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## Influencers of COVID-19 Vaccine Acceptance in the Deep South

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COVID-19 Vaccine Acceptance in the Deep South

## **Influencers of COVID-19 Vaccine Acceptance in the Deep South**

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### **Abstract**

*Background:* Within the Deep South, vaccine ratings fall between 48.5 and 58% of the region's population being fully vaccinated against COVID-19. Therefore, half of the population, or more, is at risk for the negative mortality and morbidity outcomes associated with COVID-19.

*Purpose:* The aim of this study was to describe the key influencers of accepting the COVID-19 vaccine for individuals living within the Deep South. *Methods:* A descriptive, secondary analysis of quantitative data was conducted from an online survey entitled "COVID-19 Vaccine Acceptance Survey." A total of 421 participants identified as living in the Deep South were at least 18 years of age and English speaking. As a result, these 421 participants were included in the analysis. Descriptive statistics and mean frequency scores were calculated.

*Results:* The highest means were identified among the social responsibility influencers for participants regardless of gender, race, or age. Healthcare influencers, particularly the option of a doctor, healthcare provider, or nurse, also positively influenced male and female participants who were at least 25 years old. Public figure influencers had little to no influence on the overall sample. *Conclusion:* As the current pandemic impacts those who are unvaccinated at a disproportionate rate, it is warranted expand targeted strategies and interventions to increase vaccine acceptance in the Deep South.

*Keywords:* COVID-19, vaccine, influencers, Deep South

## COVID-19 Vaccine Acceptance in the Deep South

### Introduction

The Census Bureau labels the southeastern region of the United States (U.S.) the South and including sixteen states and the DC area within the geographic area of the South (US Census Bureau, n.d.). This manuscript focuses on a portion of the southeastern region known as the Deep South, which includes Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas. This region is known for its southern hospitality, warm climate, and profitable crops. The Deep South is also known for other, less desirable characteristics. The Deep South has many difficult public health challenges such as limited access to healthcare, higher rates of chronic disease, gaps in poverty and education, and poor living conditions when compared to the rest of the U.S. According to the County Health Rankings (University of Wisconsin Population Health Institute, 2021), six of the seven Deep South states are above overall U.S. percentages for obesity, physical inactivity, uninsured rates, and air pollution levels. Three of the states also have percentages above the U.S. for unemployment rates. Each of these factors impact the daily quality of life and the overall health of the population living within these states. Additionally, many of the Deep South states are ranked among the least healthy states in the U.S. according to the United Health Foundation (2021) – Mississippi (43<sup>rd</sup>), South Carolina (45<sup>th</sup>), Alabama (49<sup>th</sup>), and Louisiana (50<sup>th</sup>).

The challenges brought on by the COVID-19 pandemic have only compounded by the pre-pandemic health disparities faced by individuals living in the Deep South. Since early 2020 when COVID-19 began to impact the U.S., there have now been more than 14.5 million cases and 225,000 deaths reported in the Deep South alone (Centers for Disease Control and Prevention [CDC], 2022a). COVID-19 continues to affect the southern portion of the U.S., notably where there are also decreased vaccine rates as compared to other regions across the U.S. (CDC, 2022b). Vaccine rates for the seven Deep South states fall between 48.5 and 58% of the state's population being fully vaccinated. Of those vaccinated, all seven states have higher vaccination rates noted in females and those who are White, non-Hispanic (John Hopkins University, 2022). Many of the reasons for decreased vaccination rates coincide with the public health challenges listed above that impact the Deep South, particularly in racial and ethnic minority groups (CDC, 2021).

The current COVID-19 pandemic in the U.S. is considered a pandemic among those who are unvaccinated (Alcendor, 2021). Therefore, future interventions and strategies for increasing COVID-19 vaccinations must be appropriately tailored for populations with lower vaccinations rates, such as the those living in the Deep South. Understanding individuals' influencers for receiving the COVID-19 vaccine can inform and guide collaborative efforts to increase vaccination rates and potentially reduce COVID-19 mortality and morbidity within this population. Thus, the aim of this study was to describe the key influencers of COVID-19 vaccine

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acceptance by individuals living in the Deep South and to use the knowledge gained to promote acceptance of the COVID-19 vaccine within the Deep South population.

