.00315	1.006	1.018	0
Combined income	1	0.00000108	1	1	0.369	1	0.00000104	1	1	0.078
Female	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF
Male	1.041	0.0996	0.863	1.256	0.672	1.025		0.854	1.232	0.789
Democrat	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF
Republican	5.049 ^{***}	0.688	3.865	6.595	0	4.494 ^{***}	0.591	3.473	5.815	0
Independent/Other	3.521 ^{***}	0.466	2.716	4.565	0	3.269 ^{***}	0.417	2.546	4.199	0
Urban	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF
Suburban	1.08	0.122	0.866	1.349	0.494	1.165	0.129	0.939	1.447	0.166
Rural	1.433 ^{**}	0.186	1.110	1.849	0.006	1.379 [*]	0.177	1.073	1.773	0.012

	Opposed to Vaccine Mandate (yes = 1, no = 0)					Opposed to Vaccine Passport (yes = 1, no = 0)				
	OR	SE	95% CI		p	OR	SE	95% CI		p
White/Caucasian	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF
African American	0.534***	0.0805	0.397	0.717	0	0.522***	0.0772	0.391	0.698	0
Hispanic	0.497***	0.0982	0.337	0.732	0	0.520***	0.0998	0.357	0.757	0.001
Asian	0.347***	0.107	0.189	0.636	0.001	0.420**	0.118	0.242	0.728	0.002
Native American/Pacific Islander	0.960	0.268	0.556	1.659	0.884	0.992	0.272	0.580	1.696	0.976
Other/more than one	1.092	0.267	0.676	1.765	0.719	1.034	0.248	0.645	1.656	0.890
Less than HS	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF
HS/GED	1.183	0.278	0.746	1.874	0.475	1.129	0.261	0.718	1.775	0.598
Some College	1.678*	0.401	1.051	2.68	0.03	1.612*	0.378	1.019	2.551	0.042
2-year CD	1.578	0.411	0.947	2.629	0.08	1.440	0.368	0.872	2.376	0.154
4-year CD	1.329	0.337	0.809	2.185	0.262	1.416	0.351	0.871	2.300	0.161
Master's	0.863	0.246	0.494	1.508	0.605	0.750	0.21	0.433	1.298	0.304
Doctoral	0.48	0.248	0.174	1.324	0.156	0.519	0.253	0.2	1.347	0.178
Professional (JD, MD)	0.586	0.253	0.251	1.367	0.216	0.509	0.216	0.221	1.171	0.112
No new source‡	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF
Mainstream news sources Yes	1.320**	0.136	1.078	1.616	0.007	1.115	0.112	0.916	1.358	0.277
Alternative/Other news sources Yes	1.729***	0.173	1.421	2.103	0	1.712***	0.167	1.414	2.073	0
Peer reviewed scientific literature Yes	1.19	0.144	0.939	1.510	0.150	1.338*	0.156	1.064	1.683	0.013
Official gov't sources such as CDC Yes	1.143	0.113	0.941	1.388	0.179	1.06	0.103	0.876	1.282	0.550
Observations	2813					2813				
LR Chi ²	599.82					526.84				
Pseudo R ²	0.175					0.152				

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

† REF refers to the reference category that is omitted from the Logistic regression analysis. For example, the reference category for gender is Female. Thus, the coefficient on Male indicates the change in likelihood relative to the omitted category (Female).

‡ It is possible that a respondent chooses multiple news sources so that this reference category is the baseline for each individual news category.

The COVID-19 injection hesitancy/rejection studies also provide evidence of how important perceptions and beliefs regarding vaccine risk and effectiveness are in injection decisions (Nguyen *et al.*, 2011; Prematunge *et al.*, 2012; Anderson S, 2020). Antivaccine attitudes and beliefs, and mistrust, which are correlated with low educational attainment are also important considerations (Bendau, 2021; Luo, 2021). General trust in science and COVID-19 injection intentions are also positively associated (Agle *et al.*, 2021). COVID-19 injection status and socioeconomic status are linked (Skidmore, 2023a; Dubé *et al.*, 2020; Hyland *et al.*, 2021; Kreps *et al.*, 2021). As discussed earlier, Skidmore (2023a) demonstrated that observed health problems in social circles from the COVID-19 disease and the COVID-19 injection in social circles are also important determinants in the COVID-19 injection decision. According to this study, knowing someone who had health problems following the COVID-19 illness increased the likelihood of injection, but knowing someone who experienced a health problem following COVID-19 injection reduced the likelihood of injection. According to a recent survey by Rasmussen (2023) “almost as many Americans believe someone close to them died from side effects of the COVID-19 injection as died from the disease itself”. This finding taken together with the present study affirms that opposition to COVID-19 injection mandates and passports has increased over time. Further, these findings suggest it may be difficult for policymakers to engender a consensus in the population around the adoption of injection mandates and passports.

