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COVID-19 on the Navajo Nation: experiences of Diné families of children with asthma

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ABSTRACT

Objective: The first case of COVID-19 on the Navajo Nation (NN) was found on March 17, 2020. Even with strong public health efforts, NN saw the highest per capita infection rate in the US during May of 2020 with 2450/100,000. To determine the impact of COVID-19 on families of children with asthma on the NN, families participating in the NHLBI funded Community Asthma Program were contacted to see if they would share their experiences.

Methods: Sixty-six of 193 families (34%) were interviewed.

Results: The average age of the child with asthma was 13.5 (SD = 3.9) and 33% were female. Most Diné children with asthma in our study did not contract COVID-19. However, the pandemic had a significant impact on them and their families. Many family members contracted COVID-19, some children lost family members, and half of interviewed parents reported a decline in their child's mental health. Twenty-five percent of families sought the help of a traditional healer. Many accessed medical care through telehealth and most were able to obtain asthma medications when needed.

Conclusions: Despite significant challenges, our research indicated resilience among Navajo families.

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Introduction

Children living on the Navajo Nation face significant, health-impacting disparities that contribute to an increased incidence of asthma and challenge its management (1,2). The Centers for Disease Control and Prevention's National Health Information Survey in 2018 found that 17.8% of American Indian or Alaska Native children under age 18 were treated for asthma in the previous year (3). In 2013, the Navajo Nation Epidemiology Center found that 14.2% of people living in the Chinle Agency, one of five on the Navajo Nation, reported having been told they have asthma with 11% being treated for asthma in the past year (4).

The Navajo Nation includes 27,000 square miles of land in the southwest United States and has the lowest population density in the United States with 7 people per square mile. Hardships on the reservation take many forms. For children with asthma living on the

reservation, health disparities include poverty, crowded and multigenerational living quarters, environmental challenges including animal and dust exposure, and high levels of indoor and outdoor air pollution (2,5). Many Navajo families must travel several hours for food, water, and firewood and must do this in cars with friends, neighbors, or families. Obtaining food can be difficult for many families given that there are only 13 grocery stores on the Navajo Nation, by comparison. West Virginia is a similar size and has over 200 grocery stores. The average Navajo Nation resident drives 3 h to the grocery store.

Children with asthma are treated at one of five Navajo Area Indian Health Service major health care service facilities offering full care or one of the seven additional outpatient care facilities and five health stations in remote areas. Long travel distances, limited transportation and absence of specialty care often

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reduce the in-depth care for children with asthma. Against this background of asthma disparities, the arrival of the COVID-19 pandemic brought new uncertainty and anxiety in families who have children with asthma.

The first confirmed case of COVID-19 on the Navajo Nation was identified March 17, 2020 (6). The Navajo government took swift action to combat COVID-19 by declaring a public health state of emergency on March 13, 2020 which established the Navajo Department of Health Command Operations Center, closed the government offices except for essential employees, ceased in-person classroom instruction for all schools located within the borders of the Navajo Nation and issued travel restriction for governmental employees. Even with strong public health efforts, the Nation saw the highest per capita infection rate in the US during May of 2020 with 2450/100,000 versus NY 2119/100,000 (7,8).

The Community Asthma Program (CAP) is NHLBI funded with the objective of improving health outcomes for Navajo children. The 6-year CAP study, includes intervention in the form of training and education about childhood asthma to healthcare providers, schools, families, and communities on the Navajo Nation. Given the very large size of the Navajo Nation, participation in the CAP study was restricted to three communities from different geographic areas of the reservation (Tuba City, Chinle, and Ft. Defiance/Window Rock). Structured interviews with the parent or guardian of a child with asthma who lives in one of these three communities are performed each year to learn about the child's health, environment, and experiences with schools and healthcare facilities. These are repeated annually to assess change over time. Notably, at the onset of the COVID-19 pandemic little was known about the risk factors for all people with asthma, and particularly for children already at elevated risk for complications secondary to the virus. In this ancillary project, we sought to determine the impact of COVID-19 on the families of children with asthma who were participating in our study with the goal to understand and describe their experiences and challenges with the pandemic.