### **Method**

#### **Design**

The current study was a descriptive, secondary analysis of quantitative data. The data were obtained from a larger cross-sectional study conducted to identify the influencers of COVID-19 vaccine acceptance among individuals in the U.S. The full results of the parent study are available as supplemental data. A brief overview of the parent study, an online survey, can be found in the methodology discussion below. The Institutional Review Board granted approval for the study.

#### **Participants**

The survey was administered in May of 2021 using recruitment through two online platforms. A total of 1395 participants completed the vaccine acceptance survey in the parent study, with 1327 indicating that they had received or were planning to receive the COVID-19 vaccine. Those participants were directed to continue the survey and provide responses based on influencers leading to their vaccine acceptance. Eligible participants were at least 18 years of age, English-speaking, and were residents of the U.S., including Puerto Rico. The current study presents the analyzed data ( $n=421$ ) obtained from participants that identified as living in one of the seven states considered the Deep South – Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas.

#### **Data Collection**

Data were obtained via an online survey entitled “COVID-19 Vaccine Acceptance Survey.” The research team developed the survey based on insights from the literature surrounding the term vaccine acceptance. Similar terms used in the literature search to identify vaccine acceptance included confidence, receptivity, and uptake. Additionally, research team members provided insight into potential vaccine influencers. Nineteen influencers for vaccine acceptance were identified and piloted by a sample of community representatives. Feedback was received and incorporated into the survey prior to implementing the survey. Completion of the survey took place using two online platforms – Amazon's Mechanical Turk (MTurk) and Facebook (Mortensen & Hughes, 2018; Perrin & Anderson, 2019). All measures were self-reported by eligible participants and took approximately ten minutes to complete. Demographic data were collected, followed by the assessment of vaccination status. Then, participants indicating that they had received or were planning to receive the COVID-19 vaccine were directed to a list of vaccine influencers (Figure 1). Participants identified the degree of influence the nineteen influencers had on their decision to accept the COVID-19 vaccine, rating each influencer on a Likert scale ranging from 1 “Definitely Not” to 5 “Definitely”. A neutral option was available.