The strengths of this research are that the sample closely fits the US population and that it provides a novel analysis of the degree to which experiences with potential COVID-19 injection adverse events, actual or imagined, influence COVID-19 inoculation decisions. These findings can be used to inform health policies.

The limitations of the study are: 1) With 2,840 respondents, the sample is small; 2) a clinical setting was not used in the reporting and diagnosis of COVID-19 injection injuries; and 3) due to the highly politicized nature of the COVID-19 crisis, respondents may interpret events with bias. Though the regression analysis controls for socioeconomic and cultural characteristics, bias could still be present.

Conclusions

The survey and analysis provide new information about factors associated with support for or opposition to COVID-19 injection mandates and passports. The evaluation shows that those who believe friends and family may have been harmed by the COVID-19 injections are more likely to oppose COVID-19 injection mandates and passports, offering an important insight for health authorities and policymakers who make critical health policy decisions.

Supplementary Materials: Supplementary Material 1 contains the survey and is included in the appendix of this paper. Supplementary Material 2 and Supplementary Material 3 can be accessed in Skidmore (2023a).

Author Contributions: Mark Skidmore developed the survey instrument, conceptualized the research methodology and design, served as project administrator, and prepared the original draft of the manuscript. Fernanda Alfaro managed the data and conducted the empirical analysis. She also helped review the manuscript and assisted with reviewing and editing the manuscript.

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Institutional Review Board Statement: The survey instrument and recruitment protocol of the National Survey of COVID-19 Health Experiences were approved via exemption determination by the Institutional Review Board (IRB) of the Michigan State University Human Research Protection Program (file number: STUDY00006960, date of approval: November 17, 2021, name of IRB: Michigan State University Human Research Protection Program). All participants gave written informed consent by reading a written consent statement and clicking “I Agree” before being allowed to take the online survey. All methods were carried out in accordance with relevant guidelines and regulations.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The survey dataset and corresponding Stata code are available from the authors upon request.

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Appendix

Supplementary Material 1: National Survey of COVID Health Experiences

NATIONAL SURVEY OF COVID-19 HEALTH EXPERIENCES

Online Survey Consent Information

Purpose of Research.

You are being asked to participate in this web-based survey in order to increase our understanding of the health experiences people have had during the COVID-19 crisis period.

What You Will Do.

If you choose to participate in this research study, you will complete a 10-20 minute survey regarding your experiences during the COVID-19 crisis. You will only take this one survey.

Participation and Withdrawal.

Your participation in this research is voluntary. You have the right to refuse to participate in this survey. You may withdraw from the web-based survey in this research study at any time.

Confidentiality.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. When the results of the research are published or discussed at conferences, no information will be included that reveals your identity. Your privacy will be protected to the maximum extent allowable by law.

Potential Benefits.

The information that you provide in the surveys will help us better understand challenges people have faced during the crisis and will be used to improve pandemic responses in the future.

Potential Risks.

Remember that only the research project team will know what you have said. Results will be shared in aggregate form only without identifying who said what. The risks are therefore minimal.

Costs and Compensation for Being in the Study.

You will not incur any expenses for participating in the survey, beyond your time, assuming you have internet access. You are eligible to receive compensation for participating in the survey as defined by Survey Sampling International.

Contact Information for Questions or Concerns.

If you have concerns or questions about this study, such as scientific issues, how to do any

part of it, or to report an injury, please contact the lead researcher: Mark Skidmore, 91 Justin S. Morrill Hall of Agriculture, Michigan State University, East Lansing, MI 48824, email mskidmor@msu.edu, tel. 517-353-9172.

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University 's Human Research Protection Program at: 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at 202 Olds Hall, MSU, East Lansing, MI 48824.

After reading the above, please indicate if you consent to participate. Selecting "I Consent" indicates you are willing to participate. Selecting "I Do Not Consent" indicates you are NOT willing to participate.

I Consent. (1)

I Do Not Consent. (2)

Skip To: Q2 If NATIONAL SURVEY OF COVID-19 HEALTH EXPERIENCES Online Survey Consent Information Purpose of Rese... = I Consent.

Skip To: End of Survey If NATIONAL SURVEY OF COVID-19 HEALTH EXPERIENCES Online Survey Consent Information Purpose of Rese... = I Do Not Consent.

In the following portion of the survey, you will be asked about your health experiences during the COVID-19 crisis.

Q1 Have you had COVID-19?

No. (1)

Yes. (2)

Skip To: Q2 If Have you had COVID-19? = Yes.

Skip To: Q10 If Have you had COVID-19? = No.

Q2 Please indicate how you were diagnosed. (check all that apply)

PCR Test (1)

Rapid Test (2)

COVID-19 Symptoms (3)

Q3 About when were you sick.

Q4 About how long did it take for you to recover?