Materials and methods

One hundred ninety-three families from the Tuba City, Chinle and Window Rock communities enrolled in the CAP study and have participated in the annual, structured interviews aimed at understanding the status of their child's asthma and environment, and support they have received in the past year from their

healthcare provider and school. When the COVID-19 pandemic arrived, approval was requested and received from the National Jewish Health IRB and the Navajo Nation Human Research Review Board to conduct a separate interview with families from each of the three communities about their experiences with COVID. When families agreed, consent was completed, and the COVID-19 interview was scheduled to occur by telephone.

Interviews were scheduled between 09/07/2020 and 01/20/2021 with one parent or guardian from each family and lasted about one hour. Participants were asked questions about the number of people in their household, COVID diagnoses among household members, social distancing, health care for the child with asthma during the pandemic, and the effect of the pandemic on income, stress and mental health, and computer/internet access. Respondents were paid for their participation in the interviews. Interviews were conducted by one research staff member while a second acted as a scribe and recorded the answers in the database. In many cases, respondents wanted to share more information, offering longer responses which were recorded by the scribe. Our team used a deductive process which emphasizes themes and participant responses from previously established concepts to analyze this qualitative data (9). Two investigators conducted a thematic content analysis to generate themes and select quotes to expand upon the breadth and range of the survey information. Themes were checked with Navajo community members to ensure their intended meaning.

Respondents were also administered the six-question Brief Resilience Scale which assesses an individual's perceived ability to bounce back or recover from stress (10). This measure was included because resilience is a commonly recognized value in AI/AN communities perhaps as a result of the shared and multi-generational experiences of adversity and trauma that these communities have experienced (11). The BRS can provide insight when it comes to how one copes with health-related stressors and is often negatively related to anxiety, depression and physical symptoms (12). The Brief Resilience Scale is scored from 1–5 with scores of 1.00–2.99 indicating low levels of resilience, scores of 3.00–4.30 indicating normal resilience and scores of 4.31–5.00 indicating high resilience. The Chronbach's α for the Brief Resilience Scale in our study was 0.70 which is acceptable for short scales (13). All interviews were conducted by Navajo staff who were bilingual in both English and Navajo.

Descriptive statistics were used to characterize the experiences of families. The COVID interview cohort

was compared to the main interviewees who did not participate in the COVID interview to investigate whether these groups might have differed in some way. The variables of comparison were: age, time since asthma diagnosis, gender, and exposure to environmental tobacco smoke (ETS). For the continuous variables age and time since asthma diagnosis, group means were compared using a *t*-test. For categorical variables gender and ETS exposure, groups were compared using a chi-square test of independence.

To investigate the relationship of BRS score and mental health indicators, a series of ANOVA procedures was conducted. For five questions regarding mental health, the interviewer made a statement to which the participant indicated their level of agreement on the following scale: 0 = Strongly Disagree; 1 = Disagree; 2 = Neither Agree or Disagree; 3 = Agree; 4 = Strongly Agree. Responses were collapsed into the following categories: (0 or 1) = "Disagree"; (2) = "Neutral"; and (3 or 4) = "Agree". One question was asked in a Yes/No form: "During the past 6 months (or during the Covid-19 quarantine), did you observe a change in your mental health because of the outbreak/pandemic and how it affected you?" The procedures compared the means BRS score across these categories to determine if groups tended to report different levels of resilience as measured by the BRS. Each procedure was followed by a Bonferroni multiple comparison test (MCT) to determine the direction of the relationship. The Bonferroni MCT was utilized because the sample sizes for the comparison groups were different in every case.

In addition, all comments from families were documented providing qualitative data for analysis.