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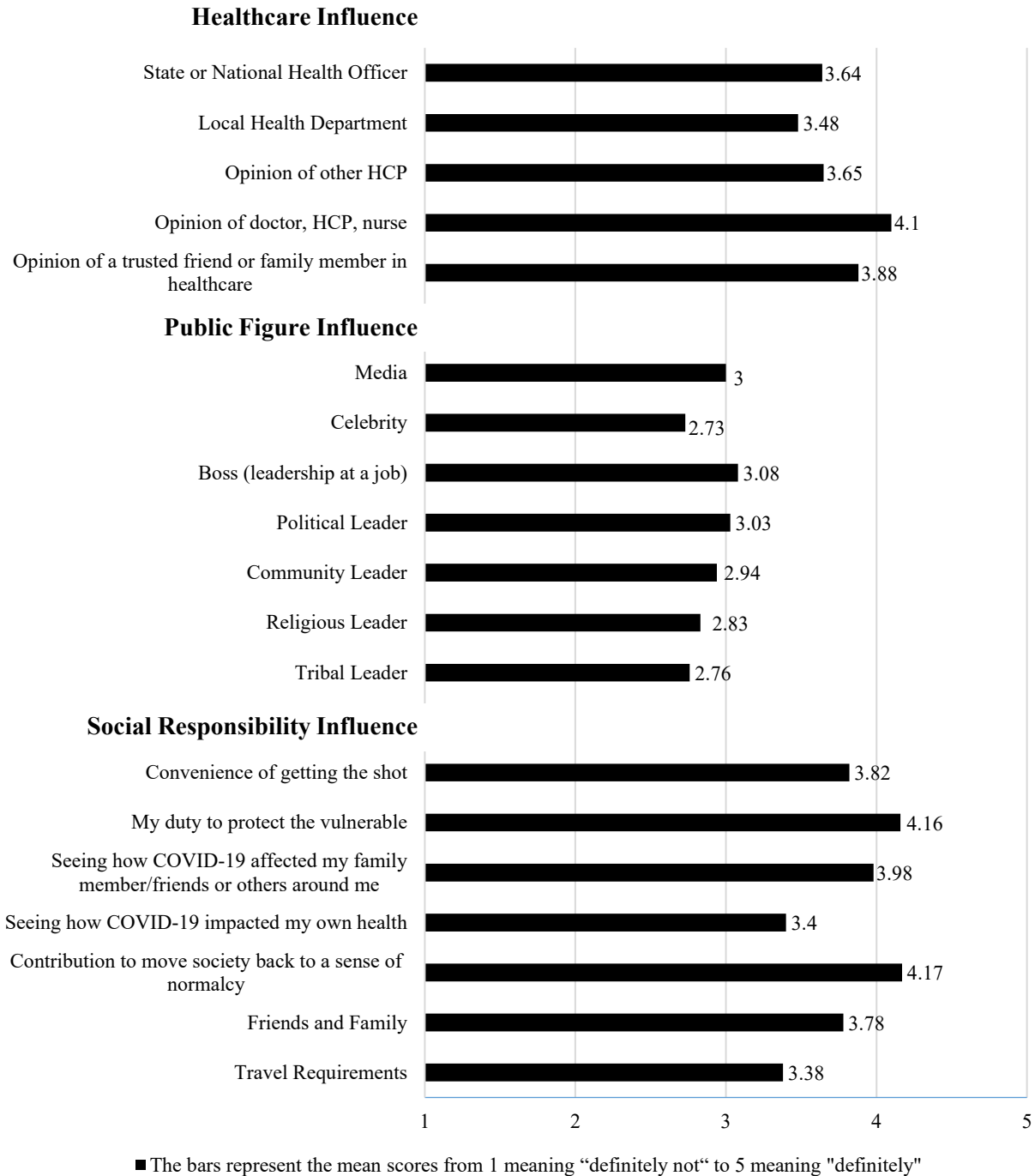
### **Statistical Analysis**

Descriptive statistics were used to characterize the sample and potential COVID-19 vaccine influencers. Mean frequency scores for each influencer were calculated and reported. Mean frequency scores that were greater than 3.5 were considered to be a positive influencer. Any mean that was less than 3.5 was thought to have little or no influence. The nineteen influencers were grouped to simplify reporting and interpretation in the parent study and adopted in this study: Healthcare Influence (5 items), Public Figure Influence (7 items), Social Responsibility Influencers (7 items). Influencers were also reported using sub-groups based on race, gender, and age. Independent *t*-tests were used to compare means among the sub-groups. The statistical package for social sciences (SPSS; Version 27) was used for data analysis.

COVID-19 Vaccine Acceptance in the Deep South

Figure 1

*Mean Frequency of Influencers to Accept the COVID-19 Vaccine for the Deep South sample (n=421)*



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**Results****Demographics**

A total of 421 participants within the parent study identified as residing in one of the seven states considered the Deep South. These 421 participants were used for this analysis. See Table 1 for the full descriptive results. The sample was comprised of an even number of males and females. The majority of the sample identified themselves as being White (79.2%), between the age of 25 and 44 (69.3%), and married (79.2%). Slightly less than a majority were college graduates (47.7%). Additionally, the majority of participants received the flu vaccine in the past 24 months (71.5%). Each of the seven Deep South states were represented, but a significant percentage of the participants identified as living in Texas (31.4%), Mississippi (25.9%), or Florida (24.5%).

**COVID-19 Vaccine Influencers**

As shown in Figure 1, the highest means of influence among all nineteen influencers were found in the social responsibility influence group – contribution to move society back to a sense of normalcy ( $\bar{x} = 4.17$ ) and my duty to protect the vulnerable ( $\bar{x} = 4.16$ ). The highest mean surrounding the influence of healthcare providers was reported as the opinion of a doctor, healthcare provider (HCP), or nurse ( $\bar{x} = 4.1$ ). Additionally, all but one healthcare influencer and all but two social responsibility influencers had mean scores indicating they were a positive influence on the participant's decision to accept the COVID-19 vaccine. The influencers in the public figure influence grouping all had a mean ranging from 2.73 to 3.08, displaying a neutral to no influence on the individual's decision to accept the COVID-19 vaccine. The results of the nineteen influencers were further broken into sub-groups based on gender, race, and age (see Tables 2 and 3).

