

INFORMATION SOURCES AND COVID-19 VACCINE
HESITANCY IN ADULTS WITH DISABILITIES

by

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People with disabilities are at increased risk of experiencing severe COVID-19 outcomes and should receive vaccinations and boosters to mitigate risk. However, COVID-19 vaccine hesitancy has been previously observed in this population and little is known about its underlying contributors. The purpose of this study is to investigate COVID-19 vaccine and booster hesitancy, sources of public health information, vaccination and hesitance rationales, misinformation susceptibility, and political ideology by expanding upon the 2021 COVID-19 and Vaccine Survey Project from the American Association on Health & Disability. Results found that over 70% of previously-hesitant respondents (n= 32) had received a primary dose of a COVID-19 vaccine and that over 90% of all respondents (n=280) had received a booster. Both the Hesitant and Not Hesitant Groups reported health care professionals as the most trusted source for reliable COVID-19 vaccine information, and the ability to correctly identify COVID-19 misinformation was related to both information sources and political ideology variables. Findings reinforce the value of health care providers in the provision of accessible and accurate COVID-19 vaccine messaging as a means of combatting misinformation, which aligns with strategies for reducing COVID-19 vaccine hesitancy in the general population given the emergence of distrust in science during the pandemic. Additionally, because this is the only study to examine the role of information sources and the longitudinal element of vaccine hesitancy among people with disabilities, and public health policymakers will be interested in the proposed programmatic applications of this research on elements of vaccine decision-making.

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Introduction

Disability is both widely dynamic and ubiquitous on a global scale; over fifteen percent of the world population has some form of disability and demographic aging trends indicate that this prevalence will continue to increase in subsequent decades.¹ Domestically, people with disabilities represent twenty-six percent of the American population (over 61 million people), yet barriers such as poor health outcomes, reduced access to healthcare services, and public health biases remain prominent issues in the United States.^{2,3}

The coronavirus disease (COVID-19) pandemic has drastically exacerbated these inequities through its impact on healthcare systems and public health coordination in the United States. Several population groups have faced disproportionate and negative health outcomes as a result of the pandemic, especially within the realms of resource accessibility and availability. Adults with disabilities are particularly disadvantaged by these factors; findings from the 2021 National Council on Disability Progress Report show that the pandemic widened existing healthcare discrimination and inequities, as well as resulted in higher rates of infection and/or death than were observed within the general population.⁴ Adults with disabilities were also more at-risk of experiencing psychological distress,⁵ being triaged out of clinical COVID-19 treatment during supply shortages,⁶ and experiencing basic needs challenges.⁷

Since vaccination is currently at the forefront of pandemic response and recovery efforts, it is important to investigate ideologies among adults with disabilities that contribute to a

¹ Groce, "Global Disability."

² CDC, "Disability Impacts All of Us Infographic"

³ Krahn et al., "Persons with Disabilities as an Unrecognized Health Disparity Population."

⁴ National Council on Disability, "2021 Progress Report."

⁵ American Psychological Association, "How COVID-19 impacts people with disabilities."

⁶ National Council on Disability, "2021 Progress Report."

⁷ Streuli et al., "COVID-19 disproportionately impacts access to basic needs among households with disabled members."

rejection or an acceptance of COVID-19 primary series and booster vaccinations. However, the prevalence of misinformation and the politicization of COVID-19 response in America has introduced unique challenges to accurate and effective public health messaging about both the SARS-CoV-2 virus and the vaccines designed to prevent it. There are currently few published works examining how these factors might affect population-specific vaccine hesitancy in adults with disabilities, and no existing literature has specifically considered how vaccine ideology might change longitudinally or how information sources might influence vaccine hesitance among this population.

This project aims to fill these gaps by investigating how adults with disabilities both interact with and trust information sources that are viewed as important for providing reliable COVID-19 vaccine guidance. This study also examined general COVID-19 knowledge and misinformation susceptibility, as well as the rationales that influenced COVID-19 vaccination decision-making. The results will be used to propose public policy and programmatic improvements that seek to create more-inclusive response methodologies and enhanced equity within infectious disease vaccine promotion moving forward.

Literature Review

The following literature review will focus on the underlying factors that contribute to general vaccination hesitance, including: historical contextualizations, the role of information sources in public health guidance, misinformation, and the politicization of COVID-19 vaccine development and rollout. Disability-specific connotations are also investigated when possible, and the limited volume of existing research on factors associated with COVID-19 vaccine uptake among people with disabilities is contextualized in relationship to the need for future study.

Situating Disability

To understand why disability-specific barriers exist within the realm of healthcare, it is necessary to first examine the multifaceted classifications of disability, as well as to contextualize the situating of disability as a whole. As a broad term, disability can be thought of as the intersect between individuals with a health condition and the surrounding socioenvironmental factors.⁸ There are currently four primary models of disability that are recognized: 1) social, 2) affirmative, 3) functional, and 4) medical. The social model is the most commonly accepted within the field of disability studies, and is also at the root of outlining the aforementioned intersection between people and the built world that creates disability. This model works to propose that differences in ability are solely created through a barrier-filled environment, as well as that people are limited by inadequate support, not their bodies.⁹ The affirmative model is closely tied to the social, and views disability as a form of reclamation that positions differences in ability as a positive and beneficial part of society.¹⁰ Taken in tandem, the social and affirmative frameworks situate disability as an invaluable factor of social identity and

⁸ World Health Organization, "Disability."

⁹ Shakespeare, "Chapter 13: The Social Model of Disability."

¹⁰ Swain and French, "Towards an Affirmation Model of Disability."

emphasize the importance of neuro- and physical-divergence in the creation of a stronger and more inclusive community. These frameworks also seek to reject the medical model of disability, an archetype that positions disability as an individually-experienced condition that can be cured by the medical industrial complex.¹¹ Similarly, the functional model of disability conceptualizes limitations as being created by impairments or deficits that then impact how a person is able to complete or partake in functional activities.¹² Together, the medical and functional models are predominantly repudiated within the disability studies community, but it is important to note that both of these models still play an invaluable part of understanding the historical and contemporary constructions of healthcare and public health practices in the United States that have resulted in the creation of various barriers and poor health outcomes for people with disabilities.

Regardless of the model that is used to frame disability, it is necessary to contextualize the different—and often overlapping—manners of how it is perceived among individuals. As outlined by the Centers for Disease Control and Prevention (CDC) using the functional model of disability, there are six main disability identifiers that are currently used for the collection of population data: 1) Deaf, or have serious difficulty hearing (Hearing); 2) Blind, or have serious difficulty seeing, even when wearing glasses (Vision); 3) Because of physical, mental, or emotional condition, have serious difficulty concentrating, remembering, or making decisions (Cognition); 4) Have serious difficulty walking or climbing stairs (Physical); 5) Have difficulty dressing or bathing (Self-care); and 6) Because of a physical, mental, or emotional condition, have difficulty doing errands alone such as visiting a doctor’s office or shopping (Independent Living). These identifiers are considered standard in clinical diagnostic code and other public

¹¹ Brisenden, “Independent Living and the Medical Model of Disability.”

¹² Smart, “The Power of Models of Disability.”

health practices within the United States, and have been uniformly implemented by the Secretary of the U.S. Department of Health and Human Services (HHS) in accordance with the 2010 Affordable Care Act. In addition, these identifiers are subsequently used by the CDC Behavioral Risk Factor Surveillance (BRFSS)—the nation’s premier public health survey, the U.S. Census Bureau, and other federal agencies. As such, disability-specific health outcomes are often reported in accordance with the six identifiers and it is common to implement all or some of these classifications within demographic data collection measures.

Vaccine Hesitance Pre-COVID-19

Understanding the historic contextualizations of vaccine hesitancy can help to further elucidate the recent emergence of COVID-specific aversions to both primary and booster doses among the general public and people with disabilities. As a broadly accepted terminology, vaccine hesitancy is defined by the World Health Organization (WHO) as a “delay in acceptance or refusal of vaccines despite availability of vaccination services.”¹³ Regardless of the fact that vaccination is commonly acknowledged as one of the most successful public health interventions due to its role in the worldwide eradication of smallpox and the elimination of poliomyelitis in America, a recent resurgence in vaccine-preventable illnesses led WHO to declare vaccine hesitancy as a major threat to global health in 2019.¹⁴⁻¹⁷ Vaccine hesitance is uniquely complicated by its multifaceted dynamic; the decision to delay or reject vaccinations is often attributed to an intersect of contexts that are historic, political, scientific, sociocultural, public health-driven, and/or media-oriented in nature.

¹³ MacDonald, “Vaccine Hesitancy.”

¹⁴ Greenwood, “The Contribution of Vaccination to Global Health.”

¹⁵ Greenwood.

¹⁶ WHO, “Smallpox.”

¹⁷ CDC, “Why CDC Is Involved in Polio Eradication.”

Historic origins of anti-vaccination movements have been observed since the onset of widespread vaccination provision in the 1800s. Beginning with the use of a preliminary cowpox inoculation designed by Dr. Edward Jenner in 1796 to protect against smallpox—an innovation that was soon met with backlash prompted by an anti-vaccine cartoon published in an influential British satire magazineⁱ—social critique of vaccination has been apparent.¹⁸ As a mobilized response to protesting vaccines, the first anti-vaccination leagues formed and spread around Europe in the 1870s and 1880s after the British Vaccination Act of 1840 made smallpox inoculation mandatory for all newborn children.¹⁹ Since then, organized anti-vaccine groups have continued to assemble across many Westernized and/or high-income countries and are currently active in Europe, Oceania, and the Americas.²⁰ The emergence of digital media, such as the internet, has also contributed to more readily accessible and frequently displayed antivaccination materials. This phenomenon was illustrated in findings from Davies et al. (2006) that demonstrated the seven most-utilized internet search engines displayed antivaccination materials in 43% of the top ten results generated from searches containing “vaccination” or “immunization.”²¹

Aversions to specific vaccines also drive forth general attitudes of hesitance and have resulted in uptakes in anti-vaccination rhetoric during the past several decades. The measles, mumps, and rubella (MMR) vaccination emerged as an especially strong vessel for resistance after *The Lancet*—a premier and generally well-respected public health journal—published a paper written in 1998 by Dr. Andrew Wakefield suggesting that the MMR vaccine was

¹⁸ Riedel, “Edward Jenner and the History of Smallpox and Vaccination.”

¹⁹ Williamson, “Anti-Vaccination Leagues.”

²⁰ Larson, Gakidou, and Murray, “The Vaccine-Hesitant Moment.”

²¹ Davies, Chapman, and Leask, “Antivaccination Activists on the World Wide Web.”

connected to the development of autism in children.²² Although the paper was retracted in 2010 and Dr. Wakefield was found guilty of both dishonesty and the breaching of ethics protocols by the General Medical Council, the twelve years in which the paper circulated resulted in widespread concern among the general public.²³ Furthermore, there was a resurgence of vaccine-preventable diseases (VPDs) in the United States during the first decade of the twenty-first century, with a notably large mumps outbreak occurring in the United States during 2006. During the outbreak, over sixty-five hundred cases of mumps were reported, and—despite the fact that most infected patients, of whom were predominantly college-aged, had received two doses of the mumps vaccine as children—the resurgence was characterized by two-dose vaccine failure among the greater population.^{24,25} Outbreaks of measles and pertussis (colloquially known as whooping cough) were also observed in North America during the 2000s, indicating that VPDs were once again a threat to public health.²⁶⁻²⁹

The progression of vaccine hesitancy is also uniquely characterized by its connection to intergenerational dynamics. Vaccine-hesitant parents (VHPs) are of particular interest when considering vaccination aversions due to their role in paternalistic decision-making abilities during infancy and toddlerhood—a time period in which children are scheduled to receive 7 critical vaccines against preventable diseases by 24 months of age within the United States.³⁰

Parental vaccine hesitancy increased dramatically from 2000 to 2009, which notably tracks with

²² Wakefield et al., “RETRACTED: Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children.”

²³ Dyer, “Lancet Retracts Wakefield’s MMR Paper.”

²⁴ Dayan et al., “Recent Resurgence of Mumps in the United States | NEJM.”

²⁵ Kancherla and Hanson, “Mumps Resurgence in the United States.”

²⁶ De Serres et al., “Largest Measles Epidemic in North America in a Decade--Quebec, Canada, 2011.”

²⁷ Winter et al., “California Pertussis Epidemic, 2010.”

²⁸ Cherry, “Epidemic Pertussis in 2012--the Resurgence of a Vaccine-Preventable Disease.”

²⁹ Centers for Disease Control and Prevention (CDC), “Measles Outbreak Associated with an Arriving Refugee - Los Angeles County, California, August-September 2011.”

³⁰ CDC, “FastStats: Immunization.”

the publication of the since-retracted paper by Dr. Wakefield. This uptick in aversion was further quantified by national studies that found that 19% of surveyed parents had “concerns about vaccines” in 2000 (Gellin et al.), while over 50% had similar concerns in 2009 (Freed et al.).^{31,32} Primary care physicians also reported high rates of vaccine rejection around the end of the 2000s; Kempe et al. (2010) implemented a national survey of pediatricians and family medicine practitioners and found that 60% had reported observing at least one vaccine refusal in 1-4% of patients and 8% reported observing refusal in over 10% of patients. The same study also inquired into the reasonings that parents provided when refusing vaccinations for their children, with the top two responses including a “concern that their child will suffer long-term complications from vaccines” (68%) and a “concern that their child could develop autism as a result of vaccination” (62%). Statistical analysis found both of these variables to be almost twice as commonly reported as the next-most report concern (33% of parents were worried about the possible ill effects of thimerosal, a mercury-based preservative used in vaccines), and both responses were significant at the 95% confidence level.³³

Since the 2010s, roughly one in four parents report being vaccine hesitant—a rate that held consistent in recent findings from Nguyen et al. published in 2022.³⁴ Aside from being linked to an uptick in VPDs during the onset of the twenty-first century, examining parental vaccine rejection is of particular interest while examining the greater realm of vaccination hesitancy due. This is due to the fact that recording an accurate, quantifiable prevalence of vaccine hesitance among the general population can be a difficult task given the myriad of

³¹ Gellin, Maibach, and Marcuse, “Do Parents Understand Immunizations?”

³² Freed et al., “Parental Vaccine Safety Concerns in 2009.”

³³ Kempe et al., “Prevalence of Parental Concerns About Childhood Vaccines.”

³⁴ Nguyen et al., “Parental Vaccine Hesitancy and Association With Childhood Diphtheria, Tetanus Toxoid, and Acellular Pertussis; Measles, Mumps, and Rubella; Rotavirus; and Combined 7-Series Vaccination.”

environmental, political, and logistical factors that might inform hesitance ideologies. Thus, examining how and why vaccine hesitance originates in parents provides room to consider how general hesitancy may arise and/or be linked to other decisions against vaccination in the population at-large.

Vaccination ideology can be further understood using the health belief model (HBM), which is a conceptual theory that links individual behavior and belief with their perception and action related to health matters.³⁵ In relation to vaccinations, the health belief model can help to further elucidate how preexisting vaccination hesitance and ideologies might impact public health behaviors via a reinforcing relationship between media selectivity and resultant healthcare decisions. When applying the health belief model to an examination of influenza vaccine uptake rates, a 2019 study from Xie et al. demonstrated that individuals who declined the influenza vaccination were found to have lower levels of trust in “authoritarian” health entities (e.g., the CDC or FDA) and reported being exposed to more negative sentiments about annual vaccination than those who chose to receive a flu shot.³⁶ The health belief model also helps to contextualize why the since-disproven postulation of vaccination being connected with the onset of childhood autism has created noticeable levels of contemporary distrust of public health practices, as well as further contextualizes a historically-rooted divide between scientists and citizens.³⁷ The vaccine-autism connection and its consequential promotion of scientifically-inaccurate vaccine discourse also highlights how the intersect between disability and vaccination has moved into the global health spotlight over the past several decades, as well as emphasizes a need to understand population-specific implications of vaccine hesitancy in and around the disability community.

³⁵ Rosenstock, “Health Belief Model.”

³⁶ Xie et al., “Understanding Flu Vaccination Acceptance Among U.S. Adults.”

³⁷ Gross, “A Broken Trust.”

Vaccine Hesitance Post-COVID-19

The COVID-19 pandemic has emerged as a new driver of vaccine adverse or hesitant ideologies among the general population, many of which have been widely publicized and reported on by digital media sources and news outlets. As both a responsive and protective measure within pandemic response, the availability of COVID-19 vaccines has become a foundational part of COVID-19 response in the United States and remains a central point in the Biden-Harris plan to reduce COVID-19 infections and hospitalizations.³⁸ However, widespread vaccine hesitancy has left many Americans unsure or against COVID-19 vaccination—in September 2020 (shortly before COVID-19 vaccinations became available to the general public), 49% of adults surveyed by the Pew Research Center stated that they would not get the COVID-19 vaccine if it were presented to them.³⁹

Current vaccination trends indicate that this hesitance has since been reduced; CDC data from January 2023 indicated that 80.9% of the U.S. population had received at least one dose, with 69.1% having completed the primary series (defined as one or two doses depending upon manufacturer), and 14.5% having chosen to receive an updated bivalent booster.⁴⁰ When examining potential reasons for why these rates were not higher, Census Bureau data found that novelty of both the coronavirus disease and the COVID-19 vaccine were widely cited as hesitance rationales among the general population near the beginning of the COVID-19 pandemic.⁴¹ According to Chou & Budenz (2020), reluctance towards receiving the initial dose(s) often stemmed from concerns in the timeline of vaccination development, the safety and

³⁸ The White House, “National COVID-19 Preparedness Plan.”

³⁹ Funk and Tyson, “Growing Share of Americans Say They Plan to Get a COVID-19 Vaccine – or Already Have.”

⁴⁰ CDC, “COVID Data Tracker.”

⁴¹ Monte, “Household Pulse Survey Shows Many Don’t Trust COVID Vaccine, Worry About Side Effects.”

efficacy of the vaccine, and the general unknowns about the SARS-CoV-2 virus.⁴² These reluctancies coincided with expedited federal and regulatory approval efforts that were being pursued by pharmaceutical companies such as Pfizer/BioNTech and Moderna at unprecedented speed, which ignited new vaccine-related apprehensions from the general public.^{43,44} Another commonly cited concern was related to the formulation of COVID-19 vaccines, which uses an mRNA-based structure in order to teach cells how to create proteins that can trigger immune responses and prepare viral resistance. Although mRNA technology had been used in various human trials since 2011, the mRNA COVID-19 vaccine from Pfizer was the first to complete all clinical trial stages and be licensed for use—a development that prompted concern and misconceptions that COVID-19 vaccinations could permanently alter human DNA sequencing and/or be a risk to the public.⁴⁵⁻⁴⁷

These scientific advancements and the resultant speculations were often paired with public commentary that supported hesitance. Notably, a medical doctor and infectious-disease researcher named Robert Malone who had claimed to have invented mRNA technology spoke out against its use on a podcast and warned that pursuing any COVID-19 vaccination campaign was erroneous.⁴⁸ Public displays of anti-vaccine activism against COVID-19 vaccinations have also been observed. In January of 2021, protestors disrupted a vaccination clinic held at Dodger Stadium in Los Angeles and caused a temporary shut-down of the site. Protestors have also gathered in shopping malls and hospitals to voice concerns over mask mandates, curfews, and

⁴² Chou and Budenz, “Considering Emotion in COVID-19 Vaccine Communication.”

⁴³ Le et al., “The COVID-19 Vaccine Development Landscape.”

⁴⁴ Muñana and 2020, “KFF COVID-19 Vaccine Monitor.”

⁴⁵ Johns Hopkins Bloomberg School of Public Health “The Long History of mRNA Vaccines.”

⁴⁶ AP News, “No, COVID-19 Vaccines Aren’t Gene Therapy.”

⁴⁷ Jaffe-Hoffman, “Could mRNA COVID-19 Vaccines Be Dangerous in the Long-Term?”

⁴⁸ Bartlett, “The Vaccine Scientist Spreading Vaccine Misinformation.”

lockdowns that had been enacted to stop the spread of the COVID-19 virus.⁴⁹ Despite the bases behind many of these claims and protests being scientifically-inaccurate in nature, it is important to consider how various COVID myths might have manipulated public concern during vaccine development and may have contributed to later acts of hesitance.^{50,51}

Misinformation

Misinformation is another important facet of situating COVID-19 vaccine hesitancy, both within the general population and specifically among people with disabilities. The exact definition of misinformation is complex and context-specific, but within the realm of public health, Swire-Thomson & Lazer (2020) postulate that the term can be understood as a claim or statement that is “contrary to the epistemic consensus of the scientific community regarding a phenomenon.”⁵² This definition places heavy emphasis on the ability for the perceptions of truth and falsehood to be constantly shifting alongside with the extent of scientific knowledge and innovation, and as a result, highlights the need for there to be a lack of evidence-based study in order for misinformation to be present. Misinformation can also be closely tied to disinformation, which is characterized by an organized or thoughtful effort to intentionally circulate misinformation in order to discredit a belief or organization, or to collect on some kind of desired gain.⁵³ Modern-day distributions of misinformation and disinformation are both heavily reliant on the internet and other digital sharing platforms as mediums for existence, especially given the lack of regulation that surround these spaces and permits users to easily reach a large audience.⁵⁴

⁴⁹ Berman, “When Antivaccine Sentiment Turned Violent.”

⁵⁰ CDC, “COVID-19 Vaccine Facts.”

⁵¹ Armstrong, “Why MRNA Vaccines Aren’t Gene Therapies.”

⁵² Swire-Thompson and Lazer, “Public Health and Online Misinformation.”

⁵³ Polger, “Misinformation and Disinformation: Thinking Critically about Information Sources.”

⁵⁴ Pickard, “The Misinformation Society.”

The implications of misinformation and disinformation in the contemporary realm of public health are further complicated by the nature of mass information dissemination during large public health crises. As defined by the World Health organization, this context-specific phenomenon is called an infodemic and occurs when there is the presence of “too much information including false or misleading information in digital and physical environments during a disease outbreak.”⁵⁵ Together, misinformation, disinformation, and infodemics all play a role in fostering vaccine-hesitant ideologies—an occurrence which became all the more apparent during the COVID-19 pandemic. As discovered by Evanega et al. (2020) in an analysis of 38 million traditional and digital articles pertaining to COVID-19 from January 1 to May 26, 2020, over 1.1 million articles mentioned misinformation in various forms.⁵⁶ Medical disinformation about the coronavirus and vaccine was also observed across numerous social media platforms during this period, which both fueled the infodemic and may have discouraged health-protective behaviors.⁵⁷

Additionally, disinformation was also at the forefront of several prominent conspiracy theories during the COVID-19 pandemic. Prior to the development of vaccinations, the nature and origin of the SARS-CoV-2 virus became widely speculated online and several digital media sources—including private domains, independently-published YouTube videos, and podcasts—began circulating the idea that Microsoft co-founder and billionaire philanthropist Bill Gates had created coronavirus in order to enact control over the general population.⁵⁸ These theories were quickly followed by a slew of other misinformation-driven notions, which became amplified around the roll-out of COVID-19 vaccines to include postulations that the vaccine: contained a

⁵⁵ WHO, “Infodemic.”

⁵⁶ Evanega et al., “Coronavirus Misinformation: Quantifying Sources and Themes in the COVID-19 ‘Infodemic.’”

⁵⁷ Baines and Elliott, “Defining Misinformation, Disinformation and Malinformation.”

⁵⁸ Ball and Maxmen, “The Epic Battle against Coronavirus Misinformation and Conspiracy Theories.”

microchip,⁵⁹ made people magnetic due to 5G telecommunication towers,⁶⁰ caused infertility,⁶¹ and more.⁶² The implications of disinformation and/or conspiracy beliefs are strikingly tangible within the realms of public health-related action; according to analysis of three surveys on social media use, conspiracy beliefs, and health-protective behaviors by Allington et al. (2020), there was a negative relationship between COVID-19 conspiracy beliefs and COVID-19 health-protective behaviors, and a positive relationship between COVID-19 conspiracy beliefs and the use of social media as an information source about COVID-19.⁶³ A cross-sectional study by Ghaddar et al. (2022) found similar results when examining a random sample of respondents from a mobile-phone database: 19.7% of people reported being “often” exposed to misinformation and 63.8% reported being “sometimes” exposed, while belief in theories rooted in conspiracy significantly reduced the likelihood of vaccination intent across all groups.⁶⁴

In addition to adversely impacting virus containment strategies and vaccine uptake, misinformation and conspiracy theories rooted in disinformation can also result in increased health risks for individuals who engage with scientifically-inaccurate content. Despite CDC findings that illustrate that Americans who are not vaccinated against COVID-19 are far more likely to contract the virus and be hospitalized and die from it than vaccinated Americans,⁶⁵ a Pew Research Center survey from September of 2021 found that unvaccinated individuals reported being less concerned about potential health implications caused by the COVID-19 and

⁵⁹ Sriskandarajah, “Where Did the Microchip Vaccine Conspiracy Theory Come from Anyway?”

⁶⁰ Salcedo, “A Doctor Falsely Told Lawmakers Vaccines Magnetize People.”

⁶¹ Abbasi, “Widespread Misinformation About Infertility Continues to Create COVID-19 Vaccine Hesitancy.”

⁶² McEvoy, “Microchips, Magnets and Shedding: Here are 5 (Debunked) COVID Vaccine Conspiracy Theories Spreading Online.”

⁶³ Allington et al., “Health-Protective Behaviour, Social Media Usage and Conspiracy Belief during the COVID-19 Public Health Emergency.”

⁶⁴ Ghaddar et al., “Conspiracy Beliefs and Vaccination Intent for COVID-19 in an Infodemic.”

⁶⁵ Scobie, “Monitoring Incidence of COVID-19 Cases, Hospitalizations, and Deaths, by Vaccination Status — 13 U.S. Jurisdictions, April 4–July 17, 2021.”

wore a mask in stores at lower rates than vaccinated individuals.⁶⁶ Furthermore, people who believed in misinformation and/or conspiracy theories were found to be less likely to report following public health guidelines and reported a proclivity towards rejecting health information from expert authorities.^{67,68} Together, trends from these studies indicate that misinformation and disinformation within an infodemic may be a critical factor in contributing to poor public health outcomes throughout the pandemic and in influencing attitudes that impacted vaccination/booster uptake decisions.

Political Response to COVID-19

Alongside the prevalence of misinformation surrounding virus response, the development of the COVID-19 pandemic in the United States has been characterized by its politicization. Commonly understood as a means of giving political tone or character to something, politicization has been present within the field of public health prior to the COVID-19 pandemic. For example, in 2017, CDC staff were directed to exclude several key words from a budget request (diversity, transgender, vulnerable, fetus, evidence-based, and science-based) in order to reduce the appearance of connections between politics and health guidance. Another commonly cited example of the historical interaction between public health and politics can be illustrated by the longstanding debates surrounding abortion rights, which have included advocates both for and against abortion including public health arguments to strengthen their respective positionings.⁶⁹ More generally, the politicization of public health may be due in part to the

⁶⁶ Gramlich, “Unvaccinated Americans Are at Higher Risk from COVID-19 but Express Less Concern than Vaccinated Adults.”

⁶⁷ Imhoff and Lamberty, “A Bioweapon or a Hoax?”

⁶⁸ Uscinski et al., “Why Do People Believe COVID-19 Conspiracy Theories?”

⁶⁹ Roberts et al., “A 21st-Century Public Health Approach to Abortion.”

theoretical argument that public health is inherently political due to its inseparable involvement with the body politic and scope of public involvement.⁷⁰

Beyond the role of politics in shaping healthcare agendas in the United States, the COVID-19 pandemic introduced an unprecedented influx of politicized public health communications that impacted how individuals received both scientific data and misinformation from various sources. At the beginning of the SARS-CoV-2 outbreak and prior to the development of vaccines, the CDC and WHO relied primarily on health-protective behaviors (e.g., social distancing, self-quarantining, and mask wearing) in order to slow the spread of the virus and prevent additional infections. While constituents from both the Democratic and Republican Parties agreed that it was necessary to partake in a range of restrictions—primarily, the closing of K-12 schools—to protect citizens in March of 2020, Democrats were more likely than Republicans to see the coronavirus in most serious terms.⁷¹ Furthermore, a study from Gollwitzer et al. (2020) used smartphone geotracking data to analyze partisan differences social distancing practices and found that people who lived in counties that had voted for Trump in the 2016 election were 14% less likely to partake in recommended social distancing procedures. Furthermore, the Trump White House Administration downplayed the severity of COVID-19 numerous times following the January 31st, 2020, declaration of an outbreak as a public health emergency from the CDC⁷²; in late February, then-President Trump publicly referred to SARS-CoV-2 as “a regular flu” and stated that the few cases in the United States meant that the pandemic was under control.⁷³ Together, these examples illustrate how COVID-19 pandemic

⁷⁰ Zaza, “Politicization of Public Health.”

⁷¹ Van Green and Tyson, “5 Facts about Partisan Reactions to COVID-19 in the U.S.”

⁷² CDC, “CDC Museum COVID-19 Timeline.”

⁷³ Beer, “All the Times Trump Compared Covid-19 To The Flu, Even After He Knew Covid-19 Was Far More Deadly.”

response was inherently interpreted as a partisan and/or political issue from both public figures and U.S. citizens, a trend that resulted in further divide and varying public health behaviors in the years to come.

News coverage on COVID-19 followed similar partisan trends to those that were observed within the public attitudes and behaviors during the initial stage of the pandemic. In a study from Hart et al. (2020), the levels of politicization and polarization in COVID-19 reporting through United States newspapers and televised news networks were monitored in order to interpret what might have influenced public perception on the pandemic from March to May of 2020. Results illustrated that newspaper coverage was more politicized than network news reporting, although both mediums were heavily polarized.⁷⁴ At the same time, American citizens were also polarized in their interpretations of COVID-19 response—in April of 2020, 83% of Republicans rated the Trump administration as having responded to COVID-19 in an “excellent” or “good” manner, while only 18% of Democrats responded in the same fashion.⁷⁵ Perhaps unsurprisingly, Democratic- and Republican-identifying voters also reported different perceptions of COVID-19 media and political coverage in regards to accuracy, working for the benefit of the people, and helping the country.⁷⁶ The relationship between the pandemic and news was further complicated by a statement made by Trump on Twitter in October of 2020 declaring that the COVID-19 outbreak occurring at the time was a “Fake News Media Conspiracy” caused by increased testing efforts for the virus that had been introduced in the United States.⁷⁷ Given that media reporting is often heavily involved with the influence of public

⁷⁴ Hart, Chinn, and Soroka, “Politicization and Polarization in COVID-19 News Coverage.”

⁷⁵ Van Green and Tyson, “5 Facts about Partisan Reactions to COVID-19 in the U.S.”

⁷⁶ Blazina et al., “Americans Are More Likely than Not to Think the News Media Are Fulfilling Key Roles during the Coronavirus Outbreak, but Partisans Are Starkly Divided.”

⁷⁷ Dale, “Fact Check: Trump Continues to Falsely Claim That Spike in Coronavirus Cases Is Due to Heightened Testing.”

opinion on science and risk issues, the natures of politicization and polarization within pandemic-time news coverage likely contributed to later findings that politically conservative Americans were less likely to accurately perceive COVID-19 health risks or to practice recommended health behaviors, in addition to trusting governmental COVID-19 reports less frequently.⁷⁸

Misinformation and disinformation continued to combine with the politicization of COVID-19 pandemic response in several notable instances, especially as virus treatments and vaccinations began to be developed and implemented within the United States. In April of 2020, then-President Trump strongly encouraged the use of chloroquine or hydroxychloroquine (both malaria drugs) in order to treat COVID-19 infections.⁷⁹ This quickly prompted the CDC to issue an official warning against using the drugs and for the American Medical Association to “strongly oppose” the prescription of the drugs for COVID-19 treatment.^{80,81} Soon after, several openly-identifying conservative and anti-vaccination public figures (e.g., Dr. Robert Malone, Dr. Peter McCullough, Tucker Carlson, and Joe Rogan) began praising ivermectin as an effective COVID-19 treatment after a widely-publicized testimony to the U.S. Senate from Dr. Pierce Kory claiming that it was a “miracle drug.”⁸² Shortly after, the FDA issued a statement against the use of ivermectin in the treatment or prevention of COVID-19—a decision which prompted backlash from supporters who claimed that ivermectin suppression was a planned element of a

⁷⁸ Stroebel et al., “Politicization of COVID-19 Health-Protective Behaviors in the United States.”

⁷⁹ Niburski and Niburski, “Impact of Trump’s Promotion of Unproven COVID-19 Treatments and Subsequent Internet Trends.”

⁸⁰ CDC Health Alert Network, “Severe Illness Associated with Using Non-Pharmaceutical Chloroquine Phosphate to Prevent and Treat Coronavirus Disease 2019 (COVID-19).”

⁸¹ PolitiFact from the Poynter Institute “American Medical Association Statement to PolitiFact about Chloroquine and Coronavirus.”

