

RESEARCH BRIEF

A Survey of Behaviors, Beliefs, and Perceptions of COVID-19 in Rural Appalachian Ohio

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ABSTRACT

Background: Preventing the spread of COVID-19 comes with many challenges. Considering the sociobehavioral effects of social distancing in rural communities specifically is incredibly important. No previous studies have been published about adherence to COVID-19 preventative measures and viewpoints on vaccination/other prevention measures in the rural Appalachian region of Ohio specifically. This present study will describe the results of a survey regarding perceptions of COVID-19 in rural communities.

Methods: A 20-question cross-sectional survey was administered over a 6-week period from February to April 2021. Survey distribution was completed via flyers with QR codes hung at 4 medical offices in Columbiana and Tuscarawas counties. The survey was adapted from the standardized FluTEST survey. Descriptive statistics and bivariate analyses were used for comparison.

Results: We had 23 respondents after removing incomplete/nonconsenting responses. Our data showed that contracting COVID-19 was associated with vaccine distrust. Females and those with health risk factors were found to be more cautious when compared to males and those without risk factors, respectively. Respondents under age 65 years were more likely to trust government health agencies. Those with emotional distress were more likely to take precautions in relation to the COVID-19 pandemic.

Conclusion: To prevent widening health inequalities in the particularly vulnerable population of Appalachia, further study with larger sample size should be conducted. This information can be used by health care providers to tailor patient education regarding COVID-19 vaccine administration, treatment, and prevention measures.

Keywords: COVID-19; Survey; FluTEST; Appalachia; Vaccine

INTRODUCTION

SARS-CoV-2, or as it is most known, COVID-19, presents itself on a wide spectrum from patients being asymptomatic to having pneumonia, acute respiratory distress syndrome, and more. These lifethreatening complications necessitate an aggressive containment strategy. Community-wide containment and an emphasis on social distancing are proven to reduce asymptomatic and presymptomatic spread. However, compliance with social distancing comes with challenges including cooperation, alteration to individuals routine, mental health and/or financial burden, and passive monitoring.

These sociobehavioral effects of social distancing in rural communities specifically are important to consider. Generally speaking, rural communities face unique barriers to health care compared to that of metropolitan areas. For example, rural communities may have inadequate access to health care due to physician shortages, increased travel distance to hospitals, and decreased access to public transportation.⁴ Physician shortages are also seen due to limited subspecialist availability.⁴

This brief report will describe the results of a survey (Appendix) regarding perceptions of COVID-19 in rural communities. To date, no previous studies have been published about adherence to



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COVID-19 preventative measures and viewpoints on vaccination/ other COVID-19 prevention measures in the rural Appalachian region of Ohio specifically.

METHODS

Setting and Design

A 20-question cross-sectional survey employing Likert-scale style questions regarding preventative measures taken against COVID-19 adapted from the Flu TElephone Survey Template (FluTEST) was created.⁵ This was administered over a 6-week period from February to April 2021. The survey was distributed to patients of 4 medical offices located in the rural Appalachian Ohio counties of Columbiana and Tuscarawas.

Participant Recruitment Process

Physician offices were recruited via emails sent to physicians on a preceptor list provided by the Northeast Ohio Medical University Rural Medicine Education Program. A flyer with a QR code was hung in each office waiting room. The QR code linked to an online survey, which each participant was able to complete on their personal electronic device.

Procedures

Only adults with capacity to take the survey were included in the survey and this was screened for with an introductory question along with a certification of informed consent. Following initial flyer placement, reminder emails were sent to participating offices every 3 weeks (twice in the 6-week period overall) to verify ongoing placement. After the 6-week period was completed, the survey flyers were removed from each location and the survey was closed.

Measures/Outcomes

Anonymous respondent demographics including residing county, age, gender identity, level of education, ethnicity, race, chosen risk

factors, and COVID-19 infection status were gathered in the survey. Health risk factors were defined as having a history of diabetes, heart disease, cancer, COPD, asthma, rheumatoid arthritis, tobacco use, or alcohol abuse. In addition, the Likert-scale style questions were adapted from the FluTEST template. Scoring in the Likert scale consisted of answers ranging from definitely, probably, and neither nor, followed by a conditional term and its opposite (ie, true and false or agree and disagree).