**Sub-group Analysis: Gender.** Influencers to accept the COVID-19 vaccine were similar between males and females (see Table 2). Both genders indicated highest means on the following influencers: my duty to protect the vulnerable ( $\bar{x} = 4.01$  for males,  $\bar{x} = 4.29$  for females,  $p = .007$ ) and the opinion of a doctor, HCP, or nurse ( $\bar{x} = 4$  for males,  $\bar{x} = 4.18$  for females,  $p = .096$ ). Additionally, while other social responsibility influencers with a positive influence were noted, only two were noted to have significant differences among gender. Females were positively influenced by the contribution to move society back to a sense of normalcy compared to males ( $p = .002$ ). Males were marginally influenced by travel requirements to accept the COVID-19 vaccine, while females reported neutral influence ( $p = .014$ ). While there were statistically significant differences noted among all seven influencers within the public health group influence, all means ranged from 3.06 to 3.4 for males and 2.37 to 2.86 for females, indicating a neutral to no influence on the individual's decision to accept the COVID-19 vaccine.

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Table 1

*Demographics of Participants that have Accepted or Plan to Accept the COVID-19 Vaccine*

Gender		
Male	207	49.4
Female	210	50.1
Self-Described	2	.5
Race		
White	332	79.2
Black/ African American	62	14.8
Other	25	6.0
Age		
18-24	15	3.6
25-34	133	31.7
35-44	158	37.6
45-54	53	12.6
55-64	39	9.3
65+	22	5.2
Education		
High School Graduate	15	3.6
Some College	55	13.1
College Graduate	201	47.7
Graduate Degree	150	35.6
Marital Status		
Married	322	77
Single	74	17.7
Widowed	4	1
Divorced	18	4.3
Flu Shot in Past 24 Moths		
Yes	301	71.5
No	115	27.3
Unsure	5	1.2
US State		
Alabama	22	5.2
Florida	103	24.5
Georgia	29	6.9
Louisiana	14	3.3
Mississippi	109	25.9
South Carolina	12	2.9
Texas	132	31.4



