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Perceptions of the Environment and Health Among Members of the Confederated Tribes of the Umatilla Indian Reservation

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ABSTRACT

Indigenous cultures perceive the natural environment as an essential link between traditional cultural practices, social connectedness, identity, and health. Many tribal communities face substantial health disparities related to exposure to environmental hazards. Our study used qualitative methods to better understand the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) members' perspectives about their environment and its connections with their health including views on environmental health hazards. Three 90-minute focus group sessions with a total of 27 participants were held to elicit opinions on meanings of health and how the environment interacts with health. A systematic text analysis was used to derive themes across focus groups. Participants expressed a holistic view of health that included environmental, physical, mental, spiritual, and social components. A healthy natural environment was identified as an essential component of a healthy individual and a healthy community. Participants also described many environmental health concerns including second-hand smoke, outdoor smoke, diesel exhaust, mold, pesticides, contaminated natural foods, and toxic wastes from the Hanford nuclear site and methamphetamine labs. Many believe the identified environmental hazards contribute to diseases in their community. The natural environment is an important resource to CTUIR members and plays an integral role in achieving and maintaining health. Knowledge about the values and concerns of the community are useful to the tribal and federal governments, health professionals, environmental health practitioners, and community members who seek to achieve sustainable and healthy rural Native communities.

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INTRODUCTION

HUMAN HEALTH IS INFLUENCED by environmental, economic, and sociodemographic factors.¹⁻³ Public health policy, therefore, involves both removing stressors that impair health⁴ and reinforcing positive elements that enhance health. Local, state, and federal agencies have begun to recognize that human health depends on a healthy and functional environment and are incorporating this knowledge into public health policy decisions.⁵ At the federal level, the U.S. Environmental Protection Agency established the Sustainable and Healthy Communities Research Program to raise awareness of the connections between health and environment. This program seeks to inform and empower community leaders by integrating community health into environmental and socioeconomic decision making.⁶

American Indians residing on reservations face a number of environmental-related health disparities and are at increased risk to environmental hazards. They may be impacted by hazardous waste sites; they collect subsistence foods from contaminated waterways, and they gather traditional foods from lands that may be contaminated. Housing characteristics and traditional practices such as smoking foods also contribute to chemical exposures. The cumulative exposures from these unique pathways may increase the risk of environment-related disease. Environmental contamination also disrupts the practice of many important cultural activities. The tribes consider it important to identify environmental risks associated with daily exposures to improve their understanding of environmental exposures and address health disparities due to carrying on traditional cultural harvesting and consumption of traditional foods and residence in remote rural settings.^{5,7,8}

In contrast to many modern societies, many tribal governments have environmental protection and restoration policies that do not separate their own health from the health of their environment or culture.^{9–14} Health for many American Indian communities is derived from membership in a community that has access to, and use of, ancestral lands and traditional resources.¹⁵ These perspectives suggest that, to ensure the health of present and future generations, public health policies are needed that help tribal citizens retain access to high quality environmental resources.

Despite science's previous history of dismissing indigenous traditional ways of knowing¹⁶ and tribal governmental policies, many U.S. environmental and public health officials now recommend incorporating traditional knowledge into federal, state, and local environmental decision making that affects indigenous communities.^{5,17,18} Traditional knowledge is a collective knowledge system comprised of values and experiences that are unique to individual societies; in the case of communities that have a more subsistent lifestyle, it bonds cultural aspects of health with the social and natural environment.^{17,19} It also informs a code of ethics—one of respect and balance—which governs community members' relationship with the environment and behavior within the environment.¹⁷

The purpose of our study was to identify the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) members' perspectives 1) about health and its connections with their environment, and 2) perceived environmental health threats in the community. We sought to identify both positive and negative elements that could be addressed to improve their community's health and inform federal and tribal government policies.

