UNDERSTANDING COVID-19 AS A LIVED EXPERIENCE OF BOTH SYNDEMIC VULNERABILITIES AND COMMUNITY STRENGTHS: COMMUNITY LEADER AND PROVIDER DESCRIPTIONS OF THE 2020 PANDEMIC IN REMOTE ALASKA

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ABSTRACT

This article examines how the COVID-19 pandemic unfolded in 2020 within the syndemic vulnerability of remote Alaska and how community members and organizations responded to help each other. Syndemic vulnerability, which originates in medical anthropology, identifies how sociocultural inequalities heighten vulnerability to multiple and concurrent adverse health outcomes with synergistic effects. Here, we examine responses by remote community leaders and service providers to the questions "What is your greatest concern for your community and/or the communities you work with in the coming months?" and "What things have gone well during the COVID response in your community or the communities you work in?" Their responses, collected between September and December 2020, illustrate the syndemic vulnerability of remote Alaska and point to the possible biosocial interactions that may be occurring as a result of the pandemic, the synergies between these domains that comprise how the pandemic is experienced within the context of syndemic vulnerability, as well as the community and regional strengths drawn upon in times of crisis. These findings are significant for identifying the immediate and long-term impacts of the pandemic, as well as the positive responses that can be supported during this pandemic and other future crises.

INTRODUCTION

When SARS-CoV-2 arrived in remote Alaska, it caused disease and disruption in an ecosocial context of syndemic vulnerability (Willen et al. 2017). "Syndemic" refers to the upstream, often large-scale, social factors that contribute to multiple, concurrent, and sometimes synergistic adverse outcomes affecting health and well-being (Gravlee 2020; Singer and Clair 2003; Willen et al. 2017). Remote Alaska is characterized as communities that are off the road system and are often predominantly Alaska Native. The geographic remoteness and small populations of many of these communities affects all residents' access to basic needs and medical services under normal times, and this limited access has been exacerbated due to pandemic-related interruptions in transportation and global supply chains (Eichelberger et al. in review; Fried et al. in review). Some remote communities are home to diverse communities of residents, including individuals identifying as Native Hawaiian and/or Pacific Islander. Pacific Islanders and Native Hawaiians experience a disproportionate COVID-19 mortality burden across the United States, as well as in Alaska, where they are 2% of the total population but represent 5% of total deaths due to COVID-19 (Penaia et al. 2021; State of Alaska Office of the Governor 2022).

In addition, Alaska Native peoples, who are the majority demographic in many remote Alaska communities, have higher prevalence of comorbidities associated with greater risk of complications stemming from COVID-19, including obesity (35%) compared to white Alaskans (26%) (EpiCenter 2017). In 2020, the mortality rate due to COVID-19 among Alaska Native people in Alaska (79.1 per 100,000) was over 3.7 times the rate among the white population (21.0 per 100,000) (AK DHSS 2020). To date, Alaska Natives represent 26% of deaths due to COVID-19 but only 16% of the state population (Penaia et al. 2021; State of Alaska Office of the Governor 2022). At the same time, community and regional institutions, as well as individual community members, organized early on to assist each other during the pandemic.

In this way, the COVID-19 pandemic is a biosocial phenomenon (McDade and Harris 2018), one that is experienced both biologically (e.g., infection) and also socially through the lived experiences of its direct and indirect impacts in specific contexts. Examining the pandemic through a biosocial framework allows us to identify how these experiences are outcomes of the social, economic, and cultural conditions that they also influence (Gravlee 2020; Mansfield 2011; Singer and Clair 2003).

We characterize the context of syndemic vulnerability into which the COVID-19 pandemic unfolded in 2020 and share community-based concerns of possible syndemics based on responses given by 22 remote community leaders and service providers to the question "What is your greatest concern for your community and/or the communities you work with in the coming months?" Their responses, collected between September and December of 2020, describe the initial biosocial impacts of the pandemic exacerbated by pre-existing vulnerabilities and possible synergies between SARS-CoV2 and pre-existing health disparities.

To balance this deficit approach, we also report responses to the question "What things have gone well during the COVID response in your community or the communities you work in?" We phrased these questions differently according to whether the interviewee lived in the community in which they worked. Their responses, also collected between September and December 2020, illustrate the syndemic vulnerability of remote Alaska and point to the possible biosocial interactions that may occur as a result of the pandemic, the possible synergies between these domains that comprise how the pandemic is experienced within the context of syndemic vulnerability, as well as the community and regional strengths drawn upon in times of crisis. These findings are significant for identifying the immediate and long-term biosocial impacts and synergies caused by the present pandemic, as well as recognizing the positive community-level responses that can be supported during this pandemic and future crises.

On a broader level, these data illustrate the need for medical anthropologists working under the syndemic framework to recognize the noninfectious illness clusters and synergies that may comprise a syndemic, as well as the supportive responses of people in communities. This balanced approach is critical when working with diverse remote communities and is often missing in the anthropological literature on risk and vulnerability.