Statistical Analysis

Descriptive statistics including frequencies and means were conducted. Bivariate analyses between variables of interest and demographic factors were examined with chi-square tests. Analyses were performed using Stata MP 13 software.⁶

Institutional Review Board

This study was approved by the Northeast Ohio Medical University institutional review board (#20-019).

RESULTS

Demographics

Twenty-three respondents were included in the analysis after removing incomplete responses and nonconsenting responses (16 respondents). Incomplete responses were defined as those that did not respond to all 20 of the questions that were provided in the survey. Respondents were majority female (74%), under age 65 years (83%), college educated (74%), without health risk factors (61%), and without prior COVID-19 infection (83%) (Table 1).

Perception on Vaccines

Those who had not contracted COVID-19 previously were significantly (p < 0.05) more likely to get vaccinated (76% vs 33%) and believe the vaccine was safe (84% vs 0%) when compared to those who had contracted the illness.

Table 1. Demographics of Survey Respondents

Demographic		(n=23)
Sex		
	Male	6 (26%)
	Female	17 (74%)
Age		
	<65 years	19 (83%)
	≥65 years	4 (17%)
Education		
	Up to high school education	6 (26%)
	Post-high school education	17 (74%)
Health risk factors		
	No health risk factors	14 (61%)
	1 or more health risk factors	9 (39%)
Prior COVID-19 infection		
	Yes	4 (17%)
	No	19 (83%)

Perceptions by Sex

Compared to males, female respondents were significantly (p < 0.05) more likely to keep away from crowded places (87.5% vs 33%), strongly agree that "catching COVID-19 would cause difficulties for the people important to [them]" (50% vs 0%), and strongly believe everyone should thoroughly and regularly wash their hands when compared to males (87.5% vs 40%) (Figure 1).

Perceptions of Those with Health Risk Factors

Compared to those without health risk factors, those with risk factors were significantly (p < 0.05) more likely to strongly agree "people who are important to you think you should thoroughly and regularly wash your hands" (75% vs 8.3%). These individuals were also significantly (p < 0.05) less likely to report feeling in control of contracting the virus compared to those with no risk factors (50% vs 14%).

Trust in Public Agencies

Those who were under the age of 65 years were significantly (p < 0.05) more likely to trust government health agencies to provide accurate information compared to those who were age 65 years and over (76% vs 50%).

Mental Health

When thinking about the pandemic in the past month 81.8%, 76.2%, 81.8%, and 100% of respondents reported feeling tense, upset, worried, or annoyed, respectively. Feeling worried or tense was significantly (p < 0.05) associated with not having enough prescription medication at home to last 7 days.

Respondents that reported feeling tense, upset, or worried were significantly (p < 0.05) more likely to cancel or postpone a social event than those who did not report these feelings. The majority of tense/worried respondents reported canceling/postponing events (55.6%, 55.6%, and 62.5%, respectively) compared to 0% of those who did not report these feelings.

Respondents that reported feeling tense, upset, or worried were significantly (p < 0.05) more likely to keep away from crowded places, with 88.9% of tense/worried respondents reporting this behavior compared to 0% of those who did not report these feelings.

Respondents that reported feeling tense, upset, or worried, were significantly (p < 0.05) more likely to believe in thoroughly and regularly washing hands, with 88.2% of tense/worried respondents reporting this behavior compared to 0% of respondents without these feelings.

Respondents that reported feeling tense, upset, or worried were significantly (p < 0.05) more likely to use hand sanitizer more often than before the COVID-19 pandemic, with 94.4% of tense/worried respondents reporting this behavior compared to 50% of respondents without these feelings.

DISCUSSION

Our survey is the first to investigate perceptions of COVID-19 in a rural Appalachian Ohio community. Despite low sample size, we uncovered important information to be examined in future research.