## COVID-19 Vaccine Acceptance in the Deep South

Table 2  
*Vaccine Influencers*

Vaccine Influencers	Male	Female				White Female	Black Female		
	<i>M</i>	<i>M</i>	<i>p</i>	<i>M</i>	<i>M</i>	<i>p</i>	<i>M</i>	<i>M</i>	<i>p</i>
<b>Healthcare Influencers</b>									
Opinion of a trusted friend or family member in healthcare	3.85	3.9	.070 <sub>a</sub>	3.86	3.81	.821 <sub>a</sub>	3.91	3.76	.571 <sub>a</sub>
Opinion of doctor, HCP, nurse	4.0	4.18	.096 <sub>a</sub>	4.01	3.91	.643 <sub>a</sub>	4.16	4.43	.230 <sub>a</sub>
Opinion of other HCP	3.7	3.61	.453 <sub>a</sub>	3.67	3.97	.109 <sub>b</sub>	3.54	4.16	.002 <sub>b</sub>
Local Health Department	3.64	3.34	.028 <sub>a</sub>	3.67	3.58	.717 <sub>a</sub>	3.31	3.65	.261 <sub>a</sub>
State or National Health Officer	3.83	3.46	.005 <sub>b</sub>	3.88	3.59	.176 <sub>a</sub>	3.42	4.0	.030 <sub>b</sub>
<b>Public Figure Influencers</b>									
Tribal Leader	3.11	2.37	<.001 <sub>a</sub>	3.1	3.79	.006 <sub>b</sub>	2.27	3.17	<.001 <sub>b</sub>
Religious Leader	3.14	2.51	<.001 <sub>a</sub>	3.13	3.78	.002 <sub>a</sub>	2.33	3.75	<.001 <sub>a</sub>
Community Leader	3.29	2.58	<.001 <sub>a</sub>	3.2	3.97	.001 <sub>b</sub>	2.5	3.57	.001 <sub>a</sub>
Political Leader	3.4	2.67	<.001 <sub>a</sub>	3.31	3.94	.009 <sub>b</sub>	2.57	3.5	.004 <sub>a</sub>
Boss (leadership at a job)	3.31	2.86	.002 <sub>a</sub>	3.34	3.47	.609 <sub>a</sub>	2.77	3.57	.010 <sub>a</sub>
Celebrity	3.06	2.39	<.001 <sub>b</sub>	3.03	3.48	.070 <sub>b</sub>	2.2	3.88	<.001 <sub>b</sub>
Media	3.35	2.65	.014 <sub>b</sub>	3.36	3.73	.093 <sub>b</sub>	2.49	3.76	<.001 <sub>b</sub>
<b>Social Responsibility Influencers</b>									
Friends and Family	3.85	3.69	.174 <sub>b</sub>	3.88	3.71	.463 <sub>a</sub>	3.69	3.78	.735 <sub>a</sub>
Contribution to move society back to a sense of normalcy	3.99	4.33	.002 <sub>a</sub>	3.99	4.0	.948 <sub>a</sub>	4.36	4.0	.114 <sub>a</sub>
Seeing how COVID-19 impacted my own health	3.51	3.28	.118 <sub>a</sub>	3.47	4.0	.015 <sub>b</sub>	3.24	3.76	.045 <sub>b</sub>
Seeing how COVID-19 affected my family member/friends or others around me	3.87	4.08	.071 <sub>b</sub>	3.89	4.06	.466 <sub>a</sub>	4.16	3.84	.152 <sub>a</sub>
My duty to protect the vulnerable	4.01	4.29	.007 <sub>a</sub>	4.05	3.85	.353 <sub>a</sub>	4.34	3.91	.05 <sub>a</sub>

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Convenience of getting the shot	3.82	3.81	.944 <sub>a</sub>	3.74	4.0	.269 <sub>a</sub>	3.83	3.63	.442 <sub>a</sub>
Travel Requirements	3.54	3.18	.014 <sub>b</sub>	3.58	3.72	.590 <sub>a</sub>	3.06	4.17	<.001 <sub>b</sub>

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*Mean Frequency of Influence to Accept the COVID-19 Vaccine Based on Gender and Race*

a = equal variances assumed. b = equal variances not assumed.

**Sub-group Analysis: Females by Race.** White females reported the highest positive influencers of their decision to accept the COVID-19 vaccine to be the contribution to move society back to a sense of normalcy ( $\bar{x} = 4.36$ ) and my duty to protect the vulnerable ( $\bar{x} = 4.34$ ), which is similar to the highest positive influencers for the total Deep South sample of this study. Black females reported the highest positive influencer in their decision to accept the COVID-19 vaccine as the opinion of a doctor, HCP, or nurse ( $\bar{x} = 4.43$ ), which was also a key influencer for the Deep South sample.

Upon analyzing the level of influence for females, eleven of the nineteen influencers were statistically significant as compared to the influencers based on race. White females had slightly higher means of influence in four of the seven social responsibility influencers; however, none of those differences were significant. Black female participants were more positively influenced to accept the COVID-19 vaccine than White female participants due to travel requirements ( $p = <.001$ ) and seeing how COVID-19 impacted my own health ( $p = .045$ ). Most of the healthcare influencers had higher means reported from females that were Black, with two influencers noted to have significance. There was also a significant difference between means noted in the female population within the public figures influence. Black females indicated the seven public figures to be a greater positive influencer in their decision to accept the COVID-19 vaccine as compared to White females. None of the public figures influenced White females' decision to receive the vaccine. A full description of influencers for female participants can be found in Table 2.

