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ABSTRACT

Given the patchwork of federal and state COVID-19 responses and the politicization of vaccination in the United States, investigating whether individuals support governmental or individual mitigation approaches can influence and inform future legal and policy approaches to infectious diseases. To measure how beliefs about government and individual pandemic response efforts differ by vaccine willingness, participants from the prospective Arizona CoVHORT study completed an online questionnaire from March 2, 2021-July 1, 2022. Participants who were vaccinated or who answered 'Large Chance,' 'Very Large Chance,' or 'Almost Certain' when asked, "When it is available to you,

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what are the chances you will get a COVID-19 vaccination?" were categorized as 'vaccine-willing' while those who were unvaccinated or reported one of the remaining answers were categorized as 'vaccine-hesitant.' By July 1, 2022, 1,359 CoVHORT participants had completed both the survey for policy and vaccine questions. Participants categorized as vaccine-willing (n=1,284) more often supported government action and reported engaging in more individual behaviours compared to vaccine-hesitant (n=75) participants. Compared to vaccine-hesitant participants, vaccine-willing participants more frequently agreed with: implementing stay at home orders for non-essential workers; closing schools, stores, places of worship, and other public places; avoiding places where people gather; maintaining an appropriate distance when in public; and wearing a mask to protect others. Two government interventions proved popular among both groups: government provision of vaccines (74.7% and 97.9%) and paid leave policies for individuals with COVID-19 or for those caring for a sick family member (72.0% and 82.7%).

Paid leave and government provision of vaccines proved popular with participants in this cohort. Further public opinions should be examined to inform future policymaking related to infectious disease mitigation.

I. INTRODUCTION

The novel coronavirus SARS-CoV-2 (COVID-19) timeline began on a global scale on January 9, 2020, when the World Health Organization (WHO) determined that a new coronavirus started causing pneumonia-like cases.[1] The United States (U.S.) confirmed its first case on January 21, 2020, in Washington State.[2] Shortly thereafter, the WHO issued a Global Health Emergency on January 30, 2020, followed by Global Air Travel restrictions for travelers coming from China. The U.S. Government began addressing COVID-19, largely at the federal level, following a Public Health Emergency Declaration by U.S. Secretary Alex Azar on January 31, 2020.[3] On March 11, 2020, the WHO announced that the COVID-19 outbreak was a pandemic, acknowledging the deaths, sustained person-to-person spread, and worldwide spread of the illness.[4]

1. *WHO Statement regarding cluster of pneumonia cases in Wuhan, China*, World Health Organization (Jan. 9, 2020), https://www.who.int/china/news/detail/09-01-2020-who-statement-regarding-cluster-of-pneumonia-cases-in-wuhan-china.

2. *First Travel-related Case of 2019 Novel Coronavirus Detected in United States*, Ctrs. for Disease Control & Prevention (Jan. 21, 2020), https://www.cdc.gov/media/releases/2020/p0121-novel-coronavirus-travel-case.html.

3. Alex M. Azar II. *Determination that a Public Health Emergency Exists*, U.S. Dep't of Health & Hum. Servs. (Jan. 21, 2020),
https://www.phe.gov/emergency/news/healthactions/phe/Pages/2019-nCoV.aspx.

4. *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March* 2020, World Health Organization (Mar. 11, 2020), https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020.

Two days later, President Trump declared a National Emergency which allowed access to federal funding for fighting COVID-19 spread.[5]

The timeline for Arizona's response to the COVID-19 pandemic reflects the governmental policy approach to preventing the spread of the disease and protecting the health of the public. The approach also reflects the public's fatigue with COVID-19 regulations and the tension between individual choices for prevention and government intervention. COVID-19 case counts began rapidly increasing in Arizona around March 5, 2020. Similar to other states across the country, pandemic response decisions in Arizona began with Governor Doug Ducey's declaration of a Public Health Emergency on March 11, 2020[6] and a Stay-at-Home Order (issued March 30), which required closure of all non-essential businesses (e.g., fitness centers, bars, restaurants, salons, movie theaters)[7] until April 30, 2020. The Stay-at-Home Order was later extended until May 15.

On May 15, 2020, Governor Ducey did not extend the Stay-at-Home Order and allowed some businesses to reopen, provided they followed recommendations set by federal and state health officials.[8] Governor Ducey also allowed professional sports teams to resume playing but without fans in attendance.[9] However, in mid-June, average case rates jumped to over 27,000 cases per week.[10] After pressure from local government and health professionals, on June 17, 2020, Governor Ducey gave individual local governments the power to implement mask mandates.[11] Shortly thereafter, the Governor announced an Executive Order requiring bars, movie theaters, and pools to close for at least a month. The Executive Order also delayed the start of in-person classes in school until late August 2020.[12] A month later Governor Ducey extended the Executive

5. Donald J. Trump, *Proclamation on Declaring a National Emergency Concerning the Novel Coronavirus Disease (COVID-19) Outbreak*, Trump White House (Mar. 13, 2020), https://trumpwhitehouse.archives.gov/presidential-actions/proclamation-declaring-national-emergency-concerning-novel-coronavirus-disease-covid-19-outbreak/.

6. *COVID-19: Declaration of Emergency, Executive Order*, Office of the Governor Doug Ducey (Mar. 11, 2020), https://azgovernor.gov/governor/news/2020/03/covid-19-declaration-emergency-executive-order.

7. *Governor Ducey Issues Executive Order Detailing "Essential Services,"* Office of the Governor Doug Ducey (Mar. 23 2020), https://azgovernor.gov/governor/news/2020/03/governor-ducey-issues-executive-order-detailing-essential-services.