METHODS

Setting

The CTUIR is a sovereign government established through a union of the Umatilla, Cayuse, and Walla Walla Tribes. In partnership with the federal government, it provides its citizens with a full range of governmental

services. Approximately one-half of the 2,800 enrolled members of the CTUIR live on or near the 172,000 acre reservation in northeastern Oregon in the Columbia River Plateau region.²⁰ The reservation is located in Umatilla County, which had an estimated population of 76,784 in 2012.^{21,22} Tribal governmental headquarters are located in Mission, Oregon, an unincorporated community. Within a 50 mile radius, there are numerous Comprehensive Environmental Response, Compensation, and Liability Information System sites, fish advisories, and the Hanford nuclear reservation sites upstream on the Columbia River with multiple National Priority List sites within its borders.

Data collection

After receiving tribal health board and tribal council approvals, members of the CTUIR aged 18 years and older were invited to participate in 90-minute focus group discussions. The CTUIR Department of Science and Engineering staff coordinated participant recruitment. This department conducts research for the CTUIR government in order to protect rights, resources, and health of its citizens. Recruitment methods included word-of-mouth and mailing letters of invitation to CTUIR members who resided within a 60-mile radius of the reservation. In total, 27 tribal members were recruited to participate in three focus group sessions comprised of 8, 10, and 9 participants. They were held on location in November and December 2011. Each participant was given a meal and a \$25 gift card. Focus group discussions were facilitated by a trained and experienced moderator who posed questions regarding participants' perceptions of individual and community health and the environment (Table 1). Probes and follow-up questions were used to explore themes and expand discussion among participants.²⁴ All discussions were audio recorded and transcribed.

Analysis and interpretation

A systematic text analysis of the transcripts was conducted using Atlas.ti data management and analysis software to derive emerging themes. Text was first coded by each question to identify the context for each of the subsequent thematic categories. Next, the text was coded according to subthemes identified throughout each of the

TABLE 1. FOCUS GROUP GUIDE QUESTIONS

What does being a healthy individual mean to you?
What does a healthy community look like?
In your opinion or experience, what gets in the way of being a healthy person or a healthy community?
In what ways is your health and the health of your family connected to the environment?
What sources of pollution or types of chemicals concern you the most?
Do you encounter any type of smoke during your day-to-day activities?
Does Hanford concern you as a source of pollution?
Would you eat plants or game or fish obtained there?

focus group sessions. All coded text and themes were independently reviewed by two other researchers. This triangulation method ensures valid and reliable interpretation and presentation of results.^{25,26} Discrepancies were discussed by the three reviewers until mutual agreement was achieved.

RESULTS

The results are organized by the question(s) asked. Table 2 presents thematic categories and list of environmental health concerns. Many responses and associated sub-themes within each section overlap, suggesting that health integrates these components. Participants perceived that the health of individuals and the community are achieved by the integration of healthy lifestyles, mental and spiritual health, social connections, and a clean natural environment. Conversely, members perceived that modern influences, barriers to the practice of traditional activities such as hunting and gathering, and polluted natural environment and foods adversely affect their health. Air and water pollutants and toxic chemical exposures were viewed as threats to the natural environment, natural foods, and ultimately health.

Health and natural environment

Participants were asked what it means to be healthy and what comprises a healthy community. Their responses to these questions encompassed many components such as healthy lifestyle, harmony and balance, and social connectedness/community involvement. Participants emphasized that their health is tied to the natural environment. Particularly, three general themes emerged: 1) access to a clean environment and unpolluted food and water, 2) loss of traditional activities tied to the environment, and 3) polluted natural environment and natural foods.