BACKGROUND

COVID-19 IN REMOTE ALASKA, FEBRUARY—EARLY DECEMBER 2020

In February 2020, approximately three months after the first detected cases of SARS-CoV-2 infection in China,

there were still no confirmed cases of COVID-19 disease in Alaska. Yet health officials began encouraging Alaskans to prepare for its emergence locally (Baty and Downey 2020; Zink 2020). The Alaska governor declared a state of emergency on March 11, 2020, two days before Alaska reported its first positive case of COVID-19 in a cargo pilot on a layover in Anchorage (AK DHSS 2020). Three additional cases were identified in the state that week—all in urban centers. The first case in remote Alaska was identified on March 18 in the Southeast community of Ketchikan (population 8000). In short succession, state public health officials declared that community transmission was occurring in Anchorage, and the Municipality of Anchorage issued a Hunker Down notice requiring limited travel outside the home for essential goods and services only (Wieber 2020).

Leaders in many remote communities focused on developing mandates, travel restrictions into small villages, testing protocols for travelers, and securing sanitation supplies and testing kits. By the end of March, there were widespread travel bans and Hunker Down orders across many communities in remote Alaska, which allowed only essential travel and required 14-day quarantines upon arrival in the community (DeMarban 2020; Hopkins 2020). Communities that had unused buildings converted them into quarantine and isolation facilities.

Some of the relatively larger communities in western Alaska began to detect sporadic COVID-19 cases in early April, but most communities remained untouched except for single and small groups (fewer than five) of cases in Nome, the Yukon-Kuskokwim region, Kodiak, Bethel, Sitka, Petersburg, and Prince of Wales–Hyder. COVID-19 cases increased slowly during the month of May, and community spread was first detected in remote Alaska in Kotzebue by the Maniilaq Health Corporation on June 12, 2020, followed closely by suspected community spread in Napaskiak (Yukon-Kuskokwim region). By the end of July, every borough or census area in Alaska had reported at least one COVID-19 case (McLaughlin and Castrodale 2020).

By the time we initiated interviews with service providers and community leaders in September 2020, a series of disruptions had affected the daily lives of remote residents. Ravn Airlines, an Alaska-based air carrier and lifeline for goods and services, including patient travel and mail to many remote Alaska communities, ceased operations in early April after declaring bankruptcy due to the drop in air travel (Hollander 2020). The State of Alaska Marine Highway System, a ferry system that is vital for access to food and medical care, dramatically cut back its already-reduced service to isolated communities. Public schools across the state closed for in-person instruction for the spring semester and remained closed for the rest of the calendar year. This left many parents and caregivers in communities without reliable, affordable, or sufficient internet access to struggle between paying bills, working, and connecting to remote learning platforms.

Most remote communities had strict masking and physical distancing requirements, travel restrictions, and quarantine mandates. Many government offices that provided services, such as licenses and public benefits, closed for in-person services. Some communities were in total lockdown: leaders would meet planes arriving at the airstrips and turn away any passengers who were not residents. During these initial months, people employed in oil, gas, and mining operations that required commuting by air carrier had to quarantine for 14 to 28 days on either end of their two- to three-week "hitch" shifts. These extended absences strained domestic relationships and depleted household resources.

USING A STRENGTHS-BASED APPROACH TO EXAMINE SYNDEMIC VULNERABILITY AND COMMUNITY RESPONSES

Since SARS-CoV-2 was first recognized as a global threat in early 2020, a growing number of scholars have called for understanding the pandemic through the framework of syndemic theory (e.g., Gravlee 2020; Horton 2020; Mendenhall 2020; Poteat et al. 2020). Syndemic theory from medical anthropology posits that diseases are part of lived biosocial experiences: they do not exist independent of the social, cultural, political, and economic contexts in which they occur and to which they contribute (Singer et al. 2017). Within this framework, the concept of syndemic vulnerability builds on interdisciplinary ideas of social determinants of health to identify the "upstream factors that contribute to harmful environments" (Willen et al. 2017:966) in which synergistic sociocultural inequalities heighten vulnerability to multiple and concurrent adverse health outcomes. While understanding this vulnerability is critical, identifying community and organizational strengths is equally important. This is particularly true within the tribal health system, where it is common to hear that American Indian/Alaska Native (AI/AN) communities are tired of hearing that they are

vulnerable without equal attention to their cultural and local strengths. AI/AN health professionals have decried the comparative dearth of scholarship on COVID-19 in AI/AN communities, in particular that which identifies community needs and strengths occurring during the pandemic (e.g., American Public Health Association 2020; Maudrie et al. 2021). Indeed, that was the primary critique of this paper when we circulated it for tribal review. Tribal leaders wanted to document local strengths as well as vulnerabilities.

Our analytical approach is therefore guided by an Indigenous holistic worldview of the interconnectedness of people, generations, and their social and natural environments. Historical memory, oral traditions, sharing traditional knowledge and foods, the continuity of language, humor, and care for one's Elders, youth, and community are central to the sense of well-being shared across the diverse array of Alaska Native communities.