⁸² Baker and Maddox, “From COVID-19 Treatment to Miracle Cure.”

global agenda focused on mass vaccination uptake.^{83,84} Taken together, these examples are demonstrative of how various news mediums involved with the circulation of disinformation contributed to the politicization of public health and vaccine rhetoric throughout the course of the pandemic.

Partisan differences on information sources—and in respective trust therein—were also observed throughout the pandemic and in subsequent vaccination demographics. According to a longitudinal study from the Pew Research Center, Americans who most relied on Trump or his task force for COVID-19 news and information at the beginning of the pandemic (January-April 2020) were among the least likely to be vaccinated over one year later (August 2021). The study also found that people who cited national news outlets and public health organizations as their most relied-upon source for pandemic information were the most likely to have received at least one vaccine to prevent COVID-19. Of these respective information sources, ninety-seven percent of respondents who listed Trump as a primary source were Republican/leaned Republican, while roughly two-thirds of respondents who listed either national news outlets and public health organizations were Democrats/leaned Democratic.⁸⁵

Disability-Specific COVID-19 Outcomes

In relation to the longstanding effects of the coronavirus disease 2019 (COVID-19) pandemic, the various public health response measures and disease outcomes have resulted in unique population challenges faced by individuals with disabilities. The 2021 Progress Report published by the National Council on Disability stated that COVID-19 has had a

⁸³ FDA, “Why You Should Not Use Ivermectin to Treat or Prevent COVID-19.”

⁸⁴ Baker and Maddox, “From COVID-19 Treatment to Miracle Cure.”

⁸⁵ Jurkowitz and Mitchell, “Americans Who Relied Most on Trump for COVID-19 News among Least Likely to Be Vaccinated.”

disproportionately negative impact on people among all six disabilities identifiers in a wide array of sectors, including: health care access, direct support access, mental health and suicide services, education, employment, and congregate care settings and transition.⁸⁶ Instances of differential and poor effects felt by individuals with disabilities following disaster response are not novel, however. Statistical analyses of population outcomes following other major public health calamities have shown the presence of ability-rooted disparities in accessing essential care services throughout the various stages of crisis response—for example, a publication from Kendall et al. (2020) examined earthquake/tsunami incidents in Japan and Hurricane Katrina in New Orleans as a means of creating a basis of comparison in order to illustrate similar patterns of ability-rooted disparities that were observed within the first eight months of COVID-19 response in the United States.⁸⁷ In addition to highlighting historic population-specific trends that have been observed, these findings also touch upon considerations of medical ethics, resource allocation, and the rationing of healthcare services—all of which are factors that have been central during pandemic response and are of increased concern when considering disability populations.

The implications of resultant resource disparities are amplified by low trust in the provision of health-related information, oftentimes stemming from prior experiences with stigma, discrimination, or ablism. Being that two major components of public health services during the pandemic have been to improve population health outcomes via a promotion of risk-reduction behaviors and to promote access to quality health services (i.e., testing, vaccination, and treatment), the effects of disproportionately negative health outcomes on individuals with

⁸⁶ National Council on Disability, “2021 Progress Report.”

⁸⁷ Kendall et al., “Immediate and Long-Term Implications of the COVID-19 Pandemic for People With Disabilities.”

disabilities and the resultant intersect with distrust of health services have illustrated a robust need for examining the accessibility of health systems and messaging in the United States, as well as for an investigation into how and why distrust might arise among groups with various disability identifiers.

Distrust of health care entities by adults with disabilities has been an especially prevalent concern in regards to the pandemic due to vaccine hesitancy. While the first vaccinations for COVID-19 were not made available in the United States until December 2020, potential contributions to hesitancy appeared well ahead of mass inoculation efforts. Beginning in late March 2020, scholarly publications warning about the potential impacts of pandemic response on the existing health disparities of people living with disabilities (PLWD) began to emerge in tandem with an onset of public health interventions and guidance being issued within the United States. One such publication appeared in *The Lancet*, wherein Armitage & Nellums (2020) outlined three major concerns for individuals with disabilities: 1) PLWD might have inequities to access in public health messaging, often due to inaccessible format; 2) measures such as physical distancing or self-isolation might disrupt service provision for PLWD, who often rely on assistance for delivery of food, medication, and personal care; and 3) PLWD might be at increased risk of COVID-19 infection or disease because of existing comorbidities, and might face additional barriers to health care during the pandemic.⁸⁸ These postulations were soon found to be warranted; as reported in a later publication from Shakespeare et al. (2021), individuals with disabilities had been adversely impacted by COVID-19 because of three factors: 1) the increased risk of poor outcomes from the disease itself, 2) reduced access to routine health care and rehabilitation, and 3) the adverse social impacts of efforts to mitigate the pandemic.⁸⁹

⁸⁸ Armitage and Nellums, "The COVID-19 Response Must Be Disability Inclusive."

⁸⁹ Shakespeare et al., "Triple Jeopardy: Disabled people and the COVID-19 pandemic."

In the United States, these trends have compounded to result in an increased prevalence of mortality from COVID-19 for people with disabilities. The National Council on Disability conducted a comprehensive report finding that, by March 2021, roughly one-third of all American COVID-19 deaths (amounting to over 181,000 people) had been observed in individuals with disabilities in long-term care facilities.⁹⁰ Furthermore, adults with disabilities continue to be at increased risk for COVID-19 infections or complications compared to the rest of the general population.^{91,92} In addition to increased mortality rates and risks of negative outcomes from COVID-19, people with disabilities have also fared negatively in health outcomes related to social and community settings—a factor that may also be related to health care distrust or hesitations. As reported by Lund et al. (2020) following an interdisciplinary literature review, the COVID-19 pandemic has introduced several pertinent sources of trauma and stress within the disability community, including: concerns about health care rationing and ableism in medical practices, isolation, and the deaths and illnesses of loved ones and community members.⁹³ By using weighted logistic regression to test for significant differences between calculated prevalence estimates in adults with and without disability, Okoro et al. (2021) arrived at similar conclusions: adults with any disability were significantly more likely than adults without disability to report current depressive symptoms, frequent mental distress, suicidal ideation, and COVID-19-related initiated or increased substance use.⁹⁴ Furthermore, adults with disabilities also reported significantly higher levels of stressors, such as access to health care

⁹⁰ National Council on Disability, “Federal Report Finds Foreseeable, Disproportionate COVID-19 Fatalities, Heavy Toll for People with Disabilities.”

⁹¹ Landes et al., “COVID-19 & Pneumonia: Increased Risk for Individuals with Intellectual and Developmental Disabilities During the Pandemic.”

⁹² CDC, “COVID-19 Information for People with Disabilities.”

⁹³ Lund et al., “The COVID-19 Pandemic, Stress, and Trauma in the Disability Community: A Call to Action.”

⁹⁴ Okoro et al., “Indicators of Poor Mental Health and Stressors during the COVID-19 Pandemic, by Disability Status: A Cross-Sectional Analysis.”

services, difficulty caring for their own (or another's) chronic condition, emotional or physical abuse from others, and not having enough food.⁹⁵

Taken in tandem with the rapid spread of the COVID-19, inequities faced by people with disabilities have multiplied in the past several years. Not only were people with disabilities disproportionately represented in the hospitalization of COVID-19 patients, but many disability-specific infrastructural supports (e.g., physical therapy, at-home healthcare providers, routine medical appointments, etc.) were reduced or eliminated during isolation periods.⁹⁶ The COVID-19 pandemic has also introduced a myriad of challenges to the field of public health as a whole, especially during the politicization and widespread distrust of pandemic response that left increasing numbers of Americans wary of public health entities such as the Centers for Disease Control and Prevention (CDC) and medical scientists.^{97,98}

Disability-Specific Vaccine Hesitance

Because people with disabilities are more susceptible to complications from vaccine-preventable diseases, vaccination uptake is of increased importance.⁹⁹⁻¹⁰¹ While the World Health Organization has created the Tailoring Immunization Program (TIP) framework to recognize and address barriers to immunization in under-vaccinated groups (e.g., refugee populations, pregnant women, and orthodox Jewish communities), there has been little

⁹⁵ National Council on Disability, "2021 Progress Report."

⁹⁶ National Council on Disability, "Federal Report Finds Foreseeable, Disproportionate COVID-19 Fatalities, Heavy Toll for People with Disabilities."

⁹⁷ Pollard and Davis, "Decline in Trust in the Centers for Disease Control and Prevention During the COVID-19 Pandemic."

⁹⁸ Kennedy et al., "Americans' Trust in Scientists, Other Groups Declines."

⁹⁹ Ting et al., "Severe Influenza in Children with Neurodevelopmental Impairment--Implications for Vaccination Policy."

¹⁰⁰ Sachedina and Donaldson, "Paediatric Mortality Related to Pandemic Influenza A H1N1 Infection in England."

¹⁰¹ Pérez-Padilla et al., "Pandemic (H1N1) 2009 Virus and Down Syndrome Patients."

exploration within the realm of vaccine hesitance observed in people with disabilities.¹⁰² Combined with findings that suggest people with disabilities use various preventive health services—a category that notably includes vaccines—less frequently than people without disabilities, examining barriers to care and other ideological contributors can help to paint a more holistic picture of disability-specific vaccination hesitance within the contexts of the COVID-19 pandemic.¹⁰³

Furthermore, while people with disabilities generally have a lower level of vaccine hesitance than the population at-large, multiple examinations of COVID-19 vaccination rates among persons with disabilities have found them to be lower than the national average.¹⁰⁴ An exploratory analysis looking into common reasons for people with disabilities to have refused COVID-19 vaccine found the behavior to be because of a concern about the immunization in general, as well as because of concerns over potential negative interactions between the vaccination and someone’s underlying health conditions and/or disabilities.¹⁰⁵ When paired with the aforementioned population trends in COVID-19 outcomes and implications, findings of disability-specific vaccine hesitancy are of particular interest to public health officials and it is important to examine how and why COVID-19 vaccine hesitance arose and operated throughout the course of the pandemic in both the general population and among people with disabilities.

Understanding how people with disabilities might differentially access health information and may encounter distinct forms of misinformation or disinformation is also an important part of contextualizing population-specific vaccine hesitancy. Within the realm of online media

¹⁰² O’Neill et al., “Vaccination in People with Disability.”

¹⁰³ Diab and Johnston, “Relationships between Level of Disability and Receipt of Preventive Health Services.”

¹⁰⁴ O’Neill et al., “Vaccination in people with disability.”

¹⁰⁵ Myers et al., “COVID-19 Vaccination Hesitancy among Americans with Disabilities Aged 18-65: An Exploratory Analysis.”

sources, the term digital gap—or digital divide—is used in reference to the barrier created when a person has trouble accessing or using the internet or other online-based services due to their disability. In 2021, the digital divide was illustrated in a study from the Pew Research Center that found a ten percent difference in the reporting of internet access between people with and without disabilities: 85% of people with disabilities went online, while 95% of people without disabilities did.¹⁰⁶ Nonetheless, people with disabilities have previously reported using social network sites to gather health information at higher rates than those without disabilities¹⁰⁷—a finding which, in the context of the pandemic, makes the digital divide even more concerning when considering the shift of many essential services to an online platform. Despite this, there has been little published literature to date that examines how vaccination and/or general public health misinformation has influenced the digital divide or into the mediums through which people with disabilities are predominantly receiving public health information during the COVID-19 pandemic.

In the population-specific contexts of people with disabilities, the prior discussions of politicization and partisanship may also combine with information sources to inform vaccination decisions among this group in unique ways. At the turn of the century, a limited telephone sample found that people with disabilities had stronger pro-Democratic bias and a greater interest in public health care than a general sample,¹⁰⁸ which might indicate increased willingness to vaccinate given other study findings on the affiliation between vaccine uptake and political party.¹⁰⁹ Since then, other nation-wide studies have found fewer differences in political

¹⁰⁶ Office of Disability Employment Policy, “Disability and the Digital Divide.”

¹⁰⁷ Fox, “The Social Life of Health Information, 201.”

¹⁰⁸ Gastil, “The Political Beliefs and Orientations of People with Disabilities.”

¹⁰⁹ Jurkowitz and Mitchell, “Americans Who Relied Most on Trump for COVID-19 News among Least Likely to Be Vaccinated.”

preferences and party affiliations among adults with disabilities, but the trend of supporting the traditionally-liberal ideology of greater governmental roles in employment and healthcare remained among this population group.¹¹⁰ However, people with disabilities also report lower levels of trust in government and are less likely than nondisabled citizens to vote, which may impede present-day efforts to measure political ideology in relation to pandemic-related public health decisions. Some exploratory analyses focused on COVID-19 vaccine hesitancy in adults with disabilities have attempted to bridge this gap, including work from Myers et al (2022) that found that being a Democrat was negatively associated with hesitancy,¹¹¹ yet questions remain about the nature and extent of intersect between political affiliation, public health information sources, and COVID-19 vaccine hesitancy in adults with disabilities.

Consequently, the effects of disproportionately negative health outcomes on individuals with disabilities and the resultant intersect with distrust of health services have illustrated a robust need for examining the accessibility of health systems and messaging in the United States, as well as for an investigation into how and why distrust might arise among groups with various disability identifiers.

¹¹⁰ Schur and Adya, “Sidelined or Mainstreamed?”

¹¹¹ Myers et al., “COVID-19 Vaccination Hesitancy among Americans with Disabilities Aged 18-65: An Exploratory Analysis.”

Literature Review Endnotes

ⁱ The publication of this cartoon in “Nothing New Under the Sun” during 1807 can be acknowledged as a symbolization of the strong anti-vaccination ideologies that existed at the time. Etched by C. Williams in London, the image depicts “a mighty and horrible monster, with the horns of a bull, the hind of a horse, the jaws of a kraken, the teeth and claws of a tiger, the tail of a cow, all the evils of Pandora’s box in his belly, plague, pestilence, leprosy, purple blotches, fetid ulcers, and filthy running sores covering his body, and an atmosphere of accumulated disease, pain and death around him, has made his appearance in the world, and devores mankind —especially poor helpless infants—not by sores only, or hundreds, or thousands, but by hundreds of thousands.” The monster is surrounded by doctors with horns who pour babies into its open jaws while soldiers from the Laboratory for Research on the Structure of Matter, the scientific body that had approved smallpox vaccination, stand in the background (Riedel, “Edward Jenner and the history of smallpox and vaccination”).

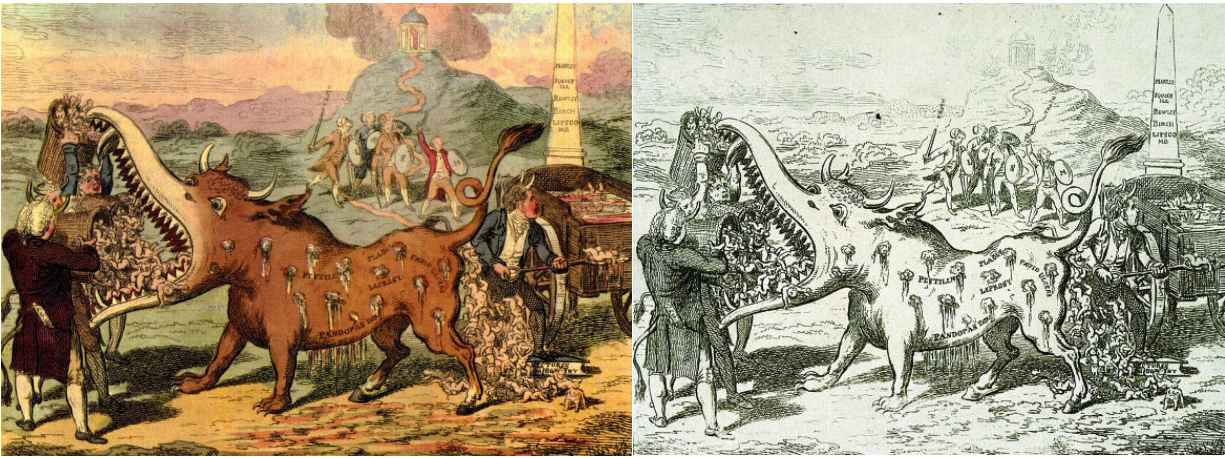


Figure 1: Side-by-side colorized and initial print of the “Vaccination Monster” published in “Nothing New Under the Sun,” London 1807

Project Development

AAHD 2021 Survey Findings

When paired with the aforementioned population trends in COVID-19 outcomes and implications, findings of disability-specific vaccine hesitancy are of particular interest to public health officials. In March and April of 2021, the American Association on Health & Disability (AAHD) conducted an online study among adults with disabilities that included over 4,000 respondents to learn more about COVID-19 perspectives and vaccination decisions.¹¹²

Respondents who identified that they were not going to be vaccinated or were not sure received a set of disability-related and general vaccine hesitancy, accessibility, and availability questions. Respondents who indicated that they were planning on being vaccinated or already had been or were in process received two open-ended questions on whether they experienced any underlying concerns about the vaccine and their motivation for being vaccinated.

Results indicated that the three “Big Reasons” for vaccine aversion among hesitant respondents were: 1) distrust in vaccine safety and/or effectiveness on disability; 2) distrust in vaccine safety and/or effectiveness on underlying health conditions; and 3) concern over the possibility of long-term side effects. Distrust in federal government officials was also widely observed in the contexts of ensuring vaccine safety/effectiveness and providing reliable information. A limited number of other studies have also examined vaccine hesitancy among individuals with disabilities (e.g., Myers et al. & the Association of State and Territorial Health Officials), but gaps in scientific literature remain when considering the underlying factors that might contribute to population-specific uncertainty regarding the COVID-19 vaccine. The results

¹¹² Drum & Ditsch, “COVID-19 Vaccine & Disability Survey: Vaccine Hesitancy Among Adults With Disabilities.”

from the AAHD survey indicate that it is especially important that information sources and their relation to vaccine hesitancy be examined in order to better understand how public health policy response focused on vaccination can be improved in the future.

The following study suggested improvements to policy response through addressing the knowledge gap between COVID-19 vaccine hesitancy and where people with disabilities receive public health information. This was achieved through conducting a secondary project stemming from the AAHD survey that was conducted in 2021, with an analytical emphasis placed on potential changes in vaccine uptake over the past year, reasons for why/why not a participant received a vaccine/booster, opinions on vaccines, where public health information is most commonly received, trust in various information sources, and the prevalence of misinformation.

Project Description

This project was developed in order to advance prior research done by the American Association on Health & Disability (AAHD) that centered on the population-specific implications of the coronavirus disease (COVID-19) on persons with disabilities. These implications were assessed and evaluated through two surveys: the COVID-19 and Disability Survey (released: April 17th, 2020; closed: May 1st, 2020)¹¹³ and the COVID-19 Vaccine & Disability Survey (released: March 12th, 2021; closed: April 5th, 2021).¹¹⁴ Major takeaways from these surveys include an indication of variance in regards to how and where adults with disabilities gathered information about COVID-19 early into the pandemic, as well as in reasonings for vaccine hesitancy once preventative inoculation became widely available. In order to investigate potential differences in the most important sources of information regarding

¹¹³ American Association on Health & Disability, “Key Findings on Pandemic Information & Impact”

¹¹⁴ Drum & Ditsch, “COVID-19 Vaccine & Disability Survey: Vaccine Hesitancy Among Adults With Disabilities.”

COVID-19, levels of trust in certain health and public health organizations and officials to provide reliable information about the COVID-19 vaccine, and levels of trust in certain health and public health organizations and officials to make sure the COVID-19 vaccine is safe and effective among persons with disabilities, this project will employ a third survey with the intent to focus on individuals who had agreed to be recontacted after the COVID-19 Vaccine & Disability Survey (2021).

This research is especially pertinent given the disproportionate severity of negative outcomes faced by individuals with disabilities during the COVID-19 pandemic—occurrences that further highlight the importance for research into the current situation of civic trust in health recommendations as a means of understanding how public health can be used to better protect vulnerable populations in the future.

Study Objectives, Research Questions, & Anticipated Findings

The objective of this study was to investigate the nature of relationships between the following variables: information sources from which adults with disabilities receive public health guidance on COVID-19 vaccines, trust in these information sources, rates of longitudinal COVID-19 vaccine uptake, rationales for accepting or refusing the COVID-19 vaccine and/or booster, misinformation susceptibility, and political ideology. To conduct this research, the 2021 AAHD COVID-19 and Vaccine Survey Project was furthered upon by means of a follow-up survey that was distributed to respondents who had indicated their willingness to be recontacted and voluntarily provided an email address by means to do so (approximately 1,500 persons).

Research questions were as follows:

1. Are there differences in the most important sources of information regarding COVID-19 and corresponding levels of trust in these information sources to

provide reliable information about the COVID-19 vaccine among persons with disabilities (mobility, hearing, vision, cognition) who previously:

- A. Reported they had been vaccinated or vaccination was in progress (Not Hesitant); or
 - B. Reported they were planning to get vaccinated (Not Hesitant); or
 - C. Reported that they were not sure (Hesitant); or
 - D. Reported they were not going to be vaccinated against COVID-19 (Hesitant).
2. Among persons with disabilities in the Hesitant Group from the 2021 COVID-19 Vaccine & Disability Survey, did they receive the vaccine and/or boosters?
 3. Is there a difference between the Not Hesitant and Hesitant Groups in the reasons for being [subsequently] vaccinated and/or boosted?
 4. Does COVID-19 knowledge and misinformation susceptibility differ between the Not Hesitant and Hesitant Groups, and if so, is it statistically associated with vaccine uptake and political ideology?

Based on the positioning of research at the time of survey design, it was predicted that adults who reported receiving a majority of information regarding COVID-19 from either politicians or digital media sources (e.g., social media, online news, etc.) would be less likely to trust the safety and efficacy of the COVID-19 vaccine, subsequently resulting in lower uptakes in vaccination (i.e., Hesitant Group). In contrast, adults who reported receiving a majority of information regarding COVID-19 from health care providers would be more likely to trust the safety and efficacy of the COVID-19 vaccine, subsequently resulting in higher uptakes in vaccination (i.e., Not Hesitant Group). In regards to the second and third research questions, it was more difficult to predict factors that might influence subsequent vaccination uptake among the Hesitant Group; however, observed trends could have been linked to the aforementioned hypothesis and the results provided room for fruitful analyses and conclusions. Given the previously-discussed finding that populations from geographic areas with a majority Republican-identifying population were less likely to practice COVID-19 health protective behaviors, the fourth research question was anticipated to yield trends in lower COVID-19 vaccine uptake among conservative respondents. Furthermore, the analysis of misinformation prevalence and

politicization within COVID-19 response presented a compelling foundation for those who were more susceptible to misinformation and/or conservative to have received the COVID-19 vaccine at lower rates than those who had a stronger knowledge of evidence-based coronavirus information and identified with another political ideology.

Methods

Survey Development and Participant Sampling Methods

This project employed a survey-based methodology in order to explore COVID-19 vaccine hesitancy in adults with disabilities in connection to information sources and levels of trust therein. The survey was developed as an expansion to the 2021 COVID-19 & Vaccine Survey for Adults with Disabilities that was conducted by the American Association on Health & Disability (AAHD) between March 12th, 2021, and April 5th, 2021.¹¹⁵ In order to consider the potential longitudinal trends of vaccine hesitancy and corresponding ideology throughout the COVID-19 pandemic, the survey was distributed to a subset of respondents from the 2021 survey who had indicated a willingness to be recontacted and supplied an email address through which to do so. As a result, the parent sample for survey respondents was as follows:

1. Subject took part in the 2021 COVID-19 & Vaccine Survey for Adults with Disabilities from AAHD (n = 4,131); and
2. Agreed to be contacted for participation in a follow-up COVID-19 survey (n= 1,471). Breakdown of this sample was as follows:
 - a. Had reported being vaccinated or a vaccination was in progress (n= 646);
 - b. Had reported plans to receive a vaccination (n = 578);
 - c. Had reported being unsure about future vaccinations (n= 171);
 - d. Had reported not planning to receive a vaccination (n= 76).

Distribution and Procedures

Once Institutional Review Board approval had been granted by the Research Compliance Services unit at the University of Oregon (STUDY00000742), the survey link was distributed

¹¹⁵ Drum & Ditsch, "COVID-19 Vaccine & Disability Survey: Vaccine Hesitancy Among Adults With Disabilities."

digitally via email (Appendix Item 1). Given the prior involvement of all subjects in the 2021 COVID-19 & Vaccine Survey for Adults with Disabilities, the survey did not include false reporting safeguards, but data were refined to remove responses from repeat IP addresses. Responses were collected through SurveyMonkey during February 20th, 2023, and March 13th, 2023, and the platform was selected for use in order to maintain conformity with the prior AAHD survey. SurveyMonkey was also utilized to encrypt data upon collection to ensure participant anonymity was protected. In order to account for accessibility barriers, large-type and braille versions of the survey were available at request and plain language was utilized whenever possible.

In order to reduce recall bias about past vaccination decisions, respondents were sorted into two groups based on prior indications regarding vaccine uptake in the 2021 COVID-19 & Vaccine Survey for Adults with Disabilities survey:

- 1) Group 1/the Hesitant Group: Not Sure (NS) or Not Planning (NO) on receiving a COVID-19 vaccination (Appendix Item 2); or
- 2) Group 2/the Not Hesitant Group: Planning (PL) or Had Already Received (YES) a COVID-19 vaccination (Appendix Item 3).

Respondents were informed of their prior vaccination decision responses through a question script ahead of being prompted to indicate current status of vaccine reception since the past AAHD survey. A series of skip patterns was then used to inquire about booster status, if applicable, as well as to inquire into the rationales for vaccination decisions, reasons for opinion changes (Group 1 who indicated having received a subsequent vaccination or Group 2 who indicated having not received a booster only), and scenarios that might prompt vaccination.

Response items in these questions were selected based on relevance and use in surveys/reports examining COVID-19 vaccination decisions within the general population.^{116,118}

Measures

The items included in this survey were developed through a consideration of field-specific standards and prior areas of investigation identified in the 2021 COVID-19 & Vaccine Survey for Adults with Disabilities from AAHD.

Disability identifiers. Classifications were drawn from the CDC Behavioral Risk Factor Surveillance Survey (BRFSS) and the U.S. Census Bureau and selected based on prevalence and prior inclusion within the parent sample. To ease respondent burden, respondents were first asked to identify their *primary* disability prior to being asked if they experienced *multiple* disabilities—and, if yes, which type(s)—in a subsequent question. The identifiers included:

1. Deaf or serious difficulty hearing (Deaf/HoH);
2. Blind or serious difficulty seeing, even when wearing glasses (Vision);
3. Serious difficulty walking or climbing stairs (Mobility); and
4. Because of a physical, mental, or emotional condition, serious difficulty concentrating, remembering, or making decisions (Cognition).

Respondents who selected Cognition as their *primary* disability were then asked if this resulted from a range of factors (listed below) in order to adequately consider the wide breadth of disabilities that are encompassed within this group and to overcome known deficiencies in the Cognition item that otherwise do not accurately identify persons with intellectual and developmental disabilities and persons with mental health-related disabilities.

1. Emotional, Psychological, or Mental Health Disability

¹¹⁶ Clark and Parker, “The Race against COVID Is Not Yet Finished.”

¹¹⁷ Tam, Qiao, and Li, “Factors Associated with Decision Making on COVID-19 Vaccine Acceptance among College Students in South Carolina.”

¹¹⁸ Reiter, Pennell, and Katz, “Acceptability of a COVID-19 Vaccine among Adults in the United States.”

2. Intellectual Disability, Autism, Epilepsy, or Brain Injury
3. Difficulty Reading, Writing, or Communicating
4. Another Disability (such as Chronic Pain, Difficulty Sleeping, Medication Side Effects, or Other)

Demographic considerations. Responses to basic participant information (age, gender, race, community locale) were constructed from standardized options seen within the U.S. Census. To collect data that fell within the population of interest (adults), the survey was coded to end if a participant indicated being seventeen or fewer years of age (≤ 17).

Single-Item Literacy Screener (SILS). This measure was included in the survey due to empirical evidence illustrating its effectiveness as a measure of identifying patients who need help reading and understanding health-related materials.¹¹⁹ The question asks: “How often do you need to have someone help you when you read instructions, pamphlets, or other written material from your doctor or pharmacy?” (Never, rarely, sometimes, often, or always). Responses correlate to lower levels of health literacy in ascending order from left to right.

COVID-19 testing, symptoms, vaccine reactions, and outcomes. All response options to these questions, including those inquiring about post-COVID conditions, were drawn directly from the CDC. The definitions of a “primary series” and “booster” COVID-19 vaccination were also drawn from the CDC. Respondents were asked to indicate whether or not they had ever tested positive for COVID-19 (Yes/No), as well as identify symptoms of infection or post-COVID conditions (colloquially known as long COVID). Respondents were also asked to identify

¹¹⁹ Morris et al., “The Single Item Literacy Screener.”

whether or not they experienced a reaction to primary and/or booster COVID-19 vaccines as well as the typologies, if applicable.

Vaccination rationales. Respondents who indicated that they had chosen to receive a primary or booster COVID-19 vaccination were asked to identify factors that contributed to this choice. These statements were generated from existing literature on reducing vaccine hesitancy.¹²⁰⁻¹²² Respondents in Group 1 who indicated that they had received a COVID-19 vaccination or booster since the 2021 COVID-19 & Vaccine Survey for Adults with Disabilities from AAHD were asked an additional question about what factors contributed to decreased hesitancy, including a write-in option to account for non-listed items.

Vaccination scenarios. Respondents from Group 1 who indicated that they had not chosen to receive a primary or booster COVID-19 vaccination were asked to identify scenarios that might incentivize uptake. These statements were generated from existing literature on reducing vaccine hesitancy (see above). Respondents from Group 2 who indicated that they had not chosen to receive a primary or booster COVID-19 vaccine since the 2021 COVID-19 & Vaccine Survey for Adults with Disabilities from AAHD were asked to rank reasons that contributed to this on a three-point scale (not a reason, little reason, big reason).

Information source categories. Groupings (health care professionals, governmental agencies, politicians, digital media sources, traditional media sources, and friends/family) were determined

¹²⁰ Shen and Dubey, “Addressing Vaccine Hesitancy.”

¹²¹ Tuckerman, Kaufman, and Danchin, “Effective Approaches to Combat Vaccine Hesitancy.”

¹²² Fridman, Gershon, and Gneezy, “COVID-19 and Vaccine Hesitancy.”

based on examples seen in other surveys inquiring into information sources, as well as prior work from AAHD (e.g., a 2020 investigative survey on COVID-19 and disability). Alongside each grouping, examples were provided in response text for clarity. Respondents were asked to indicate how frequently they relied on each of these information source types for information on COVID-19 vaccines using a 5-point Likert scale (1 = Never, ..., 5 = Always). Respondents were also asked to rank the top three types of information sources that they trusted most for reliable information on the COVID-19 vaccine/booster (most important, second most important, and third most important) before being prompted to write-in a specific source from the most important information category from their most-trusted selection—for example, “The Wall Street Journal” or “NPR.”

COVID-19 knowledge & misinformation susceptibility index. This selection of thirteenⁱ statements was drawn from the CDC, published/peer-reviewed studies, or mainstream news and media sources. In order to meet the criteria for inclusion, a statement had to be supported as either true or false by empirical finding(s). Respondents were asked to select if each statement was true or false, and the proportion of correct answers was generated into an overall score.

Statements of trust. Respondents were asked to indicate whether or not they agreed or disagreed with affirmative statements that indicated trust in each of the information source groupings—for example, “I trust health care professional to provide accurate information about COVID-19 vaccinations,” etc.

Political leaning. Respondents were asked to identify how they would describe their political views from a list of three categories (liberal, moderate, conservative), or could choose to opt out of the question (prefer to not to answer).

Data Collection, Analysis, & Cleansing

All statistical analyses were conducted using Stata statistical software. Pearson's chi-square tests, independent sample t-tests of unequal variance, and ANOVA tests with Bonferroni post-hoc adjustments were used to test for statistical differences in responses and groups, specifically comparing vaccine hesitant and vaccine non-hesitant respondents. Pairwise correlations were utilized to identify the directionality of statistically significant results, when appropriate.

Respondent data were removed from the sample if consent was not provided (n=2), if respondents indicated that they did not have a disability (n=11), or if the demographic block was the only part of the survey that was either partially or entirely completed (n=57). Respondent data was also removed if vaccine uptake was not provided (n=2) given the relationships of interest in the study. All other responses were included in the analysis, and results reporting was adjusted accordingly to reflect the sample of respondents who responded to various survey items. Of the 1,471 individuals who were recontacted for this study, only 312 respondents completed the survey and were included in the final sample (n=312). Among those who were vaccine hesitant (as based on the prior ADHD survey), n=32, and among those who were not vaccine hesitant, n=280.