**Sub-group Analysis: Males by Race.** When looking at the mean of influence reported by males (see Table 2), White males reported the highest positive influencers to be my duty to protect the vulnerable ( $\bar{x} = 4.05$ ) and the opinion of a doctor, HCP, or nurse ( $\bar{x} = 4.01$ ). Black males reported the highest positive influencers as seeing how COVID-19 affected my family/friends or others around me ( $\bar{x} = 4.06$ ) and seeing how COVID-19 impacted my own health ( $\bar{x} = 4$ ). When comparing the male responses by races, five of the nineteen influencers were statistically significant. A significant difference noted among societal influencers was that Black males had a higher degree of influence to accept the COVID-19 vaccine than White males when it came to seeing how COVID-19 impacted my own health ( $\bar{x} = 4$ ). There were no significant differences among healthcare influences, even though it can be noted that White males were more positively influenced by five of the six influencers to accept the vaccine when compared to Black males. Although public figure influence was noted to have little to no influence, there were significant differences in the mean scores when comparing males by race. Black males reported marginal positive influence for all seven public figure influences to accept the COVID-19 vaccine, with four having significant differences. White males reported no influence from public figures in their decision to receive the vaccine, with means ranging from 3.03 to 3.36.

**Sub-group Analysis: Age.** The highest means of positive influence for the age groupings to accept the COVID-19 vaccine can be found in Table 3. All age groupings had the same highest

positive influencers to receive the COVID-19 vaccine as the entire Deep South sample. The top three positive influencers within each age grouping were My duty to protect the vulnerable and contribution to move society back to a sense of normalcy. While at least one healthcare influencer was noted to positively influence the decision to accept the COVID-19 within 25 years and older participants, no healthcare influencer was noted in the 18 to 24 age grouping as an influencer to receive the COVID-19 vaccine. Participants 18 to 24 and 45 to 54 years old were positively influenced by *their friends and family* ( $\bar{x} = 3.63$  and  $3.88$  respectively). The convenience of getting the shot was another positive influencer to accept the COVID-19 vaccine that landed in the top 5 for both the 18 to 24 and 65 and older age groupings but was not one of the highest influencers for ages 25 to 64.

**Table 3**

*The top positive influencers for each age grouping to accept the COVID-19 vaccine*

Age (years)	Influencers	Mean
18-24**	1. Friends and Family	3.63
	2. My duty to protect the vulnerable	3.56
	3. Contribution to move society back to a sense of normalcy	3.56
25-34	1. Opinion of a doctor, healthcare provider, nurse	4.19
	2. Contribution to move society back to a sense of normalcy	4.14
	3. My duty to protect the vulnerable	4.11
	4. Seeing how COVID-19 affected my family/friends or others around me	4.0
	5. Opinion of a trusted friend or family member in healthcare	3.98
35-44	1. Contribution to move society back to a sense of normalcy	4.18
	2. Opinion of a doctor, healthcare provider, nurse	4.16
	3. My duty to protect the vulnerable	4.12
	4. Seeing how COVID-19 affected my family/friends or others around me	4.07
	5. Opinion of a trusted friend or family member in healthcare	3.88
45-54	1. My duty to protect the vulnerable	4.22
	2. Contribution to move society back to a sense of normalcy	4.06
	3. Opinion of doctor, healthcare provider, nurse	3.96
	4. Seeing how COVID-19 affected my family/friends or others around me	3.9
	5. Friends and family	3.88
55-64	1. My duty to protect the vulnerable	4.46
	2. Contribution to move society back to a sense of normalcy	4.39
	3. Opinion of a doctor, healthcare provider, nurse	3.97
	4. Seeing how COVID-19 affected my family/friends or others around me	3.95
	5. Opinion of a trusted friend or family member in healthcare	3.63

65+	1. Contribution to move society back to a sense of normalcy	4.5
	2. My duty to protect the vulnerable	4.45
	3. Opinion of a doctor, healthcare provider, nurse	3.6
	4. Convenience of getting the shot	4.3
	5. Opinion of a trusted friend or family member in healthcare	4.09

\*\*Only three positive influencers to accept the COVID-19 vaccine were listed for this age grouping as all other influencers reported means  $\leq 3.5$ , which indicated little to no influence.