Results

A parent or guardian from 66 of the 193 participating families (34%) was interviewed. During the pandemic, many families were extremely distressed, children had difficulty with remote learning due to lack of internet availability, family members experienced illness and

loss, parents lost jobs, and many people moved between multi-generational homes as members became ill. Families were often difficult to reach or reported that with the demands of the pandemic and consequent family disruption they did not have time to participate in the interview. Because of the low response rate, we compared the demographics of respondents versus non-respondents and found no significant differences in age of the child with asthma, duration of time since asthma diagnosis, gender of the child and exposure to tobacco smoke in the house where the child spends most nights. Demographics of families are shown in Table 1. The mean age of the child with asthma was 13.5 years (SD = 3.9) and 33% were female. The average number of people living in the household was 5.2 (SD = 2.1) and 86.4% of households had a member of the family with a chronic disease (in addition to the child with asthma).

COVID illness in households

These results are shown in Table 2. Ten respondents (15%) reported a previous positive COVID test and 19 (28.8%) reported a household member had a positive test. Eighteen respondents (27.3%) reported they had a COVID like illness and 15 (22.7%) reported that a household member had a COVID like illness. Five (27.8%) of the respondents were hospitalized for COVID and two (11%) of these were in the ICU. Ten (66.7%) of the household members were hospitalized for COVID and seven (46.7%) of these were in the ICU. Only one (1.5%) child with asthma received a positive COVID test and 11 (16.7%) had a COVID-like illness. None of the children with asthma were hospitalized for COVID.

Families who had a household member with a COVID diagnosis reported being embarrassed and that family and friends were often afraid and avoidant of them. One participant shared that, "Once people found out we had COVID, they didn't want to come near us....people are still scared of us. It was embarrassing because we cannot go to church now....some

Table 1. Demographics of families and children with asthma.

	Families interviewed (<i>n</i> = 64)	Families not interviewed (<i>n</i> = 129) ^a	Comparison test of mean or frequency, COVID interview cohort vs. no COVID interview cohort, <i>p</i> value
Age of the child with asthma, mean (SD)	12.33 (3.18)	12.36 (3.05)	0.95
Duration of time since asthma diagnosis, mean (SD)	7.69 (4.01)	8.18 (3.64)	0.39
Gender of the child with asthma, <i>n</i> (% female)	24 (37.5%)	51 (39.5%)	0.79
Exposure to commercial tobacco smoke in the house where the child spends most nights	6 (9.4%)	14 (10.9%)	0.75
Number of people living in the household, mean (SD)	5.16 (2.17)	–	N/A for those not interviewed
Anyone in the household with chronic disease, <i>n</i> (% yes)	55 (85.9%)	–	N/A for those not interviewed

^aOne participant had incomplete data so is not included in this analysis.

Table 2. COVID among families of children with asthma.

	N=64 (% yes)
Did you (parent) receive a positive COVID test?	10 (15.6%)
Did you (parent) have a COVID-like illness?	18 (28.1%)
Were you hospitalized?	3 (4.7%)
Were you in the ICU?	1 (1.6%)
Did a member of your household test positive for COVID?	19 (29.7%)
Did a member of your household have a COVID like illness?	15 (23.4 %)
Was your household member hospitalized?	10 (15.6%)
Was your household member in the ICU?	7 (10.9%)
Did your child with asthma receive a positive COVID test?	1 (1.6%)
Did your child with asthma have a COVID like illness?	11 (17.2%)
Was your child with asthma hospitalized?	0 (0.0%)
Anxious about getting COVID	47 (73.4%)
Worried about infecting others (N=63, one missing value)	42 (66.6%)
Concerned about a family member or close friend getting/dying from COVID	56 (87.5%)
Feared how COVID would impact my child's asthma care	54 (84.4%)

still don't want to come in contact with us anymore.... there is still a stigma following us around." Another stated, "When we first informed friends that my family was infected, everyone's reaction was 'yeeyah' (scary)....people are afraid of my whole household." A mother stated, "If I caught it, I would be embarrassed because I think people would think that we caught the virus because we were being careless."

Forty-nine respondents (74.2%) indicated they were anxious about getting COVID and 58 (87.9%) were concerned about a family member or close friend getting COVID. Sixty-five percent ($n=43$) were worried about infecting others. Fifty-five (83.3%) feared that COVID would impact their child's asthma care.