Access to clean environment and unpolluted food and water. Participants stated that maintaining health at the

TABLE 2. ENVIRONMENTAL HEALTH CONCERNS AND CONNECTIONS WITH HEALTH OF COMMUNITY MEMBERS

Environmental Health Concerns
Air Quality
Ambient Air (Smoke, Diesel Exhaust)
Indoor Tobacco Smoke
Water Quality
Hazardous Waste Leakage
Cattle Ranching
Toxic Chemical Exposure
Pesticides
Radiation Leakage from Hanford Nuclear Site
Methamphetamine Lab Waste
Environmental Connections to Health
Access to Clean Environment and Unpolluted Food and Water
Loss of Traditional Activities Tied to the Environment
Polluted Natural Environment and Natural Foods

individual and community levels relies on having access to a clean environment, including clean air, clean water, and unpolluted and abundant natural foods. This meant having knowledge of where and how food is grown and assurance that water is being tested and safe for consumption:

And that's what I . . . consider if you're looking for a healthy community is that we know . . . where our food's grown . . . where the water's coming from . . . how that water's tested, how that water's maintained.

Having access to clean outdoor environments allowed one individual reprieve from second-hand smoke exposure in the workplace:

I don't feel any better than when I go up into the mountains. It's clean up there . . . But, I work here in the casino, and all day just breathing smoke in. I feel dirty when I get off work. I don't feel clean. I go up there and do nothing but hack up half a lung but when I get back down, I feel better. I feel cleaner.

Many participant expressed concerns about access to traditional lands affects the ability to carry on traditional hunting and gathering activities.

Loss of traditional activities tied to the environment. Individuals linked many health threats to impacts on traditional tribal values and activities. For example, one participant lamented loss of access to traditional lands for fishing, hunting, or gathering:

Plus the loss of being able to go out and hunt and do the things we used to be able to do without somebody coming in and telling us "No you can't do that. You can't cross that. There's a fence there. You can't go here. It's posted. You can't fish in this river because of this. You can't go gather because it's on this land." There are a lot of things that were part of the environment that we're not allowed to do as freely as we once did. I think that affects . . . self-esteem, culture, you know, you as a person and who you are.

Another participant described a growing disconnect with the natural environment and traditional relationships as a cause of current problems in the community:

My concern was that we grow away from nature as a physical person. We have a spiritual vibe that was there, that was a part of our whole livelihood at one time, where Indian names come from. And when we lose touch with nature and then the symptoms begin to show that we begin to have problems that we have today.

Polluted natural environment and natural foods. Environmental contamination and polluted natural food were often identified barriers to maintaining good health. Participants expressed great concern about eating traditionally caught or hunted foods because of the reservations close proximity to known hazardous waste sites including Hanford Nuclear site:

It's the outside factors. It's the people around us, you know, that dump into the Columbia River, that dump . . . all this stuff and our fish comes up glowing or deer meat's

not what it used to be...and it affects everything that comes through here that we want to use . . . as our resource to feed ourselves, to clothe ourselves.

I have a hard time with that because . . . I don't feel safe raising my own son to eat salmon because I'm afraid that he'll suffer for it. I won't do that to him. And I think that's . . . that's really sad. Because . . . that's a gift for us . . . the salmon. That's a gift for us.

Environmental concerns and connections with health

In response to questions about specific environmental health concerns, three general themes emerged: 1) air quality, 2) water quality, and 3) toxic chemical exposure. Environmental contamination was perceived to threaten health and traditional ways of interacting with the natural environment.

Air quality. Outdoor smoke and dust from wood and field-burning and local industries including an asphalt plant, diesel exhaust, indoor tobacco smoke, and mold were cited as air quality concerns. Ambient air quality can be affected by local geography where atmospheric inversions trap smoke, dust, and exhaust in low-lying areas within the community. Concern was raised that cases of cancer were attributed to chronic exposure to these contaminants, as illustrated by two participants:

Well, besides smoke, I worked in air quality and there is, I think, a problem there but they never have proven anything. We've had people from down there by [the] riverside complaining about the air and how it affects them and there's several down that way that died from cancer From all the wood smoke that's burned down in riverside.