## Discussion

A total of 421 participants completed the survey indicating that they planned to receive or had received the COVID-19 vaccine and identified as living within one of the seven Deep South states. Among the participants within this Deep South sample, the male and female participants (49.5% and 50.1% respectively) closely aligned with the U.S. Census population report of gender distribution within the South (as defined by the U.S. Census Bureau), which reported 49% males and 51% females (US Census Bureau, n.d.-b). There was a slight variation in the race distribution compared to the South. This sample consisted of 79.2% of participants who identified as White (US Census reported 70%) and 14.8% as Black (US Census reported 19.4%). Age, educational attainment, and marital status over-represented the South's population, as the majority of participants within the sample were age 25 to 44 (69.3%), college graduates (47.7%), and were married (77%). This is compared to the South, where 26.5% of individuals are age 25 to 44, 30.9% have college degrees, and 47.3% are married (US Census Bureau, n.d.-b). These comparisons establish the overall representativeness of the study sample to the Deep South population.

In previous literature, it has been found specific populations that have been impacted by COVID-19 more than others. Evidence suggests that the prevalence, hospitalizations, and mortality rates of COVID-19 are higher among Black and Hispanic populations (Mackey et al., 2021; Mude et al., 2021). Additionally, the unwillingness to accept the COVID-19 vaccine has been noted among racial minorities, individuals with lower education levels, individuals with lower incomes, and individuals of lower ages (El-Monhandes et al., 2021; Malik et al., 2020). The sample for this study matches the population identified as being more acceptant of the COVID-19 vaccine, as a majority are White, have higher levels of education, and are middle-aged. The results of this study reinforce previous reports, thus emphasizing the need to tailor initiatives to promote vaccine acceptance within the Deep South.

The purpose of this study was to describe the positive influencers for accepting the COVID-19 vaccine among individuals living within the Deep South. Through secondary analysis of data obtained from online surveys, the degree of COVID-19 vaccine influence was measured for nineteen influencers. The influencers were grouped into three categories: social responsibility influencers, healthcare influencers, and public figure influencers.

### **Social Responsibility Influence**

Some of the highest percentages of participants surveyed indicated social responsibility positively influenced them. Two of the specific influencers among the Deep South sample were related to their duty and contribution to society. Even among the sub-groupings based on gender, race, and age, the social responsibility influencers positively influenced participants to receive the COVID-19 vaccine. This idea of social responsibility has previously been identified in the literature related to vaccine acceptance among parents' willingness to vaccinate their children (Quadri-Sheriff et al., 2012). Though the idea of vaccination acceptance has been studied in the past as it relates to childhood vaccines, further exploration of social responsibility, as an influencer, to accept the COVID-19 vaccine should be conducted.

Social responsibility not only focuses on the participants' duty and contribution to their communities. It also was noted through social responsibility influencers that participants focused on their place within society and those they are closest to. Members of underserved communities experience similar societal and healthcare access challenges, thus more likely to be influenced to protect oneself and their communities. El-Monhandes et al. (2021) identified top motivators for vaccinations as protecting oneself, friends, and family against COVID-19. The present study also found the same positive influencers for participants in the Deep South to accept the COVID-19 vaccine. Positive influences were noted among Black males and Black females, related to how COVID-19 impacted my health. Males and females, respective and irrespective of their race, were also positively influenced by seeing how COVID-19 affected my family/friends. Therefore, further supporting the idea that utilizing vaccine acceptance strategies to support individuals' values of social responsibility may help increase the vaccines' receptivity (Rutten et al., 2021).

**Healthcare Influence.** A majority of the healthcare influencers positively influenced the individual's decision to accept the COVID-19 vaccine. One influencer, opinion of the doctor, HCP, or nurse, had higher percentages of means among the sample. This finding supports the literature stating that higher vaccine acceptance and reliance on COVID-19 information comes from healthcare professionals and health officials, especially once a trusting relationship has been identified (Malik et al., 2020). Omer et al. (2021) also found that vaccine uptake increases when healthcare providers initiate vaccine discussions. In the Deep South, where healthcare challenges surround access to care, interventions to improve healthcare provider access in rural communities through telehealth or mobile clinics may be one way to enhance the influence of healthcare providers on vaccine acceptance. Additionally, medical programs that have a curriculum focus on healthcare in a rural setting may help to increase access and support to areas within the Deep South, further increasing discussions surrounding vaccine initiation. For participants 18 to 24 years old, there were no noted positive influencers related to healthcare. Therefore, another strategy to increase healthcare presence among older adolescence would be to increase the healthcare provider presence through school-based health care.