8. Emma Richburg, *Ducey orders Arizona businesses to reopen, calls for end of local mask mandates*, Cronkite News (Mar. 25, 2021), https://cronkitenews.azpbs.org/2021/03/25/doug-ducey-orders-arizona-businesses-to-reopen-ends-local-mask-mandates/.

9. Richburg, *supra* note 8.

10. *COVID-19 Data*, ARIZ. DEPT. OF HEALTH SERV. (June 27, 2022), https://www.azdhs.gov/covid19/data/index.php#confirmed-by-week.

11. *Governor backs down, allows Tucson, other locales to mandate mask-wearing*, Tucson.com (June 17, 2020), https://tucson.com/news/local/governor-backs-down-allows-tucson-other-locales-to-mandate-mask-wearing/article_5fcc9392-b0de-11ea-8f69-7f019d7e5320.html.

12. *Further Action To Reverse COVID-19 Spread in Arizona*, Office of the Governor Doug Ducey (June 29, 2020), https://azgovernor.gov/governor/news/2020/06/further-action-reverse-covid-19-spread-arizona.

Order for two more weeks but allowed schools to re-open for in-person classes on Aug 17, 2020.[13] Before July 11, 2020, restaurants were allowed to remain open at full capacity. However, in light of the growing number of positive cases, resulting hospitalizations, and deaths, Governor Ducey eventually ordered restaurants to reopen with 50% capacity for indoor dining.[14]

Toward the end of July 2020, the Arizona Department of Health Services (ADHS) released guidelines for businesses to mitigate the spread of the virus. The next month, the Arizona Department of Education released revised guidelines for schools to utilize when deciding whether it was safe to reopen for in-person classes.[15] The guidelines included thresholds for the number of cases per 100,000 people, positivity rates, and rates of COVID-19 like illnesses.[16] These guidelines used a red, yellow, and green benchmark system based on the county's coronavirus data including positivity rates, hospitalization counts, and availability of healthcare resources.[17] On August 17, 2020, schools were scheduled to reopen for in-person classes if their county met the guideline metrics.[18] Cases initially increased as the school year started. Eventually, Arizona case numbers and hospitalizations increased dramatically to average over 100,000 and 3,000 cases per week, respectively.[19]

On December 30, 2020, Governor Ducey announced an Executive Order accelerating the initial plans for COVID-19 vaccine distribution.[20] Phase 1A included healthcare workers and long-term care facility residents.[21] Phase 1B included educational workers, childcare workers, law enforcement, essential industry workers, and adults seventy-five and older.[22] Phase 1C included adults sixty-five and older, adults of any age with high-risk medical conditions, and adults living in congregate settings.[23]

13. Lily Altavena, *How Ducey's school reopening announcement will affect the school year,* AZCentral (July 23, 2020, 5:06 PM), https://cm.azcentral.com/offersreg/?return=https%3A%2F%2Fwww.azcentral.com%2Fstory%2Fnews%2Flocal%2Farizona-education%2F2020%2F07%2F23%2Fheres-when-arizona-schools-reopen%2F5493617002%2F.

14. Steve Elliott, *ADHS Phased Reopening Plan for Paused Industries*, ARIZ. DEP'T OF HEALTH SERVS. (Aug. 10, 2020), https://www.azdhs.gov/director/public-information-office/index.php#news-release-081020.

15. Kathy Hoffman, *COVID-19: Roadmap for Reopening Schools*, ARIZ. DEPT. OF EDUC. (June 2020), https://www.azed.gov/covid-19/covid-19-roadmap-reopening-schools.

16. *Id.* at 8.

17. *Id.*

18. Altavena, *supra* note 12.

19. *COVID-19 Data*, ARIZ. DEPT. OF HEALTH SERV. (July 9, 2022), *https*://www.azdhs.gov/covid19/data/index.php.

20. Ariz. Exec. Order No. 2020-62 (Mar. 11, 2020), https://azgovernor.gov/file/36816/download?token=p0Px0U6.

21. *Id.*

22. *Id.*

23. *Id.*

In January 2021, Governor Ducey and ADHS opened a 24/7 vaccination site at State Farm Stadium in Glendale.[24] A second site was opened at Phoenix Municipal Stadium on February 1, 2021, and a third state-run vaccination site was opened in Southern Arizona at the University of Arizona campus.[25] However, there were challenges in rolling out widespread vaccinations. These included difficulties and inequities in utilizing an online system for vaccination appointment registration, inconsistent and insufficient vaccine supply, confusing and variable vaccine eligibility criteria, and logistical issues with the rigid storage and use requirements for the two authorized vaccines.[26] These challenges magnified existing racial, ethnic, and rural health inequities.[27]

As vaccines became available at other sites, Governor Ducey issued an Executive Order requiring Arizona schools to offer in-person learning on March 1, 2021.[28] On March 24, 2021, the three largest Arizona counties opened vaccination to all Arizonans 16 years and older.[29] However, in the 12 smaller Arizona counties, eligibility was still based on the phased system. On March 25, 2021, Governor Ducey lifted all restrictions on businesses and gatherings.[30] As a result, businesses were left to self-determine whether they would enforce mask-wearing and social distancing.[31]

In the summer of 2021, the Arizona State Legislature passed a controversial budget that included a provision prohibiting public and charter schools from enforcing mask mandates.[32] A coalition of parents, educators, and advocacy groups brought a lawsuit challenging the constitutionality of the provisions.[33] An Arizona Superior Court judge ruled that the legislature violated the state

24. *State, Partners Opening 24/7 COVID-19 Vaccination Site at State Farm Stadium*, OFF. OF GOVERNOR DOUG DUCEY (Jan. 8, 2021), https://azgovernor.gov/governor/news/2021/01/state-partners-opening-247-covid-19-vaccination-site-state-farm-stadium.