Sample

Table 1.1

Descriptive Demographic Statistics for the Participant Sample

<i>Both groups</i>			<i>Group 1 (Hesitant)</i>		<i>Group 2 (Not Hesitant)</i>	
	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
Individual-level variables						
Age	312		32		280	
18-44	115	36.7	10	31.3	105	37.5
45-64	125	40.1	18	56.3	107	38.2
65 and over	72	23.1	4	12.5	68	24.3
Main disability	312		32		280	
Hearing	38	12.2	5	15.6	33	11.8
Vision	19	6.1	1	3.1	18	6.4
Mobility	142	45.5	18	56.3	124	44.3
Cognition	113	36.2	8	25.0	105	37.5
Gender identity	310		32		278	
Male	90	29.0	9	28.1	81	29.1
Female	207	66.8	22	68.8	185	66.6
Other	13	4.2	1	3.1	12	4.3
Race/ethnicity	301		28		273	
American Indian or Alaskan Native	2	0.7	0	0.0	2	0.7
Asian or Asian American	5	1.7	1	3.6	4	1.5
Black or African American	35	11.6	9	32.1	26	9.5
Native Hawaiian or Other Pacific Islander	1	0.3	0	0.0	1	0.4
White or Caucasian	227	75.4	12	42.9	215	78.8
Hispanic, Latino, or of Spanish Origin	13	4.3	2	7.1	11	4.0
Multiracial	18	6.0	4	14.3	14	5.1
Community	312		32		280	
Urban	92	29.5	13	40.6	79	28.2
Suburban	155	49.7	11	34.4	144	51.4
Rural	65	20.8	8	25.0	57	20.4
Political Ideology	290		27		263	
Liberal	124	42.8	6	22.2	118	44.9
Moderate	84	29.0	11	40.7	73	27.8
Conservative	27	9.3	2		7.4 25	9.5
Prefer not to answer	55	19.0	8	29.6	47	17.9

Note. Rounding, response bias, or “Prefer Not to Answer” items may impact total percentages.

Demographic characteristics

Demographic characteristics within the sample are reported in Table 1.1. Respondents ranged in age, with 37% being between 18 and 44, 40% being between 45 and 64, and 23% being elderly (65 and over). Two-thirds of respondents identified as female, with the remaining third comprised of 29% male respondents and 4% who identified in another way. The racial and ethnic composition of the sample was primarily White or Caucasian (75%), with the next largest demographic groups being Hispanic, Latino, or of Spanish origin (13%) and Black or African American (11%). Approximately half of the sample resided in suburban areas, followed by urban (30%) and rural (20%). Political ideology among respondents varied, with being 9% conservative-leaning, 29% being moderate-leaning, 42% being liberal-leaning, and the remaining 19% preferring to not disclose their political ideology.

Disability identifiers

Respondents were asked about primary and, if appropriate, secondary disabilities since any/all identifiers might influence views about COVID-19 and the vaccine. In regards to primary disability, Table 1.1 illustrates that 12% of the sample reported a hearing-related primary disability, 6% reported a vision-related primary disability, 46% reported a mobility-related primary disability, and 36% reported a cognition-related primary disability. Among respondents with cognition-related primary disabilities, Table 1.2 in the appendix shows that 28% of respondents reported that this was due to an emotional, psychological, or mental health disability; 51% reported that this was due to an intellectual disability, autism, epilepsy, or brain injury; 3% reported that this was due to difficulty reading, writing, or communicating; and 18% reported that this was due to another disability (such as chronic pain, difficulty sleeping,

medication side effects, or other). Secondary disabilities are displayed by frequency in the sample within Table 1.3 (located in the appendix), wherein 53 respondents indicated experiencing a hearing-related secondary disability, 45 respondents indicated experiencing a vision-related secondary disability, 140 respondents indicated experiencing a mobility-related secondary disability, 99 respondents indicated experiencing a cognition-related secondary disability, and 103 respondents indicated experiencing no secondary disabilities.

Methods Endnotes

ⁱ It should be noted that all data from one item of the misinformation susceptibility block was excluded from reporting due to the release of conflicting information at the time of survey dissemination. During survey development, the statement “the Chinese government created the COVID-19 virus” was coded as false due to the availability of public-facing statements from national agencies. However, conclusions released by the U.S. Energy Department through the Wall Street Journal during February 2023 stated with low-confidence that the COVID-19 pandemic was likely caused by a lab leak. As such, the item was removed to avoid skewing response accuracy scores.

Results

In this section, findings of the survey regarding COVID-19 vaccination and booster ideology among respondents in the Hesitant and Not Hesitant Groups will be discussed, but it is necessary that results pertaining to the Hesitant Group be considered conservatively given the small sample size ($n=32$). Due to the extensive number of variables examined, results are broken down into six main categories: 1) COVID-19 vaccine/booster uptake and infections, 2) rationales for vaccination and hesitance, 3) information sources, 4) health literacy, 5) COVID-19 knowledge and misinformation susceptibility, and 6) political ideology. Key discoveries included an unexpected uptake of COVID-19 vaccines and boosters by respondents who had previously been not sure or not planning on receiving vaccinations based on the 2021 AAHD survey (i.e., the Hesitant Group), as well as group differences between where respondents accessed information about COVID-19 vaccines and trends between hesitance status and the ability to correctly identify misinformation. A complete list of statistical tests and outputs can be found in the appendix (Item 4), and statistically significant results primarily refer to those with p-values less than 0.05 ($p<0.05$) or 0.01 ($p<0.01$). Any results at the 10% level ($p<0.1$) are explicitly disclosed as not statistically significant but are acknowledged as potential trends.

COVID-19 vaccine/booster uptake and infections

Table 2

Reported COVID-19 Primary Dose and Booster Vaccination(s) among Groups 1 (Hesitant) and 2 (Not Hesitant)

Vaccination status	Group 1 (Hesitant)		Group 2 (Not Hesitant)	
	<i>n</i>	Percent	<i>n</i>	Percent
<i>Uptake of COVID-19 primary dose</i>				
Total sample size	32		280	
Yes	23	71.9	153	54.6
No	9	28.1	3	1.1
Previously vaccinated (Group 2 sample only)	--	--	124	44.3
<i>Uptake of COVID-19 booster</i>				
Total sample size	23		277	
Yes	14	60.9	259	93.5
No	9	39.1	18	6.5

Note. Respondents were assigned groups based on a past response to an item on the April 2021 COVID-19 and Vaccine Survey conducted by AAHD. Group 1 respondents had indicated that they were not planning or not sure about receiving a COVID-19 vaccine, while Group 2 respondents had indicated that they were planning on receiving or had already received a COVID-19 vaccine. These past indications were revealed to respondents in order to reduce recall bias prior to a survey item inquiring about vaccine and booster (if applicable) uptake since April of 2021.

Table 3

Summary of Past COVID-19 Infections Across Participant Sample

<i>Both groups</i>	Group 1 (Hesitant)		Group 2 (Not Hesitant)	
	<i>n</i>	Percent	<i>n</i>	Percent
Prior COVID-19 infection				
Yes	146	46.8	11	34.4
No	166	53.2	21	65.6

Note. COVID-19 infection was coded as a binary variable to account for question format: “Have you ever tested positive for COVID-19?” [Yes/No].

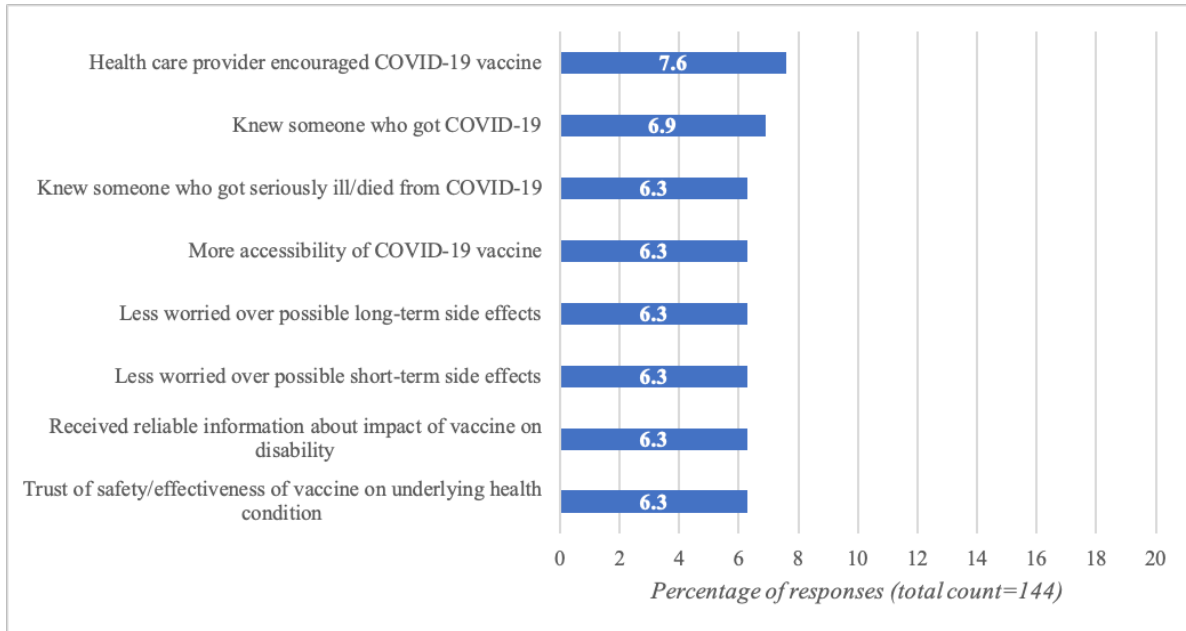
Table 2 displays the number of respondents who reported whether or not they received a primary dose vaccine since the April 2021 AAHD survey, as well as if they received any subsequent booster vaccinations. Over two-thirds (72%) of individuals in the Hesitant Group had since received a primary dose vaccination. Of these vaccinated individuals in the Hesitant Group, 61% had also received a COVID-19 booster(s). In contrast, respondents in the Not Hesitant Group had a higher rate of primary vaccination at 99%, and 94% of these individuals reported also having received a COVID-19 booster(s).

To highlight potential difference between infection rates and vaccine hesitance, Table 3 displays infection rates across both the Hesitant and Not Hesitant Groups. As presented in the Group 1 column, the Hesitant Group had a lower COVID-19 infection rate (34%) compared to the Not Hesitant Group (48%), while 53% of the combined sample reported having never tested positive for COVID-19. When testing for statistical significance between vaccine uptake and COVID-19 infections, a Pearson's chi-square estimated the two variables to be related at the 5% level ($p < 0.05$). A pairwise correlation between receiving the vaccine and reporting a COVID-19 infection across all groups was negative (-0.11 ; $p < 0.05$). However, there was no statistical difference between booster uptake and reporting a COVID-19 infection.

Rationales for vaccination and hesitance

Figure 1.1

Top Five Most Frequently Cited COVID-19 Primary Dose Vaccination Rationales Among Respondents in Group 1 (Hesitant) by Percentage of Total Responses



Note. Because some response items were cited at the same frequency, this figure includes eight rationales.

Figure 2.1

Top Five Most Frequently Cited COVID-19 Primary Dose Vaccination Rationales Among Respondents in Group 2 (Not Hesitant) by Percentage of Total Responses

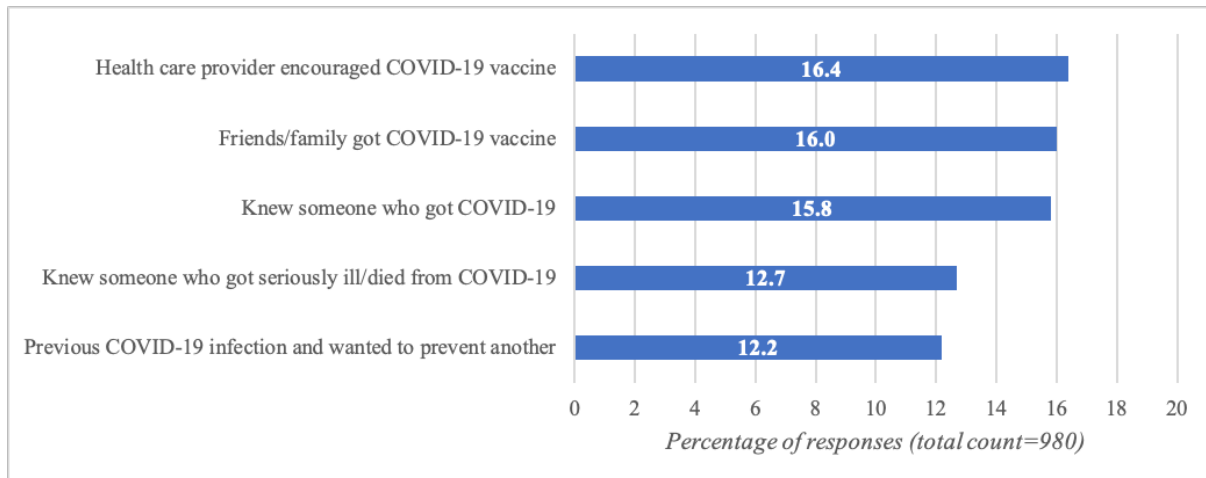
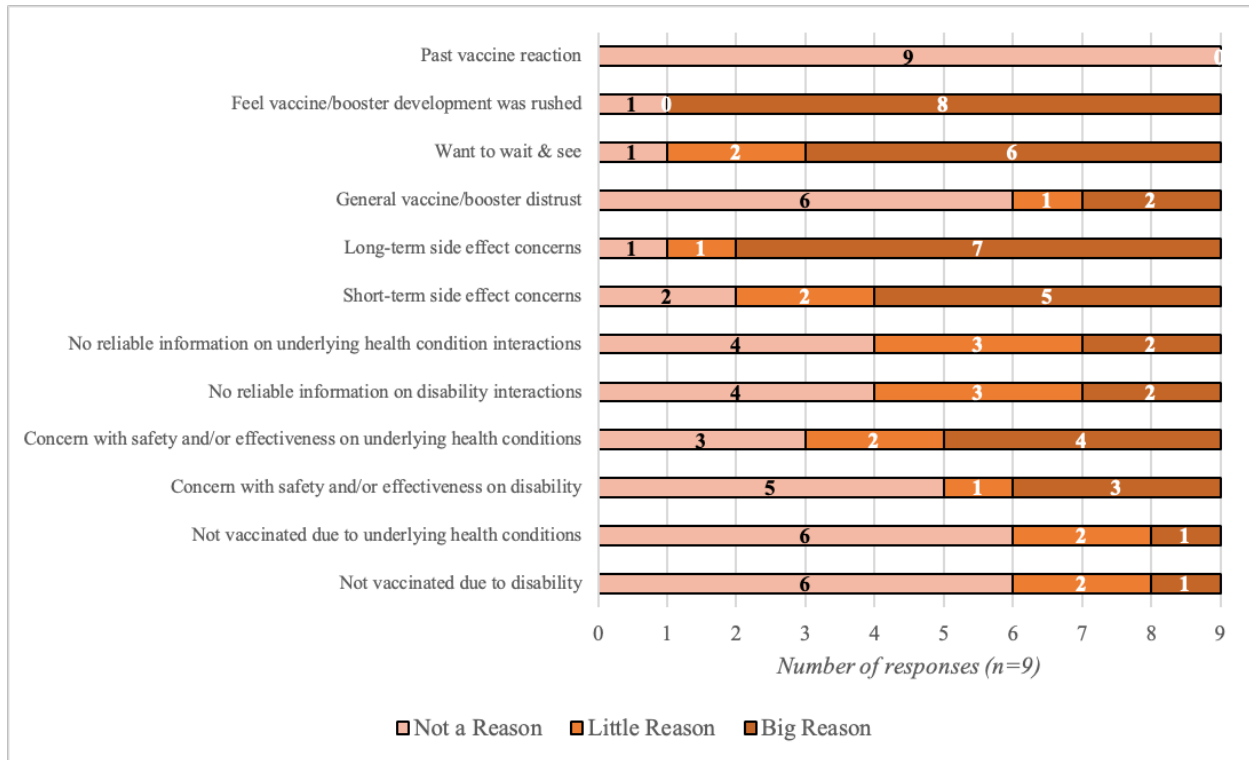


Figure 3

Summary of Hesitancy Rationales in Unvaccinated and Unboosted Group 1 (Hesitant) Respondents



Respondents were also asked to select all applicable rationales for receiving a COVID-19 vaccine to provide a more holistic view of vaccination decisions among the sample and to elucidate further trends about factors that compelled the decision to be vaccinated. Figure 1.1 displays the top five most-frequently cited vaccination rationales (by percentage of total responses) for the COVID-19 vaccine among the Hesitant Group (including five options selected at the same frequency). The most commonly reported reason for receiving a primary dose of a COVID-19 vaccine among this sample was due to the encouragement of a health care provider (7.6%), followed by the respondent having known someone who got COVID-19 (6.9%). Each of the following rationales was selected third-most frequently out of the total number of responses (6.3%), collectively comprising the rest of the top rationales: knowing someone who got

seriously ill and/or died from COVID-19, more accessibility of the COVID-19 vaccine, less worried over possible long-term vaccine side effects, less worried over possible short-term vaccine side effects, received reliable information about the impact of the vaccine on the respondent's disability, and now trusting in the safety/effectiveness of the vaccine on the respondent's underlying health condition. The complete list of rationales and frequency of responses can be found in Figure 1.2, located in the appendix.

The top five most-frequently cited rationales for COVID-19 vaccination among the Not Hesitant Group are shown by percentage of total responses in Figure 2.1. The encouragement of health care providers to receive the COVID-19 vaccine was the most common response (16.4%), followed by having friends and family who got the COVID-19 vaccine (16%) and knowing someone who got COVID-19 (15.8%). Rationales among all respondents who had received a booster (from both the Hesitant and Not Hesitant Groups) were similar in typology and frequency as those illustrated in Figure 2.1 and can be found in Figure 11 of the appendix after the complete list of rationales and frequency of responses among the Not Hesitant Group (Figure 2.2).

Possible hesitancy rationales reported by respondents who had not received a COVID-19 vaccine in both the initial 2021 AAHD survey or in this study are displayed in Figure 3 by count as being either a Big Reason, Little Reason, or Not a Reason. The most frequently reported Big Reason rationale for vaccine hesitance was the conception that the vaccine/booster development was rushed, followed by a concern over long-term side effects and the desire to wait and see how the vaccine worked for others. All respondents in this subgroup reported that prior vaccine reactions were Not a Reason for hesitance, and two-thirds reported that both general vaccine/booster distrust and concerns over possible reactions with disabilities and underlying

health conditions were also Not a Reason for the lack of COVID-19 vaccine uptake. However, it should be noted that the limited size of this sample (n=9) makes it difficult to draw significant conclusions from this group and further research should be tailored to investigate ongoing hesitance in more depth.

Information sources

Table 4

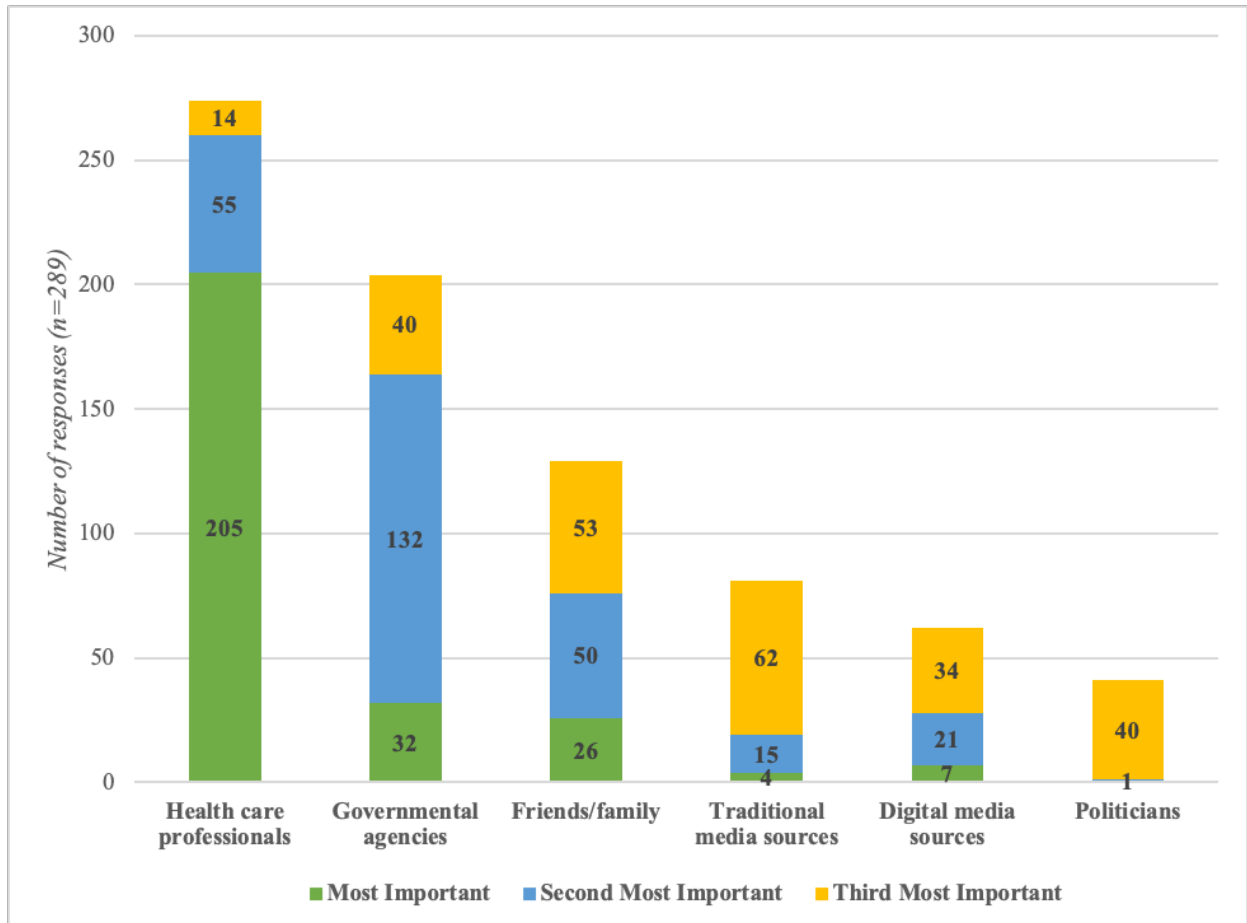
First-, Second-, and Third-Most Trusted Information Sources for Reliable COVID-19 Vaccine Information

<i>Both groups</i>			<i>Group 1 (Hesitant)</i>		<i>Group 2 (Not Hesitant)</i>	
	<i>n</i>	Percent	<i>n</i>	Percent	<i>n</i>	Percent
Information Sources						
Most Important	289		27		262	
Health care professionals	205	71.0	11	40.7	194	74.1
Governmental agencies	32	11.1	2	7.4	30	11.5
Friends/family	26	9.0	6	22.2	20	7.6
Other	15	5.2	4	14.8	11	4.2
Digital media sources	7	2.4	2	7.4	5	1.9
Traditional media sources	4	1.4	2	7.4	2	0.8
Politicians	0	0.0	0	0.0	0	0.0
Second Most Important	282		27		255	
Governmental agencies	132	46.8	6	22.2	126	49.4
Health care professionals	55	19.5	10	37.1	45	17.7
Friends/family	50	17.7	5	18.5	45	17.7
Digital media sources	21	7.4	3	11.1	18	7.1
Traditional media sources	15	5.3	3	11.1	12	4.7
Other	8	2.8	0	0.0	8	3.1
Politicians	1	0.4	0	0.0	1	0.4
Third Most Important	269		27		242	
Traditional media sources	62	23.1	3	11.1	59	24.4
Friends/family	53	19.7	3	11.1	50	20.7
Governmental agencies	40	14.9	6	22.2	34	14.1
Politicians	40	14.9	5	18.5	35	14.5
Digital media sources	34	12.6	3	11.1	31	12.8
Other	26	9.6	4	14.8	22	9.1
Health care professionals	14	5.2	3	11.1	11	4.6

Note. Respondents were asked to provide the three most important sources for COVID-19 information using a rank-choice system wherein the most important source was “1,” the second most important source was “2,” and the third most important source was “3.” Once an information source was selected as first-, second-, or third-most important, it could not be reselected in the remaining categories.

Figure 4

Summary of First-, Second-, and Third-Most Trusted Information Sources for Reliable COVID-19 Information Across Both Groups



Note. The difference in sample sizes between Group 1 (Hesitant; n=27) and Group 2 (Not Hesitant; n=262) result in a stronger weight of Group 2 in the combined sample that is represented above.

Figure 5

Comparison of Most Important Information Source for Reliable COVID-19 Information by Group

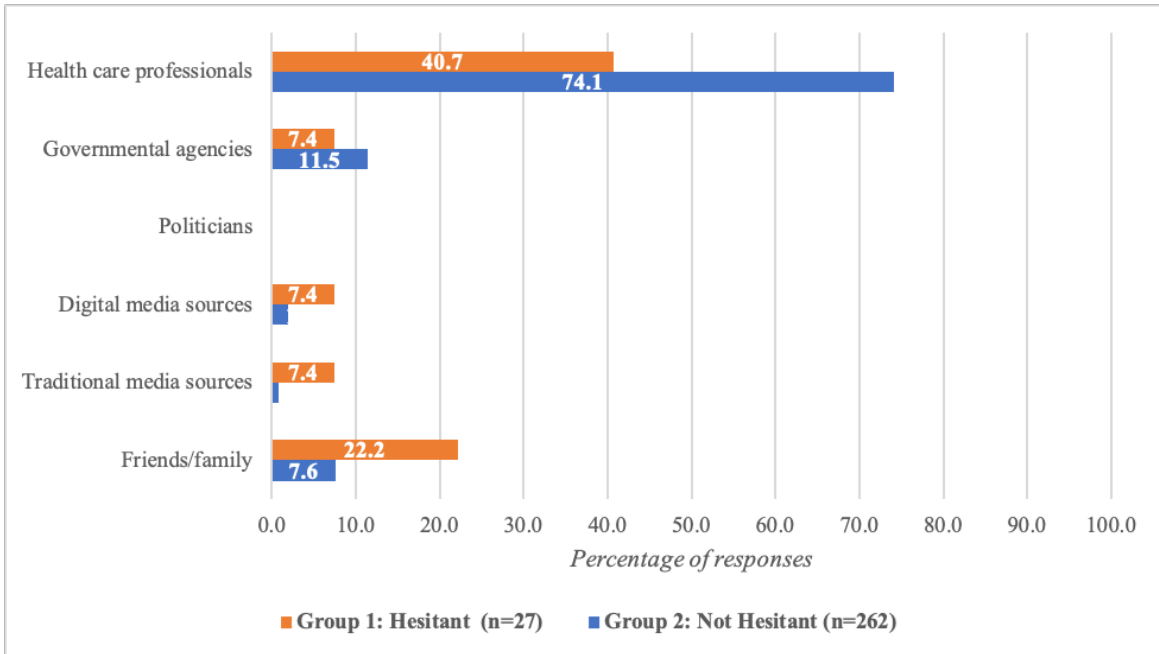


Figure 6

Comparison of Second Most Important Information Source for Reliable COVID-19 Information by Group

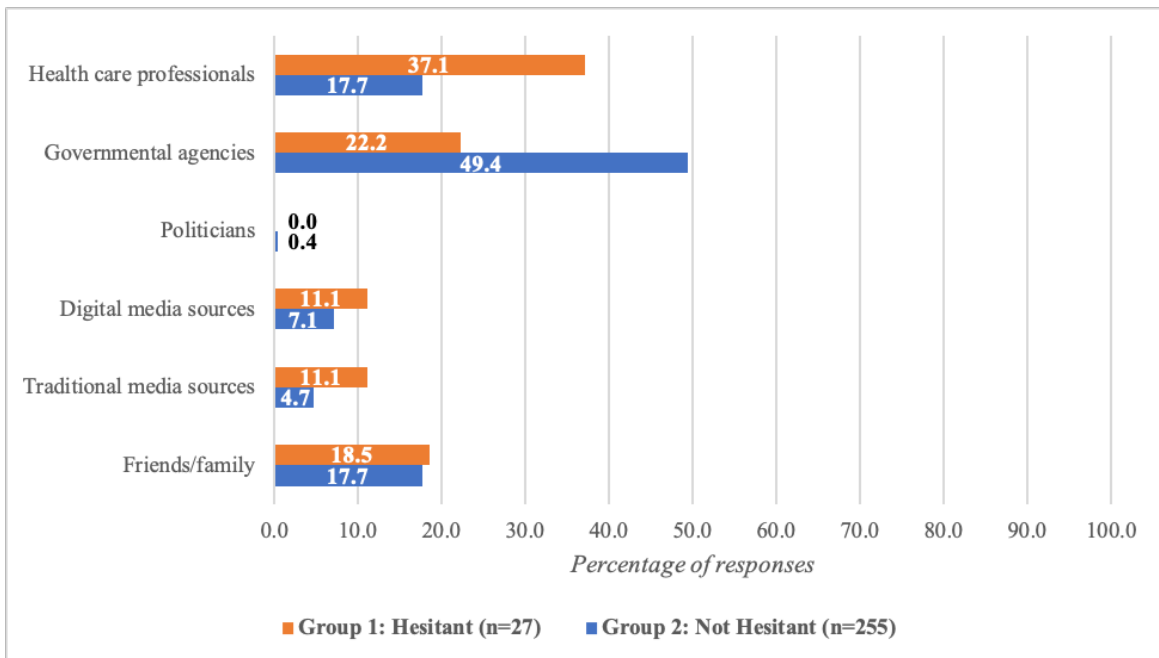


Figure 7

Comparison of Third Most Important Information Source for Reliable COVID-19 Information by Group

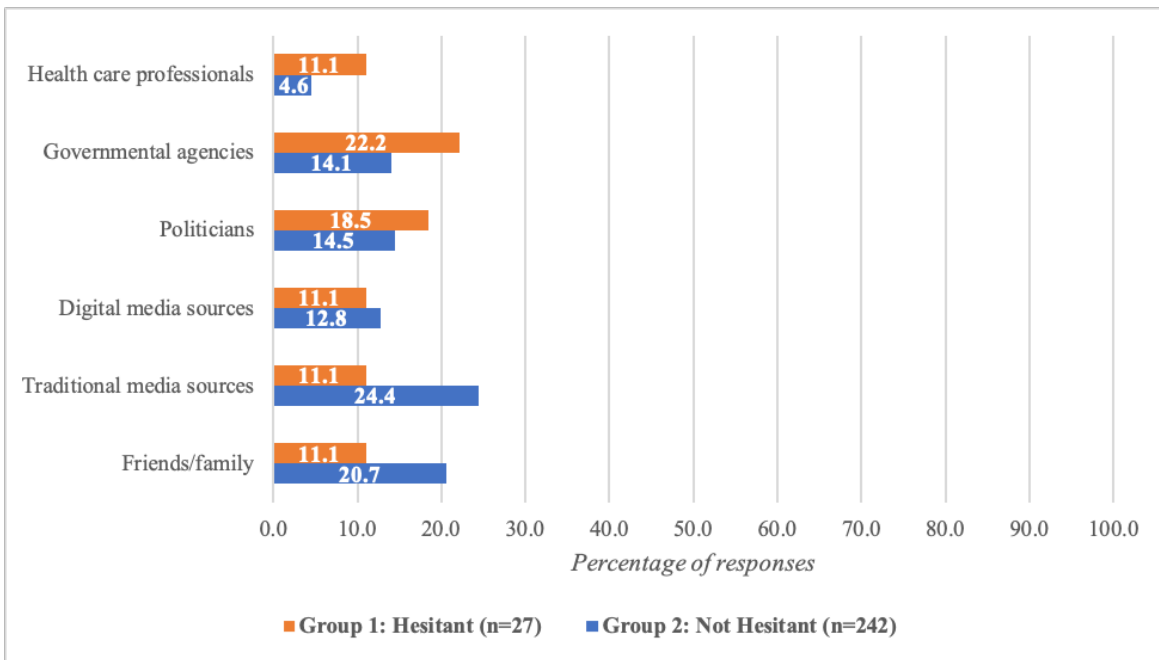
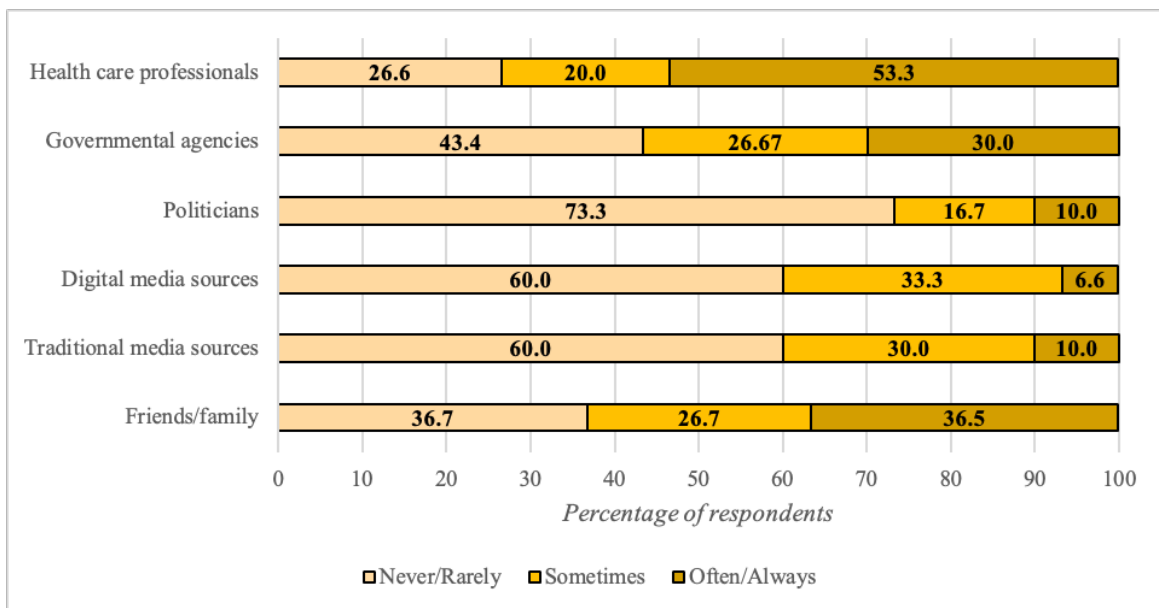


Figure 8

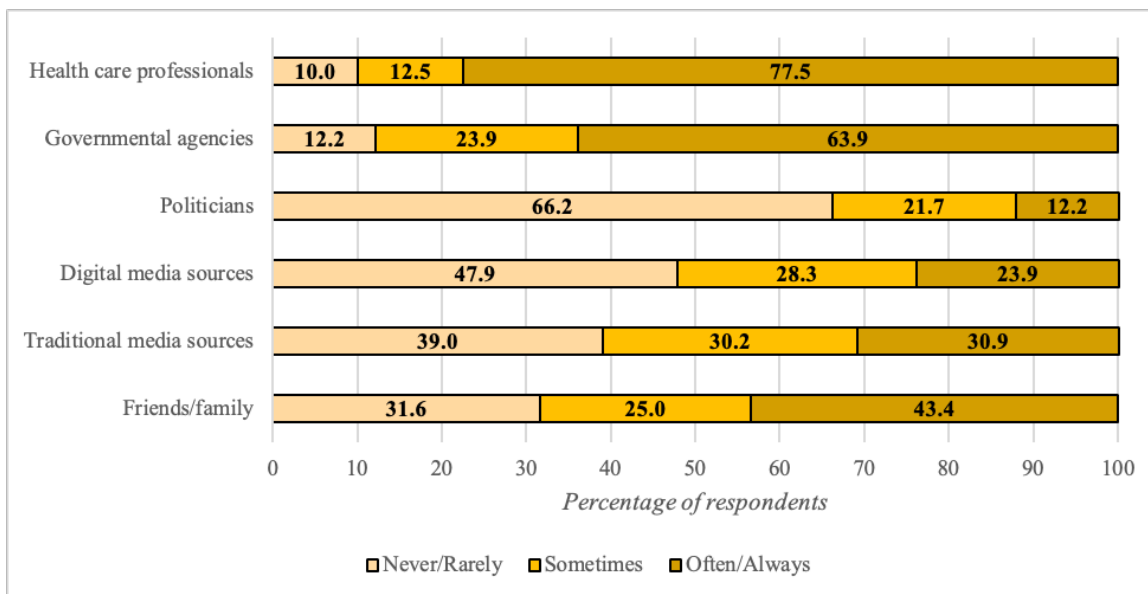
Frequency of Reliance (Never/Rarely, Sometimes, Often/Always) on Information Sources for COVID-19 Information by Group 1 (Hesitant) Respondents



Note. Respondents were asked to use a 5-point Likert scale (1=Never, ..., 5=Always) to indicate how frequently they relied on each source for information about COVID-19 vaccines. The “Never” and “Rarely” measures were combined for ease of reporting, as were the “Often” and “Always” categories.