One participant reported her story of COVID,

"I tested positive....when I first went to the IHS the doctor said I was negative and only had pneumonia and I got admitted for it. Then 2 days later they said I have COVID and sent me to Flagstaff without (me) even being aware of what was happening because I was so sick. When I woke up in the ICU the doctor told me I have COVID and I almost didn't make it but it felt like I just walked into the ER and slept one night and woke up. I have two family members that passed away during the time I was out, my father was one of them. I couldn't have any visitors at all. I was so lonely. It was a very scary and confusing experience."

Another stated, "You can't really say you got the virus because we don't want anyone to know. We just isolated ourselves and tried to beat the virus." "There was (sic) barriers to talking to other people about COVID because of the stigma, being signaled out and being afraid of us. But after opening up, we received

Table 3. Impact of COVID on mental health and income of families.

	N=64 (% yes)
Change in your mental health during COVID-19 pandemic?	38 (59.4%)
Change in your family member's mental health?	35 (54.7%)
No control over how COVID affected my life	42 (65.6%)
Experienced feelings of sadness or depression	36 (56.3%)
Felt negative and/or anxious about the future	30 (46.9%)
Experienced changes in my sleep	29 (45.3%)
Experienced changes in my eating	28 (43.8%)
Experienced changes in my concentration	35 (54.7%)
Experienced feelings of social isolation and loneliness	27 (42.2%)
Were any of the adults' jobs and income negatively affected?	36 (56.3%)
My household income has decreased	32 (50%)
Been able to purchase or obtain basic necessities?	
Yes	50 (78.1%)
Sometimes	12 (18.8%)
No	2 (3.1%)

a lot of support from everyone...words of optimistic (sic) and encouragements."

Impact of COVID on mental health and income of families

Thirty-nine respondents (59.1%) said they experienced a negative change in their mental health during the pandemic (Table 3). Thirty-six respondents (54.6%) said they saw a negative change in a household member's mental health during the pandemic. Thirty-six respondents (54.5%) experienced feelings of sadness or depression and 30 (45.5%) reported feeling negative about the future. Twenty-nine (43.9%) experienced changes in their sleep and 28 (42.4%) reported changes in their eating. Twenty-seven respondents (40.9%) reported feelings of social isolation and loneliness.

Respondents reported feelings of isolation such as "We lost my great grandmother and didn't get to grieve as a family." Another participant stated, "my boyfriend caught COVID and is still in the hospital. I have not seen him for 26 days so it brings on depression....we haven't talked in 26 days because he is on the vent machine." Not being able to attend funeral services was a common theme, "I feel very sad that I was not able to attend the service for him. I lost a lot of family due to COVID." Respondents were also concerned about other household members, "They're drinking more and smoking more weed. I think they've gotten more hateful. They really don't want people around all the time. They push people away. They're kind of isolating themselves."

"Before the virus, I was already dealing with a lot of different mental health issues. I think with these shutdowns and COVID, I kind of was forced into this

hyper mode with my PTSD. It exacerbated me that it almost made me neurotic. It increased my depression. I haven't been on any medications for my depression or mood swings for close to 10 years but I recently started medication for my mental health. I noticed I started coming home and wanted to have a drink. Like a beer. It's a real big setback to have to get back on medication though. But I'm not ashamed of it."

Thirty-six respondents (54.6%) indicated that a household member's job and income was negatively impacted during the pandemic and 32 (50%) reported a decrease in household income. Only 2 respondents indicated that they had not been able to purchase or obtain basic necessities during the pandemic. One participant reported that they were "working less hours now so we don't have enough money." Another stated that they "had to shut down because the President shut down vendors." "Normally I sell homemade food....can't do that now since everything is shut down. Everyone is scared to buy stuff that is homemade." Another reported that "I had to take leave without pay when I caught COVID and was required to use my personal vacation and sick hours during my isolation period, which caused a negative impact on my household income."