25. *Governor Ducey Announces The University Of Arizona To Be First State Vaccination Site In Southern Arizona*, OFF. OF GOVERNOR DOUG DUCEY (Feb. 10, 2021), https://azgovernor.gov/governor/news/2021/02/governor-ducey-announces-university-arizona-be-first-state-vaccination-site.

26. *Id.*

27. *Id.*

28. *Governor Ducey Issues Executive Order Requiring Schools To Offer In-Person Learning*, OFF. OF GOVERNOR DOUG DUCEY (Mar. 3, 2021), https://azgovernor.gov/governor/news/2021/03/governor-ducey-issues-executive-order-requiring-schools-offer-person-learning.

29. *Arizona Expands COVID-19 Vaccination Eligibility To All*, OFF. OF GOVERNOR DOUG DUCEY (Mar. 22, 2021), https://azgovernor.gov/governor/news/2021/03/arizona-expands-covid-19-vaccination-eligibility-all.

30. *As Arizona Hits 3 Million Vaccine Doses Administered, Governor Ducey Announces New Phase Of COVID-19 Mitigation*, OFF. OF GOVERNOR DOUG DUCEY (Mar. 25, 2021), https://azgovernor.gov/governor/news/2021/03/arizona-hits-3-million-vaccine-doses-administered-governor-ducey-announces-new.

31. *Id.*

32. Bob Christie, *Judge Weighs Challenge to Arizona Ban on School Mask Mandate,* ASSOCIATED PRESS (Sept. 13, 2021), https://apnews.com/article/health-education-arizona-coronavirus-pandemic-laws-ea984da5f05d4cd4ae81b64e03509379.

33. *Id.*

constitution's single subject and title requirements; the Arizona Supreme Court upheld this ruling in November 2021.[34]

Public and private infection mitigation measures to address a pandemic are heavily influenced by social context and public sentiment.[35] Public opinion about the COVID-19 pandemic has varied widely. Given the profound politicization of responses to the pandemic and vaccine hesitancy, investigating whether individuals support government and/or individual measures to prevent the spread of infection can influence future planning and messaging efforts for pandemic response.[36] To examine the opinion of Arizonans on certain individual and governmental steps responding to the COVID-19 pandemic, questions adapted from a survey developed by Hilyard and colleagues was used to investigate public support of proposed government actions during the 2009 HINI pandemic were added into a larger study questionnaire as part of the Arizona CoVHORT study.[37] The questions focus on opinions that address the respondent's attitude towards governmental (at the federal, tribal, state, or local level) and individual responses to infection control activities.[38]

The objective of this study was to measure whether beliefs about government and individual measures align with vaccine willingness status. We hypothesized that participants who are vaccine-willing would be more likely than vaccine-hesitant participants to support government policy measures to control the spread of COVID-19 as well as to emphasize the role of individual responsibility in taking health and safety measures.

II. METHODS

The Arizona CoVHORT study is a prospective cohort of Arizonans of all ages, with or without a history of COVID-19 infection.[39] The CoVHORT is designed to collect data on the consequences of the COVID-19 pandemic on the health and well-being of Arizonans.[40] Recruitment began in May 2020 and is ongoing as of the date of publication.[41] The study consisted of a series of electronic surveys following participants longitudinally; a baseline survey is

34. Ulysse Bex, *Arizona Supreme Court upholds ruling that allows school mask mandates*, CRONKITE NEWS (Nov. 2, 2021), https://cronkitenews.azpbs.org/2021/11/02/arizona-supreme-court-upholds-ruling-that-allows-school-mask-mandates/.

35. *See* Karen M. Hilyard et al., *The Vagaries Of Public Support For Government Actions In Case Of A Pandemic,* 29 HEALTH AFFS. 2294, 2294-295 (2010) (demonstrating that social distancing policies are more effective if at least 60 percent of the population complies with the policy).

36. Claudia Deane et al., *A Year of U.S. Public Opinion on the Coronavirus Pandemic*, PEW RSCH. CTR. (Mar. 5, 2021), https://www.pewresearch.org/2021/03/05/a-year-of-u-s-public-opinion-on-the-coronavirus-pandemic.

37. *Id.*

38. Hilyard et al., *supra* note 24 at 2295-98.

39. Collin J. Catalfamo et al., *Design of the Arizona CoVHORT: A Population-Based COVID-19 Cohort*, 9 FRONT. PUB. HEALTH at 2, 5 (2021).

40. *Id*. at 2, 9.

41. *Id*. at 1, 5.

administered upon enrollment and follow-up questionnaires are administered every 3 months.[42] A supplemental cross-sectional questionnaire focused on the COVID-19 vaccine was administered to all participants on March 2, 2021.[43] Participants that enrolled after this date were administered the vaccine questionnaire 2 weeks after completing their baseline survey.