Figure 9

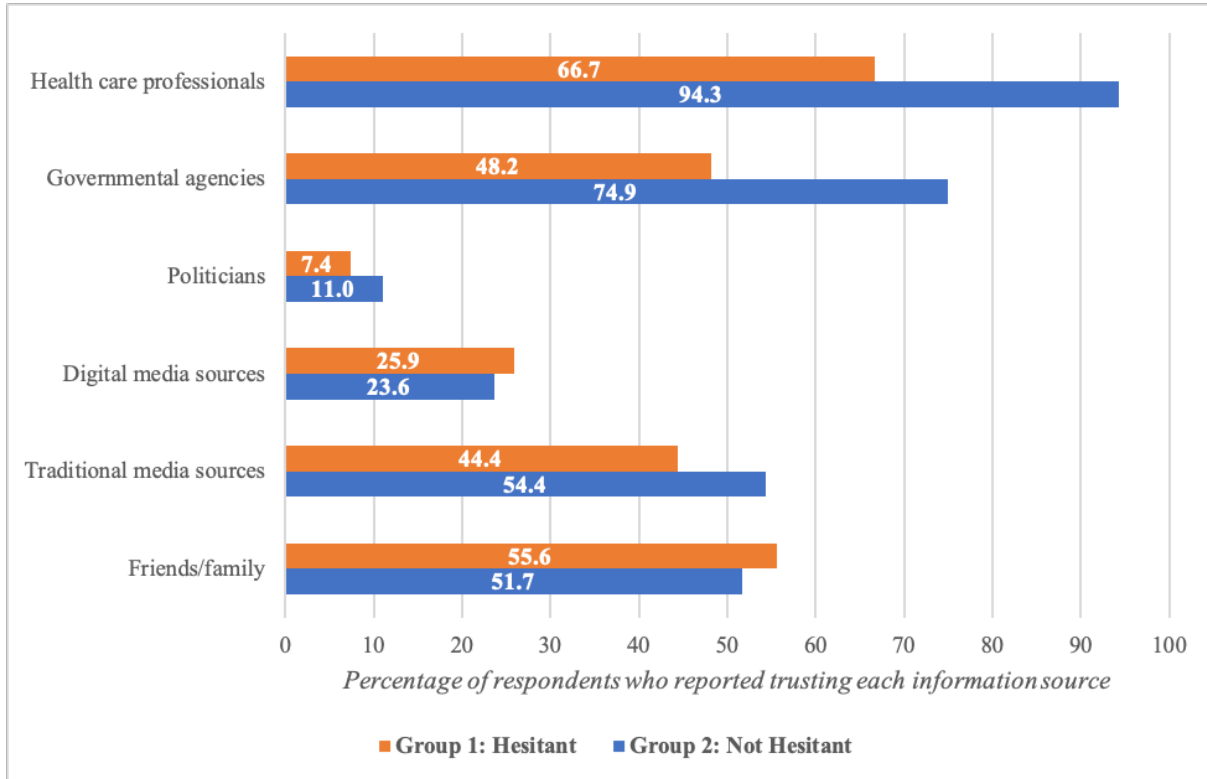
Frequency of Reliance (Never/Rarely, Sometimes, Often/Always) on Information Sources for COVID-19 Information by Group 2 (Not Hesitant) Respondents



Note. Respondents were asked to use a 5-point Likert scale (1=Never, ..., 5=Always) to indicate how frequently they relied on each source for information about COVID-19 vaccines. The “Never” and “Rarely” measures were combined for ease of reporting, as were the “Often” and “Always” categories.

Figure 10

Respondent Trust in Information Sources to Provide Accurate COVID-19 Vaccine/Booster Information by Group



Note. Trust was coded as a binary variable given question format: “Please indicate whether or not you agree with the following statements: I trust [information source] to provide accurate information about COVID-19 vaccinations.” [Agree/Disagree].

In order to ascertain what respondents considered to be the first-, second-, and third-most important sources for reliable information about the COVID-19 vaccine, a rank-choice system was used. Results are reported by both the combined sample and group-specific breakdowns in Table 4, and Figure 4 displays the total counts of sources of information across all three categories of importance for the combined sample. As demonstrated in Figure 4, Health Care Professionals (e.g., doctors, nurses, direct care workers) were listed as the “most important” information source for reliable COVID-19 vaccine information, receiving the highest number of responses (274) across all three categories of importance. Governmental Agencies (e.g., the

CDC, local/regional public health authorities, etc.) were listed as the “second-most important” information sources and also received the second greatest number of responses across all three categories of importance (132). Friends and Family received the third greatest number of responses across all three categories of importance (81), but Traditional Media Sources (e.g., televised, print, or radio materials) were listed as the “third-most important” source of information in the combined sample. Politicians (e.g., the President, mayors, governors, legislatures) received the lowest number of responses overall (41) and were not listed as the “most important” information source by any respondent.

Figures 5, 6, and 7 respectively show percentage comparisons between the Hesitant Group (orange) and Not Hesitant Group (blue) responses about the first-, second-, and third-most important information sources for reliable information about the COVID-19 vaccine. Figure 5 illustrates that both groups reported Health Care Professionals as the “most important” information source, but at differential rates of 41% among hesitant respondents and 74% among not hesitant respondents. The Hesitant Group also had a wider dispersion of responses, with 22% indicating that Friends and Family were the “most important” source of information for reliable information on the COVID-19 vaccine. In the Not Hesitant Group, Governmental Agencies received the second-highest percentage of respondents (12%). Figure 6 shows that the Hesitant Group most frequently ranked Health Care Professionals (37%) as the “second-most important” information source for reliable COVID-19 vaccine information, while the Not Hesitant Group listed Governmental Agencies most frequently (49%). Both groups reported Politicians at a rate of less than one percent (<1%) as being the “second-most important” information source on COVID-19 vaccines. Unlike Figures 5 and 6, differences between the Hesitant and Not Hesitant Groups regarding the “third-most important” source for reliable information on COVID-19

differed less (Figure 7). The Hesitant Group reported Governmental Agencies most frequently in this category (22%), followed by Politicians (19%). The Not Hesitant Group ranked Traditional Media Sources most frequently as the “third-most important” information source (24%), followed by Friends and Family (21%). Both groups also ranked Politicians as one of the top three sources that fell in the “third-most important” category for reliable COVID-19 vaccine information (Hesitant Group: 19%, Not Hesitant Group: 15%), which differs from Figures 5 and 6.

Group differences regarding information sources were then assessed for statistical significance using a Pearson’s chi-square test and pairwise correlations to assess direction and magnitude of significant relationships. Regarding the most important information source, there was a statistically significant difference ($p < 0.01$) between groups. When examining the specific information sources reported as the “most important,” there was a negative pairwise correlation (-0.21 ; $p < 0.01$) between the Hesitant Group and reporting Health Care Professionals as the “most important” information source. There were also statistically significant negative correlations between the Not Hesitant Group and ranking Traditional Media Sources (-0.17 ; $p < 0.01$) and Friends and Family (-0.15 ; $p < 0.01$) as the “most important” information source. When examining information sources in relation to vaccinated and boosted participant samples, there was no relationship between which information source respondents listed as being “most important” and vaccine uptake. However, booster uptake was related to the most important information source ($p < 0.01$), with a positive correlation between receiving a booster and ranking Health Care Professionals as the “most important” information source (0.12 ; $p < 0.05$) and a negative correlation between receiving a booster and ranking Traditional Media Sources as the “most important” information source (-0.17 ; $p < 0.01$).

Building upon the data presented in Figures 4 to 7, Figure 8 shows the dispersion of responses from a 5-point Likert scale (Never, Rarely, Sometimes, Often, Always) among the Hesitant Group regarding frequency of reliance on various information sources. Health Care Professionals were the most frequently relied upon source in this group, with 53% of respondents reporting that they Always or Often relied on Health Care Professionals. The next most frequently relied upon information source was reported to be Friends and Family, with 37% of respondents reporting Always or Often. In contrast, Politicians were the least relied upon information source and 73% of respondents reported Never or Rarely relying on Politicians. Figure 9 displays the same data variables as Figure 8, but for the Not Hesitant Group. Health Care Professionals were also the most frequently relied upon information source among these respondents, with 78% of the Not Hesitant Group reporting Always or Often—a 47% increase from the Hesitant Group. The next-most frequently relied-upon information source in the Not Hesitant Group was Governmental Agencies, with 64% of respondents reporting Always or Often. Politicians again received the highest percentage of respondents (66%) who reported Never or Rarely on this information source for COVID-19 information.

To gather more understanding about how the sample viewed information sources, survey respondents were asked about trust using a simple binary Yes/No measurement scale. Figure 10 outlines these results by illustrating the percentage of trust in information sources to provide accurate COVID-19 vaccine and/or booster information for both the Hesitant Group (orange) and the Not Hesitant Group (blue). Health Care Professionals were trusted at the highest rate among hesitant and not hesitant respondents, but with over a 25 percentage-point difference between trust rates of 67% (Hesitant Group) and 94% (Not Hesitant Group). The groups also had differences between the second-most trusted information source; the Hesitant Group listed

Friends and Family (56%) and the Not Hesitant Group listed Governmental Agencies (75%). Politicians had the lowest rate of trust among both samples, with 7% of the Hesitant Group and 11% of the Not Hesitant Group trusting Politicians. When tested for statistical significance using a Pearson's chi-squared function, differences in group trust were found to be present when considering Health Care Professionals ($p < 0.01$) and Governmental Agencies ($p < 0.01$)—both of which had negative pairwise correlations between trust and the Hesitant Group at -0.29 ($p < 0.01$) and -0.17 ($p < 0.01$), respectively.

Health literacy

Because the comprehension of health-related materials might impact the decision to accept or refuse a COVID-19 vaccine, health literacy was assessed through a single-item literacy screener (SILS) to inquire into how often respondents needed to have someone assist them when reading instructions, pamphlets, or other written materials from a doctor or pharmacy on a 5-point Likert scale (Never, Rarely, Sometimes, Often, Always). When testing SILS against vaccine uptake measures, there were no statistically significant relationships between health literacy and if survey respondents were vaccinated or boosted. Group differences in health literacy were minimal, with a Pearson's chi-square finding significance at the 10% level ($p < 0.1$) and a negative pairwise correlation (-0.13 ; $p < 0.05$) being present between being in the Hesitant Group and scoring highly (i.e., "Always") on the SILS scale. In regards to information sources, SILS was found to be related to which source respondents ranked as being the "most important" for reliable COVID information ($p < 0.01$).

Further relationship testing revealed that this difference was only significant when respondents who "Sometimes" need assistance listed Governmental Agencies ($p < 0.05$) as the "most important" information source and when respondents who "Always" or "Never" needed

assistance listed Friends and Family ($p < 0.01$) as the “most important” information source. When testing for directionality of these relationships through pairwise correlations, there was a positive correlation (0.14; $p < 0.05$) between sometimes needing assistance and listing Governmental Agencies as the most important information source, as well as a positive correlation (0.24; $p < 0.01$) between always needing assistance and ranking Friends and Family as the most important information source. A negative correlation was present between never needing assistance (-0.17; $p < 0.01$) and ranking Friends and Family as the most important information source for reliable COVID-19 vaccine information.

COVID-19 knowledge and misinformation susceptibility

Table 5

Outcomes of independent t-tests of unequal variance comparing COVID-19 knowledge and misinformation susceptibility among different sample groups

Group	n	Mean	diff	SD	t-stat	dF	p
Group 1: Hesitant	32	7.56	-2.87	3.93	-4.02	34	<.001
Group 2: Not Hesitant	280	10.44		2.83			
Received COVID-19 vaccine	300	10.23	2.23	3.01	-1.86	11	.087
Did not receive COVID-19 vaccine	12	8.00		4.09			
Received COVID-19 booster	273	10.34	1.19	2.96	-1.84	30	.075
Did not receive COVID-19 booster	27	9.15		3.22			
Liberal	84	10.71	-0.42	1.65	1.91	159	.058
Moderate	124	11.34	0.75	1.31	-3.69	202	<.001
Conservative	27	10.19	-0.90	2.00	2.26	29	.031

Respondents were also scored on their ability to correctly identify true/false statements about COVID-19. These statements included items that covered disease information, vaccine facts, disability-specific risk factors, and misinformation. Results were indexed on a scale of 0 to 12, with each correct answer corresponding to a one-point increase in the index and contributing

to a higher score being reflective of a participant selecting more correct answers. As discovered through further relationship testing displayed in Table 5, vaccinated and boosted individuals were both more likely to receive higher scores on this index; t-tests of unequal variance were used to ascertain if these differences were statistically significant, revealing a 2.23-point average difference in means between the vaccinated and non-vaccinated groups and a 1.18-point average difference in means between boosted and non-boosted groups. However, both of these differences were only significant at the 10% level ($p < 0.1$). When examining statistical difference between survey groups, respondents from the Hesitant Group scored an average of 2.9-points lower on the index than respondents from the Not Hesitant Group ($p < 0.01$).

COVID knowledge and misinformation susceptibility scores were also related to certain information sources; respondents who listed Friends and Family as the “most important” source for reliable COVID-19 information received a 1.5-point lower average score than respondents who listed any other information source ($p < 0.05$). However, this was the only relationship with statistical significance, indicating that there were no correlations between COVID knowledge and misinformation susceptibility and reporting Health Care Professionals, Governmental Agencies, Digital Media Sources, or Traditional Media Sources as the “most important” source for reliable COVID-19 vaccine information.

Political ideology

To assess if political ideology was linked to vaccine hesitance, respondents were asked to identify their leaning on a three-point scale (Liberal, Moderate, Conservative). Statistical testing using a Pearson’s chi-square test estimated that political ideology was not correlated with vaccination, but was found to positively correlate with the decision to receive a booster among moderates (0.14; $p < 0.01$) and negatively correlate among conservatives (-0.12; $p < 0.05$).

Although there were not significant differences in political ideology between the Hesitant and the Not Hesitant Groups, there were relationships between political ideology and the “second-most important” information sources that respondents reported utilizing for reliable information about the COVID-19 vaccines. Being a conservative was positively correlated with both relying on Traditional Media Sources (0.19; $p < 0.01$) and Friends and Family (0.15; $p < 0.05$), while being a moderate was positively correlated with relying on Governmental Agencies (0.17; $p < 0.01$) and negatively correlated with relying on Friends and Family (-0.23; $p < 0.01$). There were no additional relationships between political ideology and the first- or third-most important information sources.

Further statistical significance was conducted to examine the relationship between trust in information sources and political ideology through Pearson’s chi-square testing. This revealed that conservatives were less likely than non-conservatives to trust Governmental Agencies and moderates were more likely than non-moderates to trust the same source. Statistical testing also estimated that political ideology was related to knowledge about COVID-19 and misinformation susceptibility, with an ANOVA with a Bonferroni post-hoc test revealing that conservatives received a 0.9-point lower average score than non-conservatives and that moderates received a 0.8-point higher average score than non-moderates.

Discussion

Summary of Key Findings

Results from this study illustrated that there was a statistically significant difference in vaccine and booster uptake between the Hesitant and Not Hesitant groups. Nonetheless, over two-thirds of respondents from the Hesitant Group had been vaccinated since April 2021 and more than half of now-vaccinated individuals had also received a COVID-19 booster. Rationales for vaccination were similar between the Hesitant and Not Hesitant Groups, but scores on a COVID knowledge and misinformation susceptibility index illustrated that respondents from the Not Hesitant Group scored higher on average than those from the Hesitant Group (who were less knowledgeable and more misinformed), and these differences were statistically significant.

There were also group differences between which information source was ranked as the “most important” for gathering reliable information about COVID-19 vaccines and boosters, with the Not Hesitant Group being more likely to prioritize health care professionals and less likely to prioritize digital media sources, traditional media sources, or friends and family than the Hesitant Group. Frequency of reliance on information sources mirrored these trends, with the percentage of non-hesitant respondents reporting “Always” or “Often” relying on health care professionals at a higher rate than hesitant respondents. Trust in information sources also varied between groups, with positive correlations between being in the Not Hesitant Group and trusting health care professionals and governmental agencies. Political ideology was not related to vaccine uptake, but was associated with receiving a booster. Additionally, political ideology had a statistically significant relationship to COVID knowledge and misinformation susceptibility index scores, as well as to trust in some of the information sources that respondents reported as being important for reliable COVID-19 vaccine information.

Interpretations & Implications

COVID-19 vaccination outcomes and corresponding decision-making rationales

This research provides insight into the current state of vaccination decision-making among a sample of adults with disabilities, as well as how COVID-19 vaccine ideologies have changed since April 2021. A particularly surprising study finding within these areas pertains to vaccine uptake; data showed that 72% of the Hesitant Group (respondents that were previously not planning to receive a COVID-19 vaccine or not sure about vaccination intent) had since received at least one primary dose. Furthermore, 61% of the vaccinated individuals from the Hesitant Group also reported receiving a COVID-19 booster. Although there was no way to differentiate which members of the Hesitant Group in the follow-up survey had originated from the Not Sure or No Group from the 2021 AAHD parent sample, 10% of the original sample reported they would not be vaccinated and 17% of the original sample were not sure.

The present findings are substantial because they illustrate how vaccine ideology is subject to change over time. More specifically, the unexpected rates of vaccine and booster uptake among hesitant respondents indicates that initial occurrences of vaccine hesitance and/or uncertainty may not be the foremost determining predictor of vaccine uptake within the disability community. Taken in tandem with the fact that the two most frequently cited vaccination rationales among vaccinated members of the Hesitant Group were the receipt of encouragement from a health care provider to take the vaccine and knowing someone who got COVID-19, the reduction in hesitance as occurring from both proactive and event-driven behaviors creates further room for discussion about effective health promotion strategy.

Considering the drivers of vaccination within the Not Hesitant Group, the most frequently cited rationale for receiving a primary dose of COVID-19 was also the encouragement

of a health care provider. However, the next four most-cited reasons among the Not Hesitant Group were all reactive and/or event-driven, with respondents reporting: 1) having friends or family got the COVID-19 vaccine; 2) knowing someone who got COVID-19; 3) knowing someone who got seriously ill or died from COVID-19; and 4) having had a previous COVID-19 infection and wanting to prevent another. Similar to the top rationales for primary vaccine doses, the top booster rationales among both survey groups were predominantly reactive. Again, encouragement for booster uptake from a health care provider was the most-cited response, followed by friends or family getting the booster, knowing someone who got COVID-19, having a previous COVID-19 infection and wanting to prevent another, and knowing someone who got seriously ill and/or died from COVID-19. These findings seem to indicate that there may be limited variance in the factors that influenced primary and booster vaccination within the sample, despite the observation of different booster uptake rates in both the Hesitant and Not Hesitant Groups.

In addition to considering the foremost reasons for primary and booster dose vaccination among hesitant and not hesitant adults with disabilities, it is equally as important to consider the rationales that were cited less frequently to understand the multidimensionality of influences on vaccine decision-making. Both the Hesitant and Not Hesitant Groups in this study listed financial incentives and vaccine mandates as the two least-frequently cited rationales for primary vaccine uptake, indicating that these measures were not as effective at encouraging health behavior change among this sample. Group differences also emerged between other less-commonly cited rationales for vaccination. Results showed that the Hesitant Group reported having a past COVID-19 infection as a bottom-three least-influential factor for vaccine uptake, while the Not Hesitant Group reported same rationale as one of the foremost reasons for uptake. This variance

suggests that could be telling of how the sample differentially experienced and acted upon COVID-19 health impacts, which could be a significant driver of future public health promotion strategy.

The multidimensionality of vaccination decision-making would be incomplete without a discussion of continued hesitancy in the sample. Although the number of longitudinally hesitant respondents in this study was small ($n < 10$), the categorization of hesitance rationales into the categories of Big Reason, Little Reason, and Not a Reason nonetheless help to provide context about why hesitance might persist within adults with disabilities. Furthermore, because the same categorization methods were utilized in the COVID-19 and Vaccine Survey Project from AAHD, trends can be compared across time to understand if and how hesitance has changed.¹²³ At the time of the 2021 AAHD study, the four biggest reasons for vaccine hesitance in the No and Not Sure Groups were all related to disability-specific health concerns: 1) not trusting the safety and/or effectiveness of the vaccine on respondent's disability; 2) not trusting the safety and/or effectiveness of the vaccine on respondent's underlying health condition; 3) not receiving reliable information on the vaccine's impact on respondent's disability; and 4) not receiving reliable information on the impact of the vaccine on respondent's underlying health condition. Two years later, all four of these rationales were still cited as Little or Big Reasons for refusing the COVID-19 vaccine by between one-third to one-half of hesitant respondents. The percentage of individuals who listed each rationale as being in the Big Reason category did decrease, but the presence of continual knowledge barriers indicates that there is more work to be done on the improvement of accessible and disability-specific messaging. Alternatively, these findings may indicate that the provision of information alone may not reduce hesitance without addressing the

¹²³ Drum & Ditsch, "COVID-19 Vaccine & Disability Survey: Vaccine Hesitancy Among Adults With Disabilities."

influence of trust in COVID-19 vaccines and boosters. This postulation is furthered by the discovery that two-thirds of the Hesitant Group reported that vaccination had not been refused because of the general presence of underlying health conditions or disability/disabilities, which further demonstrates the importance that trust may have among members of this population.

When considering other facets of hesitance among unvaccinated respondents in the survey sample, general vaccine/booster distrust and past vaccine reactions were widely refuted as rationales for refusing a vaccine; the longitudinally hesitant sample (i.e., respondents who were in the Hesitant Group and had not received a primary dose of the COVID-19 vaccine before or since April 2021) reported these rationales as being “Not a Reason” at rates of 66% and 100%, respectively. Furthermore, 89% of unvaccinated respondents reported feeling like the development of the COVID-19 vaccine/booster was rushed as a “Big Reason” for not choosing to get vaccinated, with more than half of respondents also reporting long-term side effect concerns (78%) and short-term side effect concerns (56%) as “Big Reasons.” Two-thirds of the unvaccinated sample also listed wanting to wait and see how the vaccine affects others as a “Big Reason,” which combines with the prior findings to indicate that longitudinal hesitance may be due to COVID-specific vaccine concerns rather than omnipresent vaccine aversion. Given the lack of data on the impact of the COVID-19 vaccine on various disabilities and underlying health conditions, this finding suggests that there might be unique challenges in place when considering an effective programmatic response.

An exploratory look into the multifaceted elements of COVID-19 information sources

As discussed in the literature review, prior research has indicated that information channels are a critical element of vaccine decision-making. However, less is known regarding how the information sources utilized by people with disabilities to gather reliable COVID-19 information might pertain to vaccine hesitance or uptake. Combined with the group-based differences in vaccine and booster uptake rates, the presence of further statistical variance between what the Hesitant and the Not Hesitant Groups ranked as the “most important” source for reliable COVID-19 vaccine information suggests that the complexity of vaccine decision-making is connected to the mediums through which health information is received. Furthermore, because survey data was also collected on the frequency of reliance on—and trust in—different kinds of information sources, it becomes possible to draw stronger conclusions about how respondents in this study viewed and interacted with various communication channels while gathering public health information that informed the uptake or refusal of COVID-19 vaccines and boosters.

As briefly noted above, a major discovery in this study was the presence of statistically significant relationships between differences in which information sources the Hesitant and Not Hesitant Groups reported as being “most important” for reliable COVID-19 vaccine information. While both groups ranked health care professionals as the leading primary source, the percentages of respondents who reported this source differed by 33 percentage points between groups and was associated with a statistically significant negative correlation between being in the Hesitant Group and listing health care professionals being the most important information source. These findings are supported by prior research on the role of health care professionals as primary vaccine educators, as well as the discovery that strength of reliance on health care

providers has been established to be the most important predictor of vaccine acceptance.¹²⁴

Another important result was yielded when considering the variation of information channel typology within the “most important” information source category. Over one-fifth of the Hesitant Group reported friends and family as the second-leading response in this measure. In comparison, approximately one-tenth of the Not Hesitant Group reported governmental agencies as the second-leading response. These trends reveal that, beyond just distributional differences, the kind of communication mediums reported second-most frequently among the primary information source category were also distinctly different.

Together, the information source categories of “health care professionals” and “governmental agencies” warrant further discussion in context of this study because both are widely considered to be a consistent propagator of empirically-based health recommendations.^{125,126} This distinction is relevant given that scientific evidence is an essential part of public health response and both of these entities took on a heightened role during the coronavirus pandemic due to the necessity for disease-specific findings to be continually and effectively relayed to the public in order for positive health behaviors to be promoted. While it is more difficult to predict or ascertain if all of the varying disseminators of information within the health care professionals and governmental agencies source categories acted within the bounds of consistently reporting on accurate findings, the combination of group-based variance in prioritizing health care professionals and governmental agencies as the “most important” source for reliable COVID-19 vaccine information and the wider distribution of responses among which information source the Hesitant Group reported as being “most important” suggests that these

¹²⁴ Kestenbaum and Feemster, “Identifying and Addressing Vaccine Hesitancy.”

¹²⁵ Wu and McCormick, “Why Health Professionals Should Speak Out Against False Beliefs on the Internet.”

¹²⁶ National Institute on Aging, “How To Find Reliable Health Information Online.”

individuals may have been more divided in how they responded to influential COVID-19 materials than were respondents from the Not Hesitant Group. Furthermore, results also found that there were statistically significant correlations between being in the Not Hesitant Group and being less likely to report digital media sources, traditional media sources, and friends and family as the most important information source for reliable COVID-19 vaccine guidance. When combined with the discovery that over 85% of the Not Hesitant Group first reported relying on data-driven scientific information sources (i.e., health care professionals and government agencies) in comparison to less than half (48%) of the Hesitant Group, there is a strong indication that these groups may have been differentially exposed to, and influenced by, distinctive types of information sources while seeking COVID-19 vaccine and booster information.

Another valuable takeaway from the results of this study was the discovery that statistically significant differences in the most important information sources between the Hesitant and Not Hesitant Groups were not found to translate to a relationship between these information sources and primary vaccination uptake among the entire sample. However, information sources did have a highly significant relationship with booster uptake. When considering the magnitude of difference in this association, a positive correlation was discovered between ranking health care professionals as being of primary importance and receiving a booster, as well as a negative correlation being found between viewing traditional media sources as most important and being vaccinated with a booster dose. The role of information sources as a possible predictor of group difference in booster uptake can be further examined by considering how frequently the Hesitant and Not Hesitant Groups reported relying on the different information source categories for information on COVID-19 vaccines. Since important

differences were discovered in the results comparing Hesitant and Not Hesitant Groups views of the “most important” source for reliable COVID-19 information, a similar difference would be expected to reflect in the frequency measures.

Findings supported this theory, with 53% of the Hesitant Group reporting “Often” or “Always” relying on health care professionals and over 77% of Not Hesitant respondents reporting the same measures of frequency. Furthermore, only 30% of the Hesitant Group reporting utilizing governmental agencies at a high frequency of reliance (i.e., “Often” or “Always”) in comparison to approximately 64% of the Not Hesitant Group. These respective ranges of a 24% and a 33% difference between Hesitant and Not Hesitant Group members reporting that they frequently relied on health care professionals and governmental agencies supports the theory that non-hesitant individuals within the survey were likely exposed to empirical information about COVID-19 vaccines more often than hesitant respondents. The low frequency measure results also supported this assertion by demonstrating that over one-fourth of the Hesitant Group reported “Never” or “Rarely” relying on health care providers for COVID-19 vaccine information, with an additional 43% reporting the same for governmental agencies. Once again, these trends were not equally reflected in the Not Hesitant sample; only one-tenth of respondents in this group reported a low frequency of reliance (i.e., “Never” or “Rarely”) on health care professionals and just 12% reported the same measures for governmental agencies.

The frequency measure within this study also revealed other important group tendencies surrounding the distributional differences in how groups reported accessing information. After health care professionals, the second-most frequently relied upon source of COVID-19 vaccine information among the Hesitant Group was friends and family, with over 36% reporting “Often” or “Always.” In contrast, the second-most frequently relied upon information source among the

Not Hesitant Group was overwhelmingly governmental agencies—a category that had over a 20 percentage-point difference from the next-most frequently listed category of friends and family at 43%. These findings indicate that the trends of higher group variance that were observed in the reporting of the most important information source were replicated within the frequency measure: there was less distribution between the percentage of respondents in the Not Hesitant Group who reported “Often” or “Always” relying on information sources than in the Hesitant Group. This finding suggests that hesitant members of the sample were more likely to gather information from a wide variety of sources, which could pertain to the subsequent presence of differential vaccine attitudes and the potential to be exposed to or influenced by misinformation (a topic will be discussed in-depth later within this section).