- Less than a week. (1)
- Less than two weeks. (2)
- Less than three weeks. (3)
- Four weeks or more. (indicate the number of weeks) (4)
-

Q5 Do you have any lingering health issues in the wake of your COVID-19 infection?

- No. (1)
- Yes. (please describe below) (2)
-

Q6 Did you use any medications as treatment for COVID-19?

- No (1)
- Yes. (please list medications below) (2)
-

Q7 Did you use alternative medications such as ivermectin or hydroxychloroquine as treatment for COVID-19?

- No. (1)
- Yes. (2)

Skip To: Q10 If Did you use alternative medications such as ivermectin or hydroxychloroquine as treatment for COV... = No.

Skip To: Q8 If Did you use alternative medications such as ivermectin or hydroxychloroquine as treatment for COV... = Yes.

Q8 Which of the following alternative treatments did you use?

- Ivermectin (1)
 - Hydroxychloroquine (2)
 - Other (please describe below) (3)
-

Q9 In your assessment, did the alternative medication you took help you recover?

- No. (1)
- Yes. (2)

Q10 Which of the following statements best describes your view of alternative COVID-19 treatments such as ivermectin or hydroxychloroquine?

- Research has shown these treatments to be ineffective for COVID-19. (1)
- Research has shown these treatments to be effective for COVID-19. (2)
- I know little about the effectiveness of these treatments for COVID-19. (3)

In the following portion of the survey, you will be asked about your experiences with COVID-19 inoculation.

Q11 Have you been inoculated against COVID-19?

- No. (1)
- Yes. (2)

Skip To: Q18 If Have you been inoculated against COVID-19? = No.

Skip To: Q12 If Have you been inoculated against COVID-19? = Yes.

Q12 Did your COVID-19 infection occur before or after inoculation?

- Before. (1)
- After. (2)

I have not had COVID-19. (3)

Q13 Which of the three authorized vaccines did you use? (check all that apply)

	1st Dose (1)	2nd Dose (2)	3rd Dose (3)
Pfizer. (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Moderna. (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Johnson & Johnson. (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not remember. (4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q14 Have you experienced any health problems since you were vaccinated?

No. (1)

Yes. (Please describe below) (2)

Skip To: Q18 If Have you experienced any health problems since you were vaccinated? = No.

Skip To: Q15 If Have you experienced any health problems since you were vaccinated? = Yes. (Please describe below)

Q15 What is the timeframe of your post vaccination health problems? (check all that apply)

	0-3 Days (1)	4-30 Days (2)	30+ Days (3)
Dose 1 (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dose 2 (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dose 3 (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q16 Was the health condition reported to a doctor?

- No. (1)
- Yes. (2)

Skip To: Q18 If Was the health condition reported to a doctor? = No.

Skip To: Q17 If Was the health condition reported to a doctor? = Yes.

Q17 Was the health event reported by your doctor to the CDC Adverse Event Reporting System as a possible adverse event from vaccination?

- No. (1)
- Yes. (2)
- I do not know. (3)

In the following portion of the survey, you will be asked about the health experiences of those in your social circles.

Q18 Has anyone in your social circles (family, friends, church, work colleagues, social networks, etc.) experienced a significant health problem after they had been ill from COVID-19 (but not from the vaccine)?

- No. (1)
- Yes. (2)

Skip To: Q22 If Has anyone in your social circles (family, friends, church, work colleagues, social networks, etc... = No.

Skip To: Q19 If Has anyone in your social circles (family, friends, church, work colleagues, social networks, etc... = Yes.

Q19 Did just one person have this problem or more than one?

- One. (1)
- Two. (2)
- Three. (3)

More than three (please indicate how many below) (4)

Q20 Of the people you know who experienced a health problem after being sick from COVID-19 (but not from the vaccine), think about the one you know BEST. Please describe the health condition experienced by that person.

Q21 About how old is the person who experienced this health condition?

Under 18 years. (1)

18 to 24 years. (2)

25 to 29 years. (3)

30 to 34 years. (4)

35 to 39 years. (5)

40 to 44 years. (6)

45 to 49 years. (7)

50 to 54 years. (8)

55 to 59 years. (9)

60 to 64 years. (10)

65 to 69 years. (11)

70 to 74 years. (12)

75 to 79 years. (13)

80 to 84 years. (14)

85 to 89 years. (15)

90 years or over. (16)

Q22 Has anyone in your social circles (family, friends, church, work colleagues, social networks, etc.) experienced a significant health problem after they received the COVID-19 vaccination?

No. (1)

Yes. (2)

Skip To: Q26 If Has anyone in your social circles (family, friends, church, work colleagues, social networks, etc... = No.

Skip To: Q23 If Has anyone in your social circles (family, friends, church, work colleagues, social networks, etc... = Yes.

Q23 Did just one person have this problem or more than one?