The inclusion criteria for this analysis included all participants over the age of 18 in the Arizona CoVHORT study who completed both the 6-month follow-up CoVHORT core survey and the cross-sectional vaccine questionnaire from March 2, 2021–July 1, 2022. Demographics were collected, including age, gender (male, female, other [categories of transgender male, transgender female, and non-binary were collapsed into "other" due to small cell sizes]), race (White, mixed race [which included all other races]), ethnicity (Hispanic, non-Hispanic), educational attainment (high school or less, some college or technical school, Bachelor's degree, professional degree or higher), income level (less than $50,00, $50,000 - $75,000, more than $75,000), and housing type (single, multi-unit, apartment, other). Educational attainment and income level were added later to surveys in the study and have a higher percentage of missing data than other demographic variables. The 6-month survey included policy-related questions using a 5-point Likert scale (from strongly agree to strongly disagree), collapsed into a 3-point scale for this analysis including agree (strongly agree, agree), undecided (undecided), and disagree (strongly disagree, disagree). The policy-related questions examined actions that individuals or government entities (federal, tribal, state, or local) could take in response to the pandemic. Vaccine status was obtained from the vaccine questionnaire, which collected data on whether the participant had received a COVID-19 vaccine, the vaccine manufacturer, number of doses, and the date(s) and location(s) of vaccination. Vaccinated participants were classified as 'vaccine willing.' Non-vaccinated participants were asked, "When it is available to you, what are the chances you will get a COVID-19 vaccination?" Participants who answered, 'large chance,' 'very large chance,' or 'almost certain' were categorized as 'vaccine-willing.' Those who answered, 'do not know,' 'almost zero chance,' 'very small chance,' 'small chance,' or 'moderate chance' were categorized as 'vaccine-hesitant.'

III. RESULTS

As of July 1, 2022, of the 8,270 participants in CoVHORT, 1,802 were eligible to complete the 6-month survey and the vaccine questionnaire; 1,359 completed both surveys (75.4% response rate). The overall study sample (n=1,359) was largely middle-aged (average: 50.2; SD: 15.8), female (68.8%), and non-Hispanic (87.6%). Characteristics for those willing to receive a

42. *Id*. at 7.
43. *Id*.

vaccination (n=1,284, 94.5%) and those hesitant to receive a vaccination (n=75, 5.5%) are described in Table 1.[44] Compared to those willing to receive a vaccine, the vaccine-hesitant population was slightly younger (average: 45.8 SD: 14.7 years compared to average: 50.3 SD: 15.7 years) and included more Hispanic participants (20.5% compared to 12.0%).[45] While a large number of total participants were not able to share educational attainment (n=620) or income level (n=619) due to survey design, less than half of vaccine-hesitant participants reported an education level of some college or less, and the majority had an annual income less than $75,000.[46] Vaccine-hesitant participants also largely reported living in a single-family dwelling (88.0% compared to 81.1% among vaccine-willing).[47]

Table 1. Characteristics of adult Arizona CoVHORT participants, March 2, 2021-July 1, 2022 stratified by vaccine willingness status (n=1,359)

Characteristic[49]	Vaccine Willingness[48]					
	Hesitant N=75		Willing N=1,284		Total	
Age (years), mean (sd)	45.8	(14.7)	50.5	(15.8)	50.2	(15.8)
Gender						
Female	52	69.3%	883	68.8%	935	68.8%
Male	23	30.7%	388	30.2%	411	30.2%
Non-binary or Transgender	0	0.0%	13	1.0%	13	1.0%
Race						
Mixed Race	6	8.0%	127	9.9%	133	9.8%
White	69	92.0%	1157	90.1%	1226	90.2%

44. *See infra* Table 1.
45. *Id*.
46. *Id*.
47. *Id*.
48. "When it is available to you, what are the chances you will get a COVID-19 vaccination?" Vaccine-hesitant = Do not know, almost zero chance, very small chance, small chance, moderate chance. Vaccine-willing = Large chance, very large chance, almost certain.
49. Missingness among variables: Gender: Non-binary (n=10), Transgender female (n=2), Transgender male (n=1). Race: Asian (n=38), Black or African American (n=16), Mixed Race (n=54), Prefer not to answer (n=12), Missing (n=13); Ethnicity: Prefer not to answer (n=4), Missing (n=28); Education: Missing (n=620); Income Level: Don't know/not sure (n=20), Prefer not to Answer (n=70), Missing (n=619); Housing Type: Missing (n=1).

Ethnicity						
Non-Hispanic	58	79.5%	1104	88.0%	1162	87.6%
Hispanic	15	20.5%	150	12.0%	165	12.4%
Educational Attainment						
High school or less	1	3.1%	12	1.7%	13	1.8%
Some college or technical school	13	40.6%	99	14.0%	112	15.2%
Bachelor's Degree	8	25.0%	206	29.1%	214	29.0%
Professional degree or higher	10	31.3%	390	55.2%	400	54.1%
Income Level						
$75,000 or less	17	65.4%	228	36.5%	245	37.7%
More than $75,000	9	34.6%	396	63.5%	405	62.3%
Housing Type						
Single family house	66	88.0%	1040	81.1%	1106	81.4%
Multi-unit dwelling (duplex, townhome, condo)	3	4.0%	135	10.5%	138	10.2%
Apartment Building	5	6.7%	91	7.1%	96	7.1%
Other	1	1.3%	17	1.3%	18	1.3%