Trust is another important facet of understanding how people chose to engage with information sources, and in the context of COVID-19 vaccination, how people may determine to accept or reject vaccines based on levels of trust in what messages various information sources are conveying. Prior research on the role of trust in COVID-19 decision-making revealed that trust was more predictive of vaccine acceptance than socioeconomic status,¹²⁷ which is telling of the significance trust could have in influencing vaccination ideologies even when controlling for certain other population characteristics, such as disability. To measure trust in this survey, the item was constructed as binary variable through asking whether or not respondents agreed with affirmative statements between trust and each information source (e.g., “I trust health care professionals to provide accurate information about COVID-19 vaccinations.” [Agree/Disagree]). Although trust is often understood to exist on a spectrum rather than in absolute categories, this methodology better allowed for the broad spectrum of entities within

¹²⁷ Amo-Adjei et al., “Trust and Willingness towards COVID-19 Vaccine Uptake.”

each information category to be reflected upon rather than needing to break each item down and introducing survey fatigue to respondents.

Based on the previously discussed findings, it was expected that respondents in the Not Hesitant Group would report trusting health care professionals and governmental agencies at higher rates compared to the Hesitant Group (respectively, 28% and 27% more). The implications of these differences are furthered by a finding of statistically significant negative correlations between being in the Not Hesitant Group and reporting trust in health care professionals and governmental agencies. This finding combined with previous discussion points suggest that hesitant members of the survey sample were less likely to trust sources that distributed empirically-based information about COVID-19 vaccinations. These results are also in-line with what has been reported in other studies. A logistic regression analysis from a 2021 survey found that trust in physicians and government predicted COVID-19 vaccine uptake,¹²⁸ and another linear panel regression built upon these findings through revealing that individuals who did not trust public health institutions were likely both more likely to be vaccine hesitant and to trust friends and family for COVID-19 information.¹²⁹ Results from this survey mirrored some of these observations through the finding that individuals from the Hesitant Group reported friends and family more frequently than those from the Not Hesitant Group when considering information sources of primary and secondary importance.

Beyond the picture that is provided by considering trust in information sources, personal health literacy also offers an additional lens to examine vaccination decisions. As an element of decision-making, health literacy can be best conceptualized as the “degree to which individuals

¹²⁸ Viskupič, Wiltse, and Meyer, “Trust in Physicians and Trust in Government Predict COVID-19 Vaccine Uptake.”

¹²⁹ Choi and Fox, “Mistrust in Public Health Institutions Is a Stronger Predictor of Vaccine Hesitancy and Uptake than Trust in Trump.”

have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves.”¹³⁰ An increased demonstration of health literacy has been previously proposed to reduce COVID-19 vaccine hesitancy,¹³¹ although it is necessary to acknowledge that adults with disabilities may have an altered experience with health literacy measures. For example, if a cognitive limitation disability requires increased use of a plain language vocabulary in the relaying of health-related information and/or materials. The collection of personal health literacy levels within the sample via the standard measurement of a single-item literacy screener (SILS) was nonetheless able to shed light on the interaction between personal health literacy and what respondents reported as being primary sources for reliable COVID-19 vaccine information. A statistically significant positive correlation between always needing assistance and ranking friends and family as the most important information source was observed alongside a statistically significant negative correlation between the corresponding SILS identifier of never needing assistance and reporting the same source as being most important. Because no additional “Never” or “Always” SILS measures were found to be associated with any other information source category, these isolated trends provide insight into how friends and family might play a unique role in the dissemination of COVID-19 vaccine information for those who are not as health literate. Combined with the finding of no correlation between SILS and vaccine or booster uptake (as has been reported in other studies¹³²), the minimal presence of health literacy relationships within the survey data suggests that future examination into how health literacy may pertain to where individuals access COVID-19 vaccine

¹³⁰ Health Resources & Services Administration, “Health Literacy.”

¹³¹ Zhang et al., “The Effect of Health Literacy on COVID-19 Vaccine Hesitancy among Community Population in China.”

¹³² Siena et al., “The Association of Health Literacy with Intention to Vaccinate and Vaccination Status.”

information should be considered to test for replicated statistical significance in a population-based sample before implications are further considered.

Assessing COVID-19 knowledge & misinformation susceptibility alongside hesitance measures

Given that misinformation susceptibility has been established as a predictor of COVID-19 vaccine hesitance in the general population,¹³³ as well as the finding that accurate vaccination knowledge was associated with COVID-19 vaccine reception,¹³⁴ understanding how the sample of this study was influenced by these elements can facilitate more substantive conclusions about how different types of information sources might have impacted the ways in which individuals made vaccination decisions. The overall COVID-19 knowledge and misinformation susceptibility of the present sample was assessed through a 12-item list of true or false statements, all of which were either pulled directly from the CDC reporting of COVID-19 myths and facts,¹³⁵ peer-reviewed scientific publications about the impact of COVID-19 on adults with disabilities, or public-facing empirical refutations of misleading COVID-19 guidance (e.g., statements from then-President Trump about the use of ivermectin or hydroxychloroquine sulfate for the treatment of COVID-19 infections). A full list of these statements is available within the *COVID-19 Knowledge and Misinformation Susceptibility Index* section of Appendix Items 2 and 3.

Results from this portion of the survey were assessed holistically utilizing an index that awarded points for the correct identification of every item (0 being zero correctly-identified

¹³³ Jennings et al., “Lack of Trust, Conspiracy Beliefs, and Social Media Use Predict COVID-19 Vaccine Hesitancy.”

¹³⁴ Rebitschek et al., “Fact Boxes That Inform Individual Decisions May Contribute to a More Positive Evaluation of COVID-19 Vaccinations at the Population Level.”

¹³⁵ CDC, “COVID-19 Vaccine Myths & Facts.”

answers, 12 being a perfect score). When comparing these scores to the uptake of COVID-19 vaccines and boosters, statistical testing found significance in the variance between group index scores at the 10% level when considering both kinds of vaccination. Specifically, there was a 2.23-point average difference in means between the vaccinated and non-vaccinated groups and a 1.18-point average difference in means between boosted and non-boosted groups. Although this finding suggests a lower strength of relationship between variables across the sample, there was a highly statistically significant relationship between the index scores of the Hesitant and Not Hesitant Groups, with respondents from the Hesitant Group scoring an average of 2.9-points lower than respondents from the Not Hesitant Group. This finding should be considered an important takeaway from this study given its suggestion that the presence of lower scores on the knowledge and misinformation susceptibility measure were correlated to the reporting of former or current COVID-19 vaccine hesitance ideologies among survey respondents.

If these results were found to occur within a population-based sample, the implications of an association between vaccination decisions and the understanding of disease information, vaccine facts, disability-specific risk factors, and misinformation susceptibility suggests that *how* people receive information could have a critical impact on these facets of health knowledge. Study results further supported this through the discovery that respondents who listed friends and family as being the “most important” source for reliable COVID-19 information received a 1.5-point lower average score than respondents who listed any other information source, although this was the only relationship found between primary information sources and index scores. Nevertheless, these findings suggest that hesitance is at least partially correlated to information channels. When examining outside literature to expand on this theory, one publication studied the role of information sources in COVID-19 hesitancy and utilized a predictive regression

model to establish that more than half of the variance in vaccine intention stemmed from negative COVID-19 vaccine perceptions and a lesser tendency to utilize the websites of official public health organizations.¹³⁶ The combined trends from this study and the previous research present a reasonable interpretation that while information sources alone may not drive vaccine hesitance, the types of information received between channels could vary and be associated with vaccination decision-making.

Connections between political ideology and vaccination status, information sources, and COVID-19 & misinformation susceptibility

Studies have extensively examined the role of politics in the observation of vaccine hesitancy in the United States.¹³⁷⁻¹⁴⁰ This research attempted to build upon prior findings through the analysis of trends between political ideology and vaccination status, information sources, and the COVID-19 knowledge and misinformation susceptibility index to see how adults with disabilities could have been impacted by the politicization of COVID-19 response when making decisions to accept or reject vaccines. Results of this study found that political ideology (assessed as conservative, moderate, or liberal) among the survey sample was not statistically related to group status or vaccine uptake, but was significantly correlated with booster uptake. The directionality of these booster correlations was found to be positive between being a moderate and receiving a booster and negative between being a conservative and receiving a booster. These results are of increased interest when considering that less than 0.5% of the sample listed politicians as being the most or second most important source for reliable COVID-

¹³⁶ de Vries et al., “COVID-19 Vaccine Hesitancy.”

¹³⁷ Albrect, “Vaccination, Politics and COVID-19 Impacts”

¹³⁸ Sorell and Butler, “The Politics of Covid Vaccine Hesitancy and Opposition.”

¹³⁹ Bilewicz and Soral, “The Politics of Vaccine Hesitancy.”

¹⁴⁰ Cao, Ramirez, and Alvarez, “The Politics of Vaccine Hesitancy in the United States.”

19 information and that politicians received the lowest percentage of respondents reporting trust among both groups and out of all the information source categories. Disconnect between respondent reporting measures and the relationship between political ideology and overall booster uptake may indicate that hesitance is influenced by political leaning in ways other than by the sole influence of politicians as a trusted information source. This makes further sense when considering how the category was widely applicable across the political spectrum and respondents of one ideology may have considered all politicians when assessing trust and reliance. Furthermore, some study findings replicated trends that would be expected based on the fundamental underpinnings of certain political groups—for example, conservatives were found to be statistically less likely to trust governmental agencies than non-conservatives, which tracks alongside the antifederalist foundation of many modern conservatives.¹⁴¹

Political ideology was also somewhat related to information sources within this study, with difference being found to exist between respondent rankings of the “second most important” source for reliable COVID-19 vaccine information. This statistical variance was apparent between conservatives (more likely than non-conservatives to list traditional media sources and friends and family in the secondary information source category) and moderates (more likely to report governmental agencies and less likely to report friends and family). The lack of statistically significant relationships between political ideology and first- or third-most important information sources suggests that where respondents accessed information was not strongly associated with a self-perception of political leaning, but that conservatives and moderates still may have supplemented primary information sources in distinctive ways from those with different political ideologies. If replicated in a population-based sample, some degree

¹⁴¹ Lim, “The Anti-Federalist Legacy in Modern Conservative Politics.”

of association between political leaning and the information sources and booster uptake variables could suggest that the promotion of engagement with data-driven public health messengers might be effective at mitigating the influence of political impact on COVID-19 ideology and/or booster uptake in the future.

Politicians have also had influence on the distribution of various conspiracy theories and misinformation about COVID-19, especially given the repeated occurrences of then-President Trump using social media to distribute unsupported claims about the origin of the coronavirus disease and its treatment options. Because the COVID-19 knowledge and misinformation susceptibility index utilized in this study included some items that were directly pulled from common conspiracies and scientifically-inaccurate medical advice promoted by Trump, it was possible to compare this measure to the role of political ideology. Results demonstrated that conservatives received a 0.9-point lower average COVID-19 knowledge and misinformation susceptibility score than non-conservatives and that moderates received a 0.8-point higher average score than non-moderates, both of which suggest that political belief did at least partially correlate with respondent ability to understand COVID-19 and identify incorrect statements about the disease and vaccination. Furthermore, other research has shown political ideology to be predictive of respondent likelihood to follow government guidance on the use of personal protective measures and strategies,¹⁴² suggesting that politically-rooted differences were present in how individuals chose to perceive and act during the pandemic beyond the just the discoveries produced by this study.

¹⁴² Krase et al., “Influence of Political Ideology on Coping and Personal Protection Practices During the Early Days of the COVID-19 Pandemic.”

Limitations

Differences in group composition between the Hesitant and Not Hesitant Groups introduced difficulties to the interpretation of results, both due to inconsistencies between sample sizes and because a matched sample was not used to generate comparisons during analytical testing. As a result, findings concerning the Hesitant Group should be considered with increased prudence given the small number of respondents. The homogenous convenience sample also makes the study results narrowly generalizable to the overall population of adults with disabilities and the broad applicability of findings should be approached cautiously.

The findings of this study are subject to several additional limitations. First, there is always a possibility for survey-based methodologies to be influenced by reporting or recall bias given the nature of the collection measure. Second, it is necessary to acknowledge that the creation of survey items is a subjective process and researcher bias may be present even after attempting to adhere to field-specific standards and previously-established guidelines. Third, a limitation might have arisen from the digital platform through which this study was administered. Although hard copies and other accessible formats of the original AAHD COVID-19 and Vaccine Survey Project from April 2021 were available to participants upon request, no one without internet access was included in the initial sampling frame. Thus, individuals without internet access were also not a part of this new research. Fourth, among respondents who did complete the survey, varied response rates across items suggest at least some level of response bias was present in the final dataset. Fifth, because respondents were asked to select a single main disability identifier, individuals with multiple equivalent disabilities might not have been accurately identified. Sixth, the timeframe of study administration can also be considered as a limitation given the possibility of changes in vaccine ideology since the responses were collected

in the three weeks between February 20th and March 13th, 2023, and are solely reflective of COVID-19 vaccine and booster attitudes during this period.

Recommendations

Overall, findings regarding the gap between the uptake rates of COVID-19 primary and booster doses among the sample present opportunities for utilizing respondent reports of vaccination and hesitance rationales to suggest tactics to increase the number of adults with disabilities who receive boosters. Furthermore, the various measures of how survey respondents interacted with sources for reliable COVID-19 vaccine information in this study work together may reinforce the value of health care professionals as a primary resource for vaccination and booster guidance, but the presence of statistically significant group differences in trust and whether health care professionals were ranked as being the most important source for reliable COVID-19 vaccine information highlights that non-hesitant respondents were more likely to trust and prioritize health care professionals when gathering vaccine information. This phenomenon could also inform responsive programming about future trust-promotion strategies via informing messaging tailored to different information channels. Results from the COVID-19 knowledge and misinformation susceptibility index might also be a beneficial tool for guiding programmatic change; although respondents from the Hesitant Group had lower average scores than non-hesitant respondents, a consideration of the top-most reported rationales for vaccine uptake among the vaccinated members of this group could be telling of strategies to further increase vaccination among hesitant individuals. Finally, findings surrounding the relationships between political ideology and booster reception, information sources, and misinformation can also be utilized to consider how programming may be able to address the ways in which adults

with disabilities are influenced by factors beyond those that can be directly influenced by public health officials.

While it is important to note that the results of this research should only be taken as reflective of the outcomes and ideologies present among the somewhat limited sample of adults surveyed, there is a small pool of existing data about COVID-19 vaccine hesitancy among adults with disabilities and a lack of study into the role of information sources in potentially shaping population-specific hesitance outside of what was provided by this project. Therefore, trends observed in the Hesitant and Not Hesitant Groups can be useful in guiding the creation of observational data-design methodologies to test the effect of policy and programmatic interventions among a population-based sample. There is also a dire need for further research into the ways in which primary and secondary disability identifiers may interact with elements of COVID-19 vaccine hesitancy given that disability groups were not proportionally represented in the study sample and may benefit from different program response strategies.

Utilizing reported rationales for COVID-19 vaccine and booster uptake to inform future messaging strategies

To further explore the key finding that there was a significant increase in COVID-19 vaccine uptake among the Hesitant Group, the transtheoretical model of health behavior change (TTM) may be a beneficial tool when examining how vaccine opinions can shift in relation to the employment of various public health response tools. The TTM for health behavior change includes six stages: precontemplation, contemplation, preparation, action, maintenance, and termination (Figure 1; note that the termination stage is not represented due to it being unique to the health-based applications of the model).¹⁴³ If the same phenomenon of vaccine and booster

¹⁴³ Prochaska and Velicer, “The Transtheoretical Model of Health Behavior Change.”

uptake among previously-hesitant adults with disabilities occurs within a population-based sample, the reduction in vaccine hesitance over time could have significant policy implications via informing how public health messaging is effectively constructed to target individuals who are in the precontemplation and contemplation stages of health behavior change while navigating uncertainties about COVID-19 vaccines and boosters.

Prior publications have advocated utilizing the TTM to inform educational COVID-19 vaccine materials, and specific stage-based interventions have

been found effective as a basis for behavior change.¹⁴⁴ Within the specific contexts of encouraging COVID-19 vaccinations, literature has suggested that non-hesitant individuals would benefit more from preparation- and action-oriented response (e.g., promoting vaccine efficacy and healthcare provider recommendations) and that hesitant individuals would be better-reached through specific measures designed with the precontemplation and contemplation stages in mind (e.g., reducing concern over vaccine side effects).¹⁴⁵ The implementation of these strategies is observable when examining examples of COVID-19 vaccine messaging materials designed for adults with disabilities that have been distributed over the course of the pandemic. As outlined in a video released by the CDC, the roles of doctors as vaccine educators, promoters, and administrators aligns with the corresponding intervention strategies of the precontemplation,

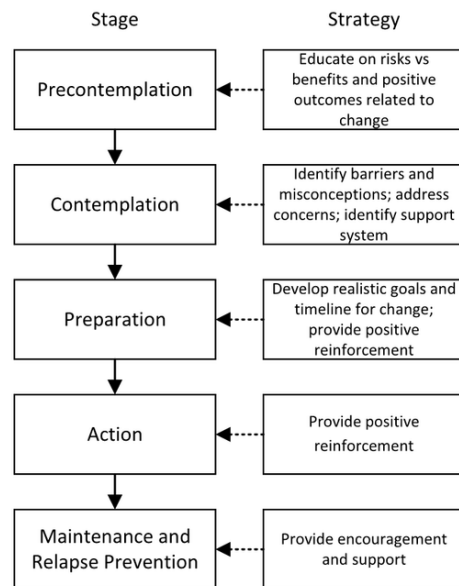


Figure 1: Transtheoretical model of health behavior change stages (left) and strategies (right), from "Integrating Taxonomies into Theory-Based Digital Health Interventions for Behavior Change," Wang et al., 2019.

¹⁴⁴ Reiter, Pennell, and Katz, "Acceptability of a COVID-19 Vaccine among Adults in the United States."

¹⁴⁵ Reiter, Pennell, and Katz.

contemplation, and action stages of the TTM.¹⁴⁶ Another CDC handout that was widely distributed (and still utilized by many state and local health care agencies) stresses the precontemplation stage through relying on the following main message to educate on the positive outcomes associated with getting vaccinated: “Vaccines (shots) are one of the tools we have to fight the COVID-19 pandemic.”¹⁴⁷ However, while some results from this survey support the effectiveness of these applications of the transtheoretical model of health behavior change within vaccine messaging, other findings indicate that different strategies might be more effective to encourage vaccine uptake among adults with disabilities.

As previously outlined, the rationales provided by the Hesitant Group imply that health education did have a positive impact on encouraging vaccine uptake, but external socioenvironmental circumstances also played a significant role. Similarly, the Not Hesitant Group reported the encouragement from health care professionals as a top rationale for vaccination, but the presence of reactive health responses were also observed in the remaining top five reasons for vaccination (having friends or family got the COVID-19 vaccine, knowing someone who got COVID-19, knowing someone who got seriously ill or died from COVID-19, and having had a previous COVID-19 infection and wanting to prevent another). These reactive responses can be further understood through critical event systems theory, which has been used to describe how an event of significance—defined as being novel, disruptive, and critical¹⁴⁸—moderates the effect of beliefs on the intent to vaccinate.¹⁴⁹ Contextualized by the variables tested within the survey, critical events might include knowing someone who got COVID, knowing someone who got seriously ill or died from COVID-19, getting COVID-19 and wanting

¹⁴⁶ CDC, *Stay Safe from COVID-19*.

¹⁴⁷ Baptist Health South Florida, “Curious About COVID-19 Vaccines? Here’s Helpful Information from the CDC.”

¹⁴⁸ Morgeson, Mitchell, and Liu, “Event System Theory.”

¹⁴⁹ Zampetakis and Melas, “The Health Belief Model Predicts Vaccination Intentions against COVID-19.”

to prevent another infection, or experiencing post-COVID conditions (i.e., long-COVID). Given that both the Hesitant and Not Hesitant Groups reported at least of two critical event rationales within the top five reasons for receiving a COVID-19 primary dose, it is logical to assume that critical events theory may be broadly applicable to how COVID-19 vaccination decisions are reached among adults with disabilities if results from this study were to be replicated in a population-based sample.

In order to better consider critical events during programmatic response, it is evident that the precontemplation stage should be further targeted in order to increase knowledge of the risks associated with not receiving a COVID-19 vaccination. A low-barrier implementation of adapting preexisting stage-based interventions to better reach adults with disabilities could be through the use of plain language in messaging materials. Although plain language has long been recognized as an essential component of universal design and health care equity,¹⁵⁰ a majority of public-facing print materials designed to support COVID-19 recommendations from the CDC currently contain lengthy text boxes and/or bullet points, as well as few and/or minor visual aids (a full list of these materials can be found under the “Print Resources” section of the Guidance for COVID-19 Communications Resources of the CDC online COVID-19 catalogue¹⁵¹). While the CDC does effectively apply plain language and visualization strategies for COVID-19 vaccine promotion in materials that are designed for people with intellectual and developmental disabilities¹⁵²—a categorization that would fall under the cognition identifier in this survey—the designation of these accessible materials to a certain disability group may exclude any adults who identify with having another type of disability from the benefits of access if they feel as

¹⁵⁰ Plainlanguage.Gov, “Plain Language in Healthcare.”

¹⁵¹ CDC, “Coronavirus Disease 2019 (COVID-19) Print Resources.”

¹⁵² CDC, “Coronavirus Disease 2019 (COVID-19) Resources for People with Intellectual & Developmental Disabilities.”

though the information was not pertinent to a mobility, vision, or hearing disability. To mitigate this, future vaccine messaging should always be designed in—or translated to—a plain language format that can be utilized to inform members of all disability groups. To guide these efforts, organizations should utilize standard plain language resources (such as the CDC’s own Plain Language Materials & Resources Guide¹⁵³) in order to maintain conformity in the phrasing and design of plain language materials, as well as consider producing materials tailored to different disability groups.

To propose solutions aimed at addressing the lower rates of booster uptake among the Hesitant and Not Hesitant Groups from the survey, the maintenance phase of the transtheoretical model can be applied through situating the continued uptake of boosters as they are developed, released, and recommended as a target maintenance activity. However, the negative trends in booster reception could be indicative of adults with disabilities slipping out of the maintenance phase and back into prior phases—an occurrence known as “relapse” within the TTM and which

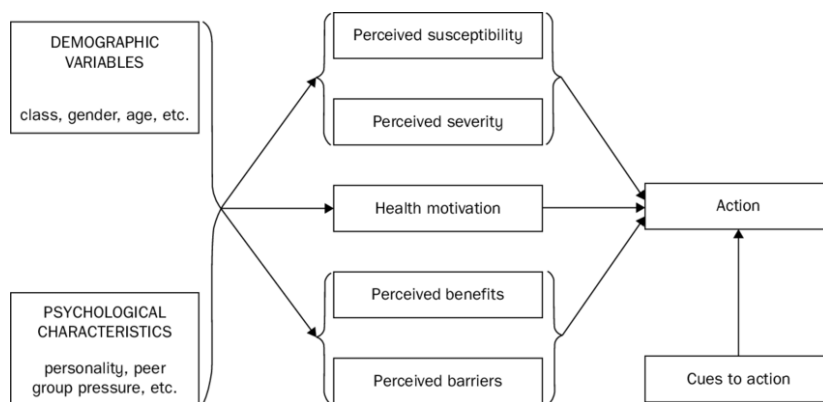


Figure 2: The health belief model with directionality indicators, from "The Health Belief Model," Abraham & Sheeran, 2015.

could have major health outcome implications given increased risk of severe outcomes among this population. Understanding how shifts between the phases of the transtheoretical model of

behavior change occur can be enhanced through an application of the health belief model (HBM), which—as introduced within the literature review—postulates that demographic and

¹⁵³ CDC, “Plain Language Materials & Resources.”

psychological characteristics combine to influence perceived benefits, barriers, susceptibility, and severity before an action is reached (Figure 2).

Employing the health belief model to COVID-19 vaccine and booster uptake, the reception of these protective measures (i.e., vaccines) can have several salient perceived benefits and barriers, and the perceived risk of COVID-19 infections will depend on how an individual understands susceptibility and severity. Previous research on the HBM and COVID-19 has also helped to elucidate the role of the model within vaccination decisions; an empirical analysis from 2021 found two-way interactions between severity and susceptibility beliefs, as well as three-way interactions between perceived severity, susceptibility, and benefits.¹⁵⁴ However, as the novelty of pandemic subsidizes and both global and national response slow—for example, the World Health Organization (WHO) ended the COVID-19 public health emergency designation on May 5th, 2023,¹⁵⁵ and the White House ended the national emergency declaration concerning the coronavirus disease on May 11th, 2023¹⁵⁶—the sense of perceived severity and susceptibility may decrease among adults with disabilities. This could lead to further disconnect between primary and booster reception, and given that the maintenance phase within the transtheoretical model of health behavior change is only effective in the context of vaccination if it is continuously practiced at disease-appropriate increments, a “relapse” of adults with disabilities back into the precontemplation phase if COVID-19 is no longer seen as a health concern may once again trigger increased infection rates and severe outcomes in the population.

Relapse out of maintaining vaccination behaviors is not only problematic because of the ways in which COVID-19 continues to impact health across the world (WHO reported that

¹⁵⁴ Zampetakis and Melas, “The Health Belief Model Predicts Vaccination Intentions against COVID-19.”

¹⁵⁵ Cheng, “WHO Says COVID Emergency Is over. So What Does That Mean?.”

¹⁵⁶ The White House, “Notice on the Continuation of the National Emergency Concerning the Coronavirus Disease 2019 (COVID-19) Pandemic.”

COVID-19 killed approximately one person every three minutes during May of 2023¹⁵⁷), but also due to the fact that a significant portion of national-level COVID-19 booster outreach guidance is currently targeted more towards the action stage of the TTM. Methods at this stage emphasize data-driven approaches and community wellness initiatives¹⁵⁸ rather than a prioritization of precontemplation- and contemplation-tailored programmatic tools (such as education and identifying barriers or misconceptions), which may fail to reach adults who are hesitant or those who no longer see COVID-19 as a viable health threat. The examination of booster rationales reported in this study also showed that many respondents acted upon reactive measures most frequently, which connects back to the importance of using critical events theory and a circular approach to theoretical models to prioritize a programmatic shift to messaging about risk in an attempt to increase proactive vaccine uptake. If enacted on current messaging about COVID-19 boosters, examples of this approach could include prioritizing data-driven messages about severe COVID-19 outcomes among adults with disabilities as a means of encouraging the booster for continued protection.

When considering how the least-frequently reported vaccination rationales could inform programmatic response, the low rates of respondent indication that financial incentives or vaccine mandates played a role in vaccine decision-making indicates that a reduction in the utilization of strategies that could cause undue inducement or be considered coercive may be strategic in the future. Inconclusive findings about the effectiveness of these policies at increasing COVID-19 vaccine uptake among the general population further supports this assertion—for example, a study of the use of financial incentive to promote the scheduling and reception of a COVID-19 primary dose discovered that while vaccination intentions increased

¹⁵⁷ WHO, “WHO Director-General’s Opening Remarks at the Media Briefing – 5 May 2023.”

¹⁵⁸ Gonzales et al., “Overview of Barriers and Facilitators in COVID-19 Vaccine Outreach.”

across the sample, overall vaccination rates remained the same and some vaccine hesitant subgroups had decreased rates of vaccination.¹⁵⁹ Similarly, the use of COVID-19 vaccine mandate policies has been linked to adverse impacts on public trust, vaccine confidence, political polarization, inequities, and social wellbeing.¹⁶⁰ For people with disabilities, the data from this survey regarding how some respondents still reported concerns over the safety and effectiveness of the vaccine on a disability and/or underlying health condition further highlights how coercive policy tools may impose added apprehensions about vaccination and should not be prioritized for continued use moving forward.

Investigating the roles of information sources, trust, and health literacy in COVID-19 vaccine messaging

To begin to investigate potential programmatic solutions for addressing how information sources may pertain to vaccine hesitance among adults with disabilities, it is first necessary to consider how information is more generally utilized to inform health-related decisions among this population. Studies have found that vaccination decisions are influenced by lifestyle, perceptions of health and risk, vaccine effectiveness, perceptions of vaccine components, and trust in institutions.^{161,162} Underlying each of these components is information dissemination; where people access public health guidance will play a role in informing how each of these factors is considered and internalized within the decision to either accept or refuse vaccination. As investigated in measures of respondent trust, frequency of reliance, and valuation in connection to which information sources were utilized for obtaining reliable COVID-19 vaccine

¹⁵⁹ Chang et al., “Financial Incentives and Other Nudges Do Not Increase COVID-19 Vaccinations among the Vaccine Hesitant.”

¹⁶⁰ Bardosh et al., “The Unintended Consequences of COVID-19 Vaccine Policy.”

¹⁶¹ Harmsen et al., “Factors That Influence Vaccination Decision-Making by Parents Who Visit an Anthroposophical Child Welfare Center.”

¹⁶² Hoogink et al., “Preferential Differences in Vaccination Decision-Making for Oneself or One’s Child in The Netherlands.”

guidance in the study, the prioritization of health care professionals and governmental agencies as important information sources consistently correlated with being in the Not Hesitant Group.

Furthermore, members of the Hesitant Group trusted these information sources less and listed friends and family as being of primary importance more often. Combined with the finding that information sources were associated with booster uptake, the previously-highlighted concern of adults with disabilities “relapsing” back into the precontemplation phase of the transtheoretical model of health behavior change due to not maintaining COVID-19 protective behaviors (e.g., receiving boosters) may be further understood through the variance in respondent perception of information source importance. In response, strengthening the role of health care providers as proponents of booster-specific education and encouragement via risk-centered messaging may mitigate the effects of relapse among adults with disabilities. This assertion is supported by the increased frequencies at which boosted respondents from both the Hesitant and Not Hesitant Groups reported relying on this source, as well as the encouragement of health care providers being listed as the top rationale for receiving COVID-19 vaccines and boosters across the sample.

Determining how to utilize or target various information sources through programmatic strategy also requires a consideration of the multidimensionality of pandemics, as well as the potential for major drawbacks if one information source is relied upon as the primary messenger of public health guidance. For example, the role of some health care professionals in the creation of further medical inequities among adults with disabilities is indicative of the unique set of challenges that are associated with reducing vaccine hesitancy in a historically disadvantaged group given the compelling reasons that exist for a distrust of health care and governmental

systems.¹⁶³ Although both the Hesitant and Not Hesitant Groups reported trusting health care professionals and governmental agencies at the two of the highest rates among all information source categories, percentages still waned to below 50 in the Hesitant Group. This is telling of how the presence of ability-based discrimination during the pandemic might have further contributed to vaccine hesitance as a result of trust, or could suggest that some adults with disabilities may have other perceptions/experiences that shape their interactions with health care professionals (e.g., poor quality of care, fear of medical settings, inaccessible services, etc.).

To mitigate the impacts of low levels of trust, the continued distribution of COVID-19 vaccine messaging materials designed for digital publication (by either official agencies or other public health entities) may be beneficial in order to increase the presence of data-driven COVID-19 information across channels, especially given the statistically significant association that members of the Hesitant Group were more likely report digital media sources as being most important for reliable COVID-19 information. The CDC currently operates a social media toolkit to provide COVID-19 vaccination graphics to the public, which could be drawn upon to expand the breadth of various public health actors when attempting to reach vaccine hesitant adults with disabilities.¹⁶⁴

The function of friends and family as a source for reliable COVID-19 vaccine information may also be uniquely related hesitance and provide another channel through which to implement responsive programming. Results found that members from the Hesitant Group were more likely to consider friends and family to be the “most important” source for COVID-19 vaccine information, and respondents who prioritized friends and family in the same importance

¹⁶³ HHS Office for Civil Rights in Action, “Bulletin: Civil Rights, HIPAA, and the Coronavirus Disease 2019 (COVID-19).”

¹⁶⁴ CDC, “Communication Resources for COVID-19 Vaccines.”

category scored 1.5 points lower on the COVID-19 knowledge and misinformation susceptibility index regardless of group status. Furthermore, low health literacy was also associated with viewing friends and family as the most important information source, while high health literacy was negatively correlated with this view. These trends may be best addressed through preexisting resources, such as the Friends and Family Campaign from the Association of University Centers on Disabilities (AUCD) National Center on Disability in Public Health.¹⁶⁵ This campaign is organized into 10 parts and aims to encourage adults with disabilities to get a COVID-19 vaccine through emphasizing community dialogue via the provision of plain language talking points and suggestions to promote COVID-19 vaccination. Distributing informational materials about the Friends and Family Campaign to local public health organizations or community groups may help further its scope of effectiveness, especially given the fundamental consideration that the campaign be enacted within previously-established social relationships to draw on preexisting trust.

Considerations for how to deconstruct the impact of misinformation and political ideology on vaccine decision-making

Another way to consider addressing the role that information has on the production of personal health beliefs is through the social construction of reality. This theory is put forth as a process by which any element or body of knowledge comes to be socially accepted as reality through the manners in which people continuously create, through both action and interaction, a shared reality that is experienced as “objectively factual and subjectively meaningful.”¹⁶⁶ The social construction of reality framework is widely accepted to inform the social model of disability given its fundamental basis on the notion that disability is the product of a shared

¹⁶⁵ AUCD, “COVID-19 Vaccine Text and Graphic Resources.”