To these approaches, we add perspectives from the political ecology of health (Jackson and Neely 2015; Mayer 2000; Zabaniotou 2020), an interdisciplinary framework through which scholars seek to understand human health and well-being in the broader context of human–environment relations, as well as the influence of large-scale and historic political and economic forces. If one understands ecosocial epidemiology and syndemic theory to be a consideration of upstream factors, the addition of political ecology asks us to consider the entire watershed. The natural environments of remote Alaska communities are largely unique in the United States: accessible only by plane, boat, and/or snowmobile. Alaska Native cultures are land-based, and daily life revolves around the subsistence seasons (fishing, hunting, and gathering) for which the months are named. Activities and access to basic needs (i.e., food, water, and heat) are affected by the seasons, by weather, and by climate change. This broader environmental context is critical for understanding how the COVID-19 pandemic is unfolding in these communities.

Together, scholars working under these frameworks have demonstrated the importance of identifying how the complex interactions between humans and their social and natural environments affect health, as well as the sociocultural and health impacts of novel infectious disease outbreaks, and how together these affect the trajectory of an outbreak. The application of Indigenous holistic worldview to these frameworks requires us to consider not just the negative upstream forces but also the upstream strengths upon which people draw to mitigate vulnerability and to protect each other. By combining these perspectives, we aim to characterize the complex biosocial context of the COVID-19 pandemic in remote Alaska as one of syndemic vulnerabilities and local strengths.

METHODS

All study methods were reviewed and approved by the Alaska Area Institutional Review Board, as well as the Alaska Native Tribal Health Consortium Health Research Review Committee. Prior to initiating data collection, we consulted with community leaders and service providers between May and September 2020 to develop our research approach and interview questions. Draft interview questions were circulated to several Alaska Native and non-Native community leaders and service providers and to the Alaska Native Tribal Health Consortium Indigenous Research Committee for feedback and suggestions of topics to include.

After integrating this feedback, we conducted 20 in-depth key informant interviews with 22 individuals (one interview was a group interview of three people) with intimate knowledge of remote Alaska due to their work. Interviewees were from health and social services (n = 10), government and public services (n = 7), or owned businesses or were involved in local economic development (n = 4) in remote communities across the state of Alaska. Twenty interviews occurred between late September and late October (September 21–October 29, 2020), with two additional interviews occurring in mid-December 2020. We included these two December interviews because of the rich perspectives the interviewees added, and because their responses were not dramatically different than the interviews conducted in September and October. All interviews were conducted prior to the availability of the COVID-19 vaccines in Alaska. Throughout this process, we attended call-in meetings with state, tribal health, and regional leaders on pandemic responses and consulted with friends and contacts living in remote Alaska. These observations and ongoing input enabled us to track the changing context of key informant responses and influenced the development of and analysis of key informant interviews.

Fifteen of the 22 (68%) interviewees were female, 12 (55%) were American Indian or Alaska Native, and 16 (73%) were currently living in remote Alaska. More than half of the interviewees were between the ages of 30 and 60 (n = 14, 64%), with one younger than 30 and four

over 60 years old. We do not report on the geographic distribution of interviewees here in order to preserve anonymity. Key informants were recruited through our professional networks as researchers working in Alaska and through the authors' own social networks as Alaska community members. Cochran is an Iñupiaq Elder, Eichelberger and Fried graduated high school in Alaska and have extended family in the state, and Hahn is a professional fisherwoman based in Cordova. All four have extensive community-based research partnerships in remote Alaskan communities.

Interviews lasted approximately one hour and covered the topics of how the COVID-19 pandemic was affecting the community they live in or the communities they work with, how people were coping with pandemic-related stressors, what had gone well in their communities since the pandemic began, and interviewees' greatest concerns for the months ahead. We obtained verbal consent from all participants and conducted interviews online using Zoom. The majority of participants agreed to have their interviews recorded for accuracy purposes. Most of the interviews were conducted by a team of two to three researchers with one primary interviewer and one to two note takers. The remaining interviews were conducted by a single interviewer who also took notes. Interview notes were reviewed alongside the audio recordings to check for accuracy.

Using the MAXQDA Smart Coding Tool to facilitate the coding and creation of code groups, one researcher analyzed key informant interview responses using in vivo coding by assigning codes that reflected either respondents' actual words or paraphrases. We then grouped codes thematically into larger subthemes identified through coding, and then grouped these subthemes into larger "master themes" identified through the literature on syndemics and vulnerability, as well as through in vivo coding. Theme identification was followed by lexical searches to identify any missed segments. In vivo codes are designated using quotation marks in the results section. Once we identified preliminary codes, the research team revised the codes in relationship to survey findings (Hahn et al. 2021) to align with these broader findings.

In this paper, we report key informants' responses to the questions "What things have gone well during the COVID-19 response in your community/the communities you work in?" and "What is your greatest concern for your community/the communities you work with in the coming months?" We first report on the results of the greatest concerns question, with five "life domains," referring to the master themes of lived experiences and vulnerabilities affected by the pandemic, which we identified through the coding process (described above): health and well-being, basic needs and services, information needs, economic, and politics and power. We then report on the specific subthemes of the largest of these domains related to concerns (health and well-being). Future papers will explore in more detail the concerns related to the other four life domains. Finally, we report on four major themes and multiple subthemes related to what went well during the COVID-19 response in communities.