Of the ten questions pertaining to COVID-19 policies, the difference in agreement between the groups was statistically significant in nine (*Figure 1*).[50] The exception, closing U.S. borders to countries with COVID-19 outbreaks, was endorsed by the majorities in both the vaccine-willing and the vaccine-hesitant groups (60.3% and 64.0% respectively, p-value=0.62).[51] The following questions had statistically significant results ($p<0.001$): closing schools, stores, places of worship, and other public places (42.3% agreement in vaccine-willing compared to 76.0% disagreement in vaccine-hesitant), implementing stay-at-home orders for non-essential workers (47.7.0% agreement in vaccine-willing compared to 68.0% disagreement in vaccine-hesitant), and trusting what the government says about the COVID-19 vaccine (77.8% agreement in vaccine-willing compared to 61.3% disagreement in vaccine-hesitant).[52] In contrast, when the question of governmental trust was framed in the negative ("I believe the government information on COVID-19 vaccines is **not** reliable"), the vaccine-willing largely disagreed while the vaccine-hesitant agreed (82.2%

50. *See infra* Figure 1.
51. *Id.*
52. *Id.*

disagreement in vaccine-willing compared to 56.8% agreement in vaccine-hesitant).[53]

Figure 1. Policy beliefs regarding government action of adult Arizona CoVHORT participants at 6-month timepoint, March 2, 2020 – July 1, 2022, stratified by vaccine-willingness status (n=1,359). Answering the question, "Please select which is most reflective of your opinion. In general, the government should…"

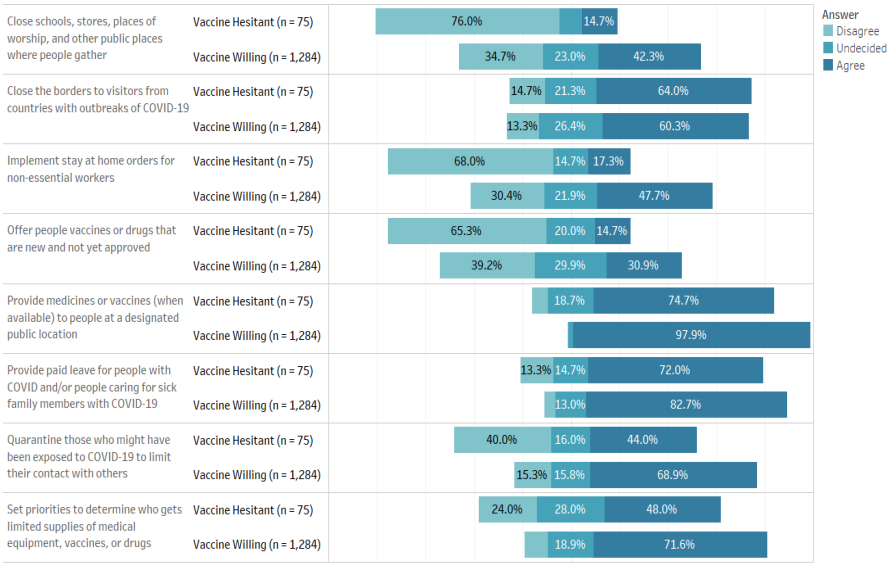

Figure 2, *below*, describes individual behaviors of participants stratified by vaccine willingness status.[54] A statistically significant ($p<0.001$) polarizing trend occurred in three questions: (1) avoiding schools, stores, and places where people gather (60.4% agreement in the vaccine-willing group, compared to 64.0% disagreement in the vaccine-hesitant group); (2) maintaining an appropriate distance when in public (92.1% agreement in the vaccine-willing group, compared to 26.7% disagreement in the vaccine-hesitant group); (3) and wearing a mask to protect others (94.7% agreement in the vaccine-willing group, compared to 26.7% disagreement in the vaccine-hesitant group).[55]

53. *See infra*, Table 2.
54. *See infra* Figure 2.
55. *Id.*

Figure 2. Individual health and safety behaviors of adult Arizona CoVHORT participants, May 2, 2020 – July 1, 2022, stratified by vaccine willingness status (n=1,359). Answering the question, "Please select which is most reflective of your opinion. In general, people should… "

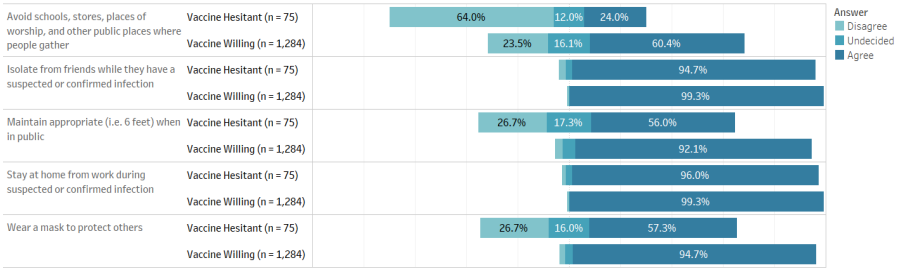

Table 2, *below*, describes the proportion of participants who agreed with engaging in individual health and safety behaviors and agreed with governmental mitigation actions during the pandemic, regardless of vaccine willingness. Overall, if a participant supported individual actions, they also supported government actions to prepare and respond during the pandemic. While not statistically significant, even if participants supported individual actions overall, they did not agree with offering people unapproved or new vaccines or drugs.