One. (1)

Two. (2)

Three. (3)

More than three. (please indicate how many below) (4)

Q24 Of the people you know who experienced a health problem after being vaccinated, think about the one you know BEST. Please describe the health condition experienced by that person.

Q25 About how old is the person who experienced this health condition?

Under 18 years. (1)

18 to 24 years. (2)

- 25 to 29 years. (3)
- 30 to 34 years. (4)
- 35 to 39 years. (5)
- 40 to 44 years. (6)
- 45 to 49 years. (7)
- 50 to 54 years. (8)
- 55 to 59 years. (9)
- 60 to 64 years. (10)
- 65 to 69 years. (11)
- 70 to 74 years. (12)
- 75 to 79 years. (13)
- 80 to 84 years. (14)
- 85 to 89 years. (15)
- 90 years or over. (16)

In this last portion of the survey, you will be asked for demographic information and your opinion on several COVID-19 policies.

Q26 What is your age?

- 18 to 24 years. (1)
- 25 to 29 years. (2)
- 30 to 34 years. (3)

- 35 to 39 years. (4)
- 40 to 44 years. (5)
- 45 to 49 years. (6)
- 50 to 54 years. (7)
- 55 to 59 years. (8)
- 60 to 64 years. (9)
- 65 to 69 years. (10)
- 70 to 74 years. (11)
- 75 to 79 years. (12)
- 80 to 84 years. (13)
- 85 to 89 years. (14)
- 90 years or over. (15)

Q27 What is the highest level of education you have completed?

- Less than High School. (1)
- High School / GED. (2)
- Some College. (3)
- 2-year College Degree. (4)
- 4-year College Degree. (5)
- Master 's Degree. (6)
- Doctoral Degree. (7)

Professional Degree. (JD, MD) (8)

Q28 What is your race?

White/Caucasian. (1)

African American. (2)

Hispanic. (3)

Asian. (4)

Native American. (5)

Pacific Islander. (6)

Other/more than one. (7) _____

Q29 Please indicate your gender below.

Q30 Which type of community do you live in?

Urban. (1)

Suburban. (2)

Rural. (3)

Q31 What is your combined annual household income?

Less than \$10,000. (1)

\$10,000 - \$14,999. (2)

\$15,000 - \$19,999. (3)

\$20,000 - \$24,999. (4)

- \$25,000 - \$34,999. (5)
- \$35,000 - \$49,999. (6)
- \$50,000 - \$74,999. (7)
- \$75,000 - \$99,999. (8)
- \$100,000 - \$149,999. (9)
- \$150,000 - \$199,999. (10)
- \$200,000 or more. (11)

Q32 Think about your social circles (family, friends, church, work colleagues, social networks, etc.). About how many people in your circles do you know well enough that you would typically learn about a significant emerging health condition? (numerical answer only please)

Q33 Please indicate your level of agreement/disagreement with the following statement: Vaccine mandates should be implemented across the nation.

- Strongly Agree. (1)
- Agree. (2)
- Neutral. (3)
- Disagree. (4)
- Strongly Disagree. (5)

Q34 Please indicate your level of agreement/disagreement with the following statement: Digital health/vaccine passports should be used to track COVID-19 vaccine status and enforce vaccine mandates.

- Strongly Agree. (1)
- Agree. (2)

- Neutral. (3)
- Disagree. (4)
- Strongly Disagree. (5)

Q35 Please indicate the reason(s) many policymakers may want to implement a digital vaccine passport system. (check all that apply)

- Systematically Monitor Vaccine Status. (1)
- Enforce Vaccine Mandates. (6)
- Facilitate the Adoption of a Digital Currency. (2)
- Control Purchases. (3)
- Control Assets. (4)
- Control Movement. (5)

Q36 Please indicate your level of agreement/disagreement with the following statement:
Lockdowns are an effective policy tool for reducing COVID-19 transmission.

- Strongly Agree. (1)
- Agree. (2)
- Neutral. (3)
- Disagree. (4)
- Strongly Disagree. (5)

Q37 Please indicate your level of agreement/disagreement with the following statement: Mask mandates are an effective policy tool for reducing COVID-19 transmission.

- Strongly Agree. (1)

- Agree. (2)
- Neutral. (3)
- Disagree. (4)
- Strongly Disagree. (5)

Q38 Please indicate where you obtain news and information about COVID-19. (check all that apply)

- Mainstream News Sources. (1)
 - Alternative News Sources. (2)
 - Peer Reviewed Scientific Literature. (3)
 - Official Gov't Sources Such as the U.S. Center for Disease Control (CDC). (4)
 - Other (please provide information below). (5)
-

Q39 Please indicate your political affiliation.

- Democrat. (1)
 - Republican. (2)
 - Independent. (3)
 - Other. (please indicate affiliation below) (4)
-

Q40 Please provide your five-digit zip code.