¹⁶⁶ Berger and Luckmann, “The Social Construction of Reality.”

social construct,¹⁶⁷ and in the context of absorbing information, the theory can help to explain how people react and respond to COVID-19 materials that ultimately influence vaccination decisions. Under the lens of social constructionism, both vaccine hesitancy and acceptance are socially constructed phenomenon that are informed by demographic variables and personality characteristics that work alongside environmental feedback to form health beliefs.¹⁶⁸ This interaction can be applied to study findings when considering how distributional variances between which information sources the Hesitant and Not Hesitant Groups reported as being of primary, secondary, and tertiary importance for reliable COVID-19 vaccine information might have worked to inform the creation of different versions of socially-constructed reality between the survey groups and ultimately influenced the varying rates of COVID-19 vaccine and booster uptake among the sample.

The social construction of reality can also help to further understanding into how misinformation impacts vaccine hesitance. Misinformation can be further contextualized within the realm of public health through a consideration of phenomenology, an approach which builds on the social construction of reality by that viewing consciousness as a key determinant in the interpretation of the outside world based on a sense of lived familiarity that will shape the analyses of decisions and subsequent change.¹⁶⁹ When applied during infectious disease response, phenomenology can help to explain how individuals may rely strongly on personal experience in addition to quantitative research when making health decisions, thus explaining how critical events or exposure to misinformation might result in the belief of inaccurate

¹⁶⁷ Drum, "Chapter 3: Models and Approaches to Disability."

¹⁶⁸ Mbah et al., "Population and Vaccine Hesitancy."

¹⁶⁹ Smith, "Phenomenology."

COVID-19 vaccine information becoming instilled as personal reality for some individuals.¹⁷⁰

Results from this study provided insight into how this relationship might be influential via considering differences in some of the vaccination rationale measures between groups; the Hesitant Group reported having an opinion change on the COVID-19 vaccine at twice the rate of the Not Hesitant Group, which is a finding that suggests more of an ideologic shift in the hesitant respondents over the two years between the dissemination of the initial AAHD research project and this survey. In relation to social constructionism and phenomenology, this difference may have been the product of receiving more empirically-based information that dismantled or challenged what individuals had previously perceived as being objective due to a lack of lived experience, receiving inaccurate guidance, or being exposed to misinformation.

Implications of observing longitudinal opinion shifts at a higher rate among the Hesitant Group in this survey call into account the value of continued and accessible attempts to provide accurate COVID-19 vaccine information to adults with disabilities. As previously discussed in the examination of vaccine and booster uptake among a majority of formerly-hesitant individuals, there is evidence that some combination of factors drove ideology shifts among the sample surveyed in this research. Identifying the specific elements that contributed to this shift could prove advantageous when considering how to increase vaccination rates among the population. For example, given that respondents in the Hesitant Group reported most frequently relying on health care professionals and friends and family for COVID-19 information, these two channels should be considered when designing materials that target misinformation in order to continue to incentivize people who have indicated some level of vaccine hesitance. When compared to the stage-based recommendations in the transtheoretical model of health behavior

¹⁷⁰ Tang and Santos, “A Brief Discussion and Application of Interpretative Phenomenological Analysis in the Field of Health Science and Public Health.”

change, the identification of population-specific barriers and/or misconceptions that exist around vaccination could continue to move more adults with disabilities into the action phase of receiving a COVID-19 vaccine and booster. However, responsive programming should also draw upon the study finding that there was a wider distribution of responses in regard to where and how often Hesitant Group members reported accessing information. This consideration would better ensure that misinformation does not continue to inform the creation of a subjective reality that is in disagreement with public health recommendations if hesitant individuals chose to turn to multiple information sources for COVID-19 vaccine guidance. Additionally, the previously-discussed Friends and Family Campaign from the AUCD National Center on Disability in Public Health might be an extremely beneficial tool when considering how to deconstruct COVID-19 vaccine misinformation implications through utilizing preexisting support systems and community-based interventions.

Another insight into how to effectively reach persistently vaccine hesitant adults with disabilities who may be experiencing hesitance as a result of misinformation exposure is revealed when examining the top “Big Reasons” for vaccine resistance within the unvaccinated sample, which included: the feeling that the vaccine/booster development was rushed, concerns over long- and short-term side effects, and wanting to wait and see how the vaccine worked for others. These hesitance rationales may be related to trust and/or confidence variables, as well as misinformation given the low levels of vaccine confidence—a term defined by the CDC as the belief that vaccines work, are safe, and are part of a trustworthy medical system¹⁷¹—that responses indicate. Increasing overall vaccine confidence should be considered as an underlying goal for public health officials when attempting to combat concerns over vaccine side effects and

¹⁷¹ CDC, “12 COVID-19 Vaccination Strategies for Your Community.”

development, and each of these “Big Reasons” may be able to be addressed through the continued production of education materials aimed at providing data that combats misinformation and encourages individuals to proactively seek the COVID-19 vaccine instead of waiting. Plain language and the use of visual aids may once again support this initiative through clearly refuting common misconceptions about the COVID-19 vaccine in an accessible manner, which could include translating the Myths & Facts about COVID-19 Vaccines guidance from the CDC (which contains information about vaccine development timelines and side effects) into a digital or printed communication resource.

Proposing programmatic solutions to the observed differences between political ideology and booster uptake, information sources, and COVID-19 knowledge and misinformation susceptibility scores may be challenging given the wide scope of political impact that was observed during pandemic response in the United States. However, the impact of political ideology on various survey measures might be linked to the social construction of reality framework due to the expansive impact of politics on lived experience in a wide variety of sectors, notably including health care provision and access. Although the influence of political viewpoints on vaccination decisions may be partially or fully addressed through some of the previously-discussed messaging and programming measures, an implementation of value-based policy making might help to guide the promotion of COVID-19 vaccines among adults with disabilities from a wide range of political backgrounds.

Value-based policy making could be especially effective when supplementing the evidence-based model that has been used to guide other COVID-19 response measures (e.g., vaccine mandates) through clearly relating various political values with policy or programmatic options to help ensure that individuals are more likely to consider the vaccination messaging or

tactic being presented.¹⁷² For example, because data from this study found that conservatives were less likely to receive a booster and less likely to trust governmental agencies, a value-based response could consider shifting the role of booster vaccination messaging away from national-level health authorities and towards other localized channels. Because there was also statistical significance associated with the relationship between conservatives and reporting family and friends as being the second-most important source for reliable COVID-19 vaccine information, an enactment of community-based messaging and interventions in geographic areas with a majority conservative-identifying population might be a plausible option.¹⁷³ Value-based public health practices could also address the finding that conservatives received lower average scores on the COVID-19 knowledge and misinformation susceptibility via informing the response of health care providers in historically conservative communities. This could take the form of increased engagement with patients to inquire about COVID-19 vaccine concerns, or through posting plain language print materials that utilize data to combat common misinformation in highly-trafficked office locations.

¹⁷² Shams et al., “Model for Value-Based Policy-Making in Health Systems.”

¹⁷³ Chu and Liu, “Integrating Health Behavior Theories to Predict American’s Intention to Receive a COVID-19 Vaccine.”

Conclusion

This study addressed knowledge gaps in the understanding of COVID-19 vaccine hesitancy among adults with disabilities by examining longitudinal hesitancy trends, information sources, and misinformation susceptibility among a sample of this population for the first time. Furthermore, findings provided additional insights into why COVID-19 vaccines and boosters were accepted or rejected, as well as supplemented prior research on the role of trust and political leaning in vaccination decisions. Results highlighted that a significant majority of previously-hesitant individuals had received at least one primary dose since April of 2021, but lower rates of booster uptake among both the Hesitant and Not Hesitant Groups presents a concerning trend in how adults with disabilities could be impacted by COVID-19 in the future if boosters are not prioritized. Given the high risk for severe illness and poor health outcomes among people with disabilities who are infected with the coronavirus, survey respondent indications that receiving booster vaccines was primarily motivated by critical events may lend insight into how to enact programmatic change to effectively encourage an increase in proactive booster vaccinations moving forward. Considering differences between how Hesitant and Not Hesitant Group members reported valuing and trusting information sources might also be advantageous when designing programming or policy implementations that could address the vaccination variances between groups, as well as to guide response to the finding that political ideology was associated with COVID-19 knowledge and misinformation susceptibility.

Recommendations from this project also utilized the transtheoretical model of health behavior change, the health belief model, and the social construction of reality framework to better understand how vaccine ideologies might have been informed. By conducting a synthesis of survey results through these conceptual tools, examples of methods to encourage vaccine and

booster uptake emerged via the consideration of plain language materials, community-oriented intervention models, value-based policy making, and leveraging the unique role of friends/family and health care professionals in messaging efforts. Although it was addressed that this study was limited by its use of a convenience sample, applying these approaches could be still be advantageous if observational data collection was used to target the impacts of tailored interventions among a population-based sample.

It is also necessary to acknowledge that finding evidence of public health disparity at any magnitude signifies the importance of considering its impacts, especially when observed among a marginalized group. Additionally, the use of vaccination as preventive health measure is most effective when there are high levels of trust and continued uptake among the *entire* population—a group that will never be completely accounted for without the adequate consideration of adults with disabilities in future COVID-19 response or other public health crisis strategy. It will only be through addressing past shortcomings and continuing to prioritize equity within research that the multidimensionality of COVID-19 vaccination decisions can be fully understood, and it is the collective responsibility of public health organizations and their constituents to be unrelenting in the advocacy for these practices.

Appendix

Item 1

Recruitment email used to contact eligible respondents for study participation

Hello,

You previously completed a survey on the COVID-19 vaccine in April 2021 that was conducted by the American Association on Health & Disability (AAHD) and had agreed to let us contact you with a follow-up survey. We would be grateful if you now completed this follow-up survey, which is available for access through the link below.

Group-specific Survey: [link here]

The average completion time of this survey is less than ten minutes. Alternate formats of the survey, such as large print or Braille, are available upon request.

If you have any questions, our AAHD team includes Devan McClain, an AAHD Policy Intern who can be reached at dmcclain@aahd.us, Dr. Charles Drum, Director of AAHD's Center on Research, Knowledge Translation, and Dissemination who can be reached at cdrum@aahd.us, and Dr. Jacob Ditsch, a postdoctoral Research Fellow at AAHD, who can be reached at jditsch@aahd.us.

Thank you.

Item 2

Complete list of survey questions (with logic) distributed to the Group 1 (hesitant) sample

Question Text & Available Answers	Logic, if applicable
<p>→ <i>Consent</i></p> <p>The American Association on Health & Disability (AAHD) and an AAHD Policy Intern from the University of Oregon are conducting an online survey to better understand the connections between information sources and COVID-19 vaccination decisions among people with disabilities. You are receiving this survey because you provided your contact information and indicated your willingness to participate</p>	<p>→ If [No], end survey.</p>

<p>following the AAHD COVID-19 and Vaccine Survey in April 2021. Participation is voluntary and you can stop at any time.</p> <p>This survey asks a series of disability-specific and general questions about COVID-19 vaccine decisions. The average completion time of this survey is less than ten minutes. Alternate formats of the survey, such as large print or Braille, are available upon request to jditsch@aahd.us.</p> <p>By completing this survey, you acknowledge that you are doing so consensually and can stop at any time. You can ask additional questions by contacting the Principal Investigator on this study, a student at the University of Oregon and an AAHD Policy Intern who can be reached at dmcclain@aahd.us. You can also contact Dr. Ditsch or Dr. Drum from AAHD for additional questions at jditsch@aahd.us or cdrum@aahd.us.</p> <p>Please indicate your willingness to proceed by selecting one of the two options below.</p> <ul style="list-style-type: none"> • Yes • No 	
<p>→ <i>Age</i></p> <p>How old are you?</p> <ul style="list-style-type: none"> • 17 or younger • 18-44 • 45-64 • 65 and over 	<p>→ If [17 or younger], end survey.</p>
<p>→ <i>Main Disability</i></p> <p>Some people have only one disability and some people have multiple disabilities. We want to know about the <i>MAIN</i> disability that you experience. What is your main disability? (Chose one)</p> <ul style="list-style-type: none"> • Deaf or Have Serious Difficulty Hearing • Blind or Have Serious Difficulty Seeing, Even When Wearing Glasses • Have Serious Difficulty Walking or Climbing Stairs • Because of a Physical, Mental, or Emotional Condition, Have Serious Difficulty Concentrating, Remembering, or Making Decisions • I do not have a disability 	<p>→ If [Because of a Physical, Mental, or Emotional Condition, Have Serious Difficulty Concentrating, Remembering, or Making Decisions], skip to <i>Cognition Follow-up</i>.</p> <p>→ If [I do not have a disability], end survey.</p>
<p>→ <i>Cognition Follow-up</i></p>	


<p>You answered that you have a disability (Because of a Physical, Mental, or Emotional Condition, Have Serious Difficulty Concentrating, Remembering, or Making Decisions).</p> <p>Is this due to (check one):</p> <ul style="list-style-type: none"> • An Emotional, Psychological, or Mental Health Disability? • An Intellectual Disability, Autism, Epilepsy, or Brain Injury? • Difficulty Reading, Writing, or Communicating? • Another Disability (such as Chronic Pain, Difficulty Sleeping, Medication Side Effects, or Other)? 	
<p>→ <i>Secondary Disabilities</i></p> <p>In addition to your main disability, do you experience other disabilities? (Choose all that apply)</p> <ul style="list-style-type: none"> • Hearing Disability • Vision Disability • Mobility Disability • Cognition Disability • I Do Not Have Multiple Disabilities 	
<p>→ <i>Gender Identity</i></p> <p>How would you describe your gender identity?</p> <ul style="list-style-type: none"> • Man • Woman • In Some Other Way • Prefer Not to Answer 	
<p>→ <i>Race/Ethnicity</i></p> <p>How would you describe your race/ethnicity? (Check all that apply)</p> <ul style="list-style-type: none"> • American Indian or Alaska Native • Asian or Asian American • Black or African American • Native Hawaiian or other Pacific Islander • White or Caucasian • Hispanic, Latino, or of Spanish Origin • Prefer not to Answer 	
<p>→ <i>Community</i></p> <p>How would you describe the community you live in?</p> <ul style="list-style-type: none"> • Urban • Suburban • Rural 	

<ul style="list-style-type: none"> • Frontier 	
<p>→ <i>Single Item Literacy Screener</i></p> <p>How often do you need to have someone help you when you read instructions, pamphlets, or other written material from your doctor or pharmacy? (Choose one)</p> <ul style="list-style-type: none"> • Never • Rarely • Sometimes • Often • Always 	
<p>→ <i>COVID Infections</i></p> <p>Have you ever tested positive for COVID-19?</p> <ul style="list-style-type: none"> • Yes • No 	<p>→ If [Yes], skip to <i>Long COVID-19 Symptoms</i>. → If [No], skip to <i>Vaccine Uptake</i>.</p>
<p>→ <i>Long COVID-19 Symptoms</i></p> <p>Long COVID or post-COVID is defined as previously having COVID-19 and still experiencing symptoms despite recovering.</p> <p>Have you experienced any of these signs and symptoms as a result of having COVID-19? (Check all that apply)</p> <ul style="list-style-type: none"> • Tiredness or fatigue affecting everyday life • Fever • Shortness of breath • Cough • Chest pain • Fast-beating or pounding heart • Difficulty thinking or concentrating • Headache • Difficulties sleeping • Dizziness • Pins-and-needles feeling (for example, in arms and legs or hands and feet) • Change in smell or taste • Depression or anxiety • Stomach pain or discomfort • Joint or muscle pain • Rash • Sickness or illness that gets worse after physical or mental effort • I have not experienced any of these symptoms as a result of COVID-19 	

<ul style="list-style-type: none"> • Other symptoms not listed 	
<p>→ <i>Vaccine Uptake</i></p> <p>In a previous survey by the American Association on Health & Disability (AAHD) in April 2021, you stated that you were not planning on getting a vaccine or you unsure about getting a vaccine for COVID-19. For the purpose of this question, we define being vaccinated as receiving your primary series of a vaccine (one or two shots depending on the manufacturer). This does NOT include getting COVID-19 booster(s).</p> <p>Since April of 2021, did you receive a single or two dose primary COVID-19 vaccination?</p> <ul style="list-style-type: none"> • Yes • No 	<p>→ If [Yes], skip to <i>Booster Uptake</i>.</p> <p>→ If [No], skip to <i>Did Not Get Vaccinated</i>.</p>
<p>→ <i>Booster Uptake</i></p> <p>Since April of 2021, did you receive any COVID-19 booster(s)?</p> <ul style="list-style-type: none"> • Yes • No 	<p>→ If [Yes], skip to <i>Vaccine & Booster Opinion Change</i>.</p> <p>→ If [No], skip to <i>Vaccine Opinion Change</i>.</p>
<p>→ <i>Vaccine Opinion Change</i></p> <p>You previously stated that you were not planning on getting a vaccine on our April 2021 survey. Please select all the reasons that led to you changing your mind on getting vaccinated.</p> <ul style="list-style-type: none"> • I now trust the safety and/or effectiveness of the COVID-19 vaccine on my disability. • I now trust the safety and/or effectiveness of the COVID-19 vaccine on my underlying health conditions. • I have received reliable information about the impact of the COVID-19 vaccine on my disability. • I have received reliable information about the impact of the COVID-19 vaccine on my underlying health conditions. • I became less worried about possible short-term side effects from the COVID-19 vaccine. • I became less worried about possible long-term side effects from the COVID-19 vaccine. • I am less hesitant towards vaccines in general. • I waited to see how the COVID-19 vaccine worked for other people. • I feel less strongly that the development of the COVID-19 vaccine was rushed. 	<p>→ Directed to skip to <i>Vaccine Side Effects (No booster)</i> after answering.</p>

<ul style="list-style-type: none"> • I got COVID-19 and wanted to protect myself from future infections. • I knew someone who got COVID-19. • I knew someone who got seriously ill or died from COVID-19. • My friends and/or family got the COVID-19 vaccine. • My health care provider encouraged me to get the COVID-19 vaccine. • I changed my opinion on the COVID-19 vaccine since it was first released. • There was a financial incentive to receive the COVID-19 vaccine. • The COVID-19 vaccine became more available to me. • The COVID-19 vaccine became more accessible to me. • My employer required the COVID-19 vaccine. • There are COVID-19 vaccine mandates where I live. • None of these reasons • Other (please specify) 	
<p>→ <i>Vaccine Side Effects (No booster)</i></p> <p>The following questions are asking about whether or not you experienced these side effects for the vaccine(s). (Check all that apply)</p> <ul style="list-style-type: none"> • Fever • Headache • Fatigue • Pain or soreness at the vaccine site • Chills • Swollen lymph nodes • Nausea and vomiting • Generally feeling unwell • I did not feel any side effects from the vaccine 	
<p>→ <i>Did Not Get Vaccinated</i></p> <p>Some people don't get vaccinated for a range of reasons. We would like to understand why you said NO to getting the COVID-19 vaccine. Please read the possible list of reasons why you're not getting vaccinated and tell us if it is not a reason, a little reason, or a big reason.</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p>Not a Reason</p> <input type="radio"/> </div> <div style="text-align: center;"> <p>Little Reason</p> <input type="radio"/> </div> <div style="text-align: center;"> <p>Big Reason</p> <input type="radio"/> </div> </div>	<p>→ Directed to <i>Vaccination Scenarios</i> after answering.</p>

<ul style="list-style-type: none"> • I am not getting vaccinated/boosted for COVID-19 because of my disability. • I am not getting vaccinated/boosted for COVID-19 because of my underlying health conditions. • I don't trust the safety and/or effectiveness of the COVID-19 vaccine/booster on my disability. • I don't trust the safety and/or effectiveness of the COVID-19 vaccine/booster on my underlying health conditions. • I have not received reliable information about the impact of the COVID-19 vaccine/booster on my disability. • I have not received reliable information about the impact of the COVID-19 vaccine/booster on my underlying health conditions. • I am worried about possible short-term side effects from the COVID-19 vaccine/booster. • I am worried about possible long-term side effects from the COVID-19 vaccine/booster. • I don't trust vaccines/boosters in general. • I want to wait and see how the COVID- 19 vaccine/booster works for other people. • I think that the development of the COVID-19 vaccine/booster was rushed. • I had a reaction or a side-effect from a previous dose of a COVID-19 vaccination, so I decided not to get another one. 	
<p>→ <i>Vaccination Scenarios</i></p> <p>Please read through the following scenarios and indicate whether or not you would receive a COVID-19 vaccination if they were to occur. [Yes/No].</p> <ul style="list-style-type: none"> • If I were to get COVID-19 and wanted to protect myself from future infections. • If I knew someone who got COVID-19. • If I knew someone who got seriously ill or died from COVID-19. • If my friends and/or family got the COVID-19 vaccine. • If my health care provider encouraged me to get the COVID-19 vaccine. • If there was a financial incentive to receive the COVID- 19 vaccine. • If the COVID-19 vaccine became more available to me. • If the COVID-19 vaccine became more accessible to me. • If my employer required the COVID- 19 vaccine. • If there were COVID- 19 vaccine mandates enacted where I live. 	

<ul style="list-style-type: none"> • Other (please specify) 	
<p>→ <i>Vaccine & Booster Opinion Change</i></p> <p>You previously stated that you were not planning on getting a vaccine on our April 2021 survey. Please select all the reasons that led to you changing your mind on getting vaccinated and/or boosted.</p> <div style="text-align: center;"> <p>COVID-19 COVID-19 Vaccine(s) Booster(s)</p>  </div> <ul style="list-style-type: none"> • I now trust the safety and/or effectiveness of the COVID-19 vaccine on my disability. • I now trust the safety and/or effectiveness of the COVID-19 vaccine on my underlying health conditions. • I have received reliable information about the impact of the COVID-19 vaccine on my disability. • I have received reliable information about the impact of the COVID-19 vaccine on my underlying health conditions. • I became less worried about possible short-term side effects from the COVID-19 vaccine. • I became less worried about possible long-term side effects from the COVID-19 vaccine. • I am less hesitant towards vaccines in general. • I waited to see how the COVID-19 vaccine worked for other people. • I feel less strongly that the development of the COVID-19 vaccine was rushed. • I got COVID-19 and wanted to protect myself from future infections. • I knew someone who got COVID-19. • I knew someone who got seriously ill or died from COVID-19. • My friends and/or family got the COVID-19 vaccine. • My health care provider encouraged me to get the COVID-19 vaccine. • I changed my opinion on the COVID-19 vaccine since it was first released. • There was a financial incentive to receive the COVID-19 vaccine. • The COVID-19 vaccine became more available to me. • The COVID-19 vaccine became more accessible to me. • My employer required the COVID-19 vaccine. • There are COVID-19 vaccine mandates where I live. 	<p>→ Directed to <i>Vaccine & Booster Side Effects</i> after answering.</p>

- None of these reasons
- Other (please specify)

→ *Vaccine & Booster Side Effects*

The following questions are asking about whether or not you experienced side effects from the vaccine(s) or booster(s). Please select YES for each side effect you have experienced or if you have not experienced ANY side effects.

COVID-19 COVID-19
Vaccine(s) Booster(s)

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

- Fever
- Headache
- Fatigue
- Pain or soreness at the vaccine/booster site
- Chills
- Swollen lymph nodes
- Nausea and vomiting
- Generally feeling unwell
- I did not experience any side effects

→ *Information Sources*

Please indicate how frequently you rely on each of the following sources for information on COVID-19 vaccines with 1 being Never and 5 being Always.

1 (Never)	2	3	4	5 (Always)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- Health care professionals (e.g., doctors, nurses, direct care workers)
- Governmental agencies (e.g., the CDC, local/regional public health authorities)
- Politicians (e.g., the President, mayors, governors, legislatures)
- Digital media sources (e.g., social media, webpages, online news, etc.)
- Traditional media sources (e.g., televised, print, or radio content)

- Friends/family
- Other

→ *Information Sources (Frequency of Reliance)*

We'd like to know more about the specific information sources that you trust for reliable information on the COVID-19 vaccine/booster. Please provide your three most important sources for COVID-19 information? (Rank the most important source as “1,” the second most important source as “2,” and the third most important source as “3”).

	Health care professionals	Governmental agencies	Politicians	Digital media sources	Traditional media sources	Friends/family	Other
Most Important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Second Most Important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Third Most Important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the most important information source, please state a specific source (e.g., Wall Street Journal, NPR, Instagram, etc.):

→ *COVID-19 Knowledge and Misinformation Susceptibility Index*

Please indicate whether the following general statements about COVID-19 are true or false.

- Vaccinated people can get COVID-19.
- A COVID-19 vaccine can make someone sick with COVID-19.
- Individuals with certain disabilities are at an increased risk for contracting COVID-19.
- Individuals with certain disabilities are at an increased risk having more severe COVID-19 illnesses.
- The COVID-19 vaccine is more dangerous than contracting COVID- 19.
- COVID-19 vaccine manufacturers skipped testing steps during the vaccine development process in order to provide the vaccine more quickly.
- Being vaccinated for COVID-19 reduces your risk of getting seriously ill from the virus.
- COVID-19 vaccines can alter a person’s DNA.
- COVID-19 vaccines cause virus variants.
- COVID-19 vaccines can cause infertility in women.
- The Chinese government created the COVID-19 virus.

<ul style="list-style-type: none"> • Ivermectin, a WHO approved anti- parasitic drug, is effective at treating COVID-19. • Hydroxychloroquine sulfate, an FDA approved anti- parasitic and immunosuppressive drug, is effective at treating COVID-19. 	
<p>→ <i>Trust in Information Sources</i></p> <p>Please indicate whether or not you agree with the following statements: [Agree/Disagree]</p> <ul style="list-style-type: none"> • I trust health care professionals to provide accurate information about COVID-19 vaccinations. • I trust governmental agencies provide accurate information about COVID-19 vaccinations. • I trust politicians to provide accurate information about COVID-19 vaccinations. • I trust digital media sources to provide accurate information about COVID-19 vaccinations. • I trust traditional media sources to provide accurate information about COVID-19 vaccinations. • I trust my family and friends to provide accurate information about COVID-19 vaccinations. 	
<p>→ <i>Political Leaning</i></p> <p>Please indicate how you would describe your political views:</p> <ul style="list-style-type: none"> • Liberal • Moderate • Conservative • Prefer not to answer 	

Item 3

Complete list of survey questions (with logic) distributed to the Group 2 (not hesitant) sample

Question Text & Available Answers	Logic, if applicable
<p>→ <i>Consent</i></p> <p>The American Association on Health & Disability (AAHD) and an AAHD Policy Intern from the University of Oregon are conducting an online survey</p>	<p>→ If [No], end survey.</p>

<p>to better understand the connections between information sources and COVID-19 vaccination decisions among people with disabilities. You are receiving this survey because you provided your contact information and indicated your willingness to participate following the AAHD COVID-19 and Vaccine Survey in April 2021. Participation is voluntary and you can stop at any time.</p> <p>This survey asks a series of disability-specific and general questions about COVID-19 vaccine decisions. The average completion time of this survey is less than ten minutes. Alternate formats of the survey, such as large print or Braille, are available upon request to jditsch@aahd.us.</p> <p>By completing this survey, you acknowledge that you are doing so consensually and can stop at any time. You can ask additional questions by contacting the Principal Investigator on this study, a student at the University of Oregon and an AAHD Policy Intern who can be reached at dmclain@aahd.us. You can also contact Dr. Ditsch or Dr. Drum from AAHD for additional questions at jditsch@aahd.us or cdrum@aahd.us.</p> <p>Please indicate your willingness to proceed by selecting one of the two options below.</p> <ul style="list-style-type: none"> • Yes • No 	
<p>→ <i>Age</i></p> <p>How old are you?</p> <ul style="list-style-type: none"> • 17 or younger • 18-44 • 45-64 • 65 and over 	<p>→ If [17 or younger], end survey.</p>
<p>→ <i>Main Disability</i></p> <p>Some people have only one disability and some people have multiple disabilities. We want to know about the <i>MAIN</i> disability that you experience. What is your main disability? (Chose one)</p> <ul style="list-style-type: none"> • Deaf or Have Serious Difficulty Hearing • Blind or Have Serious Difficulty Seeing, Even When Wearing Glasses • Have Serious Difficulty Walking or Climbing Stairs • Because of a Physical, Mental, or Emotional Condition, Have Serious Difficulty Concentrating, Remembering, or Making Decisions • I do not have a disability 	<p>→ If [Because of a Physical, Mental, or Emotional Condition, Have Serious Difficulty Concentrating, Remembering, or Making Decisions], skip to</p>

	<p><i>Cognition Follow-up.</i> → If [I do not have a disability], end survey.</p>
<p>→ <i>Cognition Follow-up</i></p> <p>You answered that you have a disability (Because of a Physical, Mental, or Emotional Condition, Have Serious Difficulty Concentrating, Remembering, or Making Decisions). Is this due to (check one):</p> <ul style="list-style-type: none"> • An Emotional, Psychological, or Mental Health Disability? • An Intellectual Disability, Autism, Epilepsy, or Brain Injury? • Difficulty Reading, Writing, or Communicating? • Another Disability (such as Chronic Pain, Difficulty Sleeping, Medication Side Effects, or Other)? 	
<p>→ <i>Secondary Disabilities</i></p> <p>In addition to your main disability, do you experience other disabilities? (Choose all that apply)</p> <ul style="list-style-type: none"> • Hearing Disability • Vision Disability • Mobility Disability • Cognition Disability • I Do Not Have Multiple Disabilities 	
<p>→ <i>Gender Identity</i></p> <p>How would you describe your gender identity?</p> <ul style="list-style-type: none"> • Man • Woman • In Some Other Way • Prefer Not to Answer 	
<p>→ <i>Race/Ethnicity</i></p> <p>How would you describe your race/ethnicity? (Check all that apply)</p> <ul style="list-style-type: none"> • American Indian or Alaska Native • Asian or Asian American • Black or African American • Native Hawaiian or other Pacific Islander 	

<ul style="list-style-type: none"> • White or Caucasian • Hispanic, Latino, or of Spanish Origin • Prefer not to Answer 	
<p>→ <i>Community</i></p> <p>How would you describe the community you live in?</p> <ul style="list-style-type: none"> • Urban • Suburban • Rural • Frontier 	
<p>→ <i>Single Item Literacy Screener</i></p> <p>How often do you need to have someone help you when you read instructions, pamphlets, or other written material from your doctor or pharmacy? (Choose one)</p> <ul style="list-style-type: none"> • Never • Rarely • Sometimes • Often • Always 	
<p>→ <i>COVID Infections</i></p> <p>Have you ever tested positive for COVID-19?</p> <ul style="list-style-type: none"> • Yes • No 	<p>→ If [Yes], skip to <i>Long COVID-19 Symptoms</i>. → If [No], skip to <i>Vaccine Uptake</i>.</p>
<p>→ <i>Long COVID-19 Symptoms</i></p> <p>Long COVID or post-COVID is defined as previously having COVID-19 and still experiencing symptoms despite recovering. Have you experienced any of these signs and symptoms as a result of having COVID-19? (Check all that apply)</p> <ul style="list-style-type: none"> • Tiredness or fatigue affecting everyday life • Fever • Shortness of breath • Cough • Chest pain • Fast-beating or pounding heart • Difficulty thinking or concentrating 	

<ul style="list-style-type: none"> • Headache • Difficulties sleeping • Dizziness • Pins-and-needles feeling (for example, in arms and legs or hands and feet) • Change in smell or taste • Depression or anxiety • Stomach pain or discomfort • Joint or muscle pain • Rash • Sickness or illness that gets worse after physical or mental effort • I have not experienced any of these symptoms as a result of COVID-19 • Other symptoms not listed 	
<p>→ <i>Vaccine Uptake</i></p> <p>In a previous survey by the American Association on Health & Disability (AAHD) in April 2021, you stated that you had already been vaccinated for COVID-19 or were planning on getting vaccinated for COVID-19. For the purpose of this question, we define being vaccinated for COVID-19 as receiving your primary series of a vaccine (one or two shots depending on the manufacturer). This does NOT include getting COVID-19 booster(s). Since April of 2021, did you receive a single or two dose primary COVID-19 vaccination?</p> <ul style="list-style-type: none"> • No, I was already vaccinated by April 2021 • Yes, I have received a COVID-19 vaccination since April 2021 • No, I did not get vaccinated 	<p>→ If [Yes, I have received a COVID-19 vaccination since April 2021] OR [No, I was already vaccinated by April 2021], skip to <i>Booster Uptake</i>. → If [No, I did not get vaccinated], skip to <i>Did Not Get Vaccinated</i>.</p>
<p>→ <i>Booster Uptake</i></p> <p>Since April of 2021, did you receive any COVID-19 booster(s)?</p> <ul style="list-style-type: none"> • Yes • No 	<p>→ If [Yes], skip to <i>Vaccine & Booster Decision-Making</i>. → If [No], skip to <i>Vaccine Decision-Making</i>.</p>

<p>→ <i>Vaccine Decision-Making</i></p> <p>Why did you make the decision to be vaccinated for COVID-19? (Choose all that apply).</p> <ul style="list-style-type: none"> • I got COVID-19 and wanted to protect myself from future infections. • I knew someone who got COVID-19. • I knew someone who got seriously ill or died from COVID-19. • My friends and/or family got the COVID-19 vaccine. • My health care provider encouraged me to get the COVID-19 vaccine. • I changed my opinion on the COVID-19 vaccine since it was first released. • There was a financial incentive to receive the COVID-19 vaccine. • The COVID-19 vaccine became more available to me. • The COVID-19 vaccine became more accessible to me. • My employer required the COVID-19 vaccine. • There are COVID-19 vaccine mandates where I live. • None of these reasons • Other (please specify) 	<p>→ Directed to <i>Vaccine Side Effects (No booster)</i> after answering.</p>
<p>→ <i>Vaccine Side Effects (No booster)</i></p> <p>The following questions are asking about whether or not you experienced these side effects for the vaccine(s). (Check all that apply)</p> <ul style="list-style-type: none"> • Fever • Headache • Fatigue • Pain or soreness at the vaccine site • Chills • Swollen lymph nodes • Nausea and vomiting • Generally feeling unwell • I did not feel any side effects from the vaccine 	<p>→ Directed to <i>Did Not Get Boosted</i> after answering.</p>
<p>→ <i>Did Not Get Vaccinated</i></p> <p>You previously stated that you were planning on getting a vaccine on our April 2021 survey. We would like to understand why you said NO to getting the COVID-19 vaccine. Please read the possible list of reasons why you're not getting vaccinated and tell us if it is not a reason, a little reason, or a big reason.</p>	<p>→ Directed to <i>Vaccination Scenarios</i> after answering.</p>

Not a Reason	Little Reason	Big Reason	
○	○	○	
<ul style="list-style-type: none"> • I am not getting vaccinated/boosted for COVID-19 because of my disability. • I am not getting vaccinated/boosted for COVID-19 because of my underlying health conditions. • I don't trust the safety and/or effectiveness of the COVID-19 vaccine/booster on my disability. • I don't trust the safety and/or effectiveness of the COVID-19 vaccine/booster on my underlying health conditions. • I have not received reliable information about the impact of the COVID-19 vaccine/booster on my disability. • I have not received reliable information about the impact of the COVID-19 vaccine/booster on my underlying health conditions. • I am worried about possible short-term side effects from the COVID-19 vaccine/booster. • I am worried about possible long-term side effects from the COVID-19 vaccine/booster. • I don't trust vaccines/boosters in general. • I want to wait and see how the COVID-19 vaccine/booster works for other people. • I think that the development of the COVID-19 vaccine/booster was rushed. • I had a reaction or a side-effect from a previous dose of a COVID-19 vaccination, so I decided not to get another one. 			
<p>→ <i>Vaccination Scenarios</i></p> <p>Please read through the following scenarios and indicate whether or not you would receive a COVID-19 vaccination if they were to occur. [Yes/No].</p> <ul style="list-style-type: none"> • If I were to get COVID-19 and wanted to protect myself from future infections. • If I knew someone who got COVID-19. • If I knew someone who got seriously ill or died from COVID-19. • If my friends and/or family got the COVID-19 vaccine. • If my health care provider encouraged me to get the COVID-19 vaccine. • If there was a financial incentive to receive the COVID-19 vaccine. 			