Table 2. Proportion of participants who comply with individual actions given their beliefs about government actions

	I trust what the government says about COVID-19 vaccines	I believe the government information on COVID-19 vaccines is not reliable	Wear a mask to protect others	Isolate from friends while they have a suspected or confirmed infection	Stay home from work during suspected or confirmed infection	Avoid public places where people gather	Maintain appropriate (i.e. 6 feet) when in public
	N = 1007	N = 140	N = 1,258	N = 1,344	N = 1,336	N = 790	N = 1,219
Quarantine those who might have been exposed to COVID-19 to limit	**717 (71.6) p<.001**	**83 (59.7) p<.001**	**876 (70.0) p<.001**	**909 (67.9) p=.003**	900 (67.7) p=.28	**609 (77.4) p<.001**	**848 (69.9) p<.001**

their contact							
Provide medicines or vaccines (when available) to people at a designated public	**989 (98.7) p<.001**	**119 (86.2) p<.001**	**1,230 (98.3) p<.001**	**1,294 (96.8) p<.001**	**1,286 (96.7) p<.001**	**778 (99.1) p<.001**	**1,189 (98.0) p<.001**
Close the borders to visitors from countries with COVID-19 outbreaks	597 (59.6) p=.15	95 (68.4) p=.09	**752 (60.1) p=.01**	808 (60.4) p=.16	803 (60.4) p=.48	**496 (63.2) p<.001**	**736 (60.6) p<.001**
Implement stay at home orders for non-essential workers	**503 (50.2) p<.001**	**48 (34.5) p<.001**	**613 (48.9) p<.001**	**620 (46.4) p=.04**	615 (46.3) p=.22	**511 (65.2) p<.001**	**605 (49.9) p<.001**
Set priorities to determine who gets limited supplies of medical equipment, vaccines, or drugs	**750 (74.8) p<.001**	**79 (56.8) p<.001**	**906 (72.4) p<.001**	**943 (70.5) p<.001**	**937 (70.4) p=.005**	**607 (77.1) p<.001**	**883 (72.7) p<.001**
Close public places where people gather	**447 (44.6) p<.001**	**42 (30.2) p<.001**	**545 (43.6) p<.001**	548 (41.0) p=.15	542 (40.8) p =.49	**475 (60.6) p<.001**	**535 (44.1) p<.001**

Offer people vaccines or drugs that are new and not yet approved	308 (30.7) p=.07	39 (28.1) p=.07	374 (29.9) p=.66	401 (30.0) p=.19	402 (30.2) p=.45	**221 (28.1) p=.005**	364 (29.9) p=.52
Provide paid leave for people with COVID and/or caring for sick family member	**856 (85.1) p<.001**	**100 (71.9) p<.001**	**1,063 (84.6) p<.001**	**1,104 (82.3) p=.04**	1,097 (82.3) p=.16	**687 (87.2) p<.001**	**1,030 (84.6) p<.001**

Note: bold indicates a significant difference (<.05) among proportion using a chi-square test with α=.05

IV. DISCUSSION

The COVID-19 pandemic provides many lessons learned regarding best practices for public health messaging. Clearly, public opinion can and has substantially influenced public policy.[56] In fact, policies often have limited efficacy unless they are publicly popular. As policymakers were forced to make decisions in response to the unprecedented and still ongoing pandemic, their decisions varied in popularity depending on several factors (e.g., educational attainment, income, and often political affiliation).[57] According to Pew Research Center, bipartisan support existed early in the pandemic (e.g., March 2020) for many government-imposed shutdown polices, including international travel restrictions, school closures, large event, sport or entertainment cancellations, recommendations to limit gatherings, and indoor dining restrictions. But sharp and pronounced disagreement grew as the pandemic continued.[58] According to a Washington Post-ABC News poll, by February 2022, 58% of adults felt that controlling the spread of COVID-19 was important, even if that meant restricting normal activities.[59] However, opinions varied across political party lines, with 84% of Democrats and 59% of Independents responding that it was more

56. Paul Burstein, *The Impact of Public Opinion on Public Policy: A Review and an Agenda*, 56 POL. RSCH. Q. 29, 29-36 (2003).

57. Deane et al., *supra* note 27. at 2.

58. *Id.* at 2-6.

59. Amy Goldstein & Emily Guskin, *Most Americans Say the Coronavirus is Not Yet Under Control and Support Restrictions to Try to Manage it, Post-ABC Poll Finds*, WASH. POST (Mar. 1 2022), https://www.washingtonpost.com/health/2022/03/01/coronavirus-not-under-control-post-abc-poll/.

important to control the spread of the virus, and only 32% of Republicans responding similarly.[60] Instead, 64% of Republicans felt it was more important to maintain normal activities.[61] Twenty-eight percent of Republicans reported having fully returned to "normal, pre-coronavirus life" and 35% mostly having returned to their "normal, pre-coronavirus life."[62] Twenty-three percent and 35% of Independents had fully or mostly returned to "normal, pre-coronavirus life," respectively.[63] Among Democrats, only 11% had fully, and 32% had mostly, returned to their "normal, pre-coronavirus life."[64]

Another poll by the Associated Press-NORC, also in February 2022, found that half of Americans supported mask requirements in public places outside one's home, with 77% of Democrats, 43% of Independents, and 22% of Republicans strongly or somewhat favoring face mask requirements.[65] According to a May 2022 Pew Research Center poll, the majority of surveyed Americans (57%) felt face masks should be required on airplanes and public transportation.[66] Once again differences appeared based on political party, with 80% of Democrats, or those that lean Democrat, supporting a mask requirement on airplanes and public transportation and 71% of Republicans, or those that lean Republican, opposing such a requirement.[67] The Pew Research Center poll also looked at opinions based on vaccination status. Sixty-six percent of individuals with at least one COVID-19 vaccine dose responded that masks should be required on airplanes and public transportation, 74% of unvaccinated individuals responded that masks should not be required.[68]