RESULTS

MAJOR THEMES OF CONCERN

The major themes of concern expressed by interviewees were related to health and well-being (n = 20, 100%), basic needs and services (n = 12, 60%), information needs (n = 4, 20%), economic concerns (n = 4, 20%), and concerns related to politics and power inequalities (n = 3, 15%) (Table 1). There was significant overlap between all concerns related to health and well-being, which we grouped into three domains: (1) physical and psychosocial health (n = 20, 100%), defined as concerns related to physical, mental, and behavioral health, vulnerable populations, comorbidities, and disease prevention; (2) socioenvironmental context of health (n = 12, 60%), defined as concerns related to how people respond to their surrounding natural environment, such as spending more time indoors during winter, and related health effects; and (3) sociocultural well-being (n = 7, 35%), into which we grouped concerns related to how the pandemic may negatively affect cultural practices, social cohesion, and interconnection, as well as the importance of traditional knowledge for health.

DOMAINS OF HEALTH AND WELL-BEING

Table 1 summarizes the subthemes of key informants' concerns related to the life domain of health and well-being and provides examples of quotes from which these codes were derived. In all 20 interviews (100%), participants mentioned concerns related to physical and psychosocial health, which we discuss below. Twelve interviewees (60%) mentioned concerns related to the socioenvironmental context of health: how people respond to their surrounding natural environment, focused on how people

Table 1. Summary of master domains in response to the question "What is your greatest concern for your community/ the communities you work with in the coming months?"

Concern Domain	Definition of Domain	# Interviews	% Interviews
Health & well-being		20	100%
Physical & psychosocial health	Physical, mental, and behavioral health, vulnerable populations, comorbidities, and disease prevention	20	100%
Socioenvironmental context	How people respond to their surrounding natural environment, such as spending more time indoors during winter, and health effects	12	60%
Sociocultural well-being	How the pandemic may negatively affect cultural practices, social cohesion, and interconnection, as well as the importance of traditional knowledge	7	35%
Basic needs & services	Access to basic needs (food, water, internet, electricity, fuel), healthcare, medicines, and community services (schooling, daycare, post office)	12	60%
Information needs	Rumors, misinformation, confusing messages, need for "personable COVID education"	4	20%
Economic	Loss of jobs, inadequate financial resources, inability to quarantine because of financial costs	4	20%
Politics and power	Leadership needs, inequalities of power	3	15%

* Concern domains are not mutually exclusive. Interviews and text were coded with multiple codes.

respond to winter conditions in remote Alaska and how this context affects health and disease risk. Finally, in seven interviews, participants identified concerns related to how the pandemic may negatively affect cultural practices, social cohesion, and interconnection, as well as the importance of traditional knowledge for survival. We discuss each of these dimensions in the following subsections.

PHYSICAL AND PSYCHOSOCIAL HEALTH

Many concerns related to health and well-being were difficult to categorize separately as either physical, mental, or behavioral. We therefore chose to group them into the inclusive category of physical and psychosocial health to acknowledge the complex interconnections between psychological, social, and physical health. Because of the substantial number of responses that fell into this category, we grouped responses into four subthemes: psychosocial health (n = 10), protecting vulnerable populations (n = 10) such as homeless and Elders, disease concentration and interaction (n = 9), and vaccine uncertainties (n = 2) into which we grouped concerns related to SARS-CoV-2 vaccines.

In half of the interviews (n = 10), participants described concerns related to psychosocial health, defined as the interplay between psychological and social responses during a novel epidemic (e.g., Eichelberger 2007; Farmer 1994; Strong 1990). The most prominent concerns in this category were how experiences of stress and social isolation would affect compliance with public health mandates and recommendations. For example, one behavioral health professional interviewed in October 2020 noted:

> It's just too much and people are trying to move on with their lives even though this is still happening. Complacency is a pretty big threat to our community.

The second most common group of concerns related to health we categorized as "disease concentration and interaction," concepts taken from syndemic theory (Gravlee 2020), into which we put concerns pertaining to potential co-occurrence or clustering of multiple epidemics (disease concentration) and the possibility of biophysical and/or biosocial synergies that would exacerbate health effects (disease interaction). The top concerns in this domain related to possible interactions between SARS-CoV-2 infection and preexisting health disparities in infectious and chronic diseases. For example, one public health nurse described her concern that the lockdowns would increase the spread of tuberculosis (TB):

> I think the other thing is like, I feel like…I deal with a lot of TB here—and both of my nurses are [dealing with it]. I mean, we still have this TB issue and I feel like with people staying at home, I feel like that's one of the other things that's going to affect people with TB. Like it's gonna spread. There's going to be more spread of TB. I mean, we still get sporadic spread of TB in the villages, but I feel like since people are staying at home and hunkering down, I don't know. It can probably go either way, but I feel like there's going to be more TB. One of the concerns that we have right now, there's like over 60 cases of TB in [the hub] and surrounding areas.

Two key informants specifically spoke about concerns regarding COVID-19 co-occurring with the annual influenza season, such as this interviewee who worked for several local governments:

> All of the experts say there's going to be a surge in the fall. Combine a possible COVID surge with the annual flu surge. That combination will be very dangerous. Clinicians have expressed that flu symptoms can mask COVID. It's going to be a challenge to identify COVID cases.