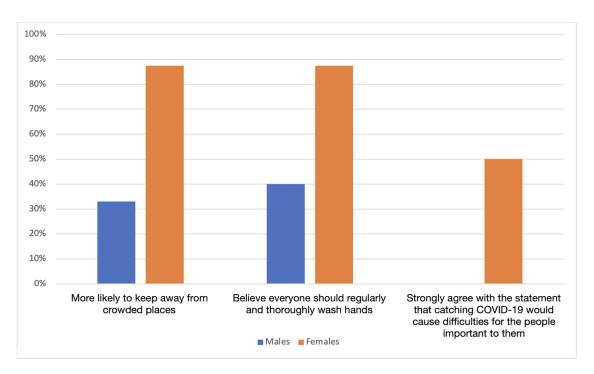


Figure 1. Differences in Beliefs by Sex

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Our study found respondents who already contracted COVID-19 were significantly (p < 0.05) less likely to get vaccinated (76% vs 33%) or believe the vaccine was safe (0% vs 84%). This finding suggests those who contracted and survived COVID-19 doubt the need for the vaccine, but further study is necessary to understand if this relationship still exists now that the vaccine is more widely available.

We found that women were significantly more likely than men to take precautionary measures (hand washing and keeping away from crowded places). This could be explained by our finding that women were significantly more likely to believe contracting COVID-19 would cause difficulties to people important to them. This may suggest women are more empathetic than men to the needs of their family and therefore might take the pandemic more seriously. This has been supported in previous studies that find women more empathetic than men as a result of contextual factors and traditional gender roles, but further study regarding differences in COVID-19 related practices between sex is necessary.^{7,8}

Our study also identified feeling stressed or tense was significantly associated with not having enough prescription medications at home to last 7 days. Further, those with health risk factors were significantly more likely than their counterparts to feel people close to them should wash their hands and that they were not in control of contracting the virus. This suggests rural residents, particularly those with health risk factors, are mindful about their unique challenges regarding COVID-19. Given limited access to health care in rural communities this caution and desire to plan is encouraging.⁹

We further discovered that patients under the age of 65 years were significantly more likely to trust government health agencies when compared to older respondents. This age-related distrust has been reported previously and may be due to older individuals having more health care contact and potentially more negative experiences from now outdated government medical advice.¹⁰

Social isolation has been associated with poor outcomes in terms of mental and physical health.¹¹ Our study revealed individuals who voluntarily engage in precautionary social isolation practices, like canceling an event or keeping away from crowded places, may experience emotional distress. In an isolated and already vulnerable rural community this may exacerbate underlying mental health problems.

Our study is not without multiple limitations. The main limitation is the small sample size and convenience sampling which reduces generalizability and therefore limits generalizability. The small sample size is likely due to the low number of doctors' offices (4) that agreed to distribute our survey. Additionally, the administration of the survey was primarily digital, potentially alienating respondents without a phone or those with limited technical com-

fort/experience. Future study will be conducted using updated distribution methods to replicate and expand upon our findings.

PUBLIC HEALTH IMPLICATIONS

Little has been published on the perceptions of COVID-19 in Appalachian Ohio. This present survey identifies key differences in this population's perceptions when stratified by sex, age, presence of health risk factors, previous COVID-19 infection status, and mental health status. Namely, women, those with health risk factors, and those with emotional distress related to the pandemic were found to be more cautious than their counterparts.

The importance of this investigation lies in the predominance of rural communities within Ohio. Out of 88 total counties in Ohio, 65 counties have over 90% of their area classified as rural. 12 The Rural Health Information Hub estimates that around 2.3 million citizens live in rural Ohio, a region characterized by lower physician to patient ratios compared to more metropolitan areas. 13,14 Given that all our responses were recorded electronically, there is a high level of suspicion that we were unable to evaluate the perspective of Amish populations who are heavily concentrated in rural areas. Due to the lack of technology and media consumption in this population, we believe that their perceptions of the pandemic may differ from other Ohioans. This study has elucidated the importance of physicians acting as liaisons between governmental agencies such as the CDC and the patients whom they serve. Since our results suggest that elderly rural Ohioans continue to maintain a distrust in the government's pandemic protocols, further studies must delve deeper into the physician patient relationship to determine potential methods of reassuring patients of their safety. The resulting information can be used by health care providers to tailor patient education regarding COVID-19.