The responses to the CoVHORT survey and vaccine questionnaire highlight specific themes that may influence future decision-making regarding policy approaches and public health messaging.[69] Overall, participants who supported vaccination largely support government interventions as well as individual responsibility for pandemic response.[70] Among the vaccine-willing participants, a vast majority agreed that they supported taking individual actions, such as isolating from friends while they have a suspected or confirmed infection (99.3%), staying home from work during suspected or confirmed infection

60. *Id.*
61. *Id.*
62. *Id.*
63. *Id.*
64. *Id.*
65. *Declines In COVID Concerns And Mask Mandate Support*, AP-NORC CTR. FOR PUB. AFFS. RSCH. (February 25, 2022), https://apnorc.org/projects/declines-in-covid-concerns-and-mask-mandate-support/.
66. Alec Tyson, *57% of Americans Say Masks Should be Required on Airplanes and Public Transportation*, PEW RSCH. CTR. (May 11, 2022), https://www.pewresearch.org/fact-tank/2022/05/11/57-of-americans-say-masks-should-be-required-on-airplanes-and-public-transportation/.
67. *Id.*
68. *Id.*
69. *See supra,* Figure 1.
70. *See supra*, Figure 1.

(99.3%), wearing a mask to protect others (94.7%), and maintaining appropriate space when in public (92.1%).[71] Vaccine-willing participants also largely trusted what the government said about the COVID-19 vaccine (77.8%).[72] The most popular government interventions among vaccine-willing participants were providing medicines or vaccines (when available) to people at designated public places (97.9%), and paid leave for people with COVID-19 and/or who are caring for sick family members (82.7%).[73] The least popular government intervention among vaccine-willing participants was offering people vaccines or drugs that are new and not yet FDA approved (30.9%).[74]

Government closures of borders, schools, and businesses proved less popular among all respondents.[75] Among vaccine-hesitant respondents, 64.0% supported closing borders to visitors from countries with outbreaks of COVID-19;60.3% of vaccine-willing participants agreed.[76] Only 14.7% of vaccine-hesitant and 42.3% of vaccine-willing participants supported governmental closures of schools, stores, places of worship, and other public places.[77] Approximately 86% of vaccine-willing participants who supported individual measures such as avoiding schools, stores, places of worship, and other public places where people gather, also supported the government closing such locations.[78]

When government and individual actions were compared amongst all participants (*Table 3*), individuals who trusted government messaging about the COVID-19 vaccine also overwhelmingly agreed that the government should provide medicines or vaccines at designated public places.[79] These participants also supported setting priorities to determine who gets limited supplies of medical equipment or vaccines.[80] However, even participants who trusted what the government said about the COVID-19 vaccine, viewed offering people vaccines or drugs that were new or not yet FDA approved was vastly unpopular.[81]

Prior to the pandemic, paid sick leave was a publicly popular policy, which could explain why it was one of the most popular government interventions for disease control and prevention.[82] A Pew Research Center survey, published in

71. *See supra* Figure 2.
72. *See supra* Table 2.
73. *See supra,* Figure 1.
74. *See supra,* Figure 1.
75. *See supra,* Figure 1.
76. *See supra,* Figure 1.
77. *See supra,* Figure 1.
78. *See supra,* Figure 2.
79. *See supra* Table 2.
80. *See supra* Table 2.
81. *See supra,* Table 2.
82. Juliana Menasce Horowitz et al., *Americans Widely Support Paid Family and Medical Leave, but Differ Over Specific Policies*, PEW RSCH. CTR (Mar. 23, 2017), https://www.pewresearch.org/social-

2017, found that 85% of respondents supported workers receiving paid leave to deal with their own serious health conditions.[83] Sixty-seven percent of respondents supported paid leave to take care of a family member who was seriously ill.[84]

As of July 2020, only thirteen states and Washington, D.C., had laws in place requiring employers to provide paid sick leave.[85] Most state laws apply to public and private sector employers. Some state laws only apply to employers with a certain number of employees.[86] For example, in Maryland, public and private employers with more than fifteen employees must provide paid leave accrual, with one hour of leave accrued for every thirty hours worked (with a maximum of forty hours per year).[87] In Michigan, public (not including federal employers) and private employers with fifty or more employees are required to provide one hour of sick leave for every thirty-five hours an employee has worked (with a maximum of forty hours per year).[88] In 2016, Arizona voters passed the Fair Wages and Healthy Families Act,[89] which established a new state minimum wage and required certain employees to accrue paid sick time (one hour for every thirty hours worked, with a maximum per year depending on the size of the employer).[90] An important aspect of Arizona's Fair Wages and Healthy Families Act, relevant to the pandemic, was the allowance of paid sick time during a public health emergency. Paid sick time can be used under the Act for:

1) Medical care or mental or physical illness, injury, or health condition of the employee or any of the employee's family members (see the definition of "family member" in Arizona Revised Statutes § 23-371 to see who qualifies as a family member);
2) A public health emergency affecting the employee or a family member of the employee pursuant to Arizona Revised Statutes § 23-373; and
3) An absence due to domestic violence, sexual violence, abuse, or stalking involving the employee or any of the employee's family

trends/2017/03/23/americans-widely-support-paid-family-and-medical-leave-but-differ-over-specific-policies.

83. *Id.*

84. *Id.*

85. *Paid Sick Leave,* NAT. CONF. OF STATE LEGIS. (July 21, 2020), https://www.ncsl.org/research/labor-and-employment/paid-sick-leave.aspx.