The third largest category of concerns was related to physical and psychosocial health, specifically how to protect vulnerable populations. From these interviews, we identified the following populations as those of greatest concern to our key informants: people living in homes without reliable running water, residents of low-quality and/or crowded homes, Elders, and people who are homeless or houseless.

The smallest category of concerns related to vaccine uncertainties (n = 2, 10%). Both interviewees in this category were concerned about how vaccines would be distributed and to whom. One interviewee, an Alaska Native woman working in social services, was particularly concerned about the safety of a vaccine, whether Alaska Native peoples would be used as "guinea pigs" to test the vaccine but also whether they would be able to access it:

> [I'm concerned about the] vaccine. What is the access to it? Are we going to be guinea pigs? Elders share stories about trauma during the Spanish flu, missionaries, so many negative instances that have occurred. Because we're oral historians—is this going to happen again with the vaccine? Are our communities going to be devastated again?

All but two interviews occurred prior to the FDA approval of any SARS-CoV-2 vaccine, and all were conducted prior to vaccine availability in Alaska. Perspectives on potential vaccines were discussed at other points in the interview, but these data are not presented here. However, these concerns correlate with our findings (see Hahn et al. 2021).

SOCIOENVIRONMENTAL CONTEXT

All concerns coded as socioenvironmental context related to how winter conditions would affect health and well-being in the context of geographically remote communities. The majority of these pertained to how winter negatively affects access to basic needs and services (n = 5), particularly water and emergency travel, and fears of how interruptions to access would affect people during the pandemic. For example, in many communities air travel is required to access emergency and critical medical care, as well as food and fuel. During the winter months, planes can be delayed for hours, even days, due to inclement weather. Several interviewees expressed concerns about the ability to evacuate (medevac) patients with severe COVID-19 to hub communities and/or Anchorage, where the Alaska Native Medical Center (a hospital serving Alaska Native and American Indian patients) and two other large hospitals are located.

> Travel in the wintertime. It's harder in the wintertime, it's harder to travel. If there's bad weather and there's an emergency situation—that's one thing I'm concerned about.

An equally common concern were the psychosocial responses to winter, including stress (n = 2), isolation (n = 1), complacency (n = 1), and the interaction between increased drinking, violence, boredom, and respiratory disease. These subthemes are discussed in more detail below. The second most common concerns pertained to people gathering indoors during winter (n = 3) and the risks for transmission as people spend more time inside.

SOCIOCULTURAL WELL-BEING

The final health dimension identified in these data are concerns that pertain to sociocultural well-being: cultural practices, social connections, knowledge and values that support health and well-being. Most prominent among

these concerns was how the pandemic was negatively affecting the social relations and cultural roles that enable access to food, water, fuel, and community services (n = 3). Other stand-alone themes were the inability to hold a traditional funeral, inadequate food access because of interruptions to subsistence, and making sure people are bathing but not using communal steam baths.

One interviewee, an Alaska Native behavioral health professional living in remote Alaska, was particularly concerned about the importance of retaining and passing on to her children the traditional knowledge needed to survive without the "Western" world:

> My concern, maybe for the first time in my life, is teaching my kids how to survive if supply chains are interrupted. I'm more concerned about making sure that they know how to do things like build a fire find food for themselves. That's one of the reasons why we put so much food away. I think we picked 30 gallons of berries and processed almost 300 fish total. We worked really hard on fish this summer, and I probably sent over half of it to other people. Because out here you just don't know, if planes are delayed for two weeks because of bad weather, the store shelves are empty, and you really have to make sure that you have enough food to last at least a month in your house, because whatever you have in your house is what you're going to eat. So that's why subsistence is of such huge importance out here to us… it's not just cultural, it's also just basic survival in order to keep living out here. I am thinking more about that, not just for the next three months or four months but for the next decade, making sure that my kids can teach their kids how to survive if there's a gap in connection to the rest of the globe. I've heard that Elders have said there's going to be a time when Western stuff isn't going to be here anymore. And you have to know how to feed yourself and take care of yourself when that happens.

Her response captures not only concerns about food and energy security in off-road communities but also the sociocultural dimensions that support well-being and the synergies between cultural practices and access to basic needs. Pandemic-related travel restrictions, lockdowns, and disruptions to the global economic system hindered subsistence and Alaska Native traditional practices—and at the same time heightened their importance. The importance of these sociocultural dimensions is also evident in descriptions of what went well in communities during the first year of the pandemic, which we discuss next.

WHAT WENT WELL IN COMMUNITIES

> When COVID-19 first made it to Alaska, as far as our Indigenous languages go, a lot of us had worked together to get the proper translation of, you know, "Keep our Elders safe," "Wash your hands or use hand sanitizer," "Use face coverings" in our Indigenous languages. And, you know, a lot of our communication is by word of mouth and we're also visual communicators and learners. And to see and hear the different languages being used—I think that's been one of the good response. Also, you know, we have our traditional foods and medicines that we use and that has actually become heightened in that regard. There have been more uses of these traditional foods as medicines. And, you know, I think it's stuff we already knew, but it's become more… like the access, you know, like everyone might not have access to a store-bought medicine, so they need to turn to the land or the sea to provide that need.—Female Alaska Native social services provider living in remote Alaska

As evident from the data already presented, the COVID-19 pandemic occurred within the context of limited access to healthcare, sanitation supplies, and food. Pandemic-related supply chain disruptions exacerbated this already-limited access. In this section, we summarize key informants' responses to the question "What things have gone well during the COVID response in your community and/or the communities you work in?" (Table 2).