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APPENDIX COVID-19 Rural Survey

Q1	Which Ohio county do you currently reside in?	Q9	Please indicate how muc	h you ag	ree with	the stater	ments be	low.	
O	(Selections were provided for each of Ohio's 88 counties)	Ф					either Disagree		
	2 How old are you?		The health effects of COVID more severe for people who			Disagree	or Agree	Agree	Not Sure
O	♦ ♦ 18-24 years		or more.	, .		O	O	O	O
	♦ 25-34 years♦ 35-44 years		The health effects of COVID more severe for people who			0	0	0	0
			serious medical condition.						
	\$\delta 45-54 years	Q10	Because of COVID-19, ir	the pas	t month h	now much	have yo	u	
	♦ 55-64 years	O		Significantly	Moderately	Did Not	Moderately	Significantly	
	♦ 65 years or above	iQ	Reduced or increased the amount you go to school,	Reduced	Reduced	Reduce	Increased	Increased	Not Sure
O	Q3 What is your gender identity?		college, university or work	O	O	O	O	O	O
	♦ Male		Reduced or increased use	0	0	0	0	0	0
	♦ Female		public transport Reduced or increased the	•		•		•	•
	♦ Transgender Male/Female-to-Male		amount you go into shops such as malls and grocery	0	0	0	0	0	0
			stores						
	♦ Other		Reduced or increased the amount of hand washing	0	0	0	0	0	0
	♦ Choose not to say		_						
	· ·····,	Q11	Because of COVID-19, in	the pas	t month l	nave you.			
	Q4 What is the highest degree or level of education that you have completed?	•			Yes		No	Not	Sure
	♦ Less than a high school diploma	:0	Canceled or postponed a						
	High school diploma or GED	iQ	social event such as meetin friends, eating out or going		0		0	()
	Some college but no degree		a sports event	10	•		•	·	
	♦ Associates degree (AA or AS)		Kept away from crowded		0		0	,)
	,		places generally		O		O	•	,
	Bachelor's degree (BA, BS, or BBA)		Cleaned or disinfected thing you might touch (such as do						
	Master's degree (MA, MS, MEng)		knobs or hard surfaces), mo		0		0	()
	Professional degree (MD, DDS, JD)		often than usual Used sanitizing hand gel to						
	Ooctorate degree (PhD, EdD)		clean your hands, more ofte than usual	en	0		0	()
O	Q5 What is your ethnicity?		Tried to avoid people who						
_	♦ Hispanic or Latino		have COVID-19		0		0	()
	NOT Hispanic or Latino		Usually used gloves when o	ut	_		_		_
	,		and about		0		0	()
	♦ Choose not to say		Usually used mask when ou and about	t	0		0	()
O	Q6 What is your race? Select all that apply.		and about						
	American Indian/Alaska Native	Q12	For each of the following	-					
	♦ Asian	O	definitely true, probab		either tru	ie nor fals	e, probal	bly false,	or definite
	Native Hawaiian	iQ	false or if you're not su						
		100		Definitely True	Probably True	Neither True nor False	Probably False	Definitely False	Not Sure
	Other Pacific Islander		Should reduce the number of people you meet	_	_	0	_	_	0
	Black or African American		or people you meet	0	0	0	0	0	0
	♦ White		Should thoroughly and	0	0	0	0	0	0
	♦ Choose not to say		regularly wash your hands Should clean or disinfect	Ü	Ŭ	Ŭ	Ŭ	Ŭ	Ŭ
~	Q7 Do you have any health risk factors? Please click all that apply.		things that you might	0	0	0	0	0	0
V			touch (such as door knobs or hard surfaces).	O	O	O	O	O	O
	Diabetes	_							
	Heart disease	_	The next questions refe family and/or friends. I						
	♦ Cancer	O	whether you think the						
	♦ COPD	iQ	false, probably false, o		,				
	♦ Asthma			Definitely	Probably	Neither True	Probably	Definitely	
	♦ Rheumatoid arthritis			True	True	nor False	False	False	Not sure
	♦ Tobacco use		People who are important to you think you should	_	_	_	_	_	_
	♦ Alcohol abuse		reduce the number of people you meet	0	0	0	0	0	0
	Δ		People who are important						
	♦ Other		to you think you should	0	0	0	0	0	0
Ö	Q8 As far as you know, have you had COVID-19 since February 2020?		thoroughly and regularly wash your hands	0	0	J	J	J	J
~~	Definitely yes. I was tested positive.		People who are important						
			to you think you should clean or disinfect things						
			that you might touch (such	0	0	0	0	0	0
	Not sure		as door knobs or hard surfaces).						
	> Probably no		,						
	A Definitely no. I was tested pagative								