And then I live right across from the hospital so all the Semis go by and all the trucks. We don't go outside on the front porch at all. If we're going to be outside, we go out back where . . . you're not having direct contact with it all, but it is tough. Lots of pollutants in the air and the exhaust going by. Like I said, coming up here is tough . . . emissions from diesel does cause cancer to some degree.

Chronic exposure to tobacco smoke was also viewed as harmful. Participants often referred to the tribe's casino when making statements about indoor air quality hazards attributed to second-hand exposure to cigarette smoke:

I don't come to the casino to gamble because it takes me two days to recover from the smoke.... Secondhand smoke is dangerous.

It's actually deadlier than smoking a cigarette itself because...all you're getting is pure toxin. You're just getting the by-product of what everybody blows out.

Concern about breathing mold spores was another home air quality concern:

Because we get a lot of rainfall here, you're going to get the mold and buildup behind the wood that eventually starts to emit . . . the poisons and those kinds of things . . . Yeah, all the houses have mold in them . . . it's bad. It's in the wall. You can't see it.

Water quality. Participants voiced concerns regarding water quality, including hazardous waste leakage and pollution caused by cattle ranching. Although the Hanford Nuclear site was not an exclusively named source of hazardous waste leakage, most participants referred to it as the main source for concern, particularly as it affects the local salmon:

The material inside of the [Hanford hazardous nuclear waste storage tanks] is going to rot it out over time and . . . it's going to leak into the river. It doesn't matter where you fish at or where you get your fish from. It's contaminated.

You know that water that sunk into the ground at Hanford is in the Columbia and fixing the salmon so that we can be poisoned.

Others expressed resentment over cattle ranching and the environmental damage in local waterways. For instance, one participant mentioned the negative impact that cattle have on the local Umatilla River and its salmon:

How is it ok for this rancher to let four or five hundred cattle go into the river and put all these pollutants in? You know, you go into a spot and there's twenty-five head standing in the water with all their feces and whatever just dirtying it up. And then you see the salmon swimming between their legs.

Toxic chemical exposure. Whether through air or water, chemicals including pesticides, radiation from the Hanford nuclear site, and methamphetamine lab waste, were cited as concerns. Participants viewed all of these sources as directly impacting the quality of natural foods and members' health:

Pesticides leaching into the ground and you know, it goes into our water source and you know, it affects our roots and berries. We'll continue to dig and dig for those roots and pick those berries regardless of what's going on. I'm convinced that constant...flow of chemicals has got to have some kind of adverse effect.

And a lot of my friends that were in the foothills or over in Pilot Rock have cancer now. And I'm wondering did that radiation roll over me? I can't believe how many of my friends that live in the open areas have cancer.

We have meth labs around the community. You know and I don't think people really understand the depths of where all these are being dumped. They can be dumped anywhere. They can be dumped on the roadside. They can be dumped up here in the mountains. They can be dumped in children's playgrounds.

Individuals viewed the natural environment's health as affecting the health of the entire ecosystem, their own health, and their traditional activities in a number of ways. These perspectives were frequently illustrated by the loss of wildlife in the area, demonstrating how the environment intersects with community members' lifestyles and well-being:

There [were] . . . a lot of bats.... But they're gone. They're long gone. And the fish begin to move up [river] . . . to where we live and higher and now they're way up as far up as the north and south fork of the Umatilla River. And so it shows that there [have been] changes in the environment that we can't see.

If you have a tainted environment, anything in it is going to suffer. And if you take that into yourself, you're going to suffer the same effects.

Everything we do is affected by that. The animals we eat, we hunt, the vegetables we grow, the roots we dig. It's all affected by what's in the water and what's in the air.

Despite the concerns about polluted natural foods, participants still viewed these foods, and the traditional activities of hunting and gathering of these foods, as central to their idea of a healthier community:

You know, if we teach the youth to hunt, we teach them to cut their own meat, we teach them how to dry their own meat, can their foods, and gather at the right times of the year so they have those foods available to them. I think if we start incorporating our first foods more often as a community, and I know we try, that's another part that might help become a healthier community.