ORGANIZATIONAL RESPONSES

In response to asking what has gone well, the most common answer (70%) was related to organizational responses, including individual organizations as well as the coordination between entities. Interviewees reported that, in response to the pandemic, businesses began to offer no-contact delivery and/or pickup services, and they created safe work environments with protections for employees such as sanitation and mask protocols and gave employees the opportunity to work from home. One respondent also highlighted that local businesses pivoted away from catering to tourists and toward serving locals instead.

Local and tribal government responses were reflected on positively, which included keeping community members informed through Facebook, radio announcements, and other means. Local and tribal governments were also appreciated for the restrictions they imposed on who could

Table 2. Summary of major themes and subthemes in response to question "What things have gone well during the COVID response in your community/the communities you work in?"

Theme	Defined	# Interviews	% Interviews
Organization responses	How organizations responded to changes related to the pandemic	14	70%
Businesses	Positive reactions related to testing employees, creating safe work environments, catering to locals, and providing no-contact delivery/pick-up services	7	35%
Local/tribal government	Positive reactions related to communication within community, travel restrictions, and strict hunker down orders	6	30%
Tribal health organizations	Positive reactions related to contact tracing in communities and schools, healthcare provider support, and adaptation of medical facilities	4	20%
Coordination between organizations/communities	Positive reactions related to co-occurring hunker down orders across proximate communities, communication/coordination between communities and organizations	5	25%
Task forces/unified commands	Positive reactions related to the creation and sustaining of these organizations	4	20%
Other	Positive reactions related to responses by tribal corporations (2), State of Alaska (2), grocery stores (2), fish processor (1), and a senior center (1)	8	40%
Caring for/helping others	Positive reactions related to taking care of Elders (4) and people in quarantine (3)	6	30%
Mask-related responses	Positive reactions related to compliance (3), production (2), and mandates (1)	5	25%
Community spirit/support	Positive reactions related to community cohesion and uplifting actions	5	25%
Traditional/cultural activities	Positive reactions related to traditional foods (2), medicines (1), creative activities and language use (2), and non-Native cultural activities (1)	4	20%
Other	Positive reactions related to outdoor activities (2), destigmatizing quarantine (1)	3	15%
No answer	Respondent did not answer question	1	5%

* Themes are not mutually exclusive. Interviews and text were coded with multiple codes. Major themes are noted in bold and are underlined; subthemes are listed in plain text.

enter the community with protocols requiring permission and/or proof of a negative COVID-19 test. Strict hunker down orders by local governments were also considered something that had gone well during the pandemic.

Tribal health organizations were mentioned as being particularly responsive with regard to making testing accessible to community members as well as conducting comprehensive contact tracing. This was particularly highlighted in one community that experienced an outbreak at the local school, which was followed by testing everyone in the school and appropriate contact tracing. Support from healthcare providers was also cited as a particular strength, as well as adapting medical facilities for the care of COVID-19 patients.

Coordination between organizations and communities was also highlighted by five interviewees. In one case, the respondent described the coordination between geographically close communities such that they would all hunker down and open in unison in response to positive COVID-19 cases in any of the included communities. Other respondents cited weekly meetings with all tribes in the region and coordination between previous silos within state government and within the community. Coordination between nonprofits and schools and after-school programs for the betterment of families and children was also mentioned. Coordination between city and tribal governments, airlines, churches, schools, Alaska Native corporations, tribal health organizations, health

centers, and the borough was a particularly wide-reaching example of such a response.

Grocery stores, in particular, were mentioned to have helped with the response by offering no-contact delivery and/or pick-up services, enforcing mask wearing, and offering special hours for Elders and high-risk individuals to shop. One respondent also described their local grocery store designating groups of houses to shop during dedicated times to limit the number of people in the store at any given time.

Finally, the State of Alaska was identified as a positive aspect of the response by being flexible with grantees and providing CARES Act funding for small infrastructure projects in the community.

CARING FOR AND HELPING OTHERS

Caring for and helping others was mentioned in 30% of interviews as an example of what had gone well during the pandemic. Interviewees gave examples of community members checking on and delivering mail to Elders and also bringing Elders food from the store to make sure they could stay safe while still getting what they needed.

Respondents also mentioned that community members made efforts to take care of people in quarantine by bringing them groceries and subsistence foods (fish) and making them food like chicken pot pies and donuts. Visiting people in quarantine safely was also highlighted as a positive response.

MASK-RELATED RESPONSES

Interviewees cited mask-related responses as something that had gone well during the pandemic. This included the implementation of mask mandates, community members complying with mask wearing, and community members producing masks for other communities and individuals within their own community.