<ul style="list-style-type: none"> • If the COVID-19 vaccine became more available to me. • If the COVID-19 vaccine became more accessible to me. • If my employer required the COVID- 19 vaccine. • If there were COVID- 19 vaccine mandates enacted where I live. • Other (please specify) 							
<p>→ <i>Did Not Get Boosted</i></p> <p>You previously stated that you were vaccinated for COVID-19. We would like to understand why you said NO to getting the COVID-19 booster despite being vaccinated. Please read the possible list of reasons why you're not getting boosted and tell us if it is not a reason, a little reason, or a big reason.</p> <table border="0" style="width: 100%; text-align: center;"> <thead> <tr> <th data-bbox="203 703 544 745">Not a Reason</th> <th data-bbox="544 703 1015 745">Little Reason</th> <th data-bbox="1015 703 1421 745">Big Reason</th> </tr> </thead> <tbody> <tr style="background-color: #e0e0e0;"> <td data-bbox="203 745 544 945"><input type="radio"/></td> <td data-bbox="544 745 1015 945"><input type="radio"/></td> <td data-bbox="1015 745 1421 945"><input type="radio"/></td> </tr> </tbody> </table> <ul style="list-style-type: none"> • I am not getting boosted for COVID-19 because of my disability. • I am not getting boosted for COVID-19 because of my underlying health conditions. • I don't trust the safety and/or effectiveness of the COVID-19 booster on my disability. • I don't trust the safety and/or effectiveness of the COVID-19 booster on my underlying health conditions. • I have not received reliable information about the impact of the COVID-19 booster on my disability. • I have not received reliable information about the impact of the COVID-19 booster on my underlying health conditions. • I am worried about possible short-term side effects from the COVID-19 booster. • I am worried about possible long-term side effects from the COVID-19 booster. • I don't trust boosters in general. • I want to wait and see how the COVID- 19 booster works for other people. • I think that the development of the COVID-19 booster was rushed. • I had a reaction or a side-effect from a previous dose of a COVID-19 vaccination, so I decided not to get a booster. 	Not a Reason	Little Reason	Big Reason	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Not a Reason	Little Reason	Big Reason					
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
<p>→ <i>Vaccine & Booster Decision-Making</i></p>	<p>→ Directed to <i>Vaccine &</i></p>						

<p>You previously stated that you were not planning on getting a vaccine on our April 2021 survey. Please select all the reasons that led to you changing your mind on getting vaccinated and/or boosted.</p> <p style="text-align: center;"> COVID-19 Vaccine(s) COVID-19 Booster(s) <input type="checkbox"/> <input type="checkbox"/> </p> <ul style="list-style-type: none"> • I got COVID-19 and wanted to protect myself from future infections. • I knew someone who got COVID-19. • I knew someone who got seriously ill or died from COVID-19. • My friends and/or family got the COVID-19 vaccine. • My health care provider encouraged me to get the COVID-19 vaccine. • I changed my opinion on the COVID-19 vaccine since it was first released. • There was a financial incentive to receive the COVID-19 vaccine. • The COVID-19 vaccine became more available to me. • The COVID-19 vaccine became more accessible to me. • My employer required the COVID-19 vaccine. • There are COVID-19 vaccine mandates where I live. • None of these reasons • Other (please specify) 	<p><i>Booster Side Effects</i> after answering.</p>
<p>→ <i>Vaccine & Booster Side Effects</i></p> <p>The following questions are asking about whether or not you experienced side effects from the vaccine(s) or booster(s). Please select YES for each side effect you have experienced or if you have not experienced ANY side effects.</p> <p style="text-align: center;"> COVID-19 Vaccine(s) COVID-19 Booster(s) <input type="checkbox"/> <input type="checkbox"/> </p> <ul style="list-style-type: none"> • Fever • Headache • Fatigue • Pain or soreness at the vaccine/booster site • Chills • Swollen lymph nodes • Nausea and vomiting • Generally feeling unwell • I did not experience any side effects 	

→ *Information Sources*

Please indicate how frequently you rely on each of the following sources for information on COVID-19 vaccines with 1 being Never and 5 being Always.

1 (Never)	2	3	4	5 (Always)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- Health care professionals (e.g., doctors, nurses, direct care workers)
- Governmental agencies (e.g., the CDC, local/regional public health authorities)
- Politicians (e.g., the President, mayors, governors, legislatures)
- Digital media sources (e.g., social media, webpages, online news, etc.)
- Traditional media sources (e.g., televised, print, or radio content)
- Friends/family
- Other

→ *Information Sources (Frequency of Reliance)*

We'd like to know more about the specific information sources that you trust for reliable information on the COVID-19 vaccine/booster. Please provide your three most important sources for COVID-19 information? (Rank the most important source as “1,” the second most important source as “2,” and the third most important source as “3”).

	Health care professionals	Governmental agencies	Politicians	Digital media sources	Traditional media sources	Friends/family	Other
Most Important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Second Most Important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Third Most Important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the most important information source, please state a specific source (e.g., Wall Street Journal, NPR, Instagram, etc.): _____

→ *COVID-19 Knowledge and Misinformation Susceptibility Index*

Please indicate whether the following general statements about COVID-19 are true or false.

- Vaccinated people can get COVID-19.

<ul style="list-style-type: none"> • A COVID-19 vaccine can make someone sick with COVID-19. • Individuals with certain disabilities are at an increased risk for contracting COVID-19. • Individuals with certain disabilities are at an increased risk having more severe COVID-19 illnesses. • The COVID-19 vaccine is more dangerous than contracting COVID-19. • COVID-19 vaccine manufacturers skipped testing steps during the vaccine development process in order to provide the vaccine more quickly. • Being vaccinated for COVID-19 reduces your risk of getting seriously ill from the virus. • COVID-19 vaccines can alter a person’s DNA. • COVID-19 vaccines cause virus variants. • COVID-19 vaccines can cause infertility in women. • The Chinese government created the COVID-19 virus. • Ivermectin, a WHO approved anti- parasitic drug, is effective at treating COVID-19. • Hydroxychloroquine sulfate, an FDA approved anti- parasitic and immunosuppressive drug, is effective at treating COVID-19. 	
<p>→ <i>Trust in Information Sources</i></p> <p>Please indicate whether or not you agree with the following statements: [Agree/Disagree]</p> <ul style="list-style-type: none"> • I trust health care professionals to provide accurate information about COVID-19 vaccinations. • I trust governmental agencies provide accurate information about COVID-19 vaccinations. • I trust politicians to provide accurate information about COVID-19 vaccinations. • I trust digital media sources to provide accurate information about COVID-19 vaccinations. • I trust traditional media sources to provide accurate information about COVID-19 vaccinations. • I trust my family and friends to provide accurate information about COVID-19 vaccinations. 	
<p>→ <i>Political Leaning</i></p> <p>Please indicate how you would describe your political views:</p> <ul style="list-style-type: none"> • Liberal • Moderate 	

<ul style="list-style-type: none"> • Conservative • Prefer not to answer 	
--	--

Table 1.2

Cognition-Specific Identifies Among Respondents with a Primary Disability Because of a Physical, Mental, or Emotional Condition, Have Serious Difficulty Concentrating, Remembering, or Making Decisions

Cognition-specific identifiers	<i>n</i>	Percent
Emotional, Psychological, or Mental Health Disability	32	28.3
Intellectual Disability, Autism, Epilepsy, or Brain Injury	58	51.3
Difficulty Reading, Writing, or Communicating	3	2.7
Another Disability (such as Chronic Pain, Difficulty Sleeping, Medication Side Effects, or Other)	20	17.7

Note. To account for the wide array of disabilities included within the “Cognition” identifier, respondents were asked to select one specific contributor.

Table 1.3

Frequency of Secondary Disabilities in Participant Sample

Secondary disability	<i>Number of responses</i>
Hearing	53
Vision	45
Mobility	140
Cognition	99
No secondary disabilities	103

Note. In addition to asking respondents to identify a main disability, another survey item asked about other disabilities. This question permitted respondents to choose all secondary disabilities that applied, or to indicate that they did not have any secondary disabilities.

Figure 1.2

Remaining COVID-19 Primary Dose Vaccination Rationales Among Respondents in Group 1 (Hesitant) by Percentage of Total Responses

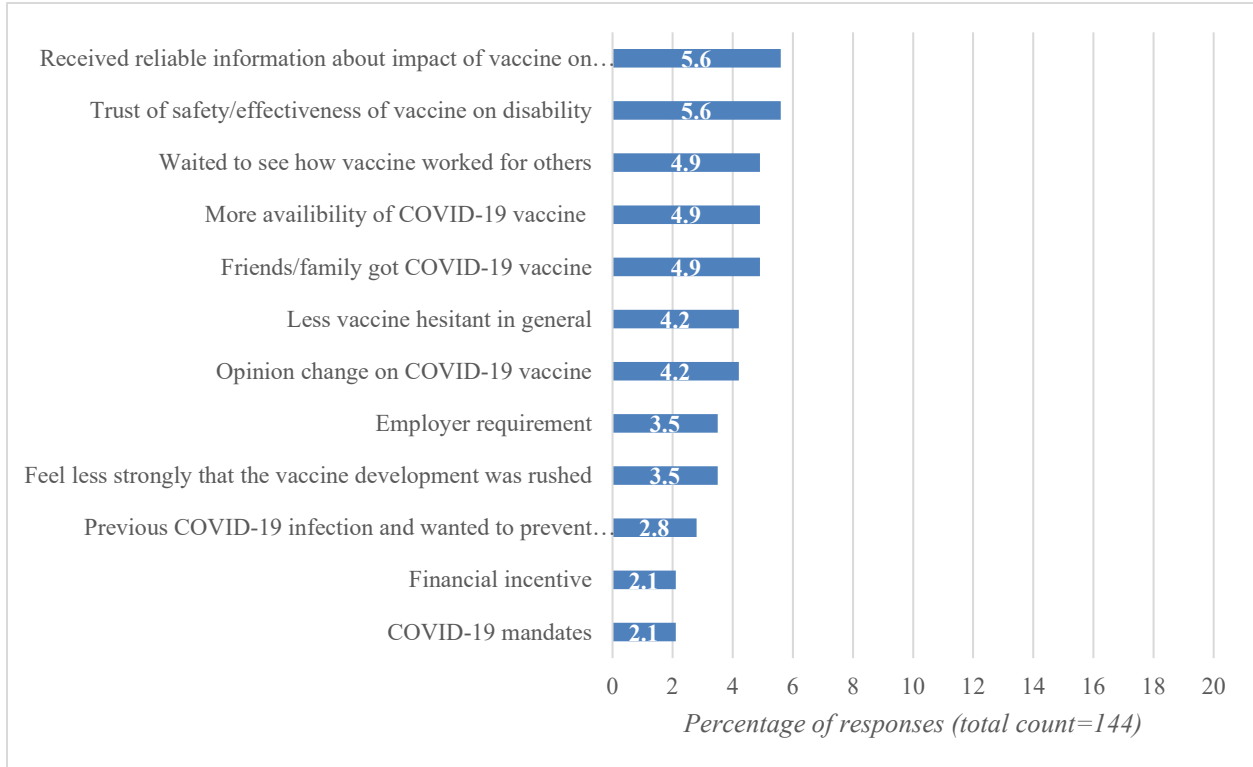


Figure 2.2

Remaining COVID-19 Primary Dose Vaccination Rationales Among Respondents in Group 2 (Not Hesitant) by Percentage of Total Responses

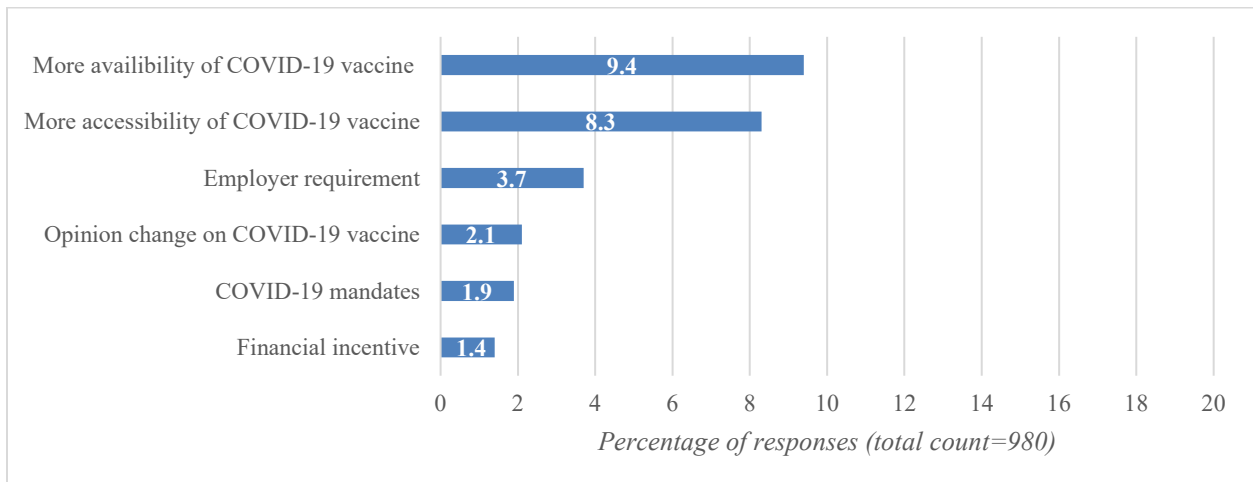
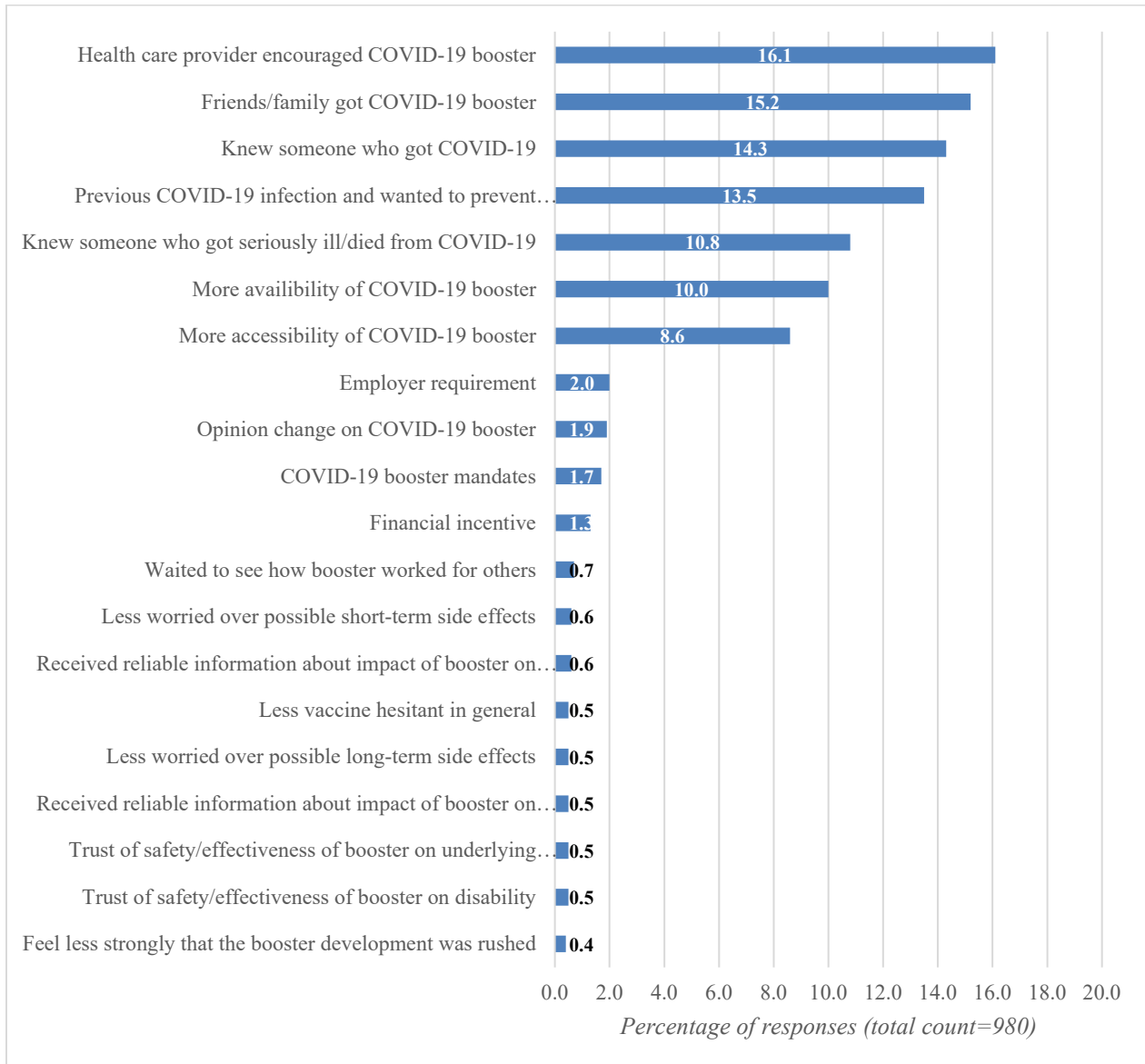


Figure 11

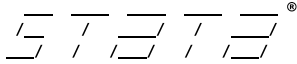
COVID-19 Booster Dose Vaccination Rationales Among Respondents in Both the Hesitant and Not Hesitant Groups by Percentage of Total Responses



Item 4

List of statistical tests and outputs from results analysis

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17.0
BE-Basic Edition

Statistics and Data Science

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Notes:

1. Unicode is supported; see [help_unicode_advice](#).

```
1 . do "/var/folders/ws/b9jvlln53p9g0hwtl3q4gcm0000gn/T//SD93652.000000"  
2 . *generating results output for thesis appendix  
3 .  
4 . use "/Users/devanmcclain/Dropbox (University of Oregon)/disability_vaccine_hesistancy/Data_Stata Materials/  
  > Combined_Groups_Devan.dta", clear  
5 .  
6 . *vaccine and booster uptake by group  
7 . tab vaccinated group, chi2
```

vaccinated	group		Total
	1	2	
0	9	3	12
1	23	277	300
Total	32	280	312

Pearson chi2(1) = 56.8341 Pr = 0.000

```
8 . pwcorr vaccinated group1 group2, sig star(0.05)
```

	vaccin~d	group1	group2
vaccinated	1.0000		
group1	-0.4268*	1.0000	
	0.0000		
group2	0.4268*	-1.0000	1.0000
	0.0000	1.0000	

```
9 . tab booster group, chi2
```

booster	group		Total
	1	2	



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0	9	18	27
1	14	259	273
Total	23	277	300

Pearson chi2(1) = 27.6119 Pr = 0.000

10 . pwcorr booster group1 group2, sig star(0.05)

	booster	group1	group2
booster	1.0000		
group1	-0.3034* 0.0000	1.0000	
group2	0.3034* 0.0000	-1.0000 1.0000	1.0000

11 .

12 . *COVID infections by group

13 . tab COVIDinfection group, chi2

Have you ever tested positive for COVID-19?	group		Total
	1	2	
No	21	145	166
Yes	11	135	146
Total	32	280	312

Pearson chi2(1) = 2.2092 Pr = 0.137

14 .

15 . *information sources by group

16 . tab infoFIRST group, chi2

infoFIRST	group		Total
	1	2	
Digital media sources	2	5	7
Friends/family	6	20	26
Governmental agencies	2	30	32
Health care profess..	11	194	205
Other	4	11	15
Traditional media s..	2	2	4
Total	27	262	289

Pearson chi2(5) = 26.1574 Pr = 0.000

17 . tab health1st group, chi2

infoFIRST= |



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=Health care profession als	group		Total
	1	2	
0	16	68	84
1	11	194	205
Total	27	262	289

Pearson chi2(1) = 13.1689 Pr = 0.000

18 . pwcorr health1st group1 group2, sig star(0.05)

	health~t	group1	group2
health1st	1.0000		
group1	-0.2135* 0.0003	1.0000	
group2	0.2135* 0.0003	-1.0000 1.0000	1.0000

19 . tab gov1st group, chi2

infoFIRST= =Governmen tal agencies	group		Total
	1	2	
0	25	232	257
1	2	30	32
Total	27	262	289

Pearson chi2(1) = 0.4063 Pr = 0.524

20 . tab digital1st group, chi2

infoFIRST= =Digital media sources	group		Total
	1	2	
0	25	257	282
1	2	5	7
Total	27	262	289

Pearson chi2(1) = 3.1317 Pr = 0.077

21 . pwcorr digital1st group1 group2, sig star(0.05)

	digita~t	group1	group2
digital1st	1.0000		



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group1	0.1041	1.0000	
	0.0773		
group2	-0.1041	-1.0000	1.0000
	0.0773	1.0000	

22 . tab traditional1s group, chi2

infoFIRST= =Tradition al media sources	group		Total
	1	2	
0	25	260	285
1	2	2	4
Total	27	262	289

Pearson chi2(1) = 7.9163 Pr = 0.005

23 . pwcorr traditional1st group1 group2, sig star(0.05)

	tradit~t	group1	group2
traditiona~t	1.0000		
group1	0.1655*	1.0000	
	0.0048		
group2	-0.1655*	-1.0000	1.0000
	0.0048	1.0000	

24 . tab friendsfam1st group, chi2

infoFIRST= =Friends/f amily	group		Total
	1	2	
0	21	242	263
1	6	20	26
Total	27	262	289

Pearson chi2(1) = 6.3630 Pr = 0.012

25 . pwcorr friendsfam1st group1 group2, sig star(0.05)

	friend~t	group1	group2
friendsfam~t	1.0000		
group1	0.1484*	1.0000	
	0.0116		
group2	-0.1484*	-1.0000	1.0000



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0.0116 1.0000

26 . tab infoSECOND group, chi2

infoSECOND	group		Total
	1	2	
Digital media sources	3	18	21
Friends/family	5	45	50
Governmental agencies	6	126	132
Health care profess..	10	45	55
Other	0	8	8
Politicians	0	1	1
Traditional media s..	3	12	15
Total	27	255	282

Pearson chi2(6) = 11.9474 Pr = 0.063

27 . tab infoTHIRD group, chi2

infoTHIRD	group		Total
	1	2	
Digital media sources	3	31	34
Friends/family	3	50	53
Governmental agencies	6	34	40
Health care profess..	3	11	14
Other	4	22	26
Politicians	5	35	40
Traditional media s..	3	59	62
Total	27	242	269

Pearson chi2(6) = 7.2304 Pr = 0.300

28 .

29 . *relationship between information and vaccines

30 . tab infoFIRST vaccinated,chi2

infoFIRST	vaccinated		Total
	0	1	
Digital media sources	1	6	7
Friends/family	2	24	26
Governmental agencies	0	32	32
Health care profess..	6	199	205
Other	1	14	15
Traditional media s..	0	4	4
Total	10	279	289

Pearson chi2(5) = 5.7764 Pr = 0.329

31 . tab infoFIRST booster,chi2

infoFIRST	booster		Total
	0	1	



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Digital media sources	1	5	6
Friends/family	3	21	24
Governmental agencies	1	31	32
Health care profess..	14	185	199
Other	5	9	14
Traditional media s..	2	2	4
Total	26	253	279

Pearson chi2(5) = 22.7277 Pr = 0.000

32 . tab health1st booster, chi2

infoFIRST= =Health care profession als	booster		Total
	0	1	
0	12	68	80
1	14	185	199
Total	26	253	279

Pearson chi2(1) = 4.2836 Pr = 0.038

33 . pwcorr health1st booster, sig star(0.05)

	health~t	booster
health1st	1.0000	
booster	0.1239* 0.0386	1.0000

34 . tab gov1st booster, chi2

infoFIRST= =Governmen tal agencies	booster		Total
	0	1	
0	25	222	247
1	1	31	32
Total	26	253	279

Pearson chi2(1) = 1.6410 Pr = 0.200

35 . tab digital1st booster, chi2

infoFIRST= =Digital media sources	booster		Total
	0	1	
0	25	248	273
1	1	5	6



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	0	1	Total
Total	26	253	279

Pearson chi2(1) = 0.3917 Pr = 0.531

36 . tab traditional1st booster, chi2

infoFIRST= =Traditional media sources	booster		Total
	0	1	
0	24	251	275
1	2	2	4
Total	26	253	279

Pearson chi2(1) = 7.9475 Pr = 0.005

37 . pwcorr traditional1st booster, sig star(0,05)

	tradit~t	booster
traditiona~t	1.0000	
booster	-0.1688* 0.0047	1.0000

38 . tab digital1st booster, chi2

infoFIRST= =Digital media sources	booster		Total
	0	1	
0	25	248	273
1	1	5	6
Total	26	253	279

Pearson chi2(1) = 0.3917 Pr = 0.531

39 . tab friendsfam1st booster, chi2

infoFIRST= =Friends/f amily	booster		Total
	0	1	
0	23	232	255
1	3	21	24
Total	26	253	279

Pearson chi2(1) = 0.3144 Pr = 0.575

40 .

41 . *trust in information sources by group

42 . tab trusthealthnum group, chi2



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trusthealth hnum	group		Total
	1	2	
0	9	15	24
1	18	248	266
Total	27	263	290

Pearson chi2(1) = 24.6254 Pr = 0.000

43 . pwcorr trusthealthnum group1 group2, sig star(0.05)

	trusth~m	group1	group2
trusthealth~m	1.0000		
group1	-0.2914* 0.0000	1.0000	
group2	0.2914* 0.0000	-1.0000 1.0000	1.0000

44 . tab trustgovnum group, chi2

trustgovnu m	group		Total
	1	2	
0	14	66	80
1	13	197	210
Total	27	263	290

Pearson chi2(1) = 8.7756 Pr = 0.003

45 . pwcorr trustgovnum group1 group2, sig star(0.05)

	trustg~m	group1	group2
trustgovnum	1.0000		
group1	-0.1740* 0.0030	1.0000	
group2	0.1740* 0.0030	-1.0000 1.0000	1.0000

46 . tab trustpoliticiansnum group, chi2

trustpolit iciansnum	group		Total
	1	2	
0	25	234	259
1	2	29	31
Total	27	263	290



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Pearson chi2(1) = 0.3360 Pr = 0.562

47 . tab trustdigitalnum group, chi2

trustdigit alnum	group		Total
	1	2	
0	20	201	221
1	7	62	69
Total	27	263	290

Pearson chi2(1) = 0.0747 Pr = 0.785

48 . tab trusttraditionalnum group, chi2

trusttradi tionalnum	group		Total
	1	2	
0	15	120	135
1	12	143	155
Total	27	263	290

Pearson chi2(1) = 0.9700 Pr = 0.325

49 . tab trustfriendfamnum group, chi2

trustfrien dfamnum	group		Total
	1	2	
0	12	127	139
1	15	136	151
Total	27	263	290

Pearson chi2(1) = 0.1450 Pr = 0.703

50 .