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Q1	4 For each of the following sta	atements,	please i	ndicate ho	w true yo	ou believe these
n	statements to be.					
-		Definitely	Probably	Neither True	Probably	Definitely

		Demintery	FIODADIY	iveither inde	riouably	Demittery	
iO		True	True	nor False	False	False	Not sure
IQ	If I don't take any preventative action, then I am likely to catch COVID-19 in the next 6 months	0	0	0	0	0	0
	I have little control over whether I will catch COVID-19	0	0	0	0	0	0
	COVID-19 would be a serious illness for me	0	0	0	0	0	0
	COVID-19 would be a mild illness for me	0	0	0	0	0	0
	If I catch COVID-19, it will cause difficulties for people who are important to me	0	0	0	0	0	0

Q15 The next set of questions is regarding preparatory measures in the event of another potential quarantine. Please answer yes, no, or not sure for each one.

-					
iQ	Very assemble have an early find at home to	Yes	No	Not sure	Not Applicable
	You currently have enough food at home to last 14 days.	0	0	0	0
	You have tried to purposely catch COVID-19 to "get it over and done with"	0	0	0	0
	You have discussed with a friend or family member what you could do if one of you caught COVID-19	0	0	0	0
	You currently have enough prescription medication at home to last 7 days	0	0	0	0

Q16 Please indicate your answer to the question below.

O				Might or might		
		Definitely yes	Probably yes	not	Probably not	Definitely not
iQ	Do you intend to take a COVID-19 vaccine when it comes out?	0	0	0	0	0

Q17 Select where you have received most of your information about COVID-19 in the

- last month.
 - \Diamond People I speak to day to day (ie, family, friends, colleagues)
 - A Health care professionals (ie, my doctor, GP, pharmacist, chemist, other health care professionals)
 - Official helplines (ie, CDCINFO, etc)
 - ♦ Official websites (ie https://www.cdc.gov, etc)
 - Official departments and agencies (ie, local hospital, Department of Health, World Health Organization, etc)
 - Search Engines (Google, Yahoo, Bing)
 - Social Media (Facebook, Twitter, Instagram)
 - News Websites (ie, Fox News, CNN, ABC, NBC, CBS)
 - ♦ Newspapers
 - ♦ Television News
 - ♦ Radio News
 - ♦ Other

iQ

Q18 In regards to this source you chose above indicate whether you think the following statements are: definitely true, probably true, neither true nor false, probably false, or definitely false or if you're not sure.

	Definitely		Neither True	Probably	Definitely	
	True	Probably True	nor False	False	False	Not sure
Can be trusted	0	0	0	0	0	0
Is accurate	0	0	0	0	0	0
Tells the whole story	0	0	0	0	0	0
Is biased or one-sided	0	0	0	0	0	0

Q19 Thinking about the CDC, Department of Health and Human Services, and other government health agencies please indicate if the following statements are definitely true, probably true, neither true nor false, probably false, or definitely false or if you're not sure.

	Definitely True	Probably True	Neither True nor False	Probably False	Definitely False	Not sure
Can be trusted	0	0	0	0	0	0
Is accurate	0	0	0	0	0	0
Tells the whole story	0	0	0	0	0	0
Is biased or one-sided	0	0	0	0	0	0

Q20 For each of the following please indicate whether you've felt that way when thinking about the pandemic in the past month. Your options are: Very much, moderately, somewhat not at all, or if you're not sure

	somewhat, not at an, or if you it not suite.							
)		Very Much	Moderately	Somewhat	Not at all	Not sure		
	Tense	0	0	0	0	0		
	Upset	0	0	0	0	0		
	Relaxed	0	0	0	0	0		
	Worried	0	0	0	0	0		
	Annoyed	0	0	0	0	0		

O

iQ

End of Survey

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