COMMUNITY SPIRIT AND SUPPORT

One-quarter of respondents mentioned community activities and/or community perspectives related to supporting each other. One respondent mentioned that community members placed teddy bears in windows so children and others could take walks around town and see them. They also told a story about people walking around in costumes in front of people's houses to say hello and improve community spirit. The sentiment of togetherness was reflected by interviews that reported a "community willingness to help with whatever came up" and stating that "we [the community] know we are one."

TRADITIONAL AND CULTURAL ACTIVITIES

Four interviewees (20%) mentioned traditional Alaska Native and cultural activities as a positive response. In particular, eating traditional Alaska Native foods such as seal oil, salmon strips, greens, berries, and muktuk to strengthen the immune system was mentioned. Sharing fish with those in quarantine was also reported. The use of traditional medicines was also reported as becoming more common, "especially when we don't have access to a pharmacy," as one respondent said. Traditional medicines included stinkweed as well as using traditional foods as medicine.

Learning and teaching traditional Alaska Native creative activities such as carving, beadwork, and dancing was reported to have been helpful. Likewise, traditional language teaching and use was mentioned with community members translating messages about "keeping our Elders safe," handwashing, and using hand sanitizer into local Indigenous languages. Non-Native local artists were also reported to have adapted theater performances, dance, and spoken word activities to be compliant with safety regulations and precautions.

OTHER/NO ANSWER

One interviewee did not provide an answer to this question, while two mentioned that outdoor activities were a positive response they had experienced and observed during the pandemic, and one responded that there had been community efforts to destigmatize quarantine.

DISCUSSION

We provide a synthesis of the primary concerns of 22 community leaders and service providers from across remote Alaska who participated in in-depth interviews between September and December 2020. Interviewees also reflected on community and organizational responses that had positive impacts. These findings represent important concerns and strengths during a specific timeframe of the

COVID-19 pandemic. All interviews occurred prior to vaccine approval and availability, and thus should be interpreted within the context of that timeframe.

Interviewees' greatest concerns in late 2020 spanned a wide range of health, socioeconomic, cultural, and logistical impacts and challenges related to COVID-19. All respondents were concerned with continuing COVID-19 infections and/or psychosocial health, and the majority were worried about the impact of winter on worsening the pandemic in their communities as people moved indoors. One recent study of suicide risk during the course of the pandemic found that suicide rates stayed the same or decreased across several high- and middle-income countries (Pirkis et al. 2021), while others found increased rates within some demographics (O'Connor et al. 2021; Sinyor et al. 2021). These concerns illustrate the importance of understanding the COVID-19 pandemic as a syndemic occurring in distinct political-ecologic contexts (Bambra et al. 2020; Kenyon 2020; Poteat et al. 2020).

Of particular concern was how pandemic-related restrictions such as sheltering at home might increase the risks of other respiratory diseases. In addition to concerns related to seasonal flu, healthcare providers were concerned about how the pandemic might exacerbate preexisting health disparities such as tuberculosis as people shelter together in low-quality, multigenerational housing during the cold and darker winter months. A study in the Yukon-Kuskokwim region found that early in the pandemic there was a decrease in respiratory syncytial virus (RSV) and acute respiratory infection (ARI) following the implementation of social distancing guidelines (Nolen et al. 2021). Outside of Alaska, a study in Greece found a 46% reduction in all-cause respiratory morbidity between March and April 2020 compared to the prior year (Kyriakopoulos et al. 2021); however, much of this trend may be due to patients avoiding medical care during the pandemic. Future research should inform strategies that account for these preexisting health needs so as not to disrupt access to care and/or preventative measures.

Interviewees' concerns about the impacts on food and water security and to community services such as school, childcare, and the post office add to the global evidence that long-term effects of pandemics are amplified in a syndemic context (see also Akseer et al. 2020; Leddy et al. 2020; Pérez-Escamilla et al. 2020). Disruptions to travel and air services negatively affected access to store-bought and traditional foods. In fact, the pandemic's negative effect on food access has been well documented in other contexts (e.g., Bennett et al. 2021; Cappelli and Cini 2020; Fitzpatrick et al. 2021). This concern reported by key informants in late 2020 has also been confirmed by data we collected through surveys and in-depth interviews conducted in 2021 (Fried et al. in review). Understanding—and preventing—the long-term consequences of these disruptions should be a priority during the continued pandemic and into the future.

Strengths were identified primarily through mention of organizational, governmental, and community-level responses, including effective communication and coordination between entities and with and between community members. Such coordination included working across previously separate silos, combined response to positive cases between three geographically close communities, businesses (included grocery stores) offering no-contact delivery and pick-up services, and tribal health organizations and other entities attending to contact tracing, testing, and other public health–related community needs. These interviews were conducted prior to the successful rollout of COVID-19 vaccines across Alaska in early 2021. In fact, Alaska initially led the other U.S. states in COVID-19 vaccine coverage, owing in great part to the decision of tribal health organizations to exercise their sovereignty and provide vaccines to all community members, regardless of eligibility.