**Public Figure Influence.** The role of public figures on the influence to receive the COVID-19 vaccine displayed neutral to no influence among all study participants. This finding remained evident in the sample when broken down by race, as there was no influence on White participants. Individuals that identified as Black have a marginally positive influence by public health figures, being more influenced by community leaders and political leaders. The idea that community partnership strategies should be used to build confidence and trust in vaccine communication has been explored and should be built upon (French et al., 2020). French et al. (2020) found that political officials, community officials, and religious leaders that share knowledge about current safety issues and are transparent about vaccine planning decrease confusion and increase trust. This idea is also supported internationally, suggesting that government and political officials are more likely to be trusted through relationships built over time and may reduce vaccine hesitancy (Razi et al., 2021). The lack of influence in our study for public figures should be further explored to identify strategies to improve trust and thus vaccine acceptance.

An additional public figure influence was the use of media. The role of media in health communication has been documented in the literature as a critical element for any pro-vaccination strategy (French et al. 2020). El-Mohandes et al. (2021) and Bonnevie et al. (2021) found that social media and the internet positively engages communities for vaccine health information. The lack of influence that media played in our Deep South sample, besides the slight influence identified by Black males and females, should be further explored.

A strength of this study is the sample size and representation from all Deep South states. To the best of the author's knowledge, this is the first study, post-vaccine deployment, to use a sample specific to the Deep South with further exploration of sub-groups within the Deep South. The breakdown of data into sub-groups allows for more directed and individualized interventions to increase vaccine acceptance. Additionally, the research team developed a survey to measure influencers of COVID-19 vaccine acceptance that was otherwise not available. The psychometric properties for the nineteen-item survey identified excellent internal consistency with a Cronbach's Alpha of  $\alpha = .929$ . Breaking down the surveys into sub-groups also identified internal consistency among items. The healthcare influencers consisted of five items ( $\alpha = .785$ ), the public figure influence consisted of seven items ( $\alpha = .943$ ), and the social responsibility influencers consisted of seven items ( $\alpha = .769$ ).

### **Limitations**

Limitations are present in all studies. For this study specifically, generalizing results should be cautioned due to the non-randomized sampling method used to collect the data. The survey was only provided in English and utilized the virtual format. This potential participants that are non-

English speaking or that do not have access to the identified platforms (Amazon MTurk or Facebook) to be underrepresented in the sample. Additionally, although the sample is modestly representative of the Deep South in gender (male and female) and race (Black and White) categories, there is an overrepresentation of age, marital status, and education and an underrepresentation of ethnic minorities groups. Therefore, additional studies are needed and may include other recruitment strategies to reach targeted demographics and participants who do not have access to Amazon MTurk or Facebook. Another limitation that the researchers identify is that this survey was administered as a self-directed online survey. Therefore, the assumption is made that the participants understand the questions and that the self-reported data is an honest response.

### **Conclusion**

The COVID-19 vaccine is an effective strategy to decrease the prevalence, intensity, and negative outcomes associated with COVID-19. With the current pandemic disproportionately impacting unvaccinated individuals to a greater extent, an increase in strategies to reduce vaccine hesitancy and increase vaccine acceptance is warranted. Implementing processes and interventions based on documented influencers for individuals living in the Deep South to accept the COVID-19 vaccine can assist healthcare teams and community members to target additional populations to promote vaccine acceptance and increase vaccine rates. It should also be noted that the sample in this study mimics individuals across the U.S. who are known to be acceptant of the COVID-19 vaccine. Further research geared toward understanding the influencers for those individuals who are not routinely accepting the COVID-19 vaccine is needed to further target the minorities and populations in the Deep South that remain resistant to the COVID-19 vaccine.



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