86. *Id.*

87. *Id.*

88. *Id.*

89. *Frequently Asked Questions (FAQS) About Minimum Wage and Earned Paid Sick Time*, INDUS. COMM'N OF ARIZ.,

https://www.azica.gov/frequently-asked-questions-about-wage-and-earned-paid-sick-time-laws (last visited July 14, 2022).

90. *Frequently Asked Questions (FAQS) About Minimum Wage and Earned Paid Sick Time*,

INDUS. COMM'N OF ARIZ. at 5, https://www.azica.gov/frequently-asked-questions-about-wage-and-earned-paid-sick-time-laws.

members (see the definition of "family member" in Arizona Revised Statutes § 23-371 to see who qualifies as a family member).[91]

The need for paid medical leave was increasingly evident during the pandemic, and the issue even received bipartisan support early in the pandemic.[92] The Families First Coronavirus Response Act (FFCRA), signed into law by President Trump on March 18, 2020,[93] required certain employers to provide employees with paid sick leave related to COVID-19.[94] However, the paid sick leave provisions under FFCRA expired on December 31, 2020.[95]

One limitation of this study is the small size of the vaccine-hesitant participants. Therefore, the results may not necessarily reflect clear opinions on governmental or individual actions for vaccine-hesitant individuals. Moreover, the population sampled includes an overrepresentation of urban residents and does not include the perceptions of rural residents and communities, which likely have lower rates of vaccination and higher rates of vaccine hesitancy. Additionally, the sample in this study does not reflect the racial diversity within the state. According to the 2020 census, Arizona's White population is 82.6%, which is considerably lower than the study population, which was over 90% White.[96] Challenges with the Arizona vaccine distribution efforts may have disadvantaged people of color, given the substantially lower vaccination rates of this populations relative to their proportion of the population.[97] Additionally, the social determinants of health, and the structural inequities inherent in healthcare delivery, likely additionally drove the disparities in vaccination rates and participation in the current study.[98] Vaccine efforts in Arizona prioritized urban populations where the most vaccine could be used for the greatest number of people. As a result, efforts to extend vaccine efforts into rural or isolated communities lagged in comparison. Additionally, the attitudes towards government interventions could have reflected the long history of racial and ethnic tension in Arizona as a border state. Arizona respondents may have perceptions and attitudes towards border closures as an infection mitigation

91. *Id.* at 3.

92. Rebecca L. Baker et al., *President Trump Signs Families First Coronavirus Response Act,* NAT. L. REV., (Mar. 23, 2020), https://www.natlawreview.com/article/president-trump-signs-families-first-coronavirus-response-act-0.

93. *Id*.

94. *Families First Coronavirus Response Act: Employee Paid Leave Rights*, U.S. DEP'T OF LAB., https://www.dol.gov/agencies/whd/pandemic/ffcra-employee-paid-leave (last visited Jan. 19, 2022).

95. *Id*.

96. *QuickFacts Arizona,* U.S. CENSUS BUREAU (July 1, 2021), https://www.census.gov/quickfacts/AZ.

97. Alex Devoid, *Lag in Vaccination Among Arizona's Racial, Ethnic Groups Unlikely to Change*, ARIZ. DAILY STAR (June 6, 2022), https://tucson.com/news/local/lag-in-vaccination-among-arizonas-racial-ethnic-groups-unlikely-to-change/article_4178b216-a6cb-11eb-822b-775686bae788.html.

98. *Id*.

strategy may not be generalizable to regions that do not experience the economic and humanistic cost of closed borders.

V. CONCLUSION

Policy makers throughout the pandemic have been forced to make real-time decisions frequently based on rapidly changing guidance as new information became, and continues to become, available.[99] Public opinion about these decisions will influence the future of infectious disease control policy and law. In this study, the clustering of both vaccine hesitancy and lack of support for government or individual action to prevent transmission likely underscores the division of COVID-19 cases observed between the vaccinated and unvaccinated. Ultimately, among predominantly vaccine-willing participants, we found that two government infection mitigation policies proved overwhelmingly popular: government provision of vaccines and paid leave policies for individuals sick with COVID-19 or caring for a family member sick with COVID-19. While paid leave policies were popular even before the pandemic, a majority of states in the U.S. lack paid sick leave requirements. The need for such laws became even more evident due to the COVID-19 pandemic, while the FFCRA attempted to address this, the Act lasted less than one year and was limited to sick leave directly related to COVID-19.[100] To plan and prepare for future response efforts involving infectious disease, policymakers should take note of the need for legislation and policy addressing paid sick leave and vaccine provisions.

99. Alex M. Azar II. *Determination that a Public Health Emergency Exists*, U.S. Dep't of Health & Hum. Servs. (Jan. 21, 2020),

https://www.phe.gov/emergency/news/healthactions/phe/Pages/2019-nCoV.aspx; *COVID-19: Declaration of Emergency, Executive Order*, Office of the Governor Doug Ducey (Mar. 11, 2020), https://azgovernor.gov/governor/news/2020/03/covid-19-declaration-emergency-executive-order; *Further Action To Reverse COVID-19 Spread in Arizona*, Office of the Governor Doug Ducey (June 29, 2020), https://azgovernor.gov/governor/news/2020/06/further-action-reverse-covid-19-spread-arizona.

100. *Families First Coronavirus Response Act: Employee Paid Leave Rights*, U.S. DEP'T OF LAB., https://www.dol.gov/agencies/whd/pandemic/ffcra-employee-paid-leave (last visited Jan. 19, 2022).