It was also apparent that community members' responses during the first year of the pandemic (2020) in terms of caring for others, supporting mask wearing, and engaging in traditional Alaska Native and non-Native cultural activities were additional areas of resilience. One respondent reported that community members came together to translate public health messages into the local Indigenous language to improve communication. Amplified responses based on engaging in traditional activities and the arts on an individual and community-wide level were also reported, as were community members coming together to care for Elders and each other. The positive responses reported by our interviewees demonstrate that sociocultural well-being is a major source of community strength with respect to contending with the pandemic and its concomitant challenges. Reflecting on how people across Indian Country have turned to Indigenous knowledge and medicines during the pandemic, Manson and Buchwald (2021:60) have referred to these as survivance: "recapitulating a way of life that nourishes indigenous ways of knowing, this time extended by lessons from a contemporary pandemic." Indeed, a key theme throughout our

conversations was the intersection of many of the respondents' concerns across personal physical and psychosocial health and sociocultural well-being. One prominent narrative among Alaska Native Elders, even prior to the COVID-19 pandemic, is that Indigenous knowledge and values provide a pathway to health and well-being in times of crisis. The belief that although the Creator allowed disease in the world, he/she also provided medicine on the land provides strength in times of uncertainty. Traditional or subsistence foods (those that are hunted or gathered), water, and local plants are the medicines that provide physical and cultural health in everyday life and in times of crisis. Social distancing mandates and travel restrictions interrupted traditional practices of food sharing and caring for vulnerable populations such as Elders and the homeless. Others mentioned the substantial impact that the disruption of normal communal events and routines such as proper funerals or use of steam baths had on mental health. Although some cultural events, such as traditional dancing, craft making, and singing groups, shifted online, the ability to engage in these activities required internet connectivity that many lack.

STRENGTHS AND LIMITATIONS

This study and the key informant interview guide were collaboratively developed with community advisors who are familiar with Alaska Native culture and life in remote Alaska communities. Additionally, several co-investigators (Eichelberger, Fried, and Hahn) drew on their community relationships throughout the state to connect to people on the frontlines of the COVID-19 responses. This study provides a key contribution to the literature on the strengths and major concerns present in remote Alaska communities as the pandemic unfolded.

This study has limitations, including that the majority of interviewees work in health and social services, which may skew the proportion of concerns about the pandemic's impact on health and healthcare access. Additionally, interviewees predominately identified as Alaska Native/American Indian (55%) and/or worked within the tribal health, governmental, and social services sectors. Though remote Alaska communities also include immigrant populations, our interviewees largely represent either an aggregate or Alaska Native view. We are therefore unable to comment on how the pandemic has affected other subpopulations.

Due to our small sample size, we are not able to explore associations between codes, for example, between worries about vaccine safety or efficacy and concerns about accessing up-to-date information. By contrast, the relationship between information needs and COVID-19 vaccine hesitancy is a prominent theme that has emerged in data from remote participant observations (not reported here). One might expect that with a larger sample size, and now that the vaccines are being actively distributed, there will be more relationships between these two codes in future interviews. Similarly, because we targeted people involved in the COVID-19 response, our sample included fully employed individuals with higher education attainment and income than many community members living in remote Alaska. Finally, the majority of key informants who participated in this first round of interviews are women, which may influence the concerns reported. Therefore, these concerns should not be generalized to the general remote Alaska population. Rather, they should be interpreted as shared concerns among community service providers and leaders.

CONCLUSION

In 2020, the COVID-19 pandemic had significant impacts on health and well-being, access to basic needs and services, and economic resources in remote Alaska communities. Service providers and community leaders interviewed for this study were primarily concerned about future impacts in five domains: health and well-being, basic needs and services, information needs, economic resources, and politics and power. Primary strengths identified by these key informants included responses by businesses, local/tribal governments, tribal health organizations, caring for/helping others including Elders, and engagement in traditional and cultural activities.

The information reported here describes the initial biosocial impacts of the COVID-19 pandemic in remote Alaska during 2020, community-based concerns for possible biosocial synergies, and the positive community responses to challenges related to the pandemic. Yet the COVID-19 pandemic continues to evolve as a biosocial and biological phenomenon, with biosocial impacts and synergies yet to be fully understood. The interviews reported here were conducted in the early phases of the pandemic, occurring before the approval and distribution of vaccines; before the emergence of the delta variant, vaccine

hesitancy, and rejection of public health mandates caused a dramatic surge in cases and crisis-level hospital care; and before the omicron variant threatened another surge.

Future research should explore the actual syndemics that have emerged as a result of the pandemic and identify promising community-centered responses. Importantly, a greater understanding is needed of synergies involving both infectious and noninfectious disease. For example, the data presented here illustrates the pandemic's negative impacts on overall well-being, including stress and possibly substance use and interpersonal violence. Might these psychosocial impacts affect infectious disease incidence, such as the dramatic increase in chlamydia cases statewide? Can we learn from and build on the community-level responses reported above for future public health crises? Anthropologists are well positioned to characterize the broader and longitudinal biosocial impacts and synergies resulting from the COVID-19 pandemic, as well as the lessons to be learned from the present pandemic that can be applied more broadly.

ENDNOTES

All study methods were reviewed and approved by the Alaska Area Institutional Review Board, as well as the Alaska Native Tribal Health Consortium (ANTHC) Health Research Review Committee. This paper was reviewed by the Alaska Native Tribal Health Consortium Health Research Review Committee, who provided feedback that we incorporated into the final draft. All errors are our own.

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