51 . *relationship between misinformation and vaccines

52 . ttest COVIDknowledge, by (vaccinated) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	12	8	1.180652	4.089899	5.401402	10.5986
1	300	10.23	.173595	3.006754	9.888377	10.57162
Combined	312	10.14423	.1742003	3.076991	9.80147	10.48699
diff		-2.23	1.193346		-4.843185	.3831852

diff = mean(0) - mean(1) t = -1.8687
H0: diff = 0 Satterthwaite's degrees of freedom = 11.4806

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0437 Pr(|T| > |t|) = 0.0874 Pr(T > t) = 0.9563



53 . ttest COVIDknowledge, by (booster) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	27	9.148148	.6194927	3.218979	7.874763	10.42153
1	273	10.337	.1797418	2.969821	9.983134	10.69086
Combined	300	10.23	.173595	3.006754	9.888377	10.57162
diff		-1.188848	.6450413		-2.50522	.127524

diff = mean(0) - mean(1) t = -1.8431
H0: diff = 0 Satterthwaite's degrees of freedom = 30.5411
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0375 Pr(|T| > |t|) = 0.0750 Pr(T > t) = 0.9625

54 .
55 . *relationship between misinformation and information sources
56 . ttest COVIDknowledge, by(health1st) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	84	10.38095	.2488671	2.280904	9.885966	10.87594
1	205	10.91707	.1209312	1.731471	10.67864	11.15551
Combined	289	10.76125	.1128796	1.918953	10.53907	10.98342
diff		-.5361208	.2766933		-1.083774	.0115322

diff = mean(0) - mean(1) t = -1.9376
H0: diff = 0 Satterthwaite's degrees of freedom = 124.011
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0275 Pr(|T| > |t|) = 0.0549 Pr(T > t) = 0.9725

57 . ttest COVIDknowledge, by(gov1st) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	257	10.73152	.1223251	1.961021	10.49063	10.97241
1	32	11	.2731241	1.545023	10.44296	11.55704
Combined	289	10.76125	.1128796	1.918953	10.53907	10.98342
diff		-.2684825	.2992661		-.8714348	.3344698

diff = mean(0) - mean(1) t = -0.8971
H0: diff = 0 Satterthwaite's degrees of freedom = 44.4673
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.1872 Pr(|T| > |t|) = 0.3745 Pr(T > t) = 0.8128

58 . ttest COVIDknowledge, by(digital1st) unequal



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```
Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	282	10.76241	.1140693	1.915549	10.53787	10.98695
1	7	10.71429	.8370665	2.21467	8.666058	12.76251
Combined	289	10.76125	.1128796	1.918953	10.53907	10.98342
diff		.0481256	.844803		-2.001066	2.097317

diff = mean(0) - mean(1) t = 0.0570
H0: diff = 0 Satterthwaite's degrees of freedom = 6.22487

Ha: diff < 0 Pr(T < t) = 0.5218
Ha: diff != 0 Pr(|T| > |t|) = 0.9564
Ha: diff > 0 Pr(T > t) = 0.4782

59 . ttest COVIDknowledge, by(traditional1st) unequal

```
Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	285	10.76491	.1139649	1.923949	10.54059	10.98924
1	4	10.5	.8660254	1.732051	7.743921	13.25608
Combined	289	10.76125	.1128796	1.918953	10.53907	10.98342
diff		.2649123	.8734918		-2.462596	2.99242

diff = mean(0) - mean(1) t = 0.3033
H0: diff = 0 Satterthwaite's degrees of freedom = 3.10479

Ha: diff < 0 Pr(T < t) = 0.6096
Ha: diff != 0 Pr(|T| > |t|) = 0.7809
Ha: diff > 0 Pr(T > t) = 0.3904

60 . ttest COVIDknowledge, by(friendsfam1st) unequal

```
Two-sample t test with unequal variances
```

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	263	10.89354	.1063275	1.724342	10.68417	11.1029
1	26	9.423077	.5952972	3.035432	8.197039	10.64911
Combined	289	10.76125	.1128796	1.918953	10.53907	10.98342
diff		1.470459	.6047183		.228846	2.712072

diff = mean(0) - mean(1) t = 2.4316
H0: diff = 0 Satterthwaite's degrees of freedom = 26.618

Ha: diff < 0 Pr(T < t) = 0.9890
Ha: diff != 0 Pr(|T| > |t|) = 0.0220
Ha: diff > 0 Pr(T > t) = 0.0110

61 .
62 . *relationship between political leaning and vaccine/boosters
63 . tab politics vaccinated, chi2



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politics	vaccinated		Total
	0	1	
0	4	120	124
1	4	80	84
2	0	27	27
Total	8	227	235

Pearson chi2(2) = 1.4344 Pr = 0.488

64 . tab liberal vaccinated, chi2

politics== 1.0000	vaccinated		Total
	0	1	
0	4	147	151
1	4	80	84
Total	8	227	235

Pearson chi2(1) = 0.7328 Pr = 0.392

65 . tab conservative vaccinated, chi2

politics== 2.0000	vaccinated		Total
	0	1	
0	8	200	208
1	0	27	27
Total	8	227	235

Pearson chi2(1) = 1.0751 Pr = 0.300

66 . tab moderate vaccinated, chi2

politics== 0.0000	vaccinated		Total
	0	1	
0	4	107	111
1	4	120	124
Total	8	227	235

Pearson chi2(1) = 0.0254 Pr = 0.873

67 . tab politics booster, chi2

politics	booster		Total
	0	1	
0	7	113	120
1	9	71	80
2	6	21	27
Total	22	205	227

Pearson chi2(2) = 7.1068 Pr = 0.029



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68 . tab liberal booster, chi2

politics== 1.0000	booster		Total
	0	1	
0	13	134	147
1	9	71	80
Total	22	205	227

Pearson chi2(1) = 0.3428 Pr = 0.558

69 . tab conservative booster, chi2

politics== 2.0000	booster		Total
	0	1	
0	16	184	200
1	6	21	27
Total	22	205	227

Pearson chi2(1) = 5.4977 Pr = 0.019

70 . tab moderate booster, chi2

politics== 0.0000	booster		Total
	0	1	
0	15	92	107
1	7	113	120
Total	22	205	227

Pearson chi2(1) = 4.3300 Pr = 0.037

71 . pwcorr moderate conservative booster, sig star(0.05)

	moderate	conservative	booster
moderate	1.0000		
conservative	-0.3808*	1.0000	
booster	0.1381*	-0.1556*	1.0000
	0.0376	0.0190	

72 .

73 . *relationship between political leaning and misinformation

74 . anova politics COVIDknowledge

Number of obs = 235 R-squared = 0.1348
Root MSE = .653216 Adj R-squared = 0.1002

Source	Partial SS	df	MS	F	Prob>F
Model	14.956057	9	1.6617841	3.89	0.0001



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COVIDknow~e	14.956057	9	1.6617841	3.89	0.0001
Residual	96.005645	225	.42669176		
Total	110.9617	234	.47419531		

75 . oneway conservative COVIDknowledge, bonferroni

Source	SS	df	MS	F	Prob > F
Between groups	2.23242799	9	.248047555	2.58	0.0077
Within groups	21.6654443	225	.096290864		
Total	23.8978723	234	.10212766		

Bartlett's equal-variances test: chi2(4) = 26.6318 Prob>chi2 = 0.000

note: Bartlett's test performed on cells with positive variance:
 3 single-observation cells not used
 2 multiple-observation cells not used

		Comparison of politics== 2.0000 by COVIDknow~e (Bonferroni)					
Row Mean- Col Mean	3	4	5	6	7	8	
4	-1 0.409						
5	-1 1.000	0 1.000					
6	-1 1.000	0 1.000	0 1.000				
7	-1 0.195	0 1.000	0 1.000	0 1.000			
8	-.636364 1.000	.363636 1.000	.363636 1.000	.363636 1.000	.363636 1.000		
9	-.8 0.663	.2 1.000	.2 1.000	.2 1.000	.2 1.000	-.163636 1.000	
10	-.793103 0.570	.206897 1.000	.206897 1.000	.206897 1.000	.206897 1.000	-.15674 1.000	
11	-.877551 0.250	.122449 1.000	.122449 1.000	.122449 1.000	.122449 1.000	-.241187 0.932	
12	-.937008 0.132	.062992 1.000	.062992 1.000	.062992 1.000	.062992 1.000	-.300644 0.104	
Row Mean- Col Mean	9	10	11				
10	.006897 1.000						



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11	-.077551 1.000	-.084448 1.000	
12	-.137008 1.000	-.143904 1.000	-.059457 1.000

76 . oneway liberal COVIDknowledge, bonferroni

Source	Analysis of variance			F	Prob > F
	SS	df	MS		
Between groups	3.36054046	9	.373393384	1.66	0.0999
Within groups	50.6139276	225	.224950789		
Total	53.9744681	234	.23066012		

Bartlett's equal-variances test: chi2(6) = 1.8132 Prob>chi2 = 0.936

note: Bartlett's test performed on cells with positive variance:
3 single-observation cells not used

Comparison of politics== 1.0000 by COVIDknowl~e
(Bonferroni)

Row Mean- Col Mean	3	4	5	6	7	8
4	.5 1.000					
5	0 1.000	-.5 1.000				
6	1 1.000	.5 1.000	1 1.000			
7	.75 1.000	.25 1.000	.75 1.000	-.25 1.000		
8	.545455 1.000	.045455 1.000	.545455 1.000	-.454545 1.000	-.204545 1.000	
9	.2 1.000	-.3 1.000	.2 1.000	-.8 1.000	-.55 1.000	-.345455 1.000
10	.482759 1.000	-.017241 1.000	.482759 1.000	-.517241 1.000	-.267241 1.000	-.062696 1.000
11	.428571 1.000	-.071429 1.000	.428571 1.000	-.571429 1.000	-.321429 1.000	-.116883 1.000
12	.283465 1.000	-.216535 1.000	.283465 1.000	-.716535 1.000	-.466535 1.000	-.26199 1.000
Row Mean- Col Mean	9	10	11			
10	.282759 1.000					



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11	.228571 1.000	-.054187 1.000	
12	.083465 1.000	-.199294 1.000	-.145107 1.000

77 . oneway moderate COVIDknowledge, bonferroni

Source	Analysis of variance			F	Prob > F
	SS	df	MS		
Between groups	6.92587081	9	.769541202	3.35	0.0007
Within groups	51.644342	225	.229530409		
Total	58.5702128	234	.250300055		

Bartlett's equal-variances test: chi2(6) = 3.6590 Prob>chi2 = 0.723

note: Bartlett's test performed on cells with positive variance:
3 single-observation cells not used

Comparison of politics== 0.0000 by COVIDknowl~e
(Bonferroni)

Row Mean- Col Mean	3	4	5	6	7	8
4	.5 1.000					
5	1 1.000	.5 1.000				
6	0 1.000	-.5 1.000	-1 1.000			
7	.25 1.000	-.25 1.000	-.75 1.000	.25 1.000		
8	.090909 1.000	-.409091 1.000	-.909091 1.000	.090909 1.000	-.159091 1.000	
9	.6 1.000	.1 1.000	-.4 1.000	.6 1.000	.35 1.000	.509091 0.711
10	.310345 1.000	-.189655 1.000	-.689655 1.000	.310345 1.000	.060345 1.000	.219436 1.000
11	.44898 1.000	-.05102 1.000	-.55102 1.000	.44898 1.000	.19898 1.000	.358071 1.000
12	.653543 1.000	.153543 1.000	-.346457 1.000	.653543 1.000	.403543 1.000	.562634 0.011
Row Mean- Col Mean	9	10	11			
10	-.289655 1.000					
11	-.15102	.138635				



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		1.000	1.000	
12	.053543	.343198	.204564	
	1.000	0.027	0.531	

78 . ttest COVIDknowledge, by(liberal) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	151	11.13245	.1234799	1.517346	10.88847	11.37643
1	84	10.71429	.1804974	1.654286	10.35528	11.07329
Combined	235	10.98298	.1028713	1.576987	10.78031	11.18565
diff		.4181646	.2186929		-.0137419	.8500712

diff = mean(0) - mean(1) t = 1.9121
H0: diff = 0 Satterthwaite's degrees of freedom = 159.533

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.9712 Pr(|T| > |t|) = 0.0577 Pr(T > t) = 0.0288

79 . ttest COVIDknowledge, by(conservative) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	208	11.08654	.1031871	1.488186	10.88311	11.28997
1	27	10.18519	.3850372	2.000712	9.39373	10.97664
Combined	235	10.98298	.1028713	1.576987	10.78031	11.18565
diff		.9013533	.3986242		.0870818	1.715625

diff = mean(0) - mean(1) t = 2.2612
H0: diff = 0 Satterthwaite's degrees of freedom = 29.8494

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.9844 Pr(|T| > |t|) = 0.0312 Pr(T > t) = 0.0156

80 . ttest COVIDknowledge, by(moderate) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	111	10.58559	.1661179	1.750161	10.25638	10.91479
1	124	11.33871	.1178347	1.312151	11.10546	11.57196
Combined	235	10.98298	.1028713	1.576987	10.78031	11.18565
diff		-.7531241	.2036668		-1.154702	-.3515463

diff = mean(0) - mean(1) t = -3.6978
H0: diff = 0 Satterthwaite's degrees of freedom = 202.66

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0



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Pr(T < t) = **0.0001** Pr(|T| > |t|) = **0.0003** Pr(T > t) = **0.9999**

81 . ttest COVIDknowledge, by(group) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
1	32	7.5625	.6940669	3.926235	6.146941	8.978059
2	280	10.43929	.168916	2.826505	10.10677	10.7718
Combined	312	10.14423	.1742003	3.076991	9.80147	10.48699
diff		-2.876786	.7143259		-4.327291	-1.42628

diff = mean(1) - mean(2) t = **-4.0273**
H0: diff = 0 Satterthwaite's degrees of freedom = **34.7674**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = **0.0001** Pr(|T| > |t|) = **0.0003** Pr(T > t) = **0.9999**

82 .

83 . *relationship between political leaning and information sources

84 . tab politics infoFIRST, chi2

politics	infoFIRST						Total
	Digital..	Friends..	Governm..	Health ..	Other	Traditi..	
0	5	6	16	82	9	2	120
1	2	8	14	53	6	1	84
2	0	2	1	23	0	1	27
Total	7	16	31	158	15	4	231

Pearson chi2(10) = **9.6807** Pr = **0.469**

85 . tab politics infoSECOND, chi2

politics	infoSECOND							Total
	Digital..	Friends..	Governm..	Health ..	Other	Politic..	Traditi..	
0	11	7	70	25	2	0	5	120
1	7	16	33	20	1	0	6	83
2	0	7	12	3	1	1	2	26
Total	18	30	115	48	4	1	13	229

Pearson chi2(12) = **27.9723** Pr = **0.006**

86 . tab liberal infoSECOND, chi2

politics== 1,0000	infoSECOND							Total
	Digital..	Friends..	Governm..	Health ..	Other	Politic..	Traditi..	
0	11	14	82	28	3	1	7	146
1	7	16	33	20	1	0	6	83
Total	18	30	115	48	4	1	13	229

Pearson chi2(6) = **8.6322** Pr = **0.195**



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87 . tab conservative infoSECOND, chi2

politics== 2.0000	infoSECOND							Total
	Digital..	Friends..	Governm..	Health ..	Other	Politic..	Traditi..	
0	18	23	103	45	3	0	11	203
1	0	7	12	3	1	1	2	26
Total	18	30	115	48	4	1	13	229

Pearson chi2(6) = 16.6795 Pr = 0.011

88 . tab conservative health2nd, chi2

politics== 2.0000	infoSECOND==Health care professionals		Total
	0	1	
0	158	45	203
1	23	3	26
Total	181	48	229

Pearson chi2(1) = 1.5717 Pr = 0.210

89 . tab conservative gov2nd, chi2

politics== 2.0000	infoSECOND==Governmen tal agencies		Total
	0	1	
0	100	103	203
1	14	12	26
Total	114	115	229

Pearson chi2(1) = 0.1938 Pr = 0.660

90 . tab conservative digital2nd, chi2

politics== 2.0000	infoSECOND==Digital media sources		Total
	0	1	
0	185	18	203
1	26	0	26
Total	211	18	229

Pearson chi2(1) = 2.5021 Pr = 0.114

91 . tab conservative traditional2nd, chi2

politics== 2.0000	infoSECOND==Politicia ns		Total
	0	1	
0	203	0	203
1	25	1	26

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Total	228	1	229
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Pearson chi2(1) = 7.8419 Pr = 0.005

92 . pwcorr conservative traditional2nd, sig star(0.05)

	conserve tradit~d	
conservative	1.0000	
traditiona~d	0.1851* 1.0000	
	0.0050	

93 . tab conservative friendsfam2nd, chi2

politics== 2.0000	infoSECOND==Friends/family		Total
	0	1	
0	180	23	203
1	19	7	26
Total	199	30	229

Pearson chi2(1) = 4.9226 Pr = 0.027

94 . pwcorr conservative friendsfam2nd, sig star(0.05)

	conserve friend~d	
conservative	1.0000	
friendsfam~d	0.1466* 1.0000	
	0.0265	

95 . tab moderate infoSECOND, chi2

politics== 0.0000	infoSECOND							Total
	Digital..	Friends..	Governm..	Health ..	Other	Politic..	Traditi..	
0	7	23	45	23	2	1	8	109
1	11	7	70	25	2	0	5	120
Total	18	30	115	48	4	1	13	229

Pearson chi2(6) = 16.1415 Pr = 0.013

96 . tab moderate health2nd, chi2

politics== 0.0000	infoSECOND==Health care professionals		Total
	0	1	
0	86	23	109
1	95	25	120



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Total	181	48	229

Pearson chi2(1) = 0.0025 Pr = 0.960

97 . tab moderate gov2nd, chi2

politics== 0.0000	infoSECOND==Governmen tal agencies		Total
	0	1	
0	64	45	109
1	50	70	120
Total	114	115	229

Pearson chi2(1) = 6.6410 Pr = 0.010

98 . tab moderate digital2nd, chi2

politics== 0.0000	infoSECOND==Digital media sources		Total
	0	1	
0	102	7	109
1	109	11	120
Total	211	18	229

Pearson chi2(1) = 0.5941 Pr = 0.441

99 . tab moderate traditional2nd, chi2

politics== 0.0000	infoSECOND==Politicia ns		Total
	0	1	
0	108	1	109
1	120	0	120
Total	228	1	229

Pearson chi2(1) = 1.1057 Pr = 0.293

100 . tab moderate friendsfam2nd, chi2

politics== 0.0000	infoSECOND==Friends/f amily		Total
	0	1	
0	86	23	109
1	113	7	120
Total	199	30	229

Pearson chi2(1) = 11.6953 Pr = 0.001

101 . pwcorr friendsfam2nd gov2nd moderate, sig star(0.05)

| friend~d gov2nd moderate



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friendsfam~d	1.0000		
gov2nd	-0.4355*	1.0000	
	0.0000		
moderate	-0.2260*	0.1703*	1.0000
	0.0006	0.0098	

102 . tab politics infoTHIRD, chi2

politics	infoTHIRD							Total
	Digital..	Friends..	Governm..	Health ..	Other	Politic..	Traditi..	
0	16	25	16	6	4	17	32	116
1	10	20	11	7	6	10	15	79
2	3	5	3	0	3	3	7	24
Total	29	50	30	13	13	30	54	219

Pearson chi2(12) = 8.2158 Pr = 0.768

103 .

104 . *relationship between political leaning and trust in information sources

105 . tab politics trusthealth, chi2

politics	Please indicate whether or not you agree with the following statements:			Total
	Agree Disagree			
	0	115	9	
1	74	10	84	
2	25	2	27	
Total	214	21	235	

Pearson chi2(2) = 1.4163 Pr = 0.493

106 . tab politics trustgov, chi2

politics	trustgov		Total
	Agree	Disagree	
0	104	20	124
1	60	24	84
2	14	13	27
Total	178	57	235

Pearson chi2(2) = 13.6984 Pr = 0.001

107 . tab trustgovnum politics, chi2

trustgovnu	politics			Total
	0	1	2	
m				



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0	20	24	13	57
1	104	60	14	178
Total	124	84	27	235

Pearson chi2(2) = 13.6984 Pr = 0.001

108 . pwcorr trustgovnum liberal conservative moderate, sig star(0.05)

	trustgovnum	liberal	conservative	moderate
trustgovnum	1.0000			
liberal	-0.0751 0.2515	1.0000		
conservative	-0.2008* 0.0020	-0.2687* 0.0000	1.0000	
moderate	0.2004* 0.0020	-0.7883* 0.0000	-0.3808* 0.0000	1.0000

109 . tab politics trustpoliticians, chi2

politics	trustpoliticians		Total
	Agree	Disagree	
0	15	109	124
1	10	74	84
2	2	25	27
Total	27	208	235

Pearson chi2(2) = 0.5016 Pr = 0.778

110 . tab politics trustdigital, chi2

politics	trustdigital		Total
	Agree	Disagree	
0	31	93	124
1	21	63	84
2	5	22	27
Total	57	178	235

Pearson chi2(2) = 0.5464 Pr = 0.761

111 . tab politics trusttraditional, chi2

politics	trusttraditional		Total
	Agree	Disagree	
0	74	50	124
1	46	38	84
2	10	17	27
Total	130	105	235



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Pearson chi2(2) = 4.6145 Pr = 0.100

112 . tab politics trustfriendfam, chi2

politics	trustfriendfam		Total
	Agree	Disagree	
0	59	65	124
1	44	40	84
2	15	12	27
Total	118	117	235

Pearson chi2(2) = 0.8099 Pr = 0.667

113 .

114 . *SILS and trust

115 . tab SILS trusthealth, chi2

How often do you need to have someone help you when you read instructions, pamphlets	Please indicate whether or not you agree with the following statements:		Total
	Agree	Disagree	
Always	37	2	39
Never	122	11	133
Often	16	1	17
Rarely	57	8	65
Sometimes	34	2	36
Total	266	24	290

Pearson chi2(4) = 2.3802 Pr = 0.666

116 . tab SILS trustgov, chi2

How often do you need to have someone help you when you read instructions, pamphlets	trustgov		Total
	Agree	Disagree	
Always	23	16	39
Never	98	35	133
Often	13	4	17
Rarely	47	18	65
Sometimes	29	7	36



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Total | 210 80 | 290

Pearson chi2(4) = 4.9687 Pr = 0.291

117 . tab SILS trustpoliticians

How often do you need to have someone help you when you read instructions, pamph	trustpoliticians		Total
	Agree	Disagree	
Always	5	34	39
Never	14	119	133
Often	1	16	17
Rarely	5	60	65
Sometimes	6	30	36
Total	31	259	290

118 . tab SILS trustdigital, chi2

How often do you need to have someone help you when you read instructions, pamph	trustdigital		Total
	Agree	Disagree	
Always	7	32	39
Never	33	100	133
Often	3	14	17
Rarely	16	49	65
Sometimes	10	26	36
Total	69	221	290

Pearson chi2(4) = 1.5045 Pr = 0.826

119 . tab SILS trusttraditional, chi2

How often do you need to have someone help you when you read instructions, pamph	trusttraditional		Total
	Agree	Disagree	



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Always	15	24	39
Never	71	62	133
Often	10	7	17
Rarely	32	33	65
Sometimes	27	9	36
Total	155	135	290

Pearson chi2(4) = 10.9033 Pr = 0.028

120 . pwcorr SILSalways SILSnever SILSoften SILSrarely SILSsometimes trusttraditionalnum, sig star(0.05)

	SILSalways	SILSnever	SILSoften	SILSrarely	SILSsometimes	trusttraditionalnum
SILSalways	1.0000					
SILSnever	-0.3535*	1.0000				
SILSoften	-0.1004	-0.2283*	1.0000			
SILSrarely	-0.2141*	-0.4865*	-0.1382*	1.0000		
SILSsometimes	-0.1534*	-0.3487*	-0.0990	-0.2111*	1.0000	
trusttraditionalnum	-0.1184*	-0.0012	0.0269	-0.0454	0.1627*	1.0000

121 . tab SILS trustfriendfam, chi2

How often do you need to have someone help you when you read instructions, pamph	trustfriendfam		Total
	Agree	Disagree	
Always	30	9	39
Never	64	69	133
Often	7	10	17
Rarely	27	38	65
Sometimes	23	13	36
Total	151	139	290

Pearson chi2(4) = 16.1956 Pr = 0.003

122 . pwcorr SILSalways SILSnever SILSoften SILSrarely SILSsometimes trustfriendfamnum, sig star(0.05)

| SILSalways SILSnever SILSoften SILSrarely SILSsometimes trustfriendfamnum



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SILSalways	1.0000					
SILSnever	-0.3535*	1.0000				
	0.0000					
SILSoften	-0.1004	-0.2283*	1.0000			
	0.0765	0.0000				
SILSrarely	-0.2141*	-0.4865*	-0.1382*	1.0000		
	0.0001	0.0000	0.0146			
SILSometi~s	-0.1534*	-0.3487*	-0.0990	-0.2111*	1.0000	
	0.0066	0.0000	0.0807	0.0002		
trustfrie~um	0.1961*	-0.0727	-0.0544	-0.1133	0.0891	1.0000
	0.0008	0.2168	0.3559	0.0539	0.1302	

```
123 .
124 . *relationship between health literacy and vaccines/boosters/info
125 . tab SILS vaccinated, chi2
```

How often do you need to have someone help you when you read instructio ns, pamph	vaccinated		Total
	0	1	
Always	1	41	42
Never	6	133	139
Often	0	19	19
Rarely	3	68	71
Sometimes	2	39	41
Total	12	300	312

Pearson chi2(4) = 1.2326 Pr = 0.873

```
126 . tab SILS booster, chi2
```

How often do you need to have someone help you when you read instructio ns, pamph	booster		Total
	0	1	
Always	4	37	41
Never	10	123	133



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Often	1	18	19
Rarely	10	58	68
Sometimes	2	37	39
Total	27	273	300

Pearson chi2(4) = 4.1259 Pr = 0.389

127 . tab SILS infoFIRST, chi2

How often do you need to have someone help you when you read instructions, pamph	infoFIRST						Total
	Digital..	Friends..	Governm..	Health ..	Other	Traditi..	
Always	0	10	0	26	2	0	38
Never	5	5	16	99	8	1	134
Often	0	1	3	12	0	1	17
Rarely	2	6	5	47	4	1	65
Sometimes	0	4	8	21	1	1	35
Total	7	26	32	205	15	4	289

Pearson chi2(20) = 36.7756 Pr = 0.012

128 . tab SILS health1st, chi2

How often do you need to have someone help you when you read instructions, pamph	infoFIRST==Health care professionals		Total
	0	1	
Always	12	26	38
Never	35	99	134
Often	5	12	17
Rarely	18	47	65
Sometimes	14	21	35
Total	84	205	289

Pearson chi2(4) = 2.7707 Pr = 0.597

129 . tab SILS gov1st, chi2

How often do you need to have	
-------------------------------	--



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someone help you when you read instructions, pamph	infoFIRST==Government al agencies		Total
	0	1	
Always	38	0	38
Never	118	16	134
Often	14	3	17
Rarely	60	5	65
Sometimes	27	8	35
Total	257	32	289

Pearson chi2(4) = 11.2708 Pr = 0.024

130 . pwcorr SILSalways SILSnever SILSoften SILSrarely SILSsometimes gov1st, sig star(0.05)

	SILSal~s	SILSne~r	SILSof~n	SILSra~y	SILSso~s	gov1st
SILSalways	1.0000					
SILSnever	-0.3535* 0.0000	1.0000				
SILSoften	-0.1004 0.0765	-0.2283* 0.0000	1.0000			
SILSrarely	-0.2141* 0.0001	-0.4865* 0.0000	-0.1382* 0.0146	1.0000		
SILSsometimes	-0.1534* 0.0066	-0.3487* 0.0000	-0.0990 0.0807	-0.2111* 0.0002	1.0000	
gov1st	-0.1373* 0.0195	0.0257 0.6634	0.0524 0.3750	-0.0580 0.3256	0.1394* 0.0177	1.0000

131 . tab SILSalways gov1st /*no observations*/

SILS==Alwa ys	infoFIRST==Government al agencies		Total
	0	1	
0	219	32	251
1	38	0	38
Total	257	32	289

132 . tab SILSsometimes gov1st /*yes observations*/

SILS==Some times	infoFIRST==Government al agencies		Total
	0	1	
0	230	24	254
1	27	8	35



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Total | 257 32 | 289

133 . tab SILS digital1st, chi2

How often do you need to have someone help you when you read instructions, pamph	infoFIRST==Digital media sources		Total
	0	1	
Always	38	0	38
Never	129	5	134
Often	17	0	17
Rarely	63	2	65
Sometimes	35	0	35
Total	282	7	289

Pearson chi2(4) = 3.3237 Pr = 0.505

134 . tab SILS traditional1st, chi2

How often do you need to have someone help you when you read instructions, pamph	infoFIRST==Traditiona l media sources		Total
	0	1	
Always	38	0	38
Never	133	1	134
Often	16	1	17
Rarely	64	1	65
Sometimes	34	1	35
Total	285	4	289

Pearson chi2(4) = 4.0207 Pr = 0.403

135 . tab SILS friendsfam1st, chi2

How often do you need to have someone help you when you read instructions, pamph	infoFIRST==Friends/fa mily		Total
	0	1	



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Always	28	10	38
Never	129	5	134
Often	16	1	17
Rarely	59	6	65
Sometimes	31	4	35
Total	263	26	289

Pearson chi2(4) = 18.9181 Pr = 0.001

136 . pwcorr SILSalways SILSnever SILSoften SILSrarely SILSsometimes friendsfam1st, sig star(0,05)

	SILSalways	SILSnever	SILSoft	SILSrarely	SILSsometimes	friendsfam1st
SILSalways	1.0000					
SILSnever	-0.3535*	1.0000				
SILSoft	-0.1004	-0.2283*	1.0000			
SILSrarely	-0.2141*	-0.4865*	-0.1382*	1.0000		
SILSsometimes	-0.1534*	-0.3487*	-0.0990	-0.2111*	1.0000	
friendsfam1st	0.2355*	-0.1711*	-0.0272	0.0044	0.0316	1.0000

137 . tab SILSalways friendsfam1st /*yes observations*/

SILS==Always	infoFIRST==Friends/family		Total
	0	1	
0	235	16	251
1	28	10	38
Total	263	26	289

138 . tab SILSnever friendsfam1st /*yes observations*/

SILS==Never	infoFIRST==Friends/family		Total
	0	1	
0	134	21	155
1	129	5	134
Total	263	26	289

139 .
 140 . *disability-specific tests
 141 . *vaccine/boosters
 142 . tab maindisability vaccinated, chi2



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Some people have only one disability and some people have multiple disabilities.	vaccinated		Total
	0	1	
Because of a Physic..	4	109	113
Blind or Have Serio..	0	19	19
Deaf or Have Seriou..	1	37	38
Have Serious Diffic..	7	135	142
Total	12	300	312

Pearson chi2(3) = 1.3910 Pr = 0.708

143 . tab maindisability booster, chi2

Some people have only one disability and some people have multiple disabilities.	booster		Total
	0	1	
Because of a Physic..	11	98	109
Blind or Have Serio..	0	19	19
Deaf or Have Seriou..	5	32	37
Have Serious Diffic..	11	124	135
Total	27	273	300

Pearson chi2(3) = 3.0777 Pr = 0.380

144 . tab maindisability infoFIRST, chi2

Some people have only one disability and some people have multiple disabilities.	infoFIRST						Total
	Digital..	Friends..	Governm..	Health ..	Other	Traditi..	
Because of a Physic..	3	16	12	65	4	1	101
Blind or Have Serio..	0	1	3	10	1	0	15
Deaf or Have Seriou..	0	2	4	26	1	1	34
Have Serious Diffic..	4	7	13	104	9	2	139
Total	7	26	32	205	15	4	289

Pearson chi2(15) = 14.2449 Pr = 0.507

145 . *COVID knowledge

146 . ttest COVIDknowledge, by(cognition) unequal

Two-sample t test with unequal variances

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
0	199	10.44724	.1892494	2.669691	10.07403	10.82044
1	113	9.610619	.3422969	3.638665	8.932402	10.28884



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```
Combined | 312 10.14423 .1742003 3.076991 9.80147 10.48699
diff | .8366167 .3911297 .0648664 1.608367
diff = mean(0) - mean(1) t = 2.1390
H0: diff = 0 Satterthwaite's degrees of freedom = 181.352
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.9831 Pr(|T| > |t|) = 0.0338 Pr(T > t) = 0.0169
```

147 . ttest COVIDknowledge, by(vision) unequal

```
Two-sample t test with unequal variances
Group | Obs Mean Std. err. Std. dev. [95% conf. interval]
0 | 293 10.14334 .1809057 3.096606 9.7873 10.49939
1 | 19 10.15789 .6500704 2.833591 8.792147 11.52364
Combined | 312 10.14423 .1742003 3.076991 9.80147 10.48699
diff | -.01455 .6747729 -1.418275 1.389174
diff = mean(0) - mean(1) t = -0.0216
H0: diff = 0 Satterthwaite's degrees of freedom = 20.8882
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.4915 Pr(|T| > |t|) = 0.9830 Pr(T > t) = 0.5085
```

148 . ttest COVIDknowledge, by(hearing) unequal

```
Two-sample t test with unequal variances
Group | Obs Mean Std. err. Std. dev. [95% conf. interval]
0 | 274 10.23358 .1762271 2.917078 9.88664 10.58051
1 | 38 9.5 .6551579 4.038664 8.172524 10.82748
Combined | 312 10.14423 .1742003 3.076991 9.80147 10.48699
diff | .7335766 .6784452 -0.6350875 2.102241
diff = mean(0) - mean(1) t = 1.0813
H0: diff = 0 Satterthwaite's degrees of freedom = 42.5176
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.8572 Pr(|T| > |t|) = 0.2857 Pr(T > t) = 0.1428
```

149 . ttest COVIDknowledge, by(mobility) unequal

```
Two-sample t test with unequal variances
Group | Obs Mean Std. err. Std. dev. [95% conf. interval]
0 | 170 9.647059 .2790282 3.638082 9.096229 10.19789
1 | 142 10.73944 .1753116 2.089079 10.39286 11.08602
Combined | 312 10.14423 .1742003 3.076991 9.80147 10.48699
diff | -1.092378 .3295313 -1.741081 -0.4436742
```



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```
diff = mean(0) - mean(1)          t = -3.3149
H0: diff = 0                      Satterthwaite's degrees of freedom = 277.021

Ha: diff < 0                      Ha: diff != 0                      Ha: diff > 0
Pr(T < t) = 0.0005                Pr(|T| > |t|) = 0.0010                Pr(T > t) = 0.9995
```

```
150 . pcorr cognition mobility vision hearing COVIDknowledge, sig star(0.05)
```

	cognit~n	mobility	vision	hearing	COVIDk~e
cognition	1.0000				
mobility	-0.6887*	1.0000			
vision	-0.1919*	-0.2327*	1.0000		
hearing	-0.2806*	-0.3404*	-0.0948	1.0000	
COVIDknowl~e	-0.1309*	0.1771*	0.0011	-0.0781	1.0000

```
151 . *politics
```

```
152 . tab politics maindisability, chi2
```

politics	Some people have only one disability and some people have multiple disabilities. Because.. Blind o.. Deaf or.. Have Se..				Total
0	42	7	17	58	124
1	30	7	10	37	84
2	10	0	3	14	27
Total	82	14	30	109	235

```
Pearson chi2(6) = 2.9838 Pr = 0.811
```

```
153 .
end of do-file
```

```
154 .
```



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