Physical and mental health of children with asthma during the pandemic

Thirty-three respondents (50%) said they saw a negative change in their child's mental health during the pandemic (Table 4). Only 4 respondents (6.1%) indicated that their child's asthma got worse during the pandemic; 59 (89.4) indicated that it was the same or better. Seven respondents (10.6%) indicated they had trouble getting their child's quick relief medication while only 2 (3%) indicated they had trouble getting their child's daily controller medication during the pandemic. One parent reported, "The hospital mailed the prescription but it is a hassle to get it at the post office....the post office is very crowded with long lines so this makes it difficult to get the medications."

Table 4. Health of children with asthma during the COVID-19 pandemic.

	N=64 (% yes)
Negative change in your child with asthma's mental health?	32 (50.0%)
How was your child's asthma during quarantine?	
Better	23 (35.9%)
No change	34 (53.1%)
Worse	4 (6.3%)
Other	3 (4.7%)
Trouble getting child's asthma medication	7 (10.9%)
Rescue or quick relief medication	7 (10.9%)
Daily controller medication	2 (3.1%)

Parents were worried about their children with asthma. One parent said of her son, "As soon as I got COVID, he lived with his aunt for nearly 3 months so he wouldn't be around me." Another said, "People were saying if you have respiratory problems, you wouldn't make it." Families were also afraid to see care for their child with asthma saying, "You don't want to take your child to the ER or Urgent Care where he has a greater risk of being exposed to the virus in the waiting room."

Parents were also worried about their child's mental health. One respondent stated that her child "became very angry, isolated herself and became withdrawn. She is not happy as she was before. I miss my little fire-cracker. She used to be a straight A student, now she has dropped to an F with no interest to improve her school work." Another reported their child "started experiencing anxiety attacks and other issues so we had to get a traditional healer to conduct a protection prayer for us." Another parent stated, "my kids are mentally stressed. They even threatened to run away." "My boys won't leave the house at all. They won't even walk outside to the car when I ask them to get me something." "My child stayed very isolated in her room. She didn't want to do anything or go anywhere. She wouldn't have dinner with the family at the table and still refuses to do so." A separate participant stated their child, "was afraid that he would lose both parents to COVID, especially when we both got really sick. He was crying and isolated himself a lot during this time."

"He's really having a hard time with it. His attitude isn't very good. He's an outgoing kid and he's only got a couple of friends. He likes to get out and do things. But I noticed he'd rather spend more time with his cousins or his dad. It's hard for him to find kids his own age at my house. He hasn't really gotten out to

Table 5. Protective strategies among families of children with asthma during the COVID-19 pandemic.

Which of the following have you done to keep yourself/your family safe from COVID?	N=66 (% yes)
Cancelled a doctor or health care appointment	42 (63.6 %)
Stockpiled food/water/wood	55 (83.3 %)
Prayed	59 (89.4 %)
Visited a doctor in person	28 (42.4 %)
Visited a traditional healer	16 (24.2 %)
Avoided public places and crowds	61 (92.4 %)
Avoided in-person contact	59 (89.4 %)
Avoided in-person contact with high-risk individuals	61 (92.4%)
Avoided in-person contact with friends	61 (92.4 %)
Wore a facemask	64 (97.0 %)
Had a tele-health visit with a doctor or health care provider	48 (72.7 %)
Frequently washed or sanitized your hands	64 (97.0 %)
Worked or studied at home	26 (39.4 %)
Isolated yourself from other persons who live in your home	21 (31.8 %)
Cancelled/postponed work or school activities	29 (43.9 %)

see the world. When he goes to Gallup, he stays in the car. He's worried. He doesn't want to be near a bigger city because it's scary. He has gotten together with his friends here and there. As long as his friends' parents are okay, then it's fine. We don't have video games here so he can't play online but he has access to the internet. My daughter has gotten into TikTok and Instagram. They keep in touch through that. It think they're tired of online school."

Others reported positive benefits, "My child started exercising more and lost about 70 pounds. He is looking healthier and breathing better and has more energy now."