DISCUSSION

Our study confirms that our sample of adult CTUIR tribal members view health in a holistic and dynamic manner that includes physical, mental, cultural, spiritual, and social components. These components were inter-related with each other and with the health of the natural environment, particularly as it relates to traditional gathered foods. Traditional foods, known as "first foods" throughout the Pacific Northwest region, include salmon, game, roots, berries, Indian celeries, and other natural foods.²⁷ These findings are consistent with prior work indicating that American Indians view the natural and social environments as inseparable features to health and well-being.^{10,11}

With respect to barriers to health, study participants cited the loss of traditional values and activities, modern influences, polluted environment/natural foods, and lack of access to traditional tribal lands which prevents or impedes traditional hunting and gathering activities. The participants viewed these as barriers to good health because modern influences make it more difficult to connect with the natural environment. Study participants stated that they wanted to continue to harvest and eat healthy natural foods but worried that they may actually be causing harm because of known or unknown contaminants that may be present in the foods. Unhealthy commercial food choices and pollutants in the natural environment were seen as main driving factors for diseases. Our study participants shared concern that rising cancer rates in the community could be linked to chronic exposure to environmental contaminants in air and water, a concern that has been observed in other American Indian communities.^{7,28}

Study participants described community health and individual health in overlapping ways. They expressed a dynamic notion of health that involves: community participation, lifestyle choices, and adaptation to changes in the natural environment. They also described a community striving to regain and retain their traditional cultural

values and ways of living, despite modern influences and environmental threats.

Focus group participants frequently described traditional practices. It is beneficial for non-tribal researchers to understand that these perspectives are based on traditional CTUIR knowledge which forms the basis for tribe's unwritten laws known as *Tamánwit*:

There is so much to this word or this way, this *Tamánwit*. It's how we live. It's our lifestyle. There is so much that we as Indian people are governed by, through our traditions, our culture, our religion and most of all, by this land that we live on. The promise that this land made and the promise that we made as Indian people to take care of this land, to take care of the resources, and to live by those teachings is the grander principle of the bigger law that was put down on this land when this world was created.¹⁵

Tamánwit includes elements of food, air, water, land, energy flow, light, people, dress and material culture, language, and shelter, all in dynamic balance. These principles help describe the tangible and intangible aspects of environmental that support the cultural identity and heritage of Pacific Northwest tribal cultures, and that guide tribal members in maintaining the health of the environment.²⁹ As such, it aligns with both science and natural processes and guides policies for sustainability by protecting the environment, maintaining tribal natural and cultural resources, and enhancing tribal members' health and well-being.

A few limitations to this study should be noted. Given the recruitment strategy for the focus groups, this was not a random sample and it is likely that not all members of the Tribe, such as elders and children, were adequately represented. Similarly, this study was specific to the CTUIR tribal community, and therefore may not be generalizable to other tribal communities. However, one strength of our study was its qualitative approach. Focus groups provided in-depth context of the meaning of health and environment specific to this tribal community and elicited environmental concerns specific to the CTUIR's lands.

Finally, the concept of traditional environmental knowledge was evident in participants' discussion on how changes in the natural environment affect all components within the ecosystem: the fish and wildlife, the people's natural foods, their traditional practices, and the health of individuals and the community. This traditional knowledge is essential to incorporate into environmental assessments and federal and tribal governmental policy-making, and for use in planning for safer and healthier tribal communities.^{5,17,18} This knowledge also provides a broader context for discussions about environmental health risks and culturally appropriate measures to reduce risk, which are necessary to address environmental disparities and improve tribal health. Finally, incorporating traditional knowledge should not only result in improved environmental conditions and sustainable communities, but greater mutual respect between tribal governments and federal and state environmental and public health agencies.

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