Protective strategies among families

Table 5 shows results of the protective strategies reported among families. Most families reported avoiding public places and crowds (92.4%), avoiding in-person contact (89.4%), avoiding in-person contact with high-risk individuals (92.4%), wearing a face mask (97%) and frequently washing or sanitizing their hands (97%). A majority of families reported stockpiling food/water and wood (83.3%) and canceling health care appointments (63.6%). Still, 42.4% reported visiting a health care provider in-person and 72.7% reported a tele-health visit with a health care provider. A large number of families reported praying (89.4%). 39.4% reported working or studying at home while 43.9% reported canceling work or school activities.

Families reported a lot of misconceptions and taboos that affected COVID mitigation strategies. One participant stated,

"On the reservation there is a lot of misinformation about how it is contracted. Also, there is the normal Navajo taboos such as if it is not seen then it is not there. If someone wants true information they should go onto the NIH or CDC. I'm slowly trying to make others realize that the disease is real; also, to learn the real information. It is hard to get people to wear a mask."

Physical distancing was difficult for families, both psychologically and physically. "I have three grandbabies that I miss and it's very hard and I just wish it could go away. Right now, we have three family members that have passed away from it and it is just too much." A mother stated that "It was very difficult explaining to the kids about their grandfather passing and why we cannot be with family during this time."

Use of a traditional healer was reported by nearly 25% of families. "I had to contact a traditional healer and bishop by phone to get a protection prayer done to help me keep my strength and faith in God to get

me through the virus as well as reassurance." Other said they were not able to contact their healer and had to use other means.

"Because of the lockdown rules I am not able to consult with a Navajo traditional healer so I had to contact my husband's traditional healer (African medicine man). He does prayers for us over the ZOOM calls and I truly believe this has helped me and my family deal with the pandemic a little better and helped put my son's fear at ease."

Brief resilience scale

The mean score for the BRS was 3.43 (SD: 0.64) indicating of normal levels of resilience according to the scale developers (10). This is comparable to the scores reported for undergraduate students from the general population (12) and mean scores reported among American Indian and Alaska Native adults in a large ($\bar{x}=3.5$; $n=496$) study examining the relationship between stress and cardiometabolic health (14). However, it is lower than a recent large study of parents of hospitalized children ($\bar{x}=3.95$; $n=671$) (15). We also compared the resilience scores of those who reported mental health issues during the pandemic with those who did not. Those who agreed with the following statements reported statistically lower resilience scores than those who disagreed: I experienced feelings of sadness or depression ($p=0.03$); I felt negative and/or anxious about the future ($p=0.0004$); I experienced changes in my sleep ($p=0.01$); and I experienced feelings of social isolation and loneliness ($p=0.004$).

Discussion

At the onset of the pandemic, little was known about how COVID-19 would affect people with asthma and there were concerns that it might be especially dangerous for children with asthma. Our data indicate that most Navajo children with asthma did not contract COVID-19; however, the pandemic had a significant impact on them and their families. Many family members contracted COVID-19, some children lost family members, and half of interviewed parents reported a decline in their child's mental health. Children around the world have experienced declines in mental health due to the COVID-19 pandemic (16) and Diné children are no exception. Navajo families may have been less able to work remotely than the US population at large which might have increased stress for families, especially while schools were closed. In our sample, only 39% reported working

remotely versus 71% of the U.S. general population (17). While we did not ask specifically about alcohol and drug use among family members, we heard a few reports of increased drinking and drug use; however, this was common across all the US during the pandemic and not unique to Diné families (18–21).

Despite COVID-19-related trauma, Diné families adopted strategies to cope with the pandemic. Most diligently followed health guidelines including washing hands, wearing masks, and social distancing. One in four families sought the help of a traditional healer. Many accessed medical care through telehealth and most were able to obtain asthma medications when needed. More recently, as the pandemic subsides, when talking with parents at our yearly assessments, they have let us know that their outlook and their child's mental health have significantly improved.

Most people in the world have experienced some degree of upheaval due to the COVID-19 pandemic. This is also true of Diné families living on the Navajo Nation. Narratives we heard in this study reflect a complex situation and social conditions. Tightly knit communities felt the burdens of isolation resulting from lockdowns and social distancing measures. To obtain necessities such as food and water, families needed to congregate in the few towns where they were available. Fear of infection (one's own or loved ones'), and fear of stigma were evident in participants' responses.

Despite their swift public health response, Navajo Nation has unique challenges. Physical distancing was difficult in the community where multi-generational housing is common and community networks are strong. Forty percent of homes have no running water and families often haul water for home and livestock use from more than 50 miles away (22). Water became difficult to access due to travel restrictions, limited hours and the shut-down of water stations. For example, the New Mexico governor evoked the Riot Act to block off all entrances into Gallup, which created the unforeseen consequence of preventing many Navajo people who depend on the well in Gallup from accessing it.

Only 30% of homes have no electricity and Diné people make up 75% of unelectrified homes in the US (22). The vast geographic scope and widespread population also make internet access challenging with 60% of residents lacking fixed internet access (6,23). A patchwork of service providers deliver only sporadic connectivity and internet service is more expensive than elsewhere in the country with the average Diné family paying \$44/month higher than elsewhere in the US (6). The closure of chapter houses, schools and other public spaces meant many families could

no longer access the Internet (24). A recent article describes the ways in which improving internet service and digital health technology capacity in Navajo Communities may improve health outcomes from health conditions, including COVID-19 (25).

Despite these difficulties, the Navajo Nation took strong community action to prevent the spread of COVID-19, for example calling in the National Guard and setting up quarantine facilities in schools and community centers with food and supplies so that persons didn't need to leave (24). They were among the first in the nation to develop outdoor, drive-thru testing and led the country in the number of persons tested. Hotels were used to isolate infected persons who lived in multi-generational households and the large community health representative (CHR) program provided education, food, water, medication and supplies to families who were isolating (26). A recent article recounts a story of a COVID-positive patient who was stopped at a roadblock (10). The individual was supposed to be isolating but had run out of food and water so needed to leave the house to get supplies. The CHR at the roadblock took care of this so the person could isolate.

Diné health beliefs are deeply linked to the relationships they establish and maintain with others and the environment. The Sa'ah Naagháí Bik'eh Hózhóón model emphasizes the Navajo worldview, a perspective grounded in maintaining balance in health between the individual, the family, the community, and the environment. In the Navajo worldview, health begins with an individual mindset cultivated by the relationships with family (biological and kinship), other living beings, land, and traditional practices. Traditional teachings about health are based on Navajo creation stories that explain destructive behaviors/lifestyle such as laziness, selfishness, uncleanness and greediness as causal factors for disease or illness.

Our research indicated resilience among Navajo families, and we heard stories of positive community structures and relationships that exist within the Diné culture. President Jonathan Nez called on citizens to "help one another" and "protect our elders" who are the reservoir of wisdom and essential carriers of knowledge. Navajo Nation continues to lead the US in vaccination efforts, with 75% of Diné over age 12 fully vaccinated; compare to only 64% of US person over age 12 being fully vaccinated (27). A strong sense of community is one of the reasons for the high vaccination rates. A survey by the Urban Indian Health Institute revealed that 87% of respondents believed getting vaccinated is their responsibility to their family, tribe and community (28). Participants shared that

vaccination was a way to protect Native communities and preserve cultural ways. Such strong ties to cultural identity and community act not only as protective factors for health but are also examples of Native resilience (29). We also observed lower resilience scores among those who indicated worse mental health.

This report has limitations. The sample interviewed represents only 34% of the original interview cohort and it is possible that the experiences of these families were different than those who did not participate. Changes in experiences and perceptions about COVID that could have changed over the course of the pandemic are not reflected in these single time-point interviews. Since this study included only Diné families living on the reservation, we are not able to determine specifically how their COVID experiences differed from families living in other geographic areas or on other tribal lands.

Conclusions

In summary, despite significant challenges during the COVID-19 pandemic, our research indicated resilience among Navajo families, and we heard stories of positive community structures and relationships that are particular to the Diné culture.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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